Computer algebra independent integration tests

1_Algebraic_functions/1.1_Binomial_products/1.1.1Linear/1.1.1.5P(x)(a+bx)^m(c+dx)^n

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Contents

1 Introduction

This report gives the result of running the computer algebra independent integration problems. The listing of the problems are maintained by and can be downloaded from Albert Rich Rubi web site.

1.1 Listing of CAS systems tested

The following systems were tested at this time.

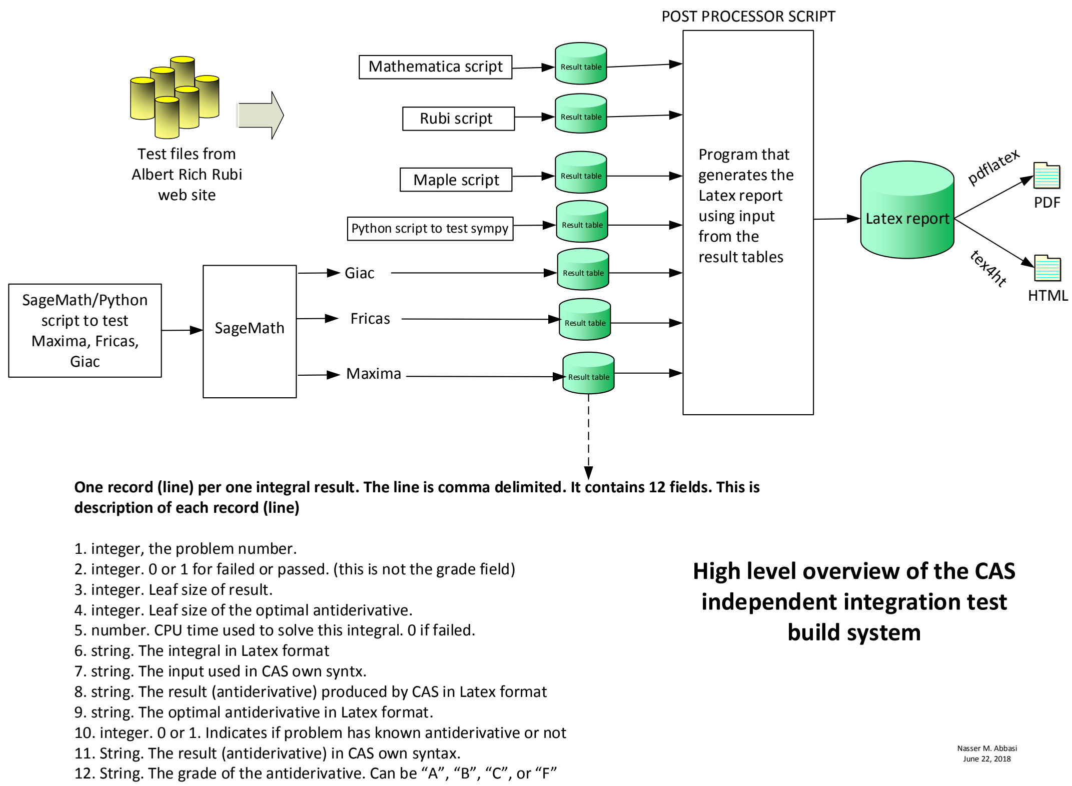
1. Mathematica 11.3 (64 bit).
2. Rubi 4.15.2 in Mathematica 11.3.
3. Rubi in Sympy (Version 1.3) under Python 3.7.0 using Anaconda distribution.
4. Maple 2018.1 (64 bit).
5. Maxima 5.41 Using Lisp ECL 16.1.2.
6. Fricas 1.3.4.
7. Sympy 1.3 under Python 3.7.0 using Anaconda distribution.
8. Giac/Xcas 1.4.9.

Maxima, Fricas and Giac/Xcas were called from inside SageMath version 8.3. This was done using SageMath integrate command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly using Python. Rubi in Sympy was also called directly using sympy 1.3 in python.

1.2 Design of the test system

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



1.3 Timing

The command `AboluteTiming[]` 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 has 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 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 is not counted in the final statistics.

1.4 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 produced was correct.

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

1.5 Important notes about some of the results

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

The exception raised is `ValueError`. Therefore Maxima result below is lower than what could result if Maxima was run directly and each question Maxima asks 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 30 such integrals out of total 705, or about 4 percent. This pecrentage can be higher or lower depending on the specific input test file.

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. If the output was an exception `ValueError` then this is most likely due to this reason.

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 loading of Maxima `abs_integrate` was found to cause some problem. 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 and Giac/XCAS results There are Few integrals which failed due to SageMath not able to translate the result back to SageMath syntax and not because these CAS system were not able to do the integrations.

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.

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

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

The other CAS systems (SageMath and Sympy) do not have special buildin function for this purpose at this time. Therefore the leaf size is determined as follows.

For Fricas, Giac and Maxima (all called via sagemath) the following code is used

```
#see https://stackoverflow.com/questions/25202346/how-to-obtain-leaf-count-express

def tree(expr):
    if expr.operator() is None:
       return expr
    else:
       return [expr.operator()]+map(tree, expr.operands())

try:
    # 1.35 is a fudge factor since this estimate of leaf count is bit lower than
    #what it should be compared to Mathematica's
    leafCount = round(1.35*len(flatten(tree(anti))))
except Exception as ee:
    leafCount =1
```

For Sympy, called directly from Python, the following code is used

```
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
```

When these cas systems implement a buildin function to find the leaf size of expressions, it will be used instead, and these tests run again.

1.6 Grading of results

The table below summarizes the grading of each CAS system.

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
Rubi	% 100. (142)	% 0. (0)
Rubi in Sympy	% 43.66 (62)	% 56.34 (80)
Mathematica	% 98.59 (140)	% 1.41 (2)
Maple	% 95.77 (136)	% 4.23 (6)
Maxima	% 21.83 (31)	% 78.17 (111)
Fricas	% 53.52 (76)	% 46.48 (66)
Sympy	% 16.2 (23)	% 83.8 (119)
Giac	% 47.18 (67)	% 52.82 (75)

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.

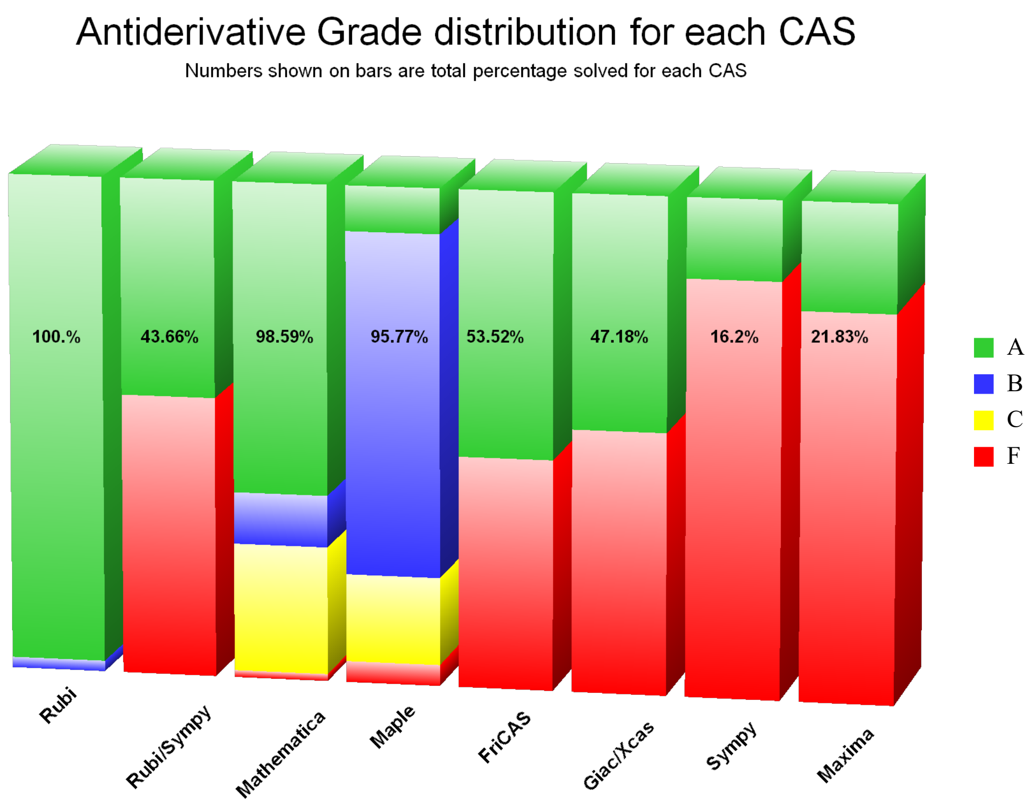
grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. 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.

Grading is currently implemented only for for Mathematica, Rubi and Maple results. For all other CAS systems (Maxima, Fricas, Sympy, Giac, Rubi in sympy), the grading function is not yet implemented. For these systems, a grade of A is assigned if the integrate command completes successfully and a grade of F otherwise.

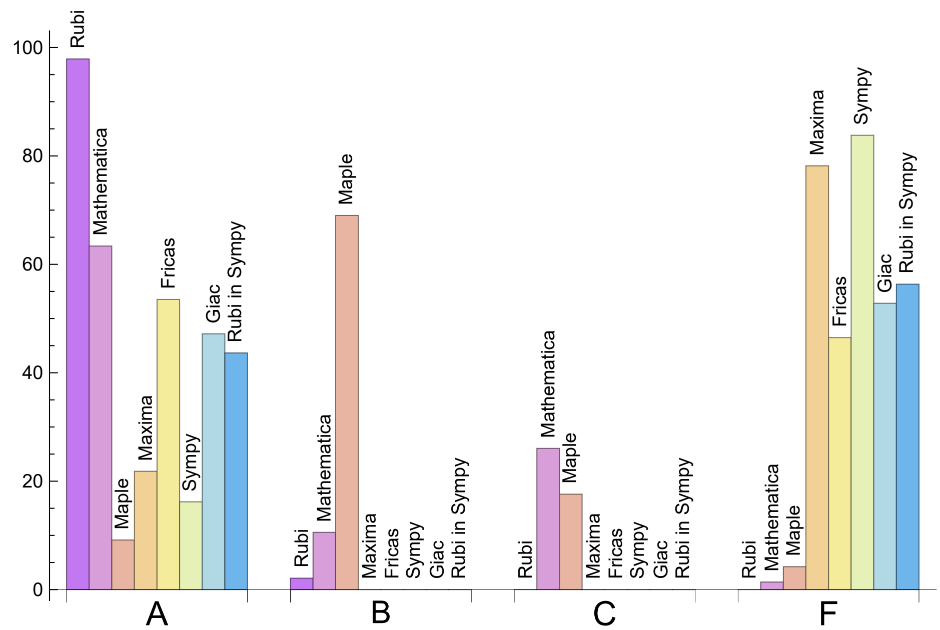
Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	97.89	2.11	0.	0.
Rubi in Sympy	43.66	0.	0.	56.34
Mathematica	63.38	10.56	26.06	1.41
Maple	9.15	69.01	17.61	4.23
Maxima	21.83	0.	0.	78.17
Fricas	53.52	0.	0.	46.48
Sympy	16.2	0.	0.	83.8
Giac	47.18	0.	0.	52.82

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



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



1.7 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	2.98	457.04	1.04	365.5	1.
Rubi in Sympy	82.07	202.82	0.99	218.5	0.95
Mathematica	7.01	3300.06	4.24	373.5	1.12
Maple	0.1	8186.17	10.29	1403.5	4.33
Maxima	1.44	300.29	1.61	173.	1.6
Fricas	6.48	356.41	1.69	1.	0.01
Sympy	66.73	1661.7	10.1	313.	4.36
Giac	0.33	291.78	1.39	186.	1.54

1.8 list of integrals that has no closed form antiderivative

{}

1.9 list of integrals not solved by each system

Not solved by Rubi {}

Not solved by Rubi in Sympy {1, 2, 8, 9, 10, 11, 16, 17, 18, 19, 24, 25, 26, 29, 30, 31, 34, 54, 55, 60, 61, 67, 75, 76, 78, 79, 80, 81, 82, 87, 88, 89, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 116, 117, 118, 119, 120, 121, 122, 123, 124, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142}

Not solved by Mathematica {30, 31}

Not solved by Maple {29, 30, 31, 32, 33, 34}

Not solved by Maxima {5, 6, 7, 8, 9, 14, 15, 16, 17, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 39, 40, 41, 46, 47, 48, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 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, 140, 141, 142}

Not solved by Fricas {29, 30, 31, 32, 33, 34, 58, 59, 65, 66, 78, 79, 80, 84, 85, 86, 91, 92, 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, 140, 141, 142}

Not solved by Sympy {1, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 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, 140, 141, 142}

Not solved by Giac {29, 30, 31, 32, 33, 34, 39, 40, 41, 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 61, 62, 63, 64, 86, 87, 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, 140, 141, 142}

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

Rubi {}

Rubi in Sympy {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

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 mean necessarily 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 easier to do further investigation to determine why it was not possible to verify the result produced.

Rubi {118, 119, 121, 122, 128, 129, 131, 132, 138, 139, 140, 141, 142}

Mathematica {29, 32, 33, 34, 74, 99, 100, 101, 106, 117, 118, 119, 121, 122, 127, 128, 129, 131, 132, 136, 137, 138, 139, 140, 141, 142}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Rubi in Sympy Verification phase not implemented yet.

2 detailed summary tables of results

2.1 Detailed conclusion table per each integral for all CAS systems

Detailed conclusion table per each integral is given by 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 just an F.

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	436	436	495	841	838	842	0	1	0
normalized size	1	1.	1.14	1.93	1.92	1.93	0.	0.	0.
time (sec)	N/A	0.859	1.42	0.018	1.366	0.217	0.	0.234	0.

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	324	324	323	505	522	522	1510	903	0
normalized size	1	1.	1.	1.56	1.61	1.61	4.66	2.79	0.
time (sec)	N/A	0.546	1.317	0.013	1.361	0.218	109.417	0.214	0.

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	184	241	267	266	848	494	226
normalized size	1	1.	0.87	1.14	1.26	1.25	4.	2.33	1.07
time (sec)	N/A	0.346	0.331	0.008	1.358	0.212	57.283	0.225	81.08

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	82	91	173	122	354	201	110
normalized size	1	1.	0.71	0.79	1.5	1.06	3.08	1.75	0.96
time (sec)	N/A	0.145	0.087	0.007	1.346	0.216	12.763	0.221	27.375

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	161	338	0	1	337	335	187
normalized size	1	1.	0.86	1.8	0.	0.01	1.79	1.78	0.99
time (sec)	N/A	0.401	0.295	0.019	0.	0.228	75.297	0.213	122.665

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	201	201	186	566	0	1	0	366	228
normalized size	1	1.	0.93	2.82	0.	0.	0.	1.82	1.13
time (sec)	N/A	1.076	0.924	0.026	0.	0.25	0.	0.214	124.728

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	253	1207	0	1	0	714	347
normalized size	1	1.	0.91	4.33	0.	0.	0.	2.56	1.24
time (sec)	N/A	1.434	1.613	0.033	0.	0.243	0.	0.223	148.874

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	375	375	344	1186	0	1	0	1	0
normalized size	1	1.	0.92	3.16	0.	0.	0.	0.	0.
time (sec)	N/A	1.867	2.631	0.036	0.	0.251	0.	0.228	0.

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	495	495	449	3252	0	1	0	1	0
normalized size	1	1.	0.91	6.57	0.	0.	0.	0.	0.
time (sec)	N/A	2.157	2.267	0.039	0.	0.261	0.	0.236	0.

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	434	434	500	841	849	841	0	1	0
normalized size	1	1.	1.15	1.94	1.96	1.94	0.	0.	0.
time (sec)	N/A	0.847	1.551	0.013	1.368	0.22	0.	0.227	0.

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	326	505	533	521	0	879	0
normalized size	1	1.	1.01	1.57	1.66	1.62	0.	2.73	0.
time (sec)	N/A	0.541	0.973	0.012	1.37	0.223	0.	0.222	0.

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	188	241	278	265	7874	436	224
normalized size	1	1.	0.9	1.15	1.32	1.26	37.5	2.08	1.07
time (sec)	N/A	0.343	0.374	0.008	1.355	0.213	48.601	0.216	81.177

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	82	91	138	122	2132	171	114
normalized size	1	1.	0.73	0.81	1.22	1.08	18.87	1.51	1.01
time (sec)	N/A	0.143	0.089	0.009	1.352	0.218	19.388	0.211	27.843

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	159	366	0	1	0	270	243
normalized size	1	1.	0.82	1.9	0.	0.01	0.	1.4	1.26
time (sec)	N/A	0.461	0.738	0.019	0.	0.229	0.	0.217	142.635

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	253	253	208	604	0	1	0	524	316
normalized size	1	1.	0.82	2.39	0.	0.	0.	2.07	1.25
time (sec)	N/A	1.37	1.029	0.037	0.	0.249	0.	0.227	151.194

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	350	350	297	1225	0	1	0	833	0
normalized size	1	1.	0.85	3.5	0.	0.	0.	2.38	0.
time (sec)	N/A	1.946	1.803	0.04	0.	0.248	0.	0.23	0.

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	463	463	382	2108	0	1	0	1	0
normalized size	1	1.	0.83	4.55	0.	0.	0.	0.	0.
time (sec)	N/A	2.822	2.911	0.053	0.	0.272	0.	0.241	0.

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	434	434	485	841	846	856	0	1	0
normalized size	1	1.	1.12	1.94	1.95	1.97	0.	0.	0.
time (sec)	N/A	0.862	2.384	0.013	1.373	0.231	0.	0.223	0.

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	317	505	531	536	0	840	0
normalized size	1	1.	0.98	1.57	1.65	1.66	0.	2.61	0.
time (sec)	N/A	0.546	0.962	0.012	1.365	0.223	0.	0.219	0.

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	177	241	275	279	4235	408	226
normalized size	1	1.	0.84	1.15	1.31	1.33	20.17	1.94	1.08
time (sec)	N/A	0.345	0.291	0.007	1.361	0.217	44.42	0.209	80.657

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	75	90	132	134	425	155	114
normalized size	1	1.	0.66	0.8	1.17	1.19	3.76	1.37	1.01
time (sec)	N/A	0.144	0.093	0.007	1.364	0.211	4.315	0.211	27.536

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	201	464	0	1	0	379	298
normalized size	1	1.	0.96	2.21	0.	0.	0.	1.8	1.42
time (sec)	N/A	0.634	1.085	0.026	0.	0.24	0.	0.219	156.355

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	336	336	268	730	0	1	0	593	410
normalized size	1	1.	0.8	2.17	0.	0.	0.	1.76	1.22
time (sec)	N/A	1.726	1.453	0.038	0.	0.254	0.	0.23	173.146

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	438	438	360	1376	0	1	0	1035	0
normalized size	1	1.	0.82	3.14	0.	0.	0.	2.36	0.
time (sec)	N/A	3.072	2.356	0.046	0.	0.269	0.	0.234	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	455	455	977	5003	0	5250	0	1	0
normalized size	1	1.	2.15	11.	0.	11.54	0.	0.	0.
time (sec)	N/A	0.943	3.903	0.03	0.	0.26	0.	0.234	0.

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	338	338	619	2588	0	2911	0	1	0
normalized size	1	1.	1.83	7.66	0.	8.61	0.	0.	0.
time (sec)	N/A	0.581	2.201	0.02	0.	0.247	0.	0.222	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	341	1039	0	1301	13311	1	228
normalized size	1	1.	1.51	4.6	0.	5.76	58.9	0.	1.01
time (sec)	N/A	0.367	0.861	0.015	0.	0.238	107.572	0.209	142.042

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	148	308	0	532	3822	1091	112
normalized size	1	1.	1.17	2.44	0.	4.22	30.33	8.66	0.89
time (sec)	N/A	0.159	0.211	0.01	0.	0.23	15.664	0.215	36.238

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	414	0	0	0	0	0	0
normalized size	1	1.	2.04	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.373	4.424	0.082	0.	0.	0.	0.	0.

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.182	0.285	0.065	0.	0.	0.	0.	0.

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	0	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.415	0.453	0.08	0.	0.	0.	0.	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	F(-1)	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	202	0	0	0	0	0	117
normalized size	1	1.	1.43	0.	0.	0.	0.	0.	0.83
time (sec)	N/A	0.23	0.51	0.082	0.	0.	0.	0.	32.186

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	F(-1)	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	268	266	327	0	0	0	0	0	230
normalized size	1	0.99	1.22	0.	0.	0.	0.	0.	0.86
time (sec)	N/A	0.72	0.971	0.092	0.	0.	0.	0.	92.315

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	F	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	610	605	446	0	0	0	0	0	0
normalized size	1	0.99	0.73	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.337	3.404	0.051	0.	0.	0.	0.	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	415	415	355	959	644	2512	0	1	415
normalized size	1	1.	0.86	2.31	1.55	6.05	0.	0.	1.
time (sec)	N/A	1.473	0.77	0.042	1.501	0.261	0.	0.318	160.039

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	286	286	243	652	459	1705	0	1	282
normalized size	1	1.	0.85	2.28	1.6	5.96	0.	0.	0.99
time (sec)	N/A	1.186	0.457	0.022	1.502	0.248	0.	0.274	94.085

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	170	138	377	263	921	0	429	155
normalized size	1	1.01	0.82	2.24	1.57	5.48	0.	2.55	0.92
time (sec)	N/A	0.498	0.241	0.018	1.516	0.234	0.	0.25	45.975

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	71	185	154	487	0	198	70
normalized size	1	1.	0.75	1.95	1.62	5.13	0.	2.08	0.74
time (sec)	N/A	0.155	0.087	0.015	1.519	0.229	0.	0.227	16.627

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	155	373	0	1	0	0	109
normalized size	1	1.	1.27	3.06	0.	0.01	0.	0.	0.89
time (sec)	N/A	0.577	0.327	0.059	0.	7.896	0.	0.	69.155

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	F(-2)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	211	899	0	1	0	0	146
normalized size	1	1.	1.29	5.52	0.	0.01	0.	0.	0.9
time (sec)	N/A	0.649	0.528	0.065	0.	30.368	0.	0.	90.717

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	F(-2)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	284	1449	0	1	0	0	230
normalized size	1	1.	1.15	5.84	0.	0.	0.	0.	0.93
time (sec)	N/A	0.739	0.57	0.065	0.	0.275	0.	0.	170.366

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	241	643	524	1621	0	551	337
normalized size	1	1.	0.71	1.89	1.54	4.77	0.	1.62	0.99
time (sec)	N/A	1.379	0.468	0.038	1.506	0.245	0.	0.245	144.536

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	228	228	160	423	356	1035	0	352	218
normalized size	1	1.	0.7	1.86	1.56	4.54	0.	1.54	0.96
time (sec)	N/A	1.039	0.326	0.034	1.517	0.246	0.	0.225	86.49

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	133	88	235	205	479	0	186	116
normalized size	1	1.02	0.68	1.81	1.58	3.68	0.	1.43	0.89
time (sec)	N/A	0.449	0.167	0.028	1.498	0.232	0.	0.225	43.239

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	45	117	105	244	282	97	41
normalized size	1	1.	0.71	1.86	1.67	3.87	4.48	1.54	0.65
time (sec)	N/A	0.137	0.064	0.023	1.499	0.232	54.28	0.223	15.268

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	155	373	0	1	0	0	109
normalized size	1	1.	1.27	3.06	0.	0.01	0.	0.	0.89
time (sec)	N/A	0.544	0.322	0.	0.	7.876	0.	0.	69.128

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	F(-2)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	211	899	0	1	0	0	146
normalized size	1	1.	1.29	5.52	0.	0.01	0.	0.	0.9
time (sec)	N/A	0.585	0.526	0.	0.	30.304	0.	0.	90.97

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	F(-2)	A	F(-2)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	284	1449	0	1	0	0	230
normalized size	1	1.	1.15	5.84	0.	0.	0.	0.	0.93
time (sec)	N/A	0.718	0.568	0.	0.	0.274	0.	0.	170.195

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	57	139	134	306	313	123	68
normalized size	1	1.	0.72	1.76	1.7	3.87	3.96	1.56	0.86
time (sec)	N/A	0.253	0.092	0.	1.511	0.234	108.768	0.216	26.453

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	45	117	105	244	282	97	41
normalized size	1	1.	0.71	1.86	1.67	3.87	4.48	1.54	0.65
time (sec)	N/A	0.136	0.062	0.	1.501	0.226	54.838	0.232	15.281

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	54	94	89	171	245	0	39
normalized size	1	1.	1.12	1.96	1.85	3.56	5.1	0.	0.81
time (sec)	N/A	0.33	0.068	0.	1.489	0.237	58.607	0.	30.036

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	54	97	89	212	221	0	37
normalized size	1	1.	1.12	2.02	1.85	4.42	4.6	0.	0.77
time (sec)	N/A	0.322	0.085	0.	1.498	0.236	65.661	0.	27.279

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	70	108	132	255	218	0	56
normalized size	1	1.	0.99	1.52	1.86	3.59	3.07	0.	0.79
time (sec)	N/A	0.345	0.104	0.	1.504	0.228	81.954	0.	26.871

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	591	584	397	1446	0	1	0	0	0
normalized size	1	0.99	0.67	2.45	0.	0.	0.	0.	0.
time (sec)	N/A	3.135	1.114	0.064	0.	0.307	0.	0.	0.

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	451	450	281	987	0	1	0	0	0
normalized size	1	1.	0.62	2.19	0.	0.	0.	0.	0.
time (sec)	N/A	2.039	0.688	0.024	0.	0.283	0.	0.	0.

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	300	297	178	588	0	1	0	0	286
normalized size	1	0.99	0.59	1.96	0.	0.	0.	0.	0.95
time (sec)	N/A	0.865	0.429	0.018	0.	0.256	0.	0.	93.536

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	125	287	0	1	0	0	172
normalized size	1	1.	0.57	1.3	0.	0.	0.	0.	0.78
time (sec)	N/A	0.313	0.286	0.016	0.	0.242	0.	0.	35.242

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	238	503	0	0	0	358	219
normalized size	1	1.	0.86	1.81	0.	0.	0.	1.29	0.79
time (sec)	N/A	0.939	0.722	0.069	0.	0.	0.	0.264	108.046

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	340	1200	0	0	0	4	282
normalized size	1	1.	1.06	3.73	0.	0.	0.	0.01	0.88
time (sec)	N/A	1.138	1.131	0.066	0.	0.	0.	0.601	126.292

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-2)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	363	361	380	1848	0	1	0	4	0
normalized size	1	0.99	1.05	5.09	0.	0.	0.	0.01	0.
time (sec)	N/A	1.381	1.315	0.075	0.	8.954	0.	1.309	0.

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	501	496	289	965	0	1	0	0	0
normalized size	1	0.99	0.58	1.93	0.	0.	0.	0.	0.
time (sec)	N/A	2.67	0.902	0.04	0.	0.288	0.	0.	0.

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	368	369	202	635	0	1	0	0	337
normalized size	1	1.	0.55	1.73	0.	0.	0.	0.	0.92
time (sec)	N/A	1.823	0.685	0.036	0.	0.271	0.	0.	170.581

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	246	249	130	365	0	1	0	0	211
normalized size	1	1.01	0.53	1.48	0.	0.	0.	0.	0.86
time (sec)	N/A	0.818	0.373	0.03	0.	0.258	0.	0.	85.448

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	91	180	0	1	338	0	119
normalized size	1	1.	0.51	1.02	0.	0.01	1.91	0.	0.67
time (sec)	N/A	0.266	0.165	0.024	0.	0.251	90.813	0.	30.016

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	238	503	0	0	0	358	219
normalized size	1	1.	0.86	1.81	0.	0.	0.	1.29	0.79
time (sec)	N/A	0.916	0.706	0.	0.	0.	0.	0.279	108.663

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	340	1200	0	0	0	4	282
normalized size	1	1.	1.06	3.73	0.	0.	0.	0.01	0.88
time (sec)	N/A	1.054	1.126	0.	0.	0.	0.	0.623	126.464

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-2)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	363	361	380	1848	0	1	0	4	0
normalized size	1	0.99	1.05	5.09	0.	0.	0.	0.01	0.
time (sec)	N/A	1.28	1.303	0.	0.	8.991	0.	1.462	0.

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	151	80	137	147	370	308	130	119
normalized size	1	1.74	0.92	1.57	1.69	4.25	3.54	1.49	1.37
time (sec)	N/A	0.278	0.129	0.	1.355	0.237	107.638	0.281	28.674

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	B	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	135	68	120	142	259	277	104	87
normalized size	1	2.6	1.31	2.31	2.73	4.98	5.33	2.	1.67
time (sec)	N/A	0.164	0.085	0.	1.361	0.236	54.7	0.26	17.168

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	B	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	135	76	93	86	212	240	96	65
normalized size	1	2.45	1.38	1.69	1.56	3.85	4.36	1.75	1.18
time (sec)	N/A	0.354	0.107	0.	1.498	0.247	57.375	0.23	21.23

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	B	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	135	76	96	86	178	216	112	48
normalized size	1	2.45	1.38	1.75	1.56	3.24	3.93	2.04	0.87
time (sec)	N/A	0.345	0.098	0.	1.554	0.248	66.447	0.234	17.716

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	129	64	103	88	238	212	196	88
normalized size	1	1.55	0.77	1.24	1.06	2.87	2.55	2.36	1.06
time (sec)	N/A	0.348	0.112	0.	1.498	0.237	82.126	0.235	20.531

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	171	75	123	119	297	219	266	119
normalized size	1	1.47	0.65	1.06	1.03	2.56	1.89	2.29	1.03
time (sec)	N/A	0.433	0.142	0.	1.484	0.237	156.866	0.232	24.916

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	199	242	178	1095	0	1	0	817	306
normalized size	1	1.22	0.89	5.5	0.	0.01	0.	4.11	1.54
time (sec)	N/A	0.652	0.709	0.075	0.	0.271	0.	0.41	84.841

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1348	1345	1801	6728	0	1	0	1	0
normalized size	1	1.	1.34	4.99	0.	0.	0.	0.	0.
time (sec)	N/A	6.35	6.532	0.062	0.	2.45	0.	0.48	0.

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	721	719	675	3571	0	1	0	1	0
normalized size	1	1.	0.94	4.95	0.	0.	0.	0.	0.
time (sec)	N/A	2.368	3.177	0.037	0.	0.889	0.	0.379	0.

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	330	330	300	1431	0	1	0	856	405
normalized size	1	1.	0.91	4.34	0.	0.	0.	2.59	1.23
time (sec)	N/A	0.762	0.633	0.023	0.	0.325	0.	0.297	68.626

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	450	453	498	4227	0	0	0	1	0
normalized size	1	1.01	1.11	9.39	0.	0.	0.	0.	0.
time (sec)	N/A	3.589	1.721	0.062	0.	0.	0.	0.429	0.

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	521	521	489	5051	0	0	0	4	0
normalized size	1	1.	0.94	9.69	0.	0.	0.	0.01	0.
time (sec)	N/A	4.624	1.683	0.06	0.	0.	0.	0.743	0.

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	658	657	1165	12065	0	0	0	4	0
normalized size	1	1.	1.77	18.34	0.	0.	0.	0.01	0.
time (sec)	N/A	6.507	6.856	0.089	0.	0.	0.	0.752	0.

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1032	1032	901	3958	0	1	0	1	0
normalized size	1	1.	0.87	3.84	0.	0.	0.	0.	0.
time (sec)	N/A	5.057	4.378	0.059	0.	31.044	0.	0.309	0.

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	540	540	470	2002	0	1	0	994	0
normalized size	1	1.	0.87	3.71	0.	0.	0.	1.84	0.
time (sec)	N/A	1.798	1.552	0.043	0.	22.99	0.	0.281	0.

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	212	763	0	1	0	425	318
normalized size	1	1.	0.86	3.1	0.	0.	0.	1.73	1.29
time (sec)	N/A	0.58	0.307	0.031	0.	1.295	0.	0.261	48.632

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	290	290	367	1822	0	0	0	797	354
normalized size	1	1.	1.27	6.28	0.	0.	0.	2.75	1.22
time (sec)	N/A	1.641	0.764	0.046	0.	0.	0.	0.363	106.287

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	364	364	421	3670	0	0	0	4	332
normalized size	1	1.	1.16	10.08	0.	0.	0.	0.01	0.91
time (sec)	N/A	2.624	1.789	0.063	0.	0.	0.	0.667	96.461

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	F(-1)	F(-1)	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	484	484	979	9100	0	0	0	0	468
normalized size	1	1.	2.02	18.8	0.	0.	0.	0.	0.97
time (sec)	N/A	3.666	6.756	0.123	0.	0.	0.	0.	155.302

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	685	685	847	15990	0	1	0	0	0
normalized size	1	1.	1.24	23.34	0.	0.	0.	0.	0.
time (sec)	N/A	4.902	6.054	0.223	0.	80.887	0.	0.	0.

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	718	715	645	2528	0	1	0	1	0
normalized size	1	1.	0.9	3.52	0.	0.	0.	0.	0.
time (sec)	N/A	3.397	2.616	0.059	0.	35.095	0.	0.336	0.

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	371	369	328	1199	0	1	0	603	0
normalized size	1	0.99	0.88	3.23	0.	0.	0.	1.63	0.
time (sec)	N/A	1.205	0.775	0.043	0.	26.686	0.	0.321	0.

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	154	425	0	1	0	262	199
normalized size	1	1.	0.94	2.59	0.	0.01	0.	1.6	1.21
time (sec)	N/A	0.386	0.193	0.032	0.	1.431	0.	0.302	35.956

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	280	746	0	0	0	467	211
normalized size	1	1.	1.49	3.97	0.	0.	0.	2.48	1.12
time (sec)	N/A	0.787	0.528	0.049	0.	0.	0.	0.449	74.35

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-2)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	254	254	397	2973	0	0	0	4	265
normalized size	1	1.	1.56	11.7	0.	0.	0.	0.02	1.04
time (sec)	N/A	1.468	2.044	0.074	0.	0.	0.	0.727	95.062

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-2)	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	424	424	604	7119	0	1	0	0	0
normalized size	1	1.	1.42	16.79	0.	0.	0.	0.	0.
time (sec)	N/A	2.355	2.704	0.165	0.	32.688	0.	0.	0.

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	826	826	1586	18802	0	1	0	0	0
normalized size	1	1.	1.92	22.76	0.	0.	0.	0.	0.
time (sec)	N/A	8.031	7.762	0.441	0.	148.303	0.	0.	0.

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1182	1154	11933	14778	0	0	0	0	0
normalized size	1	0.98	10.1	12.5	0.	0.	0.	0.	0.
time (sec)	N/A	14.309	22.367	0.129	0.	0.	0.	0.	0.

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	774	769	7297	10268	0	0	0	0	0
normalized size	1	0.99	9.43	13.27	0.	0.	0.	0.	0.
time (sec)	N/A	6.898	18.749	0.076	0.	0.	0.	0.	0.

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	706	706	9487	6257	0	0	0	0	0
normalized size	1	1.	13.44	8.86	0.	0.	0.	0.	0.
time (sec)	N/A	5.129	15.628	0.095	0.	0.	0.	0.	0.

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	687	687	5831	16177	0	0	0	0	0
normalized size	1	1.	8.49	23.55	0.	0.	0.	0.	0.
time (sec)	N/A	5.171	17.512	0.138	0.	0.	0.	0.	0.

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	964	964	13960	34389	0	0	0	0	0
normalized size	1	1.	14.48	35.67	0.	0.	0.	0.	0.
time (sec)	N/A	8.759	21.119	0.254	0.	0.	0.	0.	0.

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1716	1716	22671	68351	0	0	0	0	0
normalized size	1	1.	13.21	39.83	0.	0.	0.	0.	0.
time (sec)	N/A	22.162	25.787	0.432	0.	0.	0.	0.	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1235	1235	18421	15857	0	0	0	0	0
normalized size	1	1.	14.92	12.84	0.	0.	0.	0.	0.
time (sec)	N/A	14.826	23.916	0.088	0.	0.	0.	0.	0.

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	766	766	10708	9543	0	0	0	0	0
normalized size	1	1.	13.98	12.46	0.	0.	0.	0.	0.
time (sec)	N/A	6.736	19.563	0.05	0.	0.	0.	0.	0.

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	527	527	5393	6049	0	0	0	0	0
normalized size	1	1.	10.23	11.48	0.	0.	0.	0.	0.
time (sec)	N/A	2.727	15.694	0.043	0.	0.	0.	0.	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	540	540	551	4732	0	0	0	0	0
normalized size	1	1.	1.02	8.76	0.	0.	0.	0.	0.
time (sec)	N/A	3.085	12.287	0.059	0.	0.	0.	0.	0.

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	597	596	5074	13614	0	0	0	0	0
normalized size	1	1.	8.5	22.8	0.	0.	0.	0.	0.
time (sec)	N/A	3.827	16.817	0.115	0.	0.	0.	0.	0.

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1034	1034	13302	33007	0	0	0	0	0
normalized size	1	1.	12.86	31.92	0.	0.	0.	0.	0.
time (sec)	N/A	9.585	20.966	0.261	0.	0.	0.	0.	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	838	831	7300	10546	0	0	0	0	0
normalized size	1	0.99	8.71	12.58	0.	0.	0.	0.	0.
time (sec)	N/A	7.857	19.903	0.082	0.	0.	0.	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	528	524	3657	6174	0	0	0	0	0
normalized size	1	0.99	6.93	11.69	0.	0.	0.	0.	0.
time (sec)	N/A	2.938	15.704	0.045	0.	0.	0.	0.	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	384	383	418	2497	0	0	0	0	0
normalized size	1	1.	1.09	6.5	0.	0.	0.	0.	0.
time (sec)	N/A	1.576	10.263	0.042	0.	0.	0.	0.	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	422	422	477	3979	0	0	0	0	0
normalized size	1	1.	1.13	9.43	0.	0.	0.	0.	0.
time (sec)	N/A	2.049	9.643	0.059	0.	0.	0.	0.	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	642	642	4349	12988	0	0	0	0	0
normalized size	1	1.	6.77	20.23	0.	0.	0.	0.	0.
time (sec)	N/A	4.281	16.552	0.157	0.	0.	0.	0.	0.

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1116	1116	8844	34100	0	0	0	0	0
normalized size	1	1.	7.92	30.56	0.	0.	0.	0.	0.
time (sec)	N/A	9.807	20.192	0.406	0.	0.	0.	0.	0.

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	704	702	12665	8421	0	0	0	0	0
normalized size	1	1.	17.99	11.96	0.	0.	0.	0.	0.
time (sec)	N/A	5.154	18.949	0.091	0.	0.	0.	0.	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	410	410	442	2825	0	0	0	0	0
normalized size	1	1.	1.08	6.89	0.	0.	0.	0.	0.
time (sec)	N/A	1.717	11.806	0.045	0.	0.	0.	0.	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	291	291	326	673	0	0	0	0	248
normalized size	1	1.	1.12	2.31	0.	0.	0.	0.	0.85
time (sec)	N/A	1.144	3.693	0.039	0.	0.	0.	0.	150.009

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	309	309	248	663	0	0	0	0	0
normalized size	1	1.	0.8	2.15	0.	0.	0.	0.	0.
time (sec)	N/A	2.659	2.706	0.052	0.	0.	0.	0.	0.

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	680	680	16821	13405	0	0	0	0	0
normalized size	1	1.	24.74	19.71	0.	0.	0.	0.	0.
time (sec)	N/A	4.869	20.322	0.143	0.	0.	0.	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	990	987	21555	55327	0	0	0	0	0
normalized size	1	1.	21.77	55.89	0.	0.	0.	0.	0.
time (sec)	N/A	8.653	23.993	0.165	0.	0.	0.	0.	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	734	732	6667	20235	0	0	0	0	0
normalized size	1	1.	9.08	27.57	0.	0.	0.	0.	0.
time (sec)	N/A	3.398	17.735	0.092	0.	0.	0.	0.	0.

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	436	436	583	3003	0	0	0	0	0
normalized size	1	1.	1.34	6.89	0.	0.	0.	0.	0.
time (sec)	N/A	2.025	10.343	0.116	0.	0.	0.	0.	0.

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	616	616	1753	9443	0	0	0	0	0
normalized size	1	1.	2.85	15.33	0.	0.	0.	0.	0.
time (sec)	N/A	2.744	18.171	0.21	0.	0.	0.	0.	0.

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1128	1119	10645	75992	0	0	0	0	0
normalized size	1	0.99	9.44	67.37	0.	0.	0.	0.	0.
time (sec)	N/A	9.953	37.51	1.96	0.	0.	0.	0.	0.

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	681	679	12443	8125	0	0	0	0	0
normalized size	1	1.	18.27	11.93	0.	0.	0.	0.	0.
time (sec)	N/A	5.756	18.259	0.061	0.	0.	0.	0.	0.

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	402	402	450	3224	0	0	0	0	0
normalized size	1	1.	1.12	8.02	0.	0.	0.	0.	0.
time (sec)	N/A	2.278	9.622	0.045	0.	0.	0.	0.	0.

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	284	284	319	559	0	0	0	0	241
normalized size	1	1.	1.12	1.97	0.	0.	0.	0.	0.85
time (sec)	N/A	1.025	3.113	0.033	0.	0.	0.	0.	117.404

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	313	313	244	665	0	0	0	0	0
normalized size	1	1.	0.78	2.12	0.	0.	0.	0.	0.
time (sec)	N/A	2.659	2.261	0.046	0.	0.	0.	0.	0.

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	678	678	14516	13380	0	0	0	0	0
normalized size	1	1.	21.41	19.73	0.	0.	0.	0.	0.
time (sec)	N/A	4.591	19.354	0.107	0.	0.	0.	0.	0.

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	995	992	21555	54623	0	0	0	0	0
normalized size	1	1.	21.66	54.9	0.	0.	0.	0.	0.
time (sec)	N/A	9.674	23.957	0.156	0.	0.	0.	0.	0.

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	736	735	6648	20733	0	0	0	0	0
normalized size	1	1.	9.03	28.17	0.	0.	0.	0.	0.
time (sec)	N/A	4.425	17.566	0.089	0.	0.	0.	0.	0.

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	440	440	586	2453	0	0	0	0	0
normalized size	1	1.	1.33	5.58	0.	0.	0.	0.	0.
time (sec)	N/A	2.041	10.196	0.107	0.	0.	0.	0.	0.

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	606	606	1749	9328	0	0	0	0	0
normalized size	1	1.	2.89	15.39	0.	0.	0.	0.	0.
time (sec)	N/A	2.447	17.501	0.2	0.	0.	0.	0.	0.

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1081	1080	10637	71656	0	0	0	0	0
normalized size	1	1.	9.84	66.29	0.	0.	0.	0.	0.
time (sec)	N/A	8.317	35.716	1.606	0.	0.	0.	0.	0.

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1096	1080	18383	12279	0	0	0	0	0
normalized size	1	0.99	16.77	11.2	0.	0.	0.	0.	0.
time (sec)	N/A	13.687	23.922	0.1	0.	0.	0.	0.	0.

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F(-1)	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	608	605	8828	5679	0	0	0	0	0
normalized size	1	1.	14.52	9.34	0.	0.	0.	0.	0.
time (sec)	N/A	3.718	17.009	0.052	0.	0.	0.	0.	0.

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F	F	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	368	367	390	1804	0	0	0	0	0
normalized size	1	1.	1.06	4.9	0.	0.	0.	0.	0.
time (sec)	N/A	1.562	7.776	0.036	0.	0.	0.	0.	0.

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F(-1)	F	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	465	465	13075	1368	0	0	0	0	0
normalized size	1	1.	28.12	2.94	0.	0.	0.	0.	0.
time (sec)	N/A	3.022	16.367	0.049	0.	0.	0.	0.	0.

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	F(-1)	F(-2)	F	F(-1)
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	738	738	17743	17460	0	0	0	0	0
normalized size	1	1.	24.04	23.66	0.	0.	0.	0.	0.
time (sec)	N/A	5.534	21.155	0.131	0.	0.	0.	0.	0.

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1405	1388	38310	89498	0	0	0	0	0
normalized size	1	0.99	27.27	63.7	0.	0.	0.	0.	0.
time (sec)	N/A	24.538	35.812	0.276	0.	0.	0.	0.	0.

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	951	950	16659	42545	0	0	0	0	0
normalized size	1	1.	17.52	44.74	0.	0.	0.	0.	0.
time (sec)	N/A	6.868	21.51	0.128	0.	0.	0.	0.	0.

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	757	757	6207	15875	0	0	0	0	0
normalized size	1	1.	8.2	20.97	0.	0.	0.	0.	0.
time (sec)	N/A	4.048	16.527	0.12	0.	0.	0.	0.	0.

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	867	867	2103	20597	0	0	0	0	0
normalized size	1	1.	2.43	23.76	0.	0.	0.	0.	0.
time (sec)	N/A	7.156	18.54	0.222	0.	0.	0.	0.	0.

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F	F(-1)	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1070	1070	19544	72702	0	0	0	0	0
normalized size	1	1.	18.27	67.95	0.	0.	0.	0.	0.
time (sec)	N/A	8.22	35.436	1.787	0.	0.	0.	0.	0.

2.2 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. 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 given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [70] had the largest ratio of [0.25]

Table 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	1	1.	32	0.031
2	A	2	1	1.	32	0.031
3	A	2	1	1.	30	0.033
4	A	2	1	1.	25	0.04
5	A	4	3	1.	32	0.094
6	A	5	4	1.	32	0.125
7	A	5	5	1.	32	0.156
8	A	5	5	1.	32	0.156
9	A	6	6	1.	32	0.188
10	A	2	1	1.	32	0.031
11	A	2	1	1.	32	0.031
12	A	2	1	1.	30	0.033
13	A	2	1	1.	25	0.04
14	A	6	4	1.	32	0.125
15	A	5	4	1.	32	0.125
16	A	5	5	1.	32	0.156
17	A	6	6	1.	32	0.188
18	A	2	1	1.	32	0.031
19	A	2	1	1.	32	0.031
20	A	2	1	1.	30	0.033
21	A	2	1	1.	25	0.04
22	A	4	3	1.	32	0.094
23	A	5	4	1.	32	0.125
24	A	6	5	1.	32	0.156
25	A	2	1	1.	30	0.033
26	A	2	1	1.	30	0.033
27	A	2	1	1.	28	0.036
28	A	2	1	1.	23	0.043

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Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
29	A	3	2	1.	30	0.067
30	A	4	4	1.	30	0.133
31	A	4	4	1.	30	0.133
32	A	3	3	1.	20	0.15
33	A	4	4	0.99	25	0.16
34	A	5	5	0.99	30	0.167
35	A	7	6	1.	37	0.162
36	A	6	6	1.	37	0.162
37	A	5	5	1.01	35	0.143
38	A	5	5	1.	30	0.167
39	A	6	6	1.	37	0.162
40	A	6	6	1.	37	0.162
41	A	5	5	1.	37	0.135
42	A	6	5	1.	37	0.135
43	A	5	5	1.	37	0.135
44	A	4	4	1.02	35	0.114
45	A	4	4	1.	30	0.133
46	A	6	6	1.	37	0.162
47	A	6	6	1.	37	0.162
48	A	5	5	1.	37	0.135
49	A	4	4	1.	31	0.129
50	A	4	4	1.	30	0.133
51	A	7	7	1.	33	0.212
52	A	7	7	1.	33	0.212
53	A	6	6	1.	33	0.182
54	A	8	7	0.99	40	0.175
55	A	7	7	1.	40	0.175
56	A	6	6	0.99	38	0.158
57	A	6	6	1.	33	0.182
58	A	7	7	1.	40	0.175
59	A	7	7	1.	40	0.175
60	A	5	5	0.99	40	0.125
61	A	7	6	0.99	40	0.15
62	A	6	6	1.	40	0.15
63	A	5	5	1.01	38	0.132
64	A	5	5	1.	33	0.152

Continued on next page

Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
65	A	7	7	1.	40	0.175
66	A	7	7	1.	40	0.175
67	A	5	5	0.99	40	0.125
68	A	5	5	1.74	30	0.167
69	B	5	5	2.6	29	0.172
70	B	8	8	2.45	32	0.25
71	B	8	8	2.45	32	0.25
72	A	6	6	1.55	32	0.188
73	A	7	7	1.47	32	0.219
74	A	5	5	1.22	32	0.156
75	A	7	6	1.	36	0.167
76	A	6	5	1.	34	0.147
77	A	6	5	1.	29	0.172
78	A	8	6	1.01	36	0.167
79	A	8	6	1.	36	0.167
80	A	8	7	1.	36	0.194
81	A	6	6	1.	36	0.167
82	A	5	5	1.	34	0.147
83	A	5	5	1.	29	0.172
84	A	7	6	1.	36	0.167
85	A	7	6	1.	36	0.167
86	A	7	6	1.	36	0.167
87	A	6	6	1.	36	0.167
88	A	5	5	1.	36	0.139
89	A	4	4	0.99	34	0.118
90	A	4	4	1.	29	0.138
91	A	6	5	1.	36	0.139
92	A	6	5	1.	36	0.139
93	A	5	5	1.	36	0.139
94	A	6	5	1.	36	0.139
95	A	10	7	0.98	38	0.184
96	A	9	7	0.99	38	0.184
97	A	9	7	1.	38	0.184
98	A	9	8	1.	38	0.21
99	A	9	7	1.	38	0.184
100	A	10	8	1.	38	0.21

Continued on next page

Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
101	A	10	7	1.	38	0.184
102	A	9	7	1.	38	0.184
103	A	8	7	1.	38	0.184
104	A	8	7	1.	38	0.184
105	A	8	7	1.	38	0.184
106	A	9	8	1.	38	0.21
107	A	9	7	0.99	38	0.184
108	A	8	7	0.99	38	0.184
109	A	7	6	1.	38	0.158
110	A	7	6	1.	38	0.158
111	A	8	7	1.	38	0.184
112	A	9	7	1.	38	0.184
113	A	8	7	1.	58	0.121
114	A	7	6	1.	53	0.113
115	A	7	6	1.	60	0.1
116	A	10	8	1.	60	0.133
117	A	13	11	1.	60	0.183
118	A	10	10	1.	62	0.161
119	A	9	9	1.	62	0.145
120	A	7	7	1.	62	0.113
121	A	8	8	1.	62	0.129
122	A	9	8	0.99	62	0.129
123	A	9	7	1.	40	0.175
124	A	8	7	1.	38	0.184
125	A	6	5	1.	33	0.152
126	A	9	7	1.	40	0.175
127	A	12	10	1.	40	0.25
128	A	11	10	1.	42	0.238
129	A	10	10	1.	42	0.238
130	A	6	6	1.	42	0.143
131	A	7	7	1.	42	0.167
132	A	8	7	1.	42	0.167
133	A	9	7	0.99	42	0.167
134	A	8	7	1.	40	0.175
135	A	7	6	1.	35	0.171
136	A	11	9	1.	42	0.214

Continued on next page

Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
137	A	12	10	1.	42	0.238
138	A	11	10	0.99	44	0.227
139	A	10	10	1.	44	0.227
140	A	9	9	1.	44	0.204
141	A	10	10	1.	44	0.227
142	A	8	7	1.	44	0.159

3 Listing of integrals

3.1 $\int \frac{(a+bx)^3(A+Bx+Cx^2+Dx^3)}{\sqrt{c+dx}}\,dx$

Optimal. Leaf size=436

$$-\frac{2(c+dx)^{5/2}(bc-ad)\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{5d^7}$$
$$+\frac{2b(c+dx)^{9/2}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{9d^7}$$
$$+\frac{2(c+dx)^{7/2}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{7d^7}$$
$$-\frac{2(c+dx)^{3/2}(bc-ad)^2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{3d^7}$$
$$-\frac{2\sqrt{c+dx}(bc-ad)^3\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^7}$$
$$+\frac{2b^2(c+dx)^{11/2}(3adD-6bcD+bCd)}{11d^7}+\frac{2b^3D(c+dx)^{13/2}}{13d^7}$$

```
[Out] (-2*(b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*
x])/d^7 - (2*(b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(
5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D))*(c + d*x)^(3/2))/(3*d
^7) - (2*(b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a*b*d*(8*c*C*d - 3*
B*d^2 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2 + 3*A*d^3 - 15*c^
3*D))*(c + d*x)^(5/2))/(5*d^7) + (2*(a^3*d^3*D + 3*a^2*b*d^2*(C*d
 - 4*c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 - 10*c^2*D) + b^3*(10*c^2*
C*d - 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c + d*x)^(7/2))/(7*d^7) + (
2*b*(3*a^2*d^2*D + 3*a*b*d*(C*d - 5*c*D) - b^2*(5*c*C*d - B*d^2 -
 15*c^2*D))*(c + d*x)^(9/2))/(9*d^7) + (2*b^2*(b*C*d - 6*b*c*D +
3*a*d*D)*(c + d*x)^(11/2))/(11*d^7) + (2*b^3*D*(c + d*x)^(13/2))/
(13*d^7)
```

Rubi [A] time = 0.859434, antiderivative size = 436, normalized size of antiderivative = 1., number

of steps used = 2, number of rules used = 1, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.031$

$$-\frac{2(c+dx)^{5/2}(bc-ad)\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{5d^7}+\frac{2b(c+dx)^{9/2}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{9d^7}+\frac{2(c+dx)^{7/2}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{7d^7}-\frac{2(c+dx)^{3/2}(bc-ad)^2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{3d^7}-\frac{2\sqrt{c+dx}(bc-ad)^3\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^7}+\frac{2b^2(c+dx)^{11/2}(3adD-6bcD+bCd)}{11d^7}+\frac{2b^3D(c+dx)^{13/2}}{13d^7}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^3*(A + B*x + C*x^2 + D*x^3))/Sqrt[c + d*x],x]
```

```
[Out] (-2*(b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*
x])/d^7 - (2*(b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(
5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D))*(c + d*x)^(3/2))/(3*d
^7) - (2*(b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a*b*d*(8*c*C*d - 3*
B*d^2 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2 + 3*A*d^3 - 15*c^
3*D))*(c + d*x)^(5/2))/(5*d^7) + (2*(a^3*d^3*D + 3*a^2*b*d^2*(C*d
 - 4*c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 - 10*c^2*D) + b^3*(10*c^2*
C*d - 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c + d*x)^(7/2))/(7*d^7) + (
2*b*(3*a^2*d^2*D + 3*a*b*d*(C*d - 5*c*D) - b^2*(5*c*C*d - B*d^2 -
 15*c^2*D))*(c + d*x)^(9/2))/(9*d^7) + (2*b^2*(b*C*d - 6*b*c*D +
3*a*d*D)*(c + d*x)^(11/2))/(11*d^7) + (2*b^3*D*(c + d*x)^(13/2))/
(13*d^7)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**3*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.42002, size = 495, normalized size = 1.14

$$2\sqrt{c+dx}\left(429a^3d^3\left(d^3(105A+x(35B+3x(7C+5Dx)))-2cd^2(35B+x(14C+9Dx))-48c^3D+8c^2d(7C+3Dx)\right)+429a^2bc\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)^3*(A + B*x + C*x^2 + D*x^3))/Sqrt[c + d*x],x]
```

```
[Out] (2*Sqrt[c + d*x]*(429*a^3*d^3*(-48*c^3*D + 8*c^2*d*(7*C + 3*D*x)
- 2*c*d^2*(35*B + x*(14*C + 9*D*x)) + d^3*(105*A + x*(35*B + 3*x*
(7*C + 5*D*x)))) + 429*a^2*b*d^2*(128*c^4*D - 16*c^3*d*(9*C + 4*D
*x) + 24*c^2*d^2*(7*B + x*(3*C + 2*D*x)) + d^4*x*(105*A + x*(63*B
 + 5*x*(9*C + 7*D*x))) - 2*c*d^3*(105*A + x*(42*B + x*(27*C + 20*
D*x)))) + 39*a*b^2*d*(-1280*c^5*D + 128*c^4*d*(11*C + 5*D*x) - 16
*c^3*d^2*(99*B + 44*C*x + 30*D*x^2) + 8*c^2*d^3*(231*A + x*(99*B
+ 66*C*x + 50*D*x^2)) + d^5*x^2*(693*A + 5*x*(99*B + 7*x*(11*C +
9*D*x))) - 2*c*d^4*x*(462*A + x*(297*B + 5*x*(44*C + 35*D*x)))) +
 b^3*(15360*c^6*D - 1280*c^5*d*(13*C + 6*D*x) - 16*c^3*d^3*(1287*
A + 572*B*x + 390*C*x^2 + 300*D*x^3) + 128*c^4*d^2*(143*B + 5*x*(
13*C + 9*D*x)) + 5*d^6*x^3*(1287*A + 7*x*(143*B + 117*C*x + 99*D*
x^2)) + 8*c^2*d^4*x*(1287*A + x*(858*B + 650*C*x + 525*D*x^2)) -
2*c*d^5*x^2*(3861*A + 5*x*(572*B + 7*x*(65*C + 54*D*x))))))/(4504
5*d^7)
```

Maple [B] time = 0.018, size = 841, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^3*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(1/2),x)
```

```
[Out] 2/45045*(d*x+c)^(1/2)*(3465*D*b^3*d^6*x^6+4095*C*b^3*d^6*x^5+1228
5*D*a*b^2*d^6*x^5-3780*D*b^3*c*d^5*x^5+5005*B*b^3*d^6*x^4+15015*C
*a*b^2*d^6*x^4-4550*C*b^3*c*d^5*x^4+15015*D*a^2*b*d^6*x^4-13650*D
*a*b^2*c*d^5*x^4+4200*D*b^3*c^2*d^4*x^4+6435*A*b^3*d^6*x^3+19305*
B*a*b^2*d^6*x^3-5720*B*b^3*c*d^5*x^3+19305*C*a^2*b*d^6*x^3-17160*
C*a*b^2*c*d^5*x^3+5200*C*b^3*c^2*d^4*x^3+6435*D*a^3*d^6*x^3-17160
*D*a^2*b*c*d^5*x^3+15600*D*a*b^2*c^2*d^4*x^3-4800*D*b^3*c^3*d^3*x
^3+27027*A*a*b^2*d^6*x^2-7722*A*b^3*c*d^5*x^2+27027*B*a^2*b*d^6*x
^2-23166*B*a*b^2*c*d^5*x^2+6864*B*b^3*c^2*d^4*x^2+9009*C*a^3*d^6*
x^2-23166*C*a^2*b*c*d^5*x^2+20592*C*a*b^2*c^2*d^4*x^2-6240*C*b^3*
c^3*d^3*x^2-7722*D*a^3*c*d^5*x^2+20592*D*a^2*b*c^2*d^4*x^2-18720*
D*a*b^2*c^3*d^3*x^2+5760*D*b^3*c^4*d^2*x^2+45045*A*a^2*b*d^6*x-36
036*A*a*b^2*c*d^5*x+10296*A*b^3*c^2*d^4*x+15015*B*a^3*d^6*x-36036
*B*a^2*b*c*d^5*x+30888*B*a*b^2*c^2*d^4*x-9152*B*b^3*c^3*d^3*x-120
12*C*a^3*c*d^5*x+30888*C*a^2*b*c^2*d^4*x-27456*C*a*b^2*c^3*d^3*x+
8320*C*b^3*c^4*d^2*x+10296*D*a^3*c^2*d^4*x-27456*D*a^2*b*c^3*d^3*
x+24960*D*a*b^2*c^4*d^2*x-7680*D*b^3*c^5*d*x+45045*A*a^3*d^6-9009
0*A*a^2*b*c*d^5+72072*A*a*b^2*c^2*d^4-20592*A*b^3*c^3*d^3-30030*B
*a^3*c*d^5+72072*B*a^2*b*c^2*d^4-61776*B*a*b^2*c^3*d^3+18304*B*b^
3*c^4*d^2+24024*C*a^3*c^2*d^4-61776*C*a^2*b*c^3*d^3+54912*C*a*b^2
*c^4*d^2-16640*C*b^3*c^5*d-20592*D*a^3*c^3*d^3+54912*D*a^2*b*c^4*
d^2-49920*D*a*b^2*c^5*d+15360*D*b^3*c^6)/d^7
```

Maxima [A] time = 1.36648, size = 838, normalized size = 1.92

$$\frac{2\left(3465\,(dx+c)^{\frac{13}{2}}Db^3 - 4095\left(6\,Db^3c - \left(3\,Dab^2 + Cb^3\right)d\right)(dx+c)^{\frac{11}{2}} + 5005\left(15\,Db^3c^2 - 5\left(3\,Dab^2 + Cb^3\right)cd + \left(3\,Da^2b + 3\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/sqrt(d*x + c),x, algorithm="maxima
```

```
[Out] 2/45045*(3465*(d*x + c)^(13/2)*D*b^3 - 4095*(6*D*b^3*c - (3*D*a*b
^2 + C*b^3)*d)*(d*x + c)^(11/2) + 5005*(15*D*b^3*c^2 - 5*(3*D*a*b
^2 + C*b^3)*c*d + (3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^2)*(d*x + c)^
(9/2) - 6435*(20*D*b^3*c^3 - 10*(3*D*a*b^2 + C*b^3)*c^2*d + 4*(3*
D*a^2*b + 3*C*a*b^2 + B*b^3)*c*d^2 - (D*a^3 + 3*C*a^2*b + 3*B*a*b
^2 + A*b^3)*d^3)*(d*x + c)^(7/2) + 9009*(15*D*b^3*c^4 - 10*(3*D*a
*b^2 + C*b^3)*c^3*d + 6*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^2*d^2 -
 3*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c*d^3 + (C*a^3 + 3*B*a
^2*b + 3*A*a*b^2)*d^4)*(d*x + c)^(5/2) - 15015*(6*D*b^3*c^5 - 5*(
3*D*a*b^2 + C*b^3)*c^4*d + 4*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^3*
d^2 - 3*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^2*d^3 + 2*(C*a^
3 + 3*B*a^2*b + 3*A*a*b^2)*c*d^4 - (B*a^3 + 3*A*a^2*b)*d^5)*(d*x
+ c)^(3/2) + 45045*(D*b^3*c^6 + A*a^3*d^6 - (3*D*a*b^2 + C*b^3)*c
^5*d + (3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^4*d^2 - (D*a^3 + 3*C*a^2
*b + 3*B*a*b^2 + A*b^3)*c^3*d^3 + (C*a^3 + 3*B*a^2*b + 3*A*a*b^2)
*c^2*d^4 - (B*a^3 + 3*A*a^2*b)*c*d^5)*sqrt(d*x + c))/d^7
```

Fricas [A] time = 0.217346, size = 842, normalized size = 1.93

$$\frac{2\left(3465\,Db^3d^6x^6 + 15360\,Db^3c^6 + 45045\,Aa^3d^6 - 16640\left(3\,Dab^2 + Cb^3\right)c^5d + 18304\left(3\,Da^2b + 3\,Cab^2 + Bb^3\right)c^4d^2 - 20592\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/sqrt(d*x + c),x, algorithm="fricas
```

```
[Out] 2/45045*(3465*D*b^3*d^6*x^6 + 15360*D*b^3*c^6 + 45045*A*a^3*d^6 -
 16640*(3*D*a*b^2 + C*b^3)*c^5*d + 18304*(3*D*a^2*b + 3*C*a*b^2 +
 B*b^3)*c^4*d^2 - 20592*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c
^3*d^3 + 24024*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^2*d^4 - 30030*(B
*a^3 + 3*A*a^2*b)*c*d^5 - 315*(12*D*b^3*c*d^5 - 13*(3*D*a*b^2 + C
*b^3)*d^6)*x^5 + 35*(120*D*b^3*c^2*d^4 - 130*(3*D*a*b^2 + C*b^3)*
c*d^5 + 143*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^6)*x^4 - 5*(960*D*b
^3*c^3*d^3 - 1040*(3*D*a*b^2 + C*b^3)*c^2*d^4 + 1144*(3*D*a^2*b +
 3*C*a*b^2 + B*b^3)*c*d^5 - 1287*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 +
 A*b^3)*d^6)*x^3 + 3*(1920*D*b^3*c^4*d^2 - 2080*(3*D*a*b^2 + C*b^
3)*c^3*d^3 + 2288*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^2*d^4 - 2574*
(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c*d^5 + 3003*(C*a^3 + 3*B
```

```
*a^2*b + 3*A*a*b^2)*d^6)*x^2 - (7680*D*b^3*c^5*d - 8320*(3*D*a*b^
2 + C*b^3)*c^4*d^2 + 9152*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^3*d^3
 - 10296*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^2*d^4 + 12012*
(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c*d^5 - 15015*(B*a^3 + 3*A*a^2*b)
*d^6)*x)*sqrt(d*x + c)/d^7
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**3*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.23415, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/sqrt(d*x + c),x, algorithm="giac")

[Out] Done
```

3.2 $\int \frac{(a+bx)^2(A+Bx+Cx^2+Dx^3)}{\sqrt{c+dx}}\,dx$

Optimal. Leaf size=324

$$\frac{2(c+dx)^{5/2}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{5d^6}+\frac{2(c+dx)^{7/2}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{7d^6}+\frac{2(c+dx)^{3/2}(bc-ad)\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{3d^6}+\frac{2\sqrt{c+dx}(bc-ad)^2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^6}+\frac{2b(c+dx)^{9/2}(2adD-5bcD+bCd)}{9d^6}+\frac{2b^2D(c+dx)^{11/2}}{11d^6}$$

```
[Out] (2*(b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*x
])/d^6 + (2*(b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(4*c
^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D))*(c + d*x)^(3/2))/(3*d^6)
 + (2*(a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d - B*d^2 - 6*c^2*D
) + b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D))*(c + d*x)^(5/
2))/(5*d^6) + (2*(a^2*d^2*D + 2*a*b*d*(C*d - 4*c*D) - b^2*(4*c*C*
d - B*d^2 - 10*c^2*D))*(c + d*x)^(7/2))/(7*d^6) + (2*b*(b*C*d - 5
*b*c*D + 2*a*d*D)*(c + d*x)^(9/2))/(9*d^6) + (2*b^2*D*(c + d*x)^(
11/2))/(11*d^6)
```

Rubi [A] time = 0.546358, antiderivative size = 324, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.031$

$$\frac{2(c+dx)^{5/2}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{5d^6}+\frac{2(c+dx)^{7/2}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{7d^6}+\frac{2(c+dx)^{3/2}(bc-ad)\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{3d^6}+\frac{2\sqrt{c+dx}(bc-ad)^2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^6}+\frac{2b(c+dx)^{9/2}(2adD-5bcD+bCd)}{9d^6}+\frac{2b^2D(c+dx)^{11/2}}{11d^6}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^2*(A + B*x + C*x^2 + D*x^3))/Sqrt[c + d*x],x]
```

```
[Out] (2*(b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*x
])/d^6 + (2*(b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(4*c
^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D))*(c + d*x)^(3/2))/(3*d^6)
```

```
 + (2*(a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d - B*d^2 - 6*c^2*D
) + b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D))*(c + d*x)^(5/
2))/(5*d^6) + (2*(a^2*d^2*D + 2*a*b*d*(C*d - 4*c*D) - b^2*(4*c*C*
d - B*d^2 - 10*c^2*D))*(c + d*x)^(7/2))/(7*d^6) + (2*b*(b*C*d - 5
*b*c*D + 2*a*d*D)*(c + d*x)^(9/2))/(9*d^6) + (2*b^2*D*(c + d*x)^(
11/2))/(11*d^6)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**2*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.31686, size = 323, normalized size = 1.

$$2\sqrt{c+dx}\left(33a^2d^2\left(d^3(105A+x(35B+3x(7C+5Dx)))-2cd^2(35B+x(14C+9Dx))-48c^3D+8c^2d(7C+3Dx)\right)+22abd\left(-\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)^2*(A + B*x + C*x^2 + D*x^3))/Sqrt[c + d*x],x]
```

```
[Out] (2*Sqrt[c + d*x]*(33*a^2*d^2*(-48*c^3*D + 8*c^2*d*(7*C + 3*D*x) -
 2*c*d^2*(35*B + x*(14*C + 9*D*x)) + d^3*(105*A + x*(35*B + 3*x*(
7*C + 5*D*x)))) + 22*a*b*d*(128*c^4*D - 16*c^3*d*(9*C + 4*D*x) +
24*c^2*d^2*(7*B + x*(3*C + 2*D*x)) + d^4*x*(105*A + x*(63*B + 5*x
*(9*C + 7*D*x))) - 2*c*d^3*(105*A + x*(42*B + x*(27*C + 20*D*x)))
) + b^2*(-1280*c^5*D + 128*c^4*d*(11*C + 5*D*x) - 16*c^3*d^2*(99*
B + 44*C*x + 30*D*x^2) + 8*c^2*d^3*(231*A + x*(99*B + 66*C*x + 50
*D*x^2)) + d^5*x^2*(693*A + 5*x*(99*B + 7*x*(11*C + 9*D*x))) - 2*
c*d^4*x*(462*A + x*(297*B + 5*x*(44*C + 35*D*x))))))/(3465*d^6)
```

Maple [A] time = 0.013, size = 505, normalized size = 1.6

$$630\,b^2Dx^5d^5+770\,Cb^2d^5x^4+1540\,Dabd^5x^4-700\,Db^2cd^4x^4+990\,Bb^2d^5x^3+1980\,Cabd^5x^3-880\,Cb^2cd^4x^3+990\,Da^2d^5x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^2*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(1/2),x)
```

```
[Out] 2/3465*(d*x+c)^(1/2)*(315*D*b^2*d^5*x^5+385*C*b^2*d^5*x^4+770*D*a
*b*d^5*x^4-350*D*b^2*c*d^4*x^4+495*B*b^2*d^5*x^3+990*C*a*b*d^5*x^
3-440*C*b^2*c*d^4*x^3+495*D*a^2*d^5*x^3-880*D*a*b*c*d^4*x^3+400*D
*b^2*c^2*d^3*x^3+693*A*b^2*d^5*x^2+1386*B*a*b*d^5*x^2-594*B*b^2*c
*d^4*x^2+693*C*a^2*d^5*x^2-1188*C*a*b*c*d^4*x^2+528*C*b^2*c^2*d^3
*x^2-594*D*a^2*c*d^4*x^2+1056*D*a*b*c^2*d^3*x^2-480*D*b^2*c^3*d^2
*x^2+2310*A*a*b*d^5*x-924*A*b^2*c*d^4*x+1155*B*a^2*d^5*x-1848*B*a
*b*c*d^4*x+792*B*b^2*c^2*d^3*x-924*C*a^2*c*d^4*x+1584*C*a*b*c^2*d
^3*x-704*C*b^2*c^3*d^2*x+792*D*a^2*c^2*d^3*x-1408*D*a*b*c^3*d^2*x
+640*D*b^2*c^4*d*x+3465*A*a^2*d^5-4620*A*a*b*c*d^4+1848*A*b^2*c^2
*d^3-2310*B*a^2*c*d^4+3696*B*a*b*c^2*d^3-1584*B*b^2*c^3*d^2+1848*
C*a^2*c^2*d^3-3168*C*a*b*c^3*d^2+1408*C*b^2*c^4*d-1584*D*a^2*c^3*
d^2+2816*D*a*b*c^4*d-1280*D*b^2*c^5)/d^6
```

Maxima [A] time = 1.36064, size = 522, normalized size = 1.61

$$\frac{2\left(315\,(dx+c)^{\frac{11}{2}}Db^2 - 385\left(5\,Db^2c - \left(2\,Dab + Cb^2\right)d\right)(dx+c)^{\frac{9}{2}} + 495\left(10\,Db^2c^2 - 4\left(2\,Dab + Cb^2\right)cd + \left(Da^2 + 2\,Cab + Bb\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/sqrt(d*x + c),x, algorithm="maxima
```

```
[Out] 2/3465*(315*(d*x + c)^(11/2)*D*b^2 - 385*(5*D*b^2*c - (2*D*a*b +
C*b^2)*d)*(d*x + c)^(9/2) + 495*(10*D*b^2*c^2 - 4*(2*D*a*b + C*b^
2)*c*d + (D*a^2 + 2*C*a*b + B*b^2)*d^2)*(d*x + c)^(7/2) - 693*(10
*D*b^2*c^3 - 6*(2*D*a*b + C*b^2)*c^2*d + 3*(D*a^2 + 2*C*a*b + B*b
^2)*c*d^2 - (C*a^2 + 2*B*a*b + A*b^2)*d^3)*(d*x + c)^(5/2) + 1155
*(5*D*b^2*c^4 - 4*(2*D*a*b + C*b^2)*c^3*d + 3*(D*a^2 + 2*C*a*b +
B*b^2)*c^2*d^2 - 2*(C*a^2 + 2*B*a*b + A*b^2)*c*d^3 + (B*a^2 + 2*A
*a*b)*d^4)*(d*x + c)^(3/2) - 3465*(D*b^2*c^5 - A*a^2*d^5 - (2*D*a
*b + C*b^2)*c^4*d + (D*a^2 + 2*C*a*b + B*b^2)*c^3*d^2 - (C*a^2 +
2*B*a*b + A*b^2)*c^2*d^3 + (B*a^2 + 2*A*a*b)*c*d^4)*sqrt(d*x + c)
)/d^6
```

Fricas [A] time = 0.218213, size = 522, normalized size = 1.61

$$\frac{2\left(315\,Db^2d^5x^5 - 1280\,Db^2c^5 + 3465\,Aa^2d^5 + 1408\left(2\,Dab + Cb^2\right)c^4d - 1584\left(Da^2 + 2\,Cab + Bb^2\right)c^3d^2 + 1848\left(Ca^2 + 2\,Bab\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/sqrt(d*x + c),x, algorithm="fricas
```

```
[Out] 2/3465*(315*D*b^2*d^5*x^5 - 1280*D*b^2*c^5 + 3465*A*a^2*d^5 + 140
8*(2*D*a*b + C*b^2)*c^4*d - 1584*(D*a^2 + 2*C*a*b + B*b^2)*c^3*d^
2 + 1848*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 - 2310*(B*a^2 + 2*A*a*
b)*c*d^4 - 35*(10*D*b^2*c*d^4 - 11*(2*D*a*b + C*b^2)*d^5)*x^4 + 5
*(80*D*b^2*c^2*d^3 - 88*(2*D*a*b + C*b^2)*c*d^4 + 99*(D*a^2 + 2*C
*a*b + B*b^2)*d^5)*x^3 - 3*(160*D*b^2*c^3*d^2 - 176*(2*D*a*b + C*
b^2)*c^2*d^3 + 198*(D*a^2 + 2*C*a*b + B*b^2)*c*d^4 - 231*(C*a^2 +
 2*B*a*b + A*b^2)*d^5)*x^2 + (640*D*b^2*c^4*d - 704*(2*D*a*b + C*
b^2)*c^3*d^2 + 792*(D*a^2 + 2*C*a*b + B*b^2)*c^2*d^3 - 924*(C*a^2
 + 2*B*a*b + A*b^2)*c*d^4 + 1155*(B*a^2 + 2*A*a*b)*d^5)*x)*sqrt(d
*x + c)/d^6
```

Sympy [A] time = 109.417, size = 1510, normalized size = 4.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**2*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)
```

```
[Out] Piecewise((-(2*A*a**2*c/sqrt(c + d*x) + 2*A*a**2*(-c/sqrt(c + d*x
) - sqrt(c + d*x)) + 4*A*a*b*c*(-c/sqrt(c + d*x) - sqrt(c + d*x))
/d + 4*A*a*b*(c**2/sqrt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)*
*(3/2)/3)/d + 2*A*b**2*c*(c**2/sqrt(c + d*x) + 2*c*sqrt(c + d*x)
- (c + d*x)**(3/2)/3)/d**2 + 2*A*b**2*(-c**3/sqrt(c + d*x) - 3*c*
*2*sqrt(c + d*x) + c*(c + d*x)**(3/2) - (c + d*x)**(5/2)/5)/d**2
+ 2*B*a**2*c*(-c/sqrt(c + d*x) - sqrt(c + d*x))/d + 2*B*a**2*(c**
2/sqrt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)/3)/d + 4*B
*a*b*c*(c**2/sqrt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)
/3)/d**2 + 4*B*a*b*(-c**3/sqrt(c + d*x) - 3*c**2*sqrt(c + d*x) +
c*(c + d*x)**(3/2) - (c + d*x)**(5/2)/5)/d**2 + 2*B*b**2*c*(-c**3
/sqrt(c + d*x) - 3*c**2*sqrt(c + d*x) + c*(c + d*x)**(3/2) - (c +
 d*x)**(5/2)/5)/d**3 + 2*B*b**2*(c**4/sqrt(c + d*x) + 4*c**3*sqrt
(c + d*x) - 2*c**2*(c + d*x)**(3/2) + 4*c*(c + d*x)**(5/2)/5 - (c
 + d*x)**(7/2)/7)/d**3 + 2*C*a**2*c*(c**2/sqrt(c + d*x) + 2*c*sqr
t(c + d*x) - (c + d*x)**(3/2)/3)/d**2 + 2*C*a**2*(-c**3/sqrt(c +
d*x) - 3*c**2*sqrt(c + d*x) + c*(c + d*x)**(3/2) - (c + d*x)**(5/
2)/5)/d**2 + 4*C*a*b*c*(-c**3/sqrt(c + d*x) - 3*c**2*sqrt(c + d*x
) + c*(c + d*x)**(3/2) - (c + d*x)**(5/2)/5)/d**3 + 4*C*a*b*(c**4
/sqrt(c + d*x) + 4*c**3*sqrt(c + d*x) - 2*c**2*(c + d*x)**(3/2) +
 4*c*(c + d*x)**(5/2)/5 - (c + d*x)**(7/2)/7)/d**3 + 2*C*b**2*c*(
c**4/sqrt(c + d*x) + 4*c**3*sqrt(c + d*x) - 2*c**2*(c + d*x)**(3/
2) + 4*c*(c + d*x)**(5/2)/5 - (c + d*x)**(7/2)/7)/d**4 + 2*C*b**2
*(-c**5/sqrt(c + d*x) - 5*c**4*sqrt(c + d*x) + 10*c**3*(c + d*x)*
*(3/2)/3 - 2*c**2*(c + d*x)**(5/2) + 5*c*(c + d*x)**(7/2)/7 - (c
+ d*x)**(9/2)/9)/d**4 + 2*D*a**2*c*(-c**3/sqrt(c + d*x) - 3*c**2*
sqrt(c + d*x) + c*(c + d*x)**(3/2) - (c + d*x)**(5/2)/5)/d**3 + 2
*D*a**2*(c**4/sqrt(c + d*x) + 4*c**3*sqrt(c + d*x) - 2*c**2*(c +
d*x)**(3/2) + 4*c*(c + d*x)**(5/2)/5 - (c + d*x)**(7/2)/7)/d**3 +
 4*D*a*b*c*(c**4/sqrt(c + d*x) + 4*c**3*sqrt(c + d*x) - 2*c**2*(c
 + d*x)**(3/2) + 4*c*(c + d*x)**(5/2)/5 - (c + d*x)**(7/2)/7)/d**
4 + 4*D*a*b*(-c**5/sqrt(c + d*x) - 5*c**4*sqrt(c + d*x) + 10*c**3
```

```
*(c + d*x)**(3/2)/3 - 2*c**2*(c + d*x)**(5/2) + 5*c*(c + d*x)**(7
/2)/7 - (c + d*x)**(9/2)/9)/d**4 + 2*D*b**2*c*(-c**5/sqrt(c + d*x
) - 5*c**4*sqrt(c + d*x) + 10*c**3*(c + d*x)**(3/2)/3 - 2*c**2*(c
 + d*x)**(5/2) + 5*c*(c + d*x)**(7/2)/7 - (c + d*x)**(9/2)/9)/d**
5 + 2*D*b**2*(c**6/sqrt(c + d*x) + 6*c**5*sqrt(c + d*x) - 5*c**4*
(c + d*x)**(3/2) + 4*c**3*(c + d*x)**(5/2) - 15*c**2*(c + d*x)**(
7/2)/7 + 2*c*(c + d*x)**(9/2)/3 - (c + d*x)**(11/2)/11)/d**5)/d,
Ne(d, 0)), ((A*a**2*x + D*b**2*x**6/6 + x**5*(C*b**2 + 2*D*a*b)/5
 + x**4*(B*b**2 + 2*C*a*b + D*a**2)/4 + x**3*(A*b**2 + 2*B*a*b +
C*a**2)/3 + x**2*(2*A*a*b + B*a**2)/2)/sqrt(c), True))
```

GIAC/XCAS [A] time = 0.214397, size = 903, normalized size = 2.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/sqrt(d*x + c),x, algorithm="giac")
```

```
[Out] 2/3465*(3465*sqrt(d*x + c)*A*a^2 + 1155*((d*x + c)^(3/2) - 3*sqrt
(d*x + c)*c)*B*a^2/d + 2310*((d*x + c)^(3/2) - 3*sqrt(d*x + c)*c)
*A*a*b/d + 231*(3*(d*x + c)^(5/2)*d^8 - 10*(d*x + c)^(3/2)*c*d^8
+ 15*sqrt(d*x + c)*c^2*d^8)*C*a^2/d^10 + 462*(3*(d*x + c)^(5/2)*d
^8 - 10*(d*x + c)^(3/2)*c*d^8 + 15*sqrt(d*x + c)*c^2*d^8)*B*a*b/d
^10 + 231*(3*(d*x + c)^(5/2)*d^8 - 10*(d*x + c)^(3/2)*c*d^8 + 15*
sqrt(d*x + c)*c^2*d^8)*A*b^2/d^10 + 99*(5*(d*x + c)^(7/2)*d^18 -
21*(d*x + c)^(5/2)*c*d^18 + 35*(d*x + c)^(3/2)*c^2*d^18 - 35*sqrt
(d*x + c)*c^3*d^18)*D*a^2/d^21 + 198*(5*(d*x + c)^(7/2)*d^18 - 21
*(d*x + c)^(5/2)*c*d^18 + 35*(d*x + c)^(3/2)*c^2*d^18 - 35*sqrt(d
*x + c)*c^3*d^18)*C*a*b/d^21 + 99*(5*(d*x + c)^(7/2)*d^18 - 21*(d
*x + c)^(5/2)*c*d^18 + 35*(d*x + c)^(3/2)*c^2*d^18 - 35*sqrt(d*x
+ c)*c^3*d^18)*B*b^2/d^21 + 22*(35*(d*x + c)^(9/2)*d^32 - 180*(d*
x + c)^(7/2)*c*d^32 + 378*(d*x + c)^(5/2)*c^2*d^32 - 420*(d*x + c
)^(3/2)*c^3*d^32 + 315*sqrt(d*x + c)*c^4*d^32)*D*a*b/d^36 + 11*(3
5*(d*x + c)^(9/2)*d^32 - 180*(d*x + c)^(7/2)*c*d^32 + 378*(d*x +
c)^(5/2)*c^2*d^32 - 420*(d*x + c)^(3/2)*c^3*d^32 + 315*sqrt(d*x +
 c)*c^4*d^32)*C*b^2/d^36 + 5*(63*(d*x + c)^(11/2)*d^50 - 385*(d*x
 + c)^(9/2)*c*d^50 + 990*(d*x + c)^(7/2)*c^2*d^50 - 1386*(d*x + c
)^(5/2)*c^3*d^50 + 1155*(d*x + c)^(3/2)*c^4*d^50 - 693*sqrt(d*x +
 c)*c^5*d^50)*D*b^2/d^55)/d
```

3.3 $\int \frac{(a+bx)(A+Bx+Cx^2+Dx^3)}{\sqrt{c+dx}}\,dx$

Optimal. Leaf size=212

$$-\frac{2(c+dx)^{3/2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{3d^5} - \frac{2\sqrt{c+dx}(bc-ad)\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^5} + \frac{2(c+dx)^{5/2}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{5d^5} + \frac{2(c+dx)^{7/2}(adD-4bcD+bCd)}{7d^5} + \frac{2bD(c+dx)^{9/2}}{9d^5}$$

```
[Out] (-2*(b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*x]
)/d^5 - (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^2*C*d - 2*B*
c*d^2 + A*d^3 - 4*c^3*D))*(c + d*x)^(3/2))/(3*d^5) + (2*(a*d*(C*d
 - 3*c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*(c + d*x)^(5/2))/(5*d^
5) + (2*(b*C*d - 4*b*c*D + a*d*D)*(c + d*x)^(7/2))/(7*d^5) + (2*b
*D*(c + d*x)^(9/2))/(9*d^5)
```

Rubi [A] time = 0.346458, antiderivative size = 212, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$

$$-\frac{2(c+dx)^{3/2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{3d^5} - \frac{2\sqrt{c+dx}(bc-ad)\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^5} + \frac{2(c+dx)^{5/2}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{5d^5} + \frac{2(c+dx)^{7/2}(adD-4bcD+bCd)}{7d^5} + \frac{2bD(c+dx)^{9/2}}{9d^5}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)*(A + B*x + C*x^2 + D*x^3))/Sqrt[c + d*x],x]
```

```
[Out] (-2*(b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*x]
)/d^5 - (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^2*C*d - 2*B*
c*d^2 + A*d^3 - 4*c^3*D))*(c + d*x)^(3/2))/(3*d^5) + (2*(a*d*(C*d
 - 3*c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*(c + d*x)^(5/2))/(5*d^
5) + (2*(b*C*d - 4*b*c*D + a*d*D)*(c + d*x)^(7/2))/(7*d^5) + (2*b
*D*(c + d*x)^(9/2))/(9*d^5)
```

Rubi in Sympy [A] time = 81.0796, size = 226, normalized size = 1.07

$$\frac{2Db\left(c+dx\right)^{\frac{9}{2}}}{9d^5}+\frac{2\left(c+dx\right)^{\frac{7}{2}}\left(Cbd+Dad-4Dbc\right)}{7d^5}+\frac{2\left(c+dx\right)^{\frac{5}{2}}\left(Bbd^2+Cad^2-3Cbcd-3Dacd+6Dbc^2\right)}{5d^5}+\frac{2\left(c+dx\right)^{\frac{3}{2}}\left(Abd^3+Bad^3-2Bbcd^2-2Cacd^2+3Cbc^2d+3Dac^2d-4Dbc^3\right)}{3d^5}+\frac{2\sqrt{c+dx}\left(ad-bc\right)\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{d^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)
```

```
[Out] 2*D*b*(c + d*x)**(9/2)/(9*d**5) + 2*(c + d*x)**(7/2)*(C*b*d + D*a
*d - 4*D*b*c)/(7*d**5) + 2*(c + d*x)**(5/2)*(B*b*d**2 + C*a*d**2
- 3*C*b*c*d - 3*D*a*c*d + 6*D*b*c**2)/(5*d**5) + 2*(c + d*x)**(3/
2)*(A*b*d**3 + B*a*d**3 - 2*B*b*c*d**2 - 2*C*a*c*d**2 + 3*C*b*c**
2*d + 3*D*a*c**2*d - 4*D*b*c**3)/(3*d**5) + 2*sqrt(c + d*x)*(a*d
- b*c)*(A*d**3 - B*c*d**2 + C*c**2*d - D*c**3)/d**5
```

Mathematica [A] time = 0.331097, size = 184, normalized size = 0.87

$$2\sqrt{c+dx}\left(3ad\left(d^3(105A+x(35B+3x(7C+5Dx)))-2cd^2(35B+x(14C+9Dx))-48c^3D+8c^2d(7C+3Dx)\right)+b\left(-2cd^3(10\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)*(A + B*x + C*x^2 + D*x^3))/Sqrt[c + d*x],x]
```

```
[Out] (2*Sqrt[c + d*x]*(3*a*d*(-48*c^3*D + 8*c^2*d*(7*C + 3*D*x) - 2*c*
d^2*(35*B + x*(14*C + 9*D*x)) + d^3*(105*A + x*(35*B + 3*x*(7*C +
 5*D*x)))) + b*(128*c^4*D - 16*c^3*d*(9*C + 4*D*x) + 24*c^2*d^2*(
7*B + x*(3*C + 2*D*x)) + d^4*x*(105*A + x*(63*B + 5*x*(9*C + 7*D*
x))) - 2*c*d^3*(105*A + x*(42*B + x*(27*C + 20*D*x))))))/(315*d^5
)
```

Maple [A] time = 0.008, size = 241, normalized size = 1.1

$$70\,Dbx^4d^4+90\,Cbd^4x^3+90\,Dad^4x^3-80\,Dbcd^3x^3+126\,Bbd^4x^2+126\,Cad^4x^2-108\,Cbcd^3x^2-108\,Dacd^3x^2+96\,Dbc^2d^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(1/2),x)
```

```
[Out] 2/315*(d*x+c)^(1/2)*(35*D*b*d^4*x^4+45*C*b*d^4*x^3+45*D*a*d^4*x^3
-40*D*b*c*d^3*x^3+63*B*b*d^4*x^2+63*C*a*d^4*x^2-54*C*b*c*d^3*x^2-
54*D*a*c*d^3*x^2+48*D*b*c^2*d^2*x^2+105*A*b*d^4*x+105*B*a*d^4*x-8
4*B*b*c*d^3*x-84*C*a*c*d^3*x+72*C*b*c^2*d^2*x+72*D*a*c^2*d^2*x-64
*D*b*c^3*d*x+315*A*a*d^4-210*A*b*c*d^3-210*B*a*c*d^3+168*B*b*c^2*
d^2+168*C*a*c^2*d^2-144*C*b*c^3*d-144*D*a*c^3*d+128*D*b*c^4)/d^5
```

Maxima [A] time = 1.35823, size = 267, normalized size = 1.26

$$2\left(35\,(dx+c)^{\frac{9}{2}}Db - 45\,(4\,Dbc - (Da+Cb)d)(dx+c)^{\frac{7}{2}} + 63\,\left(6\,Dbc^2 - 3\,(Da+Cb)cd + (Ca+Bb)d^2\right)(dx+c)^{\frac{5}{2}} - 105\,\left(4\,Dbc^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/sqrt(d*x + c),x, algorithm="maxima")
```

```
[Out] 2/315*(35*(d*x + c)^(9/2)*D*b - 45*(4*D*b*c - (D*a + C*b)*d)*(d*x
 + c)^(7/2) + 63*(6*D*b*c^2 - 3*(D*a + C*b)*c*d + (C*a + B*b)*d^2
)*(d*x + c)^(5/2) - 105*(4*D*b*c^3 - 3*(D*a + C*b)*c^2*d + 2*(C*a
 + B*b)*c*d^2 - (B*a + A*b)*d^3)*(d*x + c)^(3/2) + 315*(D*b*c^4 +
 A*a*d^4 - (D*a + C*b)*c^3*d + (C*a + B*b)*c^2*d^2 - (B*a + A*b)*
c*d^3)*sqrt(d*x + c))/d^5
```

Fricas [A] time = 0.212277, size = 266, normalized size = 1.25

$$2\left(35\,Dbd^4x^4 + 128\,Dbc^4 + 315\,Aad^4 - 144\,(Da+Cb)c^3d + 168\,(Ca+Bb)c^2d^2 - 210\,(Ba+Ab)cd^3 - 5\,\left(8\,Dbcd^3 - 9\,(Da+C\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/sqrt(d*x + c),x, algorithm="fricas")
```

```
[Out] 2/315*(35*D*b*d^4*x^4 + 128*D*b*c^4 + 315*A*a*d^4 - 144*(D*a + C*
b)*c^3*d + 168*(C*a + B*b)*c^2*d^2 - 210*(B*a + A*b)*c*d^3 - 5*(8
*D*b*c*d^3 - 9*(D*a + C*b)*d^4)*x^3 + 3*(16*D*b*c^2*d^2 - 18*(D*a
 + C*b)*c*d^3 + 21*(C*a + B*b)*d^4)*x^2 - (64*D*b*c^3*d - 72*(D*a
 + C*b)*c^2*d^2 + 84*(C*a + B*b)*c*d^3 - 105*(B*a + A*b)*d^4)*x)*
sqrt(d*x + c)/d^5
```

Sympy [A] time = 57.2831, size = 848, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)
```

```
[Out] Piecewise((-(2*A*a*c/sqrt(c + d*x) + 2*A*a*(-c/sqrt(c + d*x) - sq
rt(c + d*x)) + 2*A*b*c*(-c/sqrt(c + d*x) - sqrt(c + d*x))/d + 2*A
*b*(c**2/sqrt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)/3)/
d + 2*B*a*c*(-c/sqrt(c + d*x) - sqrt(c + d*x))/d + 2*B*a*(c**2/sq
rt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)/3)/d + 2*B*b*c
*(c**2/sqrt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)/3)/d*
*2 + 2*B*b*(-c**3/sqrt(c + d*x) - 3*c**2*sqrt(c + d*x) + c*(c + d
*x)**(3/2) - (c + d*x)**(5/2)/5)/d**2 + 2*C*a*c*(c**2/sqrt(c + d*
x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)/3)/d**2 + 2*C*a*(-c**3/
sqrt(c + d*x) - 3*c**2*sqrt(c + d*x) + c*(c + d*x)**(3/2) - (c +
d*x)**(5/2)/5)/d**2 + 2*C*b*c*(-c**3/sqrt(c + d*x) - 3*c**2*sqrt(
c + d*x) + c*(c + d*x)**(3/2) - (c + d*x)**(5/2)/5)/d**3 + 2*C*b*
(c**4/sqrt(c + d*x) + 4*c**3*sqrt(c + d*x) - 2*c**2*(c + d*x)**(3
/2) + 4*c*(c + d*x)**(5/2)/5 - (c + d*x)**(7/2)/7)/d**3 + 2*D*a*c
*(-c**3/sqrt(c + d*x) - 3*c**2*sqrt(c + d*x) + c*(c + d*x)**(3/2)
 - (c + d*x)**(5/2)/5)/d**3 + 2*D*a*(c**4/sqrt(c + d*x) + 4*c**3*
sqrt(c + d*x) - 2*c**2*(c + d*x)**(3/2) + 4*c*(c + d*x)**(5/2)/5
- (c + d*x)**(7/2)/7)/d**3 + 2*D*b*c*(c**4/sqrt(c + d*x) + 4*c**3
*sqrt(c + d*x) - 2*c**2*(c + d*x)**(3/2) + 4*c*(c + d*x)**(5/2)/5
 - (c + d*x)**(7/2)/7)/d**4 + 2*D*b*(-c**5/sqrt(c + d*x) - 5*c**4
*sqrt(c + d*x) + 10*c**3*(c + d*x)**(3/2)/3 - 2*c**2*(c + d*x)**(
5/2) + 5*c*(c + d*x)**(7/2)/7 - (c + d*x)**(9/2)/9)/d**4)/d, Ne(d
, 0)), ((A*a*x + D*b*x**5/5 + x**4*(C*b + D*a)/4 + x**3*(B*b + C*
a)/3 + x**2*(A*b + B*a)/2)/sqrt(c), True))
```

GIAC/XCAS [A] time = 0.225034, size = 494, normalized size = 2.33

$$2\left(315\sqrt{dx+c}Aa + \frac{105\left((dx+c)^{\frac{3}{2}} - 3\sqrt{dx+c}c\right)Ba}{d} + \frac{105\left((dx+c)^{\frac{3}{2}} - 3\sqrt{dx+c}c\right)Ab}{d} + \frac{21\left(3(dx+c)^{\frac{5}{2}}d^8 - 10(dx+c)^{\frac{3}{2}}cd^8 + 15\sqrt{dx+c}c^2d^8\right)Ca}{d^{10}} + \frac{21\left(3(d\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/sqrt(d*x + c),x, algorithm="giac")
```

```
[Out] 2/315*(315*sqrt(d*x + c)*A*a + 105*((d*x + c)^(3/2) - 3*sqrt(d*x
+ c)*c)*B*a/d + 105*((d*x + c)^(3/2) - 3*sqrt(d*x + c)*c)*A*b/d +
 21*(3*(d*x + c)^(5/2)*d^8 - 10*(d*x + c)^(3/2)*c*d^8 + 15*sqrt(d
*x + c)*c^2*d^8)*C*a/d^10 + 21*(3*(d*x + c)^(5/2)*d^8 - 10*(d*x +
 c)^(3/2)*c*d^8 + 15*sqrt(d*x + c)*c^2*d^8)*B*b/d^10 + 9*(5*(d*x
+ c)^(7/2)*d^18 - 21*(d*x + c)^(5/2)*c*d^18 + 35*(d*x + c)^(3/2)*
c^2*d^18 - 35*sqrt(d*x + c)*c^3*d^18)*D*a/d^21 + 9*(5*(d*x + c)^(
7/2)*d^18 - 21*(d*x + c)^(5/2)*c*d^18 + 35*(d*x + c)^(3/2)*c^2*d^
18 - 35*sqrt(d*x + c)*c^3*d^18)*C*b/d^21 + (35*(d*x + c)^(9/2)*d^
32 - 180*(d*x + c)^(7/2)*c*d^32 + 378*(d*x + c)^(5/2)*c^2*d^32 -
420*(d*x + c)^(3/2)*c^3*d^32 + 315*sqrt(d*x + c)*c^4*d^32)*D*b/d^
```

36)/d

3.4 $\int \frac{A+Bx+Cx^2+Dx^3}{\sqrt{c+dx}} \, dx$

Optimal. Leaf size=115

$$\frac{2\sqrt{c+dx}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^4}-\frac{2(c+dx)^{3/2}\left(-Bd^2-3c^2D+2cCd\right)}{3d^4}+\frac{2(c+dx)^{5/2}(Cd-3cD)}{5d^4}+\frac{2D(c+dx)^{7/2}}{7d^4}$$

```
[Out] (2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*x])/d^4 - (2*(2
*c*C*d - B*d^2 - 3*c^2*D)*(c + d*x)^(3/2))/(3*d^4) + (2*(C*d - 3*
c*D)*(c + d*x)^(5/2))/(5*d^4) + (2*D*(c + d*x)^(7/2))/(7*d^4)
```

Rubi [A] time = 0.144939, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{2\sqrt{c+dx}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^4}-\frac{2(c+dx)^{3/2}\left(-Bd^2-3c^2D+2cCd\right)}{3d^4}+\frac{2(c+dx)^{5/2}(Cd-3cD)}{5d^4}+\frac{2D(c+dx)^{7/2}}{7d^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/Sqrt[c + d*x],x]
```

```
[Out] (2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*Sqrt[c + d*x])/d^4 - (2*(2
*c*C*d - B*d^2 - 3*c^2*D)*(c + d*x)^(3/2))/(3*d^4) + (2*(C*d - 3*
c*D)*(c + d*x)^(5/2))/(5*d^4) + (2*D*(c + d*x)^(7/2))/(7*d^4)
```

Rubi in Sympy [A] time = 27.3753, size = 110, normalized size = 0.96

$$\frac{2D\left(c+dx\right)^{\frac{7}{2}}}{7d^4}+\frac{2\left(c+dx\right)^{\frac{5}{2}}\left(Cd-3Dc\right)}{5d^4}+\frac{2\left(c+dx\right)^{\frac{3}{2}}\left(Bd^2-2Ccd+3Dc^2\right)}{3d^4}+\frac{2\sqrt{c+dx}\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)
```

```
[Out] 2*D*(c + d*x)**(7/2)/(7*d**4) + 2*(c + d*x)**(5/2)*(C*d - 3*D*c)/
(5*d**4) + 2*(c + d*x)**(3/2)*(B*d**2 - 2*C*c*d + 3*D*c**2)/(3*d*
*4) + 2*sqrt(c + d*x)*(A*d**3 - B*c*d**2 + C*c**2*d - D*c**3)/d**
```

4

Mathematica [A] time = 0.0865199, size = 82, normalized size = 0.71

$$\frac{2\sqrt{c+dx}\left(d^3(105A+x(35B+3x(7C+5Dx)))-2cd^2(35B+x(14C+9Dx))-48c^3D+8c^2d(7C+3Dx)\right)}{105d^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/Sqrt[c + d*x],x]
```

```
[Out] (2*Sqrt[c + d*x]*(-48*c^3*D + 8*c^2*d*(7*C + 3*D*x) - 2*c*d^2*(35
*B + x*(14*C + 9*D*x)) + d^3*(105*A + x*(35*B + 3*x*(7*C + 5*D*x)
))))/(105*d^4)
```

Maple [A] time = 0.007, size = 91, normalized size = 0.8

$$\frac{30\,Dx^3d^3+42\,Cd^3x^2-36\,Dcd^2x^2+70\,Bd^3x-56\,Ccd^2x+48\,Dc^2dx+210\,Ad^3-140\,Bcd^2+112\,Cc^2d-96\,Dc^3}{105\,d^4}\sqrt{dx+c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(d*x+c)^(1/2),x)
```

```
[Out] 2/105*(d*x+c)^(1/2)*(15*D*d^3*x^3+21*C*d^3*x^2-18*D*c*d^2*x^2+35*
B*d^3*x-28*C*c*d^2*x+24*D*c^2*d*x+105*A*d^3-70*B*c*d^2+56*C*c^2*d
-48*D*c^3)/d^4
```

Maxima [A] time = 1.34633, size = 173, normalized size = 1.5

$$\frac{2\left(105\sqrt{dx+c}A+\frac{35\left((dx+c)^{\frac{3}{2}}-3\sqrt{dx+c}c\right)B}{d}+\frac{7\left(3(dx+c)^{\frac{5}{2}}-10(dx+c)^{\frac{3}{2}}c+15\sqrt{dx+c}c^2\right)C}{d^2}+\frac{3\left(5(dx+c)^{\frac{7}{2}}-21(dx+c)^{\frac{5}{2}}c+35(dx+c)^{\frac{3}{2}}c^2-35\sqrt{dx+c}c^3\right.}{d^3}\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/sqrt(d*x + c),x, algorithm="maxima")
```

```
[Out] 2/105*(105*sqrt(d*x + c)*A + 35*((d*x + c)^(3/2) - 3*sqrt(d*x + c
)*c)*B/d + 7*(3*(d*x + c)^(5/2) - 10*(d*x + c)^(3/2)*c + 15*sqrt(
d*x + c)*c^2)*C/d^2 + 3*(5*(d*x + c)^(7/2) - 21*(d*x + c)^(5/2)*c
```

```
+ 35*(d*x + c)^(3/2)*c^2 - 35*sqrt(d*x + c)*c^3)*D/d^3)/d
```

Fricas [A] time = 0.215764, size = 122, normalized size = 1.06

$$\frac{2\left(15\,Dd^3x^3 - 48\,Dc^3 + 56\,Cc^2d - 70\,Bcd^2 + 105\,Ad^3 - 3\left(6\,Dcd^2 - 7\,Cd^3\right)x^2 + \left(24\,Dc^2d - 28\,Ccd^2 + 35\,Bd^3\right)x\right)\sqrt{dx+c}}{105\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/sqrt(d*x + c),x, algorithm="fricas")
```

```
[Out] 2/105*(15*D*d^3*x^3 - 48*D*c^3 + 56*C*c^2*d - 70*B*c*d^2 + 105*A*
d^3 - 3*(6*D*c*d^2 - 7*C*d^3)*x^2 + (24*D*c^2*d - 28*C*c*d^2 + 35
*B*d^3)*x)*sqrt(d*x + c)/d^4
```

Sympy [A] time = 12.7631, size = 354, normalized size = 3.08

$$\begin{cases} -\frac{\frac{2Ac}{\sqrt{c+dx}}+2A\left(-\frac{c}{\sqrt{c+dx}}-\sqrt{c+dx}\right)+\frac{2Bc\left(-\frac{c}{\sqrt{c+dx}}-\sqrt{c+dx}\right)}{d}+\frac{2B\left(\frac{c^2}{\sqrt{c+dx}}+2c\sqrt{c+dx}-\frac{(c+dx)^{\frac{3}{2}}}{3}\right)}{d}+\frac{2Cc\left(\frac{c^2}{\sqrt{c+dx}}+2c\sqrt{c+dx}-\frac{(c+dx)^{\frac{3}{2}}}{3}\right)}{d^2}+\frac{2C\left(-\frac{c^3}{\sqrt{c+dx}}-3c^2\sqrt{c+dx}+c(c+dx)^{\frac{3}{2}}-\frac{(c+d}{}\right.}{d^2}}{d} \\ \frac{Ax+\frac{Bx^2}{2}+\frac{Cx^3}{3}+\frac{Dx^4}{4}}{\sqrt{c}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(d*x+c)**(1/2),x)
```

```
[Out] Piecewise((-(2*A*c/sqrt(c + d*x) + 2*A*(-c/sqrt(c + d*x) - sqrt(c
 + d*x)) + 2*B*c*(-c/sqrt(c + d*x) - sqrt(c + d*x))/d + 2*B*(c**2
/sqrt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)/3)/d + 2*C*
c*(c**2/sqrt(c + d*x) + 2*c*sqrt(c + d*x) - (c + d*x)**(3/2)/3)/d
**2 + 2*C*(-c**3/sqrt(c + d*x) - 3*c**2*sqrt(c + d*x) + c*(c + d*
x)**(3/2) - (c + d*x)**(5/2)/5)/d**2 + 2*D*c*(-c**3/sqrt(c + d*x)
 - 3*c**2*sqrt(c + d*x) + c*(c + d*x)**(3/2) - (c + d*x)**(5/2)/5
)/d**3 + 2*D*(c**4/sqrt(c + d*x) + 4*c**3*sqrt(c + d*x) - 2*c**2*
(c + d*x)**(3/2) + 4*c*(c + d*x)**(5/2)/5 - (c + d*x)**(7/2)/7)/d
**3)/d, Ne(d, 0)), ((A*x + B*x**2/2 + C*x**3/3 + D*x**4/4)/sqrt(c
), True))
```

GIAC/XCAS [A] time = 0.220745, size = 201, normalized size = 1.75

$$\frac{2\left(105\sqrt{dx+c}A+\frac{35\left((dx+c)^{\frac{3}{2}}-3\sqrt{dx+c}c\right)B}{d}+\frac{7\left(3(dx+c)^{\frac{5}{2}}d^8-10(dx+c)^{\frac{3}{2}}cd^8+15\sqrt{dx+c}c^2d^8\right)C}{d^{10}}+\frac{3\left(5(dx+c)^{\frac{7}{2}}d^{18}-21(dx+c)^{\frac{5}{2}}cd^{18}+35(dx+c)^{\frac{3}{2}}c\right.}{d^{21}}\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/sqrt(d*x + c),x, algorithm="giac")
```

```
[Out] 2/105*(105*sqrt(d*x + c)*A + 35*((d*x + c)^(3/2) - 3*sqrt(d*x + c
)*c)*B/d + 7*(3*(d*x + c)^(5/2)*d^8 - 10*(d*x + c)^(3/2)*c*d^8 +
15*sqrt(d*x + c)*c^2*d^8)*C/d^10 + 3*(5*(d*x + c)^(7/2)*d^18 - 21
*(d*x + c)^(5/2)*c*d^18 + 35*(d*x + c)^(3/2)*c^2*d^18 - 35*sqrt(d
*x + c)*c^3*d^18)*D/d^21)/d
```

3.5 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)\sqrt{c+dx}}\,dx$

Optimal. Leaf size=188

$$-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{7/2}\sqrt{bc-ad}}+\frac{2\sqrt{c+dx}\left(a^2d^2D-abd(Cd-cD)+b^2\left(-\left(-Bd^2+c^2(-D)+cCd\right)\right)\right)}{b^3d^3}+\frac{2(c+dx)^{3/2}(-adD-2bcD+bCd)}{3b^2d^3}+\frac{2D(c+dx)^{5/2}}{5bd^3}$$

```
[Out] (2*(a^2*d^2*D - a*b*d*(C*d - c*D) - b^2*(c*C*d - B*d^2 - c^2*D))*
Sqrt[c + d*x])/(b^3*d^3) + (2*(b*C*d - 2*b*c*D - a*d*D)*(c + d*x)
^(3/2))/(3*b^2*d^3) + (2*D*(c + d*x)^(5/2))/(5*b*d^3) - (2*(A*b^3
 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqr
t[b*c - a*d]])/(b^(7/2)*Sqrt[b*c - a*d])
```

Rubi [A] time = 0.401087, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$

$$-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{7/2}\sqrt{bc-ad}}+\frac{2\sqrt{c+dx}\left(a^2d^2D-abd(Cd-cD)+b^2\left(-\left(-Bd^2+c^2(-D)+cCd\right)\right)\right)}{b^3d^3}+\frac{2(c+dx)^{3/2}(-adD-2bcD+bCd)}{3b^2d^3}+\frac{2D(c+dx)^{5/2}}{5bd^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)*Sqrt[c + d*x]),x]
```

```
[Out] (2*(a^2*d^2*D - a*b*d*(C*d - c*D) - b^2*(c*C*d - B*d^2 - c^2*D))*
Sqrt[c + d*x])/(b^3*d^3) + (2*(b*C*d - 2*b*c*D - a*d*D)*(c + d*x)
^(3/2))/(3*b^2*d^3) + (2*D*(c + d*x)^(5/2))/(5*b*d^3) - (2*(A*b^3
 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqr
t[b*c - a*d]])/(b^(7/2)*Sqrt[b*c - a*d])
```

Rubi in Sympy [A] time = 122.665, size = 187, normalized size = 0.99

$$\frac{2D(c+dx)^{\frac{5}{2}}}{5bd^3}+\frac{2(c+dx)^{\frac{3}{2}}(Cbd-Dad-2Dbc)}{3b^2d^3}+\frac{2\sqrt{c+dx}\left(Bb^2d^2-Cabd^2-Cb^2cd+Da^2d^2+Dabcd+Db^2c^2\right)}{b^3d^3}+\frac{2\left(Ab^3-Bab^2+Ca^2b-Da^3\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{7}{2}}\sqrt{ad-bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(1/2),x)
```

```
[Out] 2*D*(c + d*x)**(5/2)/(5*b*d**3) + 2*(c + d*x)**(3/2)*(C*b*d - D*a
*d - 2*D*b*c)/(3*b**2*d**3) + 2*sqrt(c + d*x)*(B*b**2*d**2 - C*a*
b*d**2 - C*b**2*c*d + D*a**2*d**2 + D*a*b*c*d + D*b**2*c**2)/(b**
3*d**3) + 2*(A*b**3 - B*a*b**2 + C*a**2*b - D*a**3)*atan(sqrt(b)*
sqrt(c + d*x)/sqrt(a*d - b*c))/(b**(7/2)*sqrt(a*d - b*c))
```

Mathematica [A] time = 0.295404, size = 161, normalized size = 0.86

$$\frac{2\sqrt{c+dx}\left(15a^2d^2D-5abd(-2cD+3Cd+dDx)+b^2\left(d^2\left(15B+5Cx+3Dx^2\right)+8c^2D-2cd(5C+2Dx)\right)\right)}{15b^3d^3}-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{7/2}\sqrt{bc-ad}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)*Sqrt[c + d*x]),x]
```

```
[Out] (2*Sqrt[c + d*x]*(15*a^2*d^2*D - 5*a*b*d*(3*C*d - 2*c*D + d*D*x)
+ b^2*(8*c^2*D - 2*c*d*(5*C + 2*D*x) + d^2*(15*B + 5*C*x + 3*D*x^
2))))/(15*b^3*d^3) - (2*(A*b^3 - a*(b^2*B - a*b*C + a^2*D))*ArcTa
nh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(7/2)*Sqrt[b*c -
a*d])
```

Maple [B] time = 0.019, size = 338, normalized size = 1.8

$$\frac{2D}{5bd^3}(dx+c)^{\frac{5}{2}}+\frac{2C}{3bd^2}(dx+c)^{\frac{3}{2}}-\frac{2Da}{3b^2d^2}(dx+c)^{\frac{3}{2}}-\frac{4cD}{3bd^3}(dx+c)^{\frac{3}{2}}+2\frac{B\sqrt{dx+c}}{bd}-2\frac{Ca\sqrt{dx+c}}{b^2d}-2\frac{cC\sqrt{dx+c}}{bd^2}+2\frac{Da^2\sqrt{dx+c}}{db^3}+2\frac{acD\sqrt{dx+c}}{b^2d^2}+2\frac{c^2D\sqrt{dx+c}}{bd^3}+2\frac{A}{\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)-2\frac{Ba}{b\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)+2\frac{Ca^2}{b^2\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)-2\frac{Da^3}{b^3\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)/(d*x+c)^(1/2),x)
```

```
[Out] 2/5*D*(d*x+c)^(5/2)/b/d^3+2/3/d^2/b*C*(d*x+c)^(3/2)-2/3/d^2/b^2*D
*(d*x+c)^(3/2)*a-4/3/d^3/b*D*(d*x+c)^(3/2)*c+2/d/b*B*(d*x+c)^(1/2
)-2/d/b^2*C*a*(d*x+c)^(1/2)-2/d^2/b*C*c*(d*x+c)^(1/2)+2/d/b^3*a^2
*D*(d*x+c)^(1/2)+2/d^2/b^2*D*a*c*(d*x+c)^(1/2)+2/d^3/b*D*c^2*(d*x
+c)^(1/2)+2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)
*b)^(1/2))*A-2/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d
-b*c)*b)^(1/2))*B*a+2/b^2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2
)*b/((a*d-b*c)*b)^(1/2))*C*a^2-2/b^3/((a*d-b*c)*b)^(1/2)*arctan((
d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*sqrt(d*x + c)),x, algorithm="maxima
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.228171, size = 1, normalized size = 0.01

$$\left[\frac{15\left(Da^3-Ca^2b+Bab^2-Ab^3\right)d^3\log\left(\frac{\sqrt{b^2c-abd}(bdx+2\,bc-ad)+2\left(b^2c-abd\right)\sqrt{dx+c}}{bx+a}\right)+2\left(3\,Db^2d^2x^2+8\,Db^2c^2+10\left(Dab-Cb^2\right)\right.}{15\sqrt{b^2c-abd}b^3d^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*sqrt(d*x + c)),x, algorithm="fricas
```

```
[Out] [1/15*(15*(D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*d^3*log((sqrt(b^2*c
 - a*b*d)*(b*d*x + 2*b*c - a*d) + 2*(b^2*c - a*b*d)*sqrt(d*x + c)
)/(b*x + a)) + 2*(3*D*b^2*d^2*x^2 + 8*D*b^2*c^2 + 10*(D*a*b - C*b
^2)*c*d + 15*(D*a^2 - C*a*b + B*b^2)*d^2 - (4*D*b^2*c*d + 5*(D*a*
b - C*b^2)*d^2)*x)*sqrt(b^2*c - a*b*d)*sqrt(d*x + c))/(sqrt(b^2*c
 - a*b*d)*b^3*d^3), 2/15*(15*(D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*
d^3*arctan(-(b*c - a*d)/(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))) + (
3*D*b^2*d^2*x^2 + 8*D*b^2*c^2 + 10*(D*a*b - C*b^2)*c*d + 15*(D*a^
2 - C*a*b + B*b^2)*d^2 - (4*D*b^2*c*d + 5*(D*a*b - C*b^2)*d^2)*x)
*sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))/(sqrt(-b^2*c + a*b*d)*b^3*d^
3)]
```

Sympy [A] time = 75.2973, size = 337, normalized size = 1.79

$$\frac{2D(c+dx)^{\frac{5}{2}}}{5bd^3} - \frac{2(c+dx)^{\frac{3}{2}}(-Cbd+Dad+2Dbc)}{3b^2d^3} + \frac{2\left(-Ab^3+Bab^2-Ca^2b+Da^3\right)\left(\begin{cases} \frac{\operatorname{atan}\left(\frac{1}{\sqrt{\frac{b}{ad-bc}}\sqrt{c+dx}}\right)}{\sqrt{\frac{b}{ad-bc}}(ad-bc)} & \text{for}\ \frac{b}{ad-bc}>0 \\ -\frac{\operatorname{acoth}\left(\frac{1}{\sqrt{-\frac{b}{ad-bc}}\sqrt{c+dx}}\right)}{\sqrt{-\frac{b}{ad-bc}}(ad-bc)} & \text{for}\ \frac{1}{c+dx}>-\frac{b}{ad-bc}\wedge\frac{b}{ad-bc}<0 \\ -\frac{\operatorname{atanh}\left(\frac{1}{\sqrt{-\frac{b}{ad-bc}}\sqrt{c+dx}}\right)}{\sqrt{-\frac{b}{ad-bc}}(ad-bc)} & \text{for}\ \frac{b}{ad-bc}<0\wedge\frac{1}{c+dx}<-\frac{b}{ad-bc} \end{cases}\right)}{b^3} + \frac{2\sqrt{c+dx}\left(Bb^2d^2-Cabd^2-Cb^2cd+Da^2d^2+Dabcd+Db^2c^2\right)}{b^3d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(1/2),x)
```

```
[Out] 2*D*(c + d*x)**(5/2)/(5*b*d**3) - 2*(c + d*x)**(3/2)*(-C*b*d + D*
a*d + 2*D*b*c)/(3*b**2*d**3) + 2*(-A*b**3 + B*a*b**2 - C*a**2*b +
 D*a**3)*Piecewise((atan(1/(sqrt(b/(a*d - b*c))*sqrt(c + d*x)))/(
sqrt(b/(a*d - b*c))*(a*d - b*c)), b/(a*d - b*c) > 0), (-acoth(1/(
sqrt(-b/(a*d - b*c))*sqrt(c + d*x)))/(sqrt(-b/(a*d - b*c))*(a*d -
 b*c)), (b/(a*d - b*c) < 0) & (1/(c + d*x) > -b/(a*d - b*c))), (-
atanh(1/(sqrt(-b/(a*d - b*c))*sqrt(c + d*x)))/(sqrt(-b/(a*d - b*c
))*(a*d - b*c)), (b/(a*d - b*c) < 0) & (1/(c + d*x) < -b/(a*d - b
*c))))/b**3 + 2*sqrt(c + d*x)*(B*b**2*d**2 - C*a*b*d**2 - C*b**2*
c*d + D*a**2*d**2 + D*a*b*c*d + D*b**2*c**2)/(b**3*d**3)
```

GIAC/XCAS [A] time = 0.213326, size = 335, normalized size = 1.78

$$-\frac{2\left(Da^3 - Ca^2b + Bab^2 - Ab^3\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right)}{\sqrt{-b^2c+abd}b^3} + \frac{2\left(3(dx+c)^{\frac{5}{2}}Db^4d^{12} - 10(dx+c)^{\frac{3}{2}}Db^4cd^{12} + 15\sqrt{dx+c}Db^4c^2d^{12} - 5(dx+c)^{\frac{3}{2}}Dab^3d^{13} + 5(dx+c)^{\frac{3}{2}}Cb^4d^{13} + 15\sqrt{dx+c}\right.}{15\,b^5d^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*sqrt(d*x + c)),x, algorithm="giac")
```

```
[Out] -2*(D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*arctan(sqrt(d*x + c)*b/sqr
t(-b^2*c + a*b*d))/(sqrt(-b^2*c + a*b*d)*b^3) + 2/15*(3*(d*x + c)
^(5/2)*D*b^4*d^12 - 10*(d*x + c)^(3/2)*D*b^4*c*d^12 + 15*sqrt(d*x
 + c)*D*b^4*c^2*d^12 - 5*(d*x + c)^(3/2)*D*a*b^3*d^13 + 5*(d*x +
c)^(3/2)*C*b^4*d^13 + 15*sqrt(d*x + c)*D*a*b^3*c*d^13 - 15*sqrt(d
*x + c)*C*b^4*c*d^13 + 15*sqrt(d*x + c)*D*a^2*b^2*d^14 - 15*sqrt(
d*x + c)*C*a*b^3*d^14 + 15*sqrt(d*x + c)*B*b^4*d^14)/(b^5*d^15)
```

3.6 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^2\sqrt{c+dx}}\,dx$

Optimal. Leaf size=201

$$-\frac{\sqrt{c+dx}\left(A-\frac{a\left(a^2D-abC+b^2B\right)}{b^3}\right)}{(a+bx)(bc-ad)}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-5a^3dD+3a^2b(2cD+Cd)-ab^2(Bd+4cC)+b^3(2Bc-Ad)\right)}{b^{7/2}(bc-ad)^{3/2}}+\frac{2\sqrt{c+dx}(-2adD-bcD+bCd)}{b^3d^2}+\frac{2D(c+dx)^{3/2}}{3b^2d^2}$$

```
[Out] (2*(b*C*d - b*c*D - 2*a*d*D)*Sqrt[c + d*x])/(b^3*d^2) - ((A - (a*
(b^2*B - a*b*C + a^2*D))/b^3)*Sqrt[c + d*x])/((b*c - a*d)*(a + b*
x)) + (2*D*(c + d*x)^(3/2))/(3*b^2*d^2) - ((b^3*(2*B*c - A*d) - a
*b^2*(4*c*C + B*d) - 5*a^3*d*D + 3*a^2*b*(C*d + 2*c*D))*ArcTanh[(
Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(7/2)*(b*c - a*d)^(3/
2))
```

Rubi [A] time = 1.07579, antiderivative size = 201, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{\sqrt{c+dx}\left(A-\frac{a\left(a^2D-abC+b^2B\right)}{b^3}\right)}{(a+bx)(bc-ad)}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-5a^3dD+3a^2b(2cD+Cd)-ab^2(Bd+4cC)+b^3(2Bc-Ad)\right)}{b^{7/2}(bc-ad)^{3/2}}+\frac{2\sqrt{c+dx}(-2adD-bcD+bCd)}{b^3d^2}+\frac{2D(c+dx)^{3/2}}{3b^2d^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^2*Sqrt[c + d*x]),x]
```

```
[Out] (2*(b*C*d - b*c*D - 2*a*d*D)*Sqrt[c + d*x])/(b^3*d^2) - ((A - (a*
(b^2*B - a*b*C + a^2*D))/b^3)*Sqrt[c + d*x])/((b*c - a*d)*(a + b*
x)) + (2*D*(c + d*x)^(3/2))/(3*b^2*d^2) - ((b^3*(2*B*c - A*d) - a
*b^2*(4*c*C + B*d) - 5*a^3*d*D + 3*a^2*b*(C*d + 2*c*D))*ArcTanh[(
Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(7/2)*(b*c - a*d)^(3/
2))
```

Rubi in Sympy [A] time = 124.728, size = 228, normalized size = 1.13

$$\frac{2D(c+dx)^{\frac{3}{2}}}{3b^2d^2}+\frac{\sqrt{c+dx}\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{b^3(a+bx)(ad-bc)}+\frac{2\sqrt{c+dx}\,(Cbd-2Dad-Dbc)}{b^3d^2}+\frac{d\left(Ab^3-Bab^2+Ca^2b-Da^3\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{7}{2}}(ad-bc)^{\frac{3}{2}}}+\frac{2\left(Bb^2-2Cab+3Da^2\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{7}{2}}\sqrt{ad-bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(1/2),x)
```

```
[Out] 2*D*(c + d*x)**(3/2)/(3*b**2*d**2) + sqrt(c + d*x)*(A*b**3 - B*a*
b**2 + C*a**2*b - D*a**3)/(b**3*(a + b*x)*(a*d - b*c)) + 2*sqrt(c
 + d*x)*(C*b*d - 2*D*a*d - D*b*c)/(b**3*d**2) + d*(A*b**3 - B*a*b
**2 + C*a**2*b - D*a**3)*atan(sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*
c))/(b**(7/2)*(a*d - b*c)**(3/2)) + 2*(B*b**2 - 2*C*a*b + 3*D*a**
2)*atan(sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b**(7/2)*sqrt(a*d
 - b*c))
```

Mathematica [A] time = 0.924342, size = 186, normalized size = 0.93

$$\frac{\sqrt{c+dx}\left(\frac{3\left(a\left(a^2D-abC+b^2B\right)-Ab^3\right)}{(a+bx)(bc-ad)}+\frac{-12adD-4bcD+6bCd}{d^2}+\frac{2bDx}{d}\right)}{3b^3}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-5a^3dD+3a^2b(2cD+Cd)-ab^2(Bd+4cC)+b^3(2Bc-Ad)\right)}{b^{7/2}(bc-ad)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^2*Sqrt[c + d*x]),x]
```

```
[Out] (Sqrt[c + d*x]*((6*b*C*d - 4*b*c*D - 12*a*d*D)/d^2 + (2*b*D*x)/d
+ (3*(-(A*b^3) + a*(b^2*B - a*b*C + a^2*D)))/((b*c - a*d)*(a + b*
x))))/(3*b^3) - ((b^3*(2*B*c - A*d) - a*b^2*(4*c*C + B*d) - 5*a^3
*d*D + 3*a^2*b*(C*d + 2*c*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqr
t[b*c - a*d]])/(b^(7/2)*(b*c - a*d)^(3/2))
```

Maple [B] time = 0.026, size = 566, normalized size = 2.8

$$\frac{2D}{3b^2d^2}(dx+c)^{\frac{3}{2}}+2\frac{C\sqrt{dx+c}}{b^2d}-4\frac{Da\sqrt{dx+c}}{b^3d}-2\frac{cD\sqrt{dx+c}}{b^2d^2}+\frac{Ad}{(ad-bc)(bdx+ad)}\sqrt{dx+c}$$
$$-\frac{Bda}{(ad-bc)b(bdx+ad)}\sqrt{dx+c}+\frac{Cda^2}{b^2(ad-bc)(bdx+ad)}\sqrt{dx+c}$$
$$-\frac{a^3dD}{b^3(ad-bc)(bdx+ad)}\sqrt{dx+c}+\frac{Ad}{ad-bc}\arctan\left(b\sqrt{dx+c}\frac{1}{\sqrt{(ad-bc)b}}\right)\frac{1}{\sqrt{(ad-bc)b}}$$
$$+\frac{Bda}{(ad-bc)b}\arctan\left(b\sqrt{dx+c}\frac{1}{\sqrt{(ad-bc)b}}\right)\frac{1}{\sqrt{(ad-bc)b}}$$
$$-2\frac{Bc}{(ad-bc)\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)$$
$$-3\frac{Cda^2}{b^2(ad-bc)\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)$$
$$+4\frac{Cac}{(ad-bc)b\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)$$
$$+5\frac{a^3dD}{b^3(ad-bc)\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)$$
$$-6\frac{Da^2c}{b^2(ad-bc)\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((D*x^3+C*x^2+B*x+A)/(b*x+a)^2/(d*x+c)^(1/2),x)
```

```
[Out] 2/3*D*(d*x+c)^(3/2)/b^2/d^2+2/d/b^2*C*(d*x+c)^(1/2)-4/d/b^3*D*a*(
d*x+c)^(1/2)-2/d^2/b^2*D*c*(d*x+c)^(1/2)+d/(a*d-b*c)*(d*x+c)^(1/2
)/(b*d*x+a*d)*A-d/b/(a*d-b*c)*(d*x+c)^(1/2)/(b*d*x+a*d)*B*a+d/b^2
/(a*d-b*c)*(d*x+c)^(1/2)/(b*d*x+a*d)*C*a^2-d/b^3/(a*d-b*c)*(d*x+c
)^(1/2)/(b*d*x+a*d)*D*a^3+d/(a*d-b*c)/((a*d-b*c)*b)^(1/2)*arctan(
(d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A+d/b/(a*d-b*c)/((a*d-b*c)*b
)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B*a-2/(a*d-b*
c)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2)
)*B*c-3*d/b^2/(a*d-b*c)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*
b/((a*d-b*c)*b)^(1/2))*C*a^2+4/b/(a*d-b*c)/((a*d-b*c)*b)^(1/2)*ar
ctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c+5*d/b^3/(a*d-b*c)
/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*
a^3*D-6/b^2/(a*d-b*c)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/
((a*d-b*c)*b)^(1/2))*D*a^2*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*sqrt(d*x + c)),x, algorithm="maxi
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250427, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*sqrt(d*x + c)),x, algorithm="fric
```

```
[Out] [-1/6*(2*(4*D*a*b^2*c^2 + 2*(4*D*a^2*b - 3*C*a*b^2)*c*d - 3*(5*D*
a^3 - 3*C*a^2*b + B*a*b^2 - A*b^3)*d^2 - 2*(D*b^3*c*d - D*a*b^2*d
^2)*x^2 + 2*(2*D*b^3*c^2 + 3*(D*a*b^2 - C*b^3)*c*d - (5*D*a^2*b -
 3*C*a*b^2)*d^2)*x)*sqrt(b^2*c - a*b*d)*sqrt(d*x + c) - 3*(2*(3*D
*a^3*b - 2*C*a^2*b^2 + B*a*b^3)*c*d^2 - (5*D*a^4 - 3*C*a^3*b + B*
a^2*b^2 + A*a*b^3)*d^3 + (2*(3*D*a^2*b^2 - 2*C*a*b^3 + B*b^4)*c*d
^2 - (5*D*a^3*b - 3*C*a^2*b^2 + B*a*b^3 + A*b^4)*d^3)*x)*log((sqr
t(b^2*c - a*b*d)*(b*d*x + 2*b*c - a*d) - 2*(b^2*c - a*b*d)*sqrt(d
*x + c))/(b*x + a)))/((a*b^4*c*d^2 - a^2*b^3*d^3 + (b^5*c*d^2 - a
*b^4*d^3)*x)*sqrt(b^2*c - a*b*d)), -1/3*((4*D*a*b^2*c^2 + 2*(4*D*
a^2*b - 3*C*a*b^2)*c*d - 3*(5*D*a^3 - 3*C*a^2*b + B*a*b^2 - A*b^3
)*d^2 - 2*(D*b^3*c*d - D*a*b^2*d^2)*x^2 + 2*(2*D*b^3*c^2 + 3*(D*a
*b^2 - C*b^3)*c*d - (5*D*a^2*b - 3*C*a*b^2)*d^2)*x)*sqrt(-b^2*c +
 a*b*d)*sqrt(d*x + c) + 3*(2*(3*D*a^3*b - 2*C*a^2*b^2 + B*a*b^3)*
c*d^2 - (5*D*a^4 - 3*C*a^3*b + B*a^2*b^2 + A*a*b^3)*d^3 + (2*(3*D
*a^2*b^2 - 2*C*a*b^3 + B*b^4)*c*d^2 - (5*D*a^3*b - 3*C*a^2*b^2 +
B*a*b^3 + A*b^4)*d^3)*x)*arctan(-(b*c - a*d)/(sqrt(-b^2*c + a*b*d
)*sqrt(d*x + c))))/((a*b^4*c*d^2 - a^2*b^3*d^3 + (b^5*c*d^2 - a*b
^4*d^3)*x)*sqrt(-b^2*c + a*b*d))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.213616, size = 366, normalized size = 1.82

$$\frac{\left(6\,Da^2bc - 4\,Cab^2c + 2\,Bb^3c - 5\,Da^3d + 3\,Ca^2bd - Bab^2d - Ab^3d\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right)}{(b^4c - ab^3d)\sqrt{-b^2c+abd}} + \frac{\sqrt{dx+c}Da^3d - \sqrt{dx+c}Ca^2bd + \sqrt{dx+c}Bab^2d - \sqrt{dx+c}Ab^3d}{(b^4c - ab^3d)((dx+c)b - bc + ad)} + \frac{2\left((dx+c)^{\frac{3}{2}}Db^4d^4 - 3\,\sqrt{dx+c}Db^4cd^4 - 6\,\sqrt{dx+c}Dab^3d^5 + 3\,\sqrt{dx+c}Cb^4d^5\right)}{3\,b^6d^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*sqrt(d*x + c)),x, algorithm="giac
```

```
[Out] (6*D*a^2*b*c - 4*C*a*b^2*c + 2*B*b^3*c - 5*D*a^3*d + 3*C*a^2*b*d
- B*a*b^2*d - A*b^3*d)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c + a*b*d
))/((b^4*c - a*b^3*d)*sqrt(-b^2*c + a*b*d)) + (sqrt(d*x + c)*D*a^
3*d - sqrt(d*x + c)*C*a^2*b*d + sqrt(d*x + c)*B*a*b^2*d - sqrt(d*
x + c)*A*b^3*d)/((b^4*c - a*b^3*d)*((d*x + c)*b - b*c + a*d)) + 2
/3*((d*x + c)^(3/2)*D*b^4*d^4 - 3*sqrt(d*x + c)*D*b^4*c*d^4 - 6*s
qrt(d*x + c)*D*a*b^3*d^5 + 3*sqrt(d*x + c)*C*b^4*d^5)/(b^6*d^6)
```

3.7 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^3\sqrt{c+dx}}\,dx$

Optimal. Leaf size=279

$$-\frac{\sqrt{c+dx}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{2b^3(a+bx)^2(bc-ad)}-\frac{\sqrt{c+dx}\left(-9a^3dD+a^2b(12cD+5Cd)-ab^2(Bd+8cC)+b^3(4Bc-3Ad)\right)}{4b^3(a+bx)(bc-ad)^2}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-15a^3d^2D+3a^2bd(12cD+Cd)-ab^2\left(-Bd^2+24c^2D+8cCd\right)+b^3\left(3Ad^2-4Bcd+8c^2C\right)\right)}{4b^{7/2}(bc-ad)^{5/2}}+\frac{2D\sqrt{c+dx}}{b^3d}$$

```
[Out] (2*D*Sqrt[c + d*x])/(b^3*d) - ((A*b^3 - a*(b^2*B - a*b*C + a^2*D)
)*Sqrt[c + d*x])/(2*b^3*(b*c - a*d)*(a + b*x)^2) - ((b^3*(4*B*c -
 3*A*d) - a*b^2*(8*c*C + B*d) - 9*a^3*d*D + a^2*b*(5*C*d + 12*c*D
))*Sqrt[c + d*x])/(4*b^3*(b*c - a*d)^2*(a + b*x)) - ((b^3*(8*c^2*
C - 4*B*c*d + 3*A*d^2) - 15*a^3*d^2*D + 3*a^2*b*d*(C*d + 12*c*D)
- a*b^2*(8*c*C*d - B*d^2 + 24*c^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d
*x])/Sqrt[b*c - a*d]])/(4*b^(7/2)*(b*c - a*d)^(5/2))
```

Rubi [A] time = 1.43404, antiderivative size = 279, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.156$

$$-\frac{\sqrt{c+dx}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{2b^3(a+bx)^2(bc-ad)}-\frac{\sqrt{c+dx}\left(-9a^3dD+a^2b(12cD+5Cd)-ab^2(Bd+8cC)+b^3(4Bc-3Ad)\right)}{4b^3(a+bx)(bc-ad)^2}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-15a^3d^2D+3a^2bd(12cD+Cd)-ab^2\left(-Bd^2+24c^2D+8cCd\right)+b^3\left(3Ad^2-4Bcd+8c^2C\right)\right)}{4b^{7/2}(bc-ad)^{5/2}}+\frac{2D\sqrt{c+dx}}{b^3d}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^3*Sqrt[c + d*x]),x]
```


```
[Out] (2*D*Sqrt[c + d*x])/(b^3*d) - ((A*b^3 - a*(b^2*B - a*b*C + a^2*D)
)*Sqrt[c + d*x])/(2*b^3*(b*c - a*d)*(a + b*x)^2) - ((b^3*(4*B*c -
 3*A*d) - a*b^2*(8*c*C + B*d) - 9*a^3*d*D + a^2*b*(5*C*d + 12*c*D
))*Sqrt[c + d*x])/(4*b^3*(b*c - a*d)^2*(a + b*x)) - ((b^3*(8*c^2*
C - 4*B*c*d + 3*A*d^2) - 15*a^3*d^2*D + 3*a^2*b*d*(C*d + 12*c*D)
- a*b^2*(8*c*C*d - B*d^2 + 24*c^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d
```

```
*x])/Sqrt[b*c - a*d]])/(4*b^(7/2)*(b*c - a*d)^(5/2))
```

Rubi in Sympy [A] time = 148.874, size = 347, normalized size = 1.24

$$\frac{2D\sqrt{c+dx}}{b^3d}+\frac{3d\sqrt{c+dx}\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{4b^3\left(a+bx\right)\left(ad-bc\right)^2}+\frac{\sqrt{c+dx}\left(Bb^2-2Cab+3Da^2\right)}{b^3\left(a+bx\right)\left(ad-bc\right)}+\frac{\sqrt{c+dx}\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{2b^3\left(a+bx\right)^2\left(ad-bc\right)}+\frac{3d^2\left(Ab^3-Bab^2+Ca^2b-Da^3\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{4b^{\frac{7}{2}}\left(ad-bc\right)^{\frac{5}{2}}}+\frac{d\left(Bb^2-2Cab+3Da^2\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{7}{2}}\left(ad-bc\right)^{\frac{3}{2}}}+\frac{2\left(Cb-3Da\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{7}{2}}\sqrt{ad-bc}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(1/2),x)
```

```
[Out] 2*D*sqrt(c + d*x)/(b**3*d) + 3*d*sqrt(c + d*x)*(A*b**3 - B*a*b**2
 + C*a**2*b - D*a**3)/(4*b**3*(a + b*x)*(a*d - b*c)**2) + sqrt(c
+ d*x)*(B*b**2 - 2*C*a*b + 3*D*a**2)/(b**3*(a + b*x)*(a*d - b*c))
 + sqrt(c + d*x)*(A*b**3 - B*a*b**2 + C*a**2*b - D*a**3)/(2*b**3*
(a + b*x)**2*(a*d - b*c)) + 3*d**2*(A*b**3 - B*a*b**2 + C*a**2*b
- D*a**3)*atan(sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(4*b**(7/2)
*(a*d - b*c)**(5/2)) + d*(B*b**2 - 2*C*a*b + 3*D*a**2)*atan(sqrt(
b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b**(7/2)*(a*d - b*c)**(3/2)) +
 2*(C*b - 3*D*a)*atan(sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b**
(7/2)*sqrt(a*d - b*c))
```

Mathematica [A] time = 1.61323, size = 253, normalized size = 0.91

$$\frac{\sqrt{c+dx}\left(\frac{2\left(a\left(a^2D-abC+b^2B\right)-Ab^3\right)}{(a+bx)^2(bc-ad)}+\frac{9a^3dD-a^2b(12cD+5Cd)+ab^2(Bd+8cC)+b^3(3Ad-4Bc)}{(a+bx)(bc-ad)^2}+\frac{8D}{d}\right)}{4b^3}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-15a^3d^2D+3a^2bd(12cD+Cd)+ab^2\left(Bd^2-24c^2D-8cCd\right)+b^3\left(3Ad^2-4Bcd+8c^2C\right)\right)}{4b^{7/2}(bc-ad)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^3*Sqrt[c + d*x]),x]
```

```
[Out] (Sqrt[c + d*x]*((8*D)/d + (2*(-(A*b^3) + a*(b^2*B - a*b*C + a^2*D
)))/((b*c - a*d)*(a + b*x)^2) + (b^3*(-4*B*c + 3*A*d) + a*b^2*(8*
c*C + B*d) + 9*a^3*d*D - a^2*b*(5*C*d + 12*c*D))/((b*c - a*d)^2*(
a + b*x))))/(4*b^3) - ((b^3*(8*c^2*C - 4*B*c*d + 3*A*d^2) - 15*a^
3*d^2*D + 3*a^2*b*d*(C*d + 12*c*D) + a*b^2*(-8*c*C*d + B*d^2 - 24
```

```
*c^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(4*b^(
7/2)*(b*c - a*d)^(5/2))
```

Maple [B] time = 0.033, size = 1207, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((D*x^3+C*x^2+B*x+A)/(b*x+a)^3/(d*x+c)^(1/2),x)
```

```
[Out] 2*D*(d*x+c)^(1/2)/b^3/d+3/4*d^2*b/(b*d*x+a*d)^2/(a^2*d^2-2*a*b*c*
d+b^2*c^2)*(d*x+c)^(3/2)*A+1/4*d^2/(b*d*x+a*d)^2/(a^2*d^2-2*a*b*c
*d+b^2*c^2)*(d*x+c)^(3/2)*B*a-d*b/(b*d*x+a*d)^2/(a^2*d^2-2*a*b*c*
d+b^2*c^2)*(d*x+c)^(3/2)*B*c-5/4*d^2/b/(b*d*x+a*d)^2/(a^2*d^2-2*a
*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*C*a^2+2*d/(b*d*x+a*d)^2/(a^2*d^2-2*
a*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*C*a*c+9/4*d^2/b^2/(b*d*x+a*d)^2/(a
^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*a^3*D-3*d/b/(b*d*x+a*d)^2
/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*D*a^2*c+5/4*d^2/(b*d*x
+a*d)^2/(a*d-b*c)*(d*x+c)^(1/2)*A-1/4*d^2/b/(b*d*x+a*d)^2/(a*d-b*
c)*(d*x+c)^(1/2)*B*a-d/(b*d*x+a*d)^2/(a*d-b*c)*(d*x+c)^(1/2)*B*c-
3/4*d^2/b^2/(b*d*x+a*d)^2/(a*d-b*c)*(d*x+c)^(1/2)*C*a^2+2*d/b/(b*
d*x+a*d)^2/(a*d-b*c)*(d*x+c)^(1/2)*C*a*c+7/4*d^2/b^3/(b*d*x+a*d)^
2/(a*d-b*c)*(d*x+c)^(1/2)*a^3*D-3*d/b^2/(b*d*x+a*d)^2/(a*d-b*c)*(
d*x+c)^(1/2)*D*a^2*c+3/4*d^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/((a*d-b*
c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A+1/4*d^2
/b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)
^(1/2)*b/((a*d-b*c)*b)^(1/2))*B*a-d/(a^2*d^2-2*a*b*c*d+b^2*c^2)/(
(a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B*
c+3/4*d^2/b^2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/((a*d-b*c)*b)^(1/2)*arc
tan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a^2*C-2*d/b/(a^2*d^2-2*a
*b*c*d+b^2*c^2)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-
b*c)*b)^(1/2))*C*a*c+2/(a^2*d^2-2*a*b*c*d+b^2*c^2)/((a*d-b*c)*b)^
(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*c^2-15/4*d^2/
b^3/(a^2*d^2-2*a*b*c*d+b^2*c^2)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c
)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a^3*D+9*d/b^2/(a^2*d^2-2*a*b*c*d+b
^2*c^2)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^
(1/2))*D*a^2*c-6/b/(a^2*d^2-2*a*b*c*d+b^2*c^2)/((a*d-b*c)*b)^(1/2
)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a*c^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*sqrt(d*x + c)),x, algorithm="maxi
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.243156, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*sqrt(d*x + c)),x, algorithm="fric
```

```
[Out] [1/8*(2*(8*D*a^2*b^2*c^2 - 2*(13*D*a^3*b - 3*C*a^2*b^2 + B*a*b^3
+ A*b^4)*c*d + (15*D*a^4 - 3*C*a^3*b - B*a^2*b^2 + 5*A*a*b^3)*d^2
 + 8*(D*b^4*c^2 - 2*D*a*b^3*c*d + D*a^2*b^2*d^2)*x^2 + (16*D*a*b^
3*c^2 - 4*(11*D*a^2*b^2 - 2*C*a*b^3 + B*b^4)*c*d + (25*D*a^3*b -
5*C*a^2*b^2 + B*a*b^3 + 3*A*b^4)*d^2)*x)*sqrt(b^2*c - a*b*d)*sqrt
(d*x + c) - (8*(3*D*a^3*b^2 - C*a^2*b^3)*c^2*d - 4*(9*D*a^4*b - 2
*C*a^3*b^2 - B*a^2*b^3)*c*d^2 + (15*D*a^5 - 3*C*a^4*b - B*a^3*b^2
 - 3*A*a^2*b^3)*d^3 + (8*(3*D*a*b^4 - C*b^5)*c^2*d - 4*(9*D*a^2*b
^3 - 2*C*a*b^4 - B*b^5)*c*d^2 + (15*D*a^3*b^2 - 3*C*a^2*b^3 - B*a
*b^4 - 3*A*b^5)*d^3)*x^2 + 2*(8*(3*D*a^2*b^3 - C*a*b^4)*c^2*d - 4
*(9*D*a^3*b^2 - 2*C*a^2*b^3 - B*a*b^4)*c*d^2 + (15*D*a^4*b - 3*C*
a^3*b^2 - B*a^2*b^3 - 3*A*a*b^4)*d^3)*x)*log((sqrt(b^2*c - a*b*d)
*(b*d*x + 2*b*c - a*d) - 2*(b^2*c - a*b*d)*sqrt(d*x + c))/(b*x +
a)))/((a^2*b^5*c^2*d - 2*a^3*b^4*c*d^2 + a^4*b^3*d^3 + (b^7*c^2*d
 - 2*a*b^6*c*d^2 + a^2*b^5*d^3)*x^2 + 2*(a*b^6*c^2*d - 2*a^2*b^5*
c*d^2 + a^3*b^4*d^3)*x)*sqrt(b^2*c - a*b*d)), 1/4*((8*D*a^2*b^2*c
^2 - 2*(13*D*a^3*b - 3*C*a^2*b^2 + B*a*b^3 + A*b^4)*c*d + (15*D*a
^4 - 3*C*a^3*b - B*a^2*b^2 + 5*A*a*b^3)*d^2 + 8*(D*b^4*c^2 - 2*D*
a*b^3*c*d + D*a^2*b^2*d^2)*x^2 + (16*D*a*b^3*c^2 - 4*(11*D*a^2*b^
2 - 2*C*a*b^3 + B*b^4)*c*d + (25*D*a^3*b - 5*C*a^2*b^2 + B*a*b^3
+ 3*A*b^4)*d^2)*x)*sqrt(-b^2*c + a*b*d)*sqrt(d*x + c) + (8*(3*D*a
^3*b^2 - C*a^2*b^3)*c^2*d - 4*(9*D*a^4*b - 2*C*a^3*b^2 - B*a^2*b^
3)*c*d^2 + (15*D*a^5 - 3*C*a^4*b - B*a^3*b^2 - 3*A*a^2*b^3)*d^3 +
 (8*(3*D*a*b^4 - C*b^5)*c^2*d - 4*(9*D*a^2*b^3 - 2*C*a*b^4 - B*b^
5)*c*d^2 + (15*D*a^3*b^2 - 3*C*a^2*b^3 - B*a*b^4 - 3*A*b^5)*d^3)*
x^2 + 2*(8*(3*D*a^2*b^3 - C*a*b^4)*c^2*d - 4*(9*D*a^3*b^2 - 2*C*a
^2*b^3 - B*a*b^4)*c*d^2 + (15*D*a^4*b - 3*C*a^3*b^2 - B*a^2*b^3 -
 3*A*a*b^4)*d^3)*x)*arctan(-(b*c - a*d)/(sqrt(-b^2*c + a*b*d)*sqr
t(d*x + c))))/((a^2*b^5*c^2*d - 2*a^3*b^4*c*d^2 + a^4*b^3*d^3 + (
b^7*c^2*d - 2*a*b^6*c*d^2 + a^2*b^5*d^3)*x^2 + 2*(a*b^6*c^2*d - 2
*a^2*b^5*c*d^2 + a^3*b^4*d^3)*x)*sqrt(-b^2*c + a*b*d))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.22322, size = 714, normalized size = 2.56

$$-\frac{\left(24\,Dab^2c^2 - 8\,Cb^3c^2 - 36\,Da^2bcd + 8\,Cab^2cd + 4\,Bb^3cd + 15\,Da^3d^2 - 3\,Ca^2bd^2 - Bab^2d^2 - 3\,Ab^3d^2\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right)}{4\,(b^5c^2 - 2\,ab^4cd + a^2b^3d^2)\sqrt{-b^2c+abd}}$$

$$-\frac{12\,(dx+c)^{\frac{3}{2}}Da^2b^2cd - 8\,(dx+c)^{\frac{3}{2}}Cab^3cd + 4\,(dx+c)^{\frac{3}{2}}Bb^4cd - 12\,\sqrt{dx+c}Da^2b^2c^2d + 8\,\sqrt{dx+c}Cab^3c^2d - 4\,\sqrt{dx+c}Bb^4}{}$$

$$+\frac{2\,\sqrt{dx+c}D}{b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*sqrt(d*x + c)),x, algorithm="giac
```

```
[Out] -1/4*(24*D*a*b^2*c^2 - 8*C*b^3*c^2 - 36*D*a^2*b*c*d + 8*C*a*b^2*c
*d + 4*B*b^3*c*d + 15*D*a^3*d^2 - 3*C*a^2*b*d^2 - B*a*b^2*d^2 - 3
*A*b^3*d^2)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c + a*b*d))/((b^5*c^
2 - 2*a*b^4*c*d + a^2*b^3*d^2)*sqrt(-b^2*c + a*b*d)) - 1/4*(12*(d
*x + c)^(3/2)*D*a^2*b^2*c*d - 8*(d*x + c)^(3/2)*C*a*b^3*c*d + 4*(
d*x + c)^(3/2)*B*b^4*c*d - 12*sqrt(d*x + c)*D*a^2*b^2*c^2*d + 8*s
qrt(d*x + c)*C*a*b^3*c^2*d - 4*sqrt(d*x + c)*B*b^4*c^2*d - 9*(d*x
 + c)^(3/2)*D*a^3*b*d^2 + 5*(d*x + c)^(3/2)*C*a^2*b^2*d^2 - (d*x
+ c)^(3/2)*B*a*b^3*d^2 - 3*(d*x + c)^(3/2)*A*b^4*d^2 + 19*sqrt(d*
x + c)*D*a^3*b*c*d^2 - 11*sqrt(d*x + c)*C*a^2*b^2*c*d^2 + 3*sqrt(
d*x + c)*B*a*b^3*c*d^2 + 5*sqrt(d*x + c)*A*b^4*c*d^2 - 7*sqrt(d*x
 + c)*D*a^4*d^3 + 3*sqrt(d*x + c)*C*a^3*b*d^3 + sqrt(d*x + c)*B*a
^2*b^2*d^3 - 5*sqrt(d*x + c)*A*a*b^3*d^3)/((b^5*c^2 - 2*a*b^4*c*d
 + a^2*b^3*d^2)*((d*x + c)*b - b*c + a*d)^2) + 2*sqrt(d*x + c)*D/
(b^3*d)
```

3.8 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^4\sqrt{c+dx}}\,dx$

Optimal. Leaf size=375

$$-\frac{\sqrt{c+dx}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{3b^3(a+bx)^3(bc-ad)}-\frac{\sqrt{c+dx}\left(-11a^3d^2D+a^2bd(30cD+Cd)-ab^2\left(-Bd^2+24c^2D+4cCd\right)+b^3\left(5Ad^2-6Bcd+8c^2C\right)\right)}{8b^3(a+bx)(bc-ad)^3}-\frac{\sqrt{c+dx}\left(-13a^3dD+a^2b(18cD+7Cd)-ab^2(Bd+12cC)+b^3(6Bc-5Ad)\right)}{12b^3(a+bx)^2(bc-ad)^2}+\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(5a^3d^3D+a^2bd^2(Cd-18cD)-ab^2d\left(-Bd^2-24c^2D+4cCd\right)+b^3\left(5Ad^3-6Bcd^2-16c^3D+8c^2Cd\right)\right)}{8b^{7/2}(bc-ad)^{7/2}}$$

```
[Out] -((A*b^3 - a*(b^2*B - a*b*C + a^2*D))*Sqrt[c + d*x])/(3*b^3*(b*c
- a*d)*(a + b*x)^3) - ((b^3*(6*B*c - 5*A*d) - a*b^2*(12*c*C + B*d
) - 13*a^3*d*D + a^2*b*(7*C*d + 18*c*D))*Sqrt[c + d*x])/(12*b^3*(
b*c - a*d)^2*(a + b*x)^2) - ((b^3*(8*c^2*C - 6*B*c*d + 5*A*d^2) -
 11*a^3*d^2*D + a^2*b*d*(C*d + 30*c*D) - a*b^2*(4*c*C*d - B*d^2 +
 24*c^2*D))*Sqrt[c + d*x])/(8*b^3*(b*c - a*d)^3*(a + b*x)) + ((5*
a^3*d^3*D + a^2*b*d^2*(C*d - 18*c*D) - a*b^2*d*(4*c*C*d - B*d^2 -
 24*c^2*D) + b^3*(8*c^2*C*d - 6*B*c*d^2 + 5*A*d^3 - 16*c^3*D))*Ar
cTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(8*b^(7/2)*(b*c -
 a*d)^(7/2))
```

Rubi [A] time = 1.86738, antiderivative size = 375, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.156

$$-\frac{\sqrt{c+dx}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{3b^3(a+bx)^3(bc-ad)}-\frac{\sqrt{c+dx}\left(-11a^3d^2D+a^2bd(30cD+Cd)-ab^2\left(-Bd^2+24c^2D+4cCd\right)+b^3\left(5Ad^2-6Bcd+8c^2C\right)\right)}{8b^3(a+bx)(bc-ad)^3}-\frac{\sqrt{c+dx}\left(-13a^3dD+a^2b(18cD+7Cd)-ab^2(Bd+12cC)+b^3(6Bc-5Ad)\right)}{12b^3(a+bx)^2(bc-ad)^2}+\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(5a^3d^3D+a^2bd^2(Cd-18cD)-ab^2d\left(-Bd^2-24c^2D+4cCd\right)+b^3\left(5Ad^3-6Bcd^2-16c^3D+8c^2Cd\right)\right)}{8b^{7/2}(bc-ad)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^4*Sqrt[c + d*x]),x]
```

```
[Out] -((A*b^3 - a*(b^2*B - a*b*C + a^2*D))*Sqrt[c + d*x])/(3*b^3*(b*c
- a*d)*(a + b*x)^3) - ((b^3*(6*B*c - 5*A*d) - a*b^2*(12*c*C + B*d
) - 13*a^3*d*D + a^2*b*(7*C*d + 18*c*D))*Sqrt[c + d*x])/(12*b^3*(
```

```
b*c - a*d)^2*(a + b*x)^2) - ((b^3*(8*c^2*C - 6*B*c*d + 5*A*d^2) -
 11*a^3*d^2*D + a^2*b*d*(C*d + 30*c*D) - a*b^2*(4*c*C*d - B*d^2 +
 24*c^2*D))*Sqrt[c + d*x])/(8*b^3*(b*c - a*d)^3*(a + b*x)) + ((5*
a^3*d^3*D + a^2*b*d^2*(C*d - 18*c*D) - a*b^2*d*(4*c*C*d - B*d^2 -
 24*c^2*D) + b^3*(8*c^2*C*d - 6*B*c*d^2 + 5*A*d^3 - 16*c^3*D))*Ar
cTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(8*b^(7/2)*(b*c -
 a*d)^(7/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**4/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.63059, size = 344, normalized size = 0.92

$$-\frac{\sqrt{c+dx}\left(8(bc-ad)^2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)+3(a+bx)^2\left(-11a^3d^2D+a^2bd(30cD+Cd)+ab^2\left(Bd^2-24c^2D-4cC\right.\right.\right.}{24b^3(a+bx}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-5a^3d^3D+a^2bd^2(18cD-Cd)-ab^2d\left(Bd^2+24c^2D-4cCd\right)+b^3\left(-5Ad^3+6Bcd^2+16c^3D-8c^2Cd\right)\right.}{8b^{7/2}(bc-ad)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^4*Sqrt[c + d*x]),x]
```

```
[Out] -(Sqrt[c + d*x]*(8*(b*c - a*d)^2*(A*b^3 - a*(b^2*B - a*b*C + a^2*
D)) + 2*(b*c - a*d)*(b^3*(6*B*c - 5*A*d) - a*b^2*(12*c*C + B*d) -
 13*a^3*d*D + a^2*b*(7*C*d + 18*c*D))*(a + b*x) + 3*(b^3*(8*c^2*C
 - 6*B*c*d + 5*A*d^2) - 11*a^3*d^2*D + a^2*b*d*(C*d + 30*c*D) + a
*b^2*(-4*c*C*d + B*d^2 - 24*c^2*D))*(a + b*x)^2))/(24*b^3*(b*c -
a*d)^3*(a + b*x)^3) - ((-5*a^3*d^3*D + a^2*b*d^2*(-(C*d) + 18*c*D
) - a*b^2*d*(-4*c*C*d + B*d^2 + 24*c^2*D) + b^3*(-8*c^2*C*d + 6*B
*c*d^2 - 5*A*d^3 + 16*c^3*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqr
t[b*c - a*d]])/(8*b^(7/2)*(b*c - a*d)^(7/2))
```

Maple [B] time = 0.036, size = 1186, normalized size = 3.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)^4/(d*x+c)^(1/2),x)
```

```
[Out] 2*(1/16*d*(5*A*b^3*d^2+B*a*b^2*d^2-6*B*b^3*c*d+C*a^2*b*d^2-4*C*a*
b^2*c*d+8*C*b^3*c^2-11*D*a^3*d^2+30*D*a^2*b*c*d-24*D*a*b^2*c^2)/b
/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(d*x+c)^(5/2)+1/6*
(5*A*b^3*d^2+B*a*b^2*d^2-6*B*b^3*c*d-C*a^2*b*d^2+6*C*b^3*c^2-5*D*
a^3*d^2+18*D*a^2*b*c*d-18*D*a*b^2*c^2)/b^2*d/(a^2*d^2-2*a*b*c*d+b
^2*c^2)*(d*x+c)^(3/2)+1/16*(11*A*b^3*d^2-B*a*b^2*d^2-10*B*b^3*c*d
-C*a^2*b*d^2+4*C*a*b^2*c*d+8*C*b^3*c^2-5*D*a^3*d^2+18*D*a^2*b*c*d
-24*D*a*b^2*c^2)/b^3*d/(a*d-b*c)*(d*x+c)^(1/2))/((d*x+c)*b+a*d-b*
c)^3+5/8/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/((a*d-b*c)
*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A*d^3+1/8/b
/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2
)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a*B*d^3-3/4/(a^3*d^
3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2)*arctan
((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B*c*d^2+1/8/b^2/(a^3*d^3-3*
a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2)*arctan((d*
x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a^2*C*d^3-1/2/b/(a^3*d^3-3*a^2*
b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)
^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c*d^2+1/(a^3*d^3-3*a^2*b*c*d^2+
3*a*b^2*c^2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b
/((a*d-b*c)*b)^(1/2))*C*c^2*d+5/8/b^3/(a^3*d^3-3*a^2*b*c*d^2+3*a*
b^2*c^2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a
*d-b*c)*b)^(1/2))*a^3*d^3*D-9/4/b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^
2*c^2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d
-b*c)*b)^(1/2))*D*a^2*c*d^2+3/b/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^
2*d-b^3*c^3)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c
)*b)^(1/2))*D*a*c^2*d-2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*
c^3)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/
2))*D*c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^4*sqrt(d*x + c)),x, algorithm="maxi
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250885, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^4*sqrt(d*x + c)),x, algorithm="fric
```

```
[Out] [1/48*(2*sqrt(b^2*c - a*b*d)*(4*(11*D*a^3*b^2 - 2*C*a^2*b^3 - B*a
*b^4 - 2*A*b^5)*c^2 - 2*(22*D*a^4*b + 5*C*a^3*b^2 - 8*B*a^2*b^3 -
 13*A*a*b^4)*c*d + 3*(5*D*a^5 + C*a^4*b + B*a^3*b^2 - 11*A*a^2*b^
3)*d^2 + 3*(8*(3*D*a*b^4 - C*b^5)*c^2 - 2*(15*D*a^2*b^3 - 2*C*a*b
^4 - 3*B*b^5)*c*d + (11*D*a^3*b^2 - C*a^2*b^3 - B*a*b^4 - 5*A*b^5
)*d^2)*x^2 + 2*(6*(9*D*a^2*b^3 - 2*C*a*b^4 - B*b^5)*c^2 - (59*D*a
^3*b^2 + 7*C*a^2*b^3 - 25*B*a*b^4 - 5*A*b^5)*c*d + 4*(5*D*a^4*b +
 C*a^3*b^2 - B*a^2*b^3 - 5*A*a*b^4)*d^2)*x)*sqrt(d*x + c) + 3*(16
*D*a^3*b^3*c^3 - 8*(3*D*a^4*b^2 + C*a^3*b^3)*c^2*d + 2*(9*D*a^5*b
 + 2*C*a^4*b^2 + 3*B*a^3*b^3)*c*d^2 - (5*D*a^6 + C*a^5*b + B*a^4*
b^2 + 5*A*a^3*b^3)*d^3 + (16*D*b^6*c^3 - 8*(3*D*a*b^5 + C*b^6)*c^
2*d + 2*(9*D*a^2*b^4 + 2*C*a*b^5 + 3*B*b^6)*c*d^2 - (5*D*a^3*b^3
+ C*a^2*b^4 + B*a*b^5 + 5*A*b^6)*d^3)*x^3 + 3*(16*D*a*b^5*c^3 - 8
*(3*D*a^2*b^4 + C*a*b^5)*c^2*d + 2*(9*D*a^3*b^3 + 2*C*a^2*b^4 + 3
*B*a*b^5)*c*d^2 - (5*D*a^4*b^2 + C*a^3*b^3 + B*a^2*b^4 + 5*A*a*b^
5)*d^3)*x^2 + 3*(16*D*a^2*b^4*c^3 - 8*(3*D*a^3*b^3 + C*a^2*b^4)*c
^2*d + 2*(9*D*a^4*b^2 + 2*C*a^3*b^3 + 3*B*a^2*b^4)*c*d^2 - (5*D*a
^5*b + C*a^4*b^2 + B*a^3*b^3 + 5*A*a^2*b^4)*d^3)*x)*log((sqrt(b^2
*c - a*b*d)*(b*d*x + 2*b*c - a*d) - 2*(b^2*c - a*b*d)*sqrt(d*x +
c))/(b*x + a)))/((a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2
 - a^6*b^3*d^3 + (b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3
*b^6*d^3)*x^3 + 3*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2
- a^4*b^5*d^3)*x^2 + 3*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5
*c*d^2 - a^5*b^4*d^3)*x)*sqrt(b^2*c - a*b*d)), 1/24*(sqrt(-b^2*c
+ a*b*d)*(4*(11*D*a^3*b^2 - 2*C*a^2*b^3 - B*a*b^4 - 2*A*b^5)*c^2
- 2*(22*D*a^4*b + 5*C*a^3*b^2 - 8*B*a^2*b^3 - 13*A*a*b^4)*c*d + 3
*(5*D*a^5 + C*a^4*b + B*a^3*b^2 - 11*A*a^2*b^3)*d^2 + 3*(8*(3*D*a
*b^4 - C*b^5)*c^2 - 2*(15*D*a^2*b^3 - 2*C*a*b^4 - 3*B*b^5)*c*d +
(11*D*a^3*b^2 - C*a^2*b^3 - B*a*b^4 - 5*A*b^5)*d^2)*x^2 + 2*(6*(9
*D*a^2*b^3 - 2*C*a*b^4 - B*b^5)*c^2 - (59*D*a^3*b^2 + 7*C*a^2*b^3
 - 25*B*a*b^4 - 5*A*b^5)*c*d + 4*(5*D*a^4*b + C*a^3*b^2 - B*a^2*b
^3 - 5*A*a*b^4)*d^2)*x)*sqrt(d*x + c) - 3*(16*D*a^3*b^3*c^3 - 8*(
3*D*a^4*b^2 + C*a^3*b^3)*c^2*d + 2*(9*D*a^5*b + 2*C*a^4*b^2 + 3*B
*a^3*b^3)*c*d^2 - (5*D*a^6 + C*a^5*b + B*a^4*b^2 + 5*A*a^3*b^3)*d
^3 + (16*D*b^6*c^3 - 8*(3*D*a*b^5 + C*b^6)*c^2*d + 2*(9*D*a^2*b^4
 + 2*C*a*b^5 + 3*B*b^6)*c*d^2 - (5*D*a^3*b^3 + C*a^2*b^4 + B*a*b^
5 + 5*A*b^6)*d^3)*x^3 + 3*(16*D*a*b^5*c^3 - 8*(3*D*a^2*b^4 + C*a*
b^5)*c^2*d + 2*(9*D*a^3*b^3 + 2*C*a^2*b^4 + 3*B*a*b^5)*c*d^2 - (5
*D*a^4*b^2 + C*a^3*b^3 + B*a^2*b^4 + 5*A*a*b^5)*d^3)*x^2 + 3*(16*
D*a^2*b^4*c^3 - 8*(3*D*a^3*b^3 + C*a^2*b^4)*c^2*d + 2*(9*D*a^4*b^
2 + 2*C*a^3*b^3 + 3*B*a^2*b^4)*c*d^2 - (5*D*a^5*b + C*a^4*b^2 + B
*a^3*b^3 + 5*A*a^2*b^4)*d^3)*x)*arctan(-(b*c - a*d)/(sqrt(-b^2*c
+ a*b*d)*sqrt(d*x + c))))/((a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5
*b^4*c*d^2 - a^6*b^3*d^3 + (b^9*c^3 - 3*a*b^8*c^2*d + 3*a^2*b^7*c
*d^2 - a^3*b^6*d^3)*x^3 + 3*(a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*
b^6*c*d^2 - a^4*b^5*d^3)*x^2 + 3*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d +
 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*x)*sqrt(-b^2*c + a*b*d))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**4/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.228407, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^4*sqrt(d*x + c)),x, algorithm="giac
```

```
[Out] Done
```

3.9 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^5\sqrt{c+dx}}\,dx$

Optimal. Leaf size=495

$$-\frac{\sqrt{c+dx}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{4b^3(a+bx)^4(bc-ad)}$$
$$-\frac{\sqrt{c+dx}\left(-59a^3d^2D+3a^2bd(56cD+Cd)-ab^2\left(-5Bd^2+144c^2D+16cCd\right)+b^3\left(35Ad^2-40Bcd+48c^2C\right)\right)}{96b^3(a+bx)^2(bc-ad)^3}$$
$$+\frac{\sqrt{c+dx}\left(5a^3d^3D+3a^2bd^2(Cd-8cD)-ab^2d\left(-5Bd^2-48c^2D+16cCd\right)+b^3\left(35Ad^3-40Bcd^2-64c^3D+48c^2Cd\right)\right)}{64b^3(a+bx)(bc-ad)^4}$$
$$-\frac{\sqrt{c+dx}\left(-17a^3dD+3a^2b(8cD+3Cd)-ab^2(Bd+16cC)+b^3(8Bc-7Ad)\right)}{24b^3(a+bx)^3(bc-ad)^2}$$
$$-\frac{d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(5a^3d^3D+3a^2bd^2(Cd-8cD)-ab^2d\left(-5Bd^2-48c^2D+16cCd\right)+b^3\left(35Ad^3-40Bcd^2-64c^3D+48\right.\right.}{64b^{7/2}(bc-ad)^{9/2}}$$

```
[Out] -((A*b^3 - a*(b^2*B - a*b*C + a^2*D))*Sqrt[c + d*x])/(4*b^3*(b*c
- a*d)*(a + b*x)^4) - ((b^3*(8*B*c - 7*A*d) - a*b^2*(16*c*C + B*d
) - 17*a^3*d*D + 3*a^2*b*(3*C*d + 8*c*D))*Sqrt[c + d*x])/(24*b^3*
(b*c - a*d)^2*(a + b*x)^3) - ((b^3*(48*c^2*C - 40*B*c*d + 35*A*d^
2) - 59*a^3*d^2*D + 3*a^2*b*d*(C*d + 56*c*D) - a*b^2*(16*c*C*d -
5*B*d^2 + 144*c^2*D))*Sqrt[c + d*x])/(96*b^3*(b*c - a*d)^3*(a + b
*x)^2) + ((5*a^3*d^3*D + 3*a^2*b*d^2*(C*d - 8*c*D) - a*b^2*d*(16*
c*C*d - 5*B*d^2 - 48*c^2*D) + b^3*(48*c^2*C*d - 40*B*c*d^2 + 35*A
*d^3 - 64*c^3*D))*Sqrt[c + d*x])/(64*b^3*(b*c - a*d)^4*(a + b*x))
 - (d*(5*a^3*d^3*D + 3*a^2*b*d^2*(C*d - 8*c*D) - a*b^2*d*(16*c*C*
d - 5*B*d^2 - 48*c^2*D) + b^3*(48*c^2*C*d - 40*B*c*d^2 + 35*A*d^3
 - 64*c^3*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(
64*b^(7/2)*(b*c - a*d)^(9/2))
```

Rubi [A] time = 2.15721, antiderivative size = 495, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.188$

$$-\frac{\sqrt{c+dx}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{4b^3(a+bx)^4(bc-ad)}$$
$$-\frac{\sqrt{c+dx}\left(-59a^3d^2D+3a^2bd(56cD+Cd)-ab^2\left(-5Bd^2+144c^2D+16cCd\right)+b^3\left(35Ad^2-40Bcd+48c^2C\right)\right)}{96b^3(a+bx)^2(bc-ad)^3}$$
$$+\frac{\sqrt{c+dx}\left(5a^3d^3D+3a^2bd^2(Cd-8cD)-ab^2d\left(-5Bd^2-48c^2D+16cCd\right)+b^3\left(35Ad^3-40Bcd^2-64c^3D+48c^2Cd\right)\right)}{64b^3(a+bx)(bc-ad)^4}$$
$$-\frac{\sqrt{c+dx}\left(-17a^3dD+3a^2b(8cD+3Cd)-ab^2(Bd+16cC)+b^3(8Bc-7Ad)\right)}{24b^3(a+bx)^3(bc-ad)^2}$$
$$-\frac{d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(5a^3d^3D+3a^2bd^2(Cd-8cD)-ab^2d\left(-5Bd^2-48c^2D+16cCd\right)+b^3\left(35Ad^3-40Bcd^2-64c^3D+48\right.\right.}{64b^{7/2}(bc-ad)^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^5*Sqrt[c + d*x]),x]
```

```
[Out] -((A*b^3 - a*(b^2*B - a*b*C + a^2*D))*Sqrt[c + d*x])/(4*b^3*(b*c
- a*d)*(a + b*x)^4) - ((b^3*(8*B*c - 7*A*d) - a*b^2*(16*c*C + B*d
) - 17*a^3*d*D + 3*a^2*b*(3*C*d + 8*c*D))*Sqrt[c + d*x])/(24*b^3*
(b*c - a*d)^2*(a + b*x)^3) - ((b^3*(48*c^2*C - 40*B*c*d + 35*A*d^
2) - 59*a^3*d^2*D + 3*a^2*b*d*(C*d + 56*c*D) - a*b^2*(16*c*C*d -
5*B*d^2 + 144*c^2*D))*Sqrt[c + d*x])/(96*b^3*(b*c - a*d)^3*(a + b
*x)^2) + ((5*a^3*d^3*D + 3*a^2*b*d^2*(C*d - 8*c*D) - a*b^2*d*(16*
c*C*d - 5*B*d^2 - 48*c^2*D) + b^3*(48*c^2*C*d - 40*B*c*d^2 + 35*A
*d^3 - 64*c^3*D))*Sqrt[c + d*x])/(64*b^3*(b*c - a*d)^4*(a + b*x))
 - (d*(5*a^3*d^3*D + 3*a^2*b*d^2*(C*d - 8*c*D) - a*b^2*d*(16*c*C*
d - 5*B*d^2 - 48*c^2*D) + b^3*(48*c^2*C*d - 40*B*c*d^2 + 35*A*d^3
 - 64*c^3*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(
64*b^(7/2)*(b*c - a*d)^(9/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**5/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.26692, size = 449, normalized size = 0.91

$$-\frac{\sqrt{c+dx}\left(48(bc-ad)^3\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)+2(a+bx)^2(bc-ad)\left(-59a^3d^2D+3a^2bd(56cD+Cd)+ab^2\left(5Bd^2-\cdots\right.\right.\right.}{\cdots}$$

$$-\frac{d\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(5a^3d^3D+3a^2bd^2(Cd-8cD)+ab^2d\left(5Bd^2+48c^2D-16cCd\right)+b^3\left(35Ad^3-40Bcd^2-64c^3D+48c^2\cdots\right.\right.}{64b^{7/2}(bc-ad)^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^5*Sqrt[c + d*x]),x]
```

```
[Out] -(Sqrt[c + d*x]*(48*(b*c - a*d)^3*(A*b^3 - a*(b^2*B - a*b*C + a^2
*D)) + 8*(b*c - a*d)^2*(b^3*(8*B*c - 7*A*d) - a*b^2*(16*c*C + B*d
) - 17*a^3*d*D + 3*a^2*b*(3*C*d + 8*c*D))*(a + b*x) + 2*(b*c - a*
d)*(b^3*(48*c^2*C - 40*B*c*d + 35*A*d^2) - 59*a^3*d^2*D + 3*a^2*b
*d*(C*d + 56*c*D) + a*b^2*(-16*c*C*d + 5*B*d^2 - 144*c^2*D))*(a +
 b*x)^2 - 3*(5*a^3*d^3*D + 3*a^2*b*d^2*(C*d - 8*c*D) + a*b^2*d*(-
16*c*C*d + 5*B*d^2 + 48*c^2*D) + b^3*(48*c^2*C*d - 40*B*c*d^2 + 3
5*A*d^3 - 64*c^3*D))*(a + b*x)^3))/(192*b^3*(b*c - a*d)^4*(a + b*
```

```
x)^4) - (d*(5*a^3*d^3*D + 3*a^2*b*d^2*(C*d - 8*c*D) + a*b^2*d*(-1
6*c*C*d + 5*B*d^2 + 48*c^2*D) + b^3*(48*c^2*C*d - 40*B*c*d^2 + 35
*A*d^3 - 64*c^3*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*
d]])/(64*b^(7/2)*(b*c - a*d)^(9/2))
```

Maple [B] time = 0.039, size = 3252, normalized size = 6.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)^5/(d*x+c)^(1/2),x)
```

```
[Out] 11/8/(b*d*x+a*d)^4/b/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*D*
a^2*c*d^3+73/192/(b*d*x+a*d)^4/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c
)^(3/2)*a*B*d^4-11/8/(b*d*x+a*d)^4/(a*d-b*c)*(d*x+c)^(1/2)*B*c*d^
3+35/64/(b*d*x+a*d)^4/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*
a*b^3*c^3*d+b^4*c^4)*(d*x+c)^(7/2)*A*b^3*d^4+5/64/(b*d*x+a*d)^4/(
a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*(d
*x+c)^(7/2)*a^3*d^4*D+385/192/(b*d*x+a*d)^4*b^2/(a^3*d^3-3*a^2*b*
c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(d*x+c)^(5/2)*A*d^4+511/192/(b*d*x+a
*d)^4*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*A*d^4-d/(a^4*d^
4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)/((a*d-b*
c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*c^3-5/8
/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)/
((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B
*c*d^3+3/4/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d
+b^4*c^4)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b
)^(1/2))*C*c^2*d^2-d/(b*d*x+a*d)^4/(a*d-b*c)*(d*x+c)^(1/2)*D*c^3+
5/4/(b*d*x+a*d)^4/(a*d-b*c)*(d*x+c)^(1/2)*C*c^2*d^2+11/64/(b*d*x+
a*d)^4/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(d*x+c)^(5/2
)*a^2*C*d^4+3/4/(b*d*x+a*d)^4*b/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^
2*d-b^3*c^3)*(d*x+c)^(5/2)*D*a*c^2*d^2+3/4/(b*d*x+a*d)^4/(a^4*d^4
-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*(d*x+c)^(
7/2)*D*a*b^2*c^2*d^2-11/12/(b*d*x+a*d)^4*b/(a^3*d^3-3*a^2*b*c*d^2
+3*a*b^2*c^2*d-b^3*c^3)*(d*x+c)^(5/2)*C*a*c*d^3-1/4/(b*d*x+a*d)^4
/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*
(d*x+c)^(7/2)*C*a*b^2*c*d^3-3/8/(b*d*x+a*d)^4/(a^4*d^4-4*a^3*b*c*
d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*(d*x+c)^(7/2)*D*a^2*
b*c*d^3-3/8/b^2/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*
c^3*d+b^4*c^4)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b
*c)*b)^(1/2))*D*a^2*c*d^3+3/4/b/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*
c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)
^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a*c^2*d^2-1/4/b/(a^4*d^4-4*a^3*b*
c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)/((a*d-b*c)*b)^(1/2
)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c*d^3+1/4/(b*d*
x+a*d)^4/(a*d-b*c)/b*(d*x+c)^(1/2)*C*a*c*d^3+3/8/(b*d*x+a*d)^4/(a
*d-b*c)/b^2*(d*x+c)^(1/2)*D*a^2*c*d^3-3/4/(b*d*x+a*d)^4/(a*d-b*c)
/b*(d*x+c)^(1/2)*D*a*c^2*d^2+93/64/(b*d*x+a*d)^4/(a*d-b*c)*(d*x+c
)^(1/2)*A*d^4+35/64/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*
b^3*c^3*d+b^4*c^4)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a
*d-b*c)*b)^(1/2))*A*d^4+3/64/b^2/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2
```

```
*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c
)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a^2*C*d^4+5/64/b^3/(a^4*d^4-4*a^3*
b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)/((a*d-b*c)*b)^(1
/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a^3*d^4*D-5/8/(b*
d*x+a*d)^4/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d
+b^4*c^4)*(d*x+c)^(7/2)*B*c*d^3*b^3+3/64/(b*d*x+a*d)^4/(a^4*d^4-4
*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*(d*x+c)^(7/
2)*a^2*b*C*d^4-5/12/(b*d*x+a*d)^4/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*
x+c)^(3/2)*C*a*c*d^3-3/4/(b*d*x+a*d)^4/(a^2*d^2-2*a*b*c*d+b^2*c^2
)*(d*x+c)^(3/2)*D*a*c^2*d^2-3/64/(b*d*x+a*d)^4/(a*d-b*c)/b^2*(d*x
+c)^(1/2)*a^2*C*d^4-5/64/(b*d*x+a*d)^4/(a*d-b*c)/b^3*(d*x+c)^(1/2
)*a^3*d^4*D+3/4/(b*d*x+a*d)^4/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^
2*d^2-4*a*b^3*c^3*d+b^4*c^4)*(d*x+c)^(7/2)*C*c^2*d^2*b^3+55/192/(
b*d*x+a*d)^4*b/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(d*x
+c)^(5/2)*a*B*d^4+5/8/(b*d*x+a*d)^4/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^
2*c^2*d-b^3*c^3)*(d*x+c)^(5/2)*D*a^2*c*d^3-55/24/(b*d*x+a*d)^4*b^
2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(d*x+c)^(5/2)*B*c
*d^3+11/4/(b*d*x+a*d)^4*b^2/(a^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-
b^3*c^3)*(d*x+c)^(5/2)*C*c^2*d^2-73/192/(b*d*x+a*d)^4/b/(a^3*d^3-
3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(d*x+c)^(5/2)*a^3*d^4*D-73/2
4/(b*d*x+a*d)^4*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*B*c*d
^3-11/64/(b*d*x+a*d)^4/b/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c)^(3/2
)*a^2*C*d^4+13/4/(b*d*x+a*d)^4*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x
+c)^(3/2)*C*c^2*d^2-55/192/(b*d*x+a*d)^4/b^2/(a^2*d^2-2*a*b*c*d+b
^2*c^2)*(d*x+c)^(3/2)*a^3*d^4*D-5/64/(b*d*x+a*d)^4/(a*d-b*c)/b*(d
*x+c)^(1/2)*a*B*d^4+5/64/(b*d*x+a*d)^4/(a^4*d^4-4*a^3*b*c*d^3+6*a
^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*c^4)*(d*x+c)^(7/2)*a*b^2*B*d^4-3
*d/(b*d*x+a*d)^4*b/(a^2*d^2-2*a*b*c*d+b^2*c^2)*(d*x+c)^(3/2)*D*c^
3-d/(b*d*x+a*d)^4/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^
3*c^3*d+b^4*c^4)*(d*x+c)^(7/2)*D*c^3*b^3-3*d/(b*d*x+a*d)^4*b^2/(a
^3*d^3-3*a^2*b*c*d^2+3*a*b^2*c^2*d-b^3*c^3)*(d*x+c)^(5/2)*D*c^3+5
/64/b/(a^4*d^4-4*a^3*b*c*d^3+6*a^2*b^2*c^2*d^2-4*a*b^3*c^3*d+b^4*
c^4)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/
2))*a*B*d^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^5*sqrt(d*x + c)),x, algorithm="maxi
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.260656, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^5*sqrt(d*x + c)),x, algorithm="fric

[Out] [-1/384*(2*(16*(3*D*a^3*b^3 + C*a^2*b^4 + B*a*b^5 + 3*A*b^6)*c^3
+ 8*(13*D*a^4*b^2 - 11*C*a^3*b^3 - 9*B*a^2*b^4 - 25*A*a*b^5)*c^2*
d - 2*(31*D*a^5*b + 21*C*a^4*b^2 - 73*B*a^3*b^3 - 163*A*a^2*b^4)*
c*d^2 + 3*(5*D*a^6 + 3*C*a^5*b + 5*B*a^4*b^2 - 93*A*a^3*b^3)*d^3
+ 3*(64*D*b^6*c^3 - 48*(D*a*b^5 + C*b^6)*c^2*d + 8*(3*D*a^2*b^4 +
 2*C*a*b^5 + 5*B*b^6)*c*d^2 - (5*D*a^3*b^3 + 3*C*a^2*b^4 + 5*B*a*
b^5 + 35*A*b^6)*d^3)*x^3 + (96*(3*D*a*b^5 + C*b^6)*c^3 + 16*(12*D
*a^2*b^4 - 35*C*a*b^5 - 5*B*b^6)*c^2*d - 2*(119*D*a^3*b^3 - 91*C*
a^2*b^4 - 225*B*a*b^5 - 35*A*b^6)*c*d^2 + (73*D*a^4*b^2 - 33*C*a^
3*b^3 - 55*B*a^2*b^4 - 385*A*a*b^5)*d^3)*x^2 + (64*(3*D*a^2*b^4 +
 C*a*b^5 + B*b^6)*c^3 + 8*(37*D*a^3*b^3 - 45*C*a^2*b^4 - 37*B*a*b
^5 - 7*A*b^6)*c^2*d - 4*(57*D*a^4*b^2 + 13*C*a^3*b^3 - 155*B*a^2*
b^4 - 63*A*a*b^5)*c*d^2 + (55*D*a^5*b + 33*C*a^4*b^2 - 73*B*a^3*b
^3 - 511*A*a^2*b^4)*d^3)*x)*sqrt(b^2*c - a*b*d)*sqrt(d*x + c) + 3
*(64*D*a^4*b^3*c^3*d - 48*(D*a^5*b^2 + C*a^4*b^3)*c^2*d^2 + 8*(3*
D*a^6*b + 2*C*a^5*b^2 + 5*B*a^4*b^3)*c*d^3 - (5*D*a^7 + 3*C*a^6*b
 + 5*B*a^5*b^2 + 35*A*a^4*b^3)*d^4 + (64*D*b^7*c^3*d - 48*(D*a*b^
6 + C*b^7)*c^2*d^2 + 8*(3*D*a^2*b^5 + 2*C*a*b^6 + 5*B*b^7)*c*d^3
- (5*D*a^3*b^4 + 3*C*a^2*b^5 + 5*B*a*b^6 + 35*A*b^7)*d^4)*x^4 + 4
*(64*D*a*b^6*c^3*d - 48*(D*a^2*b^5 + C*a*b^6)*c^2*d^2 + 8*(3*D*a^
3*b^4 + 2*C*a^2*b^5 + 5*B*a*b^6)*c*d^3 - (5*D*a^4*b^3 + 3*C*a^3*b
^4 + 5*B*a^2*b^5 + 35*A*a*b^6)*d^4)*x^3 + 6*(64*D*a^2*b^5*c^3*d -
 48*(D*a^3*b^4 + C*a^2*b^5)*c^2*d^2 + 8*(3*D*a^4*b^3 + 2*C*a^3*b^
4 + 5*B*a^2*b^5)*c*d^3 - (5*D*a^5*b^2 + 3*C*a^4*b^3 + 5*B*a^3*b^4
 + 35*A*a^2*b^5)*d^4)*x^2 + 4*(64*D*a^3*b^4*c^3*d - 48*(D*a^4*b^3
 + C*a^3*b^4)*c^2*d^2 + 8*(3*D*a^5*b^2 + 2*C*a^4*b^3 + 5*B*a^3*b^
4)*c*d^3 - (5*D*a^6*b + 3*C*a^5*b^2 + 5*B*a^4*b^3 + 35*A*a^3*b^4)
*d^4)*x)*log((sqrt(b^2*c - a*b*d)*(b*d*x + 2*b*c - a*d) - 2*(b^2*
c - a*b*d)*sqrt(d*x + c))/(b*x + a)))/((a^4*b^7*c^4 - 4*a^5*b^6*c
^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*d^4 + (b^11*
c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*c*d^3 + a^4*
b^7*d^4)*x^4 + 4*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^3*b^8*c^2*d^
2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*x^3 + 6*(a^2*b^9*c^4 - 4*a^3*b
^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*b^5*d^4)*x^2
 + 4*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d^2 - 4*a^6*b
^5*c*d^3 + a^7*b^4*d^4)*x)*sqrt(b^2*c - a*b*d)), -1/192*((16*(3*D
*a^3*b^3 + C*a^2*b^4 + B*a*b^5 + 3*A*b^6)*c^3 + 8*(13*D*a^4*b^2 -
 11*C*a^3*b^3 - 9*B*a^2*b^4 - 25*A*a*b^5)*c^2*d - 2*(31*D*a^5*b +
 21*C*a^4*b^2 - 73*B*a^3*b^3 - 163*A*a^2*b^4)*c*d^2 + 3*(5*D*a^6
+ 3*C*a^5*b + 5*B*a^4*b^2 - 93*A*a^3*b^3)*d^3 + 3*(64*D*b^6*c^3 -
 48*(D*a*b^5 + C*b^6)*c^2*d + 8*(3*D*a^2*b^4 + 2*C*a*b^5 + 5*B*b^
6)*c*d^2 - (5*D*a^3*b^3 + 3*C*a^2*b^4 + 5*B*a*b^5 + 35*A*b^6)*d^3
)*x^3 + (96*(3*D*a*b^5 + C*b^6)*c^3 + 16*(12*D*a^2*b^4 - 35*C*a*b
^5 - 5*B*b^6)*c^2*d - 2*(119*D*a^3*b^3 - 91*C*a^2*b^4 - 225*B*a*b
^5 - 35*A*b^6)*c*d^2 + (73*D*a^4*b^2 - 33*C*a^3*b^3 - 55*B*a^2*b^
4 - 385*A*a*b^5)*d^3)*x^2 + (64*(3*D*a^2*b^4 + C*a*b^5 + B*b^6)*c
^3 + 8*(37*D*a^3*b^3 - 45*C*a^2*b^4 - 37*B*a*b^5 - 7*A*b^6)*c^2*d
 - 4*(57*D*a^4*b^2 + 13*C*a^3*b^3 - 155*B*a^2*b^4 - 63*A*a*b^5)*c
*d^2 + (55*D*a^5*b + 33*C*a^4*b^2 - 73*B*a^3*b^3 - 511*A*a^2*b^4)
*d^3)*x)*sqrt(-b^2*c + a*b*d)*sqrt(d*x + c) - 3*(64*D*a^4*b^3*c^3
*d - 48*(D*a^5*b^2 + C*a^4*b^3)*c^2*d^2 + 8*(3*D*a^6*b + 2*C*a^5*
b^2 + 5*B*a^4*b^3)*c*d^3 - (5*D*a^7 + 3*C*a^6*b + 5*B*a^5*b^2 + 3
5*A*a^4*b^3)*d^4 + (64*D*b^7*c^3*d - 48*(D*a*b^6 + C*b^7)*c^2*d^2
```

```
 + 8*(3*D*a^2*b^5 + 2*C*a*b^6 + 5*B*b^7)*c*d^3 - (5*D*a^3*b^4 + 3
*C*a^2*b^5 + 5*B*a*b^6 + 35*A*b^7)*d^4)*x^4 + 4*(64*D*a*b^6*c^3*d
 - 48*(D*a^2*b^5 + C*a*b^6)*c^2*d^2 + 8*(3*D*a^3*b^4 + 2*C*a^2*b^
5 + 5*B*a*b^6)*c*d^3 - (5*D*a^4*b^3 + 3*C*a^3*b^4 + 5*B*a^2*b^5 +
 35*A*a*b^6)*d^4)*x^3 + 6*(64*D*a^2*b^5*c^3*d - 48*(D*a^3*b^4 + C
*a^2*b^5)*c^2*d^2 + 8*(3*D*a^4*b^3 + 2*C*a^3*b^4 + 5*B*a^2*b^5)*c
*d^3 - (5*D*a^5*b^2 + 3*C*a^4*b^3 + 5*B*a^3*b^4 + 35*A*a^2*b^5)*d
^4)*x^2 + 4*(64*D*a^3*b^4*c^3*d - 48*(D*a^4*b^3 + C*a^3*b^4)*c^2*
d^2 + 8*(3*D*a^5*b^2 + 2*C*a^4*b^3 + 5*B*a^3*b^4)*c*d^3 - (5*D*a^
6*b + 3*C*a^5*b^2 + 5*B*a^4*b^3 + 35*A*a^3*b^4)*d^4)*x)*arctan(-(
b*c - a*d)/(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))))/((a^4*b^7*c^4 -
 4*a^5*b^6*c^3*d + 6*a^6*b^5*c^2*d^2 - 4*a^7*b^4*c*d^3 + a^8*b^3*
d^4 + (b^11*c^4 - 4*a*b^10*c^3*d + 6*a^2*b^9*c^2*d^2 - 4*a^3*b^8*
c*d^3 + a^4*b^7*d^4)*x^4 + 4*(a*b^10*c^4 - 4*a^2*b^9*c^3*d + 6*a^
3*b^8*c^2*d^2 - 4*a^4*b^7*c*d^3 + a^5*b^6*d^4)*x^3 + 6*(a^2*b^9*c
^4 - 4*a^3*b^8*c^3*d + 6*a^4*b^7*c^2*d^2 - 4*a^5*b^6*c*d^3 + a^6*
b^5*d^4)*x^2 + 4*(a^3*b^8*c^4 - 4*a^4*b^7*c^3*d + 6*a^5*b^6*c^2*d
^2 - 4*a^6*b^5*c*d^3 + a^7*b^4*d^4)*x)*sqrt(-b^2*c + a*b*d))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**5/(d*x+c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.236352, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^5*sqrt(d*x + c)),x, algorithm="giac
```

```
[Out] Done
```

3.10 $\int \frac{(a+bx)^3\left(A+Bx+Cx^2+Dx^3\right)}{(c+dx)^{3/2}}\,dx$

Optimal. Leaf size=434

$$-\frac{2(c+dx)^{3/2}(bc-ad)\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{3d^7}+\frac{2b(c+dx)^{7/2}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{7d^7}+\frac{2(c+dx)^{5/2}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{5d^7}-\frac{2\sqrt{c+dx}(bc-ad)^2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{d^7}+\frac{2(bc-ad)^3\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^7\sqrt{c+dx}}+\frac{2b^2(c+dx)^{9/2}(3adD-6bcD+bCd)}{9d^7}+\frac{2b^3D(c+dx)^{11/2}}{11d^7}$$

```
[Out] (2*(b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^7*Sqrt[c
 + d*x]) - (2*(b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*
(5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D))*Sqrt[c + d*x])/d^7 -
 (2*(b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a*b*d*(8*c*C*d - 3*B*d^2
 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2 + 3*A*d^3 - 15*c^3*D))
*(c + d*x)^(3/2))/(3*d^7) + (2*(a^3*d^3*D + 3*a^2*b*d^2*(C*d - 4*
c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 - 10*c^2*D) + b^3*(10*c^2*C*d -
 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c + d*x)^(5/2))/(5*d^7) + (2*b*(
3*a^2*d^2*D + 3*a*b*d*(C*d - 5*c*D) - b^2*(5*c*C*d - B*d^2 - 15*c
^2*D))*(c + d*x)^(7/2))/(7*d^7) + (2*b^2*(b*C*d - 6*b*c*D + 3*a*d
*D)*(c + d*x)^(9/2))/(9*d^7) + (2*b^3*D*(c + d*x)^(11/2))/(11*d^7
)
```

Rubi [A] time = 0.846959, antiderivative size = 434, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.031$

$$-\frac{2(c+dx)^{3/2}(bc-ad)\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{3d^7}+\frac{2b(c+dx)^{7/2}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{7d^7}+\frac{2(c+dx)^{5/2}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{5d^7}-\frac{2\sqrt{c+dx}(bc-ad)^2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{d^7}+\frac{2(bc-ad)^3\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^7\sqrt{c+dx}}+\frac{2b^2(c+dx)^{9/2}(3adD-6bcD+bCd)}{9d^7}+\frac{2b^3D(c+dx)^{11/2}}{11d^7}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^3*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(3/2),x]
```

```
[Out] (2*(b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^7*Sqrt[c
 + d*x]) - (2*(b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*
(5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D))*Sqrt[c + d*x])/d^7 -
 (2*(b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a*b*d*(8*c*C*d - 3*B*d^2
 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2 + 3*A*d^3 - 15*c^3*D))
*(c + d*x)^(3/2))/(3*d^7) + (2*(a^3*d^3*D + 3*a^2*b*d^2*(C*d - 4*
c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 - 10*c^2*D) + b^3*(10*c^2*C*d -
 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c + d*x)^(5/2))/(5*d^7) + (2*b*(
3*a^2*d^2*D + 3*a*b*d*(C*d - 5*c*D) - b^2*(5*c*C*d - B*d^2 - 15*c
^2*D))*(c + d*x)^(7/2))/(7*d^7) + (2*b^2*(b*C*d - 6*b*c*D + 3*a*d
*D)*(c + d*x)^(9/2))/(9*d^7) + (2*b^3*D*(c + d*x)^(11/2))/(11*d^7
)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**3*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.55113, size = 500, normalized size = 1.15

$$2\left(231a^3d^3\left(d^3\left(x\left(15B+5Cx+3Dx^2\right)-15A\right)+2cd^2(15B-x(10C+3Dx))+48c^3D-8c^2d(5C-3Dx)\right)+99a^2bd^2\left(2cd^3(1\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)^3*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(3/2),x]
```

```
[Out] (2*(231*a^3*d^3*(48*c^3*D - 8*c^2*d*(5*C - 3*D*x) + 2*c*d^2*(15*B
 - x*(10*C + 3*D*x)) + d^3*(-15*A + x*(15*B + 5*C*x + 3*D*x^2)))
+ 99*a^2*b*d^2*(-384*c^4*D + 48*c^3*d*(7*C - 4*D*x) - 8*c^2*d^2*(
35*B - 3*x*(7*C + 2*D*x)) + 2*c*d^3*(105*A - x*(70*B + 3*x*(7*C +
 4*D*x))) + d^4*x*(105*A + x*(35*B + 3*x*(7*C + 5*D*x)))) + 33*a*
b^2*d*(1280*c^5*D - 128*c^4*d*(9*C - 5*D*x) + 16*c^3*d^2*(63*B -
2*x*(18*C + 5*D*x)) + 8*c^2*d^3*(-105*A + x*(63*B + 2*x*(9*C + 5*
D*x))) + d^5*x^2*(105*A + x*(63*B + 5*x*(9*C + 7*D*x))) - 2*c*d^4
*x*(210*A + x*(63*B + x*(36*C + 25*D*x)))) + b^3*(-15360*c^6*D +
1280*c^5*d*(11*C - 6*D*x) - 128*c^4*d^2*(99*B - 5*x*(11*C + 3*D*x
)) + 16*c^3*d^3*(693*A - 2*x*(198*B + 5*x*(11*C + 6*D*x))) + d^6*
x^3*(693*A + 5*x*(99*B + 7*x*(11*C + 9*D*x))) + 8*c^2*d^4*x*(693*
A + x*(198*B + 5*x*(22*C + 15*D*x))) - 2*c*d^5*x^2*(693*A + x*(39
6*B + 5*x*(55*C + 42*D*x))))))/(3465*d^7*Sqrt[c + d*x])
```

Maple [B] time = 0.013, size = 841, normalized size = 1.9

$$-\frac{-630\, b^3 D x^6 d^6 - 770\, C b^3 d^6 x^5 - 2310\, D a b^2 d^6 x^5 + 840\, D b^3 c d^5 x^5 - 990\, B b^3 d^6 x^4 - 2970\, C a b^2 d^6 x^4 + 1100\, C b^3 c d^5 x^4 - 2970}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^3*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(3/2),x)
```

```
[Out] -2/3465/(d*x+c)^(1/2)*(-315*D*b^3*d^6*x^6-385*C*b^3*d^6*x^5-1155*
D*a*b^2*d^6*x^5+420*D*b^3*c*d^5*x^5-495*B*b^3*d^6*x^4-1485*C*a*b^
2*d^6*x^4+550*C*b^3*c*d^5*x^4-1485*D*a^2*b*d^6*x^4+1650*D*a*b^2*c
*d^5*x^4-600*D*b^3*c^2*d^4*x^4-693*A*b^3*d^6*x^3-2079*B*a*b^2*d^6
*x^3+792*B*b^3*c*d^5*x^3-2079*C*a^2*b*d^6*x^3+2376*C*a*b^2*c*d^5*
x^3-880*C*b^3*c^2*d^4*x^3-693*D*a^3*d^6*x^3+2376*D*a^2*b*c*d^5*x^
3-2640*D*a*b^2*c^2*d^4*x^3+960*D*b^3*c^3*d^3*x^3-3465*A*a*b^2*d^6
*x^2+1386*A*b^3*c*d^5*x^2-3465*B*a^2*b*d^6*x^2+4158*B*a*b^2*c*d^5
*x^2-1584*B*b^3*c^2*d^4*x^2-1155*C*a^3*d^6*x^2+4158*C*a^2*b*c*d^5
*x^2-4752*C*a*b^2*c^2*d^4*x^2+1760*C*b^3*c^3*d^3*x^2+1386*D*a^3*c
*d^5*x^2-4752*D*a^2*b*c^2*d^4*x^2+5280*D*a*b^2*c^3*d^3*x^2-1920*D
*b^3*c^4*d^2*x^2-10395*A*a^2*b*d^6*x+13860*A*a*b^2*c*d^5*x-5544*A
*b^3*c^2*d^4*x-3465*B*a^3*d^6*x+13860*B*a^2*b*c*d^5*x-16632*B*a*b
^2*c^2*d^4*x+6336*B*b^3*c^3*d^3*x+4620*C*a^3*c*d^5*x-16632*C*a^2*
b*c^2*d^4*x+19008*C*a*b^2*c^3*d^3*x-7040*C*b^3*c^4*d^2*x-5544*D*a
^3*c^2*d^4*x+19008*D*a^2*b*c^3*d^3*x-21120*D*a*b^2*c^4*d^2*x+7680
*D*b^3*c^5*d*x+3465*A*a^3*d^6-20790*A*a^2*b*c*d^5+27720*A*a*b^2*c
^2*d^4-11088*A*b^3*c^3*d^3-6930*B*a^3*c*d^5+27720*B*a^2*b*c^2*d^4
-33264*B*a*b^2*c^3*d^3+12672*B*b^3*c^4*d^2+9240*C*a^3*c^2*d^4-332
64*C*a^2*b*c^3*d^3+38016*C*a*b^2*c^4*d^2-14080*C*b^3*c^5*d-11088*
D*a^3*c^3*d^3+38016*D*a^2*b*c^4*d^2-42240*D*a*b^2*c^5*d+15360*D*b
^3*c^6)/d^7
```

Maxima [A] time = 1.36816, size = 849, normalized size = 1.96

$$2\left(\frac{315\,(dx+c)^{\frac{11}{2}}\,Db^3 - 385\,\left(6\,Db^3c - \left(3\,Dab^2 + Cb^3\right)d\right)(dx+c)^{\frac{9}{2}} + 495\,\left(15\,Db^3c^2 - 5\,\left(3\,Dab^2 + Cb^3\right)cd + \left(3\,Da^2b + 3\,Cab^2 + Bb^3\right)d^2\right)(dx+c)^{\frac{7}{2}} - 693\,\left(20\,Db^3c^3 - 10\,(3\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/(d*x + c)^(3/2),x, algorithm="maxi
```

```
[Out] 2/3465*((315*(d*x + c)^(11/2)*D*b^3 - 385*(6*D*b^3*c - (3*D*a*b^2
 + C*b^3)*d)*(d*x + c)^(9/2) + 495*(15*D*b^3*c^2 - 5*(3*D*a*b^2 +
 C*b^3)*c*d + (3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^2)*(d*x + c)^(7/2
) - 693*(20*D*b^3*c^3 - 10*(3*D*a*b^2 + C*b^3)*c^2*d + 4*(3*D*a^2
*b + 3*C*a*b^2 + B*b^3)*c*d^2 - (D*a^3 + 3*C*a^2*b + 3*B*a*b^2 +
```

```
A*b^3)*d^3)*(d*x + c)^(5/2) + 1155*(15*D*b^3*c^4 - 10*(3*D*a*b^2
+ C*b^3)*c^3*d + 6*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^2*d^2 - 3*(D
*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c*d^3 + (C*a^3 + 3*B*a^2*b
+ 3*A*a*b^2)*d^4)*(d*x + c)^(3/2) - 3465*(6*D*b^3*c^5 - 5*(3*D*a*
b^2 + C*b^3)*c^4*d + 4*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^3*d^2 -
3*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^2*d^3 + 2*(C*a^3 + 3*
B*a^2*b + 3*A*a*b^2)*c*d^4 - (B*a^3 + 3*A*a^2*b)*d^5)*sqrt(d*x +
c))/d^6 - 3465*(D*b^3*c^6 + A*a^3*d^6 - (3*D*a*b^2 + C*b^3)*c^5*d
 + (3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^4*d^2 - (D*a^3 + 3*C*a^2*b +
 3*B*a*b^2 + A*b^3)*c^3*d^3 + (C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^2
*d^4 - (B*a^3 + 3*A*a^2*b)*c*d^5)/(sqrt(d*x + c)*d^6))/d
```

Fricas [A] time = 0.220227, size = 841, normalized size = 1.94

$$\frac{2\left(315\,Db^3d^6x^6 - 15360\,Db^3c^6 - 3465\,Aa^3d^6 + 14080\left(3\,Dab^2 + Cb^3\right)c^5d - 12672\left(3\,Da^2b + 3\,Cab^2 + Bb^3\right)c^4d^2 + 11088\left(Da\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/(d*x + c)^(3/2),x, algorithm="fric
```

```
[Out] 2/3465*(315*D*b^3*d^6*x^6 - 15360*D*b^3*c^6 - 3465*A*a^3*d^6 + 14
080*(3*D*a*b^2 + C*b^3)*c^5*d - 12672*(3*D*a^2*b + 3*C*a*b^2 + B*
b^3)*c^4*d^2 + 11088*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^3*
d^3 - 9240*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^2*d^4 + 6930*(B*a^3
+ 3*A*a^2*b)*c*d^5 - 35*(12*D*b^3*c*d^5 - 11*(3*D*a*b^2 + C*b^3)*
d^6)*x^5 + 5*(120*D*b^3*c^2*d^4 - 110*(3*D*a*b^2 + C*b^3)*c*d^5 +
 99*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^6)*x^4 - (960*D*b^3*c^3*d^3
 - 880*(3*D*a*b^2 + C*b^3)*c^2*d^4 + 792*(3*D*a^2*b + 3*C*a*b^2 +
 B*b^3)*c*d^5 - 693*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*d^6)*
x^3 + (1920*D*b^3*c^4*d^2 - 1760*(3*D*a*b^2 + C*b^3)*c^3*d^3 + 15
84*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^2*d^4 - 1386*(D*a^3 + 3*C*a^
2*b + 3*B*a*b^2 + A*b^3)*c*d^5 + 1155*(C*a^3 + 3*B*a^2*b + 3*A*a*
b^2)*d^6)*x^2 - (7680*D*b^3*c^5*d - 7040*(3*D*a*b^2 + C*b^3)*c^4*
d^2 + 6336*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^3*d^3 - 5544*(D*a^3
+ 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^2*d^4 + 4620*(C*a^3 + 3*B*a^2*
b + 3*A*a*b^2)*c*d^5 - 3465*(B*a^3 + 3*A*a^2*b)*d^6)*x)/(sqrt(d*x
 + c)*d^7)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + bx)^3 \left(A + Bx + Cx^2 + Dx^3\right)}{(c + dx)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**3*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] Integral((a + b*x)**3*(A + B*x + C*x**2 + D*x**3)/(c + d*x)**(3/2
), x)
```

GIAC/XCAS [A] time = 0.226548, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/(d*x + c)^(3/2),x, algorithm="giac
```

```
[Out] Done
```

3.11 $\int \frac{(a+bx)^2 \left(A+Bx+Cx^2+Dx^3\right)}{(c+dx)^{3/2}} \, dx$

Optimal. Leaf size=322

$$\frac{2(c+dx)^{3/2}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{3d^6}+\frac{2(c+dx)^{5/2}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{5d^6}+\frac{2\sqrt{c+dx}(bc-ad)\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{d^6}-\frac{2(bc-ad)^2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^6\sqrt{c+dx}}+\frac{2b(c+dx)^{7/2}(2adD-5bcD+bCd)}{7d^6}+\frac{2b^2D(c+dx)^{9/2}}{9d^6}$$

```
[Out] (-2*(b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^6*Sqrt[
c + d*x]) + (2*(b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(
4*c^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D))*Sqrt[c + d*x])/d^6 +
(2*(a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d - B*d^2 - 6*c^2*D) +
 b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D))*(c + d*x)^(3/2))
/(3*d^6) + (2*(a^2*d^2*D + 2*a*b*d*(C*d - 4*c*D) - b^2*(4*c*C*d -
 B*d^2 - 10*c^2*D))*(c + d*x)^(5/2))/(5*d^6) + (2*b*(b*C*d - 5*b*
c*D + 2*a*d*D)*(c + d*x)^(7/2))/(7*d^6) + (2*b^2*D*(c + d*x)^(9/2
))/(9*d^6)
```

Rubi [A] time = 0.541427, antiderivative size = 322, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.031$

$$\frac{2(c+dx)^{3/2}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{3d^6}+\frac{2(c+dx)^{5/2}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{5d^6}+\frac{2\sqrt{c+dx}(bc-ad)\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{d^6}-\frac{2(bc-ad)^2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^6\sqrt{c+dx}}+\frac{2b(c+dx)^{7/2}(2adD-5bcD+bCd)}{7d^6}+\frac{2b^2D(c+dx)^{9/2}}{9d^6}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^2*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(3/2),x]
```


```
[Out] (-2*(b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^6*Sqrt[
c + d*x]) + (2*(b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(
4*c^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D))*Sqrt[c + d*x])/d^6 +
(2*(a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d - B*d^2 - 6*c^2*D) +
 b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D))*(c + d*x)^(3/2))
/(3*d^6) + (2*(a^2*d^2*D + 2*a*b*d*(C*d - 4*c*D) - b^2*(4*c*C*d -
 B*d^2 - 10*c^2*D))*(c + d*x)^(5/2))/(5*d^6) + (2*b*(b*C*d - 5*b*
```

```
c*D + 2*a*d*D)*(c + d*x)^(7/2))/(7*d^6) + (2*b^2*D*(c + d*x)^(9/2
))/(9*d^6)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**2*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.97263, size = 326, normalized size = 1.01

$$\frac{2\left(21a^2d^2\left(d^3\left(x\left(15B+5Cx+3Dx^2\right)-15A\right)+2cd^2(15B-x(10C+3Dx))+48c^3D-8c^2d(5C-3Dx)\right)+6abd\left(2cd^3(105A\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)^2*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(3/2),x]
```

```
[Out] (2*(21*a^2*d^2*(48*c^3*D - 8*c^2*d*(5*C - 3*D*x) + 2*c*d^2*(15*B
- x*(10*C + 3*D*x)) + d^3*(-15*A + x*(15*B + 5*C*x + 3*D*x^2))) +
 6*a*b*d*(-384*c^4*D + 48*c^3*d*(7*C - 4*D*x) - 8*c^2*d^2*(35*B -
 3*x*(7*C + 2*D*x)) + 2*c*d^3*(105*A - x*(70*B + 3*x*(7*C + 4*D*x
))) + d^4*x*(105*A + x*(35*B + 3*x*(7*C + 5*D*x)))) + b^2*(1280*c
^5*D - 128*c^4*d*(9*C - 5*D*x) + 16*c^3*d^2*(63*B - 2*x*(18*C + 5
*D*x)) + 8*c^2*d^3*(-105*A + x*(63*B + 2*x*(9*C + 5*D*x))) + d^5*
x^2*(105*A + x*(63*B + 5*x*(9*C + 7*D*x))) - 2*c*d^4*x*(210*A + x
*(63*B + x*(36*C + 25*D*x))))))/(315*d^6*Sqrt[c + d*x])
```

Maple [A] time = 0.012, size = 505, normalized size = 1.6

$$-\frac{-70\,b^2Dx^5d^5-90\,Cb^2d^5x^4-180\,Dabd^5x^4+100\,Db^2cd^4x^4-126\,Bb^2d^5x^3-252\,Cabd^5x^3+144\,Cb^2cd^4x^3-126\,Da^2d^5x^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(3/2),x)
```

```
[Out] -2/315/(d*x+c)^(1/2)*(-35*D*b^2*d^5*x^5-45*C*b^2*d^5*x^4-90*D*a*b
*d^5*x^4+50*D*b^2*c*d^4*x^4-63*B*b^2*d^5*x^3-126*C*a*b*d^5*x^3+72
```

```
*C*b^2*c*d^4*x^3-63*D*a^2*d^5*x^3+144*D*a*b*c*d^4*x^3-80*D*b^2*c^
2*d^3*x^3-105*A*b^2*d^5*x^2-210*B*a*b*d^5*x^2+126*B*b^2*c*d^4*x^2
-105*C*a^2*d^5*x^2+252*C*a*b*c*d^4*x^2-144*C*b^2*c^2*d^3*x^2+126*
D*a^2*c*d^4*x^2-288*D*a*b*c^2*d^3*x^2+160*D*b^2*c^3*d^2*x^2-630*A
*a*b*d^5*x+420*A*b^2*c*d^4*x-315*B*a^2*d^5*x+840*B*a*b*c*d^4*x-50
4*B*b^2*c^2*d^3*x+420*C*a^2*c*d^4*x-1008*C*a*b*c^2*d^3*x+576*C*b^
2*c^3*d^2*x-504*D*a^2*c^2*d^3*x+1152*D*a*b*c^3*d^2*x-640*D*b^2*c^
4*d*x+315*A*a^2*d^5-1260*A*a*b*c*d^4+840*A*b^2*c^2*d^3-630*B*a^2*
c*d^4+1680*B*a*b*c^2*d^3-1008*B*b^2*c^3*d^2+840*C*a^2*c^2*d^3-201
6*C*a*b*c^3*d^2+1152*C*b^2*c^4*d-1008*D*a^2*c^3*d^2+2304*D*a*b*c^
4*d-1280*D*b^2*c^5)/d^6
```

Maxima [A] time = 1.36987, size = 533, normalized size = 1.66

$$2\left(\frac{35\,(dx+c)^{\frac{9}{2}}Db^2-45\left(5Db^2c-\left(2Dab+Cb^2\right)d\right)(dx+c)^{\frac{7}{2}}+63\left(10Db^2c^2-4\left(2Dab+Cb^2\right)cd+\left(Da^2+2Cab+Bb^2\right)d^2\right)(dx+c)^{\frac{5}{2}}-105\left(10Db^2c^3-6\left(2Dab+Cb^2\right)\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/(d*x + c)^(3/2),x, algorithm="maxi
```

```
[Out] 2/315*((35*(d*x + c)^(9/2)*D*b^2 - 45*(5*D*b^2*c - (2*D*a*b + C*b
^2)*d)*(d*x + c)^(7/2) + 63*(10*D*b^2*c^2 - 4*(2*D*a*b + C*b^2)*c
*d + (D*a^2 + 2*C*a*b + B*b^2)*d^2)*(d*x + c)^(5/2) - 105*(10*D*b
^2*c^3 - 6*(2*D*a*b + C*b^2)*c^2*d + 3*(D*a^2 + 2*C*a*b + B*b^2)*
c*d^2 - (C*a^2 + 2*B*a*b + A*b^2)*d^3)*(d*x + c)^(3/2) + 315*(5*D
*b^2*c^4 - 4*(2*D*a*b + C*b^2)*c^3*d + 3*(D*a^2 + 2*C*a*b + B*b^2
)*c^2*d^2 - 2*(C*a^2 + 2*B*a*b + A*b^2)*c*d^3 + (B*a^2 + 2*A*a*b)
*d^4)*sqrt(d*x + c))/d^5 + 315*(D*b^2*c^5 - A*a^2*d^5 - (2*D*a*b
+ C*b^2)*c^4*d + (D*a^2 + 2*C*a*b + B*b^2)*c^3*d^2 - (C*a^2 + 2*B
*a*b + A*b^2)*c^2*d^3 + (B*a^2 + 2*A*a*b)*c*d^4)/(sqrt(d*x + c)*d
^5))/d
```

Fricas [A] time = 0.223373, size = 521, normalized size = 1.62

$$\frac{2\left(35Db^2d^5x^5+1280Db^2c^5-315Aa^2d^5-1152\left(2Dab+Cb^2\right)c^4d+1008\left(Da^2+2Cab+Bb^2\right)c^3d^2-840\left(Ca^2+2Bab+A\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/(d*x + c)^(3/2),x, algorithm="fric
```

```
[Out] 2/315*(35*D*b^2*d^5*x^5 + 1280*D*b^2*c^5 - 315*A*a^2*d^5 - 1152*(
2*D*a*b + C*b^2)*c^4*d + 1008*(D*a^2 + 2*C*a*b + B*b^2)*c^3*d^2 -
 840*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 + 630*(B*a^2 + 2*A*a*b)*c*
d^4 - 5*(10*D*b^2*c*d^4 - 9*(2*D*a*b + C*b^2)*d^5)*x^4 + (80*D*b^
```

```
2*c^2*d^3 - 72*(2*D*a*b + C*b^2)*c*d^4 + 63*(D*a^2 + 2*C*a*b + B*
b^2)*d^5)*x^3 - (160*D*b^2*c^3*d^2 - 144*(2*D*a*b + C*b^2)*c^2*d^
3 + 126*(D*a^2 + 2*C*a*b + B*b^2)*c*d^4 - 105*(C*a^2 + 2*B*a*b +
A*b^2)*d^5)*x^2 + (640*D*b^2*c^4*d - 576*(2*D*a*b + C*b^2)*c^3*d^
2 + 504*(D*a^2 + 2*C*a*b + B*b^2)*c^2*d^3 - 420*(C*a^2 + 2*B*a*b
+ A*b^2)*c*d^4 + 315*(B*a^2 + 2*A*a*b)*d^5)*x)/(sqrt(d*x + c)*d^6
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+bx)^2\left(A+Bx+Cx^2+Dx^3\right)}{(c+dx)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**2*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] Integral((a + b*x)**2*(A + B*x + C*x**2 + D*x**3)/(c + d*x)**(3/2
), x)
```

GIAC/XCAS [A] time = 0.222198, size = 879, normalized size = 2.73

$$\frac{2\left(Db^2c^5 - 2\,Dabc^4d - Cb^2c^4d + Da^2c^3d^2 + 2\,Cabc^3d^2 + Bb^2c^3d^2 - Ca^2c^2d^3 - 2\,Babc^2d^3 - Ab^2c^2d^3 + Ba^2cd^4 + 2\,Aabcd^4 - \right.}{\sqrt{dx+c}d^6} + \frac{2\left(35\,(dx+c)^{\frac{9}{2}}Db^2d^{48} - 225\,(dx+c)^{\frac{7}{2}}Db^2cd^{48} + 630\,(dx+c)^{\frac{5}{2}}Db^2c^2d^{48} - 1050\,(dx+c)^{\frac{3}{2}}Db^2c^3d^{48} + 1575\,\sqrt{dx+c}Db^2c^4d^{48}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/(d*x + c)^(3/2),x, algorithm="giac
```

```
[Out] 2*(D*b^2*c^5 - 2*D*a*b*c^4*d - C*b^2*c^4*d + D*a^2*c^3*d^2 + 2*C*
a*b*c^3*d^2 + B*b^2*c^3*d^2 - C*a^2*c^2*d^3 - 2*B*a*b*c^2*d^3 - A
*b^2*c^2*d^3 + B*a^2*c*d^4 + 2*A*a*b*c*d^4 - A*a^2*d^5)/(sqrt(d*x
 + c)*d^6) + 2/315*(35*(d*x + c)^(9/2)*D*b^2*d^48 - 225*(d*x + c)
^(7/2)*D*b^2*c*d^48 + 630*(d*x + c)^(5/2)*D*b^2*c^2*d^48 - 1050*(
d*x + c)^(3/2)*D*b^2*c^3*d^48 + 1575*sqrt(d*x + c)*D*b^2*c^4*d^48
 + 90*(d*x + c)^(7/2)*D*a*b*d^49 + 45*(d*x + c)^(7/2)*C*b^2*d^49
- 504*(d*x + c)^(5/2)*D*a*b*c*d^49 - 252*(d*x + c)^(5/2)*C*b^2*c*
d^49 + 1260*(d*x + c)^(3/2)*D*a*b*c^2*d^49 + 630*(d*x + c)^(3/2)*
C*b^2*c^2*d^49 - 2520*sqrt(d*x + c)*D*a*b*c^3*d^49 - 1260*sqrt(d*
x + c)*C*b^2*c^3*d^49 + 63*(d*x + c)^(5/2)*D*a^2*d^50 + 126*(d*x
+ c)^(5/2)*C*a*b*d^50 + 63*(d*x + c)^(5/2)*B*b^2*d^50 - 315*(d*x
+ c)^(3/2)*D*a^2*c*d^50 - 630*(d*x + c)^(3/2)*C*a*b*c*d^50 - 315*
(d*x + c)^(3/2)*B*b^2*c*d^50 + 945*sqrt(d*x + c)*D*a^2*c^2*d^50 +
```

```
 1890*sqrt(d*x + c)*C*a*b*c^2*d^50 + 945*sqrt(d*x + c)*B*b^2*c^2*
d^50 + 105*(d*x + c)^(3/2)*C*a^2*d^51 + 210*(d*x + c)^(3/2)*B*a*b
*d^51 + 105*(d*x + c)^(3/2)*A*b^2*d^51 - 630*sqrt(d*x + c)*C*a^2*
c*d^51 - 1260*sqrt(d*x + c)*B*a*b*c*d^51 - 630*sqrt(d*x + c)*A*b^
2*c*d^51 + 315*sqrt(d*x + c)*B*a^2*d^52 + 630*sqrt(d*x + c)*A*a*b
*d^52)/d^54
```

3.12 $\int \frac{(a+bx)(A+Bx+Cx^2+Dx^3)}{(c+dx)^{3/2}}\,dx$

Optimal. Leaf size=210

$$-\frac{2\sqrt{c+dx}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{d^5}+\frac{2(bc-ad)\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^5\sqrt{c+dx}}+\frac{2(c+dx)^{3/2}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{3d^5}+\frac{2(c+dx)^{5/2}(adD-4bcD+bCd)}{5d^5}+\frac{2bD(c+dx)^{7/2}}{7d^5}$$

```
[Out] (2*(b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^5*Sqrt[c +
 d*x]) - (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^2*C*d - 2*B
*c*d^2 + A*d^3 - 4*c^3*D))*Sqrt[c + d*x])/d^5 + (2*(a*d*(C*d - 3*
c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*(c + d*x)^(3/2))/(3*d^5) +
(2*(b*C*d - 4*b*c*D + a*d*D)*(c + d*x)^(5/2))/(5*d^5) + (2*b*D*(c
 + d*x)^(7/2))/(7*d^5)
```

Rubi [A] time = 0.342634, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$

$$-\frac{2\sqrt{c+dx}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{d^5}+\frac{2(bc-ad)\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^5\sqrt{c+dx}}+\frac{2(c+dx)^{3/2}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{3d^5}+\frac{2(c+dx)^{5/2}(adD-4bcD+bCd)}{5d^5}+\frac{2bD(c+dx)^{7/2}}{7d^5}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(3/2),x]
```


```
[Out] (2*(b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^5*Sqrt[c +
 d*x]) - (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^2*C*d - 2*B
*c*d^2 + A*d^3 - 4*c^3*D))*Sqrt[c + d*x])/d^5 + (2*(a*d*(C*d - 3*
c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*(c + d*x)^(3/2))/(3*d^5) +
(2*(b*C*d - 4*b*c*D + a*d*D)*(c + d*x)^(5/2))/(5*d^5) + (2*b*D*(c
 + d*x)^(7/2))/(7*d^5)
```

Rubi in Sympy [A] time = 81.1771, size = 224, normalized size = 1.07

$$\frac{2Db\left(c+dx\right)^{\frac{7}{2}}}{7d^5}+\frac{2\left(c+dx\right)^{\frac{5}{2}}\left(Cbd+Dad-4Dbc\right)}{5d^5}+\frac{2\left(c+dx\right)^{\frac{3}{2}}\left(Bbd^2+Cad^2-3Cbcd-3Dacd+6Dbc^2\right)}{3d^5}+\frac{2\sqrt{c+dx}\left(Abd^3+Bad^3-2Bbcd^2-2Cacd^2+3Cbc^2d+3Dac^2d-4Dbc^3\right)}{d^5}-\frac{2\left(ad-bc\right)\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{d^5\sqrt{c+dx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] 2*D*b*(c + d*x)**(7/2)/(7*d**5) + 2*(c + d*x)**(5/2)*(C*b*d + D*a
*d - 4*D*b*c)/(5*d**5) + 2*(c + d*x)**(3/2)*(B*b*d**2 + C*a*d**2
- 3*C*b*c*d - 3*D*a*c*d + 6*D*b*c**2)/(3*d**5) + 2*sqrt(c + d*x)*
(A*b*d**3 + B*a*d**3 - 2*B*b*c*d**2 - 2*C*a*c*d**2 + 3*C*b*c**2*d
 + 3*D*a*c**2*d - 4*D*b*c**3)/d**5 - 2*(a*d - b*c)*(A*d**3 - B*c*
d**2 + C*c**2*d - D*c**3)/(d**5*sqrt(c + d*x))
```

Mathematica [A] time = 0.373705, size = 188, normalized size = 0.9

$$\frac{14ad\left(d^3\left(x\left(15B+5Cx+3Dx^2\right)-15A\right)+2cd^2(15B-x(10C+3Dx))+48c^3D-8c^2d(5C-3Dx)\right)+b\left(4cd^3(105A-x(70B\right.}{105d^5\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(3/2),x]
```

```
[Out] (14*a*d*(48*c^3*D - 8*c^2*d*(5*C - 3*D*x) + 2*c*d^2*(15*B - x*(10
*C + 3*D*x)) + d^3*(-15*A + x*(15*B + 5*C*x + 3*D*x^2))) + b*(-76
8*c^4*D + 96*c^3*d*(7*C - 4*D*x) + 16*c^2*d^2*(-35*B + 3*x*(7*C +
 2*D*x)) + 4*c*d^3*(105*A - x*(70*B + 3*x*(7*C + 4*D*x))) + 2*d^4
*x*(105*A + x*(35*B + 3*x*(7*C + 5*D*x)))))/(105*d^5*Sqrt[c + d*x
])
```

Maple [A] time = 0.008, size = 241, normalized size = 1.2

$$-\frac{-30\,Dbx^4d^4-42\,Cbd^4x^3-42\,Dad^4x^3+48\,Dbcd^3x^3-70\,Bbd^4x^2-70\,Cad^4x^2+84\,Cbcd^3x^2+84\,Dacd^3x^2-96\,Dbc^2d^2x^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(3/2),x)
```

```
[Out] -2/105/(d*x+c)^(1/2)*(-15*D*b*d^4*x^4-21*C*b*d^4*x^3-21*D*a*d^4*x
^3+24*D*b*c*d^3*x^3-35*B*b*d^4*x^2-35*C*a*d^4*x^2+42*C*b*c*d^3*x^
2+42*D*a*c*d^3*x^2-48*D*b*c^2*d^2*x^2-105*A*b*d^4*x-105*B*a*d^4*x
+140*B*b*c*d^3*x+140*C*a*c*d^3*x-168*C*b*c^2*d^2*x-168*D*a*c^2*d^
2*x+192*D*b*c^3*d*x+105*A*a*d^4-210*A*b*c*d^3-210*B*a*c*d^3+280*B
*b*c^2*d^2+280*C*a*c^2*d^2-336*C*b*c^3*d-336*D*a*c^3*d+384*D*b*c^
4)/d^5
```

Maxima [A] time = 1.35549, size = 278, normalized size = 1.32

$$\frac{2\left(\frac{15\,(dx+c)^{\frac{7}{2}}Db-21\,(4\,Dbc-(Da+Cb)d)(dx+c)^{\frac{5}{2}}+35\,\left(6\,Dbc^2-3\,(Da+Cb)cd+(Ca+Bb)d^2\right)(dx+c)^{\frac{3}{2}}-105\,\left(4\,Dbc^3-3\,(Da+Cb)c^2d+2\,(Ca+Bb)cd^2-(Ba+Ab)d^3\right.}{d^4}\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/(d*x + c)^(3/2),x, algorithm="maxima
```

```
[Out] 2/105*((15*(d*x + c)^(7/2)*D*b - 21*(4*D*b*c - (D*a + C*b)*d)*(d*
x + c)^(5/2) + 35*(6*D*b*c^2 - 3*(D*a + C*b)*c*d + (C*a + B*b)*d^
2)*(d*x + c)^(3/2) - 105*(4*D*b*c^3 - 3*(D*a + C*b)*c^2*d + 2*(C*
a + B*b)*c*d^2 - (B*a + A*b)*d^3)*sqrt(d*x + c))/d^4 - 105*(D*b*c
^4 + A*a*d^4 - (D*a + C*b)*c^3*d + (C*a + B*b)*c^2*d^2 - (B*a + A
*b)*c*d^3)/(sqrt(d*x + c)*d^4))/d
```

Fricas [A] time = 0.212791, size = 265, normalized size = 1.26

$$\frac{2\left(15\,Dbd^4x^4-384\,Dbc^4-105\,Aad^4+336\,(Da+Cb)c^3d-280\,(Ca+Bb)c^2d^2+210\,(Ba+Ab)cd^3-3\,\left(8\,Dbcd^3-7\,(Da+C\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/(d*x + c)^(3/2),x, algorithm="fricas
```

```
[Out] 2/105*(15*D*b*d^4*x^4 - 384*D*b*c^4 - 105*A*a*d^4 + 336*(D*a + C*
b)*c^3*d - 280*(C*a + B*b)*c^2*d^2 + 210*(B*a + A*b)*c*d^3 - 3*(8
*D*b*c*d^3 - 7*(D*a + C*b)*d^4)*x^3 + (48*D*b*c^2*d^2 - 42*(D*a +
 C*b)*c*d^3 + 35*(C*a + B*b)*d^4)*x^2 - (192*D*b*c^3*d - 168*(D*a
 + C*b)*c^2*d^2 + 140*(C*a + B*b)*c*d^3 - 105*(B*a + A*b)*d^4)*x)
/(sqrt(d*x + c)*d^5)
```

Sympy [A] time = 48.6013, size = 7874, normalized size = 37.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] -2*A*a/(d*sqrt(c + d*x)) + A*b*Piecewise((4*c/(d**2*sqrt(c + d*x)
) + 2*x/(d*sqrt(c + d*x)), Ne(d, 0)), (x**2/(2*c**(3/2)), True))
+ B*a*Piecewise((4*c/(d**2*sqrt(c + d*x)) + 2*x/(d*sqrt(c + d*x))
, Ne(d, 0)), (x**2/(2*c**(3/2)), True)) + B*b*(-16*c**(19/2)*sqrt
(1 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c
**5*d**6*x**3) + 16*c**(19/2)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c*
*6*d**5*x**2 + 3*c**5*d**6*x**3) - 40*c**(17/2)*d*x*sqrt(1 + d*x/
c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*
x**3) + 48*c**(17/2)*d*x/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d*
*5*x**2 + 3*c**5*d**6*x**3) - 30*c**(15/2)*d**2*x**2*sqrt(1 + d*x
/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6
*x**3) + 48*c**(15/2)*d**2*x**2/(3*c**8*d**3 + 9*c**7*d**4*x + 9*
c**6*d**5*x**2 + 3*c**5*d**6*x**3) - 4*c**(13/2)*d**3*x**3*sqrt(1
 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**
5*d**6*x**3) + 16*c**(13/2)*d**3*x**3/(3*c**8*d**3 + 9*c**7*d**4*
x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) + 2*c**(11/2)*d**4*x**4*
sqrt(1 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 +
 3*c**5*d**6*x**3)) + C*a*(-16*c**(19/2)*sqrt(1 + d*x/c)/(3*c**8*
d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) + 16*
c**(19/2)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**
5*d**6*x**3) - 40*c**(17/2)*d*x*sqrt(1 + d*x/c)/(3*c**8*d**3 + 9*
c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) + 48*c**(17/2)
*d*x/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**
6*x**3) - 30*c**(15/2)*d**2*x**2*sqrt(1 + d*x/c)/(3*c**8*d**3 + 9
*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) + 48*c**(15/2
)*d**2*x**2/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c
**5*d**6*x**3) - 4*c**(13/2)*d**3*x**3*sqrt(1 + d*x/c)/(3*c**8*d*
*3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) + 16*c*
*(13/2)*d**3*x**3/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2
 + 3*c**5*d**6*x**3) + 2*c**(11/2)*d**4*x**4*sqrt(1 + d*x/c)/(3*c
**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3))
+ C*b*(32*c**(45/2)*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5
*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**
4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 32*c**(45/2)/(5*c*
*20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*
x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x*
*6) + 176*c**(43/2)*d*x*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*
d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8
*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 192*c**(43/2)*
d*x/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c*
*17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14
*d**10*x**6) + 396*c**(41/2)*d**2*x**2*sqrt(1 + d*x/c)/(5*c**20*d
**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3
+ 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) -
 480*c**(41/2)*d**2*x**2/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**
18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**1
```

```
5*d**9*x**5 + 5*c**14*d**10*x**6) + 462*c**(39/2)*d**3*x**3*sqrt(
1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 +
 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 +
5*c**14*d**10*x**6) - 640*c**(39/2)*d**3*x**3/(5*c**20*d**4 + 30*
c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**1
6*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 290*c**(
37/2)*d**4*x**4*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x +
 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 +
30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 480*c**(37/2)*d**4*x**
4/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**1
7*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d
**10*x**6) + 92*c**(35/2)*d**5*x**5*sqrt(1 + d*x/c)/(5*c**20*d**4
 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 7
5*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 19
2*c**(35/2)*d**5*x**5/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*
d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d
**9*x**5 + 5*c**14*d**10*x**6) + 16*c**(33/2)*d**6*x**6*sqrt(1 +
d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100
*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c*
*14*d**10*x**6) - 32*c**(33/2)*d**6*x**6/(5*c**20*d**4 + 30*c**19
*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**
8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 6*c**(31/2)*d
**7*x**7*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**
18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**1
5*d**9*x**5 + 5*c**14*d**10*x**6) + 2*c**(29/2)*d**8*x**8*sqrt(1
+ d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 1
00*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*
c**14*d**10*x**6)) + D*a*(32*c**(45/2)*sqrt(1 + d*x/c)/(5*c**20*d
**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3
+ 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) -
 32*c**(45/2)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**
2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5
 + 5*c**14*d**10*x**6) + 176*c**(43/2)*d*x*sqrt(1 + d*x/c)/(5*c**
20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x
**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**
6) - 192*c**(43/2)*d*x/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18
*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*
d**9*x**5 + 5*c**14*d**10*x**6) + 396*c**(41/2)*d**2*x**2*sqrt(1
+ d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 1
00*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*
c**14*d**10*x**6) - 480*c**(41/2)*d**2*x**2/(5*c**20*d**4 + 30*c*
*19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*
d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 462*c**(39
/2)*d**3*x**3*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 7
5*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30
*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 640*c**(39/2)*d**3*x**3/
(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*
d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**
10*x**6) + 290*c**(37/2)*d**4*x**4*sqrt(1 + d*x/c)/(5*c**20*d**4
+ 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75
*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 480
*c**(37/2)*d**4*x**4/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d
**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d*
*9*x**5 + 5*c**14*d**10*x**6) + 92*c**(35/2)*d**5*x**5*sqrt(1 + d
*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*
c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**
```

```
14*d**10*x**6) - 192*c**(35/2)*d**5*x**5/(5*c**20*d**4 + 30*c**19
*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**
8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 16*c**(33/2)*
d**6*x**6*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c*
*18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**
15*d**9*x**5 + 5*c**14*d**10*x**6) - 32*c**(33/2)*d**6*x**6/(5*c*
*20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*
x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x*
*6) + 6*c**(31/2)*d**7*x**7*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c*
*19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*
d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 2*c**(29/2
)*d**8*x**8*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*
c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c
**15*d**9*x**5 + 5*c**14*d**10*x**6)) + D*b*(-256*c**(87/2)*sqrt(
1 + d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x*
*2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**
10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c*
*32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) + 2
56*c**(87/2)/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*
x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d
**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*
c**32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) -
 2432*c**(85/2)*d*x*sqrt(1 + d*x/c)/(35*c**40*d**5 + 350*c**39*d*
*6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d
**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c
**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9 +
35*c**30*d**15*x**10) + 2560*c**(85/2)*d*x/(35*c**40*d**5 + 350*c
**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*
c**36*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 +
 4200*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*
x**9 + 35*c**30*d**15*x**10) - 10336*c**(83/2)*d**2*x**2*sqrt(1 +
 d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2
+ 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*
x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32
*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) + 1152
0*c**(83/2)*d**2*x**2/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c*
*38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 882
0*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**
7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15
*x**10) - 25840*c**(81/2)*d**3*x**3*sqrt(1 + d*x/c)/(35*c**40*d**
5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**
3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**
11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**
31*d**14*x**9 + 35*c**30*d**15*x**10) + 30720*c**(81/2)*d**3*x**3
/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*
c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 +
7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*
x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) - 41990*c**(7
9/2)*d**4*x**4*sqrt(1 + d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*x
+ 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x
**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*
d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c*
*30*d**15*x**10) + 53760*c**(79/2)*d**4*x**4/(35*c**40*d**5 + 350
*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 735
0*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6
 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**1
```

```
4*x**9 + 35*c**30*d**15*x**10) - 46182*c**(77/2)*d**5*x**5*sqrt(1
 + d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**
2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**1
0*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**
32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) + 64
512*c**(77/2)*d**5*x**5/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*
c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8
820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x
**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**
15*x**10) - 34584*c**(75/2)*d**6*x**6*sqrt(1 + d*x/c)/(35*c**40*d
**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x
**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d
**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c
**31*d**14*x**9 + 35*c**30*d**15*x**10) + 53760*c**(75/2)*d**6*x*
*6/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2 + 420
0*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5
+ 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**1
3*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) - 17112*c**
(73/2)*d**7*x**7*sqrt(1 + d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*
x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9
*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**3
3*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*
c**30*d**15*x**10) + 30720*c**(73/2)*d**7*x**7/(35*c**40*d**5 + 3
50*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7
350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x*
*6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d*
*14*x**9 + 35*c**30*d**15*x**10) - 4980*c**(71/2)*d**8*x**8*sqrt(
1 + d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x*
*2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**
10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c*
*32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) + 1
1520*c**(71/2)*d**8*x**8/(35*c**40*d**5 + 350*c**39*d**6*x + 1575
*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 +
8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*
x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d*
*15*x**10) - 340*c**(69/2)*d**9*x**9*sqrt(1 + d*x/c)/(35*c**40*d*
*5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x*
*3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d*
*11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c*
*31*d**14*x**9 + 35*c**30*d**15*x**10) + 2560*c**(69/2)*d**9*x**9
/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*
c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 +
7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*
x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) + 424*c**(67/
2)*d**10*x**10*sqrt(1 + d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*x
+ 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x
**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*
d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c*
*30*d**15*x**10) + 256*c**(67/2)*d**10*x**10/(35*c**40*d**5 + 350
*c**39*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 735
0*c**36*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6
 + 4200*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**1
4*x**9 + 35*c**30*d**15*x**10) + 248*c**(65/2)*d**11*x**11*sqrt(1
 + d*x/c)/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**
2 + 4200*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**1
0*x**5 + 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**
```

```
32*d**13*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10) + 74
*c**(63/2)*d**12*x**12*sqrt(1 + d*x/c)/(35*c**40*d**5 + 350*c**39
*d**6*x + 1575*c**38*d**7*x**2 + 4200*c**37*d**8*x**3 + 7350*c**3
6*d**9*x**4 + 8820*c**35*d**10*x**5 + 7350*c**34*d**11*x**6 + 420
0*c**33*d**12*x**7 + 1575*c**32*d**13*x**8 + 350*c**31*d**14*x**9
 + 35*c**30*d**15*x**10) + 10*c**(61/2)*d**13*x**13*sqrt(1 + d*x/
c)/(35*c**40*d**5 + 350*c**39*d**6*x + 1575*c**38*d**7*x**2 + 420
0*c**37*d**8*x**3 + 7350*c**36*d**9*x**4 + 8820*c**35*d**10*x**5
+ 7350*c**34*d**11*x**6 + 4200*c**33*d**12*x**7 + 1575*c**32*d**1
3*x**8 + 350*c**31*d**14*x**9 + 35*c**30*d**15*x**10))
```

GIAC/XCAS [A] time = 0.216426, size = 436, normalized size = 2.08

$$-\frac{2\left(Dbc^4 - Dac^3d - Cbc^3d + Cac^2d^2 + Bbc^2d^2 - Bacd^3 - Abcd^3 + Aad^4\right)}{\sqrt{dx+c}\,d^5} + \frac{2\left(15\,(dx+c)^{\frac{7}{2}}Dbd^{30} - 84\,(dx+c)^{\frac{5}{2}}Dbcd^{30} + 210\,(dx+c)^{\frac{3}{2}}Dbc^2d^{30} - 420\,\sqrt{dx+c}Dbc^3d^{30} + 21\,(dx+c)^{\frac{5}{2}}Dad^{31} + 21\,(dx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/(d*x + c)^(3/2),x, algorithm="giac")
```

```
[Out] -2*(D*b*c^4 - D*a*c^3*d - C*b*c^3*d + C*a*c^2*d^2 + B*b*c^2*d^2 -
 B*a*c*d^3 - A*b*c*d^3 + A*a*d^4)/(sqrt(d*x + c)*d^5) + 2/105*(15
*(d*x + c)^(7/2)*D*b*d^30 - 84*(d*x + c)^(5/2)*D*b*c*d^30 + 210*(
d*x + c)^(3/2)*D*b*c^2*d^30 - 420*sqrt(d*x + c)*D*b*c^3*d^30 + 21
*(d*x + c)^(5/2)*D*a*d^31 + 21*(d*x + c)^(5/2)*C*b*d^31 - 105*(d*
x + c)^(3/2)*D*a*c*d^31 - 105*(d*x + c)^(3/2)*C*b*c*d^31 + 315*sq
rt(d*x + c)*D*a*c^2*d^31 + 315*sqrt(d*x + c)*C*b*c^2*d^31 + 35*(d
*x + c)^(3/2)*C*a*d^32 + 35*(d*x + c)^(3/2)*B*b*d^32 - 210*sqrt(d
*x + c)*C*a*c*d^32 - 210*sqrt(d*x + c)*B*b*c*d^32 + 105*sqrt(d*x
+ c)*B*a*d^33 + 105*sqrt(d*x + c)*A*b*d^33)/d^35
```

3.13 $\int \frac{A+Bx+Cx^2+Dx^3}{(c+dx)^{3/2}}\,dx$

Optimal. Leaf size=113

$$-\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^4\sqrt{c+dx}}-\frac{2\sqrt{c+dx}\left(-Bd^2-3c^2D+2cCd\right)}{d^4}+\frac{2(c+dx)^{3/2}(Cd-3cD)}{3d^4}+\frac{2D(c+dx)^{5/2}}{5d^4}$$

```
[Out] (-2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^4*Sqrt[c + d*x]) - (2
*(2*c*C*d - B*d^2 - 3*c^2*D)*Sqrt[c + d*x])/d^4 + (2*(C*d - 3*c*D
)*(c + d*x)^(3/2))/(3*d^4) + (2*D*(c + d*x)^(5/2))/(5*d^4)
```

Rubi [A] time = 0.143156, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.04

$$-\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^4\sqrt{c+dx}}-\frac{2\sqrt{c+dx}\left(-Bd^2-3c^2D+2cCd\right)}{d^4}+\frac{2(c+dx)^{3/2}(Cd-3cD)}{3d^4}+\frac{2D(c+dx)^{5/2}}{5d^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/(c + d*x)^(3/2),x]
```

```
[Out] (-2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^4*Sqrt[c + d*x]) - (2
*(2*c*C*d - B*d^2 - 3*c^2*D)*Sqrt[c + d*x])/d^4 + (2*(C*d - 3*c*D
)*(c + d*x)^(3/2))/(3*d^4) + (2*D*(c + d*x)^(5/2))/(5*d^4)
```

Rubi in Sympy [A] time = 27.8429, size = 114, normalized size = 1.01

$$\frac{2D\left(c+dx\right)^{\frac{5}{2}}}{5d^4}+\frac{2\left(c+dx\right)^{\frac{3}{2}}\left(Cd-3Dc\right)}{3d^4}+\frac{2\sqrt{c+dx}\left(Bd^2-2Ccd+3Dc^2\right)}{d^4}-\frac{2\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{d^4\sqrt{c+dx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] 2*D*(c + d*x)**(5/2)/(5*d**4) + 2*(c + d*x)**(3/2)*(C*d - 3*D*c)/
(3*d**4) + 2*sqrt(c + d*x)*(B*d**2 - 2*C*c*d + 3*D*c**2)/d**4 - 2
*(A*d**3 - B*c*d**2 + C*c**2*d - D*c**3)/(d**4*sqrt(c + d*x))
```

Mathematica [A] time = 0.0889582, size = 82, normalized size = 0.73

$$\frac{2\left(d^3\left(x\left(15B+5Cx+3Dx^2\right)-15A\right)+2cd^2(15B-x(10C+3Dx))+48c^3D-8c^2d(5C-3Dx)\right)}{15d^4\sqrt{c+dx}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/(c + d*x)^(3/2),x]
```

```
[Out] (2*(48*c^3*D - 8*c^2*d*(5*C - 3*D*x) + 2*c*d^2*(15*B - x*(10*C +
3*D*x)) + d^3*(-15*A + x*(15*B + 5*C*x + 3*D*x^2))))/(15*d^4*Sqrt
[c + d*x])
```

Maple [A] time = 0.009, size = 91, normalized size = 0.8

$$-\frac{-6\,Dx^3d^3-10\,Cd^3x^2+12\,Dcd^2x^2-30\,Bd^3x+40\,Ccd^2x-48\,Dc^2dx+30\,Ad^3-60\,Bcd^2+80\,Cc^2d-96\,Dc^3}{15\,d^4}\frac{1}{\sqrt{dx+c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(d*x+c)^(3/2),x)
```

```
[Out] -2/15/(d*x+c)^(1/2)*(-3*D*d^3*x^3-5*C*d^3*x^2+6*D*c*d^2*x^2-15*B*
d^3*x+20*C*c*d^2*x-24*D*c^2*d*x+15*A*d^3-30*B*c*d^2+40*C*c^2*d-48
*D*c^3)/d^4
```

Maxima [A] time = 1.35154, size = 138, normalized size = 1.22

$$\frac{2\left(\frac{3\,(dx+c)^{\frac{5}{2}}D-5\,(3\,Dc-Cd)(dx+c)^{\frac{3}{2}}+15\left(3\,Dc^2-2\,Ccd+Bd^2\right)\sqrt{dx+c}}{d^3}+\frac{15\left(Dc^3-Cc^2d+Bcd^2-Ad^3\right)}{\sqrt{dx+c}\,d^3}\right)}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/(d*x + c)^(3/2),x, algorithm="maxima")
```

```
[Out] 2/15*((3*(d*x + c)^(5/2)*D - 5*(3*D*c - C*d)*(d*x + c)^(3/2) + 15
*(3*D*c^2 - 2*C*c*d + B*d^2)*sqrt(d*x + c))/d^3 + 15*(D*c^3 - C*c
^2*d + B*c*d^2 - A*d^3)/(sqrt(d*x + c)*d^3))/d
```

Fricas [A] time = 0.218068, size = 122, normalized size = 1.08

$$\frac{2\left(3\,Dd^3x^3 + 48\,Dc^3 - 40\,Cc^2d + 30\,Bcd^2 - 15\,Ad^3 - \left(6\,Dcd^2 - 5\,Cd^3\right)x^2 + \left(24\,Dc^2d - 20\,Ccd^2 + 15\,Bd^3\right)x\right)}{15\,\sqrt{dx+c}d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/(d*x + c)^(3/2),x, algorithm="fricas")
```

```
[Out] 2/15*(3*D*d^3*x^3 + 48*D*c^3 - 40*C*c^2*d + 30*B*c*d^2 - 15*A*d^3
 - (6*D*c*d^2 - 5*C*d^3)*x^2 + (24*D*c^2*d - 20*C*c*d^2 + 15*B*d^
3)*x)/(sqrt(d*x + c)*d^4)
```

Sympy [A] time = 19.3877, size = 2132, normalized size = 18.87

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(d*x+c)**(3/2),x)
```

```
[Out] -2*A/(d*sqrt(c + d*x)) + B*Piecewise((4*c/(d**2*sqrt(c + d*x)) +
2*x/(d*sqrt(c + d*x)), Ne(d, 0)), (x**2/(2*c**(3/2)), True)) + C*
(-16*c**(19/2)*sqrt(1 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c
**6*d**5*x**2 + 3*c**5*d**6*x**3) + 16*c**(19/2)/(3*c**8*d**3 + 9
*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) - 40*c**(17/2
)*d*x*sqrt(1 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5*
x**2 + 3*c**5*d**6*x**3) + 48*c**(17/2)*d*x/(3*c**8*d**3 + 9*c**7
*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) - 30*c**(15/2)*d**
2*x**2*sqrt(1 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**6*d**5
*x**2 + 3*c**5*d**6*x**3) + 48*c**(15/2)*d**2*x**2/(3*c**8*d**3 +
 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) - 4*c**(13/
2)*d**3*x**3*sqrt(1 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x + 9*c**
6*d**5*x**2 + 3*c**5*d**6*x**3) + 16*c**(13/2)*d**3*x**3/(3*c**8*
d**3 + 9*c**7*d**4*x + 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3) + 2*c
**(11/2)*d**4*x**4*sqrt(1 + d*x/c)/(3*c**8*d**3 + 9*c**7*d**4*x +
 9*c**6*d**5*x**2 + 3*c**5*d**6*x**3)) + D*(32*c**(45/2)*sqrt(1 +
 d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 10
0*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c
**14*d**10*x**6) - 32*c**(45/2)/(5*c**20*d**4 + 30*c**19*d**5*x +
 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 +
30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 176*c**(43/2)*d*x*sqrt
(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2
+ 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 +
 5*c**14*d**10*x**6) - 192*c**(43/2)*d*x/(5*c**20*d**4 + 30*c**19
*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**
8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 396*c**(41/2)
*d**2*x**2*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c
**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c*
```

```
*15*d**9*x**5 + 5*c**14*d**10*x**6) - 480*c**(41/2)*d**2*x**2/(5*
c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**
7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*
x**6) + 462*c**(39/2)*d**3*x**3*sqrt(1 + d*x/c)/(5*c**20*d**4 + 3
0*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c*
*16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 640*c*
*(39/2)*d**3*x**3/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6
*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*
x**5 + 5*c**14*d**10*x**6) + 290*c**(37/2)*d**4*x**4*sqrt(1 + d*x
/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c*
*17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14
*d**10*x**6) - 480*c**(37/2)*d**4*x**4/(5*c**20*d**4 + 30*c**19*d
**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*
x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) + 92*c**(35/2)*d*
*5*x**5*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**1
8*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15
*d**9*x**5 + 5*c**14*d**10*x**6) - 192*c**(35/2)*d**5*x**5/(5*c**
20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x
**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**
6) + 16*c**(33/2)*d**6*x**6*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*c*
*19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**16*
d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6) - 32*c**(33/
2)*d**6*x**6/(5*c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2
 + 100*c**17*d**7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5
+ 5*c**14*d**10*x**6) + 6*c**(31/2)*d**7*x**7*sqrt(1 + d*x/c)/(5*
c**20*d**4 + 30*c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**
7*x**3 + 75*c**16*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*
x**6) + 2*c**(29/2)*d**8*x**8*sqrt(1 + d*x/c)/(5*c**20*d**4 + 30*
c**19*d**5*x + 75*c**18*d**6*x**2 + 100*c**17*d**7*x**3 + 75*c**1
6*d**8*x**4 + 30*c**15*d**9*x**5 + 5*c**14*d**10*x**6))
```

GIAC/XCAS [A] time = 0.211352, size = 171, normalized size = 1.51

$$\frac{2\left(Dc^3 - Cc^2d + Bcd^2 - Ad^3\right)}{\sqrt{dx+c}\,d^4} + \frac{2\left(3\,(dx+c)^{\frac{5}{2}}Dd^{16} - 15\,(dx+c)^{\frac{3}{2}}Dcd^{16} + 45\,\sqrt{dx+c}Dc^2d^{16} + 5\,(dx+c)^{\frac{3}{2}}Cd^{17} - 30\,\sqrt{dx+c}Ccd^{17} + 15\,\sqrt{dx+c}Bd^{18}\right)}{15\,d^{20}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/(d*x + c)^(3/2),x, algorithm="giac")
```

```
[Out] 2*(D*c^3 - C*c^2*d + B*c*d^2 - A*d^3)/(sqrt(d*x + c)*d^4) + 2/15*
(3*(d*x + c)^(5/2)*D*d^16 - 15*(d*x + c)^(3/2)*D*c*d^16 + 45*sqrt
(d*x + c)*D*c^2*d^16 + 5*(d*x + c)^(3/2)*C*d^17 - 30*sqrt(d*x + c
)*C*c*d^17 + 15*sqrt(d*x + c)*B*d^18)/d^20
```

3.14 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)(c+dx)^{3/2}}\,dx$

Optimal. Leaf size=193

$$-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{5/2}(bc-ad)^{3/2}}+\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^3\sqrt{c+dx}(bc-ad)}+\frac{2\sqrt{c+dx}(-adD-bcD+bCd)}{b^2d^3}+\frac{2D(c+dx)^{3/2}}{3bd^3}-\frac{2cD\sqrt{c+dx}}{bd^3}$$

```
[Out] (2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^3*(b*c - a*d)*Sqrt[c +
 d*x]) - (2*c*D*Sqrt[c + d*x])/(b*d^3) + (2*(b*C*d - b*c*D - a*d*
D)*Sqrt[c + d*x])/(b^2*d^3) + (2*D*(c + d*x)^(3/2))/(3*b*d^3) - (
2*(A*b^3 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d
*x])/Sqrt[b*c - a*d]])/(b^(5/2)*(b*c - a*d)^(3/2))
```

Rubi [A] time = 0.460671, antiderivative size = 193, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{5/2}(bc-ad)^{3/2}}+\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^3\sqrt{c+dx}(bc-ad)}+\frac{2\sqrt{c+dx}(-adD-bcD+bCd)}{b^2d^3}+\frac{2D(c+dx)^{3/2}}{3bd^3}-\frac{2cD\sqrt{c+dx}}{bd^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)*(c + d*x)^(3/2)),x]
```

```
[Out] (2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(d^3*(b*c - a*d)*Sqrt[c +
 d*x]) - (2*c*D*Sqrt[c + d*x])/(b*d^3) + (2*(b*C*d - b*c*D - a*d*
D)*Sqrt[c + d*x])/(b^2*d^3) + (2*D*(c + d*x)^(3/2))/(3*b*d^3) - (
2*(A*b^3 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d
*x])/Sqrt[b*c - a*d]])/(b^(5/2)*(b*c - a*d)^(3/2))
```

Rubi in Sympy [A] time = 142.635, size = 243, normalized size = 1.26

$$\frac{2D\left(c+dx\right)^{\frac{3}{2}}}{3bd^3}+\frac{2\sqrt{c+dx}\left(Cbd-Dad-2Dbc\right)}{b^2d^3}-\frac{2\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{b^3\sqrt{c+dx}\left(ad-bc\right)}-\frac{2\left(Bb^2d^2-Cabd^2-Cb^2cd+Da^2d^2+Dabcd+Db^2c^2\right)}{b^3d^3\sqrt{c+dx}}-\frac{2\left(Ab^3-Bab^2+Ca^2b-Da^3\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{5}{2}}\left(ad-bc\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(3/2),x)
```

```
[Out] 2*D*(c + d*x)**(3/2)/(3*b*d**3) + 2*sqrt(c + d*x)*(C*b*d - D*a*d
- 2*D*b*c)/(b**2*d**3) - 2*(A*b**3 - B*a*b**2 + C*a**2*b - D*a**3
)/(b**3*sqrt(c + d*x)*(a*d - b*c)) - 2*(B*b**2*d**2 - C*a*b*d**2
- C*b**2*c*d + D*a**2*d**2 + D*a*b*c*d + D*b**2*c**2)/(b**3*d**3*
sqrt(c + d*x)) - 2*(A*b**3 - B*a*b**2 + C*a**2*b - D*a**3)*atan(s
qrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b**(5/2)*(a*d - b*c)**(3/2
))
```

Mathematica [A] time = 0.738247, size = 159, normalized size = 0.82

$$\frac{2\sqrt{c+dx}\left(\frac{3\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{(c+dx)(bc-ad)}-\frac{3adD}{b^2}+\frac{-5cD+3Cd+dDx}{b}\right)}{3d^3}-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{5/2}(bc-ad)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)*(c + d*x)^(3/2)),x]
```

```
[Out] (2*Sqrt[c + d*x]*((-3*a*d*D)/b^2 + (3*(c^2*C*d - B*c*d^2 + A*d^3
- c^3*D))/((b*c - a*d)*(c + d*x)) + (3*C*d - 5*c*D + d*D*x)/b))/(
3*d^3) - (2*(A*b^3 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh[(Sqrt[b]*
Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(5/2)*(b*c - a*d)^(3/2))
```

Maple [B] time = 0.019, size = 366, normalized size = 1.9

$$\frac{2D}{3bd^3}(dx+c)^{\frac{3}{2}}+2\frac{C\sqrt{dx+c}}{bd^2}-2\frac{Da\sqrt{dx+c}}{b^2d^2}-4\frac{cD\sqrt{dx+c}}{bd^3}-2\frac{Ab}{(ad-bc)\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)+2\frac{Ba}{(ad-bc)\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)-2\frac{Ca^2}{(ad-bc)b\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)+2\frac{Da^3}{(ad-bc)b^2\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)-2\frac{A}{(ad-bc)\sqrt{dx+c}}+2\frac{Bc}{(ad-bc)d\sqrt{dx+c}}-2\frac{c^2C}{d^2(ad-bc)\sqrt{dx+c}}+2\frac{Dc^3}{d^3(ad-bc)\sqrt{dx+c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)/(d*x+c)^(3/2),x)
```

```
[Out] 2/3*D*(d*x+c)^(3/2)/b/d^3+2/d^2/b*C*(d*x+c)^(1/2)-2/d^2/b^2*D*a*(
d*x+c)^(1/2)-4*c*D*(d*x+c)^(1/2)/b/d^3-2*b/(a*d-b*c)/((a*d-b*c)*b
)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A+2/(a*d-b*c)
/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*
B*a-2/b/(a*d-b*c)/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*
d-b*c)*b)^(1/2))*C*a^2+2/b^2/(a*d-b*c)/((a*d-b*c)*b)^(1/2)*arctan
((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a^3-2/(a*d-b*c)/(d*x+c)^(
1/2)*A+2/d/(a*d-b*c)/(d*x+c)^(1/2)*B*c-2/d^2/(a*d-b*c)/(d*x+c)^(1
/2)*C*c^2+2/d^3/(a*d-b*c)/(d*x+c)^(1/2)*D*c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*(d*x + c)^(3/2)),x, algorithm="maxi
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229387, size = 1, normalized size = 0.01

$$\Bigg[-\frac{3\,(Da^3 - Ca^2b + Bab^2 - Ab^3)\sqrt{dx+c}\,d^3\log\left(\frac{\sqrt{b^2c-abd}(bdx+2\,bc-ad)-2\,(b^2c-abd)\sqrt{dx+c}}{bx+a}\right) + 2\,(8\,Db^2c^3 - 3\,Ab^2d^3 - 2\,(Dab +}{3\,(b^3cd^3 - ab}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*(d*x + c)^(3/2)),x, algorithm="fric
```

```
[Out] [-1/3*(3*(D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*sqrt(d*x + c)*d^3*lo
g((sqrt(b^2*c - a*b*d)*(b*d*x + 2*b*c - a*d) - 2*(b^2*c - a*b*d)*
sqrt(d*x + c))/(b*x + a)) + 2*(8*D*b^2*c^3 - 3*A*b^2*d^3 - 2*(D*a
*b + 3*C*b^2)*c^2*d - 3*(D*a^2 - C*a*b - B*b^2)*c*d^2 - (D*b^2*c*
d^2 - D*a*b*d^3)*x^2 + (4*D*b^2*c^2*d - (D*a*b + 3*C*b^2)*c*d^2 -
 3*(D*a^2 - C*a*b)*d^3)*x)*sqrt(b^2*c - a*b*d))/((b^3*c*d^3 - a*b
^2*d^4)*sqrt(b^2*c - a*b*d)*sqrt(d*x + c)), 2/3*(3*(D*a^3 - C*a^2
*b + B*a*b^2 - A*b^3)*sqrt(d*x + c)*d^3*arctan(-(b*c - a*d)/(sqrt
(-b^2*c + a*b*d)*sqrt(d*x + c))) - (8*D*b^2*c^3 - 3*A*b^2*d^3 - 2
*(D*a*b + 3*C*b^2)*c^2*d - 3*(D*a^2 - C*a*b - B*b^2)*c*d^2 - (D*b
^2*c*d^2 - D*a*b*d^3)*x^2 + (4*D*b^2*c^2*d - (D*a*b + 3*C*b^2)*c*
```

```
d^2 - 3*(D*a^2 - C*a*b)*d^3)*x)*sqrt(-b^2*c + a*b*d))/((b^3*c*d^3
 - a*b^2*d^4)*sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Bx + Cx^2 + Dx^3}{(a + bx)(c + dx)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(3/2),x)
```

```
[Out] Integral((A + B*x + C*x**2 + D*x**3)/((a + b*x)*(c + d*x)**(3/2))
, x)
```

GIAC/XCAS [A] time = 0.217296, size = 270, normalized size = 1.4

$$-\frac{2\left(Da^3 - Ca^2b + Bab^2 - Ab^3\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right)}{(b^3c - ab^2d)\sqrt{-b^2c + abd}} - \frac{2\left(Dc^3 - Cc^2d + Bcd^2 - Ad^3\right)}{(bcd^3 - ad^4)\sqrt{dx + c}} + \frac{2\left((dx + c)^{\frac{3}{2}}Db^2d^6 - 6\sqrt{dx + c}Db^2cd^6 - 3\sqrt{dx + c}Dabd^7 + 3\sqrt{dx + c}Cb^2d^7\right)}{3\,b^3d^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*(d*x + c)^(3/2)),x, algorithm="giac
```

```
[Out] -2*(D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*arctan(sqrt(d*x + c)*b/sqr
t(-b^2*c + a*b*d))/((b^3*c - a*b^2*d)*sqrt(-b^2*c + a*b*d)) - 2*(
D*c^3 - C*c^2*d + B*c*d^2 - A*d^3)/((b*c*d^3 - a*d^4)*sqrt(d*x +
c)) + 2/3*((d*x + c)^(3/2)*D*b^2*d^6 - 6*sqrt(d*x + c)*D*b^2*c*d^
6 - 3*sqrt(d*x + c)*D*a*b*d^7 + 3*sqrt(d*x + c)*C*b^2*d^7)/(b^3*d
^9)
```

3.15 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^2(c+dx)^{3/2}}\,dx$

Optimal. Leaf size=253

$$-\frac{A-\frac{a(a^2D-abC+b^2B)}{b^3}}{(a+bx)\sqrt{c+dx}(bc-ad)}+\frac{a^3d^3D-a^2bCd^3+ab^2Bd^3+b^3\left(-\left(3Ad^3-2Bcd^2-2c^3D+2c^2Cd\right)\right)}{b^3d^2\sqrt{c+dx}(bc-ad)^2}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-3a^3dD+a^2b(6cD+Cd)-ab^2(4cC-Bd)+b^3(2Bc-3Ad)\right)}{b^{5/2}(bc-ad)^{5/2}}+\frac{2D\sqrt{c+dx}}{b^2d^2}$$

```
[Out] (a*b^2*B*d^3 - a^2*b*C*d^3 + a^3*d^3*D - b^3*(2*c^2*C*d - 2*B*c*d
^2 + 3*A*d^3 - 2*c^3*D))/(b^3*d^2*(b*c - a*d)^2*Sqrt[c + d*x]) -
(A - (a*(b^2*B - a*b*C + a^2*D))/b^3)/((b*c - a*d)*(a + b*x)*Sqrt
[c + d*x]) + (2*D*Sqrt[c + d*x])/(b^2*d^2) - ((b^3*(2*B*c - 3*A*d
) - a*b^2*(4*c*C - B*d) - 3*a^3*d*D + a^2*b*(C*d + 6*c*D))*ArcTan
h[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(5/2)*(b*c - a*d)^
(5/2))
```

Rubi [A] time = 1.37002, antiderivative size = 253, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125

$$-\frac{A-\frac{a(a^2D-abC+b^2B)}{b^3}}{(a+bx)\sqrt{c+dx}(bc-ad)}+\frac{a^3d^3D-a^2bCd^3+ab^2Bd^3+b^3\left(-\left(3Ad^3-2Bcd^2-2c^3D+2c^2Cd\right)\right)}{b^3d^2\sqrt{c+dx}(bc-ad)^2}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-3a^3dD+a^2b(6cD+Cd)-ab^2(4cC-Bd)+b^3(2Bc-3Ad)\right)}{b^{5/2}(bc-ad)^{5/2}}+\frac{2D\sqrt{c+dx}}{b^2d^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^2*(c + d*x)^(3/2)),x]
```

```
[Out] (a*b^2*B*d^3 - a^2*b*C*d^3 + a^3*d^3*D - b^3*(2*c^2*C*d - 2*B*c*d
^2 + 3*A*d^3 - 2*c^3*D))/(b^3*d^2*(b*c - a*d)^2*Sqrt[c + d*x]) -
(A - (a*(b^2*B - a*b*C + a^2*D))/b^3)/((b*c - a*d)*(a + b*x)*Sqrt
[c + d*x]) + (2*D*Sqrt[c + d*x])/(b^2*d^2) - ((b^3*(2*B*c - 3*A*d
) - a*b^2*(4*c*C - B*d) - 3*a^3*d*D + a^2*b*(C*d + 6*c*D))*ArcTan
h[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(5/2)*(b*c - a*d)^
(5/2))
```

Rubi in Sympy [A] time = 151.194, size = 316, normalized size = 1.25

$$\frac{2D\sqrt{c+dx}}{b^2d^2} - \frac{3d\left(Ab^3 - Bab^2 + Ca^2b - Da^3\right)}{b^3\sqrt{c+dx}\,(ad-bc)^2} - \frac{2\left(Bb^2 - 2Cab + 3Da^2\right)}{b^3\sqrt{c+dx}\,(ad-bc)} + \frac{Ab^3 - Bab^2 + Ca^2b - Da^3}{b^3(a+bx)\sqrt{c+dx}\,(ad-bc)} - \frac{2(Cbd - 2Dad - Dbc)}{b^3d^2\sqrt{c+dx}} - \frac{3d\left(Ab^3 - Bab^2 + Ca^2b - Da^3\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{5}{2}}(ad-bc)^{\frac{5}{2}}} - \frac{2\left(Bb^2 - 2Cab + 3Da^2\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{5}{2}}(ad-bc)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(3/2),x)
```

```
[Out] 2*D*sqrt(c + d*x)/(b**2*d**2) - 3*d*(A*b**3 - B*a*b**2 + C*a**2*b
 - D*a**3)/(b**3*sqrt(c + d*x)*(a*d - b*c)**2) - 2*(B*b**2 - 2*C*
a*b + 3*D*a**2)/(b**3*sqrt(c + d*x)*(a*d - b*c)) + (A*b**3 - B*a*
b**2 + C*a**2*b - D*a**3)/(b**3*(a + b*x)*sqrt(c + d*x)*(a*d - b*
c)) - 2*(C*b*d - 2*D*a*d - D*b*c)/(b**3*d**2*sqrt(c + d*x)) - 3*d
*(A*b**3 - B*a*b**2 + C*a**2*b - D*a**3)*atan(sqrt(b)*sqrt(c + d*
x)/sqrt(a*d - b*c))/(b**(5/2)*(a*d - b*c)**(5/2)) - 2*(B*b**2 - 2
*C*a*b + 3*D*a**2)*atan(sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b
**(5/2)*(a*d - b*c)**(3/2))
```

Mathematica [A] time = 1.02873, size = 208, normalized size = 0.82

$$\sqrt{c+dx}\left(\frac{a\left(a^2D - abC + b^2B\right) - Ab^3}{b^2(a+bx)(bc-ad)^2} + \frac{2\left(-Ad^3 + Bcd^2 + c^3D - c^2Cd\right)}{d^2(c+dx)(bc-ad)^2} + \frac{2D}{b^2d^2}\right) - \frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-3a^3dD + a^2b(6cD + Cd) + ab^2(Bd - 4cC) + b^3(2Bc - 3Ad)\right)}{b^{5/2}(bc-ad)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^2*(c + d*x)^(3/2)),x]
```

```
[Out] Sqrt[c + d*x]*((2*D)/(b^2*d^2) + (-(A*b^3) + a*(b^2*B - a*b*C + a
^2*D))/(b^2*(b*c - a*d)^2*(a + b*x)) + (2*(-(c^2*C*d) + B*c*d^2 -
 A*d^3 + c^3*D))/(d^2*(b*c - a*d)^2*(c + d*x))) - ((b^3*(2*B*c -
3*A*d) + a*b^2*(-4*c*C + B*d) - 3*a^3*d*D + a^2*b*(C*d + 6*c*D))*
ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(5/2)*(b*c -
 a*d)^(5/2))
```

Maple [B] time = 0.037, size = 604, normalized size = 2.4

$$2\,\frac{D\sqrt{dx+c}}{b^2d^2}-2\,\frac{Ad}{(ad-bc)^2\sqrt{dx+c}}+2\,\frac{Bc}{(ad-bc)^2\sqrt{dx+c}}$$
$$-2\,\frac{c^2C}{d\,(ad-bc)^2\sqrt{dx+c}}+2\,\frac{Dc^3}{d^2\,(ad-bc)^2\sqrt{dx+c}}-\frac{bdA}{(ad-bc)^2\,(bdx+ad)}\sqrt{dx+c}$$
$$+\frac{Bda}{(ad-bc)^2\,(bdx+ad)}\sqrt{dx+c}-\frac{Cda^2}{(ad-bc)^2\,b\,(bdx+ad)}\sqrt{dx+c}$$
$$+\frac{a^3dD}{(ad-bc)^2\,b^2\,(bdx+ad)}\sqrt{dx+c}-3\,\frac{bdA}{(ad-bc)^2\sqrt{(ad-bc)\,b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)\,b}}\right)$$
$$+\frac{Bda}{(ad-bc)^2}\arctan\left(b\sqrt{dx+c}\frac{1}{\sqrt{(ad-bc)\,b}}\right)\frac{1}{\sqrt{(ad-bc)\,b}}$$
$$+2\,\frac{bBc}{(ad-bc)^2\sqrt{(ad-bc)\,b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)\,b}}\right)$$
$$+\frac{Cda^2}{(ad-bc)^2\,b}\arctan\left(b\sqrt{dx+c}\frac{1}{\sqrt{(ad-bc)\,b}}\right)\frac{1}{\sqrt{(ad-bc)\,b}}$$
$$-4\,\frac{Cac}{(ad-bc)^2\sqrt{(ad-bc)\,b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)\,b}}\right)$$
$$-3\,\frac{a^3dD}{(ad-bc)^2\,b^2\sqrt{(ad-bc)\,b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)\,b}}\right)$$
$$+6\,\frac{Da^2c}{(ad-bc)^2\,b\sqrt{(ad-bc)\,b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)\,b}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)^2/(d*x+c)^(3/2),x)
```

```
[Out] 2*D*(d*x+c)^(1/2)/b^2/d^2-2*d/(a*d-b*c)^2/(d*x+c)^(1/2)*A+2/(a*d-
b*c)^2/(d*x+c)^(1/2)*B*c-2/d/(a*d-b*c)^2/(d*x+c)^(1/2)*C*c^2+2/d^
2/(a*d-b*c)^2/(d*x+c)^(1/2)*D*c^3-d/(a*d-b*c)^2*b*(d*x+c)^(1/2)/(
b*d*x+a*d)*A+d/(a*d-b*c)^2*(d*x+c)^(1/2)/(b*d*x+a*d)*B*a-d/(a*d-b
*c)^2/b*(d*x+c)^(1/2)/(b*d*x+a*d)*C*a^2+d/(a*d-b*c)^2/b^2*(d*x+c)
^(1/2)/(b*d*x+a*d)*a^3*D-3*d/(a*d-b*c)^2*b/((a*d-b*c)*b)^(1/2)*ar
ctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A+d/(a*d-b*c)^2/((a*d-b
*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B*a+2/(a
*d-b*c)^2*b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)
*b)^(1/2))*B*c+d/(a*d-b*c)^2/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)
^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a^2-4/(a*d-b*c)^2/((a*d-b*c)*b)^(
1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c-3*d/(a*d-b
*c)^2/b^2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b
)^(1/2))*a^3*D+6/(a*d-b*c)^2/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)
^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a^2*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*(d*x + c)^(3/2)),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248702, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*(d*x + c)^(3/2)),x, algorithm="fr
```

```
[Out] [-1/2*((2*(3*D*a^3*b - 2*C*a^2*b^2 + B*a*b^3)*c*d^2 - (3*D*a^4 -
C*a^3*b - B*a^2*b^2 + 3*A*a*b^3)*d^3 + (2*(3*D*a^2*b^2 - 2*C*a*b^
3 + B*b^4)*c*d^2 - (3*D*a^3*b - C*a^2*b^2 - B*a*b^3 + 3*A*b^4)*d^
3)*x)*sqrt(d*x + c)*log((sqrt(b^2*c - a*b*d)*(b*d*x + 2*b*c - a*d
) + 2*(b^2*c - a*b*d)*sqrt(d*x + c))/(b*x + a)) - 2*(4*D*a*b^2*c^
3 - 2*A*a*b^2*d^3 - 2*(2*D*a^2*b + C*a*b^2)*c^2*d + (3*D*a^3 - C*
a^2*b + 3*B*a*b^2 - A*b^3)*c*d^2 + 2*(D*b^3*c^2*d - 2*D*a*b^2*c*d
^2 + D*a^2*b*d^3)*x^2 + (4*D*b^3*c^3 - 2*(D*a*b^2 + C*b^3)*c^2*d
- 2*(D*a^2*b - B*b^3)*c*d^2 + (3*D*a^3 - C*a^2*b + B*a*b^2 - 3*A*
b^3)*d^3)*x)*sqrt(b^2*c - a*b*d))/((a*b^4*c^2*d^2 - 2*a^2*b^3*c*d
^3 + a^3*b^2*d^4 + (b^5*c^2*d^2 - 2*a*b^4*c*d^3 + a^2*b^3*d^4)*x)
*sqrt(b^2*c - a*b*d)*sqrt(d*x + c)), -((2*(3*D*a^3*b - 2*C*a^2*b^
2 + B*a*b^3)*c*d^2 - (3*D*a^4 - C*a^3*b - B*a^2*b^2 + 3*A*a*b^3)*
d^3 + (2*(3*D*a^2*b^2 - 2*C*a*b^3 + B*b^4)*c*d^2 - (3*D*a^3*b - C
*a^2*b^2 - B*a*b^3 + 3*A*b^4)*d^3)*x)*sqrt(d*x + c)*arctan(-(b*c
- a*d)/(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))) - (4*D*a*b^2*c^3 - 2
*A*a*b^2*d^3 - 2*(2*D*a^2*b + C*a*b^2)*c^2*d + (3*D*a^3 - C*a^2*b
 + 3*B*a*b^2 - A*b^3)*c*d^2 + 2*(D*b^3*c^2*d - 2*D*a*b^2*c*d^2 +
D*a^2*b*d^3)*x^2 + (4*D*b^3*c^3 - 2*(D*a*b^2 + C*b^3)*c^2*d - 2*(
D*a^2*b - B*b^3)*c*d^2 + (3*D*a^3 - C*a^2*b + B*a*b^2 - 3*A*b^3)*
d^3)*x)*sqrt(-b^2*c + a*b*d))/((a*b^4*c^2*d^2 - 2*a^2*b^3*c*d^3 +
 a^3*b^2*d^4 + (b^5*c^2*d^2 - 2*a*b^4*c*d^3 + a^2*b^3*d^4)*x)*sqr
t(-b^2*c + a*b*d)*sqrt(d*x + c))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(3/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [A] time = 0.226864, size = 524, normalized size = 2.07

$$\frac{\left(6\,Da^2bc - 4\,Cab^2c + 2\,Bb^3c - 3\,Da^3d + Ca^2bd + Bab^2d - 3\,Ab^3d\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right)}{(b^4c^2 - 2\,ab^3cd + a^2b^2d^2)\sqrt{-b^2c+abd}} + \frac{2\,(dx+c)Db^3c^3 - 2\,Db^3c^4 - 2\,(dx+c)Cb^3c^2d + 2\,Dab^2c^3d + 2\,Cb^3c^3d + 2\,(dx+c)Bb^3cd^2 - 2\,Cab^2c^2d^2 - 2\,Bb^3c^2d^2 + (dx+\cdots}{(b^4c^2d^2 - 2\,ab^3cd^3 + a^2b^2d^4)\left((dx+c)^{\frac{3}{2}}b - \sqrt{\cdots}\right.} + \frac{2\,\sqrt{dx+c}D}{b^2d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*(d*x + c)^(3/2)),x, algorithm="gi
```

```
[Out] (6*D*a^2*b*c - 4*C*a*b^2*c + 2*B*b^3*c - 3*D*a^3*d + C*a^2*b*d +
B*a*b^2*d - 3*A*b^3*d)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c + a*b*d
))/((b^4*c^2 - 2*a*b^3*c*d + a^2*b^2*d^2)*sqrt(-b^2*c + a*b*d)) +
 (2*(d*x + c)*D*b^3*c^3 - 2*D*b^3*c^4 - 2*(d*x + c)*C*b^3*c^2*d +
 2*D*a*b^2*c^3*d + 2*C*b^3*c^3*d + 2*(d*x + c)*B*b^3*c*d^2 - 2*C*
a*b^2*c^2*d^2 - 2*B*b^3*c^2*d^2 + (d*x + c)*D*a^3*d^3 - (d*x + c)
*C*a^2*b*d^3 + (d*x + c)*B*a*b^2*d^3 - 3*(d*x + c)*A*b^3*d^3 + 2*
B*a*b^2*c*d^3 + 2*A*b^3*c*d^3 - 2*A*a*b^2*d^4)/((b^4*c^2*d^2 - 2*
a*b^3*c*d^3 + a^2*b^2*d^4)*((d*x + c)^(3/2)*b - sqrt(d*x + c)*b*c
 + sqrt(d*x + c)*a*d)) + 2*sqrt(d*x + c)*D/(b^2*d^2)
```

3.16 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^3(c+dx)^{3/2}}\,dx$

Optimal. Leaf size=350

$$-\frac{Ab^3-a\left(a^2D-abC+b^2B\right)}{2b^3(a+bx)^2\sqrt{c+dx}(bc-ad)}-\frac{a^3d^3D-a^2bCd^3+ab^2Bd^3+b^3\left(-\left(5Ad^3-4Bcd^2-4c^3D+4c^2Cd\right)\right)}{2b^3d\sqrt{c+dx}(bc-ad)^3}$$
$$-\frac{\sqrt{c+dx}\left(-7a^3dD+3a^2b(4cD+Cd)-ab^2(8cC-Bd)+b^3(4Bc-5Ad)\right)}{4b^2(a+bx)(bc-ad)^3}$$
$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-3a^3d^2D-a^2bd(Cd-12cD)+ab^2\left(-3Bd^2-24c^2D+8cCd\right)+b^3\left(15Ad^2-12Bcd+8c^2C\right)\right)}{4b^{5/2}(bc-ad)^{7/2}}$$

```
[Out] -(a*b^2*B*d^3 - a^2*b*C*d^3 + a^3*d^3*D - b^3*(4*c^2*C*d - 4*B*c*
d^2 + 5*A*d^3 - 4*c^3*D))/(2*b^3*d*(b*c - a*d)^3*Sqrt[c + d*x]) -
 (A*b^3 - a*(b^2*B - a*b*C + a^2*D))/(2*b^3*(b*c - a*d)*(a + b*x)
^2*Sqrt[c + d*x]) - ((b^3*(4*B*c - 5*A*d) - a*b^2*(8*c*C - B*d) -
 7*a^3*d*D + 3*a^2*b*(C*d + 4*c*D))*Sqrt[c + d*x])/(4*b^2*(b*c -
a*d)^3*(a + b*x)) - ((b^3*(8*c^2*C - 12*B*c*d + 15*A*d^2) - 3*a^3
*d^2*D - a^2*b*d*(C*d - 12*c*D) + a*b^2*(8*c*C*d - 3*B*d^2 - 24*c
^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(4*b^(5/
2)*(b*c - a*d)^(7/2))
```

Rubi [A] time = 1.94552, antiderivative size = 350, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.156

$$-\frac{Ab^3-a\left(a^2D-abC+b^2B\right)}{2b^3(a+bx)^2\sqrt{c+dx}(bc-ad)}-\frac{a^3d^3D-a^2bCd^3+ab^2Bd^3+b^3\left(-\left(5Ad^3-4Bcd^2-4c^3D+4c^2Cd\right)\right)}{2b^3d\sqrt{c+dx}(bc-ad)^3}$$
$$-\frac{\sqrt{c+dx}\left(-7a^3dD+3a^2b(4cD+Cd)-ab^2(8cC-Bd)+b^3(4Bc-5Ad)\right)}{4b^2(a+bx)(bc-ad)^3}$$
$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-3a^3d^2D-a^2bd(Cd-12cD)+ab^2\left(-3Bd^2-24c^2D+8cCd\right)+b^3\left(15Ad^2-12Bcd+8c^2C\right)\right)}{4b^{5/2}(bc-ad)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^3*(c + d*x)^(3/2)),x]
```

```
[Out] -(a*b^2*B*d^3 - a^2*b*C*d^3 + a^3*d^3*D - b^3*(4*c^2*C*d - 4*B*c*
d^2 + 5*A*d^3 - 4*c^3*D))/(2*b^3*d*(b*c - a*d)^3*Sqrt[c + d*x]) -
 (A*b^3 - a*(b^2*B - a*b*C + a^2*D))/(2*b^3*(b*c - a*d)*(a + b*x)
^2*Sqrt[c + d*x]) - ((b^3*(4*B*c - 5*A*d) - a*b^2*(8*c*C - B*d) -
 7*a^3*d*D + 3*a^2*b*(C*d + 4*c*D))*Sqrt[c + d*x])/(4*b^2*(b*c -
a*d)^3*(a + b*x)) - ((b^3*(8*c^2*C - 12*B*c*d + 15*A*d^2) - 3*a^3
*d^2*D - a^2*b*d*(C*d - 12*c*D) + a*b^2*(8*c*C*d - 3*B*d^2 - 24*c
^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(4*b^(5/
2)*(b*c - a*d)^(7/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.80251, size = 297, normalized size = 0.85

$$\frac{1}{4}\left(\sqrt{c+dx}\left(\frac{2\left(a\left(a^2D-abC+b^2B\right)-Ab^3\right)}{b^2(a+bx)^2(bc-ad)^2}+\frac{5a^3dD-a^2b(12cD+Cd)+ab^2(8cC-3Bd)+b^3(7Ad-4Bc)}{b^2(a+bx)(bc-ad)^3}+\frac{8\left(-Ad^3+Bcd^2+c^3D-c^2Cd\right)}{d(c+dx)(ad-bc)^3}\right)-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(-3a^3d^2D+a^2bd(12cD-Cd)+ab^2\left(-3Bd^2-24c^2D+8cCd\right)+b^3\left(15Ad^2-12Bcd+8c^2C\right)\right)}{b^{5/2}(bc-ad)^{7/2}}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^3*(c + d*x)^(3/2)),x]
```

```
[Out] (Sqrt[c + d*x]*((2*(-(A*b^3) + a*(b^2*B - a*b*C + a^2*D)))/(b^2*(
b*c - a*d)^2*(a + b*x)^2) + (b^3*(-4*B*c + 7*A*d) + a*b^2*(8*c*C
- 3*B*d) + 5*a^3*d*D - a^2*b*(C*d + 12*c*D))/(b^2*(b*c - a*d)^3*(
a + b*x)) + (8*(-(c^2*C*d) + B*c*d^2 - A*d^3 + c^3*D))/(d*(-(b*c)
 + a*d)^3*(c + d*x))) - ((b^3*(8*c^2*C - 12*B*c*d + 15*A*d^2) - 3
*a^3*d^2*D + a^2*b*d*(-(C*d) + 12*c*D) + a*b^2*(8*c*C*d - 3*B*d^2
 - 24*c^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(
b^(5/2)*(b*c - a*d)^(7/2)))/4
```

Maple [B] time = 0.04, size = 1225, normalized size = 3.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)^3/(d*x+c)^(3/2),x)
```

```
[Out] 15/4*d^2/(a*d-b*c)^3/(b*d*x+a*d)^2/b*(d*x+c)^(1/2)*D*a^3*c-3*d/(a
*d-b*c)^3/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)
*b)^(1/2))*D*a^2*c-2*d/(a*d-b*c)^3/(b*d*x+a*d)^2*b*(d*x+c)^(3/2)*
C*a*c-1/4*d^2/(a*d-b*c)^3/(b*d*x+a*d)^2*b*(d*x+c)^(1/2)*B*a*c+2*d
/(a*d-b*c)^3/(b*d*x+a*d)^2*b*(d*x+c)^(1/2)*C*a*c^2+1/4*d^2/(a*d-b
*c)^3/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^
(1/2))*a^2*C+3/4*d^2/(a*d-b*c)^3/b^2/((a*d-b*c)*b)^(1/2)*arctan((
d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a^3*D-2*d/(a*d-b*c)^3/((a*d-b
*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c+3/
4*d^2/(a*d-b*c)^3/(b*d*x+a*d)^2*b*(d*x+c)^(3/2)*B*a+d/(a*d-b*c)^3
/(b*d*x+a*d)^2*b^2*(d*x+c)^(3/2)*B*c-5/4*d^2/(a*d-b*c)^3/(b*d*x+a
*d)^2/b*(d*x+c)^(3/2)*a^3*D+3*d/(a*d-b*c)^3/(b*d*x+a*d)^2*(d*x+c)
^(3/2)*D*a^2*c-9/4*d^3/(a*d-b*c)^3/(b*d*x+a*d)^2*b*(d*x+c)^(1/2)*
A*a+9/4*d^2/(a*d-b*c)^3/(b*d*x+a*d)^2*b^2*(d*x+c)^(1/2)*A*c-d/(a*
d-b*c)^3/(b*d*x+a*d)^2*b^2*(d*x+c)^(1/2)*B*c^2-1/4*d^3/(a*d-b*c)^
3/(b*d*x+a*d)^2/b*(d*x+c)^(1/2)*C*a^3-7/4*d^2/(a*d-b*c)^3/(b*d*x+
a*d)^2*(d*x+c)^(1/2)*C*a^2*c-3/4*d^3/(a*d-b*c)^3/(b*d*x+a*d)^2/b^
2*(d*x+c)^(1/2)*D*a^4-3*d/(a*d-b*c)^3/(b*d*x+a*d)^2*(d*x+c)^(1/2)
*D*a^2*c^2+3*d/(a*d-b*c)^3*b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(
1/2)*b/((a*d-b*c)*b)^(1/2))*B*c-2*d^2/(a*d-b*c)^3/(d*x+c)^(1/2)*A
-2/(a*d-b*c)^3/(d*x+c)^(1/2)*C*c^2+6/(a*d-b*c)^3/((a*d-b*c)*b)^(1
/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a*c^2-2/(a*d-b*
c)^3*b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(
1/2))*C*c^2+3/4*d^2/(a*d-b*c)^3/((a*d-b*c)*b)^(1/2)*arctan((d*x+c
)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B*a-7/4*d^2/(a*d-b*c)^3/(b*d*x+a*d
)^2*b^2*(d*x+c)^(3/2)*A+1/4*d^2/(a*d-b*c)^3/(b*d*x+a*d)^2*(d*x+c)
^(3/2)*C*a^2+5/4*d^3/(a*d-b*c)^3/(b*d*x+a*d)^2*(d*x+c)^(1/2)*B*a^
2-15/4*d^2/(a*d-b*c)^3*b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)
*b/((a*d-b*c)*b)^(1/2))*A+2*d/(a*d-b*c)^3/(d*x+c)^(1/2)*B*c+2/d/(
a*d-b*c)^3/(d*x+c)^(1/2)*D*c^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*(d*x + c)^(3/2)),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.248481, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*(d*x + c)^(3/2)),x, algorithm="fr
```

```
[Out] [1/8*((8*(3*D*a^3*b^2 - C*a^2*b^3)*c^2*d - 4*(3*D*a^4*b + 2*C*a^3
*b^2 - 3*B*a^2*b^3)*c*d^2 + (3*D*a^5 + C*a^4*b + 3*B*a^3*b^2 - 15
*A*a^2*b^3)*d^3 + (8*(3*D*a*b^4 - C*b^5)*c^2*d - 4*(3*D*a^2*b^3 +
 2*C*a*b^4 - 3*B*b^5)*c*d^2 + (3*D*a^3*b^2 + C*a^2*b^3 + 3*B*a*b^
4 - 15*A*b^5)*d^3)*x^2 + 2*(8*(3*D*a^2*b^3 - C*a*b^4)*c^2*d - 4*(
3*D*a^3*b^2 + 2*C*a^2*b^3 - 3*B*a*b^4)*c*d^2 + (3*D*a^4*b + C*a^3
*b^2 + 3*B*a^2*b^3 - 15*A*a*b^4)*d^3)*x)*sqrt(d*x + c)*log((sqrt(
b^2*c - a*b*d)*(b*d*x + 2*b*c - a*d) + 2*(b^2*c - a*b*d)*sqrt(d*x
 + c))/(b*x + a)) - 2*(8*D*a^2*b^2*c^3 - 8*A*a^2*b^2*d^3 + 2*(5*D
*a^3*b - 7*C*a^2*b^2 + B*a*b^3 + A*b^4)*c^2*d - (3*D*a^4 + C*a^3*
b - 13*B*a^2*b^2 + 9*A*a*b^3)*c*d^2 + (8*D*b^4*c^3 - 8*C*b^4*c^2*
d + 4*(3*D*a^2*b^2 - 2*C*a*b^3 + 3*B*b^4)*c*d^2 - (5*D*a^3*b - C*
a^2*b^2 - 3*B*a*b^3 + 15*A*b^4)*d^3)*x^2 + (16*D*a*b^3*c^3 + 4*(3
*D*a^2*b^2 - 6*C*a*b^3 + B*b^4)*c^2*d + (5*D*a^3*b - 5*C*a^2*b^2
+ 21*B*a*b^3 - 5*A*b^4)*c*d^2 - (3*D*a^4 + C*a^3*b - 5*B*a^2*b^2
+ 25*A*a*b^3)*d^3)*x)*sqrt(b^2*c - a*b*d))/((a^2*b^5*c^3*d - 3*a^
3*b^4*c^2*d^2 + 3*a^4*b^3*c*d^3 - a^5*b^2*d^4 + (b^7*c^3*d - 3*a*
b^6*c^2*d^2 + 3*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^2 + 2*(a*b^6*c^3*d
 - 3*a^2*b^5*c^2*d^2 + 3*a^3*b^4*c*d^3 - a^4*b^3*d^4)*x)*sqrt(b^2
*c - a*b*d)*sqrt(d*x + c)), 1/4*((8*(3*D*a^3*b^2 - C*a^2*b^3)*c^2
*d - 4*(3*D*a^4*b + 2*C*a^3*b^2 - 3*B*a^2*b^3)*c*d^2 + (3*D*a^5 +
 C*a^4*b + 3*B*a^3*b^2 - 15*A*a^2*b^3)*d^3 + (8*(3*D*a*b^4 - C*b^
5)*c^2*d - 4*(3*D*a^2*b^3 + 2*C*a*b^4 - 3*B*b^5)*c*d^2 + (3*D*a^3
*b^2 + C*a^2*b^3 + 3*B*a*b^4 - 15*A*b^5)*d^3)*x^2 + 2*(8*(3*D*a^2
*b^3 - C*a*b^4)*c^2*d - 4*(3*D*a^3*b^2 + 2*C*a^2*b^3 - 3*B*a*b^4)
*c*d^2 + (3*D*a^4*b + C*a^3*b^2 + 3*B*a^2*b^3 - 15*A*a*b^4)*d^3)*
x)*sqrt(d*x + c)*arctan(-(b*c - a*d)/(sqrt(-b^2*c + a*b*d)*sqrt(d
*x + c))) - (8*D*a^2*b^2*c^3 - 8*A*a^2*b^2*d^3 + 2*(5*D*a^3*b - 7
*C*a^2*b^2 + B*a*b^3 + A*b^4)*c^2*d - (3*D*a^4 + C*a^3*b - 13*B*a
^2*b^2 + 9*A*a*b^3)*c*d^2 + (8*D*b^4*c^3 - 8*C*b^4*c^2*d + 4*(3*D
*a^2*b^2 - 2*C*a*b^3 + 3*B*b^4)*c*d^2 - (5*D*a^3*b - C*a^2*b^2 -
3*B*a*b^3 + 15*A*b^4)*d^3)*x^2 + (16*D*a*b^3*c^3 + 4*(3*D*a^2*b^2
 - 6*C*a*b^3 + B*b^4)*c^2*d + (5*D*a^3*b - 5*C*a^2*b^2 + 21*B*a*b
^3 - 5*A*b^4)*c*d^2 - (3*D*a^4 + C*a^3*b - 5*B*a^2*b^2 + 25*A*a*b
^3)*d^3)*x)*sqrt(-b^2*c + a*b*d))/((a^2*b^5*c^3*d - 3*a^3*b^4*c^2
*d^2 + 3*a^4*b^3*c*d^3 - a^5*b^2*d^4 + (b^7*c^3*d - 3*a*b^6*c^2*d
^2 + 3*a^2*b^5*c*d^3 - a^3*b^4*d^4)*x^2 + 2*(a*b^6*c^3*d - 3*a^2*
b^5*c^2*d^2 + 3*a^3*b^4*c*d^3 - a^4*b^3*d^4)*x)*sqrt(-b^2*c + a*b
*d)*sqrt(d*x + c))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.230137, size = 833, normalized size = 2.38

$$-\frac{\left(24\,Dab^2c^2-8\,Cb^3c^2-12\,Da^2bcd-8\,Cab^2cd+12\,Bb^3cd+3\,Da^3d^2+Ca^2bd^2+3\,Bab^2d^2-15\,Ab^3d^2\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right.}{4\,(b^5c^3-3\,ab^4c^2d+3\,a^2b^3cd^2-a^3b^2d^3)\sqrt{-b^2c+abd}}$$
$$-\frac{2\left(Dc^3-Cc^2d+Bcd^2-Ad^3\right)}{(b^3c^3d-3\,ab^2c^2d^2+3\,a^2bcd^3-a^3d^4)\sqrt{dx+c}}$$
$$-\frac{12\,(dx+c)^{\frac{3}{2}}Da^2b^2cd-8\,(dx+c)^{\frac{3}{2}}Cab^3cd+4\,(dx+c)^{\frac{3}{2}}Bb^4cd-12\,\sqrt{dx+c}Da^2b^2c^2d+8\,\sqrt{dx+c}Cab^3c^2d-4\,\sqrt{dx+c}Bb^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*(d*x + c)^(3/2)),x, algorithm="gi
```

```
[Out] -1/4*(24*D*a*b^2*c^2 - 8*C*b^3*c^2 - 12*D*a^2*b*c*d - 8*C*a*b^2*c
*d + 12*B*b^3*c*d + 3*D*a^3*d^2 + C*a^2*b*d^2 + 3*B*a*b^2*d^2 - 1
5*A*b^3*d^2)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c + a*b*d))/((b^5*c
^3 - 3*a*b^4*c^2*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*sqrt(-b^2*c +
 a*b*d)) - 2*(D*c^3 - C*c^2*d + B*c*d^2 - A*d^3)/((b^3*c^3*d - 3*
a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3*d^4)*sqrt(d*x + c)) - 1/4*(12
*(d*x + c)^(3/2)*D*a^2*b^2*c*d - 8*(d*x + c)^(3/2)*C*a*b^3*c*d +
4*(d*x + c)^(3/2)*B*b^4*c*d - 12*sqrt(d*x + c)*D*a^2*b^2*c^2*d +
8*sqrt(d*x + c)*C*a*b^3*c^2*d - 4*sqrt(d*x + c)*B*b^4*c^2*d - 5*(
d*x + c)^(3/2)*D*a^3*b*d^2 + (d*x + c)^(3/2)*C*a^2*b^2*d^2 + 3*(d
*x + c)^(3/2)*B*a*b^3*d^2 - 7*(d*x + c)^(3/2)*A*b^4*d^2 + 15*sqrt
(d*x + c)*D*a^3*b*c*d^2 - 7*sqrt(d*x + c)*C*a^2*b^2*c*d^2 - sqrt(
d*x + c)*B*a*b^3*c*d^2 + 9*sqrt(d*x + c)*A*b^4*c*d^2 - 3*sqrt(d*x
 + c)*D*a^4*d^3 - sqrt(d*x + c)*C*a^3*b*d^3 + 5*sqrt(d*x + c)*B*a
^2*b^2*d^3 - 9*sqrt(d*x + c)*A*a*b^3*d^3)/((b^5*c^3 - 3*a*b^4*c^2
*d + 3*a^2*b^3*c*d^2 - a^3*b^2*d^3)*((d*x + c)*b - b*c + a*d)^2)
```

3.17 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^4(c+dx)^{3/2}}\,dx$

Optimal. Leaf size=463

$$-\frac{Ab^3-a\left(a^2D-abC+b^2B\right)}{3b^3(a+bx)^3\sqrt{c+dx}(bc-ad)}-\frac{\sqrt{c+dx}\left(5a^3d^2D-a^2bd(11Cd-18cD)+ab^2\left(-7Bd^2-72c^2D+36cCd\right)+b^3\left(49Ad^2-42Bcd+24c^2C\right)\right)}{24b^2(a+bx)(bc-ad)^4}+\frac{a^3d^3D-a^2bCd^3+ab^2Bd^3+b^3\left(-\left(7Ad^3-6Bcd^2-6c^3D+6c^2Cd\right)\right)}{3b^3\sqrt{c+dx}(bc-ad)^4}-\frac{\sqrt{c+dx}\left(-11a^3dD+a^2b(18cD+5Cd)-ab^2(12cC-Bd)+b^3(6Bc-7Ad)\right)}{12b^2(a+bx)^2(bc-ad)^3}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3d^3D+a^2bd^2(Cd-6cD)-ab^2d\left(-5Bd^2-24c^2D+12cCd\right)+b^3\left(-\left(35Ad^3-30Bcd^2-16c^3D+24c\right.\right.\right.}{8b^{5/2}(bc-ad)^{9/2}}$$

```
[Out] (a*b^2*B*d^3 - a^2*b*C*d^3 + a^3*d^3*D - b^3*(6*c^2*C*d - 6*B*c*d
^2 + 7*A*d^3 - 6*c^3*D))/(3*b^3*(b*c - a*d)^4*Sqrt[c + d*x]) - (A
*b^3 - a*(b^2*B - a*b*C + a^2*D))/(3*b^3*(b*c - a*d)*(a + b*x)^3*
Sqrt[c + d*x]) - ((b^3*(6*B*c - 7*A*d) - a*b^2*(12*c*C - B*d) - 1
1*a^3*d*D + a^2*b*(5*C*d + 18*c*D))*Sqrt[c + d*x])/(12*b^2*(b*c -
 a*d)^3*(a + b*x)^2) - ((b^3*(24*c^2*C - 42*B*c*d + 49*A*d^2) + 5
*a^3*d^2*D - a^2*b*d*(11*C*d - 18*c*D) + a*b^2*(36*c*C*d - 7*B*d^
2 - 72*c^2*D))*Sqrt[c + d*x])/(24*b^2*(b*c - a*d)^4*(a + b*x)) -
((a^3*d^3*D + a^2*b*d^2*(C*d - 6*c*D) - a*b^2*d*(12*c*C*d - 5*B*d
^2 - 24*c^2*D) - b^3*(24*c^2*C*d - 30*B*c*d^2 + 35*A*d^3 - 16*c^3
*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(8*b^(5/2)
*(b*c - a*d)^(9/2))
```

Rubi [A] time = 2.82227, antiderivative size = 463, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188

$$-\frac{Ab^3-a\left(a^2D-abC+b^2B\right)}{3b^3(a+bx)^3\sqrt{c+dx}(bc-ad)}-\frac{\sqrt{c+dx}\left(5a^3d^2D-a^2bd(11Cd-18cD)+ab^2\left(-7Bd^2-72c^2D+36cCd\right)+b^3\left(49Ad^2-42Bcd+24c^2C\right)\right)}{24b^2(a+bx)(bc-ad)^4}+\frac{a^3d^3D-a^2bCd^3+ab^2Bd^3+b^3\left(-\left(7Ad^3-6Bcd^2-6c^3D+6c^2Cd\right)\right)}{3b^3\sqrt{c+dx}(bc-ad)^4}-\frac{\sqrt{c+dx}\left(-11a^3dD+a^2b(18cD+5Cd)-ab^2(12cC-Bd)+b^3(6Bc-7Ad)\right)}{12b^2(a+bx)^2(bc-ad)^3}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3d^3D+a^2bd^2(Cd-6cD)-ab^2d\left(-5Bd^2-24c^2D+12cCd\right)+b^3\left(-\left(35Ad^3-30Bcd^2-16c^3D+24c\right.\right.\right.}{8b^{5/2}(bc-ad)^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^4*(c + d*x)^(3/2)),x]
```

```
[Out] (a*b^2*B*d^3 - a^2*b*C*d^3 + a^3*d^3*D - b^3*(6*c^2*C*d - 6*B*c*d
^2 + 7*A*d^3 - 6*c^3*D))/(3*b^3*(b*c - a*d)^4*Sqrt[c + d*x]) - (A
*b^3 - a*(b^2*B - a*b*C + a^2*D))/(3*b^3*(b*c - a*d)*(a + b*x)^3*
Sqrt[c + d*x]) - ((b^3*(6*B*c - 7*A*d) - a*b^2*(12*c*C - B*d) - 1
1*a^3*d*D + a^2*b*(5*C*d + 18*c*D))*Sqrt[c + d*x])/(12*b^2*(b*c -
 a*d)^3*(a + b*x)^2) - ((b^3*(24*c^2*C - 42*B*c*d + 49*A*d^2) + 5
*a^3*d^2*D - a^2*b*d*(11*C*d - 18*c*D) + a*b^2*(36*c*C*d - 7*B*d^
2 - 72*c^2*D))*Sqrt[c + d*x])/(24*b^2*(b*c - a*d)^4*(a + b*x)) -
((a^3*d^3*D + a^2*b*d^2*(C*d - 6*c*D) - a*b^2*d*(12*c*C*d - 5*B*d
^2 - 24*c^2*D) - b^3*(24*c^2*C*d - 30*B*c*d^2 + 35*A*d^3 - 16*c^3
*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(8*b^(5/2)
*(b*c - a*d)^(9/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**4/(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.91107, size = 382, normalized size = 0.83

$$\frac{1}{24}\left(\frac{\sqrt{c+dx}\left(\frac{8(bc-ad)^2\left(a\left(a^2D-abC+b^2B\right)-Ab^3\right)}{b^2(a+bx)^3}+\frac{3\left(a^3d^2D+a^2bd(Cd-6cD)+ab^2\left(5Bd^2+24c^2D-12cCd\right)+b^3\left(-19Ad^2+14Bcd-8c^2C\right)\right)}{b^2(a+bx)}-\frac{2(bc-ad)}{}\right.}{(bc-ad)^4}\right.$$
$$-\frac{3\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3d^3D+a^2bd^2(Cd-6cD)+ab^2d\left(5Bd^2+24c^2D-12cCd\right)+b^3\left(-35Ad^3+30Bcd^2+16c^3D-24c^2C\right.\right.}{b^{5/2}(bc-ad)^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^4*(c + d*x)^(3/2)),x]
```

```
[Out] ((Sqrt[c + d*x]*((8*(b*c - a*d)^2*(-(A*b^3) + a*(b^2*B - a*b*C +
a^2*D)))/(b^2*(a + b*x)^3) - (2*(b*c - a*d)*(b^3*(6*B*c - 11*A*d)
 + a*b^2*(-12*c*C + 5*B*d) - 7*a^3*d*D + a^2*b*(C*d + 18*c*D)))/(
b^2*(a + b*x)^2) + (3*(b^3*(-8*c^2*C + 14*B*c*d - 19*A*d^2) + a^3
*d^2*D + a^2*b*d*(C*d - 6*c*D) + a*b^2*(-12*c*C*d + 5*B*d^2 + 24*
c^2*D)))/(b^2*(a + b*x)) + (48*(-(c^2*C*d) + B*c*d^2 - A*d^3 + c^
3*D))/(c + d*x)))/(b*c - a*d)^4 - (3*(a^3*d^3*D + a^2*b*d^2*(C*d
```

```
- 6*c*D) + a*b^2*d*(-12*c*C*d + 5*B*d^2 + 24*c^2*D) + b^3*(-24*c^
2*C*d + 30*B*c*d^2 - 35*A*d^3 + 16*c^3*D))*ArcTanh[(Sqrt[b]*Sqrt[
c + d*x])/Sqrt[b*c - a*d]])/(b^(5/2)*(b*c - a*d)^(9/2)))/24
```

Maple [B] time = 0.053, size = 2108, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)^4/(d*x+c)^(3/2),x)
```

```
[Out] 3/(a*d-b*c)^4/(b*d*x+a*d)^3*d*b^2*(d*x+c)^(1/2)*D*a*c^4+9/4/(a*d-
b*c)^4/(b*d*x+a*d)^3*d^2*b^3*(d*x+c)^(1/2)*B*c^3-1/8/(a*d-b*c)^4/
(b*d*x+a*d)^3*d^5/b*(d*x+c)^(1/2)*C*a^4-1/(a*d-b*c)^4/(b*d*x+a*d)
^3*d*b^3*(d*x+c)^(1/2)*C*c^4-1/8/(a*d-b*c)^4/(b*d*x+a*d)^3*d^5/b^
2*(d*x+c)^(1/2)*D*a^5+7/4/(a*d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)
*B*b^3*c*d^2-1/(a*d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*C*b^3*c^2*
d+5/8/(a*d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*a*b^2*B*d^3+1/8/(a*
d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*a^2*b*C*d^3-17/3/(a*d-b*c)^4
/(b*d*x+a*d)^3*b^2*d^4*(d*x+c)^(3/2)*A*a+17/3/(a*d-b*c)^4/(b*d*x+
a*d)^3*b^3*d^3*(d*x+c)^(3/2)*A*c+5/3/(a*d-b*c)^4/(b*d*x+a*d)^3*b*
d^4*(d*x+c)^(3/2)*B*a^2-4/(a*d-b*c)^4/(b*d*x+a*d)^3*b^3*d^2*(d*x+
c)^(3/2)*B*c^2+2/(a*d-b*c)^4/(b*d*x+a*d)^3*b^3*d*(d*x+c)^(3/2)*C*
c^3-1/3/(a*d-b*c)^4/(b*d*x+a*d)^3/b*d^4*(d*x+c)^(3/2)*D*a^4-29/8/
(a*d-b*c)^4/(b*d*x+a*d)^3*d^5*b*(d*x+c)^(1/2)*A*a^2-29/8/(a*d-b*c
)^4/(b*d*x+a*d)^3*d^3*b^3*(d*x+c)^(1/2)*A*c^2+15/4/(a*d-b*c)^4*b/
((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B
*c*d^2+1/8/(a*d-b*c)^4/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)
*b/((a*d-b*c)*b)^(1/2))*a^2*C*d^3-3/(a*d-b*c)^4*b/((a*d-b*c)*b)^(
1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*c^2*d+1/8/(a*d
-b*c)^4/b^2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)
*b)^(1/2))*a^3*d^3*D-3/2/(a*d-b*c)^4/((a*d-b*c)*b)^(1/2)*arctan((
d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c*d^2+3/(a*d-b*c)^4/((a*d
-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a*c^
2*d-9/4/(a*d-b*c)^4/(b*d*x+a*d)^3*d^4*(d*x+c)^(1/2)*C*a^3*c+11/8/
(a*d-b*c)^4/(b*d*x+a*d)^3*d^3*(d*x+c)^(1/2)*D*a^3*c^2+1/3/(a*d-b*
c)^4/(b*d*x+a*d)^3*d^3*(d*x+c)^(3/2)*D*a^3*c-2/(a*d-b*c)^4/(d*x+c
)^(1/2)*A*d^3+2/(a*d-b*c)^4/(d*x+c)^(1/2)*D*c^3+7/3/(a*d-b*c)^4/(
b*d*x+a*d)^3*b^2*d^3*(d*x+c)^(3/2)*B*a*c-13/3/(a*d-b*c)^4/(b*d*x+
a*d)^3*b*d^3*(d*x+c)^(3/2)*C*a^2*c+2/(a*d-b*c)^4/(b*d*x+a*d)^3*b^
2*d^2*(d*x+c)^(3/2)*C*a*c^2+6/(a*d-b*c)^4/(b*d*x+a*d)^3*b*d^2*(d*
x+c)^(3/2)*D*a^2*c^2-1/2/(a*d-b*c)^4/(b*d*x+a*d)^3*d^2*b^2*(d*x+c
)^(1/2)*C*a*c^3+1/(a*d-b*c)^4/(b*d*x+a*d)^3*d^4/b*(d*x+c)^(1/2)*D
*a^4*c-21/4/(a*d-b*c)^4/(b*d*x+a*d)^3*d^2*b*(d*x+c)^(1/2)*D*a^2*c
^3-3/4/(a*d-b*c)^4/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/(
(a*d-b*c)*b)^(1/2))*D*a^2*c*d^2-6/(a*d-b*c)^4/(b*d*x+a*d)^3*b^2*d
*(d*x+c)^(3/2)*D*a*c^3+29/4/(a*d-b*c)^4/(b*d*x+a*d)^3*d^4*b^2*(d*
x+c)^(1/2)*A*a*c-1/2/(a*d-b*c)^4/(b*d*x+a*d)^3*d^4*b*(d*x+c)^(1/2
)*B*a^2*c-3/2/(a*d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*C*a*b^2*c*d
^2-3/4/(a*d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*D*a^2*b*c*d^2+3/(a
*d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*D*a*b^2*c^2*d-25/8/(a*d-b*c
```

```
)^4/(b*d*x+a*d)^3*d^3*b^2*(d*x+c)^(1/2)*B*a*c^2+31/8/(a*d-b*c)^4/
(b*d*x+a*d)^3*d^3*b*(d*x+c)^(1/2)*C*a^2*c^2+5/8/(a*d-b*c)^4/((a*d
-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a*B*d^
3-19/8/(a*d-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*A*b^3*d^3+1/8/(a*d
-b*c)^4/(b*d*x+a*d)^3*(d*x+c)^(5/2)*a^3*d^3*D+11/8/(a*d-b*c)^4/(b
*d*x+a*d)^3*d^5*(d*x+c)^(1/2)*B*a^3+1/3/(a*d-b*c)^4/(b*d*x+a*d)^3
*d^4*(d*x+c)^(3/2)*C*a^3-35/8/(a*d-b*c)^4*b/((a*d-b*c)*b)^(1/2)*a
rctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A*d^3+2/(a*d-b*c)^4*b/
((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D
*c^3+2/(a*d-b*c)^4/(d*x+c)^(1/2)*B*c*d^2-2/(a*d-b*c)^4/(d*x+c)^(1
/2)*C*c^2*d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^4*(d*x + c)^(3/2)),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.272113, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^4*(d*x + c)^(3/2)),x, algorithm="fr
```

```
[Out] [-1/48*(3*(16*D*a^3*b^3*c^3 + 24*(D*a^4*b^2 - C*a^3*b^3)*c^2*d -
6*(D*a^5*b + 2*C*a^4*b^2 - 5*B*a^3*b^3)*c*d^2 + (D*a^6 + C*a^5*b
+ 5*B*a^4*b^2 - 35*A*a^3*b^3)*d^3 + (16*D*b^6*c^3 + 24*(D*a*b^5 -
 C*b^6)*c^2*d - 6*(D*a^2*b^4 + 2*C*a*b^5 - 5*B*b^6)*c*d^2 + (D*a^
3*b^3 + C*a^2*b^4 + 5*B*a*b^5 - 35*A*b^6)*d^3)*x^3 + 3*(16*D*a*b^
5*c^3 + 24*(D*a^2*b^4 - C*a*b^5)*c^2*d - 6*(D*a^3*b^3 + 2*C*a^2*b
^4 - 5*B*a*b^5)*c*d^2 + (D*a^4*b^2 + C*a^3*b^3 + 5*B*a^2*b^4 - 35
*A*a*b^5)*d^3)*x^2 + 3*(16*D*a^2*b^4*c^3 + 24*(D*a^3*b^3 - C*a^2*
b^4)*c^2*d - 6*(D*a^4*b^2 + 2*C*a^3*b^3 - 5*B*a^2*b^4)*c*d^2 + (D
*a^5*b + C*a^4*b^2 + 5*B*a^3*b^3 - 35*A*a^2*b^4)*d^3)*x)*sqrt(d*x
 + c)*log((sqrt(b^2*c - a*b*d)*(b*d*x + 2*b*c - a*d) + 2*(b^2*c -
 a*b*d)*sqrt(d*x + c))/(b*x + a)) + 2*(48*A*a^3*b^2*d^3 - 4*(23*D
*a^3*b^2 - 2*C*a^2*b^3 - B*a*b^4 - 2*A*b^5)*c^3 - 2*(8*D*a^4*b -
47*C*a^3*b^2 + 14*B*a^2*b^3 + 19*A*a*b^4)*c^2*d + 3*(D*a^5 + C*a^
4*b - 27*B*a^3*b^2 + 29*A*a^2*b^3)*c*d^2 - 3*(16*D*b^5*c^3 + 24*(
D*a*b^4 - C*b^5)*c^2*d - 6*(D*a^2*b^3 + 2*C*a*b^4 - 5*B*b^5)*c*d^
2 + (D*a^3*b^2 + C*a^2*b^3 + 5*B*a*b^4 - 35*A*b^5)*d^3)*x^3 - (24
```

```
*(9*D*a*b^4 - C*b^5)*c^3 + 6*(15*D*a^2*b^3 - 34*C*a*b^4 + 5*B*b^5
)*c^2*d + (17*D*a^3*b^2 - 95*C*a^2*b^3 + 245*B*a*b^4 - 35*A*b^5)*
c*d^2 - 8*(D*a^4*b - C*a^3*b^2 - 5*B*a^2*b^3 + 35*A*a*b^4)*d^3)*x
^2 - (12*(21*D*a^2*b^3 - 2*C*a*b^4 - B*b^5)*c^3 + 2*(29*D*a^3*b^2
 - 125*C*a^2*b^3 + 41*B*a*b^4 + 7*A*b^5)*c^2*d + 2*(4*D*a^4*b - 1
9*C*a^3*b^2 + 106*B*a^2*b^3 - 49*A*a*b^4)*c*d^2 - 3*(D*a^5 + C*a^
4*b - 11*B*a^3*b^2 + 77*A*a^2*b^3)*d^3)*x)*sqrt(b^2*c - a*b*d))/(
(a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*c^2*d^2 - 4*a^6*b^3*c*
d^3 + a^7*b^2*d^4 + (b^9*c^4 - 4*a*b^8*c^3*d + 6*a^2*b^7*c^2*d^2
- 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^3 + 3*(a*b^8*c^4 - 4*a^2*b^7*c
^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3 + a^5*b^4*d^4)*x^2 + 3
*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5*c^2*d^2 - 4*a^5*b^4*c
*d^3 + a^6*b^3*d^4)*x)*sqrt(b^2*c - a*b*d)*sqrt(d*x + c)), -1/24*
(3*(16*D*a^3*b^3*c^3 + 24*(D*a^4*b^2 - C*a^3*b^3)*c^2*d - 6*(D*a^
5*b + 2*C*a^4*b^2 - 5*B*a^3*b^3)*c*d^2 + (D*a^6 + C*a^5*b + 5*B*a
^4*b^2 - 35*A*a^3*b^3)*d^3 + (16*D*b^6*c^3 + 24*(D*a*b^5 - C*b^6)
*c^2*d - 6*(D*a^2*b^4 + 2*C*a*b^5 - 5*B*b^6)*c*d^2 + (D*a^3*b^3 +
 C*a^2*b^4 + 5*B*a*b^5 - 35*A*b^6)*d^3)*x^3 + 3*(16*D*a*b^5*c^3 +
 24*(D*a^2*b^4 - C*a*b^5)*c^2*d - 6*(D*a^3*b^3 + 2*C*a^2*b^4 - 5*
B*a*b^5)*c*d^2 + (D*a^4*b^2 + C*a^3*b^3 + 5*B*a^2*b^4 - 35*A*a*b^
5)*d^3)*x^2 + 3*(16*D*a^2*b^4*c^3 + 24*(D*a^3*b^3 - C*a^2*b^4)*c^
2*d - 6*(D*a^4*b^2 + 2*C*a^3*b^3 - 5*B*a^2*b^4)*c*d^2 + (D*a^5*b
+ C*a^4*b^2 + 5*B*a^3*b^3 - 35*A*a^2*b^4)*d^3)*x)*sqrt(d*x + c)*a
rctan(-(b*c - a*d)/(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))) + (48*A*
a^3*b^2*d^3 - 4*(23*D*a^3*b^2 - 2*C*a^2*b^3 - B*a*b^4 - 2*A*b^5)*
c^3 - 2*(8*D*a^4*b - 47*C*a^3*b^2 + 14*B*a^2*b^3 + 19*A*a*b^4)*c^
2*d + 3*(D*a^5 + C*a^4*b - 27*B*a^3*b^2 + 29*A*a^2*b^3)*c*d^2 - 3
*(16*D*b^5*c^3 + 24*(D*a*b^4 - C*b^5)*c^2*d - 6*(D*a^2*b^3 + 2*C*
a*b^4 - 5*B*b^5)*c*d^2 + (D*a^3*b^2 + C*a^2*b^3 + 5*B*a*b^4 - 35*
A*b^5)*d^3)*x^3 - (24*(9*D*a*b^4 - C*b^5)*c^3 + 6*(15*D*a^2*b^3 -
 34*C*a*b^4 + 5*B*b^5)*c^2*d + (17*D*a^3*b^2 - 95*C*a^2*b^3 + 245
*B*a*b^4 - 35*A*b^5)*c*d^2 - 8*(D*a^4*b - C*a^3*b^2 - 5*B*a^2*b^3
 + 35*A*a*b^4)*d^3)*x^2 - (12*(21*D*a^2*b^3 - 2*C*a*b^4 - B*b^5)*
c^3 + 2*(29*D*a^3*b^2 - 125*C*a^2*b^3 + 41*B*a*b^4 + 7*A*b^5)*c^2
*d + 2*(4*D*a^4*b - 19*C*a^3*b^2 + 106*B*a^2*b^3 - 49*A*a*b^4)*c*
d^2 - 3*(D*a^5 + C*a^4*b - 11*B*a^3*b^2 + 77*A*a^2*b^3)*d^3)*x)*s
qrt(-b^2*c + a*b*d))/((a^3*b^6*c^4 - 4*a^4*b^5*c^3*d + 6*a^5*b^4*
c^2*d^2 - 4*a^6*b^3*c*d^3 + a^7*b^2*d^4 + (b^9*c^4 - 4*a*b^8*c^3*
d + 6*a^2*b^7*c^2*d^2 - 4*a^3*b^6*c*d^3 + a^4*b^5*d^4)*x^3 + 3*(a
*b^8*c^4 - 4*a^2*b^7*c^3*d + 6*a^3*b^6*c^2*d^2 - 4*a^4*b^5*c*d^3
+ a^5*b^4*d^4)*x^2 + 3*(a^2*b^7*c^4 - 4*a^3*b^6*c^3*d + 6*a^4*b^5
*c^2*d^2 - 4*a^5*b^4*c*d^3 + a^6*b^3*d^4)*x)*sqrt(-b^2*c + a*b*d)
*sqrt(d*x + c))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**4/(d*x+c)**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.241304, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^4*(d*x + c)^(3/2)),x, algorithm="gi
```

```
[Out] Done
```

3.18 $\int \frac{(a+bx)^3 (A+Bx+Cx^2+Dx^3)}{(c+dx)^{5/2}} dx$

Optimal. Leaf size=434

$$-\frac{2\sqrt{c+dx}(bc-ad)\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{d^7}+\frac{2b(c+dx)^{5/2}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{5d^7}+\frac{2(c+dx)^{3/2}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{3d^7}+\frac{2(bc-ad)^2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{d^7\sqrt{c+dx}}+\frac{2(bc-ad)^3\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^7(c+dx)^{3/2}}+\frac{2b^2(c+dx)^{7/2}(3adD-6bcD+bCd)}{7d^7}+\frac{2b^3D(c+dx)^{9/2}}{9d^7}$$

```
[Out] (2*(b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^7*(c +
 d*x)^(3/2)) + (2*(b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D)
- b*(5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D)))/(d^7*Sqrt[c + d
*x]) - (2*(b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a*b*d*(8*c*C*d - 3
*B*d^2 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2 + 3*A*d^3 - 15*c
^3*D))*Sqrt[c + d*x])/d^7 + (2*(a^3*d^3*D + 3*a^2*b*d^2*(C*d - 4*
c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 - 10*c^2*D) + b^3*(10*c^2*C*d -
 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c + d*x)^(3/2))/(3*d^7) + (2*b*(
3*a^2*d^2*D + 3*a*b*d*(C*d - 5*c*D) - b^2*(5*c*C*d - B*d^2 - 15*c
^2*D))*(c + d*x)^(5/2))/(5*d^7) + (2*b^2*(b*C*d - 6*b*c*D + 3*a*d
*D)*(c + d*x)^(7/2))/(7*d^7) + (2*b^3*D*(c + d*x)^(9/2))/(9*d^7)
```

Rubi [A] time = 0.862334, antiderivative size = 434, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.031

$$-\frac{2\sqrt{c+dx}(bc-ad)\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{d^7}+\frac{2b(c+dx)^{5/2}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{5d^7}+\frac{2(c+dx)^{3/2}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{3d^7}+\frac{2(bc-ad)^2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{d^7\sqrt{c+dx}}+\frac{2(bc-ad)^3\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^7(c+dx)^{3/2}}+\frac{2b^2(c+dx)^{7/2}(3adD-6bcD+bCd)}{7d^7}+\frac{2b^3D(c+dx)^{9/2}}{9d^7}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^3*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(5/2),x]
```

```
[Out] (2*(b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^7*(c +
 d*x)^(3/2)) + (2*(b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D)
- b*(5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D)))/(d^7*Sqrt[c + d
*x]) - (2*(b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a*b*d*(8*c*C*d - 3
*B*d^2 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2 + 3*A*d^3 - 15*c
^3*D))*Sqrt[c + d*x])/d^7 + (2*(a^3*d^3*D + 3*a^2*b*d^2*(C*d - 4*
c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 - 10*c^2*D) + b^3*(10*c^2*C*d -
 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c + d*x)^(3/2))/(3*d^7) + (2*b*(
3*a^2*d^2*D + 3*a*b*d*(C*d - 5*c*D) - b^2*(5*c*C*d - B*d^2 - 15*c
^2*D))*(c + d*x)^(5/2))/(5*d^7) + (2*b^2*(b*C*d - 6*b*c*D + 3*a*d
*D)*(c + d*x)^(7/2))/(7*d^7) + (2*b^3*D*(c + d*x)^(9/2))/(9*d^7)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**3*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.38416, size = 485, normalized size = 1.12

$$\frac{2\left(-105a^3d^3\left(d^3\left(A+3Bx+x^2(-(3C+Dx))\right)+2cd^2(B+3x(Dx-2C))+16c^3D-8c^2d(C-3Dx)\right)+63a^2bd^2\left(-2cd^3\left(5A+\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)^3*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(5/2),x]
```

```
[Out] (2*(-105*a^3*d^3*(16*c^3*D - 8*c^2*d*(C - 3*D*x) + 2*c*d^2*(B + 3
*x*(-2*C + D*x)) + d^3*(A + 3*B*x - x^2*(3*C + D*x))) + 63*a^2*b*
d^2*(128*c^4*D + c^3*(-80*C*d + 192*d*D*x) + 8*c^2*d^2*(5*B + 3*x
*(-5*C + 2*D*x)) + d^4*x*(-15*A + x*(15*B + 5*C*x + 3*D*x^2)) - 2
*c*d^3*(5*A + x*(-30*B + 15*C*x + 4*D*x^2))) + b^3*(5120*c^6*D -
3840*c^5*d*(C - 2*D*x) + 384*c^4*d^2*(7*B + 5*x*(-3*C + D*x)) + 2
4*c^2*d^4*x*(-105*A + x*(42*B + 5*x*(2*C + D*x))) - 6*c*d^5*x^2*(
105*A + x*(28*B + 5*x*(3*C + 2*D*x))) - 16*c^3*d^3*(105*A + 2*x*(
-126*B + 5*x*(9*C + 2*D*x))) + d^6*x^3*(105*A + x*(63*B + 5*x*(9*
C + 7*D*x)))) + 9*a*b^2*d*(-1280*c^5*D + 128*c^4*d*(7*C - 15*D*x)
 - 16*c^3*d^2*(35*B + 6*x*(-14*C + 5*D*x)) + d^5*x^2*(105*A + x*(
35*B + 3*x*(7*C + 5*D*x))) + 8*c^2*d^3*(35*A + x*(-105*B + 2*x*(2
1*C + 5*D*x))) - 2*c*d^4*x*(-210*A + x*(105*B + x*(28*C + 15*D*x)
)))))/(315*d^7*(c + d*x)^(3/2))
```

Maple [B] time = 0.013, size = 841, normalized size = 1.9

$$-\frac{-70\,b^3Dx^6d^6 - 90\,Cb^3d^6x^5 - 270\,Dab^2d^6x^5 + 120\,Db^3cd^5x^5 - 126\,Bb^3d^6x^4 - 378\,Cab^2d^6x^4 + 180\,Cb^3cd^5x^4 - 378\,Da^2bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^3*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(5/2),x)
```

```
[Out] -2/315/(d*x+c)^(3/2)*(-35*D*b^3*d^6*x^6-45*C*b^3*d^6*x^5-135*D*a*
b^2*d^6*x^5+60*D*b^3*c*d^5*x^5-63*B*b^3*d^6*x^4-189*C*a*b^2*d^6*x
^4+90*C*b^3*c*d^5*x^4-189*D*a^2*b*d^6*x^4+270*D*a*b^2*c*d^5*x^4-1
20*D*b^3*c^2*d^4*x^4-105*A*b^3*d^6*x^3-315*B*a*b^2*d^6*x^3+168*B*
b^3*c*d^5*x^3-315*C*a^2*b*d^6*x^3+504*C*a*b^2*c*d^5*x^3-240*C*b^3
*c^2*d^4*x^3-105*D*a^3*d^6*x^3+504*D*a^2*b*c*d^5*x^3-720*D*a*b^2*
c^2*d^4*x^3+320*D*b^3*c^3*d^3*x^3-945*A*a*b^2*d^6*x^2+630*A*b^3*c
*d^5*x^2-945*B*a^2*b*d^6*x^2+1890*B*a*b^2*c*d^5*x^2-1008*B*b^3*c^
2*d^4*x^2-315*C*a^3*d^6*x^2+1890*C*a^2*b*c*d^5*x^2-3024*C*a*b^2*c
^2*d^4*x^2+1440*C*b^3*c^3*d^3*x^2+630*D*a^3*c*d^5*x^2-3024*D*a^2*
b*c^2*d^4*x^2+4320*D*a*b^2*c^3*d^3*x^2-1920*D*b^3*c^4*d^2*x^2+945
*A*a^2*b*d^6*x-3780*A*a*b^2*c*d^5*x+2520*A*b^3*c^2*d^4*x+315*B*a^
3*d^6*x-3780*B*a^2*b*c*d^5*x+7560*B*a*b^2*c^2*d^4*x-4032*B*b^3*c^
3*d^3*x-1260*C*a^3*c*d^5*x+7560*C*a^2*b*c^2*d^4*x-12096*C*a*b^2*c
^3*d^3*x+5760*C*b^3*c^4*d^2*x+2520*D*a^3*c^2*d^4*x-12096*D*a^2*b*
c^3*d^3*x+17280*D*a*b^2*c^4*d^2*x-7680*D*b^3*c^5*d*x+105*A*a^3*d^
6+630*A*a^2*b*c*d^5-2520*A*a*b^2*c^2*d^4+1680*A*b^3*c^3*d^3+210*B
*a^3*c*d^5-2520*B*a^2*b*c^2*d^4+5040*B*a*b^2*c^3*d^3-2688*B*b^3*c
^4*d^2-840*C*a^3*c^2*d^4+5040*C*a^2*b*c^3*d^3-8064*C*a*b^2*c^4*d^
2+3840*C*b^3*c^5*d+1680*D*a^3*c^3*d^3-8064*D*a^2*b*c^4*d^2+11520*
D*a*b^2*c^5*d-5120*D*b^3*c^6)/d^7
```

Maxima [A] time = 1.37251, size = 846, normalized size = 1.95

$$2\left(\frac{35\,(dx+c)^{\frac{9}{2}}Db^3-45\,(6\,Db^3c-(3\,Dab^2+Cb^3)\,d)\,(dx+c)^{\frac{7}{2}}+63\,(15\,Db^3c^2-5\,(3\,Dab^2+Cb^3)\,cd+(3\,Da^2b+3\,Cab^2+Bb^3)\,d^2)\,(dx+c)^{\frac{5}{2}}-105\,(20\,Db^3c^3-10\,(3\,Dab}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/(d*x + c)^(5/2),x, algorithm="maxi
```

```
[Out] 2/315*((35*(d*x + c)^(9/2)*D*b^3 - 45*(6*D*b^3*c - (3*D*a*b^2 + C
*b^3)*d)*(d*x + c)^(7/2) + 63*(15*D*b^3*c^2 - 5*(3*D*a*b^2 + C*b^
3)*c*d + (3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^2)*(d*x + c)^(5/2) - 1
05*(20*D*b^3*c^3 - 10*(3*D*a*b^2 + C*b^3)*c^2*d + 4*(3*D*a^2*b +
3*C*a*b^2 + B*b^3)*c*d^2 - (D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3
)*d^3)*(d*x + c)^(3/2) + 315*(15*D*b^3*c^4 - 10*(3*D*a*b^2 + C*b^
3)*c^3*d + 6*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^2*d^2 - 3*(D*a^3 +
 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c*d^3 + (C*a^3 + 3*B*a^2*b + 3*A*
```

```
a*b^2)*d^4)*sqrt(d*x + c))/d^6 - 105*(D*b^3*c^6 + A*a^3*d^6 - (3*
D*a*b^2 + C*b^3)*c^5*d + (3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^4*d^2
- (D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^3*d^3 + (C*a^3 + 3*B*
a^2*b + 3*A*a*b^2)*c^2*d^4 - (B*a^3 + 3*A*a^2*b)*c*d^5 - 3*(6*D*b
^3*c^5 - 5*(3*D*a*b^2 + C*b^3)*c^4*d + 4*(3*D*a^2*b + 3*C*a*b^2 +
 B*b^3)*c^3*d^2 - 3*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^2*d
^3 + 2*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c*d^4 - (B*a^3 + 3*A*a^2*b
)*d^5)*(d*x + c))/((d*x + c)^(3/2)*d^6))/d
```

Fricas [A] time = 0.231058, size = 856, normalized size = 1.97

$$\frac{2 \left(35 \, D b^{3} d^{6} x^{6} + 5120 \, D b^{3} c^{6} - 105 \, A a^{3} d^{6} - 3840 \, \left(3 \, D a b^{2} + C b^{3}\right) c^{5} d + 2688 \, \left(3 \, D a^{2} b + 3 \, C a b^{2} + B b^{3}\right) c^{4} d^{2} - 1680 \, \left(D a^{3} + 3 \, C\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/(d*x + c)^(5/2),x, algorithm="fric
```

```
[Out] 2/315*(35*D*b^3*d^6*x^6 + 5120*D*b^3*c^6 - 105*A*a^3*d^6 - 3840*(
3*D*a*b^2 + C*b^3)*c^5*d + 2688*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c
^4*d^2 - 1680*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^3*d^3 + 8
40*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^2*d^4 - 210*(B*a^3 + 3*A*a^2
*b)*c*d^5 - 15*(4*D*b^3*c*d^5 - 3*(3*D*a*b^2 + C*b^3)*d^6)*x^5 +
3*(40*D*b^3*c^2*d^4 - 30*(3*D*a*b^2 + C*b^3)*c*d^5 + 21*(3*D*a^2*
b + 3*C*a*b^2 + B*b^3)*d^6)*x^4 - (320*D*b^3*c^3*d^3 - 240*(3*D*a
*b^2 + C*b^3)*c^2*d^4 + 168*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c*d^5
 - 105*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*d^6)*x^3 + 3*(640*
D*b^3*c^4*d^2 - 480*(3*D*a*b^2 + C*b^3)*c^3*d^3 + 336*(3*D*a^2*b
+ 3*C*a*b^2 + B*b^3)*c^2*d^4 - 210*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2
 + A*b^3)*c*d^5 + 105*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*d^6)*x^2 +
3*(2560*D*b^3*c^5*d - 1920*(3*D*a*b^2 + C*b^3)*c^4*d^2 + 1344*(3*
D*a^2*b + 3*C*a*b^2 + B*b^3)*c^3*d^3 - 840*(D*a^3 + 3*C*a^2*b + 3
*B*a*b^2 + A*b^3)*c^2*d^4 + 420*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c
*d^5 - 105*(B*a^3 + 3*A*a^2*b)*d^6)*x)/((d^8*x + c*d^7)*sqrt(d*x
+ c))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + bx)^3 \left(A + Bx + Cx^2 + Dx^3\right)}{(c + dx)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**3*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] Integral((a + b*x)**3*(A + B*x + C*x**2 + D*x**3)/(c + d*x)**(5/2
```

```
), x)
```

GIAC/XCAS [A] time = 0.222604, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3/(d*x + c)^(5/2),x, algorithm="giac
```

```
[Out] Done
```

3.19 $\int \frac{(a+bx)^2(A+Bx+Cx^2+Dx^3)}{(c+dx)^{5/2}}\,dx$

Optimal. Leaf size=322

$$\frac{2\sqrt{c+dx}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{d^6}+\frac{2(c+dx)^{3/2}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{3d^6}-\frac{2(bc-ad)\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{d^6\sqrt{c+dx}}-\frac{2(bc-ad)^2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^6(c+dx)^{3/2}}+\frac{2b(c+dx)^{5/2}(2adD-5bcD+bCd)}{5d^6}+\frac{2b^2D(c+dx)^{7/2}}{7d^6}$$

```
[Out] (-2*(b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^6*(c
+ d*x)^(3/2)) - (2*(b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) -
 b*(4*c^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D)))/(d^6*Sqrt[c + d*
x]) + (2*(a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d - B*d^2 - 6*c^
2*D) + b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D))*Sqrt[c + d
*x])/d^6 + (2*(a^2*d^2*D + 2*a*b*d*(C*d - 4*c*D) - b^2*(4*c*C*d -
 B*d^2 - 10*c^2*D))*(c + d*x)^(3/2))/(3*d^6) + (2*b*(b*C*d - 5*b*
c*D + 2*a*d*D)*(c + d*x)^(5/2))/(5*d^6) + (2*b^2*D*(c + d*x)^(7/2
))/(7*d^6)
```

Rubi [A] time = 0.545665, antiderivative size = 322, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.031

$$\frac{2\sqrt{c+dx}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{d^6}+\frac{2(c+dx)^{3/2}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{3d^6}-\frac{2(bc-ad)\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{d^6\sqrt{c+dx}}-\frac{2(bc-ad)^2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^6(c+dx)^{3/2}}+\frac{2b(c+dx)^{5/2}(2adD-5bcD+bCd)}{5d^6}+\frac{2b^2D(c+dx)^{7/2}}{7d^6}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^2*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(5/2),x]
```



```
[Out] (-2*(b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^6*(c
+ d*x)^(3/2)) - (2*(b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) -
 b*(4*c^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D)))/(d^6*Sqrt[c + d*
x]) + (2*(a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d - B*d^2 - 6*c^
2*D) + b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D))*Sqrt[c + d
*x])/d^6 + (2*(a^2*d^2*D + 2*a*b*d*(C*d - 4*c*D) - b^2*(4*c*C*d -
 B*d^2 - 10*c^2*D))*(c + d*x)^(3/2))/(3*d^6) + (2*b*(b*C*d - 5*b*
```

```
c*D + 2*a*d*D)*(c + d*x)^(5/2))/(5*d^6) + (2*b^2*D*(c + d*x)^(7/2
))/(7*d^6)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**2*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.961516, size = 317, normalized size = 0.98

$$-70a^2d^2\left(d^3\left(A+3Bx+x^2(-(3C+Dx))\right)+2cd^2(B+3x(Dx-2C))+16c^3D-8c^2d(C-3Dx)\right)+28abd\left(-2cd^3\left(5A+x\left(-3\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)^2*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(5/2),x]
```

```
[Out] (-70*a^2*d^2*(16*c^3*D - 8*c^2*d*(C - 3*D*x) + 2*c*d^2*(B + 3*x*(
-2*C + D*x)) + d^3*(A + 3*B*x - x^2*(3*C + D*x))) + 28*a*b*d*(128
*c^4*D + c^3*(-80*C*d + 192*d*D*x) + 8*c^2*d^2*(5*B + 3*x*(-5*C +
 2*D*x)) + d^4*x*(-15*A + x*(15*B + 5*C*x + 3*D*x^2)) - 2*c*d^3*(
5*A + x*(-30*B + 15*C*x + 4*D*x^2))) + 2*b^2*(-1280*c^5*D + 128*c
^4*d*(7*C - 15*D*x) - 16*c^3*d^2*(35*B + 6*x*(-14*C + 5*D*x)) + d
^5*x^2*(105*A + x*(35*B + 3*x*(7*C + 5*D*x))) + 8*c^2*d^3*(35*A +
 x*(-105*B + 2*x*(21*C + 5*D*x))) - 2*c*d^4*x*(-210*A + x*(105*B
+ x*(28*C + 15*D*x)))))/(105*d^6*(c + d*x)^(3/2))
```

Maple [A] time = 0.012, size = 505, normalized size = 1.6

$$-\frac{-30\,b^2Dx^5d^5-42\,Cb^2d^5x^4-84\,Dabd^5x^4+60\,Db^2cd^4x^4-70\,Bb^2d^5x^3-140\,Cabd^5x^3+112\,Cb^2cd^4x^3-70\,Da^2d^5x^3+22}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^2*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(5/2),x)
```

```
[Out] -2/105/(d*x+c)^(3/2)*(-15*D*b^2*d^5*x^5-21*C*b^2*d^5*x^4-42*D*a*b
*d^5*x^4+30*D*b^2*c*d^4*x^4-35*B*b^2*d^5*x^3-70*C*a*b*d^5*x^3+56*
```

```
C*b^2*c*d^4*x^3-35*D*a^2*d^5*x^3+112*D*a*b*c*d^4*x^3-80*D*b^2*c^2
*d^3*x^3-105*A*b^2*d^5*x^2-210*B*a*b*d^5*x^2+210*B*b^2*c*d^4*x^2-
105*C*a^2*d^5*x^2+420*C*a*b*c*d^4*x^2-336*C*b^2*c^2*d^3*x^2+210*D
*a^2*c*d^4*x^2-672*D*a*b*c^2*d^3*x^2+480*D*b^2*c^3*d^2*x^2+210*A*
a*b*d^5*x-420*A*b^2*c*d^4*x+105*B*a^2*d^5*x-840*B*a*b*c*d^4*x+840
*B*b^2*c^2*d^3*x-420*C*a^2*c*d^4*x+1680*C*a*b*c^2*d^3*x-1344*C*b^
2*c^3*d^2*x+840*D*a^2*c^2*d^3*x-2688*D*a*b*c^3*d^2*x+1920*D*b^2*c
^4*d*x+35*A*a^2*d^5+140*A*a*b*c*d^4-280*A*b^2*c^2*d^3+70*B*a^2*c*
d^4-560*B*a*b*c^2*d^3+560*B*b^2*c^3*d^2-280*C*a^2*c^2*d^3+1120*C*
a*b*c^3*d^2-896*C*b^2*c^4*d+560*D*a^2*c^3*d^2-1792*D*a*b*c^4*d+12
80*D*b^2*c^5)/d^6
```

Maxima [A] time = 1.36482, size = 531, normalized size = 1.65

$$2\left(\frac{15\,(dx+c)^{\frac{7}{2}}\,Db^2-21\,\left(5\,Db^2c-\left(2\,Dab+Cb^2\right)d\right)(dx+c)^{\frac{5}{2}}+35\,\left(10\,Db^2c^2-4\,\left(2\,Dab+Cb^2\right)cd+\left(Da^2+2\,Cab+Bb^2\right)d^2\right)(dx+c)^{\frac{3}{2}}-105\,\left(10\,Db^2c^3-6\,\left(2\,Dab+Cb^2\right)\right.}{d^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/(d*x + c)^(5/2),x, algorithm="maxi
```

```
[Out] 2/105*((15*(d*x + c)^(7/2)*D*b^2 - 21*(5*D*b^2*c - (2*D*a*b + C*b
^2)*d)*(d*x + c)^(5/2) + 35*(10*D*b^2*c^2 - 4*(2*D*a*b + C*b^2)*c
*d + (D*a^2 + 2*C*a*b + B*b^2)*d^2)*(d*x + c)^(3/2) - 105*(10*D*b
^2*c^3 - 6*(2*D*a*b + C*b^2)*c^2*d + 3*(D*a^2 + 2*C*a*b + B*b^2)*
c*d^2 - (C*a^2 + 2*B*a*b + A*b^2)*d^3)*sqrt(d*x + c))/d^5 + 35*(D
*b^2*c^5 - A*a^2*d^5 - (2*D*a*b + C*b^2)*c^4*d + (D*a^2 + 2*C*a*b
 + B*b^2)*c^3*d^2 - (C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 + (B*a^2 +
2*A*a*b)*c*d^4 - 3*(5*D*b^2*c^4 - 4*(2*D*a*b + C*b^2)*c^3*d + 3*(
D*a^2 + 2*C*a*b + B*b^2)*c^2*d^2 - 2*(C*a^2 + 2*B*a*b + A*b^2)*c*
d^3 + (B*a^2 + 2*A*a*b)*d^4)*(d*x + c))/((d*x + c)^(3/2)*d^5))/d
```

Fricas [A] time = 0.222851, size = 536, normalized size = 1.66

$$\frac{2\left(15\,Db^2d^5x^5-1280\,Db^2c^5-35\,Aa^2d^5+896\left(2\,Dab+Cb^2\right)c^4d-560\left(Da^2+2\,Cab+Bb^2\right)c^3d^2+280\left(Ca^2+2\,Bab+Ab^2\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/(d*x + c)^(5/2),x, algorithm="fric
```

```
[Out] 2/105*(15*D*b^2*d^5*x^5 - 1280*D*b^2*c^5 - 35*A*a^2*d^5 + 896*(2*
D*a*b + C*b^2)*c^4*d - 560*(D*a^2 + 2*C*a*b + B*b^2)*c^3*d^2 + 28
0*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 - 70*(B*a^2 + 2*A*a*b)*c*d^4
- 3*(10*D*b^2*c*d^4 - 7*(2*D*a*b + C*b^2)*d^5)*x^4 + (80*D*b^2*c^
2*d^3 - 56*(2*D*a*b + C*b^2)*c*d^4 + 35*(D*a^2 + 2*C*a*b + B*b^2)
```

```
*d^5)*x^3 - 3*(160*D*b^2*c^3*d^2 - 112*(2*D*a*b + C*b^2)*c^2*d^3
+ 70*(D*a^2 + 2*C*a*b + B*b^2)*c*d^4 - 35*(C*a^2 + 2*B*a*b + A*b^
2)*d^5)*x^2 - 3*(640*D*b^2*c^4*d - 448*(2*D*a*b + C*b^2)*c^3*d^2
+ 280*(D*a^2 + 2*C*a*b + B*b^2)*c^2*d^3 - 140*(C*a^2 + 2*B*a*b +
A*b^2)*c*d^4 + 35*(B*a^2 + 2*A*a*b)*d^5)*x)/((d^7*x + c*d^6)*sqrt
(d*x + c))
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+bx)^2 \left(A+Bx+Cx^2+Dx^3\right)}{(c+dx)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**2*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] Integral((a + b*x)**2*(A + B*x + C*x**2 + D*x**3)/(c + d*x)**(5/2
), x)
```

GIAC/XCAS [A] time = 0.218949, size = 840, normalized size = 2.61

$$-\frac{2\left(15\,(dx+c)Db^2c^4-Db^2c^5-24\,(dx+c)Dabc^3d-12\,(dx+c)Cb^2c^3d+2\,Dabc^4d+Cb^2c^4d+9\,(dx+c)Da^2c^2d^2+18\,(dx\right.}{}$$

$$+\frac{2\left(15\,(dx+c)^{\frac{7}{2}}Db^2d^{36}-105\,(dx+c)^{\frac{5}{2}}Db^2cd^{36}+350\,(dx+c)^{\frac{3}{2}}Db^2c^2d^{36}-1050\,\sqrt{dx+c}Db^2c^3d^{36}+42\,(dx+c)^{\frac{5}{2}}Dabd^{37}+2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2/(d*x + c)^(5/2),x, algorithm="giac
```

```
[Out] -2/3*(15*(d*x + c)*D*b^2*c^4 - D*b^2*c^5 - 24*(d*x + c)*D*a*b*c^3
*d - 12*(d*x + c)*C*b^2*c^3*d + 2*D*a*b*c^4*d + C*b^2*c^4*d + 9*(
d*x + c)*D*a^2*c^2*d^2 + 18*(d*x + c)*C*a*b*c^2*d^2 + 9*(d*x + c)
*B*b^2*c^2*d^2 - D*a^2*c^3*d^2 - 2*C*a*b*c^3*d^2 - B*b^2*c^3*d^2
- 6*(d*x + c)*C*a^2*c*d^3 - 12*(d*x + c)*B*a*b*c*d^3 - 6*(d*x + c
)*A*b^2*c*d^3 + C*a^2*c^2*d^3 + 2*B*a*b*c^2*d^3 + A*b^2*c^2*d^3 +
 3*(d*x + c)*B*a^2*d^4 + 6*(d*x + c)*A*a*b*d^4 - B*a^2*c*d^4 - 2*
A*a*b*c*d^4 + A*a^2*d^5)/((d*x + c)^(3/2)*d^6) + 2/105*(15*(d*x +
 c)^(7/2)*D*b^2*d^36 - 105*(d*x + c)^(5/2)*D*b^2*c*d^36 + 350*(d*
x + c)^(3/2)*D*b^2*c^2*d^36 - 1050*sqrt(d*x + c)*D*b^2*c^3*d^36 +
 42*(d*x + c)^(5/2)*D*a*b*d^37 + 21*(d*x + c)^(5/2)*C*b^2*d^37 -
280*(d*x + c)^(3/2)*D*a*b*c*d^37 - 140*(d*x + c)^(3/2)*C*b^2*c*d^
37 + 1260*sqrt(d*x + c)*D*a*b*c^2*d^37 + 630*sqrt(d*x + c)*C*b^2*
c^2*d^37 + 35*(d*x + c)^(3/2)*D*a^2*d^38 + 70*(d*x + c)^(3/2)*C*a
*b*d^38 + 35*(d*x + c)^(3/2)*B*b^2*d^38 - 315*sqrt(d*x + c)*D*a^2
```

```
*c*d^38 - 630*sqrt(d*x + c)*C*a*b*c*d^38 - 315*sqrt(d*x + c)*B*b^
2*c*d^38 + 105*sqrt(d*x + c)*C*a^2*d^39 + 210*sqrt(d*x + c)*B*a*b
*d^39 + 105*sqrt(d*x + c)*A*b^2*d^39)/d^42
```

3.20 $\int \frac{(a+bx)(A+Bx+Cx^2+Dx^3)}{(c+dx)^{5/2}}\,dx$

Optimal. Leaf size=210

$$\frac{2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{d^5\sqrt{c+dx}}+\frac{2(bc-ad)\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^5(c+dx)^{3/2}}+\frac{2\sqrt{c+dx}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{d^5}+\frac{2(c+dx)^{3/2}(adD-4bcD+bCd)}{3d^5}+\frac{2bD(c+dx)^{5/2}}{5d^5}$$

```
[Out] (2*(b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^5*(c + d
*x)^(3/2)) + (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^2*C*d -
 2*B*c*d^2 + A*d^3 - 4*c^3*D)))/(d^5*Sqrt[c + d*x]) + (2*(a*d*(C*
d - 3*c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*Sqrt[c + d*x])/d^5 +
(2*(b*C*d - 4*b*c*D + a*d*D)*(c + d*x)^(3/2))/(3*d^5) + (2*b*D*(c
 + d*x)^(5/2))/(5*d^5)
```

Rubi [A] time = 0.345126, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.033

$$\frac{2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{d^5\sqrt{c+dx}}+\frac{2(bc-ad)\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^5(c+dx)^{3/2}}+\frac{2\sqrt{c+dx}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{d^5}+\frac{2(c+dx)^{3/2}(adD-4bcD+bCd)}{3d^5}+\frac{2bD(c+dx)^{5/2}}{5d^5}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(5/2),x]
```

```
[Out] (2*(b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^5*(c + d
*x)^(3/2)) + (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^2*C*d -
 2*B*c*d^2 + A*d^3 - 4*c^3*D)))/(d^5*Sqrt[c + d*x]) + (2*(a*d*(C*
d - 3*c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*Sqrt[c + d*x])/d^5 +
(2*(b*C*d - 4*b*c*D + a*d*D)*(c + d*x)^(3/2))/(3*d^5) + (2*b*D*(c
 + d*x)^(5/2))/(5*d^5)
```

Rubi in Sympy [A] time = 80.6565, size = 226, normalized size = 1.08

$$\frac{2Db\left(c+dx\right)^{\frac{5}{2}}}{5d^5}+\frac{2\left(c+dx\right)^{\frac{3}{2}}\left(Cbd+Dad-4Dbc\right)}{3d^5}+\frac{2\sqrt{c+dx}\left(Bbd^2+Cad^2-3Cbcd-3Dacd+6Dbc^2\right)}{d^5}-\frac{2\left(Abd^3+Bad^3-2Bbcd^2-2Cacd^2+3Cbc^2d+3Dac^2d-4Dbc^3\right)}{d^5\sqrt{c+dx}}-\frac{2\left(ad-bc\right)\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{3d^5\left(c+dx\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] 2*D*b*(c + d*x)**(5/2)/(5*d**5) + 2*(c + d*x)**(3/2)*(C*b*d + D*a
*d - 4*D*b*c)/(3*d**5) + 2*sqrt(c + d*x)*(B*b*d**2 + C*a*d**2 - 3
*C*b*c*d - 3*D*a*c*d + 6*D*b*c**2)/d**5 - 2*(A*b*d**3 + B*a*d**3
- 2*B*b*c*d**2 - 2*C*a*c*d**2 + 3*C*b*c**2*d + 3*D*a*c**2*d - 4*D
*b*c**3)/(d**5*sqrt(c + d*x)) - 2*(a*d - b*c)*(A*d**3 - B*c*d**2
+ C*c**2*d - D*c**3)/(3*d**5*(c + d*x)**(3/2))
```

Mathematica [A] time = 0.29109, size = 177, normalized size = 0.84

$$\frac{2\left(b\left(-2cd^3\left(5A+x\left(-30B+15Cx+4Dx^2\right)\right)+d^4x\left(x\left(15B+5Cx+3Dx^2\right)-15A\right)+8c^2d^2(5B+3x(2Dx-5C))+128c^4D\right.\right.}{15d^5(c+dx}$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)*(A + B*x + C*x^2 + D*x^3))/(c + d*x)^(5/2),x]
```

```
[Out] (2*(-5*a*d*(16*c^3*D - 8*c^2*d*(C - 3*D*x) + 2*c*d^2*(B + 3*x*(-2
*C + D*x)) + d^3*(A + 3*B*x - x^2*(3*C + D*x))) + b*(128*c^4*D +
c^3*(-80*C*d + 192*d*D*x) + 8*c^2*d^2*(5*B + 3*x*(-5*C + 2*D*x))
+ d^4*x*(-15*A + x*(15*B + 5*C*x + 3*D*x^2)) - 2*c*d^3*(5*A + x*(
-30*B + 15*C*x + 4*D*x^2)))))/(15*d^5*(c + d*x)^(3/2))
```

Maple [A] time = 0.007, size = 241, normalized size = 1.2

$$-\frac{-6\,Dbx^4d^4-10\,Cbd^4x^3-10\,Dad^4x^3+16\,Dbcd^3x^3-30\,Bbd^4x^2-30\,Cad^4x^2+60\,Cbcd^3x^2+60\,Dacd^3x^2-96\,Dbc^2d^2x^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(D*x^3+C*x^2+B*x+A)/(d*x+c)^(5/2),x)
```

```
[Out] -2/15/(d*x+c)^(3/2)*(-3*D*b*d^4*x^4-5*C*b*d^4*x^3-5*D*a*d^4*x^3+8
*D*b*c*d^3*x^3-15*B*b*d^4*x^2-15*C*a*d^4*x^2+30*C*b*c*d^3*x^2+30*
D*a*c*d^3*x^2-48*D*b*c^2*d^2*x^2+15*A*b*d^4*x+15*B*a*d^4*x-60*B*b
*c*d^3*x-60*C*a*c*d^3*x+120*C*b*c^2*d^2*x+120*D*a*c^2*d^2*x-192*D
*b*c^3*d*x+5*A*a*d^4+10*A*b*c*d^3+10*B*a*c*d^3-40*B*b*c^2*d^2-40*
C*a*c^2*d^2+80*C*b*c^3*d+80*D*a*c^3*d-128*D*b*c^4)/d^5
```

Maxima [A] time = 1.36125, size = 275, normalized size = 1.31

$$\frac{2\left(\frac{3\,(dx+c)^{\frac{5}{2}}Db-5\,(4\,Dbc-(Da+Cb)d)(dx+c)^{\frac{3}{2}}+15\,\left(6\,Dbc^2-3\,(Da+Cb)cd+(Ca+Bb)d^2\right)\sqrt{dx+c}}{d^4}-\frac{5\,\left(Dbc^4+Aad^4-(Da+Cb)c^3d+(Ca+Bb)c^2d^2-(Ba+Ab)c\right.}{(}\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/(d*x + c)^(5/2),x, algorithm="maxima
```

```
[Out] 2/15*((3*(d*x + c)^(5/2)*D*b - 5*(4*D*b*c - (D*a + C*b)*d)*(d*x +
 c)^(3/2) + 15*(6*D*b*c^2 - 3*(D*a + C*b)*c*d + (C*a + B*b)*d^2)*
sqrt(d*x + c))/d^4 - 5*(D*b*c^4 + A*a*d^4 - (D*a + C*b)*c^3*d + (
C*a + B*b)*c^2*d^2 - (B*a + A*b)*c*d^3 - 3*(4*D*b*c^3 - 3*(D*a +
C*b)*c^2*d + 2*(C*a + B*b)*c*d^2 - (B*a + A*b)*d^3)*(d*x + c))/((
d*x + c)^(3/2)*d^4))/d
```

Fricas [A] time = 0.21685, size = 279, normalized size = 1.33

$$\frac{2\left(3\,Dbd^4x^4+128\,Dbc^4-5\,Aad^4-80\,(Da+Cb)c^3d+40\,(Ca+Bb)c^2d^2-10\,(Ba+Ab)cd^3-\left(8\,Dbcd^3-5\,(Da+Cb)d^4\right)x^3\right.}{15\,(d^6x+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/(d*x + c)^(5/2),x, algorithm="fricas
```

```
[Out] 2/15*(3*D*b*d^4*x^4 + 128*D*b*c^4 - 5*A*a*d^4 - 80*(D*a + C*b)*c^
3*d + 40*(C*a + B*b)*c^2*d^2 - 10*(B*a + A*b)*c*d^3 - (8*D*b*c*d^
3 - 5*(D*a + C*b)*d^4)*x^3 + 3*(16*D*b*c^2*d^2 - 10*(D*a + C*b)*c
*d^3 + 5*(C*a + B*b)*d^4)*x^2 + 3*(64*D*b*c^3*d - 40*(D*a + C*b)*
c^2*d^2 + 20*(C*a + B*b)*c*d^3 - 5*(B*a + A*b)*d^4)*x)/((d^6*x +
c*d^5)*sqrt(d*x + c))
```

Sympy [A] time = 44.4195, size = 4235, normalized size = 20.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)*(D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] -2*A*a/(3*d*(c + d*x)**(3/2)) + A*b*Piecewise((-4*c/(3*c*d**2*sqr
t(c + d*x) + 3*d**3*x*sqrt(c + d*x)) - 6*d*x/(3*c*d**2*sqrt(c + d
*x) + 3*d**3*x*sqrt(c + d*x)), Ne(d, 0)), (x**2/(2*c**(5/2)), Tru
e)) + B*a*Piecewise((-4*c/(3*c*d**2*sqrt(c + d*x) + 3*d**3*x*sqrt
(c + d*x)) - 6*d*x/(3*c*d**2*sqrt(c + d*x) + 3*d**3*x*sqrt(c + d*
x)), Ne(d, 0)), (x**2/(2*c**(5/2)), True)) + B*b*Piecewise((16*c*
*2/(3*c*d**3*sqrt(c + d*x) + 3*d**4*x*sqrt(c + d*x)) + 24*c*d*x/(
3*c*d**3*sqrt(c + d*x) + 3*d**4*x*sqrt(c + d*x)) + 6*d**2*x**2/(3
*c*d**3*sqrt(c + d*x) + 3*d**4*x*sqrt(c + d*x)), Ne(d, 0)), (x**3
/(3*c**(5/2)), True)) + C*a*Piecewise((16*c**2/(3*c*d**3*sqrt(c +
 d*x) + 3*d**4*x*sqrt(c + d*x)) + 24*c*d*x/(3*c*d**3*sqrt(c + d*x
) + 3*d**4*x*sqrt(c + d*x)) + 6*d**2*x**2/(3*c*d**3*sqrt(c + d*x)
 + 3*d**4*x*sqrt(c + d*x)), Ne(d, 0)), (x**3/(3*c**(5/2)), True))
 + C*b*Piecewise((-32*c**3/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqr
t(c + d*x)) - 48*c**2*d*x/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt
(c + d*x)) - 12*c*d**2*x**2/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sq
rt(c + d*x)) + 2*d**3*x**3/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqr
t(c + d*x)), Ne(d, 0)), (x**4/(4*c**(5/2)), True)) + D*a*Piecewis
e((-32*c**3/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x)) - 4
8*c**2*d*x/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x)) - 12
*c*d**2*x**2/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x)) +
2*d**3*x**3/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x)), Ne
(d, 0)), (x**4/(4*c**(5/2)), True)) + D*b*(256*c**(85/2)*sqrt(1 +
 d*x/c)/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 +
 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x
**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d
**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) - 256*c*
*(85/2)/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 +
 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x
**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d
**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) + 2432*c
**(83/2)*d*x*sqrt(1 + d*x/c)/(15*c**40*d**5 + 150*c**39*d**6*x +
675*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4
 + 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**
12*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*
d**15*x**10) - 2560*c**(83/2)*d*x/(15*c**40*d**5 + 150*c**39*d**6
*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9
*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**3
3*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c
**30*d**15*x**10) + 10336*c**(81/2)*d**2*x**2*sqrt(1 + d*x/c)/(15
*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37
*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*
c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x**8 +
 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) - 11520*c**(81/2)*d
**2*x**2/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2
+ 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*
```

```
x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*
d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) + 25840
*c**(79/2)*d**3*x**3*sqrt(1 + d*x/c)/(15*c**40*d**5 + 150*c**39*d
**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d
**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c
**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 1
5*c**30*d**15*x**10) - 30720*c**(79/2)*d**3*x**3/(15*c**40*d**5 +
 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 +
3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x
**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d*
*14*x**9 + 15*c**30*d**15*x**10) + 41990*c**(77/2)*d**4*x**4*sqrt
(1 + d*x/c)/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x*
*2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**
10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**
32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) - 53
760*c**(77/2)*d**4*x**4/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c
**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 37
80*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*x*
*7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15
*x**10) + 46192*c**(75/2)*d**5*x**5*sqrt(1 + d*x/c)/(15*c**40*d**
5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x**3
 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d**1
1*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**31
*d**14*x**9 + 15*c**30*d**15*x**10) - 64512*c**(75/2)*d**5*x**5/(
15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**
37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 315
0*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x**8
 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) + 34664*c**(73/2)
*d**6*x**6*sqrt(1 + d*x/c)/(15*c**40*d**5 + 150*c**39*d**6*x + 67
5*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 +
 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12
*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d*
*15*x**10) - 53760*c**(73/2)*d**6*x**6/(15*c**40*d**5 + 150*c**39
*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36
*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800
*c**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 +
 15*c**30*d**15*x**10) + 17392*c**(71/2)*d**7*x**7*sqrt(1 + d*x/c
)/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*
c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 +
3150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x
**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) - 30720*c**(71
/2)*d**7*x**7/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*
x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d
**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c
**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) +
5540*c**(69/2)*d**8*x**8*sqrt(1 + d*x/c)/(15*c**40*d**5 + 150*c**
39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**
36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 18
00*c**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9
 + 15*c**30*d**15*x**10) - 11520*c**(69/2)*d**8*x**8/(15*c**40*d*
*5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x**
3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d**
11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**3
1*d**14*x**9 + 15*c**30*d**15*x**10) + 1040*c**(67/2)*d**9*x**9*s
qrt(1 + d*x/c)/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7
*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*
```

```
d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*
c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) -
 2560*c**(67/2)*d**9*x**9/(15*c**40*d**5 + 150*c**39*d**6*x + 675
*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4 +
3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**12*
x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d**
15*x**10) + 136*c**(65/2)*d**10*x**10*sqrt(1 + d*x/c)/(15*c**40*d
**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x*
*3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d*
*11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**
31*d**14*x**9 + 15*c**30*d**15*x**10) - 256*c**(65/2)*d**10*x**10
/(15*c**40*d**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c
**37*d**8*x**3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3
150*c**34*d**11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x*
*8 + 150*c**31*d**14*x**9 + 15*c**30*d**15*x**10) + 32*c**(63/2)*
d**11*x**11*sqrt(1 + d*x/c)/(15*c**40*d**5 + 150*c**39*d**6*x + 6
75*c**38*d**7*x**2 + 1800*c**37*d**8*x**3 + 3150*c**36*d**9*x**4
+ 3780*c**35*d**10*x**5 + 3150*c**34*d**11*x**6 + 1800*c**33*d**1
2*x**7 + 675*c**32*d**13*x**8 + 150*c**31*d**14*x**9 + 15*c**30*d
**15*x**10) + 6*c**(61/2)*d**12*x**12*sqrt(1 + d*x/c)/(15*c**40*d
**5 + 150*c**39*d**6*x + 675*c**38*d**7*x**2 + 1800*c**37*d**8*x*
*3 + 3150*c**36*d**9*x**4 + 3780*c**35*d**10*x**5 + 3150*c**34*d*
*11*x**6 + 1800*c**33*d**12*x**7 + 675*c**32*d**13*x**8 + 150*c**
31*d**14*x**9 + 15*c**30*d**15*x**10))
```

GIAC/XCAS [A] time = 0.209497, size = 408, normalized size = 1.94

$$\frac{2\left(12\,(dx+c)Dbc^3 - Dbc^4 - 9\,(dx+c)Dac^2d - 9\,(dx+c)Cbc^2d + Dac^3d + Cbc^3d + 6\,(dx+c)Cacd^2 + 6\,(dx+c)Bbcd^2 - Ca\cdots\right.}{3\,(dx+c)^{\frac{3}{2}}d^5}$$

$$+\frac{2\left(3\,(dx+c)^{\frac{5}{2}}Dbd^{20} - 20\,(dx+c)^{\frac{3}{2}}Dbcd^{20} + 90\,\sqrt{dx+c}Dbc^2d^{20} + 5\,(dx+c)^{\frac{3}{2}}Dad^{21} + 5\,(dx+c)^{\frac{3}{2}}Cbd^{21} - 45\,\sqrt{dx+c}Dacd\cdots\right.}{15\,d^{25}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)/(d*x + c)^(5/2),x, algorithm="giac")
```

```
[Out] 2/3*(12*(d*x + c)*D*b*c^3 - D*b*c^4 - 9*(d*x + c)*D*a*c^2*d - 9*(
d*x + c)*C*b*c^2*d + D*a*c^3*d + C*b*c^3*d + 6*(d*x + c)*C*a*c*d^
2 + 6*(d*x + c)*B*b*c*d^2 - C*a*c^2*d^2 - B*b*c^2*d^2 - 3*(d*x +
c)*B*a*d^3 - 3*(d*x + c)*A*b*d^3 + B*a*c*d^3 + A*b*c*d^3 - A*a*d^
4)/((d*x + c)^(3/2)*d^5) + 2/15*(3*(d*x + c)^(5/2)*D*b*d^20 - 20*
(d*x + c)^(3/2)*D*b*c*d^20 + 90*sqrt(d*x + c)*D*b*c^2*d^20 + 5*(d
*x + c)^(3/2)*D*a*d^21 + 5*(d*x + c)^(3/2)*C*b*d^21 - 45*sqrt(d*x
 + c)*D*a*c*d^21 - 45*sqrt(d*x + c)*C*b*c*d^21 + 15*sqrt(d*x + c)
*C*a*d^22 + 15*sqrt(d*x + c)*B*b*d^22)/d^25
```

3.21 $\int \frac{A+Bx+Cx^2+Dx^3}{(c+dx)^{5/2}}\,dx$

Optimal. Leaf size=113

$$-\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^4(c+dx)^{3/2}}+\frac{2\left(-Bd^2-3c^2D+2cCd\right)}{d^4\sqrt{c+dx}}+\frac{2\sqrt{c+dx}(Cd-3cD)}{d^4}+\frac{2D(c+dx)^{3/2}}{3d^4}$$

```
[Out] (-2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^4*(c + d*x)^(3/2))
+ (2*(2*c*C*d - B*d^2 - 3*c^2*D))/(d^4*Sqrt[c + d*x]) + (2*(C*d -
 3*c*D)*Sqrt[c + d*x])/d^4 + (2*D*(c + d*x)^(3/2))/(3*d^4)
```

Rubi [A] time = 0.143657, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.04

$$-\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^4(c+dx)^{3/2}}+\frac{2\left(-Bd^2-3c^2D+2cCd\right)}{d^4\sqrt{c+dx}}+\frac{2\sqrt{c+dx}(Cd-3cD)}{d^4}+\frac{2D(c+dx)^{3/2}}{3d^4}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/(c + d*x)^(5/2),x]
```

```
[Out] (-2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^4*(c + d*x)^(3/2))
+ (2*(2*c*C*d - B*d^2 - 3*c^2*D))/(d^4*Sqrt[c + d*x]) + (2*(C*d -
 3*c*D)*Sqrt[c + d*x])/d^4 + (2*D*(c + d*x)^(3/2))/(3*d^4)
```

Rubi in Sympy [A] time = 27.5358, size = 114, normalized size = 1.01

$$\frac{2D\left(c+dx\right)^{\frac{3}{2}}}{3d^4}+\frac{2\sqrt{c+dx}\left(Cd-3Dc\right)}{d^4}-\frac{2\left(Bd^2-2Ccd+3Dc^2\right)}{d^4\sqrt{c+dx}}-\frac{2\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{3d^4\left(c+dx\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] 2*D*(c + d*x)**(3/2)/(3*d**4) + 2*sqrt(c + d*x)*(C*d - 3*D*c)/d**
4 - 2*(B*d**2 - 2*C*c*d + 3*D*c**2)/(d**4*sqrt(c + d*x)) - 2*(A*d
**3 - B*c*d**2 + C*c**2*d - D*c**3)/(3*d**4*(c + d*x)**(3/2))
```

Mathematica [A] time = 0.0927967, size = 75, normalized size = 0.66

$$-\frac{2\left(d^3\left(A+3Bx+x^2(-(3C+Dx))\right)+2cd^2(B+3x(Dx-2C))+16c^3D-8c^2d(C-3Dx)\right)}{3d^4(c+dx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/(c + d*x)^(5/2),x]
```

```
[Out] (-2*(16*c^3*D - 8*c^2*d*(C - 3*D*x) + 2*c*d^2*(B + 3*x*(-2*C + D*
x)) + d^3*(A + 3*B*x - x^2*(3*C + D*x))))/(3*d^4*(c + d*x)^(3/2))
```

Maple [A] time = 0.007, size = 90, normalized size = 0.8

$$-\frac{-2\,Dx^{3}d^{3}-6\,Cd^{3}x^{2}+12\,Dcd^{2}x^{2}+6\,Bd^{3}x-24\,Ccd^{2}x+48\,Dc^{2}dx+2\,Ad^{3}+4\,Bcd^{2}-16\,Cc^{2}d+32\,Dc^{3}}{3\,d^{4}}(dx+c)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(d*x+c)^(5/2),x)
```

```
[Out] -2/3/(d*x+c)^(3/2)*(-D*d^3*x^3-3*C*d^3*x^2+6*D*c*d^2*x^2+3*B*d^3*
x-12*C*c*d^2*x+24*D*c^2*d*x+A*d^3+2*B*c*d^2-8*C*c^2*d+16*D*c^3)/d
^4
```

Maxima [A] time = 1.36395, size = 132, normalized size = 1.17

$$\frac{2\left(\frac{(dx+c)^{\frac{3}{2}}D-3\,(3\,Dc-Cd)\sqrt{dx+c}}{d^{3}}+\frac{Dc^{3}-Cc^{2}d+Bcd^{2}-Ad^{3}-3\left(3\,Dc^{2}-2\,Ccd+Bd^{2}\right)(dx+c)}{(dx+c)^{\frac{3}{2}}d^{3}}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/(d*x + c)^(5/2),x, algorithm="maxima")
```

```
[Out] 2/3*(((d*x + c)^(3/2)*D - 3*(3*D*c - C*d)*sqrt(d*x + c))/d^3 + (D
*c^3 - C*c^2*d + B*c*d^2 - A*d^3 - 3*(3*D*c^2 - 2*C*c*d + B*d^2)*
(d*x + c))/((d*x + c)^(3/2)*d^3))/d
```

Fricas [A] time = 0.211331, size = 134, normalized size = 1.19

$$\frac{2\left(Dd^{3}x^{3}-16\,Dc^{3}+8\,Cc^{2}d-2\,Bcd^{2}-Ad^{3}-3\left(2\,Dcd^{2}-Cd^{3}\right)x^{2}-3\left(8\,Dc^{2}d-4\,Ccd^{2}+Bd^{3}\right)x\right)}{3\left(d^{5}x+cd^{4}\right)\sqrt{dx+c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/(d*x + c)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/3*(D*d^3*x^3 - 16*D*c^3 + 8*C*c^2*d - 2*B*c*d^2 - A*d^3 - 3*(2*
D*c*d^2 - C*d^3)*x^2 - 3*(8*D*c^2*d - 4*C*c*d^2 + B*d^3)*x)/((d^5
*x + c*d^4)*sqrt(d*x + c))
```

Sympy [A] time = 4.3149, size = 425, normalized size = 3.76

$$\begin{cases} -\frac{2Ad^3}{3cd^4\sqrt{c+dx}+3d^5x\sqrt{c+dx}} - \frac{4Bcd^2}{3cd^4\sqrt{c+dx}+3d^5x\sqrt{c+dx}} - \frac{6Bd^3x}{3cd^4\sqrt{c+dx}+3d^5x\sqrt{c+dx}} + \frac{16Cc^2d}{3cd^4\sqrt{c+dx}+3d^5x\sqrt{c+dx}} + \frac{24Ccd^2x}{3cd^4\sqrt{c+dx}+3d^5x\sqrt{c+dx}} + \frac{}{3cd^4} \\ \frac{Ax+\frac{Bx^2}{2}+\frac{Cx^3}{3}+\frac{Dx^4}{4}}{c^{\frac{5}{2}}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(d*x+c)**(5/2),x)
```

```
[Out] Piecewise((-2*A*d**3/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c +
d*x)) - 4*B*c*d**2/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*
x)) - 6*B*d**3*x/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x)
) + 16*C*c**2*d/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x))
 + 24*C*c*d**2*x/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x)
) + 6*C*d**3*x**2/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x
)) - 32*D*c**3/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x))
- 48*D*c**2*d*x/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d*x))
 - 12*D*c*d**2*x**2/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c + d
*x)) + 2*D*d**3*x**3/(3*c*d**4*sqrt(c + d*x) + 3*d**5*x*sqrt(c +
d*x)), Ne(d, 0)), ((A*x + B*x**2/2 + C*x**3/3 + D*x**4/4)/c**(5/2
), True))
```

GIAC/XCAS [A] time = 0.211075, size = 155, normalized size = 1.37

$$-\frac{2\left(9\,(dx+c)Dc^2 - Dc^3 - 6\,(dx+c)Ccd + Cc^2d + 3\,(dx+c)Bd^2 - Bcd^2 + Ad^3\right)}{3\,(dx+c)^{\frac{3}{2}}\,d^4} + \frac{2\left((dx+c)^{\frac{3}{2}}Dd^8 - 9\,\sqrt{dx+c}Dcd^8 + 3\,\sqrt{dx+c}Cd^9\right)}{3\,d^{12}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/(d*x + c)^(5/2),x, algorithm="giac")
```

```
[Out] -2/3*(9*(d*x + c)*D*c^2 - D*c^3 - 6*(d*x + c)*C*c*d + C*c^2*d + 3
*(d*x + c)*B*d^2 - B*c*d^2 + A*d^3)/((d*x + c)^(3/2)*d^4) + 2/3*(
(d*x + c)^(3/2)*D*d^8 - 9*sqrt(d*x + c)*D*c*d^8 + 3*sqrt(d*x + c)
*C*d^9)/d^12
```

3.22 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)(c+dx)^{5/2}} \, dx$

Optimal. Leaf size=210

$$-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{3/2}(bc-ad)^{5/2}}+\frac{2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(-Ad^3-2c^3D+c^2Cd\right)\right)}{d^3\sqrt{c+dx}(bc-ad)^2}+\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^3(c+dx)^{3/2}(bc-ad)}+\frac{2D\sqrt{c+dx}}{bd^3}$$

```
[Out] (2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^3*(b*c - a*d)*(c + d
*x)^(3/2)) + (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(c^2*C*d - A
*d^3 - 2*c^3*D)))/(d^3*(b*c - a*d)^2*Sqrt[c + d*x]) + (2*D*Sqrt[c
 + d*x])/(b*d^3) - (2*(A*b^3 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh
[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(3/2)*(b*c - a*d)^(
5/2))
```

Rubi [A] time = 0.633884, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.094$

$$-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{3/2}(bc-ad)^{5/2}}+\frac{2\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(-Ad^3-2c^3D+c^2Cd\right)\right)}{d^3\sqrt{c+dx}(bc-ad)^2}+\frac{2\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{3d^3(c+dx)^{3/2}(bc-ad)}+\frac{2D\sqrt{c+dx}}{bd^3}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)*(c + d*x)^(5/2)),x]
```

```
[Out] (2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D))/(3*d^3*(b*c - a*d)*(c + d
*x)^(3/2)) + (2*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(c^2*C*d - A
*d^3 - 2*c^3*D)))/(d^3*(b*c - a*d)^2*Sqrt[c + d*x]) + (2*D*Sqrt[c
 + d*x])/(b*d^3) - (2*(A*b^3 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh
[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(3/2)*(b*c - a*d)^(
5/2))
```

Rubi in Sympy [A] time = 156.355, size = 298, normalized size = 1.42

$$\frac{2D\sqrt{c+dx}}{bd^3}+\frac{2\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{b^2\sqrt{c+dx}\,(ad-bc)^2}-\frac{2\,(Cbd-Dad-2Dbc)}{b^2d^3\sqrt{c+dx}}-\frac{2\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{3b^3\,(c+dx)^{\frac{3}{2}}\,(ad-bc)}-\frac{2\left(Bb^2d^2-Cabd^2-Cb^2cd+Da^2d^2+Dabcd+Db^2c^2\right)}{3b^3d^3\,(c+dx)^{\frac{3}{2}}}+\frac{2\left(Ab^3-Bab^2+Ca^2b-Da^3\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{3}{2}}\,(ad-bc)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(5/2),x)
```

```
[Out] 2*D*sqrt(c + d*x)/(b*d**3) + 2*(A*b**3 - B*a*b**2 + C*a**2*b - D*
a**3)/(b**2*sqrt(c + d*x)*(a*d - b*c)**2) - 2*(C*b*d - D*a*d - 2*
D*b*c)/(b**2*d**3*sqrt(c + d*x)) - 2*(A*b**3 - B*a*b**2 + C*a**2*
b - D*a**3)/(3*b**3*(c + d*x)**(3/2)*(a*d - b*c)) - 2*(B*b**2*d**
2 - C*a*b*d**2 - C*b**2*c*d + D*a**2*d**2 + D*a*b*c*d + D*b**2*c*
*2)/(3*b**3*d**3*(c + d*x)**(3/2)) + 2*(A*b**3 - B*a*b**2 + C*a**
2*b - D*a**3)*atan(sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b**(3/
2)*(a*d - b*c)**(5/2))
```

Mathematica [A] time = 1.0851, size = 201, normalized size = 0.96

$$\frac{2\sqrt{c+dx}\left(\frac{3b\left(Ad^3+2c^3D-c^2Cd\right)-3ad\left(Bd^2+3c^2D-2cCd\right)}{(c+dx)(bc-ad)^2}+\frac{Ad^3-Bcd^2+c^3(-D)+c^2Cd}{(c+dx)^2(bc-ad)}+\frac{3D}{b}\right)}{3d^3}-\frac{2\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)}{b^{3/2}(bc-ad)^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)*(c + d*x)^(5/2)),x]
```

```
[Out] (2*Sqrt[c + d*x]*((3*D)/b + (c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)/(
(b*c - a*d)*(c + d*x)^2) + (-3*a*d*(-2*c*C*d + B*d^2 + 3*c^2*D) +
 3*b*(-(c^2*C*d) + A*d^3 + 2*c^3*D))/((b*c - a*d)^2*(c + d*x))))/
(3*d^3) - (2*(A*b^3 - a*(b^2*B - a*b*C + a^2*D))*ArcTanh[(Sqrt[b]
*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(3/2)*(b*c - a*d)^(5/2))
```

Maple [B] time = 0.026, size = 464, normalized size = 2.2

$$2\frac{D\sqrt{dx+c}}{bd^3}-\frac{2A}{3ad-3bc}(dx+c)^{-\frac{3}{2}}+\frac{2Bc}{3(ad-bc)d}(dx+c)^{-\frac{3}{2}}-\frac{2c^2C}{3d^2(ad-bc)}(dx+c)^{-\frac{3}{2}}+\frac{2Dc^3}{3d^3(ad-bc)}(dx+c)^{-\frac{3}{2}}+2\frac{Ab}{(ad-bc)^2\sqrt{dx+c}}-2\frac{Ba}{(ad-bc)^2\sqrt{dx+c}}+4\frac{Cac}{d(ad-bc)^2\sqrt{dx+c}}-2\frac{Cbc^2}{d^2(ad-bc)^2\sqrt{dx+c}}-6\frac{Dac^2}{d^2(ad-bc)^2\sqrt{dx+c}}+4\frac{Dbc^3}{d^3(ad-bc)^2\sqrt{dx+c}}+2\frac{Ab^2}{(ad-bc)^2\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)-2\frac{bBa}{(ad-bc)^2\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)+2\frac{Ca^2}{(ad-bc)^2\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)-2\frac{Da^3}{b(ad-bc)^2\sqrt{(ad-bc)b}}\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{(ad-bc)b}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)/(d*x+c)^(5/2),x)
```

```
[Out] 2*D*(d*x+c)^(1/2)/b/d^3-2/3/(a*d-b*c)/(d*x+c)^(3/2)*A+2/3/d/(a*d-
b*c)/(d*x+c)^(3/2)*B*c-2/3/d^2/(a*d-b*c)/(d*x+c)^(3/2)*C*c^2+2/3/
d^3/(a*d-b*c)/(d*x+c)^(3/2)*D*c^3+2/(a*d-b*c)^2/(d*x+c)^(1/2)*A*b
-2/(a*d-b*c)^2/(d*x+c)^(1/2)*B*a+4/d/(a*d-b*c)^2/(d*x+c)^(1/2)*C*
a*c-2/d^2/(a*d-b*c)^2/(d*x+c)^(1/2)*C*b*c^2-6/d^2/(a*d-b*c)^2/(d*
x+c)^(1/2)*D*a*c^2+4/d^3/(a*d-b*c)^2/(d*x+c)^(1/2)*D*b*c^3+2*b^2/
(a*d-b*c)^2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)
*b)^(1/2))*A-2*b/(a*d-b*c)^2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(
1/2)*b/((a*d-b*c)*b)^(1/2))*B*a+2/(a*d-b*c)^2/((a*d-b*c)*b)^(1/2)
*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a^2-2/b/(a*d-b*c)^
2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))
*D*a^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*(d*x + c)^(5/2)),x, algorithm="maxi
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.239961, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*(d*x + c)^(5/2)),x, algorithm="fric
```

```
[Out] [1/3*(3*((D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*d^4*x + (D*a^3 - C*a
^2*b + B*a*b^2 - A*b^3)*c*d^3)*sqrt(d*x + c)*log((sqrt(b^2*c - a*
b*d)*(b*d*x + 2*b*c - a*d) + 2*(b^2*c - a*b*d)*sqrt(d*x + c))/(b*
x + a)) + 2*(8*D*b^2*c^4 - A*a*b*d^4 - 2*(7*D*a*b + C*b^2)*c^3*d
+ (3*D*a^2 + 5*C*a*b - B*b^2)*c^2*d^2 - 2*(B*a*b - 2*A*b^2)*c*d^3
 + 3*(D*b^2*c^2*d^2 - 2*D*a*b*c*d^3 + D*a^2*d^4)*x^2 + 3*(4*D*b^2
*c^3*d - (7*D*a*b + C*b^2)*c^2*d^2 + 2*(D*a^2 + C*a*b)*c*d^3 - (B
*a*b - A*b^2)*d^4)*x)*sqrt(b^2*c - a*b*d))/((b^3*c^3*d^3 - 2*a*b^
2*c^2*d^4 + a^2*b*c*d^5 + (b^3*c^2*d^4 - 2*a*b^2*c*d^5 + a^2*b*d^
6)*x)*sqrt(b^2*c - a*b*d)*sqrt(d*x + c)), 2/3*(3*((D*a^3 - C*a^2*
b + B*a*b^2 - A*b^3)*d^4*x + (D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*
c*d^3)*sqrt(d*x + c)*arctan(-(b*c - a*d)/(sqrt(-b^2*c + a*b*d)*sq
rt(d*x + c))) + (8*D*b^2*c^4 - A*a*b*d^4 - 2*(7*D*a*b + C*b^2)*c^
3*d + (3*D*a^2 + 5*C*a*b - B*b^2)*c^2*d^2 - 2*(B*a*b - 2*A*b^2)*c
*d^3 + 3*(D*b^2*c^2*d^2 - 2*D*a*b*c*d^3 + D*a^2*d^4)*x^2 + 3*(4*D
*b^2*c^3*d - (7*D*a*b + C*b^2)*c^2*d^2 + 2*(D*a^2 + C*a*b)*c*d^3
- (B*a*b - A*b^2)*d^4)*x)*sqrt(-b^2*c + a*b*d))/((b^3*c^3*d^3 - 2
*a*b^2*c^2*d^4 + a^2*b*c*d^5 + (b^3*c^2*d^4 - 2*a*b^2*c*d^5 + a^2
*b*d^6)*x)*sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Bx + Cx^2 + Dx^3}{(a + bx)(c + dx)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(5/2),x)
```

```
[Out] Integral((A + B*x + C*x**2 + D*x**3)/((a + b*x)*(c + d*x)**(5/2))
, x)
```

GIAC/XCAS [A] time = 0.219336, size = 379, normalized size = 1.8

$$-\frac{2\left(Da^3 - Ca^2b + Bab^2 - Ab^3\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right)}{(b^3c^2 - 2\,ab^2cd + a^2bd^2)\sqrt{-b^2c + abd}}$$
$$+\frac{2\left(6\,(dx+c)Dbc^3 - Dbc^4 - 9\,(dx+c)Dac^2d - 3\,(dx+c)Cbc^2d + Dac^3d + Cbc^3d + 6\,(dx+c)Cacd^2 - Cac^2d^2 - Bbc^2d^2 - 3\right.}{3\,(b^2c^2d^3 - 2\,abcd^4 + a^2d^5)(dx+c)^{\frac{3}{2}}}$$
$$+\frac{2\sqrt{dx+c}D}{bd^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)*(d*x + c)^(5/2)),x, algorithm="giac
```

```
[Out] -2*(D*a^3 - C*a^2*b + B*a*b^2 - A*b^3)*arctan(sqrt(d*x + c)*b/sqr
t(-b^2*c + a*b*d))/((b^3*c^2 - 2*a*b^2*c*d + a^2*b*d^2)*sqrt(-b^2
*c + a*b*d)) + 2/3*(6*(d*x + c)*D*b*c^3 - D*b*c^4 - 9*(d*x + c)*D
*a*c^2*d - 3*(d*x + c)*C*b*c^2*d + D*a*c^3*d + C*b*c^3*d + 6*(d*x
 + c)*C*a*c*d^2 - C*a*c^2*d^2 - B*b*c^2*d^2 - 3*(d*x + c)*B*a*d^3
 + 3*(d*x + c)*A*b*d^3 + B*a*c*d^3 + A*b*c*d^3 - A*a*d^4)/((b^2*c
^2*d^3 - 2*a*b*c*d^4 + a^2*d^5)*(d*x + c)^(3/2)) + 2*sqrt(d*x + c
)*D/(b*d^3)
```

3.23 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^2(c+dx)^{5/2}}\,dx$

Optimal. Leaf size=336

$$-\frac{A-\frac{a\left(a^2D-abC+b^2B\right)}{b^3}}{(a+bx)(c+dx)^{3/2}(bc-ad)}-\frac{-a^3d^3D+a^2bCd^3+ab^2d\left(-3Bd^2-6c^2D+4cCd\right)+b^3\left(-\left(-5Ad^3+2Bcd^2-2c^3D\right)\right)}{b^2d^2\sqrt{c+dx}(bc-ad)^3}+\frac{3a^3d^3D-3a^2bCd^3+3ab^2Bd^3+b^3\left(-\left(5Ad^3-2Bcd^2-2c^3D+2c^2Cd\right)\right)}{3b^3d^2(c+dx)^{3/2}(bc-ad)^2}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3(-d)D-a^2b(Cd-6cD)-ab^2(4cC-3Bd)+b^3(2Bc-5Ad)\right)}{b^{3/2}(bc-ad)^{7/2}}$$

```
[Out] (3*a*b^2*B*d^3 - 3*a^2*b*C*d^3 + 3*a^3*d^3*D - b^3*(2*c^2*C*d - 2
*B*c*d^2 + 5*A*d^3 - 2*c^3*D))/(3*b^3*d^2*(b*c - a*d)^2*(c + d*x)
^(3/2)) - (A - (a*(b^2*B - a*b*C + a^2*D))/b^3)/((b*c - a*d)*(a +
 b*x)*(c + d*x)^(3/2)) - (a^2*b*C*d^3 - a^3*d^3*D + a*b^2*d*(4*c*
C*d - 3*B*d^2 - 6*c^2*D) - b^3*(2*B*c*d^2 - 5*A*d^3 - 2*c^3*D))/(
b^2*d^2*(b*c - a*d)^3*Sqrt[c + d*x]) - ((b^3*(2*B*c - 5*A*d) - a*
b^2*(4*c*C - 3*B*d) - a^3*d*D - a^2*b*(C*d - 6*c*D))*ArcTanh[(Sqr
t[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(3/2)*(b*c - a*d)^(7/2))
```

Rubi [A] time = 1.72581, antiderivative size = 336, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$-\frac{A-\frac{a\left(a^2D-abC+b^2B\right)}{b^3}}{(a+bx)(c+dx)^{3/2}(bc-ad)}-\frac{-a^3d^3D+a^2bCd^3+ab^2d\left(-3Bd^2-6c^2D+4cCd\right)+b^3\left(-\left(-5Ad^3+2Bcd^2-2c^3D\right)\right)}{b^2d^2\sqrt{c+dx}(bc-ad)^3}+\frac{3a^3d^3D-3a^2bCd^3+3ab^2Bd^3+b^3\left(-\left(5Ad^3-2Bcd^2-2c^3D+2c^2Cd\right)\right)}{3b^3d^2(c+dx)^{3/2}(bc-ad)^2}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3(-d)D-a^2b(Cd-6cD)-ab^2(4cC-3Bd)+b^3(2Bc-5Ad)\right)}{b^{3/2}(bc-ad)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^2*(c + d*x)^(5/2)),x]
```


```
[Out] (3*a*b^2*B*d^3 - 3*a^2*b*C*d^3 + 3*a^3*d^3*D - b^3*(2*c^2*C*d - 2
*B*c*d^2 + 5*A*d^3 - 2*c^3*D))/(3*b^3*d^2*(b*c - a*d)^2*(c + d*x)
^(3/2)) - (A - (a*(b^2*B - a*b*C + a^2*D))/b^3)/((b*c - a*d)*(a +
 b*x)*(c + d*x)^(3/2)) - (a^2*b*C*d^3 - a^3*d^3*D + a*b^2*d*(4*c*
C*d - 3*B*d^2 - 6*c^2*D) - b^3*(2*B*c*d^2 - 5*A*d^3 - 2*c^3*D))/(
```

```
b^2*d^2*(b*c - a*d)^3*Sqrt[c + d*x]) - ((b^3*(2*B*c - 5*A*d) - a*
b^2*(4*c*C - 3*B*d) - a^3*d*D - a^2*b*(C*d - 6*c*D))*ArcTanh[(Sqr
t[b]*Sqrt[c + d*x])/Sqrt[b*c - a*d]])/(b^(3/2)*(b*c - a*d)^(7/2))
```

Rubi in Sympy [A] time = 173.146, size = 410, normalized size = 1.22

$$-\frac{2D}{b^2d^2\sqrt{c+dx}}+\frac{5d\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{b^2\sqrt{c+dx}\,(ad-bc)^3}+\frac{2\left(Bb^2-2Cab+3Da^2\right)}{b^2\sqrt{c+dx}\,(ad-bc)^2}$$
$$-\frac{5d\left(Ab^3-Bab^2+Ca^2b-Da^3\right)}{3b^3(c+dx)^{\frac{3}{2}}(ad-bc)^2}-\frac{2\left(Bb^2-2Cab+3Da^2\right)}{3b^3(c+dx)^{\frac{3}{2}}(ad-bc)}$$
$$+\frac{Ab^3-Bab^2+Ca^2b-Da^3}{b^3(a+bx)(c+dx)^{\frac{3}{2}}(ad-bc)}-\frac{2(Cbd-2Dad-Dbc)}{3b^3d^2(c+dx)^{\frac{3}{2}}}$$
$$+\frac{5d\left(Ab^3-Bab^2+Ca^2b-Da^3\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{3}{2}}(ad-bc)^{\frac{7}{2}}}+\frac{2\left(Bb^2-2Cab+3Da^2\right)\operatorname{atan}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{ad-bc}}\right)}{b^{\frac{3}{2}}(ad-bc)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(5/2),x)
```

```
[Out] -2*D/(b**2*d**2*sqrt(c + d*x)) + 5*d*(A*b**3 - B*a*b**2 + C*a**2*
b - D*a**3)/(b**2*sqrt(c + d*x)*(a*d - b*c)**3) + 2*(B*b**2 - 2*C
*a*b + 3*D*a**2)/(b**2*sqrt(c + d*x)*(a*d - b*c)**2) - 5*d*(A*b**
3 - B*a*b**2 + C*a**2*b - D*a**3)/(3*b**3*(c + d*x)**(3/2)*(a*d -
 b*c)**2) - 2*(B*b**2 - 2*C*a*b + 3*D*a**2)/(3*b**3*(c + d*x)**(3
/2)*(a*d - b*c)) + (A*b**3 - B*a*b**2 + C*a**2*b - D*a**3)/(b**3*
(a + b*x)*(c + d*x)**(3/2)*(a*d - b*c)) - 2*(C*b*d - 2*D*a*d - D*
b*c)/(3*b**3*d**2*(c + d*x)**(3/2)) + 5*d*(A*b**3 - B*a*b**2 + C*
a**2*b - D*a**3)*atan(sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b**
(3/2)*(a*d - b*c)**(7/2)) + 2*(B*b**2 - 2*C*a*b + 3*D*a**2)*atan(
sqrt(b)*sqrt(c + d*x)/sqrt(a*d - b*c))/(b**(3/2)*(a*d - b*c)**(5/
2))
```

Mathematica [A] time = 1.45345, size = 268, normalized size = 0.8

$$\sqrt{c+dx}\left(\frac{a\left(a^2D-abC+b^2B\right)-Ab^3}{b(a+bx)(bc-ad)^3}+\frac{2\left(-Ad^3+Bcd^2+c^3D-c^2Cd\right)}{3d^2(c+dx)^2(bc-ad)^2}\right.$$
$$\left.+\frac{b\left(4Ad^3-2Bcd^2+2c^3D\right)-2ad\left(Bd^2+3c^2D-2cCd\right)}{d^2(c+dx)(ad-bc)^3}\right)$$
$$-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3(-d)D+a^2b(6cD-Cd)+ab^2(3Bd-4cC)+b^3(2Bc-5Ad)\right)}{b^{3/2}(bc-ad)^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^2*(c + d*x)^(5/2)),x]
```

```
[Out] Sqrt[c + d*x]*((-(A*b^3) + a*(b^2*B - a*b*C + a^2*D))/(b*(b*c - a
*d)^3*(a + b*x)) + (2*(-(c^2*C*d) + B*c*d^2 - A*d^3 + c^3*D))/(3*
d^2*(b*c - a*d)^2*(c + d*x)^2) + (-2*a*d*(-2*c*C*d + B*d^2 + 3*c^
2*D) + b*(-2*B*c*d^2 + 4*A*d^3 + 2*c^3*D))/(d^2*(-(b*c) + a*d)^3*
(c + d*x))) - ((b^3*(2*B*c - 5*A*d) + a*b^2*(-4*c*C + 3*B*d) - a^
3*d*D + a^2*b*(-(C*d) + 6*c*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/S
qrt[b*c - a*d]])/(b^(3/2)*(b*c - a*d)^(7/2))
```

Maple [B] time = 0.038, size = 730, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)^2/(d*x+c)^(5/2),x)
```

```
[Out] -2/3*d/(a*d-b*c)^2/(d*x+c)^(3/2)*A+2/3/(a*d-b*c)^2/(d*x+c)^(3/2)*
B*c-2/3/d/(a*d-b*c)^2/(d*x+c)^(3/2)*C*c^2+2/3/d^2/(a*d-b*c)^2/(d*
x+c)^(3/2)*D*c^3+4*d/(a*d-b*c)^3/(d*x+c)^(1/2)*A*b-2*d/(a*d-b*c)^
3/(d*x+c)^(1/2)*B*a-2/(a*d-b*c)^3/(d*x+c)^(1/2)*B*b*c+4/(a*d-b*c)
^3/(d*x+c)^(1/2)*C*a*c-6/d/(a*d-b*c)^3/(d*x+c)^(1/2)*D*a*c^2+2/d^
2/(a*d-b*c)^3/(d*x+c)^(1/2)*D*b*c^3+d/(a*d-b*c)^3*b^2*(d*x+c)^(1/
2)/(b*d*x+a*d)*A-d/(a*d-b*c)^3*b*(d*x+c)^(1/2)/(b*d*x+a*d)*B*a+d/
(a*d-b*c)^3*(d*x+c)^(1/2)/(b*d*x+a*d)*C*a^2-d/(a*d-b*c)^3/b*(d*x+
c)^(1/2)/(b*d*x+a*d)*D*a^3+5*d/(a*d-b*c)^3*b^2/((a*d-b*c)*b)^(1/2
)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A-3*d/(a*d-b*c)^3*b
/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*
B*a-2/(a*d-b*c)^3*b^2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/
((a*d-b*c)*b)^(1/2))*B*c+d/(a*d-b*c)^3/((a*d-b*c)*b)^(1/2)*arctan
((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a^2+4/(a*d-b*c)^3*b/((a*d
-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c+
d/(a*d-b*c)^3/b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-
b*c)*b)^(1/2))*a^3*D-6/(a*d-b*c)^3/((a*d-b*c)*b)^(1/2)*arctan((d*
x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a^2*c
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*(d*x + c)^(5/2)),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.253691, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*(d*x + c)^(5/2)),x, algorithm="fr
```

```
[Out] [1/6*(3*(2*(3*D*a^3*b - 2*C*a^2*b^2 + B*a*b^3)*c^2*d^2 - (D*a^4 +
 C*a^3*b - 3*B*a^2*b^2 + 5*A*a*b^3)*c*d^3 + (2*(3*D*a^2*b^2 - 2*C
*a*b^3 + B*b^4)*c*d^3 - (D*a^3*b + C*a^2*b^2 - 3*B*a*b^3 + 5*A*b^
4)*d^4)*x^2 + (2*(3*D*a^2*b^2 - 2*C*a*b^3 + B*b^4)*c^2*d^2 + 5*(D
*a^3*b - C*a^2*b^2 + B*a*b^3 - A*b^4)*c*d^3 - (D*a^4 + C*a^3*b -
3*B*a^2*b^2 + 5*A*a*b^3)*d^4)*x)*sqrt(d*x + c)*log((sqrt(b^2*c -
a*b*d)*(b*d*x + 2*b*c - a*d) - 2*(b^2*c - a*b*d)*sqrt(d*x + c))/(
b*x + a)) - 2*(4*D*a*b^2*c^4 - 2*A*a^2*b*d^4 - 2*(8*D*a^2*b - C*a
*b^2)*c^3*d - (3*D*a^3 - 13*C*a^2*b + 11*B*a*b^2 - 3*A*b^3)*c^2*d
^2 - 2*(2*B*a^2*b - 7*A*a*b^2)*c*d^3 + 3*(2*D*b^3*c^3*d - 6*D*a*b
^2*c^2*d^2 + 2*(2*C*a*b^2 - B*b^3)*c*d^3 - (D*a^3 - C*a^2*b + 3*B
*a*b^2 - 5*A*b^3)*d^4)*x^2 + 2*(2*D*b^3*c^4 - (5*D*a*b^2 - C*b^3)
*c^3*d - (9*D*a^2*b - 5*C*a*b^2 + 4*B*b^3)*c^2*d^2 - (3*D*a^3 - 9
*C*a^2*b + 8*B*a*b^2 - 10*A*b^3)*c*d^3 - (3*B*a^2*b - 5*A*a*b^2)*
d^4)*x)*sqrt(b^2*c - a*b*d))/((a*b^4*c^4*d^2 - 3*a^2*b^3*c^3*d^3
+ 3*a^3*b^2*c^2*d^4 - a^4*b*c*d^5 + (b^5*c^3*d^3 - 3*a*b^4*c^2*d^
4 + 3*a^2*b^3*c*d^5 - a^3*b^2*d^6)*x^2 + (b^5*c^4*d^2 - 2*a*b^4*c
^3*d^3 + 2*a^3*b^2*c*d^5 - a^4*b*d^6)*x)*sqrt(b^2*c - a*b*d)*sqrt
(d*x + c)), -1/3*(3*(2*(3*D*a^3*b - 2*C*a^2*b^2 + B*a*b^3)*c^2*d^
2 - (D*a^4 + C*a^3*b - 3*B*a^2*b^2 + 5*A*a*b^3)*c*d^3 + (2*(3*D*a
^2*b^2 - 2*C*a*b^3 + B*b^4)*c*d^3 - (D*a^3*b + C*a^2*b^2 - 3*B*a*
b^3 + 5*A*b^4)*d^4)*x^2 + (2*(3*D*a^2*b^2 - 2*C*a*b^3 + B*b^4)*c^
2*d^2 + 5*(D*a^3*b - C*a^2*b^2 + B*a*b^3 - A*b^4)*c*d^3 - (D*a^4
+ C*a^3*b - 3*B*a^2*b^2 + 5*A*a*b^3)*d^4)*x)*sqrt(d*x + c)*arctan
(-(b*c - a*d)/(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))) + (4*D*a*b^2*
c^4 - 2*A*a^2*b*d^4 - 2*(8*D*a^2*b - C*a*b^2)*c^3*d - (3*D*a^3 -
13*C*a^2*b + 11*B*a*b^2 - 3*A*b^3)*c^2*d^2 - 2*(2*B*a^2*b - 7*A*a
*b^2)*c*d^3 + 3*(2*D*b^3*c^3*d - 6*D*a*b^2*c^2*d^2 + 2*(2*C*a*b^2
 - B*b^3)*c*d^3 - (D*a^3 - C*a^2*b + 3*B*a*b^2 - 5*A*b^3)*d^4)*x^
2 + 2*(2*D*b^3*c^4 - (5*D*a*b^2 - C*b^3)*c^3*d - (9*D*a^2*b - 5*C
*a*b^2 + 4*B*b^3)*c^2*d^2 - (3*D*a^3 - 9*C*a^2*b + 8*B*a*b^2 - 10
*A*b^3)*c*d^3 - (3*B*a^2*b - 5*A*a*b^2)*d^4)*x)*sqrt(-b^2*c + a*b
*d))/((a*b^4*c^4*d^2 - 3*a^2*b^3*c^3*d^3 + 3*a^3*b^2*c^2*d^4 - a^
4*b*c*d^5 + (b^5*c^3*d^3 - 3*a*b^4*c^2*d^4 + 3*a^2*b^3*c*d^5 - a^
3*b^2*d^6)*x^2 + (b^5*c^4*d^2 - 2*a*b^4*c^3*d^3 + 2*a^3*b^2*c*d^5
 - a^4*b*d^6)*x)*sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.230075, size = 593, normalized size = 1.76

$$\frac{\left(6\,Da^2bc - 4\,Cab^2c + 2\,Bb^3c - Da^3d - Ca^2bd + 3\,Bab^2d - 5\,Ab^3d\right)\arctan\left(\frac{\sqrt{dx+c}b}{\sqrt{-b^2c+abd}}\right)}{(b^4c^3 - 3\,ab^3c^2d + 3\,a^2b^2cd^2 - a^3bd^3)\sqrt{-b^2c+abd}} + \frac{\sqrt{dx+c}Da^3d - \sqrt{dx+c}Ca^2bd + \sqrt{dx+c}Bab^2d - \sqrt{dx+c}Ab^3d}{(b^4c^3 - 3\,ab^3c^2d + 3\,a^2b^2cd^2 - a^3bd^3)((dx+c)b - bc + ad)} - \frac{2\left(3\,(dx+c)Dbc^3 - Dbc^4 - 9\,(dx+c)Dac^2d + Dac^3d + Cbc^3d + 6\,(dx+c)Cacd^2 - 3\,(dx+c)Bbcd^2 - Cac^2d^2 - Bbc^2d^2 - 3\right.}{3\,(b^3c^3d^2 - 3\,ab^2c^2d^3 + 3\,a^2bcd^4 - a^3d^5)(dx+c)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^2*(d*x + c)^(5/2)),x, algorithm="gi
```

```
[Out] (6*D*a^2*b*c - 4*C*a*b^2*c + 2*B*b^3*c - D*a^3*d - C*a^2*b*d + 3*
B*a*b^2*d - 5*A*b^3*d)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c + a*b*d
))/((b^4*c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*sqrt(
-b^2*c + a*b*d)) + (sqrt(d*x + c)*D*a^3*d - sqrt(d*x + c)*C*a^2*b
*d + sqrt(d*x + c)*B*a*b^2*d - sqrt(d*x + c)*A*b^3*d)/((b^4*c^3 -
 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*((d*x + c)*b - b*c
+ a*d)) - 2/3*(3*(d*x + c)*D*b*c^3 - D*b*c^4 - 9*(d*x + c)*D*a*c^
2*d + D*a*c^3*d + C*b*c^3*d + 6*(d*x + c)*C*a*c*d^2 - 3*(d*x + c)
*B*b*c*d^2 - C*a*c^2*d^2 - B*b*c^2*d^2 - 3*(d*x + c)*B*a*d^3 + 6*
(d*x + c)*A*b*d^3 + B*a*c*d^3 + A*b*c*d^3 - A*a*d^4)/((b^3*c^3*d^
2 - 3*a*b^2*c^2*d^3 + 3*a^2*b*c*d^4 - a^3*d^5)*(d*x + c)^(3/2))
```

3.24 $\int \frac{A+Bx+Cx^2+Dx^3}{(a+bx)^3(c+dx)^{5/2}}\,dx$

Optimal. Leaf size=438

$$-\frac{Ab^3-a\left(a^2D-abC+b^2B\right)}{2b^3(a+bx)^2(c+dx)^{3/2}(bc-ad)}+\frac{a^3\left(-d^2\right)D+a^2bCd^2+ab^2\left(-3Bd^2-6c^2D+4cCd\right)+b^3\left(7Ad^2-4Bcd+2c^2C\right)}{b^2\sqrt{c+dx}(bc-ad)^4}-\frac{3a^3d^3D-3a^2bCd^3+3ab^2Bd^3+b^3\left(-\left(7Ad^3-4Bcd^2-4c^3D+4c^2Cd\right)\right)}{6b^3d(c+dx)^{3/2}(bc-ad)^3}-\frac{\sqrt{c+dx}\left(-5a^3dD+a^2b(12cD+Cd)-ab^2(8cC-3Bd)+b^3(4Bc-7Ad)\right)}{4b(a+bx)(bc-ad)^4}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3d^2D+3a^2bd(Cd-4cD)+3ab^2\left(-5Bd^2-8c^2D+8cCd\right)+b^3\left(35Ad^2-20Bcd+8c^2C\right)\right)}{4b^{3/2}(bc-ad)^{9/2}}$$

```
[Out] -(3*a*b^2*B*d^3 - 3*a^2*b*C*d^3 + 3*a^3*d^3*D - b^3*(4*c^2*C*d -
4*B*c*d^2 + 7*A*d^3 - 4*c^3*D))/(6*b^3*d*(b*c - a*d)^3*(c + d*x)^
(3/2)) - (A*b^3 - a*(b^2*B - a*b*C + a^2*D))/(2*b^3*(b*c - a*d)*(
a + b*x)^2*(c + d*x)^(3/2)) + (a^2*b*C*d^2 + b^3*(2*c^2*C - 4*B*c
*d + 7*A*d^2) - a^3*d^2*D + a*b^2*(4*c*C*d - 3*B*d^2 - 6*c^2*D))/
(b^2*(b*c - a*d)^4*Sqrt[c + d*x]) - ((b^3*(4*B*c - 7*A*d) - a*b^2
*(8*c*C - 3*B*d) - 5*a^3*d*D + a^2*b*(C*d + 12*c*D))*Sqrt[c + d*x
])/(4*b*(b*c - a*d)^4*(a + b*x)) - ((b^3*(8*c^2*C - 20*B*c*d + 35
*A*d^2) + a^3*d^2*D + 3*a^2*b*d*(C*d - 4*c*D) + 3*a*b^2*(8*c*C*d
- 5*B*d^2 - 8*c^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c -
a*d]])/(4*b^(3/2)*(b*c - a*d)^(9/2))
```

Rubi [A] time = 3.07157, antiderivative size = 438, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.156$

$$-\frac{Ab^3-a\left(a^2D-abC+b^2B\right)}{2b^3(a+bx)^2(c+dx)^{3/2}(bc-ad)}+\frac{a^3\left(-d^2\right)D+a^2bCd^2+ab^2\left(-3Bd^2-6c^2D+4cCd\right)+b^3\left(7Ad^2-4Bcd+2c^2C\right)}{b^2\sqrt{c+dx}(bc-ad)^4}-\frac{3a^3d^3D-3a^2bCd^3+3ab^2Bd^3+b^3\left(-\left(7Ad^3-4Bcd^2-4c^3D+4c^2Cd\right)\right)}{6b^3d(c+dx)^{3/2}(bc-ad)^3}-\frac{\sqrt{c+dx}\left(-5a^3dD+a^2b(12cD+Cd)-ab^2(8cC-3Bd)+b^3(4Bc-7Ad)\right)}{4b(a+bx)(bc-ad)^4}-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3d^2D+3a^2bd(Cd-4cD)+3ab^2\left(-5Bd^2-8c^2D+8cCd\right)+b^3\left(35Ad^2-20Bcd+8c^2C\right)\right)}{4b^{3/2}(bc-ad)^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^3*(c + d*x)^(5/2)),x]
```

```
[Out] -(3*a*b^2*B*d^3 - 3*a^2*b*C*d^3 + 3*a^3*d^3*D - b^3*(4*c^2*C*d -
4*B*c*d^2 + 7*A*d^3 - 4*c^3*D))/(6*b^3*d*(b*c - a*d)^3*(c + d*x)^
(3/2)) - (A*b^3 - a*(b^2*B - a*b*C + a^2*D))/(2*b^3*(b*c - a*d)*(
a + b*x)^2*(c + d*x)^(3/2)) + (a^2*b*C*d^2 + b^3*(2*c^2*C - 4*B*c
*d + 7*A*d^2) - a^3*d^2*D + a*b^2*(4*c*C*d - 3*B*d^2 - 6*c^2*D))/
(b^2*(b*c - a*d)^4*Sqrt[c + d*x]) - ((b^3*(4*B*c - 7*A*d) - a*b^2
*(8*c*C - 3*B*d) - 5*a^3*d*D + a^2*b*(C*d + 12*c*D))*Sqrt[c + d*x
])/(4*b*(b*c - a*d)^4*(a + b*x)) - ((b^3*(8*c^2*C - 20*B*c*d + 35
*A*d^2) + a^3*d^2*D + 3*a^2*b*d*(C*d - 4*c*D) + 3*a*b^2*(8*c*C*d
- 5*B*d^2 - 8*c^2*D))*ArcTanh[(Sqrt[b]*Sqrt[c + d*x])/Sqrt[b*c -
a*d]])/(4*b^(3/2)*(b*c - a*d)^(9/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(5/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.35608, size = 360, normalized size = 0.82

$$\sqrt{c+dx}\left(\frac{a\left(a^2D-abC+b^2B\right)-Ab^3}{2b(a+bx)^2(bc-ad)^3}+\frac{a^3dD+3a^2b(Cd-4cD)+ab^2(8cC-7Bd)+b^3(11Ad-4Bc)}{4b(a+bx)(bc-ad)^4}+\frac{2\left(b\left(3Ad^2-2Bcd+c^2C\right)-a\left(Bd^2+3c^2D-2cCd\right)\right)}{(c+dx)(bc-ad)^4}+\frac{2\left(-Ad^3+Bcd^2+c^3D-c^2Cd\right)}{3d(c+dx)^2(ad-bc)^3}\right)-\frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt{c+dx}}{\sqrt{bc-ad}}\right)\left(a^3d^2D+3a^2bd(Cd-4cD)-3ab^2\left(5Bd^2+8c^2D-8cCd\right)+b^3\left(35Ad^2-20Bcd+8c^2C\right)\right)}{4b^{3/2}(bc-ad)^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2 + D*x^3)/((a + b*x)^3*(c + d*x)^(5/2)),x]
```

```
[Out] Sqrt[c + d*x]*((-(A*b^3) + a*(b^2*B - a*b*C + a^2*D))/(2*b*(b*c -
 a*d)^3*(a + b*x)^2) + (b^3*(-4*B*c + 11*A*d) + a*b^2*(8*c*C - 7*
B*d) + a^3*d*D + 3*a^2*b*(C*d - 4*c*D))/(4*b*(b*c - a*d)^4*(a + b
*x)) + (2*(-(c^2*C*d) + B*c*d^2 - A*d^3 + c^3*D))/(3*d*(-(b*c) +
a*d)^3*(c + d*x)^2) + (2*(b*(c^2*C - 2*B*c*d + 3*A*d^2) - a*(-2*c
*C*d + B*d^2 + 3*c^2*D)))/((b*c - a*d)^4*(c + d*x))) - ((b^3*(8*c
^2*C - 20*B*c*d + 35*A*d^2) + a^3*d^2*D + 3*a^2*b*d*(C*d - 4*c*D)
```

```
 - 3*a*b^2*(-8*c*C*d + 5*B*d^2 + 8*c^2*D))*ArcTanh[(Sqrt[b]*Sqrt[
c + d*x])/Sqrt[b*c - a*d]])/(4*b^(3/2)*(b*c - a*d)^(9/2))
```

Maple [B] time = 0.046, size = 1376, normalized size = 3.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((D*x^3+C*x^2+B*x+A)/(b*x+a)^3/(d*x+c)^(5/2),x)
```

```
[Out] 2*d/(a*d-b*c)^4/(b*d*x+a*d)^2*(d*x+c)^(3/2)*C*a*b^2*c-d/(a*d-b*c)
^4/(b*d*x+a*d)^2*(d*x+c)^(3/2)*B*b^3*c+3/4*d^2/(a*d-b*c)^4/(b*d*x
+a*d)^2*(d*x+c)^(3/2)*a^2*b*C+2/(a*d-b*c)^4*b^2/((a*d-b*c)*b)^(1/
2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*c^2+11/4*d^2/(a*
d-b*c)^4/(b*d*x+a*d)^2*(d*x+c)^(3/2)*A*b^3+1/4*d^2/(a*d-b*c)^4/(b
*d*x+a*d)^2*(d*x+c)^(3/2)*a^3*D+5/4*d^3/(a*d-b*c)^4/(b*d*x+a*d)^2
*(d*x+c)^(1/2)*C*a^3+35/4*d^2/(a*d-b*c)^4*b^2/((a*d-b*c)*b)^(1/2)
*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*A+3/4*d^2/(a*d-b*c)^
4/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))
*a^2*C+4*d/(a*d-b*c)^4/(d*x+c)^(1/2)*C*a*c-4*d/(a*d-b*c)^4/(d*x+c
)^(1/2)*B*b*c-2/3*d^2/(a*d-b*c)^3/(d*x+c)^(3/2)*A-2/3/(a*d-b*c)^3
/(d*x+c)^(3/2)*C*c^2+6*d/(a*d-b*c)^4*b/((a*d-b*c)*b)^(1/2)*arctan
((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*C*a*c-3*d/(a*d-b*c)^4/(b*d*
x+a*d)^2*(d*x+c)^(3/2)*D*a^2*b*c+5/4*d^2/(a*d-b*c)^4/(b*d*x+a*d)^
2*b^2*(d*x+c)^(1/2)*B*a*c+3/4*d^2/(a*d-b*c)^4/(b*d*x+a*d)^2*b*(d*
x+c)^(1/2)*C*a^2*c-2*d/(a*d-b*c)^4/(b*d*x+a*d)^2*b^2*(d*x+c)^(1/2
)*C*a*c^2+3*d/(a*d-b*c)^4/(b*d*x+a*d)^2*b*(d*x+c)^(1/2)*D*a^2*c^2
-6/(a*d-b*c)^4/(d*x+c)^(1/2)*D*a*c^2+2/3/d/(a*d-b*c)^3/(d*x+c)^(3
/2)*D*c^3+2/3*d/(a*d-b*c)^3/(d*x+c)^(3/2)*B*c+6*d^2/(a*d-b*c)^4/(
d*x+c)^(1/2)*A*b-2*d^2/(a*d-b*c)^4/(d*x+c)^(1/2)*B*a+2/(a*d-b*c)^
4/(d*x+c)^(1/2)*C*b*c^2+13/4*d^3/(a*d-b*c)^4/(b*d*x+a*d)^2*b^2*(d
*x+c)^(1/2)*A*a-13/4*d^2/(a*d-b*c)^4/(b*d*x+a*d)^2*b^3*(d*x+c)^(1
/2)*A*c-9/4*d^3/(a*d-b*c)^4/(b*d*x+a*d)^2*b*(d*x+c)^(1/2)*B*a^2+d
/(a*d-b*c)^4/(b*d*x+a*d)^2*b^3*(d*x+c)^(1/2)*B*c^2-1/4*d^3/(a*d-b
*c)^4/(b*d*x+a*d)^2/b*(d*x+c)^(1/2)*D*a^4-11/4*d^2/(a*d-b*c)^4/(b
*d*x+a*d)^2*(d*x+c)^(1/2)*D*a^3*c-15/4*d^2/(a*d-b*c)^4*b/((a*d-b*
c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*B*a-5*d/(
a*d-b*c)^4*b^2/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b
*c)*b)^(1/2))*B*c+1/4*d^2/(a*d-b*c)^4/b/((a*d-b*c)*b)^(1/2)*arcta
n((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*a^3*D-3*d/(a*d-b*c)^4/((a*
d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b)^(1/2))*D*a^2
*c-7/4*d^2/(a*d-b*c)^4/(b*d*x+a*d)^2*(d*x+c)^(3/2)*B*a*b^2-6/(a*d
-b*c)^4*b/((a*d-b*c)*b)^(1/2)*arctan((d*x+c)^(1/2)*b/((a*d-b*c)*b
)^(1/2))*D*a*c^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*(d*x + c)^(5/2)),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.268619, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*(d*x + c)^(5/2)),x, algorithm="fr
```

```
[Out] [-1/24*(3*(8*(3*D*a^3*b^2 - C*a^2*b^3)*c^3*d + 4*(3*D*a^4*b - 6*C
*a^3*b^2 + 5*B*a^2*b^3)*c^2*d^2 - (D*a^5 + 3*C*a^4*b - 15*B*a^3*b
^2 + 35*A*a^2*b^3)*c*d^3 + (8*(3*D*a*b^4 - C*b^5)*c^2*d^2 + 4*(3*
D*a^2*b^3 - 6*C*a*b^4 + 5*B*b^5)*c*d^3 - (D*a^3*b^2 + 3*C*a^2*b^3
 - 15*B*a*b^4 + 35*A*b^5)*d^4)*x^3 + (8*(3*D*a*b^4 - C*b^5)*c^3*d
 + 20*(3*D*a^2*b^3 - 2*C*a*b^4 + B*b^5)*c^2*d^2 + (23*D*a^3*b^2 -
 51*C*a^2*b^3 + 55*B*a*b^4 - 35*A*b^5)*c*d^3 - 2*(D*a^4*b + 3*C*a
^3*b^2 - 15*B*a^2*b^3 + 35*A*a*b^4)*d^4)*x^2 + (16*(3*D*a^2*b^3 -
 C*a*b^4)*c^3*d + 8*(6*D*a^3*b^2 - 7*C*a^2*b^3 + 5*B*a*b^4)*c^2*d
^2 + 10*(D*a^4*b - 3*C*a^3*b^2 + 5*B*a^2*b^3 - 7*A*a*b^4)*c*d^3 -
 (D*a^5 + 3*C*a^4*b - 15*B*a^3*b^2 + 35*A*a^2*b^3)*d^4)*x)*sqrt(d
*x + c)*log((sqrt(b^2*c - a*b*d)*(b*d*x + 2*b*c - a*d) - 2*(b^2*c
 - a*b*d)*sqrt(d*x + c))/(b*x + a)) + 2*(8*D*a^2*b^2*c^4 + 8*A*a^
3*b*d^4 + 2*(47*D*a^3*b - 25*C*a^2*b^2 + 3*B*a*b^3 + 3*A*b^4)*c^3
*d + (3*D*a^4 - 55*C*a^3*b + 83*B*a^2*b^2 - 39*A*a*b^3)*c^2*d^2 +
 16*(B*a^3*b - 5*A*a^2*b^2)*c*d^3 + 3*(8*(3*D*a*b^3 - C*b^4)*c^2*
d^2 + 4*(3*D*a^2*b^2 - 6*C*a*b^3 + 5*B*b^4)*c*d^3 - (D*a^3*b + 3*
C*a^2*b^2 - 15*B*a*b^3 + 35*A*b^4)*d^4)*x^3 + (8*D*b^4*c^4 + 32*(
2*D*a*b^3 - C*b^4)*c^3*d + 8*(27*D*a^2*b^2 - 17*C*a*b^3 + 10*B*b^
4)*c^2*d^2 + 4*(6*D*a^3*b - 33*C*a^2*b^2 + 40*B*a*b^3 - 35*A*b^4)
*c*d^3 + (3*D*a^4 - 15*C*a^3*b + 75*B*a^2*b^2 - 175*A*a*b^3)*d^4)
*x^2 + (16*D*a*b^3*c^4 + 4*(41*D*a^2*b^2 - 22*C*a*b^3 + 3*B*b^4)*
c^3*d + (129*D*a^3*b - 149*C*a^2*b^2 + 145*B*a*b^3 - 21*A*b^4)*c^
2*d^2 + 2*(3*D*a^4 - 39*C*a^3*b + 67*B*a^2*b^2 - 119*A*a*b^3)*c*d
^3 + 8*(3*B*a^3*b - 7*A*a^2*b^2)*d^4)*x)*sqrt(b^2*c - a*b*d))/((a
^2*b^5*c^5*d - 4*a^3*b^4*c^4*d^2 + 6*a^4*b^3*c^3*d^3 - 4*a^5*b^2*
c^2*d^4 + a^6*b*c*d^5 + (b^7*c^4*d^2 - 4*a*b^6*c^3*d^3 + 6*a^2*b^
5*c^2*d^4 - 4*a^3*b^4*c*d^5 + a^4*b^3*d^6)*x^3 + (b^7*c^5*d - 2*a
*b^6*c^4*d^2 - 2*a^2*b^5*c^3*d^3 + 8*a^3*b^4*c^2*d^4 - 7*a^4*b^3*
c*d^5 + 2*a^5*b^2*d^6)*x^2 + (2*a*b^6*c^5*d - 7*a^2*b^5*c^4*d^2 +
 8*a^3*b^4*c^3*d^3 - 2*a^4*b^3*c^2*d^4 - 2*a^5*b^2*c*d^5 + a^6*b*
d^6)*x)*sqrt(b^2*c - a*b*d)*sqrt(d*x + c)), 1/12*(3*(8*(3*D*a^3*b
^2 - C*a^2*b^3)*c^3*d + 4*(3*D*a^4*b - 6*C*a^3*b^2 + 5*B*a^2*b^3)
*c^2*d^2 - (D*a^5 + 3*C*a^4*b - 15*B*a^3*b^2 + 35*A*a^2*b^3)*c*d^
3 + (8*(3*D*a*b^4 - C*b^5)*c^2*d^2 + 4*(3*D*a^2*b^3 - 6*C*a*b^4 +
 5*B*b^5)*c*d^3 - (D*a^3*b^2 + 3*C*a^2*b^3 - 15*B*a*b^4 + 35*A*b^
5)*d^4)*x^3 + (8*(3*D*a*b^4 - C*b^5)*c^3*d + 20*(3*D*a^2*b^3 - 2*
```

```
C*a*b^4 + B*b^5)*c^2*d^2 + (23*D*a^3*b^2 - 51*C*a^2*b^3 + 55*B*a*
b^4 - 35*A*b^5)*c*d^3 - 2*(D*a^4*b + 3*C*a^3*b^2 - 15*B*a^2*b^3 +
 35*A*a*b^4)*d^4)*x^2 + (16*(3*D*a^2*b^3 - C*a*b^4)*c^3*d + 8*(6*
D*a^3*b^2 - 7*C*a^2*b^3 + 5*B*a*b^4)*c^2*d^2 + 10*(D*a^4*b - 3*C*
a^3*b^2 + 5*B*a^2*b^3 - 7*A*a*b^4)*c*d^3 - (D*a^5 + 3*C*a^4*b - 1
5*B*a^3*b^2 + 35*A*a^2*b^3)*d^4)*x)*sqrt(d*x + c)*arctan(-(b*c -
a*d)/(sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))) - (8*D*a^2*b^2*c^4 + 8
*A*a^3*b*d^4 + 2*(47*D*a^3*b - 25*C*a^2*b^2 + 3*B*a*b^3 + 3*A*b^4
)*c^3*d + (3*D*a^4 - 55*C*a^3*b + 83*B*a^2*b^2 - 39*A*a*b^3)*c^2*
d^2 + 16*(B*a^3*b - 5*A*a^2*b^2)*c*d^3 + 3*(8*(3*D*a*b^3 - C*b^4)
*c^2*d^2 + 4*(3*D*a^2*b^2 - 6*C*a*b^3 + 5*B*b^4)*c*d^3 - (D*a^3*b
 + 3*C*a^2*b^2 - 15*B*a*b^3 + 35*A*b^4)*d^4)*x^3 + (8*D*b^4*c^4 +
 32*(2*D*a*b^3 - C*b^4)*c^3*d + 8*(27*D*a^2*b^2 - 17*C*a*b^3 + 10
*B*b^4)*c^2*d^2 + 4*(6*D*a^3*b - 33*C*a^2*b^2 + 40*B*a*b^3 - 35*A
*b^4)*c*d^3 + (3*D*a^4 - 15*C*a^3*b + 75*B*a^2*b^2 - 175*A*a*b^3)
*d^4)*x^2 + (16*D*a*b^3*c^4 + 4*(41*D*a^2*b^2 - 22*C*a*b^3 + 3*B*
b^4)*c^3*d + (129*D*a^3*b - 149*C*a^2*b^2 + 145*B*a*b^3 - 21*A*b^
4)*c^2*d^2 + 2*(3*D*a^4 - 39*C*a^3*b + 67*B*a^2*b^2 - 119*A*a*b^3
)*c*d^3 + 8*(3*B*a^3*b - 7*A*a^2*b^2)*d^4)*x)*sqrt(-b^2*c + a*b*d
))/((a^2*b^5*c^5*d - 4*a^3*b^4*c^4*d^2 + 6*a^4*b^3*c^3*d^3 - 4*a^
5*b^2*c^2*d^4 + a^6*b*c*d^5 + (b^7*c^4*d^2 - 4*a*b^6*c^3*d^3 + 6*
a^2*b^5*c^2*d^4 - 4*a^3*b^4*c*d^5 + a^4*b^3*d^6)*x^3 + (b^7*c^5*d
 - 2*a*b^6*c^4*d^2 - 2*a^2*b^5*c^3*d^3 + 8*a^3*b^4*c^2*d^4 - 7*a^
4*b^3*c*d^5 + 2*a^5*b^2*d^6)*x^2 + (2*a*b^6*c^5*d - 7*a^2*b^5*c^4
*d^2 + 8*a^3*b^4*c^3*d^3 - 2*a^4*b^3*c^2*d^4 - 2*a^5*b^2*c*d^5 +
a^6*b*d^6)*x)*sqrt(-b^2*c + a*b*d)*sqrt(d*x + c))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x**3+C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(5/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.234238, size = 1035, normalized size = 2.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)/((b*x + a)^3*(d*x + c)^(5/2)),x, algorithm="gi

[Out] -1/4*(24*D*a*b^2*c^2 - 8*C*b^3*c^2 + 12*D*a^2*b*c*d - 24*C*a*b^2*
c*d + 20*B*b^3*c*d - D*a^3*d^2 - 3*C*a^2*b*d^2 + 15*B*a*b^2*d^2 -
```

```
 35*A*b^3*d^2)*arctan(sqrt(d*x + c)*b/sqrt(-b^2*c + a*b*d))/((b^5
*c^4 - 4*a*b^4*c^3*d + 6*a^2*b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*
b*d^4)*sqrt(-b^2*c + a*b*d)) - 2/3*(D*b*c^4 + 9*(d*x + c)*D*a*c^2
*d - 3*(d*x + c)*C*b*c^2*d - D*a*c^3*d - C*b*c^3*d - 6*(d*x + c)*
C*a*c*d^2 + 6*(d*x + c)*B*b*c*d^2 + C*a*c^2*d^2 + B*b*c^2*d^2 + 3
*(d*x + c)*B*a*d^3 - 9*(d*x + c)*A*b*d^3 - B*a*c*d^3 - A*b*c*d^3
+ A*a*d^4)/((b^4*c^4*d - 4*a*b^3*c^3*d^2 + 6*a^2*b^2*c^2*d^3 - 4*
a^3*b*c*d^4 + a^4*d^5)*(d*x + c)^(3/2)) - 1/4*(12*(d*x + c)^(3/2)
*D*a^2*b^2*c*d - 8*(d*x + c)^(3/2)*C*a*b^3*c*d + 4*(d*x + c)^(3/2
)*B*b^4*c*d - 12*sqrt(d*x + c)*D*a^2*b^2*c^2*d + 8*sqrt(d*x + c)*
C*a*b^3*c^2*d - 4*sqrt(d*x + c)*B*b^4*c^2*d - (d*x + c)^(3/2)*D*a
^3*b*d^2 - 3*(d*x + c)^(3/2)*C*a^2*b^2*d^2 + 7*(d*x + c)^(3/2)*B*
a*b^3*d^2 - 11*(d*x + c)^(3/2)*A*b^4*d^2 + 11*sqrt(d*x + c)*D*a^3
*b*c*d^2 - 3*sqrt(d*x + c)*C*a^2*b^2*c*d^2 - 5*sqrt(d*x + c)*B*a*
b^3*c*d^2 + 13*sqrt(d*x + c)*A*b^4*c*d^2 + sqrt(d*x + c)*D*a^4*d^
3 - 5*sqrt(d*x + c)*C*a^3*b*d^3 + 9*sqrt(d*x + c)*B*a^2*b^2*d^3 -
 13*sqrt(d*x + c)*A*a*b^3*d^3)/((b^5*c^4 - 4*a*b^4*c^3*d + 6*a^2*
b^3*c^2*d^2 - 4*a^3*b^2*c*d^3 + a^4*b*d^4)*((d*x + c)*b - b*c + a
*d)^2)
```

3.25 $\int (a+bx)^3(c+dx)^n\left(A+Bx+Cx^2+Dx^3\right)\,dx$

Optimal. Leaf size=455

$$-\frac{(bc-ad)(c+dx)^{n+3}\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{d^7(n+3)}+\frac{b(c+dx)^{n+5}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{d^7(n+5)}+\frac{(c+dx)^{n+4}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{d^7(n+4)}-\frac{(bc-ad)^3(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^7(n+1)}-\frac{(bc-ad)^2(c+dx)^{n+2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{d^7(n+2)}+\frac{b^2(c+dx)^{n+6}(3adD-6bcD+bCd)}{d^7(n+6)}+\frac{b^3D(c+dx)^{n+7}}{d^7(n+7)}$$

```
[Out] -(((b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1
 + n))/(d^7*(1 + n))) - ((b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*
c^2*D) - b*(5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D))*(c + d*x)
^(2 + n))/(d^7*(2 + n)) - ((b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a
*b*d*(8*c*C*d - 3*B*d^2 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2
 + 3*A*d^3 - 15*c^3*D))*(c + d*x)^(3 + n))/(d^7*(3 + n)) + ((a^3*
d^3*D + 3*a^2*b*d^2*(C*d - 4*c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 -
10*c^2*D) + b^3*(10*c^2*C*d - 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c +
 d*x)^(4 + n))/(d^7*(4 + n)) + (b*(3*a^2*d^2*D + 3*a*b*d*(C*d - 5
*c*D) - b^2*(5*c*C*d - B*d^2 - 15*c^2*D))*(c + d*x)^(5 + n))/(d^7
*(5 + n)) + (b^2*(b*C*d - 6*b*c*D + 3*a*d*D)*(c + d*x)^(6 + n))/(
d^7*(6 + n)) + (b^3*D*(c + d*x)^(7 + n))/(d^7*(7 + n))
```

Rubi [A] time = 0.942828, antiderivative size = 455, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$

$$-\frac{(bc-ad)(c+dx)^{n+3}\left(a^2d^2(Cd-3cD)-abd\left(-3Bd^2-15c^2D+8cCd\right)+b^2\left(3Ad^3-6Bcd^2-15c^3D+10c^2Cd\right)\right)}{d^7(n+3)}+\frac{b(c+dx)^{n+5}\left(3a^2d^2D+3abd(Cd-5cD)+b^2\left(-\left(-Bd^2-15c^2D+5cCd\right)\right)\right)}{d^7(n+5)}+\frac{(c+dx)^{n+4}\left(a^3d^3D+3a^2bd^2(Cd-4cD)-3ab^2d\left(-Bd^2-10c^2D+4cCd\right)+b^3\left(Ad^3-4Bcd^2-20c^3D+10c^2Cd\right)\right)}{d^7(n+4)}-\frac{(bc-ad)^3(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^7(n+1)}-\frac{(bc-ad)^2(c+dx)^{n+2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(3Ad^3-4Bcd^2-6c^3D+5c^2Cd\right)\right)}{d^7(n+2)}+\frac{b^2(c+dx)^{n+6}(3adD-6bcD+bCd)}{d^7(n+6)}+\frac{b^3D(c+dx)^{n+7}}{d^7(n+7)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)^3*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] -(((b*c - a*d)^3*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1
 + n))/(d^7*(1 + n))) - ((b*c - a*d)^2*(a*d*(2*c*C*d - B*d^2 - 3*
c^2*D) - b*(5*c^2*C*d - 4*B*c*d^2 + 3*A*d^3 - 6*c^3*D))*(c + d*x)
^(2 + n))/(d^7*(2 + n)) - ((b*c - a*d)*(a^2*d^2*(C*d - 3*c*D) - a
*b*d*(8*c*C*d - 3*B*d^2 - 15*c^2*D) + b^2*(10*c^2*C*d - 6*B*c*d^2
 + 3*A*d^3 - 15*c^3*D))*(c + d*x)^(3 + n))/(d^7*(3 + n)) + ((a^3*
d^3*D + 3*a^2*b*d^2*(C*d - 4*c*D) - 3*a*b^2*d*(4*c*C*d - B*d^2 -
10*c^2*D) + b^3*(10*c^2*C*d - 4*B*c*d^2 + A*d^3 - 20*c^3*D))*(c +
 d*x)^(4 + n))/(d^7*(4 + n)) + (b*(3*a^2*d^2*D + 3*a*b*d*(C*d - 5
*c*D) - b^2*(5*c*C*d - B*d^2 - 15*c^2*D))*(c + d*x)^(5 + n))/(d^7
*(5 + n)) + (b^2*(b*C*d - 6*b*c*D + 3*a*d*D)*(c + d*x)^(6 + n))/(
d^7*(6 + n)) + (b^3*D*(c + d*x)^(7 + n))/(d^7*(7 + n))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**3*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Timed out
```

Mathematica [B] time = 3.90259, size = 977, normalized size = 2.15

$$\frac{(c+dx)^{n+1}\left(\left(720Dc^6-120d(C(n+7)+6D(n+1)x)c^5+24d^2\left(B\left(n^2+13n+42\right)+5(n+1)x(C(n+7)+3D(n+2)x)\right)c^4-6c\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x)^3*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((c + d*x)^(1 + n)*(a^3*d^3*(210 + 107*n + 18*n^2 + n^3)*(-6*c^3*
D + 2*c^2*d*(C*(4 + n) + 3*D*(1 + n)*x) - c*d^2*(B*(12 + 7*n + n^
2) + (1 + n)*x*(2*C*(4 + n) + 3*D*(2 + n)*x)) + d^3*(A*(24 + 26*n
 + 9*n^2 + n^3) + (1 + n)*x*(B*(12 + 7*n + n^2) + (2 + n)*x*(C*(4
 + n) + D*(3 + n)*x)))) + 3*a^2*b*d^2*(42 + 13*n + n^2)*(24*c^4*D
 - 6*c^3*d*(C*(5 + n) + 4*D*(1 + n)*x) + 2*c^2*d^2*(B*(20 + 9*n +
 n^2) + 3*(1 + n)*x*(C*(5 + n) + 2*D*(2 + n)*x)) - c*d^3*(A*(60 +
 47*n + 12*n^2 + n^3) + (1 + n)*x*(2*B*(20 + 9*n + n^2) + (2 + n)
*x*(3*C*(5 + n) + 4*D*(3 + n)*x))) + d^4*(1 + n)*x*(A*(60 + 47*n
+ 12*n^2 + n^3) + (2 + n)*x*(B*(20 + 9*n + n^2) + (3 + n)*x*(C*(5
```

```
 + n) + D*(4 + n)*x)))) + 3*a*b^2*d*(7 + n)*(-120*c^5*D + 24*c^4*
d*(C*(6 + n) + 5*D*(1 + n)*x) - 6*c^3*d^2*(B*(30 + 11*n + n^2) +
2*(1 + n)*x*(2*C*(6 + n) + 5*D*(2 + n)*x)) + 2*c^2*d^3*(A*(120 +
74*n + 15*n^2 + n^3) + (1 + n)*x*(3*B*(30 + 11*n + n^2) + 2*(2 +
n)*x*(3*C*(6 + n) + 5*D*(3 + n)*x))) - c*d^4*(1 + n)*x*(2*A*(120
+ 74*n + 15*n^2 + n^3) + (2 + n)*x*(3*B*(30 + 11*n + n^2) + (3 +
n)*x*(4*C*(6 + n) + 5*D*(4 + n)*x))) + d^5*(2 + 3*n + n^2)*x^2*(A
*(120 + 74*n + 15*n^2 + n^3) + (3 + n)*x*(B*(30 + 11*n + n^2) + (
4 + n)*x*(C*(6 + n) + D*(5 + n)*x)))) + b^3*(720*c^6*D - 120*c^5*
d*(C*(7 + n) + 6*D*(1 + n)*x) + 24*c^4*d^2*(B*(42 + 13*n + n^2) +
 5*(1 + n)*x*(C*(7 + n) + 3*D*(2 + n)*x)) - 6*c^3*d^3*(A*(210 + 1
07*n + 18*n^2 + n^3) + 2*(1 + n)*x*(2*B*(42 + 13*n + n^2) + 5*(2
+ n)*x*(C*(7 + n) + 2*D*(3 + n)*x))) + 2*c^2*d^4*(1 + n)*x*(3*A*(
210 + 107*n + 18*n^2 + n^3) + (2 + n)*x*(6*B*(42 + 13*n + n^2) +
5*(3 + n)*x*(2*C*(7 + n) + 3*D*(4 + n)*x))) - c*d^5*(2 + 3*n + n^
2)*x^2*(3*A*(210 + 107*n + 18*n^2 + n^3) + (3 + n)*x*(4*B*(42 + 1
3*n + n^2) + (4 + n)*x*(5*C*(7 + n) + 6*D*(5 + n)*x))) + d^6*(6 +
 11*n + 6*n^2 + n^3)*x^3*(A*(210 + 107*n + 18*n^2 + n^3) + (4 + n
)*x*(B*(42 + 13*n + n^2) + (5 + n)*x*(C*(7 + n) + D*(6 + n)*x))))
))/(d^7*(1 + n)*(2 + n)*(3 + n)*(4 + n)*(5 + n)*(6 + n)*(7 + n))
```

Maple [B] time = 0.03, size = 5003, normalized size = 11.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^3*(d*x+c)^n*(D*x^3+C*x^2+B*x+A),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3*(d*x + c)^n,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.260236, size = 5250, normalized size = 11.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3*(d*x + c)^n,x, algorithm="fricas")
```

```
[Out] (A*a^3*c*d^6*n^6 + 720*D*b^3*c^7 + 5040*A*a^3*c*d^6 - 840*(3*D*a*
b^2 + C*b^3)*c^6*d + 1008*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^5*d^2
 - 1260*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^4*d^3 + 1680*(C
*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^3*d^4 - 2520*(B*a^3 + 3*A*a^2*b)*
c^2*d^5 + (D*b^3*d^7*n^6 + 21*D*b^3*d^7*n^5 + 175*D*b^3*d^7*n^4 +
 735*D*b^3*d^7*n^3 + 1624*D*b^3*d^7*n^2 + 1764*D*b^3*d^7*n + 720*
D*b^3*d^7)*x^7 + (840*(3*D*a*b^2 + C*b^3)*d^7 + (D*b^3*c*d^6 + (3
*D*a*b^2 + C*b^3)*d^7)*n^6 + (15*D*b^3*c*d^6 + 22*(3*D*a*b^2 + C*
b^3)*d^7)*n^5 + 5*(17*D*b^3*c*d^6 + 38*(3*D*a*b^2 + C*b^3)*d^7)*n
^4 + 5*(45*D*b^3*c*d^6 + 164*(3*D*a*b^2 + C*b^3)*d^7)*n^3 + (274*
D*b^3*c*d^6 + 1849*(3*D*a*b^2 + C*b^3)*d^7)*n^2 + 2*(60*D*b^3*c*d
^6 + 1019*(3*D*a*b^2 + C*b^3)*d^7)*n)*x^6 + (27*A*a^3*c*d^6 - (B*
a^3 + 3*A*a^2*b)*c^2*d^5)*n^5 + (1008*(3*D*a^2*b + 3*C*a*b^2 + B*
b^3)*d^7 + ((3*D*a*b^2 + C*b^3)*c*d^6 + (3*D*a^2*b + 3*C*a*b^2 +
B*b^3)*d^7)*n^6 - (6*D*b^3*c^2*d^5 - 17*(3*D*a*b^2 + C*b^3)*c*d^6
 - 23*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^7)*n^5 - 3*(20*D*b^3*c^2*
d^5 - 35*(3*D*a*b^2 + C*b^3)*c*d^6 - 69*(3*D*a^2*b + 3*C*a*b^2 +
B*b^3)*d^7)*n^4 - 5*(42*D*b^3*c^2*d^5 - 59*(3*D*a*b^2 + C*b^3)*c*
d^6 - 185*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^7)*n^3 - 2*(150*D*b^3
*c^2*d^5 - 187*(3*D*a*b^2 + C*b^3)*c*d^6 - 1072*(3*D*a^2*b + 3*C*
a*b^2 + B*b^3)*d^7)*n^2 - 12*(12*D*b^3*c^2*d^5 - 14*(3*D*a*b^2 +
C*b^3)*c*d^6 - 201*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*d^7)*n)*x^5 +
(295*A*a^3*c*d^6 + 2*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^3*d^4 - 25
*(B*a^3 + 3*A*a^2*b)*c^2*d^5)*n^4 + (1260*(D*a^3 + 3*C*a^2*b + 3*
B*a*b^2 + A*b^3)*d^7 + ((3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c*d^6 + (
D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*d^7)*n^6 - (5*(3*D*a*b^2 +
 C*b^3)*c^2*d^5 - 19*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c*d^6 - 24*(
D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*d^7)*n^5 + (30*D*b^3*c^3*d
^4 - 65*(3*D*a*b^2 + C*b^3)*c^2*d^5 + 131*(3*D*a^2*b + 3*C*a*b^2
+ B*b^3)*c*d^6 + 226*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*d^7)
*n^4 + (180*D*b^3*c^3*d^4 - 265*(3*D*a*b^2 + C*b^3)*c^2*d^5 + 401
*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c*d^6 + 1056*(D*a^3 + 3*C*a^2*b
+ 3*B*a*b^2 + A*b^3)*d^7)*n^3 + 5*(66*D*b^3*c^3*d^4 - 83*(3*D*a*b
^2 + C*b^3)*c^2*d^5 + 108*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c*d^6 +
 509*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*d^7)*n^2 + 6*(30*D*b
^3*c^3*d^4 - 35*(3*D*a*b^2 + C*b^3)*c^2*d^5 + 42*(3*D*a^2*b + 3*C
*a*b^2 + B*b^3)*c*d^6 + 492*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^
3)*d^7)*n)*x^4 + (1665*A*a^3*c*d^6 - 6*(D*a^3 + 3*C*a^2*b + 3*B*a
*b^2 + A*b^3)*c^4*d^3 + 44*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^3*d^
4 - 245*(B*a^3 + 3*A*a^2*b)*c^2*d^5)*n^3 + (1680*(C*a^3 + 3*B*a^2
*b + 3*A*a*b^2)*d^7 + ((D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c*
d^6 + (C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*d^7)*n^6 - (4*(3*D*a^2*b +
3*C*a*b^2 + B*b^3)*c^2*d^5 - 21*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 +
A*b^3)*c*d^6 - 25*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*d^7)*n^5 + (20*
(3*D*a*b^2 + C*b^3)*c^3*d^4 - 64*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*
c^2*d^5 + 163*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c*d^6 + 247
*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*d^7)*n^4 - (120*D*b^3*c^4*d^3 -
200*(3*D*a*b^2 + C*b^3)*c^3*d^4 + 332*(3*D*a^2*b + 3*C*a*b^2 + B*
b^3)*c^2*d^5 - 567*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c*d^6
- 1219*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*d^7)*n^3 - 4*(90*D*b^3*c^4
*d^3 - 115*(3*D*a*b^2 + C*b^3)*c^3*d^4 + 152*(3*D*a^2*b + 3*C*a*b
```

```
^2 + B*b^3)*c^2*d^5 - 211*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)
*c*d^6 - 778*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*d^7)*n^2 - 4*(60*D*b
^3*c^4*d^3 - 70*(3*D*a*b^2 + C*b^3)*c^3*d^4 + 84*(3*D*a^2*b + 3*C
*a*b^2 + B*b^3)*c^2*d^5 - 105*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*
b^3)*c*d^6 - 949*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*d^7)*n)*x^3 + (5
104*A*a^3*c*d^6 + 24*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^5*d^2 - 10
8*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^4*d^3 + 358*(C*a^3 +
3*B*a^2*b + 3*A*a*b^2)*c^3*d^4 - 1175*(B*a^3 + 3*A*a^2*b)*c^2*d^5
)*n^2 + (2520*(B*a^3 + 3*A*a^2*b)*d^7 + ((C*a^3 + 3*B*a^2*b + 3*A
*a*b^2)*c*d^6 + (B*a^3 + 3*A*a^2*b)*d^7)*n^6 - (3*(D*a^3 + 3*C*a^
2*b + 3*B*a*b^2 + A*b^3)*c^2*d^5 - 23*(C*a^3 + 3*B*a^2*b + 3*A*a*
b^2)*c*d^6 - 26*(B*a^3 + 3*A*a^2*b)*d^7)*n^5 + 3*(4*(3*D*a^2*b +
3*C*a*b^2 + B*b^3)*c^3*d^4 - 19*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 +
A*b^3)*c^2*d^5 + 67*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c*d^6 + 90*(B
*a^3 + 3*A*a^2*b)*d^7)*n^4 - (60*(3*D*a*b^2 + C*b^3)*c^4*d^3 - 16
8*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^3*d^4 + 375*(D*a^3 + 3*C*a^2*
b + 3*B*a*b^2 + A*b^3)*c^2*d^5 - 817*(C*a^3 + 3*B*a^2*b + 3*A*a*b
^2)*c*d^6 - 1420*(B*a^3 + 3*A*a^2*b)*d^7)*n^3 + (360*D*b^3*c^5*d^
2 - 480*(3*D*a*b^2 + C*b^3)*c^4*d^3 + 660*(3*D*a^2*b + 3*C*a*b^2
+ B*b^3)*c^3*d^4 - 951*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^
2*d^5 + 1478*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c*d^6 + 3929*(B*a^3
+ 3*A*a^2*b)*d^7)*n^2 + 6*(60*D*b^3*c^5*d^2 - 70*(3*D*a*b^2 + C*b
^3)*c^4*d^3 + 84*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^3*d^4 - 105*(D
*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^2*d^5 + 140*(C*a^3 + 3*B*
a^2*b + 3*A*a*b^2)*c*d^6 + 879*(B*a^3 + 3*A*a^2*b)*d^7)*n)*x^2 +
2*(4014*A*a^3*c*d^6 - 60*(3*D*a*b^2 + C*b^3)*c^6*d + 156*(3*D*a^2
*b + 3*C*a*b^2 + B*b^3)*c^5*d^2 - 321*(D*a^3 + 3*C*a^2*b + 3*B*a*
b^2 + A*b^3)*c^4*d^3 + 638*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^3*d^
4 - 1377*(B*a^3 + 3*A*a^2*b)*c^2*d^5)*n + (5040*A*a^3*d^7 + (A*a^
3*d^7 + (B*a^3 + 3*A*a^2*b)*c*d^6)*n^6 + (27*A*a^3*d^7 - 2*(C*a^3
 + 3*B*a^2*b + 3*A*a*b^2)*c^2*d^5 + 25*(B*a^3 + 3*A*a^2*b)*c*d^6)
*n^5 + (295*A*a^3*d^7 + 6*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)
*c^3*d^4 - 44*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^2*d^5 + 245*(B*a^
3 + 3*A*a^2*b)*c*d^6)*n^4 + (1665*A*a^3*d^7 - 24*(3*D*a^2*b + 3*C
*a*b^2 + B*b^3)*c^4*d^3 + 108*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*
b^3)*c^3*d^4 - 358*(C*a^3 + 3*B*a^2*b + 3*A*a*b^2)*c^2*d^5 + 1175
*(B*a^3 + 3*A*a^2*b)*c*d^6)*n^3 + 2*(2552*A*a^3*d^7 + 60*(3*D*a*b
^2 + C*b^3)*c^5*d^2 - 156*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^4*d^3
 + 321*(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^3*d^4 - 638*(C*a
^3 + 3*B*a^2*b + 3*A*a*b^2)*c^2*d^5 + 1377*(B*a^3 + 3*A*a^2*b)*c*
d^6)*n^2 - 12*(60*D*b^3*c^6*d - 669*A*a^3*d^7 - 70*(3*D*a*b^2 + C
*b^3)*c^5*d^2 + 84*(3*D*a^2*b + 3*C*a*b^2 + B*b^3)*c^4*d^3 - 105*
(D*a^3 + 3*C*a^2*b + 3*B*a*b^2 + A*b^3)*c^3*d^4 + 140*(C*a^3 + 3*
B*a^2*b + 3*A*a*b^2)*c^2*d^5 - 210*(B*a^3 + 3*A*a^2*b)*c*d^6)*n)*
x)*(d*x + c)^n/(d^7*n^7 + 28*d^7*n^6 + 322*d^7*n^5 + 1960*d^7*n^4
 + 6769*d^7*n^3 + 13132*d^7*n^2 + 13068*d^7*n + 5040*d^7)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**3*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.233791, size = 1, normalized size = 0.

$$\text{Done}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^3*(d*x + c)^n,x, algorithm="giac")
```

```
[Out] Done
```

3.26 $\int (a+bx)^2(c+dx)^n \left(A+Bx+Cx^2+Dx^3\right)\, dx$

Optimal. Leaf size=338

$$\frac{(c+dx)^{n+3}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{d^6(n+3)}+\frac{(c+dx)^{n+4}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{d^6(n+4)}+\frac{(bc-ad)^2(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^6(n+1)}+\frac{(bc-ad)(c+dx)^{n+2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{d^6(n+2)}+\frac{b(c+dx)^{n+5}(2adD-5bcD+bCd)}{d^6(n+5)}+\frac{b^2D(c+dx)^{n+6}}{d^6(n+6)}$$

```
[Out] ((b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1 +
 n))/(d^6*(1 + n)) + ((b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D
) - b*(4*c^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D))*(c + d*x)^(2 +
 n))/(d^6*(2 + n)) + ((a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d -
 B*d^2 - 6*c^2*D) + b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D
))*(c + d*x)^(3 + n))/(d^6*(3 + n)) + ((a^2*d^2*D + 2*a*b*d*(C*d
- 4*c*D) - b^2*(4*c*C*d - B*d^2 - 10*c^2*D))*(c + d*x)^(4 + n))/(
d^6*(4 + n)) + (b*(b*C*d - 5*b*c*D + 2*a*d*D)*(c + d*x)^(5 + n))/
(d^6*(5 + n)) + (b^2*D*(c + d*x)^(6 + n))/(d^6*(6 + n))
```

Rubi [A] time = 0.580939, antiderivative size = 338, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$

$$\frac{(c+dx)^{n+3}\left(a^2d^2(Cd-3cD)-2abd\left(-Bd^2-6c^2D+3cCd\right)+b^2\left(Ad^3-3Bcd^2-10c^3D+6c^2Cd\right)\right)}{d^6(n+3)}+\frac{(c+dx)^{n+4}\left(a^2d^2D+2abd(Cd-4cD)+b^2\left(-\left(-Bd^2-10c^2D+4cCd\right)\right)\right)}{d^6(n+4)}+\frac{(bc-ad)^2(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^6(n+1)}+\frac{(bc-ad)(c+dx)^{n+2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(2Ad^3-3Bcd^2-5c^3D+4c^2Cd\right)\right)}{d^6(n+2)}+\frac{b(c+dx)^{n+5}(2adD-5bcD+bCd)}{d^6(n+5)}+\frac{b^2D(c+dx)^{n+6}}{d^6(n+6)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)^2*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((b*c - a*d)^2*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1 +
 n))/(d^6*(1 + n)) + ((b*c - a*d)*(a*d*(2*c*C*d - B*d^2 - 3*c^2*D
```

```
) - b*(4*c^2*C*d - 3*B*c*d^2 + 2*A*d^3 - 5*c^3*D))*(c + d*x)^(2 +
 n))/(d^6*(2 + n)) + ((a^2*d^2*(C*d - 3*c*D) - 2*a*b*d*(3*c*C*d -
 B*d^2 - 6*c^2*D) + b^2*(6*c^2*C*d - 3*B*c*d^2 + A*d^3 - 10*c^3*D
))*(c + d*x)^(3 + n))/(d^6*(3 + n)) + ((a^2*d^2*D + 2*a*b*d*(C*d
- 4*c*D) - b^2*(4*c*C*d - B*d^2 - 10*c^2*D))*(c + d*x)^(4 + n))/(
d^6*(4 + n)) + (b*(b*C*d - 5*b*c*D + 2*a*d*D)*(c + d*x)^(5 + n))/
(d^6*(5 + n)) + (b^2*D*(c + d*x)^(6 + n))/(d^6*(6 + n))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**2*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.20084, size = 619, normalized size = 1.83

$$(c+dx)^{n+1}\left(a^2d^2\left(n^2+11n+30\right)\left(d^3\left(A\left(n^3+9n^2+26n+24\right)+(n+1)x\left(B\left(n^2+7n+12\right)+(n+2)x(C(n+4)+D(n+3)x)\right.\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x)^2*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((c + d*x)^(1 + n)*(a^2*d^2*(30 + 11*n + n^2)*(-6*c^3*D + 2*c^2*d
*(C*(4 + n) + 3*D*(1 + n)*x) - c*d^2*(B*(12 + 7*n + n^2) + (1 + n
)*x*(2*C*(4 + n) + 3*D*(2 + n)*x)) + d^3*(A*(24 + 26*n + 9*n^2 +
n^3) + (1 + n)*x*(B*(12 + 7*n + n^2) + (2 + n)*x*(C*(4 + n) + D*(
3 + n)*x)))) + 2*a*b*d*(6 + n)*(24*c^4*D - 6*c^3*d*(C*(5 + n) + 4
*D*(1 + n)*x) + 2*c^2*d^2*(B*(20 + 9*n + n^2) + 3*(1 + n)*x*(C*(5
 + n) + 2*D*(2 + n)*x)) - c*d^3*(A*(60 + 47*n + 12*n^2 + n^3) + (
1 + n)*x*(2*B*(20 + 9*n + n^2) + (2 + n)*x*(3*C*(5 + n) + 4*D*(3
+ n)*x))) + d^4*(1 + n)*x*(A*(60 + 47*n + 12*n^2 + n^3) + (2 + n)
*x*(B*(20 + 9*n + n^2) + (3 + n)*x*(C*(5 + n) + D*(4 + n)*x)))) -
 b^2*(120*c^5*D - 24*c^4*d*(C*(6 + n) + 5*D*(1 + n)*x) + 6*c^3*d^
2*(B*(30 + 11*n + n^2) + 2*(1 + n)*x*(2*C*(6 + n) + 5*D*(2 + n)*x
)) - 2*c^2*d^3*(A*(120 + 74*n + 15*n^2 + n^3) + (1 + n)*x*(3*B*(3
0 + 11*n + n^2) + 2*(2 + n)*x*(3*C*(6 + n) + 5*D*(3 + n)*x))) + c
*d^4*(1 + n)*x*(2*A*(120 + 74*n + 15*n^2 + n^3) + (2 + n)*x*(3*B*
(30 + 11*n + n^2) + (3 + n)*x*(4*C*(6 + n) + 5*D*(4 + n)*x))) - d
^5*(2 + 3*n + n^2)*x^2*(A*(120 + 74*n + 15*n^2 + n^3) + (3 + n)*x
*(B*(30 + 11*n + n^2) + (4 + n)*x*(C*(6 + n) + D*(5 + n)*x))))))/
(d^6*(1 + n)*(2 + n)*(3 + n)*(4 + n)*(5 + n)*(6 + n))
```

Maple [B] time = 0.02, size = 2588, normalized size = 7.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^2*(d*x+c)^n*(D*x^3+C*x^2+B*x+A),x)
```

```
[Out] (d*x+c)^(1+n)*(D*b^2*d^5*n^5*x^5+C*b^2*d^5*n^5*x^4+2*D*a*b*d^5*n^
5*x^4+15*D*b^2*d^5*n^4*x^5+B*b^2*d^5*n^5*x^3+2*C*a*b*d^5*n^5*x^3+
16*C*b^2*d^5*n^4*x^4+D*a^2*d^5*n^5*x^3+32*D*a*b*d^5*n^4*x^4-5*D*b
^2*c*d^4*n^4*x^4+85*D*b^2*d^5*n^3*x^5+A*b^2*d^5*n^5*x^2+2*B*a*b*d
^5*n^5*x^2+17*B*b^2*d^5*n^4*x^3+C*a^2*d^5*n^5*x^2+34*C*a*b*d^5*n^
4*x^3-4*C*b^2*c*d^4*n^4*x^3+95*C*b^2*d^5*n^3*x^4+17*D*a^2*d^5*n^4
*x^3-8*D*a*b*c*d^4*n^4*x^3+190*D*a*b*d^5*n^3*x^4-50*D*b^2*c*d^4*n
^3*x^4+225*D*b^2*d^5*n^2*x^5+2*A*a*b*d^5*n^5*x+18*A*b^2*d^5*n^4*x
^2+B*a^2*d^5*n^5*x+36*B*a*b*d^5*n^4*x^2-3*B*b^2*c*d^4*n^4*x^2+107
*B*b^2*d^5*n^3*x^3+18*C*a^2*d^5*n^4*x^2-6*C*a*b*c*d^4*n^4*x^2+214
*C*a*b*d^5*n^3*x^3-48*C*b^2*c*d^4*n^3*x^3+260*C*b^2*d^5*n^2*x^4-3
*D*a^2*c*d^4*n^4*x^2+107*D*a^2*d^5*n^3*x^3-96*D*a*b*c*d^4*n^3*x^3
+520*D*a*b*d^5*n^2*x^4+20*D*b^2*c^2*d^3*n^3*x^3-175*D*b^2*c*d^4*n
^2*x^4+274*D*b^2*d^5*n*x^5+A*a^2*d^5*n^5+38*A*a*b*d^5*n^4*x-2*A*b
^2*c*d^4*n^4*x+121*A*b^2*d^5*n^3*x^2+19*B*a^2*d^5*n^4*x-4*B*a*b*c
*d^4*n^4*x+242*B*a*b*d^5*n^3*x^2-42*B*b^2*c*d^4*n^3*x^2+307*B*b^2
*d^5*n^2*x^3-2*C*a^2*c*d^4*n^4*x+121*C*a^2*d^5*n^3*x^2-84*C*a*b*c
*d^4*n^3*x^2+614*C*a*b*d^5*n^2*x^3+12*C*b^2*c^2*d^3*n^3*x^2-188*C
*b^2*c*d^4*n^2*x^3+324*C*b^2*d^5*n*x^4-42*D*a^2*c*d^4*n^3*x^2+307
*D*a^2*d^5*n^2*x^3+24*D*a*b*c^2*d^3*n^3*x^2-376*D*a*b*c*d^4*n^2*x
^3+648*D*a*b*d^5*n*x^4+120*D*b^2*c^2*d^3*n^2*x^3-250*D*b^2*c*d^4*
n*x^4+120*D*b^2*d^5*x^5+20*A*a^2*d^5*n^4-2*A*a*b*c*d^4*n^4+274*A*
a*b*d^5*n^3*x-32*A*b^2*c*d^4*n^3*x+372*A*b^2*d^5*n^2*x^2-B*a^2*c*
d^4*n^4+137*B*a^2*d^5*n^3*x-64*B*a*b*c*d^4*n^3*x+744*B*a*b*d^5*n^
2*x^2+6*B*b^2*c^2*d^3*n^3*x-195*B*b^2*c*d^4*n^2*x^2+396*B*b^2*d^5
*n*x^3-32*C*a^2*c*d^4*n^3*x+372*C*a^2*d^5*n^2*x^2+12*C*a*b*c^2*d^
3*n^3*x-390*C*a*b*c*d^4*n^2*x^2+792*C*a*b*d^5*n*x^3+108*C*b^2*c^2
*d^3*n^2*x^2-288*C*b^2*c*d^4*n*x^3+144*C*b^2*d^5*x^4+6*D*a^2*c^2*
d^3*n^3*x-195*D*a^2*c*d^4*n^2*x^2+396*D*a^2*d^5*n*x^3+216*D*a*b*c
^2*d^3*n^2*x^2-576*D*a*b*c*d^4*n*x^3+288*D*a*b*d^5*x^4-60*D*b^2*c
^3*d^2*n^2*x^2+220*D*b^2*c^2*d^3*n*x^3-120*D*b^2*c*d^4*x^4+155*A*
a^2*d^5*n^3-36*A*a*b*c*d^4*n^3+922*A*a*b*d^5*n^2*x+2*A*b^2*c^2*d^
3*n^3-178*A*b^2*c*d^4*n^2*x+508*A*b^2*d^5*n*x^2-18*B*a^2*c*d^4*n^
3+461*B*a^2*d^5*n^2*x+4*B*a*b*c^2*d^3*n^3-356*B*a*b*c*d^4*n^2*x+1
016*B*a*b*d^5*n*x^2+72*B*b^2*c^2*d^3*n^2*x-336*B*b^2*c*d^4*n*x^2+
180*B*b^2*d^5*x^3+2*C*a^2*c^2*d^3*n^3-178*C*a^2*c*d^4*n^2*x+508*C
*a^2*d^5*n*x^2+144*C*a*b*c^2*d^3*n^2*x-672*C*a*b*c*d^4*n*x^2+360*
C*a*b*d^5*x^3-24*C*b^2*c^3*d^2*n^2*x+240*C*b^2*c^2*d^3*n*x^2-144*
C*b^2*c*d^4*x^3+72*D*a^2*c^2*d^3*n^2*x-336*D*a^2*c*d^4*n*x^2+180*
D*a^2*d^5*x^3-48*D*a*b*c^3*d^2*n^2*x+480*D*a*b*c^2*d^3*n*x^2-288*
D*a*b*c*d^4*x^3-180*D*b^2*c^3*d^2*n*x^2+120*D*b^2*c^2*d^3*x^3+580
*A*a^2*d^5*n^2-238*A*a*b*c*d^4*n^2+1404*A*a*b*d^5*n*x+30*A*b^2*c^
2*d^3*n^2-388*A*b^2*c*d^4*n*x+240*A*b^2*d^5*x^2-119*B*a^2*c*d^4*n
^2+702*B*a^2*d^5*n*x+60*B*a*b*c^2*d^3*n^2-776*B*a*b*c*d^4*n*x+480
*B*a*b*d^5*x^2-6*B*b^2*c^3*d^2*n^2+246*B*b^2*c^2*d^3*n*x-180*B*b^
```

```
2*c*d^4*x^2+30*C*a^2*c^2*d^3*n^2-388*C*a^2*c*d^4*n*x+240*C*a^2*d^
5*x^2-12*C*a*b*c^3*d^2*n^2+492*C*a*b*c^2*d^3*n*x-360*C*a*b*c*d^4*
x^2-168*C*b^2*c^3*d^2*n*x+144*C*b^2*c^2*d^3*x^2-6*D*a^2*c^3*d^2*n
^2+246*D*a^2*c^2*d^3*n*x-180*D*a^2*c*d^4*x^2-336*D*a*b*c^3*d^2*n*
x+288*D*a*b*c^2*d^3*x^2+120*D*b^2*c^4*d*n*x-120*D*b^2*c^3*d^2*x^2
+1044*A*a^2*d^5*n-684*A*a*b*c*d^4*n+720*A*a*b*d^5*x+148*A*b^2*c^2
*d^3*n-240*A*b^2*c*d^4*x-342*B*a^2*c*d^4*n+360*B*a^2*d^5*x+296*B*
a*b*c^2*d^3*n-480*B*a*b*c*d^4*x-66*B*b^2*c^3*d^2*n+180*B*b^2*c^2*
d^3*x+148*C*a^2*c^2*d^3*n-240*C*a^2*c*d^4*x-132*C*a*b*c^3*d^2*n+3
60*C*a*b*c^2*d^3*x+24*C*b^2*c^4*d*n-144*C*b^2*c^3*d^2*x-66*D*a^2*
c^3*d^2*n+180*D*a^2*c^2*d^3*x+48*D*a*b*c^4*d*n-288*D*a*b*c^3*d^2*
x+120*D*b^2*c^4*d*x+720*A*a^2*d^5-720*A*a*b*c*d^4+240*A*b^2*c^2*d
^3-360*B*a^2*c*d^4+480*B*a*b*c^2*d^3-180*B*b^2*c^3*d^2+240*C*a^2*
c^2*d^3-360*C*a*b*c^3*d^2+144*C*b^2*c^4*d-180*D*a^2*c^3*d^2+288*D
*a*b*c^4*d-120*D*b^2*c^5)/d^6/(n^6+21*n^5+175*n^4+735*n^3+1624*n^
2+1764*n+720)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2*(d*x + c)^n,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.246987, size = 2911, normalized size = 8.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2*(d*x + c)^n,x, algorithm="fricas")
```

```
[Out] (A*a^2*c*d^5*n^5 - 120*D*b^2*c^6 + 720*A*a^2*c*d^5 + 144*(2*D*a*b
 + C*b^2)*c^5*d - 180*(D*a^2 + 2*C*a*b + B*b^2)*c^4*d^2 + 240*(C*
a^2 + 2*B*a*b + A*b^2)*c^3*d^3 - 360*(B*a^2 + 2*A*a*b)*c^2*d^4 +
(D*b^2*d^6*n^5 + 15*D*b^2*d^6*n^4 + 85*D*b^2*d^6*n^3 + 225*D*b^2*
d^6*n^2 + 274*D*b^2*d^6*n + 120*D*b^2*d^6)*x^6 + (144*(2*D*a*b +
C*b^2)*d^6 + (D*b^2*c*d^5 + (2*D*a*b + C*b^2)*d^6)*n^5 + 2*(5*D*b
^2*c*d^5 + 8*(2*D*a*b + C*b^2)*d^6)*n^4 + 5*(7*D*b^2*c*d^5 + 19*(
2*D*a*b + C*b^2)*d^6)*n^3 + 10*(5*D*b^2*c*d^5 + 26*(2*D*a*b + C*b
^2)*d^6)*n^2 + 12*(2*D*b^2*c*d^5 + 27*(2*D*a*b + C*b^2)*d^6)*n)*x
^5 + (20*A*a^2*c*d^5 - (B*a^2 + 2*A*a*b)*c^2*d^4)*n^4 + (180*(D*a
^2 + 2*C*a*b + B*b^2)*d^6 + ((2*D*a*b + C*b^2)*c*d^5 + (D*a^2 + 2
*C*a*b + B*b^2)*d^6)*n^5 - (5*D*b^2*c^2*d^4 - 12*(2*D*a*b + C*b^2
```

```
)*c*d^5 - 17*(D*a^2 + 2*C*a*b + B*b^2)*d^6)*n^4 - (30*D*b^2*c^2*d
^4 - 47*(2*D*a*b + C*b^2)*c*d^5 - 107*(D*a^2 + 2*C*a*b + B*b^2)*d
^6)*n^3 - (55*D*b^2*c^2*d^4 - 72*(2*D*a*b + C*b^2)*c*d^5 - 307*(D
*a^2 + 2*C*a*b + B*b^2)*d^6)*n^2 - 6*(5*D*b^2*c^2*d^4 - 6*(2*D*a*
b + C*b^2)*c*d^5 - 66*(D*a^2 + 2*C*a*b + B*b^2)*d^6)*n)*x^4 + (15
5*A*a^2*c*d^5 + 2*(C*a^2 + 2*B*a*b + A*b^2)*c^3*d^3 - 18*(B*a^2 +
 2*A*a*b)*c^2*d^4)*n^3 + (240*(C*a^2 + 2*B*a*b + A*b^2)*d^6 + ((D
*a^2 + 2*C*a*b + B*b^2)*c*d^5 + (C*a^2 + 2*B*a*b + A*b^2)*d^6)*n^
5 - 2*(2*(2*D*a*b + C*b^2)*c^2*d^4 - 7*(D*a^2 + 2*C*a*b + B*b^2)*
c*d^5 - 9*(C*a^2 + 2*B*a*b + A*b^2)*d^6)*n^4 + (20*D*b^2*c^3*d^3
- 36*(2*D*a*b + C*b^2)*c^2*d^4 + 65*(D*a^2 + 2*C*a*b + B*b^2)*c*d
^5 + 121*(C*a^2 + 2*B*a*b + A*b^2)*d^6)*n^3 + 4*(15*D*b^2*c^3*d^3
 - 20*(2*D*a*b + C*b^2)*c^2*d^4 + 28*(D*a^2 + 2*C*a*b + B*b^2)*c*
d^5 + 93*(C*a^2 + 2*B*a*b + A*b^2)*d^6)*n^2 + 4*(10*D*b^2*c^3*d^3
 - 12*(2*D*a*b + C*b^2)*c^2*d^4 + 15*(D*a^2 + 2*C*a*b + B*b^2)*c*
d^5 + 127*(C*a^2 + 2*B*a*b + A*b^2)*d^6)*n)*x^3 + (580*A*a^2*c*d^
5 - 6*(D*a^2 + 2*C*a*b + B*b^2)*c^4*d^2 + 30*(C*a^2 + 2*B*a*b + A
*b^2)*c^3*d^3 - 119*(B*a^2 + 2*A*a*b)*c^2*d^4)*n^2 + (360*(B*a^2
+ 2*A*a*b)*d^6 + ((C*a^2 + 2*B*a*b + A*b^2)*c*d^5 + (B*a^2 + 2*A*
a*b)*d^6)*n^5 - (3*(D*a^2 + 2*C*a*b + B*b^2)*c^2*d^4 - 16*(C*a^2
+ 2*B*a*b + A*b^2)*c*d^5 - 19*(B*a^2 + 2*A*a*b)*d^6)*n^4 + (12*(2
*D*a*b + C*b^2)*c^3*d^3 - 36*(D*a^2 + 2*C*a*b + B*b^2)*c^2*d^4 +
89*(C*a^2 + 2*B*a*b + A*b^2)*c*d^5 + 137*(B*a^2 + 2*A*a*b)*d^6)*n
^3 - (60*D*b^2*c^4*d^2 - 84*(2*D*a*b + C*b^2)*c^3*d^3 + 123*(D*a^
2 + 2*C*a*b + B*b^2)*c^2*d^4 - 194*(C*a^2 + 2*B*a*b + A*b^2)*c*d^
5 - 461*(B*a^2 + 2*A*a*b)*d^6)*n^2 - 6*(10*D*b^2*c^4*d^2 - 12*(2*
D*a*b + C*b^2)*c^3*d^3 + 15*(D*a^2 + 2*C*a*b + B*b^2)*c^2*d^4 - 2
0*(C*a^2 + 2*B*a*b + A*b^2)*c*d^5 - 117*(B*a^2 + 2*A*a*b)*d^6)*n)
*x^2 + 2*(522*A*a^2*c*d^5 + 12*(2*D*a*b + C*b^2)*c^5*d - 33*(D*a^
2 + 2*C*a*b + B*b^2)*c^4*d^2 + 74*(C*a^2 + 2*B*a*b + A*b^2)*c^3*d
^3 - 171*(B*a^2 + 2*A*a*b)*c^2*d^4)*n + (720*A*a^2*d^6 + (A*a^2*d
^6 + (B*a^2 + 2*A*a*b)*c*d^5)*n^5 + 2*(10*A*a^2*d^6 - (C*a^2 + 2*
B*a*b + A*b^2)*c^2*d^4 + 9*(B*a^2 + 2*A*a*b)*c*d^5)*n^4 + (155*A*
a^2*d^6 + 6*(D*a^2 + 2*C*a*b + B*b^2)*c^3*d^3 - 30*(C*a^2 + 2*B*a
*b + A*b^2)*c^2*d^4 + 119*(B*a^2 + 2*A*a*b)*c*d^5)*n^3 + 2*(290*A
*a^2*d^6 - 12*(2*D*a*b + C*b^2)*c^4*d^2 + 33*(D*a^2 + 2*C*a*b + B
*b^2)*c^3*d^3 - 74*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^4 + 171*(B*a^2
 + 2*A*a*b)*c*d^5)*n^2 + 12*(10*D*b^2*c^5*d + 87*A*a^2*d^6 - 12*(
2*D*a*b + C*b^2)*c^4*d^2 + 15*(D*a^2 + 2*C*a*b + B*b^2)*c^3*d^3 -
 20*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^4 + 30*(B*a^2 + 2*A*a*b)*c*d^
5)*n)*x)*(d*x + c)^n/(d^6*n^6 + 21*d^6*n^5 + 175*d^6*n^4 + 735*d^
6*n^3 + 1624*d^6*n^2 + 1764*d^6*n + 720*d^6)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**2*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.221591, size = 1, normalized size = 0.

$$Done$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^2*(d*x + c)^n,x, algorithm="giac")
```

```
[Out] Done
```

3.27 $\int (a + bx)(c + dx)^n \left(A + Bx + Cx^2 + Dx^3\right) \, dx$

Optimal. Leaf size=226

$$-\frac{(bc-ad)(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^5(n+1)} -\frac{(c+dx)^{n+2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{d^5(n+2)} +\frac{(c+dx)^{n+3}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{d^5(n+3)} +\frac{(c+dx)^{n+4}(adD-4bcD+bCd)}{d^5(n+4)}+\frac{bD(c+dx)^{n+5}}{d^5(n+5)}$$

```
[Out] -(((b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1 +
 n))/(d^5*(1 + n))) - ((a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^
2*C*d - 2*B*c*d^2 + A*d^3 - 4*c^3*D))*(c + d*x)^(2 + n))/(d^5*(2
+ n)) + ((a*d*(C*d - 3*c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*(c +
 d*x)^(3 + n))/(d^5*(3 + n)) + ((b*C*d - 4*b*c*D + a*d*D)*(c + d*
x)^(4 + n))/(d^5*(4 + n)) + (b*D*(c + d*x)^(5 + n))/(d^5*(5 + n))
```

Rubi [A] time = 0.36659, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.036$

$$-\frac{(bc-ad)(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^5(n+1)} -\frac{(c+dx)^{n+2}\left(ad\left(-Bd^2-3c^2D+2cCd\right)-b\left(Ad^3-2Bcd^2-4c^3D+3c^2Cd\right)\right)}{d^5(n+2)} +\frac{(c+dx)^{n+3}\left(ad(Cd-3cD)-b\left(-Bd^2-6c^2D+3cCd\right)\right)}{d^5(n+3)} +\frac{(c+dx)^{n+4}(adD-4bcD+bCd)}{d^5(n+4)}+\frac{bD(c+dx)^{n+5}}{d^5(n+5)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```


```
[Out] -(((b*c - a*d)*(c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1 +
 n))/(d^5*(1 + n))) - ((a*d*(2*c*C*d - B*d^2 - 3*c^2*D) - b*(3*c^
2*C*d - 2*B*c*d^2 + A*d^3 - 4*c^3*D))*(c + d*x)^(2 + n))/(d^5*(2
+ n)) + ((a*d*(C*d - 3*c*D) - b*(3*c*C*d - B*d^2 - 6*c^2*D))*(c +
 d*x)^(3 + n))/(d^5*(3 + n)) + ((b*C*d - 4*b*c*D + a*d*D)*(c + d*
x)^(4 + n))/(d^5*(4 + n)) + (b*D*(c + d*x)^(5 + n))/(d^5*(5 + n))
```

Rubi in Sympy [A] time = 142.042, size = 228, normalized size = 1.01

$$\frac{Db(c+dx)^{n+5}}{d^5(n+5)}+\frac{(c+dx)^{n+1}(ad-bc)\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{d^5(n+1)}+\frac{(c+dx)^{n+2}\left(Abd^3+Bad^3-2Bbcd^2-2Cacd^2+3Cbc^2d+3Dac^2d-4Dbc^3\right)}{d^5(n+2)}+\frac{(c+dx)^{n+3}\left(Bbd^2+Cad^2-3Cbcd-3Dacd+6Dbc^2\right)}{d^5(n+3)}+\frac{(c+dx)^{n+4}(Cbd+Dad-4Dbc)}{d^5(n+4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] D*b*(c + d*x)**(n + 5)/(d**5*(n + 5)) + (c + d*x)**(n + 1)*(a*d -
 b*c)*(A*d**3 - B*c*d**2 + C*c**2*d - D*c**3)/(d**5*(n + 1)) + (c
 + d*x)**(n + 2)*(A*b*d**3 + B*a*d**3 - 2*B*b*c*d**2 - 2*C*a*c*d*
*2 + 3*C*b*c**2*d + 3*D*a*c**2*d - 4*D*b*c**3)/(d**5*(n + 2)) + (
c + d*x)**(n + 3)*(B*b*d**2 + C*a*d**2 - 3*C*b*c*d - 3*D*a*c*d +
6*D*b*c**2)/(d**5*(n + 3)) + (c + d*x)**(n + 4)*(C*b*d + D*a*d -
4*D*b*c)/(d**5*(n + 4))
```

Mathematica [A] time = 0.861265, size = 341, normalized size = 1.51

$$\frac{(c+dx)^{n+1}\left(ad(n+5)\left(d^3\left(A\left(n^3+9n^2+26n+24\right)+(n+1)x\left(B\left(n^2+7n+12\right)+(n+2)x(C(n+4)+D(n+3)x)\right)\right)-cd^2\left(B\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x)*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((c + d*x)^(1 + n)*(a*d*(5 + n)*(-6*c^3*D + 2*c^2*d*(C*(4 + n) +
3*D*(1 + n)*x) - c*d^2*(B*(12 + 7*n + n^2) + (1 + n)*x*(2*C*(4 +
n) + 3*D*(2 + n)*x)) + d^3*(A*(24 + 26*n + 9*n^2 + n^3) + (1 + n)
*x*(B*(12 + 7*n + n^2) + (2 + n)*x*(C*(4 + n) + D*(3 + n)*x)))) +
 b*(24*c^4*D - 6*c^3*d*(C*(5 + n) + 4*D*(1 + n)*x) + 2*c^2*d^2*(B
*(20 + 9*n + n^2) + 3*(1 + n)*x*(C*(5 + n) + 2*D*(2 + n)*x)) - c*
d^3*(A*(60 + 47*n + 12*n^2 + n^3) + (1 + n)*x*(2*B*(20 + 9*n + n^
2) + (2 + n)*x*(3*C*(5 + n) + 4*D*(3 + n)*x))) + d^4*(1 + n)*x*(A
*(60 + 47*n + 12*n^2 + n^3) + (2 + n)*x*(B*(20 + 9*n + n^2) + (3
+ n)*x*(C*(5 + n) + D*(4 + n)*x))))))/(d^5*(1 + n)*(2 + n)*(3 + n
)*(4 + n)*(5 + n))
```

Maple [B] time = 0.015, size = 1039, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(d*x+c)^n*(D*x^3+C*x^2+B*x+A),x)
```

```
[Out] (d*x+c)^(1+n)*(D*b*d^4*n^4*x^4+C*b*d^4*n^4*x^3+D*a*d^4*n^4*x^3+10
*D*b*d^4*n^3*x^4+B*b*d^4*n^4*x^2+C*a*d^4*n^4*x^2+11*C*b*d^4*n^3*x
^3+11*D*a*d^4*n^3*x^3-4*D*b*c*d^3*n^3*x^3+35*D*b*d^4*n^2*x^4+A*b*
d^4*n^4*x+B*a*d^4*n^4*x+12*B*b*d^4*n^3*x^2+12*C*a*d^4*n^3*x^2-3*C
*b*c*d^3*n^3*x^2+41*C*b*d^4*n^2*x^3-3*D*a*c*d^3*n^3*x^2+41*D*a*d^
4*n^2*x^3-24*D*b*c*d^3*n^2*x^3+50*D*b*d^4*n*x^4+A*a*d^4*n^4+13*A*
b*d^4*n^3*x+13*B*a*d^4*n^3*x-2*B*b*c*d^3*n^3*x+49*B*b*d^4*n^2*x^2
-2*C*a*c*d^3*n^3*x+49*C*a*d^4*n^2*x^2-24*C*b*c*d^3*n^2*x^2+61*C*b
*d^4*n*x^3-24*D*a*c*d^3*n^2*x^2+61*D*a*d^4*n*x^3+12*D*b*c^2*d^2*n
^2*x^2-44*D*b*c*d^3*n*x^3+24*D*b*d^4*x^4+14*A*a*d^4*n^3-A*b*c*d^3
*n^3+59*A*b*d^4*n^2*x-B*a*c*d^3*n^3+59*B*a*d^4*n^2*x-20*B*b*c*d^3
*n^2*x+78*B*b*d^4*n*x^2-20*C*a*c*d^3*n^2*x+78*C*a*d^4*n*x^2+6*C*b
*c^2*d^2*n^2*x-51*C*b*c*d^3*n*x^2+30*C*b*d^4*x^3+6*D*a*c^2*d^2*n^
2*x-51*D*a*c*d^3*n*x^2+30*D*a*d^4*x^3+36*D*b*c^2*d^2*n*x^2-24*D*b
*c*d^3*x^3+71*A*a*d^4*n^2-12*A*b*c*d^3*n^2+107*A*b*d^4*n*x-12*B*a
*c*d^3*n^2+107*B*a*d^4*n*x+2*B*b*c^2*d^2*n^2-58*B*b*c*d^3*n*x+40*
B*b*d^4*x^2+2*C*a*c^2*d^2*n^2-58*C*a*c*d^3*n*x+40*C*a*d^4*x^2+36*
C*b*c^2*d^2*n*x-30*C*b*c*d^3*x^2+36*D*a*c^2*d^2*n*x-30*D*a*c*d^3*
x^2-24*D*b*c^3*d*n*x+24*D*b*c^2*d^2*x^2+154*A*a*d^4*n-47*A*b*c*d^
3*n+60*A*b*d^4*x-47*B*a*c*d^3*n+60*B*a*d^4*x+18*B*b*c^2*d^2*n-40*
B*b*c*d^3*x+18*C*a*c^2*d^2*n-40*C*a*c*d^3*x-6*C*b*c^3*d*n+30*C*b*
c^2*d^2*x-6*D*a*c^3*d*n+30*D*a*c^2*d^2*x-24*D*b*c^3*d*x+120*A*a*d
^4-60*A*b*c*d^3-60*B*a*c*d^3+40*B*b*c^2*d^2+40*C*a*c^2*d^2-30*C*b
*c^3*d-30*D*a*c^3*d+24*D*b*c^4)/d^5/(n^5+15*n^4+85*n^3+225*n^2+27
4*n+120)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)*(d*x + c)^n,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.238085, size = 1301, normalized size = 5.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)*(d*x + c)^n,x, algorithm="fricas")
```

```
[Out] (A*a*c*d^4*n^4 + 24*D*b*c^5 + 120*A*a*c*d^4 - 30*(D*a + C*b)*c^4*
d + 40*(C*a + B*b)*c^3*d^2 - 60*(B*a + A*b)*c^2*d^3 + (D*b*d^5*n^
4 + 10*D*b*d^5*n^3 + 35*D*b*d^5*n^2 + 50*D*b*d^5*n + 24*D*b*d^5)*
x^5 + (30*(D*a + C*b)*d^5 + (D*b*c*d^4 + (D*a + C*b)*d^5)*n^4 + (
6*D*b*c*d^4 + 11*(D*a + C*b)*d^5)*n^3 + (11*D*b*c*d^4 + 41*(D*a +
 C*b)*d^5)*n^2 + (6*D*b*c*d^4 + 61*(D*a + C*b)*d^5)*n)*x^4 + (14*
A*a*c*d^4 - (B*a + A*b)*c^2*d^3)*n^3 + (40*(C*a + B*b)*d^5 + ((D*
a + C*b)*c*d^4 + (C*a + B*b)*d^5)*n^4 - 4*(D*b*c^2*d^3 - 2*(D*a +
 C*b)*c*d^4 - 3*(C*a + B*b)*d^5)*n^3 - (12*D*b*c^2*d^3 - 17*(D*a
+ C*b)*c*d^4 - 49*(C*a + B*b)*d^5)*n^2 - 2*(4*D*b*c^2*d^3 - 5*(D*
a + C*b)*c*d^4 - 39*(C*a + B*b)*d^5)*n)*x^3 + (71*A*a*c*d^4 + 2*(
C*a + B*b)*c^3*d^2 - 12*(B*a + A*b)*c^2*d^3)*n^2 + (60*(B*a + A*b
)*d^5 + ((C*a + B*b)*c*d^4 + (B*a + A*b)*d^5)*n^4 - (3*(D*a + C*b
)*c^2*d^3 - 10*(C*a + B*b)*c*d^4 - 13*(B*a + A*b)*d^5)*n^3 + (12*
D*b*c^3*d^2 - 18*(D*a + C*b)*c^2*d^3 + 29*(C*a + B*b)*c*d^4 + 59*
(B*a + A*b)*d^5)*n^2 + (12*D*b*c^3*d^2 - 15*(D*a + C*b)*c^2*d^3 +
 20*(C*a + B*b)*c*d^4 + 107*(B*a + A*b)*d^5)*n)*x^2 + (154*A*a*c*
d^4 - 6*(D*a + C*b)*c^4*d + 18*(C*a + B*b)*c^3*d^2 - 47*(B*a + A*
b)*c^2*d^3)*n + (120*A*a*d^5 + (A*a*d^5 + (B*a + A*b)*c*d^4)*n^4
+ 2*(7*A*a*d^5 - (C*a + B*b)*c^2*d^3 + 6*(B*a + A*b)*c*d^4)*n^3 +
 (71*A*a*d^5 + 6*(D*a + C*b)*c^3*d^2 - 18*(C*a + B*b)*c^2*d^3 + 4
7*(B*a + A*b)*c*d^4)*n^2 - 2*(12*D*b*c^4*d - 77*A*a*d^5 - 15*(D*a
 + C*b)*c^3*d^2 + 20*(C*a + B*b)*c^2*d^3 - 30*(B*a + A*b)*c*d^4)*
n)*x)*(d*x + c)^n/(d^5*n^5 + 15*d^5*n^4 + 85*d^5*n^3 + 225*d^5*n^
2 + 274*d^5*n + 120*d^5)
```

Sympy [A] time = 107.572, size = 13311, normalized size = 58.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Piecewise((c**n*(A*a*x + A*b*x**2/2 + B*a*x**2/2 + B*b*x**3/3 + C
*a*x**3/3 + C*b*x**4/4 + D*a*x**4/4 + D*b*x**5/5), Eq(d, 0)), (-3
*A*a*c*d**4/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 +
48*c**2*d**8*x**3 + 12*c*d**9*x**4) - A*b*c**2*d**3/(12*c**5*d**5
 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*
d**9*x**4) - 4*A*b*c*d**4*x/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c
**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) - B*a*c**2*d*
*3/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d
**8*x**3 + 12*c*d**9*x**4) - 4*B*a*c*d**4*x/(12*c**5*d**5 + 48*c*
*4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**
4) - B*b*c**3*d**2/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*
x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) - 4*B*b*c**2*d**3*x/(1
2*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x
**3 + 12*c*d**9*x**4) - 6*B*b*c*d**4*x**2/(12*c**5*d**5 + 48*c**4
*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4)
 - C*a*c**3*d**2/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x*
*2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) - 4*C*a*c**2*d**3*x/(12*
c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**
```

```
3 + 12*c*d**9*x**4) - 6*C*a*c*d**4*x**2/(12*c**5*d**5 + 48*c**4*d
**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) +
 3*C*b*d**5*x**4/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x*
*2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) + 3*D*a*d**5*x**4/(12*c*
*5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3
+ 12*c*d**9*x**4) + 12*D*b*c**5*log(c/d + x)/(12*c**5*d**5 + 48*c
**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x*
*4) + 13*D*b*c**5/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x
**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) + 48*D*b*c**4*d*x*log(c
/d + x)/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c
**2*d**8*x**3 + 12*c*d**9*x**4) + 40*D*b*c**4*d*x/(12*c**5*d**5 +
 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d*
*9*x**4) + 72*D*b*c**3*d**2*x**2*log(c/d + x)/(12*c**5*d**5 + 48*
c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x
**4) + 36*D*b*c**3*d**2*x**2/(12*c**5*d**5 + 48*c**4*d**6*x + 72*
c**3*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) + 48*D*b*c**
2*d**3*x**3*log(c/d + x)/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3
*d**7*x**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) + 12*D*b*c*d**4*
x**4*log(c/d + x)/(12*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x
**2 + 48*c**2*d**8*x**3 + 12*c*d**9*x**4) - 12*D*b*c*d**4*x**4/(1
2*c**5*d**5 + 48*c**4*d**6*x + 72*c**3*d**7*x**2 + 48*c**2*d**8*x
**3 + 12*c*d**9*x**4), Eq(n, -5)), (-2*A*a*d**4/(6*c**3*d**5 + 18
*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) - A*b*c*d**3/(6*c**3
*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) - 3*A*b*d*
*4*x/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3
) - B*a*c*d**3/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6
*d**8*x**3) - 3*B*a*d**4*x/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d
**7*x**2 + 6*d**8*x**3) - 2*B*b*c**2*d**2/(6*c**3*d**5 + 18*c**2*
d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) - 6*B*b*c*d**3*x/(6*c**3*d
**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) - 6*B*b*d**4
*x**2/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**
3) - 2*C*a*c**2*d**2/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x*
*2 + 6*d**8*x**3) - 6*C*a*c*d**3*x/(6*c**3*d**5 + 18*c**2*d**6*x
+ 18*c*d**7*x**2 + 6*d**8*x**3) - 6*C*a*d**4*x**2/(6*c**3*d**5 +
18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) + 6*C*b*c**3*d*log
(c/d + x)/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8
*x**3) + 11*C*b*c**3*d/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*
x**2 + 6*d**8*x**3) + 18*C*b*c**2*d**2*x*log(c/d + x)/(6*c**3*d**
5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) + 27*C*b*c**2*
d**2*x/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x*
*3) + 18*C*b*c*d**3*x**2*log(c/d + x)/(6*c**3*d**5 + 18*c**2*d**6
*x + 18*c*d**7*x**2 + 6*d**8*x**3) + 18*C*b*c*d**3*x**2/(6*c**3*d
**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) + 6*C*b*d**4
*x**3*log(c/d + x)/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2
 + 6*d**8*x**3) + 6*D*a*c**3*d*log(c/d + x)/(6*c**3*d**5 + 18*c**
2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) + 11*D*a*c**3*d/(6*c**3*
d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) + 18*D*a*c*
*2*d**2*x*log(c/d + x)/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*
x**2 + 6*d**8*x**3) + 27*D*a*c**2*d**2*x/(6*c**3*d**5 + 18*c**2*d
**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) + 18*D*a*c*d**3*x**2*log(c/
d + x)/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x*
*3) + 18*D*a*c*d**3*x**2/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**
7*x**2 + 6*d**8*x**3) + 6*D*a*d**4*x**3*log(c/d + x)/(6*c**3*d**5
 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) - 24*D*b*c**4*l
og(c/d + x)/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d*
*8*x**3) - 44*D*b*c**4/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*
```

```
x**2 + 6*d**8*x**3) - 72*D*b*c**3*d*x*log(c/d + x)/(6*c**3*d**5 +
 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) - 108*D*b*c**3*d*
x/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) -
 72*D*b*c**2*d**2*x**2*log(c/d + x)/(6*c**3*d**5 + 18*c**2*d**6*x
 + 18*c*d**7*x**2 + 6*d**8*x**3) - 72*D*b*c**2*d**2*x**2/(6*c**3*
d**5 + 18*c**2*d**6*x + 18*c*d**7*x**2 + 6*d**8*x**3) - 24*D*b*c*
d**3*x**3*log(c/d + x)/(6*c**3*d**5 + 18*c**2*d**6*x + 18*c*d**7*
x**2 + 6*d**8*x**3) + 6*D*b*d**4*x**4/(6*c**3*d**5 + 18*c**2*d**6
*x + 18*c*d**7*x**2 + 6*d**8*x**3), Eq(n, -4)), (-A*a*c*d**4/(2*c
**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + A*b*d**5*x**2/(2*c**3
*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + B*a*d**5*x**2/(2*c**3*d*
*5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + 2*B*b*c**3*d**2*log(c/d + x
)/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + B*b*c**3*d**2/(
2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + 4*B*b*c**2*d**3*x*
log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + 2*B*
b*c*d**4*x**2*log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**
7*x**2) - 2*B*b*c*d**4*x**2/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d*
*7*x**2) + 2*C*a*c**3*d**2*log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**
6*x + 2*c*d**7*x**2) + C*a*c**3*d**2/(2*c**3*d**5 + 4*c**2*d**6*x
 + 2*c*d**7*x**2) + 4*C*a*c**2*d**3*x*log(c/d + x)/(2*c**3*d**5 +
 4*c**2*d**6*x + 2*c*d**7*x**2) + 2*C*a*c*d**4*x**2*log(c/d + x)/
(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) - 2*C*a*c*d**4*x**2
/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) - 6*C*b*c**4*d*log
(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) - 3*C*b*c
**4*d/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) - 12*C*b*c**3
*d**2*x*log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2
) - 6*C*b*c**2*d**3*x**2*log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*
x + 2*c*d**7*x**2) + 6*C*b*c**2*d**3*x**2/(2*c**3*d**5 + 4*c**2*d
**6*x + 2*c*d**7*x**2) + 2*C*b*c*d**4*x**3/(2*c**3*d**5 + 4*c**2*
d**6*x + 2*c*d**7*x**2) - 6*D*a*c**4*d*log(c/d + x)/(2*c**3*d**5
+ 4*c**2*d**6*x + 2*c*d**7*x**2) - 3*D*a*c**4*d/(2*c**3*d**5 + 4*
c**2*d**6*x + 2*c*d**7*x**2) - 12*D*a*c**3*d**2*x*log(c/d + x)/(2
*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) - 6*D*a*c**2*d**3*x**
2*log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + 6*
D*a*c**2*d**3*x**2/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2)
+ 2*D*a*c*d**4*x**3/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2)
 + 12*D*b*c**5*log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d*
*7*x**2) + 6*D*b*c**5/(2*c**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**
2) + 24*D*b*c**4*d*x*log(c/d + x)/(2*c**3*d**5 + 4*c**2*d**6*x +
2*c*d**7*x**2) + 12*D*b*c**3*d**2*x**2*log(c/d + x)/(2*c**3*d**5
+ 4*c**2*d**6*x + 2*c*d**7*x**2) - 12*D*b*c**3*d**2*x**2/(2*c**3*
d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) - 4*D*b*c**2*d**3*x**3/(2*c
**3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2) + D*b*c*d**4*x**4/(2*c*
*3*d**5 + 4*c**2*d**6*x + 2*c*d**7*x**2), Eq(n, -3)), (-6*A*a*d**
4/(6*c*d**5 + 6*d**6*x) + 6*A*b*c*d**3*log(c/d + x)/(6*c*d**5 + 6
*d**6*x) + 6*A*b*c*d**3/(6*c*d**5 + 6*d**6*x) + 6*A*b*d**4*x*log(
c/d + x)/(6*c*d**5 + 6*d**6*x) + 6*B*a*c*d**3*log(c/d + x)/(6*c*d
**5 + 6*d**6*x) + 6*B*a*c*d**3/(6*c*d**5 + 6*d**6*x) + 6*B*a*d**4
*x*log(c/d + x)/(6*c*d**5 + 6*d**6*x) - 12*B*b*c**2*d**2*log(c/d
+ x)/(6*c*d**5 + 6*d**6*x) - 12*B*b*c**2*d**2/(6*c*d**5 + 6*d**6*
x) - 12*B*b*c*d**3*x*log(c/d + x)/(6*c*d**5 + 6*d**6*x) + 6*B*b*d
**4*x**2/(6*c*d**5 + 6*d**6*x) - 12*C*a*c**2*d**2*log(c/d + x)/(6
*c*d**5 + 6*d**6*x) - 12*C*a*c**2*d**2/(6*c*d**5 + 6*d**6*x) - 12
*C*a*c*d**3*x*log(c/d + x)/(6*c*d**5 + 6*d**6*x) + 6*C*a*d**4*x**
2/(6*c*d**5 + 6*d**6*x) + 18*C*b*c**3*d*log(c/d + x)/(6*c*d**5 +
6*d**6*x) + 18*C*b*c**3*d/(6*c*d**5 + 6*d**6*x) + 18*C*b*c**2*d**
```

```
2*x*log(c/d + x)/(6*c*d**5 + 6*d**6*x) - 9*C*b*c*d**3*x**2/(6*c*d
**5 + 6*d**6*x) + 3*C*b*d**4*x**3/(6*c*d**5 + 6*d**6*x) + 18*D*a*
c**3*d*log(c/d + x)/(6*c*d**5 + 6*d**6*x) + 18*D*a*c**3*d/(6*c*d*
*5 + 6*d**6*x) + 18*D*a*c**2*d**2*x*log(c/d + x)/(6*c*d**5 + 6*d*
*6*x) - 9*D*a*c*d**3*x**2/(6*c*d**5 + 6*d**6*x) + 3*D*a*d**4*x**3
/(6*c*d**5 + 6*d**6*x) - 24*D*b*c**4*log(c/d + x)/(6*c*d**5 + 6*d
**6*x) - 24*D*b*c**4/(6*c*d**5 + 6*d**6*x) - 24*D*b*c**3*d*x*log(
c/d + x)/(6*c*d**5 + 6*d**6*x) + 12*D*b*c**2*d**2*x**2/(6*c*d**5
+ 6*d**6*x) - 4*D*b*c*d**3*x**3/(6*c*d**5 + 6*d**6*x) + 2*D*b*d**
4*x**4/(6*c*d**5 + 6*d**6*x), Eq(n, -2)), (A*a*log(c/d + x)/d - A
*b*c*log(c/d + x)/d**2 + A*b*x/d - B*a*c*log(c/d + x)/d**2 + B*a*
x/d + B*b*c**2*log(c/d + x)/d**3 - B*b*c*x/d**2 + B*b*x**2/(2*d)
+ C*a*c**2*log(c/d + x)/d**3 - C*a*c*x/d**2 + C*a*x**2/(2*d) - C*
b*c**3*log(c/d + x)/d**4 + C*b*c**2*x/d**3 - C*b*c*x**2/(2*d**2)
+ C*b*x**3/(3*d) - D*a*c**3*log(c/d + x)/d**4 + D*a*c**2*x/d**3 -
 D*a*c*x**2/(2*d**2) + D*a*x**3/(3*d) + D*b*c**4*log(c/d + x)/d**
5 - D*b*c**3*x/d**4 + D*b*c**2*x**2/(2*d**3) - D*b*c*x**3/(3*d**2
) + D*b*x**4/(4*d), Eq(n, -1)), (A*a*c*d**4*n**4*(c + d*x)**n/(d*
*5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*
n + 120*d**5) + 14*A*a*c*d**4*n**3*(c + d*x)**n/(d**5*n**5 + 15*d
**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5)
+ 71*A*a*c*d**4*n**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*
d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 154*A*a*c*d*
*4*n*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*
d**5*n**2 + 274*d**5*n + 120*d**5) + 120*A*a*c*d**4*(c + d*x)**n/
(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d*
*5*n + 120*d**5) + A*a*d**5*n**4*x*(c + d*x)**n/(d**5*n**5 + 15*d
**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5)
+ 14*A*a*d**5*n**3*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*
d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 71*A*a*d**5*
n**2*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 22
5*d**5*n**2 + 274*d**5*n + 120*d**5) + 154*A*a*d**5*n*x*(c + d*x)
**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 27
4*d**5*n + 120*d**5) + 120*A*a*d**5*x*(c + d*x)**n/(d**5*n**5 + 1
5*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**
5) - A*b*c**2*d**3*n**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 +
85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 12*A*b*c*
*2*d**3*n**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**
3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 47*A*b*c**2*d**3*n*(
c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n
**2 + 274*d**5*n + 120*d**5) - 60*A*b*c**2*d**3*(c + d*x)**n/(d**
5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n
 + 120*d**5) + A*b*c*d**4*n**4*x*(c + d*x)**n/(d**5*n**5 + 15*d**
5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) +
12*A*b*c*d**4*n**3*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*
d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 47*A*b*c*d**
4*n**2*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 +
225*d**5*n**2 + 274*d**5*n + 120*d**5) + 60*A*b*c*d**4*n*x*(c + d
*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 +
 274*d**5*n + 120*d**5) + A*b*d**5*n**4*x**2*(c + d*x)**n/(d**5*n
**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n +
120*d**5) + 13*A*b*d**5*n**3*x**2*(c + d*x)**n/(d**5*n**5 + 15*d*
*5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) +
 59*A*b*d**5*n**2*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 8
5*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 107*A*b*d*
*5*n*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 +
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 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 60*A*b*d**5*x**2*(c + d
*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 +
 274*d**5*n + 120*d**5) - B*a*c**2*d**3*n**3*(c + d*x)**n/(d**5*n
**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n +
120*d**5) - 12*B*a*c**2*d**3*n**2*(c + d*x)**n/(d**5*n**5 + 15*d*
*5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) -
 47*B*a*c**2*d**3*n*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d
**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 60*B*a*c**2*d
**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d
**5*n**2 + 274*d**5*n + 120*d**5) + B*a*c*d**4*n**4*x*(c + d*x)**
n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*
d**5*n + 120*d**5) + 12*B*a*c*d**4*n**3*x*(c + d*x)**n/(d**5*n**5
 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120
*d**5) + 47*B*a*c*d**4*n**2*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n
**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 60*
B*a*c*d**4*n*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n
**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + B*a*d**5*n**4*x**2
*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5
*n**2 + 274*d**5*n + 120*d**5) + 13*B*a*d**5*n**3*x**2*(c + d*x)*
*n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274
*d**5*n + 120*d**5) + 59*B*a*d**5*n**2*x**2*(c + d*x)**n/(d**5*n*
*5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 1
20*d**5) + 107*B*a*d**5*n*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*
n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 60
*B*a*d**5*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n
**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 2*B*b*c**3*d**2*n*
*2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d*
*5*n**2 + 274*d**5*n + 120*d**5) + 18*B*b*c**3*d**2*n*(c + d*x)**
n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*
d**5*n + 120*d**5) + 40*B*b*c**3*d**2*(c + d*x)**n/(d**5*n**5 + 1
5*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**
5) - 2*B*b*c**2*d**3*n**3*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**
4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 18*B*
b*c**2*d**3*n**2*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d*
*5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 40*B*b*c**2*d*
*3*n*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 22
5*d**5*n**2 + 274*d**5*n + 120*d**5) + B*b*c*d**4*n**4*x**2*(c +
d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2
+ 274*d**5*n + 120*d**5) + 10*B*b*c*d**4*n**3*x**2*(c + d*x)**n/(
d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**
5*n + 120*d**5) + 29*B*b*c*d**4*n**2*x**2*(c + d*x)**n/(d**5*n**5
 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120
*d**5) + 20*B*b*c*d**4*n*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n
**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + B*b
*d**5*n**4*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*
n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 12*B*b*d**5*n**3*
x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*
d**5*n**2 + 274*d**5*n + 120*d**5) + 49*B*b*d**5*n**2*x**3*(c + d
*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 +
 274*d**5*n + 120*d**5) + 78*B*b*d**5*n*x**3*(c + d*x)**n/(d**5*n
**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n +
120*d**5) + 40*B*b*d**5*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n*
*4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 2*C*
a*c**3*d**2*n**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5
*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 18*C*a*c**3*d**2
*n*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d*
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*5*n**2 + 274*d**5*n + 120*d**5) + 40*C*a*c**3*d**2*(c + d*x)**n/
(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d*
*5*n + 120*d**5) - 2*C*a*c**2*d**3*n**3*x*(c + d*x)**n/(d**5*n**5
 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120
*d**5) - 18*C*a*c**2*d**3*n**2*x*(c + d*x)**n/(d**5*n**5 + 15*d**
5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) -
40*C*a*c**2*d**3*n*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*
d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + C*a*c*d**4*n
**4*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 +
225*d**5*n**2 + 274*d**5*n + 120*d**5) + 10*C*a*c*d**4*n**3*x**2*
(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*
n**2 + 274*d**5*n + 120*d**5) + 29*C*a*c*d**4*n**2*x**2*(c + d*x)
**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 27
4*d**5*n + 120*d**5) + 20*C*a*c*d**4*n*x**2*(c + d*x)**n/(d**5*n*
*5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 1
20*d**5) + C*a*d**5*n**4*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n
**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 12*
C*a*d**5*n**3*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d*
*5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 49*C*a*d**5*n*
*2*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 2
25*d**5*n**2 + 274*d**5*n + 120*d**5) + 78*C*a*d**5*n*x**3*(c + d
*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 +
 274*d**5*n + 120*d**5) + 40*C*a*d**5*x**3*(c + d*x)**n/(d**5*n**
5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 12
0*d**5) - 6*C*b*c**4*d*n*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 +
 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 30*C*b*c
**4*d*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225
*d**5*n**2 + 274*d**5*n + 120*d**5) + 6*C*b*c**3*d**2*n**2*x*(c +
 d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2
 + 274*d**5*n + 120*d**5) + 30*C*b*c**3*d**2*n*x*(c + d*x)**n/(d*
*5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*
n + 120*d**5) - 3*C*b*c**2*d**3*n**3*x**2*(c + d*x)**n/(d**5*n**5
 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120
*d**5) - 18*C*b*c**2*d**3*n**2*x**2*(c + d*x)**n/(d**5*n**5 + 15*
d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5)
 - 15*C*b*c**2*d**3*n*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4
 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + C*b*c*
d**4*n**4*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n
**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 8*C*b*c*d**4*n**3*
x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*
d**5*n**2 + 274*d**5*n + 120*d**5) + 17*C*b*c*d**4*n**2*x**3*(c +
 d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2
 + 274*d**5*n + 120*d**5) + 10*C*b*c*d**4*n*x**3*(c + d*x)**n/(d*
*5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*
n + 120*d**5) + C*b*d**5*n**4*x**4*(c + d*x)**n/(d**5*n**5 + 15*d
**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5)
+ 11*C*b*d**5*n**3*x**4*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 +
85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 41*C*b*d*
*5*n**2*x**4*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**
3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 61*C*b*d**5*n*x**4*(
c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n
**2 + 274*d**5*n + 120*d**5) + 30*C*b*d**5*x**4*(c + d*x)**n/(d**
5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n
 + 120*d**5) - 6*D*a*c**4*d*n*(c + d*x)**n/(d**5*n**5 + 15*d**5*n
**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 30*
D*a*c**4*d*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3
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+ 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 6*D*a*c**3*d**2*n**2*x
*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5
*n**2 + 274*d**5*n + 120*d**5) + 30*D*a*c**3*d**2*n*x*(c + d*x)**
n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*
d**5*n + 120*d**5) - 3*D*a*c**2*d**3*n**3*x**2*(c + d*x)**n/(d**5
*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n
+ 120*d**5) - 18*D*a*c**2*d**3*n**2*x**2*(c + d*x)**n/(d**5*n**5
+ 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*
d**5) - 15*D*a*c**2*d**3*n*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5
*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + D
*a*c*d**4*n**4*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d
**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 8*D*a*c*d**4*
n**3*x**3*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 +
 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 17*D*a*c*d**4*n**2*x**3
*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5
*n**2 + 274*d**5*n + 120*d**5) + 10*D*a*c*d**4*n*x**3*(c + d*x)**
n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*
d**5*n + 120*d**5) + D*a*d**5*n**4*x**4*(c + d*x)**n/(d**5*n**5 +
 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d
**5) + 11*D*a*d**5*n**3*x**4*(c + d*x)**n/(d**5*n**5 + 15*d**5*n*
*4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 41*D
*a*d**5*n**2*x**4*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**
5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 61*D*a*d**5*n*x
**4*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d
**5*n**2 + 274*d**5*n + 120*d**5) + 30*D*a*d**5*x**4*(c + d*x)**n
/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d
**5*n + 120*d**5) + 24*D*b*c**5*(c + d*x)**n/(d**5*n**5 + 15*d**5
*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) - 2
4*D*b*c**4*d*n*x*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5
*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 12*D*b*c**3*d**2
*n**2*x**2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3
+ 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 12*D*b*c**3*d**2*n*x**
2*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**
5*n**2 + 274*d**5*n + 120*d**5) - 4*D*b*c**2*d**3*n**3*x**3*(c +
d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2
+ 274*d**5*n + 120*d**5) - 12*D*b*c**2*d**3*n**2*x**3*(c + d*x)**
n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*
d**5*n + 120*d**5) - 8*D*b*c**2*d**3*n*x**3*(c + d*x)**n/(d**5*n*
*5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 1
20*d**5) + D*b*c*d**4*n**4*x**4*(c + d*x)**n/(d**5*n**5 + 15*d**5
*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 6
*D*b*c*d**4*n**3*x**4*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85
*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 11*D*b*c*d*
*4*n**2*x**4*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**
3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 6*D*b*c*d**4*n*x**4*
(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*
n**2 + 274*d**5*n + 120*d**5) + D*b*d**5*n**4*x**5*(c + d*x)**n/(
d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**
5*n + 120*d**5) + 10*D*b*d**5*n**3*x**5*(c + d*x)**n/(d**5*n**5 +
 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d
**5) + 35*D*b*d**5*n**2*x**5*(c + d*x)**n/(d**5*n**5 + 15*d**5*n*
*4 + 85*d**5*n**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 50*D
*b*d**5*n*x**5*(c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n
**3 + 225*d**5*n**2 + 274*d**5*n + 120*d**5) + 24*D*b*d**5*x**5*(
c + d*x)**n/(d**5*n**5 + 15*d**5*n**4 + 85*d**5*n**3 + 225*d**5*n
**2 + 274*d**5*n + 120*d**5), True))
```

GIAC/XCAS [A] time = 0.209286, size = 1, normalized size = 0.

$$Done$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)*(d*x + c)^n,x, algorithm="giac")
```

```
[Out] Done
```

3.28 $\int (c+dx)^n \left(A+Bx+Cx^2+Dx^3\right) \, dx$

Optimal. Leaf size=126

$$\frac{(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^4(n+1)}-\frac{(c+dx)^{n+2}\left(-Bd^2-3c^2D+2cCd\right)}{d^4(n+2)}+\frac{(Cd-3cD)(c+dx)^{n+3}}{d^4(n+3)}+\frac{D(c+dx)^{n+4}}{d^4(n+4)}$$

```
[Out] ((c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1 + n))/(d^4*(1 +
 n)) - ((2*c*C*d - B*d^2 - 3*c^2*D)*(c + d*x)^(2 + n))/(d^4*(2 +
n)) + ((C*d - 3*c*D)*(c + d*x)^(3 + n))/(d^4*(3 + n)) + (D*(c + d
*x)^(4 + n))/(d^4*(4 + n))
```

Rubi [A] time = 0.1585, antiderivative size = 126, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{(c+dx)^{n+1}\left(Ad^3-Bcd^2+c^3(-D)+c^2Cd\right)}{d^4(n+1)}-\frac{(c+dx)^{n+2}\left(-Bd^2-3c^2D+2cCd\right)}{d^4(n+2)}+\frac{(Cd-3cD)(c+dx)^{n+3}}{d^4(n+3)}+\frac{D(c+dx)^{n+4}}{d^4(n+4)}$$

Antiderivative was successfully verified.

```
[In]  Int[(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((c^2*C*d - B*c*d^2 + A*d^3 - c^3*D)*(c + d*x)^(1 + n))/(d^4*(1 +
 n)) - ((2*c*C*d - B*d^2 - 3*c^2*D)*(c + d*x)^(2 + n))/(d^4*(2 +
n)) + ((C*d - 3*c*D)*(c + d*x)^(3 + n))/(d^4*(3 + n)) + (D*(c + d
*x)^(4 + n))/(d^4*(4 + n))
```

Rubi in Sympy [A] time = 36.2376, size = 112, normalized size = 0.89

$$\frac{D\left(c+dx\right)^{n+4}}{d^4\left(n+4\right)}+\frac{\left(c+dx\right)^{n+1}\left(Ad^3-Bcd^2+Cc^2d-Dc^3\right)}{d^4\left(n+1\right)}+\frac{\left(c+dx\right)^{n+2}\left(Bd^2-2Ccd+3Dc^2\right)}{d^4\left(n+2\right)}+\frac{\left(c+dx\right)^{n+3}\left(Cd-3Dc\right)}{d^4\left(n+3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] D*(c + d*x)**(n + 4)/(d**4*(n + 4)) + (c + d*x)**(n + 1)*(A*d**3
- B*c*d**2 + C*c**2*d - D*c**3)/(d**4*(n + 1)) + (c + d*x)**(n +
```

```
2)*(B*d**2 - 2*C*c*d + 3*D*c**2)/(d**4*(n + 2)) + (c + d*x)**(n +
 3)*(C*d - 3*D*c)/(d**4*(n + 3))
```

Mathematica [A] time = 0.211243, size = 148, normalized size = 1.17

$$\frac{(c+dx)^{n+1}\left(d^3\left(A\left(n^3+9n^2+26n+24\right)+(n+1)x\left(B\left(n^2+7n+12\right)+(n+2)x(C(n+4)+D(n+3)x)\right)\right)-cd^2\left(B\left(n^2+7n+\right.\right.\right.}{d^4(n+1)(n+2)(n+3)(n+4)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((c + d*x)^(1 + n)*(-6*c^3*D + 2*c^2*d*(C*(4 + n) + 3*D*(1 + n)*x
) - c*d^2*(B*(12 + 7*n + n^2) + (1 + n)*x*(2*C*(4 + n) + 3*D*(2 +
 n)*x)) + d^3*(A*(24 + 26*n + 9*n^2 + n^3) + (1 + n)*x*(B*(12 + 7
*n + n^2) + (2 + n)*x*(C*(4 + n) + D*(3 + n)*x)))))/(d^4*(1 + n)*
(2 + n)*(3 + n)*(4 + n))
```

Maple [B] time = 0.01, size = 308, normalized size = 2.4

$$\frac{(dx+c)^{1+n}\left(Dd^3n^3x^3+Cd^3n^3x^2+6\,Dd^3n^2x^3+Bd^3n^3x+7\,Cd^3n^2x^2-3\,Dcd^2n^2x^2+11\,Dd^3nx^3+Ad^3n^3+8\,Bd^3n^2x-2\,Cc\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^n*(D*x^3+C*x^2+B*x+A),x)
```

```
[Out] (d*x+c)^(1+n)*(D*d^3*n^3*x^3+C*d^3*n^3*x^2+6*D*d^3*n^2*x^3+B*d^3*
n^3*x+7*C*d^3*n^2*x^2-3*D*c*d^2*n^2*x^2+11*D*d^3*n*x^3+A*d^3*n^3+
8*B*d^3*n^2*x-2*C*c*d^2*n^2*x+14*C*d^3*n*x^2-9*D*c*d^2*n*x^2+6*D*
d^3*x^3+9*A*d^3*n^2-B*c*d^2*n^2+19*B*d^3*n*x-10*C*c*d^2*n*x+8*C*d
^3*x^2+6*D*c^2*d*n*x-6*D*c*d^2*x^2+26*A*d^3*n-7*B*c*d^2*n+12*B*d^
3*x+2*C*c^2*d*n-8*C*c*d^2*x+6*D*c^2*d*x+24*A*d^3-12*B*c*d^2+8*C*c
^2*d-6*D*c^3)/d^4/(n^4+10*n^3+35*n^2+50*n+24)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.229822, size = 532, normalized size = 4.22

$$\frac{\left(Acd^3n^3 - 6\,Dc^4 + 8\,Cc^3d - 12\,Bc^2d^2 + 24\,Acd^3 + \left(Dd^4n^3 + 6\,Dd^4n^2 + 11\,Dd^4n + 6\,Dd^4\right)x^4 + \left(8\,Cd^4 + \left(Dcd^3 + Cd^4\right)n^3 + (3\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n,x, algorithm="fricas")
```

```
[Out] (A*c*d^3*n^3 - 6*D*c^4 + 8*C*c^3*d - 12*B*c^2*d^2 + 24*A*c*d^3 +
(D*d^4*n^3 + 6*D*d^4*n^2 + 11*D*d^4*n + 6*D*d^4)*x^4 + (8*C*d^4 +
 (D*c*d^3 + C*d^4)*n^3 + (3*D*c*d^3 + 7*C*d^4)*n^2 + 2*(D*c*d^3 +
 7*C*d^4)*n)*x^3 - (B*c^2*d^2 - 9*A*c*d^3)*n^2 + (12*B*d^4 + (C*c
*d^3 + B*d^4)*n^3 - (3*D*c^2*d^2 - 5*C*c*d^3 - 8*B*d^4)*n^2 - (3*
D*c^2*d^2 - 4*C*c*d^3 - 19*B*d^4)*n)*x^2 + (2*C*c^3*d - 7*B*c^2*d
^2 + 26*A*c*d^3)*n + (24*A*d^4 + (B*c*d^3 + A*d^4)*n^3 - (2*C*c^2
*d^2 - 7*B*c*d^3 - 9*A*d^4)*n^2 + 2*(3*D*c^3*d - 4*C*c^2*d^2 + 6*
B*c*d^3 + 13*A*d^4)*n)*x)*(d*x + c)^n/(d^4*n^4 + 10*d^4*n^3 + 35*
d^4*n^2 + 50*d^4*n + 24*d^4)
```

Sympy [A] time = 15.6643, size = 3822, normalized size = 30.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Piecewise((c**n*(A*x + B*x**2/2 + C*x**3/3 + D*x**4/4), Eq(d, 0))
, (-2*A*d**3/(6*c**3*d**4 + 18*c**2*d**5*x + 18*c*d**6*x**2 + 6*d
**7*x**3) - B*c*d**2/(6*c**3*d**4 + 18*c**2*d**5*x + 18*c*d**6*x*
*2 + 6*d**7*x**3) - 3*B*d**3*x/(6*c**3*d**4 + 18*c**2*d**5*x + 18
*c*d**6*x**2 + 6*d**7*x**3) - 2*C*c**2*d/(6*c**3*d**4 + 18*c**2*d
**5*x + 18*c*d**6*x**2 + 6*d**7*x**3) - 6*C*c*d**2*x/(6*c**3*d**4
 + 18*c**2*d**5*x + 18*c*d**6*x**2 + 6*d**7*x**3) - 6*C*d**3*x**2
/(6*c**3*d**4 + 18*c**2*d**5*x + 18*c*d**6*x**2 + 6*d**7*x**3) +
6*D*c**3*log(c/d + x)/(6*c**3*d**4 + 18*c**2*d**5*x + 18*c*d**6*x
**2 + 6*d**7*x**3) + 11*D*c**3/(6*c**3*d**4 + 18*c**2*d**5*x + 18
*c*d**6*x**2 + 6*d**7*x**3) + 18*D*c**2*d*x*log(c/d + x)/(6*c**3*
d**4 + 18*c**2*d**5*x + 18*c*d**6*x**2 + 6*d**7*x**3) + 27*D*c**2
*d*x/(6*c**3*d**4 + 18*c**2*d**5*x + 18*c*d**6*x**2 + 6*d**7*x**3
) + 18*D*c*d**2*x**2*log(c/d + x)/(6*c**3*d**4 + 18*c**2*d**5*x +
 18*c*d**6*x**2 + 6*d**7*x**3) + 18*D*c*d**2*x**2/(6*c**3*d**4 +
18*c**2*d**5*x + 18*c*d**6*x**2 + 6*d**7*x**3) + 6*D*d**3*x**3*lo
g(c/d + x)/(6*c**3*d**4 + 18*c**2*d**5*x + 18*c*d**6*x**2 + 6*d**
```

```
7*x**3), Eq(n, -4)), (-A*c*d**3/(2*c**3*d**4 + 4*c**2*d**5*x + 2*
c*d**6*x**2) + B*d**4*x**2/(2*c**3*d**4 + 4*c**2*d**5*x + 2*c*d**
6*x**2) + 2*C*c**3*d*log(c/d + x)/(2*c**3*d**4 + 4*c**2*d**5*x +
2*c*d**6*x**2) + C*c**3*d/(2*c**3*d**4 + 4*c**2*d**5*x + 2*c*d**6
*x**2) + 4*C*c**2*d**2*x*log(c/d + x)/(2*c**3*d**4 + 4*c**2*d**5*
x + 2*c*d**6*x**2) + 2*C*c*d**3*x**2*log(c/d + x)/(2*c**3*d**4 +
4*c**2*d**5*x + 2*c*d**6*x**2) - 2*C*c*d**3*x**2/(2*c**3*d**4 + 4
*c**2*d**5*x + 2*c*d**6*x**2) - 6*D*c**4*log(c/d + x)/(2*c**3*d**
4 + 4*c**2*d**5*x + 2*c*d**6*x**2) - 3*D*c**4/(2*c**3*d**4 + 4*c*
*2*d**5*x + 2*c*d**6*x**2) - 12*D*c**3*d*x*log(c/d + x)/(2*c**3*d
**4 + 4*c**2*d**5*x + 2*c*d**6*x**2) - 6*D*c**2*d**2*x**2*log(c/d
 + x)/(2*c**3*d**4 + 4*c**2*d**5*x + 2*c*d**6*x**2) + 6*D*c**2*d*
*2*x**2/(2*c**3*d**4 + 4*c**2*d**5*x + 2*c*d**6*x**2) + 2*D*c*d**
3*x**3/(2*c**3*d**4 + 4*c**2*d**5*x + 2*c*d**6*x**2), Eq(n, -3)),
 (-2*A*d**3/(2*c*d**4 + 2*d**5*x) + 2*B*c*d**2*log(c/d + x)/(2*c*
d**4 + 2*d**5*x) + 2*B*c*d**2/(2*c*d**4 + 2*d**5*x) + 2*B*d**3*x*
log(c/d + x)/(2*c*d**4 + 2*d**5*x) - 4*C*c**2*d*log(c/d + x)/(2*c
*d**4 + 2*d**5*x) - 4*C*c**2*d/(2*c*d**4 + 2*d**5*x) - 4*C*c*d**2
*x*log(c/d + x)/(2*c*d**4 + 2*d**5*x) + 2*C*d**3*x**2/(2*c*d**4 +
 2*d**5*x) + 6*D*c**3*log(c/d + x)/(2*c*d**4 + 2*d**5*x) + 6*D*c*
*3/(2*c*d**4 + 2*d**5*x) + 6*D*c**2*d*x*log(c/d + x)/(2*c*d**4 +
2*d**5*x) - 3*D*c*d**2*x**2/(2*c*d**4 + 2*d**5*x) + D*d**3*x**3/(
2*c*d**4 + 2*d**5*x), Eq(n, -2)), (A*log(c/d + x)/d - B*c*log(c/d
 + x)/d**2 + B*x/d + C*c**2*log(c/d + x)/d**3 - C*c*x/d**2 + C*x*
*2/(2*d) - D*c**3*log(c/d + x)/d**4 + D*c**2*x/d**3 - D*c*x**2/(2
*d**2) + D*x**3/(3*d), Eq(n, -1)), (A*c*d**3*n**3*(c + d*x)**n/(d
**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 9
*A*c*d**3*n**2*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n
**2 + 50*d**4*n + 24*d**4) + 26*A*c*d**3*n*(c + d*x)**n/(d**4*n**
4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 24*A*c*d
**3*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d*
*4*n + 24*d**4) + A*d**4*n**3*x*(c + d*x)**n/(d**4*n**4 + 10*d**4
*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 9*A*d**4*n**2*x*(c
+ d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n +
24*d**4) + 26*A*d**4*n*x*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 +
 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 24*A*d**4*x*(c + d*x)**n/(
d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) -
B*c**2*d**2*n**2*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4
*n**2 + 50*d**4*n + 24*d**4) - 7*B*c**2*d**2*n*(c + d*x)**n/(d**4
*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) - 12*B
*c**2*d**2*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2
+ 50*d**4*n + 24*d**4) + B*c*d**3*n**3*x*(c + d*x)**n/(d**4*n**4
+ 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 7*B*c*d**3
*n**2*x*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 5
0*d**4*n + 24*d**4) + 12*B*c*d**3*n*x*(c + d*x)**n/(d**4*n**4 + 1
0*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + B*d**4*n**3*x
**2*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d*
*4*n + 24*d**4) + 8*B*d**4*n**2*x**2*(c + d*x)**n/(d**4*n**4 + 10
*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 19*B*d**4*n*x*
*2*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**
4*n + 24*d**4) + 12*B*d**4*x**2*(c + d*x)**n/(d**4*n**4 + 10*d**4
*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 2*C*c**3*d*n*(c + d
*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*
d**4) + 8*C*c**3*d*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d*
*4*n**2 + 50*d**4*n + 24*d**4) - 2*C*c**2*d**2*n**2*x*(c + d*x)**
n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4)
```

```
 - 8*C*c**2*d**2*n*x*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*
d**4*n**2 + 50*d**4*n + 24*d**4) + C*c*d**3*n**3*x**2*(c + d*x)**
n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4)
 + 5*C*c*d**3*n**2*x**2*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 +
35*d**4*n**2 + 50*d**4*n + 24*d**4) + 4*C*c*d**3*n*x**2*(c + d*x)
**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**
4) + C*d**4*n**3*x**3*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35
*d**4*n**2 + 50*d**4*n + 24*d**4) + 7*C*d**4*n**2*x**3*(c + d*x)*
*n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4
) + 14*C*d**4*n*x**3*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*
d**4*n**2 + 50*d**4*n + 24*d**4) + 8*C*d**4*x**3*(c + d*x)**n/(d*
*4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) - 6*
D*c**4*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50
*d**4*n + 24*d**4) + 6*D*c**3*d*n*x*(c + d*x)**n/(d**4*n**4 + 10*
d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) - 3*D*c**2*d**2*n
**2*x**2*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 +
50*d**4*n + 24*d**4) - 3*D*c**2*d**2*n*x**2*(c + d*x)**n/(d**4*n*
*4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + D*c*d**
3*n**3*x**3*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2
 + 50*d**4*n + 24*d**4) + 3*D*c*d**3*n**2*x**3*(c + d*x)**n/(d**4
*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 2*D*
c*d**3*n*x**3*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n*
*2 + 50*d**4*n + 24*d**4) + D*d**4*n**3*x**4*(c + d*x)**n/(d**4*n
**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 6*D*d*
*4*n**2*x**4*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**
2 + 50*d**4*n + 24*d**4) + 11*D*d**4*n*x**4*(c + d*x)**n/(d**4*n*
*4 + 10*d**4*n**3 + 35*d**4*n**2 + 50*d**4*n + 24*d**4) + 6*D*d**
4*x**4*(c + d*x)**n/(d**4*n**4 + 10*d**4*n**3 + 35*d**4*n**2 + 50
*d**4*n + 24*d**4), True))
```

GIAC/XCAS [A] time = 0.215109, size = 1091, normalized size = 8.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n,x, algorithm="giac")
```

```
[Out] (D*d^4*n^3*x^4*e^(n*ln(d*x + c)) + D*c*d^3*n^3*x^3*e^(n*ln(d*x +
c)) + C*d^4*n^3*x^3*e^(n*ln(d*x + c)) + 6*D*d^4*n^2*x^4*e^(n*ln(d
*x + c)) + C*c*d^3*n^3*x^2*e^(n*ln(d*x + c)) + B*d^4*n^3*x^2*e^(n
*ln(d*x + c)) + 3*D*c*d^3*n^2*x^3*e^(n*ln(d*x + c)) + 7*C*d^4*n^2
*x^3*e^(n*ln(d*x + c)) + 11*D*d^4*n*x^4*e^(n*ln(d*x + c)) + B*c*d
^3*n^3*x*e^(n*ln(d*x + c)) + A*d^4*n^3*x*e^(n*ln(d*x + c)) - 3*D*
c^2*d^2*n^2*x^2*e^(n*ln(d*x + c)) + 5*C*c*d^3*n^2*x^2*e^(n*ln(d*x
 + c)) + 8*B*d^4*n^2*x^2*e^(n*ln(d*x + c)) + 2*D*c*d^3*n*x^3*e^(n
*ln(d*x + c)) + 14*C*d^4*n*x^3*e^(n*ln(d*x + c)) + 6*D*d^4*x^4*e^
(n*ln(d*x + c)) + A*c*d^3*n^3*e^(n*ln(d*x + c)) - 2*C*c^2*d^2*n^2
*x*e^(n*ln(d*x + c)) + 7*B*c*d^3*n^2*x*e^(n*ln(d*x + c)) + 9*A*d^
4*n^2*x*e^(n*ln(d*x + c)) - 3*D*c^2*d^2*n*x^2*e^(n*ln(d*x + c)) +
 4*C*c*d^3*n*x^2*e^(n*ln(d*x + c)) + 19*B*d^4*n*x^2*e^(n*ln(d*x +
 c)) + 8*C*d^4*x^3*e^(n*ln(d*x + c)) - B*c^2*d^2*n^2*e^(n*ln(d*x
```

```
+ c)) + 9*A*c*d^3*n^2*e^(n*ln(d*x + c)) + 6*D*c^3*d*n*x*e^(n*ln(d
*x + c)) - 8*C*c^2*d^2*n*x*e^(n*ln(d*x + c)) + 12*B*c*d^3*n*x*e^(
n*ln(d*x + c)) + 26*A*d^4*n*x*e^(n*ln(d*x + c)) + 12*B*d^4*x^2*e^
(n*ln(d*x + c)) + 2*C*c^3*d*n*e^(n*ln(d*x + c)) - 7*B*c^2*d^2*n*e
^(n*ln(d*x + c)) + 26*A*c*d^3*n*e^(n*ln(d*x + c)) + 24*A*d^4*x*e^
(n*ln(d*x + c)) - 6*D*c^4*e^(n*ln(d*x + c)) + 8*C*c^3*d*e^(n*ln(d
*x + c)) - 12*B*c^2*d^2*e^(n*ln(d*x + c)) + 24*A*c*d^3*e^(n*ln(d*
x + c)))/(d^4*n^4 + 10*d^4*n^3 + 35*d^4*n^2 + 50*d^4*n + 24*d^4)
```

3.29 $\int \frac{(c+dx)^n \left(A+Bx+Cx^2+Dx^3\right)}{a+bx}\,dx$

Optimal. Leaf size=203

$$-\frac{(c+dx)^{n+1}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\,{}_2F_1\left(1,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)}{b^3(n+1)(bc-ad)}+\frac{(c+dx)^{n+1}\left(a^2d^2D-abd(Cd-cD)+b^2\left(-\left(-Bd^2+c^2(-D)+cCd\right)\right)\right)}{b^3d^3(n+1)}+\frac{(c+dx)^{n+2}(-adD-2bcD+bCd)}{b^2d^3(n+2)}+\frac{D(c+dx)^{n+3}}{bd^3(n+3)}$$

```
[Out] ((a^2*d^2*D - a*b*d*(C*d - c*D) - b^2*(c*C*d - B*d^2 - c^2*D))*(c
 + d*x)^(1 + n))/(b^3*d^3*(1 + n)) + ((b*C*d - 2*b*c*D - a*d*D)*(
c + d*x)^(2 + n))/(b^2*d^3*(2 + n)) + (D*(c + d*x)^(3 + n))/(b*d^
3*(3 + n)) - ((A*b^3 - a*(b^2*B - a*b*C + a^2*D))*(c + d*x)^(1 +
n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(c + d*x))/(b*c - a*d)])
/(b^3*(b*c - a*d)*(1 + n))
```

Rubi [A] time = 0.372897, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$

$$-\frac{(c+dx)^{n+1}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)\,{}_2F_1\left(1,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)}{b^3(n+1)(bc-ad)}+\frac{(c+dx)^{n+1}\left(a^2d^2D-abd(Cd-cD)+b^2\left(-\left(-Bd^2+c^2(-D)+cCd\right)\right)\right)}{b^3d^3(n+1)}+\frac{(c+dx)^{n+2}(-adD-2bcD+bCd)}{b^2d^3(n+2)}+\frac{D(c+dx)^{n+3}}{bd^3(n+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x),x]
```

```
[Out] ((a^2*d^2*D - a*b*d*(C*d - c*D) - b^2*(c*C*d - B*d^2 - c^2*D))*(c
 + d*x)^(1 + n))/(b^3*d^3*(1 + n)) + ((b*C*d - 2*b*c*D - a*d*D)*(
c + d*x)^(2 + n))/(b^2*d^3*(2 + n)) + (D*(c + d*x)^(3 + n))/(b*d^
3*(3 + n)) - ((A*b^3 - a*(b^2*B - a*b*C + a^2*D))*(c + d*x)^(1 +
n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(c + d*x))/(b*c - a*d)])
/(b^3*(b*c - a*d)*(1 + n))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A)/(b*x+a),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 4.42386, size = 414, normalized size = 2.04

$$\frac{1}{12}(c+dx)^n\left(-\frac{12A(c+dx)\,{}_2F_1\left(1,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)}{(n+1)(bc-ad)}+\frac{18aBcx^2F_1\left(2;-n,1;3;-\frac{dx}{c},-\frac{bx}{a}\right)}{(a+bx)\left(3acF_1\left(2;-n,1;3;-\frac{dx}{c},-\frac{bx}{a}\right)+adnxF_1\left(3;1-n,1;4;-\frac{dx}{c},-\frac{bx}{a}\right)-bcxF_1\left(3;-n,2;4;-\frac{dx}{c},-\frac{bx}{a}\right)\right)}+\frac{16acCx^3F_1\left(3;-n,1;4;-\frac{dx}{c},-\frac{bx}{a}\right)}{(a+bx)\left(4acF_1\left(3;-n,1;4;-\frac{dx}{c},-\frac{bx}{a}\right)+adnxF_1\left(4;1-n,1;5;-\frac{dx}{c},-\frac{bx}{a}\right)-bcxF_1\left(4;-n,2;5;-\frac{dx}{c},-\frac{bx}{a}\right)\right)}+\frac{15acDx^4F_1\left(4;-n,1;5;-\frac{dx}{c},-\frac{bx}{a}\right)}{(a+bx)\left(5acF_1\left(4;-n,1;5;-\frac{dx}{c},-\frac{bx}{a}\right)+adnxF_1\left(5;1-n,1;6;-\frac{dx}{c},-\frac{bx}{a}\right)-bcxF_1\left(5;-n,2;6;-\frac{dx}{c},-\frac{bx}{a}\right)\right)}\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x),x]
```

```
[Out] ((c + d*x)^n*((18*a*B*c*x^2*AppellF1[2, -n, 1, 3, -((d*x)/c), -((
b*x)/a)])/((a + b*x)*(3*a*c*AppellF1[2, -n, 1, 3, -((d*x)/c), -((
b*x)/a)] + a*d*n*x*AppellF1[3, 1 - n, 1, 4, -((d*x)/c), -((b*x)/a
)] - b*c*x*AppellF1[3, -n, 2, 4, -((d*x)/c), -((b*x)/a)])) + (16*
a*c*C*x^3*AppellF1[3, -n, 1, 4, -((d*x)/c), -((b*x)/a)])/((a + b*
x)*(4*a*c*AppellF1[3, -n, 1, 4, -((d*x)/c), -((b*x)/a)] + a*d*n*x
*AppellF1[4, 1 - n, 1, 5, -((d*x)/c), -((b*x)/a)] - b*c*x*AppellF
1[4, -n, 2, 5, -((d*x)/c), -((b*x)/a)])) + (15*a*c*D*x^4*AppellF1
[4, -n, 1, 5, -((d*x)/c), -((b*x)/a)])/((a + b*x)*(5*a*c*AppellF1
[4, -n, 1, 5, -((d*x)/c), -((b*x)/a)] + a*d*n*x*AppellF1[5, 1 - n
, 1, 6, -((d*x)/c), -((b*x)/a)] - b*c*x*AppellF1[5, -n, 2, 6, -((
d*x)/c), -((b*x)/a)])) - (12*A*(c + d*x)*Hypergeometric2F1[1, 1 +
 n, 2 + n, (b*(c + d*x))/(b*c - a*d)])/((b*c - a*d)*(1 + n))))/12
```

Maple [F] time = 0.082, size = 0, normalized size = 0.

$$\int \frac{(dx+c)^n\left(Dx^3+Cx^2+Bx+A\right)}{bx+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^n*(D*x^3+C*x^2+B*x+A)/(b*x+a),x)

[Out] int((d*x+c)^n*(D*x^3+C*x^2+B*x+A)/(b*x+a),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Dx^3 + Cx^2 + Bx + A)(dx + c)^n}{bx + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a),x, algorithm="maxima")

[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Dx^3 + Cx^2 + Bx + A)(dx + c)^n}{bx + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a),x, algorithm="fricas")

[Out] integral((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A)/(b*x+a),x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Dx^3 + Cx^2 + Bx + A\right)(dx + c)^n}{bx + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a),x, algorithm="giac")
```

```
[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a), x)
```

3.30 $\int \frac{(c+dx)^n (A+Bx+Cx^2+Dx^3)}{(a+bx)^2} \, dx$

Optimal. Leaf size=220

$$-\frac{(c+dx)^{n+1}\left(A-\frac{a(a^2D-abC+b^2B)}{b^3}\right)}{(a+bx)(bc-ad)}+\frac{(c+dx)^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)\left(a^3dD(n+3)-a^2b(3cD+Cd(n+2))+ab^2(Bd(n+1)+2cC)-b^3(Adn+Bc)\right)}{b^3(n+1)(bc-ad)^2}+\frac{(c+dx)^{n+1}(-2adD-bcD+bCd)}{b^3d^2(n+1)}+\frac{D(c+dx)^{n+2}}{b^2d^2(n+2)}$$

```
[Out] ((b*C*d - b*c*D - 2*a*d*D)*(c + d*x)^(1 + n))/(b^3*d^2*(1 + n)) -
 ((A - (a*(b^2*B - a*b*C + a^2*D))/b^3)*(c + d*x)^(1 + n))/((b*c
- a*d)*(a + b*x)) + (D*(c + d*x)^(2 + n))/(b^2*d^2*(2 + n)) + ((a
^3*d*D*(3 + n) - b^3*(B*c + A*d*n) + a*b^2*(2*c*C + B*d*(1 + n))
- a^2*b*(3*c*D + C*d*(2 + n)))*(c + d*x)^(1 + n)*Hypergeometric2F
1[1, 1 + n, 2 + n, (b*(c + d*x))/(b*c - a*d)])/(b^3*(b*c - a*d)^2
*(1 + n))
```

Rubi [A] time = 1.18241, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$-\frac{(c+dx)^{n+1}\left(A-\frac{a(a^2D-abC+b^2B)}{b^3}\right)}{(a+bx)(bc-ad)}+\frac{(c+dx)^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)\left(a^3dD(n+3)-a^2b(3cD+Cd(n+2))+ab^2(Bd(n+1)+2cC)-b^3(Adn+Bc)\right)}{b^3(n+1)(bc-ad)^2}+\frac{(c+dx)^{n+1}(-2adD-bcD+bCd)}{b^3d^2(n+1)}+\frac{D(c+dx)^{n+2}}{b^2d^2(n+2)}$$

Antiderivative was successfully verified.

```
[In]  Int[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x)^2,x]
```

```
[Out] ((b*C*d - b*c*D - 2*a*d*D)*(c + d*x)^(1 + n))/(b^3*d^2*(1 + n)) -
 ((A - (a*(b^2*B - a*b*C + a^2*D))/b^3)*(c + d*x)^(1 + n))/((b*c
- a*d)*(a + b*x)) + (D*(c + d*x)^(2 + n))/(b^2*d^2*(2 + n)) + ((a
^3*d*D*(3 + n) - b^3*(B*c + A*d*n) + a*b^2*(2*c*C + B*d*(1 + n))
- a^2*b*(3*c*D + C*d*(2 + n)))*(c + d*x)^(1 + n)*Hypergeometric2F
1[1, 1 + n, 2 + n, (b*(c + d*x))/(b*c - a*d)])/(b^3*(b*c - a*d)^2
*(1 + n))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A)/(b*x+a)**2,x)

[Out] Timed out
```

Mathematica [A] time = 0.284921, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^n\left(A+Bx+Cx^2+Dx^3\right)}{(a+bx)^2}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x)^2,x]

[Out] Integrate[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x)^2, x]
```

Maple [F] time = 0.065, size = 0, normalized size = 0.

$$\int \frac{(dx+c)^n\left(Dx^3+Cx^2+Bx+A\right)}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^n*(D*x^3+C*x^2+B*x+A)/(b*x+a)^2,x)

[Out] int((d*x+c)^n*(D*x^3+C*x^2+B*x+A)/(b*x+a)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Dx^3+Cx^2+Bx+A\right)(dx+c)^n}{(bx+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^2,x, algorithm="maxima")
```

```
[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^2, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Dx^3 + Cx^2 + Bx + A)(dx + c)^n}{b^2x^2 + 2\,abx + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^2,x, algorithm="fricas")
```

```
[Out] integral((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b^2*x^2 + 2*a*b*x
 + a^2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A)/(b*x+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Dx^3 + Cx^2 + Bx + A)(dx + c)^n}{(bx + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^2,x, algorithm="giac")
```

```
[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^2, x)
```

3.31 $\int \frac{(c+dx)^n\left(A+Bx+Cx^2+Dx^3\right)}{(a+bx)^3}\,dx$

Optimal. Leaf size=329

$$-\frac{(c+dx)^{n+1}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{2b^3(a+bx)^2(bc-ad)}-\frac{(c+dx)^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)\left(a^3\left(-d^2\right)D\left(n^2+5n+6\right)+a^2bd(n+2)(6cD+Cd(n+1))-ab^2\left(Bd^2n(n+1)+6c\right.\right.}{2b^3(n+1)(bc-ad)^3}-\frac{(c+dx)^{n+1}\left(a^3(-d)D(n+5)+a^2b(6cD+Cd(n+3))-ab^2(Bd(n+1)+4cC)+b^3(2Bc-Ad(1-n))\right)}{2b^3(a+bx)(bc-ad)^2}+\frac{D(c+dx)^{n+1}}{b^3d(n+1)}$$

```
[Out] (D*(c + d*x)^(1 + n))/(b^3*d*(1 + n)) - ((A*b^3 - a*(b^2*B - a*b*
C + a^2*D))*(c + d*x)^(1 + n))/(2*b^3*(b*c - a*d)*(a + b*x)^2) -
((b^3*(2*B*c - A*d*(1 - n)) - a^3*d*D*(5 + n) - a*b^2*(4*c*C + B*
d*(1 + n)) + a^2*b*(6*c*D + C*d*(3 + n)))*(c + d*x)^(1 + n))/(2*b
^3*(b*c - a*d)^2*(a + b*x)) - ((b^3*(2*c^2*C + 2*B*c*d*n - A*d^2*
(1 - n)*n) - a^3*d^2*D*(6 + 5*n + n^2) + a^2*b*d*(2 + n)*(6*c*D +
 C*d*(1 + n)) - a*b^2*(6*c^2*D + 4*c*C*d*(1 + n) + B*d^2*n*(1 + n
)))*(c + d*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(c +
d*x))/(b*c - a*d)])/(2*b^3*(b*c - a*d)^3*(1 + n))
```

Rubi [A] time = 1.41521, antiderivative size = 329, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$-\frac{(c+dx)^{n+1}\left(Ab^3-a\left(a^2D-abC+b^2B\right)\right)}{2b^3(a+bx)^2(bc-ad)}-\frac{(c+dx)^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)\left(a^3\left(-d^2\right)D\left(n^2+5n+6\right)+a^2bd(n+2)(6cD+Cd(n+1))-ab^2\left(Bd^2n(n+1)+6c\right.\right.}{2b^3(n+1)(bc-ad)^3}-\frac{(c+dx)^{n+1}\left(a^3(-d)D(n+5)+a^2b(6cD+Cd(n+3))-ab^2(Bd(n+1)+4cC)+b^3(2Bc-Ad(1-n))\right)}{2b^3(a+bx)(bc-ad)^2}+\frac{D(c+dx)^{n+1}}{b^3d(n+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x)^3,x]
```

```
[Out] (D*(c + d*x)^(1 + n))/(b^3*d*(1 + n)) - ((A*b^3 - a*(b^2*B - a*b*
C + a^2*D))*(c + d*x)^(1 + n))/(2*b^3*(b*c - a*d)*(a + b*x)^2) -
((b^3*(2*B*c - A*d*(1 - n)) - a^3*d*D*(5 + n) - a*b^2*(4*c*C + B*
d*(1 + n)) + a^2*b*(6*c*D + C*d*(3 + n)))*(c + d*x)^(1 + n))/(2*b
^3*(b*c - a*d)^2*(a + b*x)) - ((b^3*(2*c^2*C + 2*B*c*d*n - A*d^2*
```

```
(1 - n)*n) - a^3*d^2*D*(6 + 5*n + n^2) + a^2*b*d*(2 + n)*(6*c*D +
 C*d*(1 + n)) - a*b^2*(6*c^2*D + 4*c*C*d*(1 + n) + B*d^2*n*(1 + n
)))*(c + d*x)^(1 + n)*Hypergeometric2F1[1, 1 + n, 2 + n, (b*(c +
d*x))/(b*c - a*d)])/(2*b^3*(b*c - a*d)^3*(1 + n))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A)/(b*x+a)**3,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.452517, size = 0, normalized size = 0.

$$\int \frac{(c+dx)^n\left(A+Bx+Cx^2+Dx^3\right)}{(a+bx)^3}\,dx$$

Verification is Not applicable to the result.

```
[In]  Integrate[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x)^3,x]
```

```
[Out] Integrate[((c + d*x)^n*(A + B*x + C*x^2 + D*x^3))/(a + b*x)^3, x]
```

Maple [F] time = 0.08, size = 0, normalized size = 0.

$$\int \frac{(dx+c)^n\left(Dx^3+Cx^2+Bx+A\right)}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((d*x+c)^n*(D*x^3+C*x^2+B*x+A)/(b*x+a)^3,x)
```

```
[Out] int((d*x+c)^n*(D*x^3+C*x^2+B*x+A)/(b*x+a)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Dx^3+Cx^2+Bx+A\right)(dx+c)^n}{(bx+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^3,x, algorithm="maxima")
```

```
[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^3, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(Dx^3 + Cx^2 + Bx + A\right)(dx + c)^n}{b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^3,x, algorithm="fricas")
```

```
[Out] integral((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b^3*x^3 + 3*a*b^2
*x^2 + 3*a^2*b*x + a^3), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x+c)**n*(D*x**3+C*x**2+B*x+A)/(b*x+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Dx^3 + Cx^2 + Bx + A\right)(dx + c)^n}{(bx + a)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^3,x, algorithm="giac")
```

```
[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(d*x + c)^n/(b*x + a)^3, x)
```

3.32 $\int (a+bx)^m (A+Bx)(c+dx)^n \, dx$

Optimal. Leaf size=141

$$\frac{(a+bx)^{m+1}(c+dx)^n \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} (Abd(m+n+2)-B(ad(n+1)+bc(m+1)))\,{}_2F_1\left(m+1,-n;m+2;-\frac{d(a+bx)}{bc-ad}\right)}{b^2d(m+1)(m+n+2)} + \frac{B(a+bx)^{m+1}(c+dx)^{n+1}}{bd(m+n+2)}$$

```
[Out] (B*(a + b*x)^(1 + m)*(c + d*x)^(1 + n))/(b*d*(2 + m + n)) + ((A*b
*d*(2 + m + n) - B*(b*c*(1 + m) + a*d*(1 + n)))*(a + b*x)^(1 + m)
*(c + d*x)^n*Hypergeometric2F1[1 + m, -n, 2 + m, -((d*(a + b*x))/
(b*c - a*d))])/(b^2*d*(1 + m)*(2 + m + n)*((b*(c + d*x))/(b*c - a
*d))^n)
```

Rubi [A] time = 0.229908, antiderivative size = 141, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.15$

$$\frac{(a+bx)^{m+1}(c+dx)^n \left(\frac{b(c+dx)}{bc-ad}\right)^{-n} (Abd(m+n+2)-B(ad(n+1)+bc(m+1)))\,{}_2F_1\left(m+1,-n;m+2;-\frac{d(a+bx)}{bc-ad}\right)}{b^2d(m+1)(m+n+2)} + \frac{B(a+bx)^{m+1}(c+dx)^{n+1}}{bd(m+n+2)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)^m*(A + B*x)*(c + d*x)^n,x]
```

```
[Out] (B*(a + b*x)^(1 + m)*(c + d*x)^(1 + n))/(b*d*(2 + m + n)) + ((A*b
*d*(2 + m + n) - B*(b*c*(1 + m) + a*d*(1 + n)))*(a + b*x)^(1 + m)
*(c + d*x)^n*Hypergeometric2F1[1 + m, -n, 2 + m, -((d*(a + b*x))/
(b*c - a*d))])/(b^2*d*(1 + m)*(2 + m + n)*((b*(c + d*x))/(b*c - a
*d))^n)
```

Rubi in Sympy [A] time = 32.1858, size = 117, normalized size = 0.83

$$\frac{B(a+bx)^{m+1}(c+dx)^{n+1}}{bd(m+n+2)} - \frac{\left(\frac{b(-c-dx)}{ad-bc}\right)^{-n} (a+bx)^{m+1}(c+dx)^n(-Abd(m+n+2)+B(ad(n+1)+bc(m+1)))\,{}_2F_1\left(\begin{matrix}-n, m+1\\ m+2\end{matrix}\middle|\frac{d(a+bx)}{ad-bc}\right)}{b^2d(m+1)(m+n+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**m*(B*x+A)*(d*x+c)**n,x)
```

```
[Out] B*(a + b*x)**(m + 1)*(c + d*x)**(n + 1)/(b*d*(m + n + 2)) - (b*(-
c - d*x)/(a*d - b*c))**(-n)*(a + b*x)**(m + 1)*(c + d*x)**n*(-A*b
*d*(m + n + 2) + B*(a*d*(n + 1) + b*c*(m + 1)))*hyper((-n, m + 1)
, (m + 2,), d*(a + b*x)/(a*d - b*c))/(b**2*d*(m + 1)*(m + n + 2))
```

Mathematica [C] time = 0.510487, size = 202, normalized size = 1.43

$$(a+bx)^m(c+dx)^n\left(\frac{A(c+dx)\left(\frac{d(a+bx)}{ad-bc}\right)^{-m}{}_2F_1\left(-m,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)}{d(n+1)}+\frac{3aBcx^2F_1\left(2;-m,-n;3;-\frac{bx}{a},-\frac{dx}{c}\right)}{6acF_1\left(2;-m,-n;3;-\frac{bx}{a},-\frac{dx}{c}\right)+2bcmxF_1\left(3;1-m,-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)+2adnxF_1\left(3;-m,1-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)}\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x)^m*(A + B*x)*(c + d*x)^n,x]
```

```
[Out] (a + b*x)^m*(c + d*x)^n*((3*a*B*c*x^2*AppellF1[2, -m, -n, 3, -((b
*x)/a), -((d*x)/c)])/(6*a*c*AppellF1[2, -m, -n, 3, -((b*x)/a), -(
(d*x)/c)] + 2*b*c*m*x*AppellF1[3, 1 - m, -n, 4, -((b*x)/a), -((d*
x)/c)] + 2*a*d*n*x*AppellF1[3, -m, 1 - n, 4, -((b*x)/a), -((d*x)/
c)]) + (A*(c + d*x)*Hypergeometric2F1[-m, 1 + n, 2 + n, (b*(c + d
*x))/(b*c - a*d)])/(d*(1 + n)*((d*(a + b*x))/(-(b*c) + a*d))^m))
```

Maple [F] time = 0.082, size = 0, normalized size = 0.

$$\int (bx+a)^m\,(Bx+A)\,(dx+c)^n\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^m*(B*x+A)*(d*x+c)^n,x)
```

```
[Out] int((b*x+a)^m*(B*x+A)*(d*x+c)^n,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx+A)(bx+a)^m(dx+c)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="maxima")
```

```
[Out] integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((Bx + A)(bx + a)^m(dx + c)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="fricas")
```

```
[Out] integral((B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**m*(B*x+A)*(d*x+c)**n,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int (Bx + A)(bx + a)^m(dx + c)^n\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="giac")
```

```
[Out] integrate((B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

3.33 $\int (a+bx)^m(c+dx)^n\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=268

$$-\frac{(a+bx)^{m+1}(c+dx)^n\left(\frac{b(c+dx)}{bc-ad}\right)^{-n}{}_2F_1\left(m+1,-n;m+2;-\frac{d(a+bx)}{bc-ad}\right)\left(d(m+n+2)\left(a^2Cd(n+1)+abcC(m+2)-Ab^2d(m+\right.\right.}{b^3d^2(m+1)(m+n+2)(m+n+3)}$$
$$-\frac{(a+bx)^{m+1}(c+dx)^{n+1}(aCd(m+2n+4)+b(cC(m+2)-Bd(m+n+3)))}{b^2d^2(m+n+2)(m+n+3)}+\frac{C(a+bx)^{m+2}(c+dx)^{n+1}}{b^2d(m+n+3)}$$

```
[Out] -(((a*C*d*(4 + m + 2*n) + b*(c*C*(2 + m) - B*d*(3 + m + n)))*(a +
 b*x)^(1 + m)*(c + d*x)^(1 + n))/(b^2*d^2*(2 + m + n)*(3 + m + n)
)) + (C*(a + b*x)^(2 + m)*(c + d*x)^(1 + n))/(b^2*d*(3 + m + n))
- ((d*(2 + m + n)*(a*b*c*C*(2 + m) + a^2*C*d*(1 + n) - A*b^2*d*(3
 + m + n)) - (b*c*(1 + m) + a*d*(1 + n))*(a*C*d*(4 + m + 2*n) + b
*(c*C*(2 + m) - B*d*(3 + m + n))))*(a + b*x)^(1 + m)*(c + d*x)^n*
Hypergeometric2F1[1 + m, -n, 2 + m, -((d*(a + b*x))/(b*c - a*d))]
)/(b^3*d^2*(1 + m)*(2 + m + n)*(3 + m + n)*((b*(c + d*x))/(b*c -
a*d))^n)
```

Rubi [A] time = 0.719828, antiderivative size = 266, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$-\frac{(a+bx)^{m+1}(c+dx)^n\left(\frac{b(c+dx)}{bc-ad}\right)^{-n}{}_2F_1\left(m+1,-n;m+2;-\frac{d(a+bx)}{bc-ad}\right)\left(d(m+n+2)\left(a^2Cd(n+1)+abcC(m+2)-Ab^2d(m+\right.\right.}{b^3d^2(m+1)(m+n+2)(m+n+3)}$$
$$-\frac{(a+bx)^{m+1}(c+dx)^{n+1}(aCd(m+2n+4)-bBd(m+n+3)+bcC(m+2))}{b^2d^2(m+n+2)(m+n+3)}+\frac{C(a+bx)^{m+2}(c+dx)^{n+1}}{b^2d(m+n+3)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)^m*(c + d*x)^n*(A + B*x + C*x^2),x]
```

```
[Out] -(((b*c*C*(2 + m) - b*B*d*(3 + m + n) + a*C*d*(4 + m + 2*n))*(a +
 b*x)^(1 + m)*(c + d*x)^(1 + n))/(b^2*d^2*(2 + m + n)*(3 + m + n)
)) + (C*(a + b*x)^(2 + m)*(c + d*x)^(1 + n))/(b^2*d*(3 + m + n))
- ((d*(2 + m + n)*(a*b*c*C*(2 + m) + a^2*C*d*(1 + n) - A*b^2*d*(3
 + m + n)) - (b*c*(1 + m) + a*d*(1 + n))*(b*c*C*(2 + m) - b*B*d*(
3 + m + n) + a*C*d*(4 + m + 2*n)))*(a + b*x)^(1 + m)*(c + d*x)^n*
Hypergeometric2F1[1 + m, -n, 2 + m, -((d*(a + b*x))/(b*c - a*d))]
)/(b^3*d^2*(1 + m)*(2 + m + n)*(3 + m + n)*((b*(c + d*x))/(b*c -
a*d))^n)
```

Rubi in Sympy [A] time = 92.3149, size = 230, normalized size = 0.86

$$\frac{C\left(\frac{b(-c-dx)}{ad-bc}\right)^{-n}(a+bx)^{m+1}(c+dx)^{n}(ad-bc)^{2}\,{}_{2}F_{1}\left(\begin{matrix}-n-2,m+1\\m+2\end{matrix}\middle|\frac{d(a+bx)}{ad-bc}\right)}{b^{3}d^{2}(m+1)}+\frac{\left(\frac{b(-c-dx)}{ad-bc}\right)^{-n}(a+bx)^{m+1}(c+dx)^{n}\left(Ad^{2}-Bcd+Cc^{2}\right){}_{2}F_{1}\left(\begin{matrix}-n,m+1\\m+2\end{matrix}\middle|\frac{d(a+bx)}{ad-bc}\right)}{bd^{2}(m+1)}-\frac{\left(\frac{b(-c-dx)}{ad-bc}\right)^{-n}(a+bx)^{m+1}(c+dx)^{n}(Bd-2Cc)(ad-bc)\,{}_{2}F_{1}\left(\begin{matrix}-n-1,m+1\\m+2\end{matrix}\middle|\frac{d(a+bx)}{ad-bc}\right)}{b^{2}d^{2}(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**m*(d*x+c)**n*(C*x**2+B*x+A),x)
```

```
[Out] C*(b*(-c - d*x)/(a*d - b*c))**(-n)*(a + b*x)**(m + 1)*(c + d*x)**
n*(a*d - b*c)**2*hyper((-n - 2, m + 1), (m + 2,), d*(a + b*x)/(a*
d - b*c))/(b**3*d**2*(m + 1)) + (b*(-c - d*x)/(a*d - b*c))**(-n)*
(a + b*x)**(m + 1)*(c + d*x)**n*(A*d**2 - B*c*d + C*c**2)*hyper((
-n, m + 1), (m + 2,), d*(a + b*x)/(a*d - b*c))/(b*d**2*(m + 1)) -
 (b*(-c - d*x)/(a*d - b*c))**(-n)*(a + b*x)**(m + 1)*(c + d*x)**n
*(B*d - 2*C*c)*(a*d - b*c)*hyper((-n - 1, m + 1), (m + 2,), d*(a
+ b*x)/(a*d - b*c))/(b**2*d**2*(m + 1))
```

Mathematica [C] time = 0.970823, size = 327, normalized size = 1.22

$$\frac{1}{3}(a+bx)^{m}(c+dx)^{n}\left(\frac{3A(c+dx)\left(\frac{d(a+bx)}{ad-bc}\right)^{-m}{}_{2}F_{1}\left(-m,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)}{d(n+1)}+\frac{9aBcx^{2}F_{1}\left(2;-m,-n;3;-\frac{bx}{a},-\frac{dx}{c}\right)}{6acF_{1}\left(2;-m,-n;3;-\frac{bx}{a},-\frac{dx}{c}\right)+2bcmxF_{1}\left(3;1-m,-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)+2adnxF_{1}\left(3;-m,1-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)}+\frac{4acCx^{3}F_{1}\left(3;-m,-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)}{4acF_{1}\left(3;-m,-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)+bcmxF_{1}\left(4;1-m,-n;5;-\frac{bx}{a},-\frac{dx}{c}\right)+adnxF_{1}\left(4;-m,1-n;5;-\frac{bx}{a},-\frac{dx}{c}\right)}\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x)^m*(c + d*x)^n*(A + B*x + C*x^2),x]
```

```
[Out] ((a + b*x)^m*(c + d*x)^n*((9*a*B*c*x^2*AppellF1[2, -m, -n, 3, -((
b*x)/a), -((d*x)/c)])/(6*a*c*AppellF1[2, -m, -n, 3, -((b*x)/a), -
((d*x)/c)] + 2*b*c*m*x*AppellF1[3, 1 - m, -n, 4, -((b*x)/a), -((d
```

```
*x)/c)] + 2*a*d*n*x*AppellF1[3, -m, 1 - n, 4, -((b*x)/a), -((d*x)
/c)]) + (4*a*c*C*x^3*AppellF1[3, -m, -n, 4, -((b*x)/a), -((d*x)/c
)])/(4*a*c*AppellF1[3, -m, -n, 4, -((b*x)/a), -((d*x)/c)] + b*c*m
*x*AppellF1[4, 1 - m, -n, 5, -((b*x)/a), -((d*x)/c)] + a*d*n*x*Ap
pellF1[4, -m, 1 - n, 5, -((b*x)/a), -((d*x)/c)]) + (3*A*(c + d*x)
*Hypergeometric2F1[-m, 1 + n, 2 + n, (b*(c + d*x))/(b*c - a*d)])/
(d*(1 + n)*((d*(a + b*x))/(-(b*c) + a*d))^m)))/3
```

Maple [F] time = 0.092, size = 0, normalized size = 0.

$$\int (bx+a)^m (dx+c)^n \left(Cx^2+Bx+A\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^m*(d*x+c)^n*(C*x^2+B*x+A),x)
```

```
[Out] int((b*x+a)^m*(d*x+c)^n*(C*x^2+B*x+A),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Cx^2+Bx+A\right)(bx+a)^m(dx+c)^n\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="maxima")
```

```
[Out] integrate((C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(Cx^2+Bx+A\right)(bx+a)^m(dx+c)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="fricas")
```

```
[Out] integral((C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**m*(d*x+c)**n*(C*x**2+B*x+A),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Cx^2 + Bx + A\right)(bx + a)^m (dx + c)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="giac")
```

```
[Out] integrate((C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

3.34 $\int (a+bx)^m (c+dx)^n \left(A+Bx+Cx^2+Dx^3\right)\,dx$

Optimal. Leaf size=610

$$\frac{(a+bx)^{m+1}(c+dx)^{n+1}\left(a^2d^2D\left(m^2+m(3n+8)+3\left(n^2+5n+6\right)\right)+abd\left(cD(m+2)(m+3n+6)-Cd\left(m^2+m(3n+8)+2\left(\right.\right.\right.}{b^3d^3(m+n+2)(m+n+3)(}$$
$$+\frac{(a+bx)^{m+1}(c+dx)^n\left(\frac{b(c+dx)}{bc-ad}\right)^{-n}{}_2F_1\left(m+1,-n;m+2;-\frac{d(a+bx)}{bc-ad}\right)\left(d(m+n+2)\left(a^3d^2D(n+1)(m+2n+6)-a^2bd(Cd(n+\right.\right.}{}$$
$$-\frac{(a+bx)^{m+2}(c+dx)^{n+1}(adD(2m+3n+9)+b(cD(m+3)-Cd(m+n+4)))}{b^3d^2(m+n+3)(m+n+4)}+\frac{D(a+bx)^{m+3}(c+dx)^{n+1}}{b^3d(m+n+4)}$$

```
[Out] ((a^2*d^2*D*(m^2 + m*(8 + 3*n) + 3*(6 + 5*n + n^2)) + b^2*(c^2*D*
(6 + 5*m + m^2) - c*C*d*(2 + m)*(4 + m + n) + B*d^2*(12 + m^2 + 7
*n + n^2 + m*(7 + 2*n))) + a*b*d*(c*D*(2 + m)*(6 + m + 3*n) - C*d
*(m^2 + m*(8 + 3*n) + 2*(8 + 6*n + n^2))))*(a + b*x)^(1 + m)*(c +
 d*x)^(1 + n))/(b^3*d^3*(2 + m + n)*(3 + m + n)*(4 + m + n)) - ((
a*d*D*(9 + 2*m + 3*n) + b*(c*D*(3 + m) - C*d*(4 + m + n)))*(a + b
*x)^(2 + m)*(c + d*x)^(1 + n))/(b^3*d^2*(3 + m + n)*(4 + m + n))
+ (D*(a + b*x)^(3 + m)*(c + d*x)^(1 + n))/(b^3*d*(4 + m + n)) + (
(d*(2 + m + n)*(a^3*d^2*D*(1 + n)*(6 + m + 2*n) + a*b^2*c*(2 + m)
*(c*D*(3 + m) - C*d*(4 + m + n)) + A*b^3*d^2*(12 + m^2 + 7*n + n^
2 + m*(7 + 2*n)) - a^2*b*d*(C*d*(1 + n)*(4 + m + n) - c*D*(2 + m)
*(6 + m + 3*n))) - (b*c*(1 + m) + a*d*(1 + n))*(a^2*d^2*D*(m^2 +
m*(8 + 3*n) + 3*(6 + 5*n + n^2)) + b^2*(c^2*D*(6 + 5*m + m^2) - c
*C*d*(2 + m)*(4 + m + n) + B*d^2*(12 + m^2 + 7*n + n^2 + m*(7 + 2
*n))) + a*b*d*(c*D*(2 + m)*(6 + m + 3*n) - C*d*(m^2 + m*(8 + 3*n)
 + 2*(8 + 6*n + n^2)))))*(a + b*x)^(1 + m)*(c + d*x)^n*Hypergeome
tric2F1[1 + m, -n, 2 + m, -((d*(a + b*x))/(b*c - a*d))])/(b^4*d^3
*(1 + m)*(2 + m + n)*(3 + m + n)*(4 + m + n)*((b*(c + d*x))/(b*c
- a*d))^n)
```

Rubi [A] time = 2.33733, antiderivative size = 605, normalized size of antiderivative = 0.99, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{(a+bx)^{m+1}(c+dx)^{n+1}\left(a^2d^2D\left(m^2+m(3n+8)+3\left(n^2+5n+6\right)\right)+abd\left(cD(m+2)(m+3n+6)-Cd\left(m^2+m(3n+8)+2\left(\right.\right.\right.}{b^3d^3(m+n+2)(m+n+3)(}$$
$$+\frac{(a+bx)^{m+1}(c+dx)^n\left(\frac{b(c+dx)}{bc-ad}\right)^{-n}{}_2F_1\left(m+1,-n;m+2;-\frac{d(a+bx)}{bc-ad}\right)\left(a^3d^2D(n+1)(m+2n+6)-\frac{(ad(n+1)+bc(m+1))\left(a^2d^2D\left(m^2+\right.\right.}{}\right.}{}$$
$$-\frac{(a+bx)^{m+2}(c+dx)^{n+1}(adD(2m+3n+9)+bcD(m+3)-bCd(m+n+4))}{b^3d^2(m+n+3)(m+n+4)}+\frac{D(a+bx)^{m+3}(c+dx)^{n+1}}{b^3d(m+n+4)}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)^m*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((a^2*d^2*D*(m^2 + m*(8 + 3*n) + 3*(6 + 5*n + n^2)) + b^2*(c^2*D*
(6 + 5*m + m^2) - c*C*d*(2 + m)*(4 + m + n) + B*d^2*(12 + m^2 + 7
```

```
*n + n^2 + m*(7 + 2*n))) + a*b*d*(c*D*(2 + m)*(6 + m + 3*n) - C*d
*(m^2 + m*(8 + 3*n) + 2*(8 + 6*n + n^2)))))*(a + b*x)^(1 + m)*(c +
 d*x)^(1 + n))/(b^3*d^3*(2 + m + n)*(3 + m + n)*(4 + m + n)) - ((
b*c*D*(3 + m) - b*C*d*(4 + m + n) + a*d*D*(9 + 2*m + 3*n))*(a + b
*x)^(2 + m)*(c + d*x)^(1 + n))/(b^3*d^2*(3 + m + n)*(4 + m + n))
+ (D*(a + b*x)^(3 + m)*(c + d*x)^(1 + n))/(b^3*d*(4 + m + n)) + (
(a^3*d^2*D*(1 + n)*(6 + m + 2*n) + a*b^2*c*(2 + m)*(c*D*(3 + m) -
 C*d*(4 + m + n)) + A*b^3*d^2*(12 + m^2 + 7*n + n^2 + m*(7 + 2*n)
) - a^2*b*d*(C*d*(1 + n)*(4 + m + n) - c*D*(2 + m)*(6 + m + 3*n))
 - ((b*c*(1 + m) + a*d*(1 + n))*(a^2*d^2*D*(m^2 + m*(8 + 3*n) + 3
*(6 + 5*n + n^2)) + b^2*(c^2*D*(6 + 5*m + m^2) - c*C*d*(2 + m)*(4
 + m + n) + B*d^2*(12 + m^2 + 7*n + n^2 + m*(7 + 2*n))) + a*b*d*(
c*D*(2 + m)*(6 + m + 3*n) - C*d*(m^2 + m*(8 + 3*n) + 2*(8 + 6*n +
 n^2)))))/(d*(2 + m + n)))*(a + b*x)^(1 + m)*(c + d*x)^n*Hypergeo
metric2F1[1 + m, -n, 2 + m, -((d*(a + b*x))/(b*c - a*d))])/(b^4*d
^2*(1 + m)*(3 + m + n)*(4 + m + n)*((b*(c + d*x))/(b*c - a*d))^n)
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**m*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 3.40405, size = 446, normalized size = 0.73

$$\frac{1}{12}(a+bx)^m(c+dx)^n\left(\frac{12A(c+dx)\left(\frac{d(a+bx)}{ad-bc}\right)^{-m}{}_2F_1\left(-m,n+1;n+2;\frac{b(c+dx)}{bc-ad}\right)}{d(n+1)}+\frac{18aBcx^2F_1\left(2;-m,-n;3;-\frac{bx}{a},-\frac{dx}{c}\right)}{3acF_1\left(2;-m,-n;3;-\frac{bx}{a},-\frac{dx}{c}\right)+bcmxF_1\left(3;1-m,-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)+adnxF_1\left(3;-m,1-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)}+\frac{16acCx^3F_1\left(3;-m,-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)}{4acF_1\left(3;-m,-n;4;-\frac{bx}{a},-\frac{dx}{c}\right)+bcmxF_1\left(4;1-m,-n;5;-\frac{bx}{a},-\frac{dx}{c}\right)+adnxF_1\left(4;-m,1-n;5;-\frac{bx}{a},-\frac{dx}{c}\right)}+\frac{15acDx^4F_1\left(4;-m,-n;5;-\frac{bx}{a},-\frac{dx}{c}\right)}{5acF_1\left(4;-m,-n;5;-\frac{bx}{a},-\frac{dx}{c}\right)+bcmxF_1\left(5;1-m,-n;6;-\frac{bx}{a},-\frac{dx}{c}\right)+adnxF_1\left(5;-m,1-n;6;-\frac{bx}{a},-\frac{dx}{c}\right)}\right)$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(a + b*x)^m*(c + d*x)^n*(A + B*x + C*x^2 + D*x^3),x]
```

```
[Out] ((a + b*x)^m*(c + d*x)^n*((18*a*B*c*x^2*AppellF1[2, -m, -n, 3, -(
(b*x)/a), -((d*x)/c)])/(3*a*c*AppellF1[2, -m, -n, 3, -((b*x)/a),
-((d*x)/c)] + b*c*m*x*AppellF1[3, 1 - m, -n, 4, -((b*x)/a), -((d*
x)/c)] + a*d*n*x*AppellF1[3, -m, 1 - n, 4, -((b*x)/a), -((d*x)/c)
]) + (16*a*c*C*x^3*AppellF1[3, -m, -n, 4, -((b*x)/a), -((d*x)/c)]
)/(4*a*c*AppellF1[3, -m, -n, 4, -((b*x)/a), -((d*x)/c)] + b*c*m*x
*AppellF1[4, 1 - m, -n, 5, -((b*x)/a), -((d*x)/c)] + a*d*n*x*Appe
llF1[4, -m, 1 - n, 5, -((b*x)/a), -((d*x)/c)]) + (15*a*c*D*x^4*Ap
pellF1[4, -m, -n, 5, -((b*x)/a), -((d*x)/c)])/(5*a*c*AppellF1[4,
-m, -n, 5, -((b*x)/a), -((d*x)/c)] + b*c*m*x*AppellF1[5, 1 - m, -
n, 6, -((b*x)/a), -((d*x)/c)] + a*d*n*x*AppellF1[5, -m, 1 - n, 6,
 -((b*x)/a), -((d*x)/c)]) + (12*A*(c + d*x)*Hypergeometric2F1[-m,
 1 + n, 2 + n, (b*(c + d*x))/(b*c - a*d)])/(d*(1 + n)*((d*(a + b*
x))/(-(b*c) + a*d))^m)))/12
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

$$\int (bx+a)^m (dx+c)^n \left(Dx^3+Cx^2+Bx+A\right) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^m*(d*x+c)^n*(D*x^3+C*x^2+B*x+A),x)
```

```
[Out] int((b*x+a)^m*(d*x+c)^n*(D*x^3+C*x^2+B*x+A),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Dx^3+Cx^2+Bx+A\right)(bx+a)^m(dx+c)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="maxima")
```

```
[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(Dx^3+Cx^2+Bx+A\right)(bx+a)^m(dx+c)^n, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="fricas")
```

```
[Out] integral((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*(d*x+c)**n*(D*x**3+C*x**2+B*x+A),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Dx^3 + Cx^2 + Bx + A\right)(bx + a)^m (dx + c)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n,x, algorithm="giac")
```

```
[Out] integrate((D*x^3 + C*x^2 + B*x + A)*(b*x + a)^m*(d*x + c)^n, x)
```

3.35 $\int \sqrt{1-dx}\sqrt{1+dx}(e+fx)^3\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=415

$$-\frac{\left(1-d^2x^2\right)^{3/2}(e+fx)^2\left(7d^2f(2Af+Be)-C\left(3d^2e^2-8f^2\right)\right)}{70d^4f}$$
$$+\frac{x\sqrt{1-d^2x^2}\left(8Ad^4e^3+6Ad^2ef^2+6Bd^2e^2f+Bf^3+2Cd^2e^3+3Cef^2\right)}{16d^4}$$
$$+\frac{\left(1-d^2x^2\right)^{3/2}\left(3d^2fx\left(-98Ad^2ef^2-14Bd^2e^2f-35Bf^3+6Cd^2e^3-41Cef^2\right)+8\left(C\left(3d^4e^4-30d^2e^2f^2-8f^4\right)-7d^2f\left(2\right.\right.\right.}{840d^6f}$$
$$+\frac{\sin^{-1}(dx)\left(8Ad^4e^3+6Ad^2ef^2+6Bd^2e^2f+Bf^3+2Cd^2e^3+3Cef^2\right)}{16d^5}$$
$$+\frac{\left(1-d^2x^2\right)^{3/2}(e+fx)^3(3Ce-7Bf)}{42d^2f}-\frac{C\left(1-d^2x^2\right)^{3/2}(e+fx)^4}{7d^2f}$$

```
[Out] ((2*C*d^2*e^3 + 8*A*d^4*e^3 + 6*B*d^2*e^2*f + 3*C*e*f^2 + 6*A*d^2
*e*f^2 + B*f^3)*x*Sqrt[1 - d^2*x^2])/(16*d^4) - ((7*d^2*f*(B*e +
2*A*f) - C*(3*d^2*e^2 - 8*f^2))*(e + f*x)^2*(1 - d^2*x^2)^(3/2))/
(70*d^4*f) + ((3*C*e - 7*B*f)*(e + f*x)^3*(1 - d^2*x^2)^(3/2))/(4
2*d^2*f) - (C*(e + f*x)^4*(1 - d^2*x^2)^(3/2))/(7*d^2*f) + ((8*(C
*(3*d^4*e^4 - 30*d^2*e^2*f^2 - 8*f^4) - 7*d^2*f*(2*A*f*(6*d^2*e^2
 + f^2) + B*(d^2*e^3 + 6*e*f^2))) + 3*d^2*f*(6*C*d^2*e^3 - 14*B*d
^2*e^2*f - 41*C*e*f^2 - 98*A*d^2*e*f^2 - 35*B*f^3)*x)*(1 - d^2*x^
2)^(3/2))/(840*d^6*f) + ((2*C*d^2*e^3 + 8*A*d^4*e^3 + 6*B*d^2*e^2
*f + 3*C*e*f^2 + 6*A*d^2*e*f^2 + B*f^3)*ArcSin[d*x])/(16*d^5)
```

Rubi [A] time = 1.47305, antiderivative size = 415, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.162$

$$-\frac{\left(1-d^2x^2\right)^{3/2}(e+fx)^2\left(7d^2f(2Af+Be)-C\left(3d^2e^2-8f^2\right)\right)}{70d^4f}$$
$$+\frac{x\sqrt{1-d^2x^2}\left(8Ad^4e^3+6Ad^2ef^2+6Bd^2e^2f+Bf^3+2Cd^2e^3+3Cef^2\right)}{16d^4}$$
$$+\frac{\left(1-d^2x^2\right)^{3/2}\left(3d^2fx\left(-98Ad^2ef^2-14Bd^2e^2f-35Bf^3+6Cd^2e^3-41Cef^2\right)+8\left(C\left(3d^4e^4-30d^2e^2f^2-8f^4\right)-7d^2f\left(2\right.\right.\right.}{840d^6f}$$
$$+\frac{\sin^{-1}(dx)\left(8Ad^4e^3+6Ad^2ef^2+6Bd^2e^2f+Bf^3+2Cd^2e^3+3Cef^2\right)}{16d^5}$$
$$+\frac{\left(1-d^2x^2\right)^{3/2}(e+fx)^3(3Ce-7Bf)}{42d^2f}-\frac{C\left(1-d^2x^2\right)^{3/2}(e+fx)^4}{7d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^3*(A + B*x + C*x^2),x]
```

```
[Out] ((2*C*d^2*e^3 + 8*A*d^4*e^3 + 6*B*d^2*e^2*f + 3*C*e*f^2 + 6*A*d^2
*e*f^2 + B*f^3)*x*Sqrt[1 - d^2*x^2])/(16*d^4) - ((7*d^2*f*(B*e +
2*A*f) - C*(3*d^2*e^2 - 8*f^2))*(e + f*x)^2*(1 - d^2*x^2)^(3/2))/
(70*d^4*f) + ((3*C*e - 7*B*f)*(e + f*x)^3*(1 - d^2*x^2)^(3/2))/(4
2*d^2*f) - (C*(e + f*x)^4*(1 - d^2*x^2)^(3/2))/(7*d^2*f) + ((8*(C
*(3*d^4*e^4 - 30*d^2*e^2*f^2 - 8*f^4) - 7*d^2*f*(2*A*f*(6*d^2*e^2
 + f^2) + B*(d^2*e^3 + 6*e*f^2))) + 3*d^2*f*(6*C*d^2*e^3 - 14*B*d
^2*e^2*f - 41*C*e*f^2 - 98*A*d^2*e*f^2 - 35*B*f^3)*x)*(1 - d^2*x^
2)^(3/2))/(840*d^6*f) + ((2*C*d^2*e^3 + 8*A*d^4*e^3 + 6*B*d^2*e^2
*f + 3*C*e*f^2 + 6*A*d^2*e*f^2 + B*f^3)*ArcSin[d*x])/(16*d^5)
```

Rubi in Sympy [A] time = 160.039, size = 415, normalized size = 1.

$$-\frac{C(e+fx)^4\left(-d^2x^2+1\right)^{\frac{3}{2}}}{7d^2f}-\frac{(e+fx)^3(7Bf-3Ce)\left(-d^2x^2+1\right)^{\frac{3}{2}}}{42d^2f}+\frac{x\sqrt{-d^2x^2+1}\left(8Ad^4e^3+6Ad^2ef^2+6Bd^2e^2f+Bf^3+2Cd^2e^3+3Cef^2\right)}{16d^4}-\frac{(e+fx)^2\left(-d^2x^2+1\right)^{\frac{3}{2}}\left(d^2e(7Bf-3Ce)+f^2\left(14Ad^2+8C\right)\right)}{70d^4f}+\frac{\left(8Ad^4e^3+6Ad^2ef^2+6Bd^2e^2f+Bf^3+2Cd^2e^3+3Cef^2\right)\operatorname{asin}(dx)}{16d^5}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}\left(2016Ad^4e^2f^2+336Ad^2f^4+168Bd^4e^3f+1008Bd^2ef^3-72Cd^4e^4+720Cd^2e^2f^2+192Cf^4+9d^2fx\left(98Ad\right.\right.}{2520d^6f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)**3*(C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] -C*(e + f*x)**4*(-d**2*x**2 + 1)**(3/2)/(7*d**2*f) - (e + f*x)**3
*(7*B*f - 3*C*e)*(-d**2*x**2 + 1)**(3/2)/(42*d**2*f) + x*sqrt(-d*
*2*x**2 + 1)*(8*A*d**4*e**3 + 6*A*d**2*e*f**2 + 6*B*d**2*e**2*f +
 B*f**3 + 2*C*d**2*e**3 + 3*C*e*f**2)/(16*d**4) - (e + f*x)**2*(-
d**2*x**2 + 1)**(3/2)*(d**2*e*(7*B*f - 3*C*e) + f**2*(14*A*d**2 +
 8*C))/(70*d**4*f) + (8*A*d**4*e**3 + 6*A*d**2*e*f**2 + 6*B*d**2*
e**2*f + B*f**3 + 2*C*d**2*e**3 + 3*C*e*f**2)*asin(d*x)/(16*d**5)
 - (-d**2*x**2 + 1)**(3/2)*(2016*A*d**4*e**2*f**2 + 336*A*d**2*f*
*4 + 168*B*d**4*e**3*f + 1008*B*d**2*e*f**3 - 72*C*d**4*e**4 + 72
0*C*d**2*e**2*f**2 + 192*C*f**4 + 9*d**2*f*x*(98*A*d**2*e*f**2 +
14*B*d**2*e**2*f + 35*B*f**3 - 6*C*d**2*e**3 + 41*C*e*f**2))/(252
0*d**6*f)
```

Mathematica [A] time = 0.770045, size = 355, normalized size = 0.86

$$\frac{105d\sin^{-1}(dx)\left(8Ad^4e^3+6Ad^2ef^2+6Bd^2e^2f+Bf^3+2Cd^2e^3+3Cef^2\right)+\sqrt{1-d^2x^2}\left(14Ad^2\left(6d^4x\left(10e^3+20e^2fx+15ef\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^3*(A + B*x + C*x^2),x]
```

```
[Out] (Sqrt[1 - d^2*x^2]*(14*A*d^2*(-16*f^3 - d^2*f*(120*e^2 + 45*e*f*x
 + 8*f^2*x^2) + 6*d^4*x*(10*e^3 + 20*e^2*f*x + 15*e*f^2*x^2 + 4*f
^3*x^3)) + 7*B*(-3*d^2*f^2*(32*e + 5*f*x) - 2*d^4*(40*e^3 + 45*e^
2*f*x + 24*e*f^2*x^2 + 5*f^3*x^3) + 4*d^6*x^2*(20*e^3 + 45*e^2*f*
x + 36*e*f^2*x^2 + 10*f^3*x^3)) - C*(128*f^3 + d^2*f*(672*e^2 + 3
15*e*f*x + 64*f^2*x^2) + 6*d^4*x*(35*e^3 + 56*e^2*f*x + 35*e*f^2*
x^2 + 8*f^3*x^3) - 12*d^6*x^3*(35*e^3 + 84*e^2*f*x + 70*e*f^2*x^2
 + 20*f^3*x^3))) + 105*d*(2*C*d^2*e^3 + 8*A*d^4*e^3 + 6*B*d^2*e^2
*f + 3*C*e*f^2 + 6*A*d^2*e*f^2 + B*f^3)*ArcSin[d*x])/(1680*d^6)
```

Maple [C] time = 0.042, size = 959, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)^3*(C*x^2+B*x+A)*(-d*x+1)^(1/2)*(d*x+1)^(1/2),x)
```

```
[Out] 1/1680*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(-128*C*(-d^2*x^2+1)^(1/2)*cs
gn(d)*f^3+840*A*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^5*e^3+21
0*C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^3*e^3+105*B*arctan(c
sgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*f^3-560*B*(-d^2*x^2+1)^(1/2)*csg
n(d)*d^4*e^3-630*A*(-d^2*x^2+1)^(1/2)*csgn(d)*x*d^4*e*f^2-630*B*(
-d^2*x^2+1)^(1/2)*csgn(d)*x*d^4*e^2*f-315*C*(-d^2*x^2+1)^(1/2)*cs
gn(d)*x*d^2*e*f^2+1260*A*csgn(d)*x^3*d^6*e*f^2*(-d^2*x^2+1)^(1/2)
-336*C*(-d^2*x^2+1)^(1/2)*csgn(d)*x^2*d^4*e^2*f+840*C*csgn(d)*x^5
*d^6*e*f^2*(-d^2*x^2+1)^(1/2)+1008*B*csgn(d)*x^4*d^6*e*f^2*(-d^2*
x^2+1)^(1/2)+1008*C*csgn(d)*x^4*d^6*e^2*f*(-d^2*x^2+1)^(1/2)+1260
*B*csgn(d)*x^3*d^6*e^2*f*(-d^2*x^2+1)^(1/2)+1680*A*csgn(d)*x^2*d^
6*e^2*f*(-d^2*x^2+1)^(1/2)-210*C*(-d^2*x^2+1)^(1/2)*csgn(d)*x^3*d
^4*e*f^2-336*B*(-d^2*x^2+1)^(1/2)*csgn(d)*x^2*d^4*e*f^2-224*A*(-d
^2*x^2+1)^(1/2)*csgn(d)*d^2*f^3+630*A*arctan(csgn(d)*d*x/(-d^2*x^
2+1)^(1/2))*d^3*e*f^2+630*B*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2)
)*d^3*e^2*f+315*C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*e*f^2+
840*A*(-d^2*x^2+1)^(1/2)*csgn(d)*x*d^6*e^3-210*C*(-d^2*x^2+1)^(1/
2)*csgn(d)*x*d^4*e^3-105*B*(-d^2*x^2+1)^(1/2)*csgn(d)*x*d^2*f^3+2
40*C*csgn(d)*x^6*d^6*f^3*(-d^2*x^2+1)^(1/2)+280*B*csgn(d)*x^5*d^6
*f^3*(-d^2*x^2+1)^(1/2)+336*A*csgn(d)*x^4*d^6*f^3*(-d^2*x^2+1)^(1
/2)+420*C*csgn(d)*x^3*d^6*e^3*(-d^2*x^2+1)^(1/2)+560*B*csgn(d)*x^
2*d^6*e^3*(-d^2*x^2+1)^(1/2)-48*C*(-d^2*x^2+1)^(1/2)*csgn(d)*x^4*
d^4*f^3-70*B*(-d^2*x^2+1)^(1/2)*csgn(d)*x^3*d^4*f^3-112*A*(-d^2*x
^2+1)^(1/2)*csgn(d)*x^2*d^4*f^3-1680*A*(-d^2*x^2+1)^(1/2)*csgn(d)
*d^4*e^2*f-64*C*(-d^2*x^2+1)^(1/2)*csgn(d)*x^2*d^2*f^3-672*B*(-d^
2*x^2+1)^(1/2)*csgn(d)*d^2*e*f^2-672*C*(-d^2*x^2+1)^(1/2)*csgn(d)
*d^2*e^2*f)*csgn(d)/d^6/(-d^2*x^2+1)^(1/2)
```

Maxima [A] time = 1.50095, size = 644, normalized size = 1.55

$$-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Cf^3x^4}{7\,d^2}+\frac{1}{2}\sqrt{-d^2x^2+1}Ae^3x+\frac{Ae^3\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\sqrt{d^2}}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Be^3}{3\,d^2}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Ae^2f}{d^2}-\frac{4\left(-d^2x^2+1\right)^{\frac{3}{2}}Cf^3x^2}{35\,d^4}-\frac{\left(3\,Cef^2+Bf^3\right)\left(-d^2x^2+1\right)^{\frac{3}{2}}x^3}{6\,d^2}-\frac{\left(3\,Ce^2f+3\,Bef^2+Af^3\right)\left(-d^2x^2+1\right)^{\frac{3}{2}}x^2}{5\,d^2}-\frac{\left(Ce^3+3\,Be^2f+3\,Aef^2\right)\left(-d^2x^2+1\right)^{\frac{3}{2}}x}{4\,d^2}+\frac{\left(Ce^3+3\,Be^2f+3\,Aef^2\right)\sqrt{-d^2x^2+1}x}{8\,d^2}-\frac{8\left(-d^2x^2+1\right)^{\frac{3}{2}}Cf^3}{105\,d^6}-\frac{\left(3\,Cef^2+Bf^3\right)\left(-d^2x^2+1\right)^{\frac{3}{2}}x}{8\,d^4}+\frac{\left(Ce^3+3\,Be^2f+3\,Aef^2\right)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{8\sqrt{d^2}d^2}-\frac{2\left(3\,Ce^2f+3\,Bef^2+Af^3\right)\left(-d^2x^2+1\right)^{\frac{3}{2}}}{15\,d^4}+\frac{\left(3\,Cef^2+Bf^3\right)\sqrt{-d^2x^2+1}x}{16\,d^4}+\frac{\left(3\,Cef^2+Bf^3\right)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{16\sqrt{d^2}d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3,x, algorithm=
```

```
[Out] -1/7*(-d^2*x^2 + 1)^(3/2)*C*f^3*x^4/d^2 + 1/2*sqrt(-d^2*x^2 + 1)*
A*e^3*x + 1/2*A*e^3*arcsin(d^2*x/sqrt(d^2))/sqrt(d^2) - 1/3*(-d^2
*x^2 + 1)^(3/2)*B*e^3/d^2 - (-d^2*x^2 + 1)^(3/2)*A*e^2*f/d^2 - 4/
35*(-d^2*x^2 + 1)^(3/2)*C*f^3*x^2/d^4 - 1/6*(3*C*e*f^2 + B*f^3)*(
-d^2*x^2 + 1)^(3/2)*x^3/d^2 - 1/5*(3*C*e^2*f + 3*B*e*f^2 + A*f^3)
*(-d^2*x^2 + 1)^(3/2)*x^2/d^2 - 1/4*(C*e^3 + 3*B*e^2*f + 3*A*e*f^
2)*(-d^2*x^2 + 1)^(3/2)*x/d^2 + 1/8*(C*e^3 + 3*B*e^2*f + 3*A*e*f^
2)*sqrt(-d^2*x^2 + 1)*x/d^2 - 8/105*(-d^2*x^2 + 1)^(3/2)*C*f^3/d^
6 - 1/8*(3*C*e*f^2 + B*f^3)*(-d^2*x^2 + 1)^(3/2)*x/d^4 + 1/8*(C*e
^3 + 3*B*e^2*f + 3*A*e*f^2)*arcsin(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^
2) - 2/15*(3*C*e^2*f + 3*B*e*f^2 + A*f^3)*(-d^2*x^2 + 1)^(3/2)/d^
4 + 1/16*(3*C*e*f^2 + B*f^3)*sqrt(-d^2*x^2 + 1)*x/d^4 + 1/16*(3*C
*e*f^2 + B*f^3)*arcsin(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^4)
```

Fricas [A] time = 0.261212, size = 2512, normalized size = 6.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3,x, algorithm=
```

```
[Out] 1/1680*(240*C*d^13*f^3*x^14 + 280*(3*C*d^13*e*f^2 + B*d^13*f^3)*x
^13 + 336*(3*C*d^13*e^2*f + 3*B*d^13*e*f^2 + (A*d^13 - 18*C*d^11)
```

```
*f^3)*x^12 + 70*(6*C*d^13*e^3 + 18*B*d^13*e^2*f - 101*B*d^11*f^3
+ 3*(6*A*d^13 - 101*C*d^11)*e*f^2)*x^11 + 112*(5*B*d^13*e^3 - 228
*B*d^11*e*f^2 + 3*(5*A*d^13 - 76*C*d^11)*e^2*f - (76*A*d^11 - 233
*C*d^9)*f^3)*x^10 - 105*(306*B*d^11*e^2*f - 293*B*d^9*f^3 - 2*(4*
A*d^13 - 51*C*d^11)*e^3 + 3*(102*A*d^11 - 293*C*d^9)*e*f^2)*x^9 -
 560*(26*B*d^11*e^3 - 201*B*d^9*e*f^2 + 3*(26*A*d^11 - 67*C*d^9)*
e^2*f - (67*A*d^9 - 68*C*d^7)*f^3)*x^8 + 35*(4194*B*d^9*e^2*f - 1
285*B*d^7*f^3 - 6*(100*A*d^11 - 233*C*d^9)*e^3 + 3*(1398*A*d^9 -
1285*C*d^7)*e*f^2)*x^7 + 1120*(61*B*d^9*e^3 - 150*B*d^7*e*f^2 + 3
*(61*A*d^9 - 50*C*d^7)*e^2*f - 2*(25*A*d^7 - 8*C*d^5)*f^3)*x^6 -
280*(882*B*d^7*e^2*f - 61*B*d^5*f^3 - 6*(52*A*d^9 - 49*C*d^7)*e^3
 + 3*(294*A*d^7 - 61*C*d^5)*e*f^2)*x^5 - 26880*(4*B*d^7*e^3 - 3*B
*d^5*e*f^2 - A*d^5*f^3 + 3*(4*A*d^7 - C*d^5)*e^2*f)*x^4 + 560*(30
6*B*d^5*e^2*f + 19*B*d^3*f^3 - 6*(36*A*d^7 - 17*C*d^5)*e^3 + 3*(1
02*A*d^5 + 19*C*d^3)*e*f^2)*x^3 + 53760*(B*d^5*e^3 + 3*A*d^5*e^2*
f)*x^2 + 7*(240*C*d^11*f^3*x^12 + 280*(3*C*d^11*e*f^2 + B*d^11*f^
3)*x^11 + 48*(21*C*d^11*e^2*f + 21*B*d^11*e*f^2 + (7*A*d^11 - 41*
C*d^9)*f^3)*x^10 + 210*(2*C*d^11*e^3 + 6*B*d^11*e^2*f - 11*B*d^9*
f^3 + 3*(2*A*d^11 - 11*C*d^9)*e*f^2)*x^9 + 80*(7*B*d^11*e^3 - 105
*B*d^9*e*f^2 + 21*(A*d^11 - 5*C*d^9)*e^2*f - (35*A*d^9 - 52*C*d^7
)*f^3)*x^8 - 105*(102*B*d^9*e^2*f - 47*B*d^7*f^3 - 2*(4*A*d^11 -
17*C*d^9)*e^3 + 3*(34*A*d^9 - 47*C*d^7)*e*f^2)*x^7 - 160*(31*B*d^
9*e^3 - 114*B*d^7*e*f^2 + 3*(31*A*d^9 - 38*C*d^7)*e^2*f - 2*(19*A
*d^7 - 8*C*d^5)*f^3)*x^6 + 40*(630*B*d^7*e^2*f - 71*B*d^5*f^3 - 4
2*(4*A*d^9 - 5*C*d^7)*e^3 + 3*(210*A*d^7 - 71*C*d^5)*e*f^2)*x^5 +
 3840*(3*B*d^7*e^3 - 3*B*d^5*e*f^2 - A*d^5*f^3 + 3*(3*A*d^7 - C*d
^5)*e^2*f)*x^4 - 80*(270*B*d^5*e^2*f + 13*B*d^3*f^3 - 6*(28*A*d^7
 - 15*C*d^5)*e^3 + 3*(90*A*d^5 + 13*C*d^3)*e*f^2)*x^3 - 7680*(B*d
^5*e^3 + 3*A*d^5*e^2*f)*x^2 + 960*(6*B*d^3*e^2*f + B*d*f^3 - 2*(4
*A*d^5 - C*d^3)*e^3 + 3*(2*A*d^3 + C*d)*e*f^2)*x)*sqrt(d*x + 1)*s
qrt(-d*x + 1) - 6720*(6*B*d^3*e^2*f + B*d*f^3 - 2*(4*A*d^5 - C*d^
3)*e^3 + 3*(2*A*d^3 + C*d)*e*f^2)*x - 210*(7*(6*B*d^8*e^2*f + B*d
^6*f^3 + 2*(4*A*d^10 + C*d^8)*e^3 + 3*(2*A*d^8 + C*d^6)*e*f^2)*x^
6 - 384*B*d^2*e^2*f - 56*(6*B*d^6*e^2*f + B*d^4*f^3 + 2*(4*A*d^8
+ C*d^6)*e^3 + 3*(2*A*d^6 + C*d^4)*e*f^2)*x^4 - 128*(4*A*d^4 + C*
d^2)*e^3 - 192*(2*A*d^2 + C)*e*f^2 - 64*B*f^3 + 112*(6*B*d^4*e^2*
f + B*d^2*f^3 + 2*(4*A*d^6 + C*d^4)*e^3 + 3*(2*A*d^4 + C*d^2)*e*f
^2)*x^2 - ((6*B*d^8*e^2*f + B*d^6*f^3 + 2*(4*A*d^10 + C*d^8)*e^3
+ 3*(2*A*d^8 + C*d^6)*e*f^2)*x^6 - 384*B*d^2*e^2*f - 24*(6*B*d^6*
e^2*f + B*d^4*f^3 + 2*(4*A*d^8 + C*d^6)*e^3 + 3*(2*A*d^6 + C*d^4)
*e*f^2)*x^4 - 128*(4*A*d^4 + C*d^2)*e^3 - 192*(2*A*d^2 + C)*e*f^2
 - 64*B*f^3 + 80*(6*B*d^4*e^2*f + B*d^2*f^3 + 2*(4*A*d^6 + C*d^4)
*e^3 + 3*(2*A*d^4 + C*d^2)*e*f^2)*x^2)*sqrt(d*x + 1)*sqrt(-d*x +
1))*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(7*d^11*x^6
 - 56*d^9*x^4 + 112*d^7*x^2 - 64*d^5 - (d^11*x^6 - 24*d^9*x^4 + 8
0*d^7*x^2 - 64*d^5)*sqrt(d*x + 1)*sqrt(-d*x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**3*(C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.317627, size = 1, normalized size = 0.

$$\text{Done}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3,x, algorithm=
```

```
[Out] Done
```

3.36 $\int \sqrt{1-dx}\sqrt{1+dx}(e+fx)^2\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=286

$$\frac{\sin^{-1}(dx)\left(2d^2\left(A\left(4d^2e^2+f^2\right)+2Bef\right)+C\left(2d^2e^2+f^2\right)\right)}{16d^5}+\frac{x\sqrt{1-d^2x^2}\left(2d^2\left(A\left(4d^2e^2+f^2\right)+2Bef\right)+C\left(2d^2e^2+f^2\right)\right)}{16d^4}+\frac{\left(1-d^2x^2\right)^{3/2}\left(8\left(C\left(d^2e^3-4ef^2\right)-2f\left(5Ad^2ef+B\left(d^2e^2+f^2\right)\right)\right)-3fx\left(5f^2\left(2Ad^2+C\right)-2d^2e(Ce-2Bf)\right)\right)}{120d^4f}+\frac{\left(1-d^2x^2\right)^{3/2}(e+fx)^2(Ce-2Bf)}{10d^2f}-\frac{C\left(1-d^2x^2\right)^{3/2}(e+fx)^3}{6d^2f}$$

```
[Out] ((C*(2*d^2*e^2 + f^2) + 2*d^2*(2*B*e*f + A*(4*d^2*e^2 + f^2)))*x*
Sqrt[1 - d^2*x^2])/(16*d^4) + ((C*e - 2*B*f)*(e + f*x)^2*(1 - d^2
*x^2)^(3/2))/(10*d^2*f) - (C*(e + f*x)^3*(1 - d^2*x^2)^(3/2))/(6*
d^2*f) + ((8*(C*(d^2*e^3 - 4*e*f^2) - 2*f*(5*A*d^2*e*f + B*(d^2*e
^2 + f^2))) - 3*f*(5*(C + 2*A*d^2)*f^2 - 2*d^2*e*(C*e - 2*B*f))*x
)*(1 - d^2*x^2)^(3/2))/(120*d^4*f) + ((C*(2*d^2*e^2 + f^2) + 2*d^
2*(2*B*e*f + A*(4*d^2*e^2 + f^2)))*ArcSin[d*x])/(16*d^5)
```

Rubi [A] time = 1.18619, antiderivative size = 286, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.162

$$\frac{\sin^{-1}(dx)\left(2d^2\left(A\left(4d^2e^2+f^2\right)+2Bef\right)+C\left(2d^2e^2+f^2\right)\right)}{16d^5}+\frac{x\sqrt{1-d^2x^2}\left(2d^2\left(A\left(4d^2e^2+f^2\right)+2Bef\right)+C\left(2d^2e^2+f^2\right)\right)}{16d^4}+\frac{\left(1-d^2x^2\right)^{3/2}\left(8\left(C\left(d^2e^3-4ef^2\right)-2f\left(5Ad^2ef+B\left(d^2e^2+f^2\right)\right)\right)-3fx\left(5f^2\left(2Ad^2+C\right)-2d^2e(Ce-2Bf)\right)\right)}{120d^4f}+\frac{\left(1-d^2x^2\right)^{3/2}(e+fx)^2(Ce-2Bf)}{10d^2f}-\frac{C\left(1-d^2x^2\right)^{3/2}(e+fx)^3}{6d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^2*(A + B*x + C*x^2),x]
```


```
[Out] ((C*(2*d^2*e^2 + f^2) + 2*d^2*(2*B*e*f + A*(4*d^2*e^2 + f^2)))*x*
Sqrt[1 - d^2*x^2])/(16*d^4) + ((C*e - 2*B*f)*(e + f*x)^2*(1 - d^2
*x^2)^(3/2))/(10*d^2*f) - (C*(e + f*x)^3*(1 - d^2*x^2)^(3/2))/(6*
d^2*f) + ((8*(C*(d^2*e^3 - 4*e*f^2) - 2*f*(5*A*d^2*e*f + B*(d^2*e
^2 + f^2))) - 3*f*(5*(C + 2*A*d^2)*f^2 - 2*d^2*e*(C*e - 2*B*f))*x
)*(1 - d^2*x^2)^(3/2))/(120*d^4*f) + ((C*(2*d^2*e^2 + f^2) + 2*d^
2*(2*B*e*f + A*(4*d^2*e^2 + f^2)))*ArcSin[d*x])/(16*d^5)
```

Rubi in Sympy [A] time = 94.0848, size = 282, normalized size = 0.99

$$-\frac{C(e+fx)^3\left(-d^2x^2+1\right)^{\frac{3}{2}}}{6d^2f}-\frac{(e+fx)^2(2Bf-Ce)\left(-d^2x^2+1\right)^{\frac{3}{2}}}{10d^2f}+\frac{x\sqrt{-d^2x^2+1}\left(8Ad^4e^2+2Ad^2f^2+4Bd^2ef+2Cd^2e^2+Cf^2\right)}{16d^4}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}\left(240Ad^2ef^2+48Bd^2e^2f+48Bf^3-24Cd^2e^3+96Cef^2+9fx\left(2d^2e(2Bf-Ce)+5f^2\left(2Ad^2+C\right)\right)\right)}{360d^4f}+\frac{\left(8Ad^4e^2+2Ad^2f^2+4Bd^2ef+2Cd^2e^2+Cf^2\right)\operatorname{asin}(dx)}{16d^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)**2*(C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] -C*(e + f*x)**3*(-d**2*x**2 + 1)**(3/2)/(6*d**2*f) - (e + f*x)**2
*(2*B*f - C*e)*(-d**2*x**2 + 1)**(3/2)/(10*d**2*f) + x*sqrt(-d**2
*x**2 + 1)*(8*A*d**4*e**2 + 2*A*d**2*f**2 + 4*B*d**2*e*f + 2*C*d*
*2*e**2 + C*f**2)/(16*d**4) - (-d**2*x**2 + 1)**(3/2)*(240*A*d**2
*e*f**2 + 48*B*d**2*e**2*f + 48*B*f**3 - 24*C*d**2*e**3 + 96*C*e*
f**2 + 9*f*x*(2*d**2*e*(2*B*f - C*e) + 5*f**2*(2*A*d**2 + C)))/(3
60*d**4*f) + (8*A*d**4*e**2 + 2*A*d**2*f**2 + 4*B*d**2*e*f + 2*C*
d**2*e**2 + C*f**2)*asin(d*x)/(16*d**5)
```

Mathematica [A] time = 0.456678, size = 243, normalized size = 0.85

$$\frac{15\sin^{-1}(dx)\left(2d^2\left(A\left(4d^2e^2+f^2\right)+2Bef\right)+C\left(2d^2e^2+f^2\right)\right)-d\sqrt{1-d^2x^2}\left(-10Ad^2\left(12d^2e^2x+16ef\left(d^2x^2-1\right)+3f^2x\left(\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^2*(A + B*x + C*x^2),x]
```

```
[Out] (-(d*Sqrt[1 - d^2*x^2]*(-10*A*d^2*(12*d^2*e^2*x + 16*e*f*(-1 + d^
2*x^2) + 3*f^2*x*(-1 + 2*d^2*x^2)) + 4*B*(8*f^2 + d^2*(20*e^2 + 1
5*e*f*x + 4*f^2*x^2) - 2*d^4*x^2*(10*e^2 + 15*e*f*x + 6*f^2*x^2))
 + C*(e^2*(30*d^2*x - 60*d^4*x^3) + 5*f^2*x*(3 + 2*d^2*x^2 - 8*d^
4*x^4) + 32*e*f*(2 + d^2*x^2 - 3*d^4*x^4)))) + 15*(C*(2*d^2*e^2 +
 f^2) + 2*d^2*(2*B*e*f + A*(4*d^2*e^2 + f^2)))*ArcSin[d*x])/(240*
d^5)
```

Maple [C] time = 0.022, size = 652, normalized size = 2.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((f*x+e)^2*(C*x^2+B*x+A)*(-d*x+1)^(1/2)*(d*x+1)^(1/2),x)
```

```
[Out] 1/240*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(120*A*e^2*arctan(csgn(d)*d*x/
(-d^2*x^2+1)^(1/2))*d^4+30*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))
*A*f^2*d^2+30*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*C*e^2*d^2+15
*C*f^2*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))-32*B*csgn(d)*d*(-d^
2*x^2+1)^(1/2)*f^2+60*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*B*e*
f*d^2-80*B*csgn(d)*d^3*(-d^2*x^2+1)^(1/2)*e^2-60*x*(-d^2*x^2+1)^(
1/2)*B*e*f*d^3*csgn(d)+96*C*csgn(d)*x^4*d^5*e*f*(-d^2*x^2+1)^(1/2
)+120*B*csgn(d)*x^3*d^5*e*f*(-d^2*x^2+1)^(1/2)+160*A*csgn(d)*x^2*
d^5*e*f*(-d^2*x^2+1)^(1/2)-32*C*csgn(d)*d^3*(-d^2*x^2+1)^(1/2)*x^
2*e*f+40*C*csgn(d)*x^5*d^5*f^2*(-d^2*x^2+1)^(1/2)+48*B*csgn(d)*x^
4*d^5*f^2*(-d^2*x^2+1)^(1/2)+60*A*csgn(d)*x^3*d^5*f^2*(-d^2*x^2+1
)^(1/2)+60*C*csgn(d)*x^3*d^5*e^2*(-d^2*x^2+1)^(1/2)+80*B*csgn(d)*
x^2*d^5*e^2*(-d^2*x^2+1)^(1/2)-10*C*f^2*x^3*(-d^2*x^2+1)^(1/2)*d^
3*csgn(d)-16*B*csgn(d)*d^3*(-d^2*x^2+1)^(1/2)*x^2*f^2-160*A*csgn(
d)*d^3*(-d^2*x^2+1)^(1/2)*e*f-64*C*csgn(d)*d*(-d^2*x^2+1)^(1/2)*e
*f+120*A*e^2*x*(-d^2*x^2+1)^(1/2)*d^5*csgn(d)-30*x*(-d^2*x^2+1)^(
1/2)*A*f^2*d^3*csgn(d)-30*x*(-d^2*x^2+1)^(1/2)*C*e^2*d^3*csgn(d)-
15*C*f^2*x*(-d^2*x^2+1)^(1/2)*csgn(d)*d)*csgn(d)/(-d^2*x^2+1)^(1/
2)/d^5
```

Maxima [A] time = 1.50157, size = 459, normalized size = 1.6

$$
\begin{aligned}
&-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Cf^2x^3}{6\,d^2}+\frac{1}{2}\sqrt{-d^2x^2+1}Ae^2x+\frac{Ae^2\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\sqrt{d^2}}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Be^2}{3\,d^2}\\
&-\frac{2\left(-d^2x^2+1\right)^{\frac{3}{2}}Aef}{3\,d^2}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}\left(2\,Cef+Bf^2\right)x^2}{5\,d^2}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}\left(Ce^2+2\,Bef+Af^2\right)x}{4\,d^2}\\
&-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Cf^2x}{8\,d^4}+\frac{\sqrt{-d^2x^2+1}\left(Ce^2+2\,Bef+Af^2\right)x}{8\,d^2}+\frac{\sqrt{-d^2x^2+1}Cf^2x}{16\,d^4}\\
&+\frac{\left(Ce^2+2\,Bef+Af^2\right)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{8\sqrt{d^2}d^2}+\frac{Cf^2\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{16\sqrt{d^2}d^4}-\frac{2\left(-d^2x^2+1\right)^{\frac{3}{2}}\left(2\,Cef+Bf^2\right)}{15\,d^4}
\end{aligned}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2,x, algorithm=
```

```
[Out] -1/6*(-d^2*x^2 + 1)^(3/2)*C*f^2*x^3/d^2 + 1/2*sqrt(-d^2*x^2 + 1)*
A*e^2*x + 1/2*A*e^2*arcsin(d^2*x/sqrt(d^2))/sqrt(d^2) - 1/3*(-d^2
*x^2 + 1)^(3/2)*B*e^2/d^2 - 2/3*(-d^2*x^2 + 1)^(3/2)*A*e*f/d^2 -
1/5*(-d^2*x^2 + 1)^(3/2)*(2*C*e*f + B*f^2)*x^2/d^2 - 1/4*(-d^2*x^
2 + 1)^(3/2)*(C*e^2 + 2*B*e*f + A*f^2)*x/d^2 - 1/8*(-d^2*x^2 + 1)
^(3/2)*C*f^2*x/d^4 + 1/8*sqrt(-d^2*x^2 + 1)*(C*e^2 + 2*B*e*f + A*
f^2)*x/d^2 + 1/16*sqrt(-d^2*x^2 + 1)*C*f^2*x/d^4 + 1/8*(C*e^2 + 2
*B*e*f + A*f^2)*arcsin(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^2) + 1/16*C*
```

```
f^2*arcsin(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^4) - 2/15*(-d^2*x^2 + 1)
^(3/2)*(2*C*e*f + B*f^2)/d^4
```

Fricas [A] time = 0.24753, size = 1705, normalized size = 5.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2,x, algorithm=
```

```
[Out] -1/240*(240*C*d^11*f^2*x^11 + 288*(2*C*d^11*e*f + B*d^11*f^2)*x^1
0 + 20*(18*C*d^11*e^2 + 36*B*d^11*e*f + (18*A*d^11 - 79*C*d^9)*f^
2)*x^9 + 480*(B*d^11*e^2 - 4*B*d^9*f^2 + 2*(A*d^11 - 4*C*d^9)*e*f
)*x^8 - 30*(164*B*d^9*e*f - 2*(12*A*d^11 - 41*C*d^9)*e^2 + (82*A*
d^9 - 95*C*d^7)*f^2)*x^7 - 80*(43*B*d^9*e^2 - 44*B*d^7*f^2 + 2*(4
3*A*d^9 - 44*C*d^7)*e*f)*x^6 + 30*(332*B*d^7*e*f - 2*(76*A*d^9 -
83*C*d^7)*e^2 + (166*A*d^7 - 45*C*d^5)*f^2)*x^5 + 960*(7*B*d^7*e^
2 - 2*B*d^5*f^2 + 2*(7*A*d^7 - 2*C*d^5)*e*f)*x^4 - 640*(12*B*d^5*
e*f - 6*(2*A*d^7 - C*d^5)*e^2 + (6*A*d^5 + C*d^3)*f^2)*x^3 - 3840
*(B*d^5*e^2 + 2*A*d^5*e*f)*x^2 - (40*C*d^11*f^2*x^11 + 48*(2*C*d^
11*e*f + B*d^11*f^2)*x^10 + 10*(6*C*d^11*e^2 + 12*B*d^11*e*f + (6
*A*d^11 - 73*C*d^9)*f^2)*x^9 + 80*(B*d^11*e^2 - 11*B*d^9*f^2 + 2*
(A*d^11 - 11*C*d^9)*e*f)*x^8 - 15*(148*B*d^9*e*f - 2*(4*A*d^11 -
37*C*d^9)*e^2 + (74*A*d^9 - 139*C*d^7)*f^2)*x^7 - 80*(19*B*d^9*e^
2 - 32*B*d^7*f^2 + 2*(19*A*d^9 - 32*C*d^7)*e*f)*x^6 + 10*(684*B*d
^7*e*f - 18*(12*A*d^9 - 19*C*d^7)*e^2 + (342*A*d^7 - 149*C*d^5)*f
^2)*x^5 + 960*(5*B*d^7*e^2 - 2*B*d^5*f^2 + 2*(5*A*d^7 - 2*C*d^5)*
e*f)*x^4 - 80*(84*B*d^5*e*f - 6*(12*A*d^7 - 7*C*d^5)*e^2 + (42*A*
d^5 + 5*C*d^3)*f^2)*x^3 - 3840*(B*d^5*e^2 + 2*A*d^5*e*f)*x^2 + 48
0*(4*B*d^3*e*f - 2*(4*A*d^5 - C*d^3)*e^2 + (2*A*d^3 + C*d)*f^2)*x
)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 480*(4*B*d^3*e*f - 2*(4*A*d^5 -
C*d^3)*e^2 + (2*A*d^3 + C*d)*f^2)*x + 30*((4*B*d^8*e*f + 2*(4*A*d
^10 + C*d^8)*e^2 + (2*A*d^8 + C*d^6)*f^2)*x^6 - 128*B*d^2*e*f - 1
8*(4*B*d^6*e*f + 2*(4*A*d^8 + C*d^6)*e^2 + (2*A*d^6 + C*d^4)*f^2)
*x^4 - 64*(4*A*d^4 + C*d^2)*e^2 - 32*(2*A*d^2 + C)*f^2 + 48*(4*B*
d^4*e*f + 2*(4*A*d^6 + C*d^4)*e^2 + (2*A*d^4 + C*d^2)*f^2)*x^2 +
2*(64*B*d^2*e*f + 3*(4*B*d^6*e*f + 2*(4*A*d^8 + C*d^6)*e^2 + (2*A
*d^6 + C*d^4)*f^2)*x^4 + 32*(4*A*d^4 + C*d^2)*e^2 + 16*(2*A*d^2 +
 C)*f^2 - 16*(4*B*d^4*e*f + 2*(4*A*d^6 + C*d^4)*e^2 + (2*A*d^4 +
C*d^2)*f^2)*x^2)*sqrt(d*x + 1)*sqrt(-d*x + 1))*arctan((sqrt(d*x +
 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(d^11*x^6 - 18*d^9*x^4 + 48*d^7*x
^2 - 32*d^5 + 2*(3*d^9*x^4 - 16*d^7*x^2 + 16*d^5)*sqrt(d*x + 1)*s
qrt(-d*x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x+e)**2*(C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A]   time = 0.2736, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2,x, algorithm=
```

```
[Out] Done
```

3.37 $\int \sqrt{1-dx}\sqrt{1+dx}(e+fx)\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=168

$$\frac{x\sqrt{1-d^2x^2}\left(4Ad^2e+Bf+Ce\right)}{8d^2}-\frac{\left(1-d^2x^2\right)^{3/2}\left(4\left(5d^2f(Af+Be)-C\left(3d^2e^2-2f^2\right)\right)-3d^2fx(3Ce-5Bf)\right)}{60d^4f}+\frac{\sin^{-1}(dx)\left(4Ad^2e+Bf+Ce\right)}{8d^3}-\frac{C\left(1-d^2x^2\right)^{3/2}(e+fx)^2}{5d^2f}$$

```
[Out] ((C*e + 4*A*d^2*e + B*f)*x*Sqrt[1 - d^2*x^2])/(8*d^2) - (C*(e + f
*x)^2*(1 - d^2*x^2)^(3/2))/(5*d^2*f) - ((4*(5*d^2*f*(B*e + A*f) -
 C*(3*d^2*e^2 - 2*f^2)) - 3*d^2*f*(3*C*e - 5*B*f)*x)*(1 - d^2*x^2
)^(3/2))/(60*d^4*f) + ((C*e + 4*A*d^2*e + B*f)*ArcSin[d*x])/(8*d^
3)
```

Rubi [A] time = 0.498443, antiderivative size = 170, normalized size of antiderivative = 1.01, number of steps used = 5, number of rules used = 5, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}=0.143$

$$\frac{x\sqrt{1-d^2x^2}\left(4Ad^2e+Bf+Ce\right)}{8d^2}-\frac{\left(1-d^2x^2\right)^{3/2}\left(4\left(5d^2f(Af+Be)-C\left(3d^2e^2-2f^2\right)\right)-3d^2fx(3Ce-5Bf)\right)}{60d^4f}+\frac{\sin^{-1}(dx)\left(4Ad^2e+Bf+Ce\right)}{8d^3}-\frac{C\left(1-d^2x^2\right)^{3/2}(e+fx)^2}{5d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)*(A + B*x + C*x^2),x]
```

```
[Out] ((C*e + 4*A*d^2*e + B*f)*x*Sqrt[1 - d^2*x^2])/(8*d^2) - (C*(e + f
*x)^2*(1 - d^2*x^2)^(3/2))/(5*d^2*f) - ((4*(5*d^2*f*(B*e + A*f) -
 C*(3*d^2*e^2 - 2*f^2)) - 3*d^2*f*(3*C*e - 5*B*f)*x)*(1 - d^2*x^2
)^(3/2))/(60*d^4*f) + ((C*e + 4*A*d^2*e + B*f)*ArcSin[d*x])/(8*d^
3)
```

Rubi in Sympy [A] time = 45.9748, size = 155, normalized size = 0.92

$$-\frac{C(e+fx)^2\left(-d^2x^2+1\right)^{\frac{3}{2}}}{5d^2f}+\frac{x\sqrt{-d^2x^2+1}\left(4Ad^2e+Bf+Ce\right)}{8d^2}+\frac{\left(4Ad^2e+Bf+Ce\right)\operatorname{asin}(dx)}{8d^3}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}\left(4d^2e(5Bf-3Ce)+3d^2fx(5Bf-3Ce)+4f^2\left(5Ad^2+2C\right)\right)}{60d^4f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x+e)*(C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] -C*(e + f*x)**2*(-d**2*x**2 + 1)**(3/2)/(5*d**2*f) + x*sqrt(-d**2
*x**2 + 1)*(4*A*d**2*e + B*f + C*e)/(8*d**2) + (4*A*d**2*e + B*f
+ C*e)*asin(d*x)/(8*d**3) - (-d**2*x**2 + 1)**(3/2)*(4*d**2*e*(5*
B*f - 3*C*e) + 3*d**2*f*x*(5*B*f - 3*C*e) + 4*f**2*(5*A*d**2 + 2*
C))/(60*d**4*f)
```

Mathematica [A] time = 0.2406, size = 138, normalized size = 0.82

$$\frac{15d\sin^{-1}(dx)\left(4Ad^2e+Bf+Ce\right)+\sqrt{1-d^2x^2}\left(8d^2x^2\left(5Ad^2f+5Bd^2e-Cf\right)-15d^2x\left(-4Ad^2e+Bf+Ce\right)-8\left(5Ad^2f+5\right.\right.}{120d^4}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)*(A + B*x + C*x^2),x]
```

```
[Out] (Sqrt[1 - d^2*x^2]*(-8*(5*B*d^2*e + 2*C*f + 5*A*d^2*f) - 15*d^2*(
C*e - 4*A*d^2*e + B*f)*x + 8*d^2*(5*B*d^2*e - C*f + 5*A*d^2*f)*x^
2 + 30*d^4*(C*e + B*f)*x^3 + 24*C*d^4*f*x^4) + 15*d*(C*e + 4*A*d^
2*e + B*f)*ArcSin[d*x])/(120*d^4)
```

Maple [C] time = 0.018, size = 377, normalized size = 2.2

$$\frac{csgn(d)}{120\,d^4}\sqrt{-dx+1}\sqrt{dx+1}\left(24\,Ccsgn(d)\,x^4d^4f\sqrt{-d^2x^2+1}+30\,Bcsgn(d)\,x^3d^4f\sqrt{-d^2x^2+1}+30\,Ccsgn(d)\,x^3d^4e\sqrt{-d^2x^2+\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)*(C*x^2+B*x+A)*(-d*x+1)^(1/2)*(d*x+1)^(1/2),x)
```

```
[Out] 1/120*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(24*C*csgn(d)*x^4*d^4*f*(-d^2*
x^2+1)^(1/2)+30*B*csgn(d)*x^3*d^4*f*(-d^2*x^2+1)^(1/2)+30*C*csgn(
d)*x^3*d^4*e*(-d^2*x^2+1)^(1/2)+40*A*csgn(d)*x^2*d^4*f*(-d^2*x^2+
1)^(1/2)+40*B*csgn(d)*x^2*d^4*e*(-d^2*x^2+1)^(1/2)+60*A*csgn(d)*(
-d^2*x^2+1)^(1/2)*x*d^4*e-8*C*csgn(d)*(-d^2*x^2+1)^(1/2)*x^2*d^2*
f-15*B*csgn(d)*(-d^2*x^2+1)^(1/2)*x*d^2*f-15*C*csgn(d)*(-d^2*x^2+
1)^(1/2)*x*d^2*e-40*A*csgn(d)*(-d^2*x^2+1)^(1/2)*d^2*f+60*A*arcta
n(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^3*e-40*B*csgn(d)*(-d^2*x^2+1)
^(1/2)*d^2*e+15*B*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*f-16*C
*csgn(d)*(-d^2*x^2+1)^(1/2)*f+15*C*arctan(csgn(d)*d*x/(-d^2*x^2+1
)^(1/2))*d*e)*csgn(d)/d^4/(-d^2*x^2+1)^(1/2)
```

Maxima [A] time = 1.51607, size = 263, normalized size = 1.57

$$\frac{1}{2}\sqrt{-d^2x^2+1}Aex - \frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Cfx^2}{5\,d^2} + \frac{Ae\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\sqrt{d^2}} - \frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Be}{3\,d^2} - \frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Af}{3\,d^2} - \frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}(Ce+Bf)x}{4\,d^2} + \frac{\sqrt{-d^2x^2+1}(Ce+Bf)x}{8\,d^2} - \frac{2\left(-d^2x^2+1\right)^{\frac{3}{2}}Cf}{15\,d^4} + \frac{(Ce+Bf)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{8\sqrt{d^2}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e),x, algorithm="m
```

```
[Out] 1/2*sqrt(-d^2*x^2 + 1)*A*e*x - 1/5*(-d^2*x^2 + 1)^(3/2)*C*f*x^2/d
^2 + 1/2*A*e*arcsin(d^2*x/sqrt(d^2))/sqrt(d^2) - 1/3*(-d^2*x^2 +
1)^(3/2)*B*e/d^2 - 1/3*(-d^2*x^2 + 1)^(3/2)*A*f/d^2 - 1/4*(-d^2*x
^2 + 1)^(3/2)*(C*e + B*f)*x/d^2 + 1/8*sqrt(-d^2*x^2 + 1)*(C*e + B
*f)*x/d^2 - 2/15*(-d^2*x^2 + 1)^(3/2)*C*f/d^4 + 1/8*(C*e + B*f)*a
rcsin(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^2)
```

Fricas [A] time = 0.234449, size = 921, normalized size = 5.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e),x, algorithm="f
```

```
[Out] 1/120*(24*C*d^9*f*x^10 + 30*(C*d^9*e + B*d^9*f)*x^9 + 40*(B*d^9*e
 + (A*d^9 - 8*C*d^7)*f)*x^8 - 15*(27*B*d^7*f - (4*A*d^9 - 27*C*d^
7)*e)*x^7 - 40*(14*B*d^7*e + (14*A*d^7 - 19*C*d^5)*f)*x^6 + 15*(6
9*B*d^5*f - (52*A*d^7 - 69*C*d^5)*e)*x^5 + 480*(3*B*d^5*e + (3*A*
d^5 - C*d^3)*f)*x^4 - 60*(15*B*d^3*f - (28*A*d^5 - 15*C*d^3)*e)*x
^3 - 960*(B*d^3*e + A*d^3*f)*x^2 + 5*(24*C*d^7*f*x^8 + 30*(C*d^7*
e + B*d^7*f)*x^7 + 8*(5*B*d^7*e + (5*A*d^7 - 13*C*d^5)*f)*x^6 - 1
5*(9*B*d^5*f - (4*A*d^7 - 9*C*d^5)*e)*x^5 - 96*(2*B*d^5*e + (2*A*
d^5 - C*d^3)*f)*x^4 + 12*(13*B*d^3*f - (20*A*d^5 - 13*C*d^3)*e)*x
^3 + 192*(B*d^3*e + A*d^3*f)*x^2 - 48*(B*d*f - (4*A*d^3 - C*d)*e)
*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 240*(B*d*f - (4*A*d^3 - C*d)*e
)*x - 30*(5*(B*d^4*f + (4*A*d^6 + C*d^4)*e)*x^4 - 20*(B*d^2*f + (
4*A*d^4 + C*d^2)*e)*x^2 - ((B*d^4*f + (4*A*d^6 + C*d^4)*e)*x^4 -
12*(B*d^2*f + (4*A*d^4 + C*d^2)*e)*x^2 + 16*(4*A*d^2 + C)*e + 16*
B*f)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 16*(4*A*d^2 + C)*e + 16*B*f)*
arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(5*d^7*x^4 - 20
*d^5*x^2 + 16*d^3 - (d^7*x^4 - 12*d^5*x^2 + 16*d^3)*sqrt(d*x + 1)
*sqrt(-d*x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x+e)*(C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.249742, size = 429, normalized size = 2.55

$$\frac{8\left((dx+1)\left(3(dx+1)\left(\frac{dx+1}{d^3}-\frac{4}{d^3}\right)+\frac{17}{d^3}\right)-\frac{10}{d^3}\right)(dx+1)^{\frac{3}{2}}\sqrt{-dx+1}Cf+\frac{40(dx+1)^{\frac{3}{2}}(dx-1)\sqrt{-dx+1}Af}{d}+\frac{40(dx+1)^{\frac{3}{2}}(dx-1)\sqrt{-dx+1}Be}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e),x, algorithm="g
```

```
[Out] 1/120*(8*((d*x + 1)*(3*(d*x + 1)*((d*x + 1)/d^3 - 4/d^3) + 17/d^3
) - 10/d^3)*(d*x + 1)^(3/2)*sqrt(-d*x + 1)*C*f + 40*(d*x + 1)^(3/
2)*(d*x - 1)*sqrt(-d*x + 1)*A*f/d + 40*(d*x + 1)^(3/2)*(d*x - 1)*
sqrt(-d*x + 1)*B*e/d + 15*(((d*x + 1)*(2*(d*x + 1)*((d*x + 1)/d^2
 - 3/d^2) + 5/d^2) - 1/d^2)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 2*arcs
in(1/2*sqrt(2)*sqrt(d*x + 1))/d^2)*B*f + 60*(sqrt(d*x + 1)*sqrt(-
d*x + 1)*d*x + 2*arcsin(1/2*sqrt(2)*sqrt(d*x + 1)))*A*e + 15*(((d
*x + 1)*(2*(d*x + 1)*((d*x + 1)/d^2 - 3/d^2) + 5/d^2) - 1/d^2)*sq
rt(d*x + 1)*sqrt(-d*x + 1) + 2*arcsin(1/2*sqrt(2)*sqrt(d*x + 1))/
d^2)*C*e)/d
```

3.38 $\int \sqrt{1-dx}\sqrt{1+dx}\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=95

$$\frac{x\sqrt{1-d^2x^2}\left(4Ad^2+C\right)}{8d^2}+\frac{\left(4Ad^2+C\right)\sin^{-1}(dx)}{8d^3}-\frac{B\left(1-d^2x^2\right)^{3/2}}{3d^2}-\frac{Cx\left(1-d^2x^2\right)^{3/2}}{4d^2}$$

```
[Out] ((C + 4*A*d^2)*x*Sqrt[1 - d^2*x^2])/(8*d^2) - (B*(1 - d^2*x^2)^(3
/2))/(3*d^2) - (C*x*(1 - d^2*x^2)^(3/2))/(4*d^2) + ((C + 4*A*d^2)
*ArcSin[d*x])/(8*d^3)
```

Rubi [A] time = 0.154758, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167

$$\frac{x\sqrt{1-d^2x^2}\left(4Ad^2+C\right)}{8d^2}+\frac{\left(4Ad^2+C\right)\sin^{-1}(dx)}{8d^3}-\frac{B\left(1-d^2x^2\right)^{3/2}}{3d^2}-\frac{Cx\left(1-d^2x^2\right)^{3/2}}{4d^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(A + B*x + C*x^2),x]
```

```
[Out] ((C + 4*A*d^2)*x*Sqrt[1 - d^2*x^2])/(8*d^2) - (B*(1 - d^2*x^2)^(3
/2))/(3*d^2) - (C*x*(1 - d^2*x^2)^(3/2))/(4*d^2) + ((C + 4*A*d^2)
*ArcSin[d*x])/(8*d^3)
```

Rubi in Sympy [A] time = 16.6266, size = 70, normalized size = 0.74

$$\frac{x\left(4Ad^2+C\right)\sqrt{-d^2x^2+1}}{8d^2}-\frac{(4B+3Cx)\left(-d^2x^2+1\right)^{\frac{3}{2}}}{12d^2}+\frac{\left(4Ad^2+C\right)\operatorname{asin}(dx)}{8d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] x*(4*A*d**2 + C)*sqrt(-d**2*x**2 + 1)/(8*d**2) - (4*B + 3*C*x)*(-
d**2*x**2 + 1)**(3/2)/(12*d**2) + (4*A*d**2 + C)*asin(d*x)/(8*d**
3)
```

Mathematica [A] time = 0.0874555, size = 71, normalized size = 0.75

$$\frac{d\sqrt{1-d^2x^2}\left(12Ad^2x+8Bd^2x^2-8B+6Cd^2x^3-3Cx\right)+3\left(4Ad^2+C\right)\sin^{-1}(dx)}{24d^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 - d*x]*Sqrt[1 + d*x]*(A + B*x + C*x^2),x]
```

```
[Out] (d*Sqrt[1 - d^2*x^2]*(-8*B - 3*C*x + 12*A*d^2*x + 8*B*d^2*x^2 + 6
*C*d^2*x^3) + 3*(C + 4*A*d^2)*ArcSin[d*x])/(24*d^3)
```

Maple [C] time = 0.015, size = 185, normalized size = 2.

$$\frac{csgn(d)}{24\,d^3}\sqrt{-dx+1}\sqrt{dx+1}\left(6\,Ccsgn(d)\,x^3d^3\sqrt{-d^2x^2+1}+8\,Bcsgn(d)\,x^2d^3\sqrt{-d^2x^2+1}+12\,Ax\sqrt{-d^2x^2+1}d^3csgn(d)-3\,Cx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(-d*x+1)^(1/2)*(d*x+1)^(1/2),x)
```

```
[Out] 1/24*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(6*C*csgn(d)*x^3*d^3*(-d^2*x^2+
1)^(1/2)+8*B*csgn(d)*x^2*d^3*(-d^2*x^2+1)^(1/2)+12*A*x*(-d^2*x^2+
1)^(1/2)*d^3*csgn(d)-3*C*x*(-d^2*x^2+1)^(1/2)*csgn(d)*d+12*A*arct
an(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^2-8*B*(-d^2*x^2+1)^(1/2)*csg
n(d)*d+3*C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2)))*csgn(d)/(-d^2*
x^2+1)^(1/2)/d^3
```

Maxima [A] time = 1.51922, size = 154, normalized size = 1.62

$$\frac{1}{2}\sqrt{-d^2x^2+1}Ax-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}Cx}{4\,d^2}+\frac{A\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\sqrt{d^2}}-\frac{\left(-d^2x^2+1\right)^{\frac{3}{2}}B}{3\,d^2}+\frac{\sqrt{-d^2x^2+1}Cx}{8\,d^2}+\frac{C\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{8\sqrt{d^2}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1),x, algorithm="maxima")
```

```
[Out] 1/2*sqrt(-d^2*x^2 + 1)*A*x - 1/4*(-d^2*x^2 + 1)^(3/2)*C*x/d^2 + 1
/2*A*arcsin(d^2*x/sqrt(d^2))/sqrt(d^2) - 1/3*(-d^2*x^2 + 1)^(3/2)
*B/d^2 + 1/8*sqrt(-d^2*x^2 + 1)*C*x/d^2 + 1/8*C*arcsin(d^2*x/sqrt
(d^2))/(sqrt(d^2)*d^2)
```

Fricas [A] time = 0.228682, size = 487, normalized size = 5.13

$$-\frac{24\,Cd^7x^7+32\,Bd^7x^6-120\,Bd^5x^4+96\,Bd^3x^2+12\left(4\,Ad^7-7\,Cd^5\right)x^5-12\left(12\,Ad^5-7\,Cd^3\right)x^3-\left(6\,Cd^7x^7+8\,Bd^7x^6-72\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1),x, algorithm="fricas")
```

```
[Out] -1/24*(24*C*d^7*x^7 + 32*B*d^7*x^6 - 120*B*d^5*x^4 + 96*B*d^3*x^2
 + 12*(4*A*d^7 - 7*C*d^5)*x^5 - 12*(12*A*d^5 - 7*C*d^3)*x^3 - (6*
C*d^7*x^7 + 8*B*d^7*x^6 - 72*B*d^5*x^4 + 96*B*d^3*x^2 + 3*(4*A*d^
7 - 17*C*d^5)*x^5 - 24*(4*A*d^5 - 3*C*d^3)*x^3 + 24*(4*A*d^3 - C*
d)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 24*(4*A*d^3 - C*d)*x + 6*((4
*A*d^6 + C*d^4)*x^4 + 32*A*d^2 - 8*(4*A*d^4 + C*d^2)*x^2 - 4*(8*A
*d^2 - (4*A*d^4 + C*d^2)*x^2 + 2*C)*sqrt(d*x + 1)*sqrt(-d*x + 1)
+ 8*C)*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(d^7*x^4
 - 8*d^5*x^2 + 8*d^3 + 4*(d^5*x^2 - 2*d^3)*sqrt(d*x + 1)*sqrt(-d*
x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(-d*x+1)**(1/2)*(d*x+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.226715, size = 198, normalized size = 2.08

$$\frac{\frac{8(dx+1)^{\frac{3}{2}}(dx-1)\sqrt{-dx+1}B}{d}+12\left(\sqrt{dx+1}\sqrt{-dx+1}dx+2\,\arcsin\left(\frac{1}{2}\sqrt{2}\sqrt{dx+1}\right)\right)A+3\left(\left((dx+1)\left(2(dx+1)\left(\frac{dx+1}{d^2}-\frac{3}{d^2}\right)+\frac{5}{d^2}\right)\right.\right.}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + 1)*sqrt(-d*x + 1),x, algorithm="giac")
```

```
[Out] 1/24*(8*(d*x + 1)^(3/2)*(d*x - 1)*sqrt(-d*x + 1)*B/d + 12*(sqrt(d
*x + 1)*sqrt(-d*x + 1)*d*x + 2*arcsin(1/2*sqrt(2)*sqrt(d*x + 1)))
*A + 3*(((d*x + 1)*(2*(d*x + 1)*((d*x + 1)/d^2 - 3/d^2) + 5/d^2)
- 1/d^2)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 2*arcsin(1/2*sqrt(2)*sqrt
(d*x + 1))/d^2)*C)/d
```

3.39 $\int \frac{A+Bx+Cx^2}{\sqrt{1-dx}\sqrt{1+dx}(e+fx)} \, dx$

Optimal. Leaf size=122

$$\frac{\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)}{f^2\sqrt{d^2e^2-f^2}}-\frac{\sin^{-1}(dx)(Ce-Bf)}{df^2}-\frac{C\sqrt{1-d^2x^2}}{d^2f}$$

```
[Out] -((C*Sqrt[1 - d^2*x^2])/(d^2*f)) - ((C*e - B*f)*ArcSin[d*x])/(d*f
^2) + ((C*e^2 - B*e*f + A*f^2)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2
 - f^2]*Sqrt[1 - d^2*x^2])])/(f^2*Sqrt[d^2*e^2 - f^2])
```

Rubi [A] time = 0.577429, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.162$

$$\frac{\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)}{f^2\sqrt{d^2e^2-f^2}}-\frac{\sin^{-1}(dx)(Ce-Bf)}{df^2}-\frac{C\sqrt{1-d^2x^2}}{d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)),x]
```

```
[Out] -((C*Sqrt[1 - d^2*x^2])/(d^2*f)) - ((C*e - B*f)*ArcSin[d*x])/(d*f
^2) + ((C*e^2 - B*e*f + A*f^2)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2
 - f^2]*Sqrt[1 - d^2*x^2])])/(f^2*Sqrt[d^2*e^2 - f^2])
```

Rubi in Sympy [A] time = 69.1554, size = 109, normalized size = 0.89

$$-\frac{C\sqrt{-d^2x^2+1}}{d^2f}-\frac{\left(Af^2-Bef+Ce^2\right)\operatorname{atanh}\left(\frac{d^2ex+f}{\sqrt{-de+f}\sqrt{de+f}\sqrt{-d^2x^2+1}}\right)}{f^2\sqrt{-de+f}\sqrt{de+f}}+\frac{(Bf-Ce)\operatorname{asin}(dx)}{df^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -C*sqrt(-d**2*x**2 + 1)/(d**2*f) - (A*f**2 - B*e*f + C*e**2)*atan
h((d**2*e*x + f)/(sqrt(-d*e + f)*sqrt(d*e + f)*sqrt(-d**2*x**2 +
1)))/(f**2*sqrt(-d*e + f)*sqrt(d*e + f)) + (B*f - C*e)*asin(d*x)/
(d*f**2)
```

Mathematica [A] time = 0.326682, size = 155, normalized size = 1.27

$$\frac{-\frac{\left(f(Af-Be)+Ce^2\right)\log\left(\sqrt{1-d^2x^2}\sqrt{f^2-d^2e^2}+d^2ex+f\right)}{\sqrt{f^2-d^2e^2}}+\frac{\log(e+fx)\left(f(Af-Be)+Ce^2\right)}{\sqrt{f^2-d^2e^2}}+\frac{\sin^{-1}(dx)(Bf-Ce)}{d}-\frac{Cf\sqrt{1-d^2x^2}}{d^2}}{f^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)),x]
```

```
[Out] (-((C*f*Sqrt[1 - d^2*x^2])/d^2) + ((-(C*e) + B*f)*ArcSin[d*x])/d
+ ((C*e^2 + f*(-(B*e) + A*f))*Log[e + f*x])/Sqrt[-(d^2*e^2) + f^2
] - ((C*e^2 + f*(-(B*e) + A*f))*Log[f + d^2*e*x + Sqrt[-(d^2*e^2)
 + f^2]*Sqrt[1 - d^2*x^2]])/Sqrt[-(d^2*e^2) + f^2])/f^2
```

Maple [C] time = 0.059, size = 373, normalized size = 3.1

$$\frac{csgn(d)}{f^3d^2}\left(-Acsgn(d)\ln\left(2\frac{1}{fx+e}\left(d^2ex+\sqrt{-d^2x^2+1}\sqrt{-\frac{d^2e^2-f^2}{f^2}}f+f\right)\right)d^2f^2+Bcsgn(d)\ln\left(2\frac{1}{fx+e}\left(d^2ex+\sqrt{-d^2x\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] (-A*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)
^(1/2)*f+f)/(f*x+e))*d^2*f^2+B*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)
^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^2*e*f-C*csgn(d)
*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)
/(f*x+e))*d^2*e^2+B*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*f^2*
(-(d^2*e^2-f^2)/f^2)^(1/2)-C*csgn(d)*f^2*(-d^2*x^2+1)^(1/2)*(-(d^
2*e^2-f^2)/f^2)^(1/2)-C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*
e*f*(-(d^2*e^2-f^2)/f^2)^(1/2))*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*csgn
(d)/(-(d^2*e^2-f^2)/f^2)^(1/2)/f^3/(-d^2*x^2+1)^(1/2)/d^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)),x, algorithm=
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 7.89625, size = 1, normalized size = 0.01

$$\left[\frac{\sqrt{-d^2e^2+f^2}Cdfx^2+2\left(\sqrt{-d^2e^2+f^2}(Ce-Bf)\sqrt{dx+1}\sqrt{-dx+1}-\sqrt{-d^2e^2+f^2}(Ce-Bf)\right)\arctan\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{dx}\right)-(}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)),x, algorithm=
```

```
[Out] [(sqrt(-d^2*e^2 + f^2)*C*d*f*x^2 + 2*(sqrt(-d^2*e^2 + f^2)*(C*e -
 B*f)*sqrt(d*x + 1)*sqrt(-d*x + 1) - sqrt(-d^2*e^2 + f^2)*(C*e -
B*f))*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)) - (C*d*e^2
 - B*d*e*f + A*d*f^2 - (C*d*e^2 - B*d*e*f + A*d*f^2)*sqrt(d*x + 1
)*sqrt(-d*x + 1))*log(-((d^2*e^2*f - f^3)*x^2 + (d^2*e^3 - e*f^2)
*x + sqrt(-d^2*e^2 + f^2)*(e*f*x - (d^2*e^2 - f^2)*x^2 + e^2) - (
(d^2*e^3 - e*f^2)*sqrt(-d*x + 1)*x + sqrt(-d^2*e^2 + f^2)*(e*f*x
+ e^2)*sqrt(-d*x + 1))*sqrt(d*x + 1))/(sqrt(d*x + 1)*sqrt(-d*x +
1)*(f*x + e) - f*x - e)))/(sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)*sqr
t(-d*x + 1)*d*f^2 - sqrt(-d^2*e^2 + f^2)*d*f^2), (sqrt(d^2*e^2 -
f^2)*C*d*f*x^2 - 2*(C*d*e^2 - B*d*e*f + A*d*f^2 - (C*d*e^2 - B*d*
e*f + A*d*f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1))*arctan(-(sqrt(d^2*e^
2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*e - sqrt(d^2*e^2 - f^2)*(f*
x + e))/((d^2*e^2 - f^2)*x)) + 2*(sqrt(d^2*e^2 - f^2)*(C*e - B*f)
*sqrt(d*x + 1)*sqrt(-d*x + 1) - sqrt(d^2*e^2 - f^2)*(C*e - B*f))*
arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(sqrt(d^2*e^2 -
 f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*d*f^2 - sqrt(d^2*e^2 - f^2)*d*
f^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A+Bx+Cx^2}{(e+fx)\sqrt{-dx+1}\sqrt{dx+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Integral((A + B*x + C*x**2)/((e + f*x)*sqrt(-d*x + 1)*sqrt(d*x +
1)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)),x, algorithm=
```

```
[Out] Exception raised: TypeError
```

3.40 $\int \frac{A+Bx+Cx^2}{\sqrt{1-dx}\sqrt{1+dx}(e+fx)^2}\,dx$

Optimal. Leaf size=163

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{f\left(d^2e^2-f^2\right)(e+fx)} - \frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{f^2\left(d^2e^2-f^2\right)^{3/2}} + \frac{C\sin^{-1}(dx)}{df^2}$$

```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(f*(d^2*e^2 - f^2)*(e
 + f*x)) + (C*ArcSin[d*x])/(d*f^2) - ((C*d^2*e^3 - 2*C*e*f^2 - A*
d^2*e*f^2 + B*f^3)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt
[1 - d^2*x^2])])/(f^2*(d^2*e^2 - f^2)^(3/2))
```

Rubi [A] time = 0.648546, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.162

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{f\left(d^2e^2-f^2\right)(e+fx)} - \frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{f^2\left(d^2e^2-f^2\right)^{3/2}} + \frac{C\sin^{-1}(dx)}{df^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^2),x]
```

```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(f*(d^2*e^2 - f^2)*(e
 + f*x)) + (C*ArcSin[d*x])/(d*f^2) - ((C*d^2*e^3 - 2*C*e*f^2 - A*
d^2*e*f^2 + B*f^3)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt
[1 - d^2*x^2])])/(f^2*(d^2*e^2 - f^2)^(3/2))
```

Rubi in Sympy [A] time = 90.7172, size = 146, normalized size = 0.9

$$\frac{C\operatorname{asin}(dx)}{df^2} - \frac{\sqrt{-d^2x^2+1}\left(Af^2-Bef+Ce^2\right)}{f(e+fx)\left(-d^2e^2+f^2\right)} - \frac{\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)\operatorname{atanh}\left(\frac{d^2ex+f}{\sqrt{-de+f}\sqrt{de+f}\sqrt{-d^2x^2+1}}\right)}{f^2(-de+f)^{\frac{3}{2}}(de+f)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**2/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] C*asin(d*x)/(d*f**2) - sqrt(-d**2*x**2 + 1)*(A*f**2 - B*e*f + C*e
**2)/(f*(e + f*x)*(-d**2*e**2 + f**2)) - (-A*d**2*e*f**2 + B*f**3
 + C*d**2*e**3 - 2*C*e*f**2)*atanh((d**2*e*x + f)/(sqrt(-d*e + f)
*sqrt(d*e + f)*sqrt(-d**2*x**2 + 1)))/(f**2*(-d*e + f)**(3/2)*(d*
e + f)**(3/2))
```

Mathematica [A] time = 0.52843, size = 211, normalized size = 1.29

$$\frac{-\frac{f\sqrt{1-d^2x^2}\left(f(Af-Be)+Ce^2\right)}{(f^2-d^2e^2)(e+fx)}-\frac{\log\left(\sqrt{1-d^2x^2}\sqrt{f^2-d^2e^2}+d^2ex+f\right)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{(f^2-d^2e^2)^{3/2}}+\frac{\log(e+fx)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{(f^2-d^2e^2)^{3/2}}+\frac{C\sin}{}}{f^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^2),x]
```

```
[Out] (-((f*(C*e^2 + f*(-(B*e) + A*f))*Sqrt[1 - d^2*x^2])/((-(d^2*e^2)
+ f^2)*(e + f*x))) + (C*ArcSin[d*x])/d + ((C*d^2*e^3 - 2*C*e*f^2
- A*d^2*e*f^2 + B*f^3)*Log[e + f*x])/(-(d^2*e^2) + f^2)^(3/2) - (
(C*d^2*e^3 - 2*C*e*f^2 - A*d^2*e*f^2 + B*f^3)*Log[f + d^2*e*x + S
qrt[-(d^2*e^2) + f^2]*Sqrt[1 - d^2*x^2]])/(-(d^2*e^2) + f^2)^(3/2
))/f^2
```

Maple [C] time = 0.065, size = 899, normalized size = 5.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)^2/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] (-A*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)
^(1/2)*f+f)/(f*x+e))*x*d^3*e*f^3+C*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^
2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d^3*e^3*f-A
*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1
/2)*f+f)/(f*x+e))*d^3*e^2*f^2+C*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1
)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^3*e^4+C*arctan
(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*x*d^2*e^2*f^2*(-(d^2*e^2-f^2)/f^
2)^(1/2)+A*csgn(d)*d*f^4*(-(d^2*e^2-f^2)/f^2)^(1/2)*(-d^2*x^2+1)^
(1/2)+B*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/
f^2)^(1/2)*f+f)/(f*x+e))*x*d*f^4-B*csgn(d)*d*e*f^3*(-(d^2*e^2-f^2
)/f^2)^(1/2)*(-d^2*x^2+1)^(1/2)-2*C*csgn(d)*ln(2*(d^2*e*x+(-d^2*x
^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d*e*f^3+C*
csgn(d)*d*e^2*f^2*(-(d^2*e^2-f^2)/f^2)^(1/2)*(-d^2*x^2+1)^(1/2)+C
```

```
*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^2*e^3*f*(-(d^2*e^2-f^2)
/f^2)^(1/2)+B*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2
-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d*e*f^3-2*C*csgn(d)*ln(2*(d^2*e*x+
(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d*e^2
*f^2-C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*x*f^4*(-(d^2*e^2-f^
2)/f^2)^(1/2)-C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*e*f^3*(-(d
^2*e^2-f^2)/f^2)^(1/2))*csgn(d)*(d*x+1)^(1/2)*(-d*x+1)^(1/2)/(-d^
2*x^2+1)^(1/2)/(d*e-f)/(d*e+f)/d/(-(d^2*e^2-f^2)/f^2)^(1/2)/f^3/(
f*x+e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2),x, algorith
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 30.3678, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2),x, algorith
```

```
[Out] [((C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4)*sqrt(-d^2*e^2 + f^2)*sqrt(d
*x + 1)*sqrt(-d*x + 1)*x - 2*((C*d^2*e^4 - C*e^2*f^2 + (C*d^2*e^3
*f - C*e*f^3)*x)*sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1
) - (C*d^2*e^4 - C*e^2*f^2 + (C*d^2*e^3*f - C*e*f^3)*x)*sqrt(-d^2
*e^2 + f^2))*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)) - (
C*d^3*e^5 + B*d*e^2*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 - (C*d^3*e^5 +
B*d*e^2*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 + (C*d^3*e^4*f + B*d*e*f^4
- (A*d^3 + 2*C*d)*e^2*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + (C*d
^3*e^4*f + B*d*e*f^4 - (A*d^3 + 2*C*d)*e^2*f^3)*x)*log(((d^2*e^2*
f - f^3)*x^2 + (d^2*e^3 - e*f^2)*x - sqrt(-d^2*e^2 + f^2)*(e*f*x
- (d^2*e^2 - f^2)*x^2 + e^2) - ((d^2*e^3 - e*f^2)*sqrt(-d*x + 1)*
x - sqrt(-d^2*e^2 + f^2)*(e*f*x + e^2)*sqrt(-d*x + 1))*sqrt(d*x +
 1))/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e) - f*x - e)) - sqrt(-
d^2*e^2 + f^2)*((C*d^3*e^3*f - B*d^3*e^2*f^2 + A*d^3*e*f^3)*x^2 +
 (C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4)*x))/((d^3*e^4*f^2 - d*e^2*f^
4 + (d^3*e^3*f^3 - d*e*f^5)*x)*sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)
*sqrt(-d*x + 1) - (d^3*e^4*f^2 - d*e^2*f^4 + (d^3*e^3*f^3 - d*e*f
^5)*x)*sqrt(-d^2*e^2 + f^2)), ((C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4
)*sqrt(d^2*e^2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*x + 2*(C*d^3*e
```

```
^5 + B*d*e^2*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 - (C*d^3*e^5 + B*d*e^2
*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 + (C*d^3*e^4*f + B*d*e*f^4 - (A*d^
3 + 2*C*d)*e^2*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + (C*d^3*e^4*
f + B*d*e*f^4 - (A*d^3 + 2*C*d)*e^2*f^3)*x)*arctan(-(sqrt(d^2*e^2
 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*e - sqrt(d^2*e^2 - f^2)*(f*x
 + e))/((d^2*e^2 - f^2)*x)) - 2*((C*d^2*e^4 - C*e^2*f^2 + (C*d^2*
e^3*f - C*e*f^3)*x)*sqrt(d^2*e^2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x +
 1) - (C*d^2*e^4 - C*e^2*f^2 + (C*d^2*e^3*f - C*e*f^3)*x)*sqrt(d^
2*e^2 - f^2))*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)) -
sqrt(d^2*e^2 - f^2)*((C*d^3*e^3*f - B*d^3*e^2*f^2 + A*d^3*e*f^3)*
x^2 + (C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4)*x))/((d^3*e^4*f^2 - d*e
^2*f^4 + (d^3*e^3*f^3 - d*e*f^5)*x)*sqrt(d^2*e^2 - f^2)*sqrt(d*x
+ 1)*sqrt(-d*x + 1) - (d^3*e^4*f^2 - d*e^2*f^4 + (d^3*e^3*f^3 - d
*e*f^5)*x)*sqrt(d^2*e^2 - f^2))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**2/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2),x, algorith
```

```
[Out] Exception raised: TypeError
```

3.41 $\int \frac{A+Bx+Cx^2}{\sqrt{1-dx}\sqrt{1+dx}(e+fx)^3}\,dx$

Optimal. Leaf size=248

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{2f\left(d^2e^2-f^2\right)(e+fx)^2} + \frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(C\left(d^2e^2+2f^2\right)-d^2\left(3Bef-A\left(2d^2e^2+f^2\right)\right)\right)}{2\left(d^2e^2-f^2\right)^{5/2}} - \frac{\sqrt{1-d^2x^2}\left(-3Ad^2ef^2+Bd^2e^2f+2Bf^3+Cd^2e^3-4Cef^2\right)}{2f\left(d^2e^2-f^2\right)^2(e+fx)}$$

```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)*
(e + f*x)^2) - ((C*d^2*e^3 + B*d^2*e^2*f - 4*C*e*f^2 - 3*A*d^2*e*
f^2 + 2*B*f^3)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)^2*(e + f*x
)) + ((C*(d^2*e^2 + 2*f^2) - d^2*(3*B*e*f - A*(2*d^2*e^2 + f^2)))
*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt[1 - d^2*x^2])])/(
2*(d^2*e^2 - f^2)^(5/2))
```

Rubi [A] time = 0.73869, antiderivative size = 248, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.135$

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{2f\left(d^2e^2-f^2\right)(e+fx)^2} + \frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(C\left(d^2e^2+2f^2\right)-d^2\left(3Bef-A\left(2d^2e^2+f^2\right)\right)\right)}{2\left(d^2e^2-f^2\right)^{5/2}} - \frac{\sqrt{1-d^2x^2}\left(-3Ad^2ef^2+Bd^2e^2f+2Bf^3+Cd^2e^3-4Cef^2\right)}{2f\left(d^2e^2-f^2\right)^2(e+fx)}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^3),x]
```

```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)*
(e + f*x)^2) - ((C*d^2*e^3 + B*d^2*e^2*f - 4*C*e*f^2 - 3*A*d^2*e*
f^2 + 2*B*f^3)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)^2*(e + f*x
)) + ((C*(d^2*e^2 + 2*f^2) - d^2*(3*B*e*f - A*(2*d^2*e^2 + f^2)))
*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt[1 - d^2*x^2])])/(
2*(d^2*e^2 - f^2)^(5/2))
```

Rubi in Sympy [A] time = 170.366, size = 230, normalized size = 0.93

$$-\frac{\left(2Ad^4e^2+Ad^2f^2-3Bd^2ef+Cd^2e^2+2Cf^2\right)\operatorname{atanh}\left(\frac{d^2ex+f}{\sqrt{-de+f}\sqrt{de+f}\sqrt{-d^2x^2+1}}\right)}{2\left(-de+f\right)^{\frac{5}{2}}\left(de+f\right)^{\frac{5}{2}}} - \frac{\sqrt{-d^2x^2+1}\left(-3Ad^2ef^2+Bd^2e^2f+2Bf^3+Cd^2e^3-4Cef^2\right)}{2f\left(e+fx\right)\left(-de+f\right)^2\left(de+f\right)^2} - \frac{\sqrt{-d^2x^2+1}\left(Af^2-Bef+Ce^2\right)}{2f\left(e+fx\right)^2\left(-d^2e^2+f^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**3/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -(2*A*d**4*e**2 + A*d**2*f**2 - 3*B*d**2*e*f + C*d**2*e**2 + 2*C*
f**2)*atanh((d**2*e*x + f)/(sqrt(-d*e + f)*sqrt(d*e + f)*sqrt(-d*
*2*x**2 + 1)))/(2*(-d*e + f)**(5/2)*(d*e + f)**(5/2)) - sqrt(-d**
2*x**2 + 1)*(-3*A*d**2*e*f**2 + B*d**2*e**2*f + 2*B*f**3 + C*d**2
*e**3 - 4*C*e*f**2)/(2*f*(e + f*x)*(-d*e + f)**2*(d*e + f)**2) -
sqrt(-d**2*x**2 + 1)*(A*f**2 - B*e*f + C*e**2)/(2*f*(e + f*x)**2*
(-d**2*e**2 + f**2))
```

Mathematica [A] time = 0.570227, size = 284, normalized size = 1.15

$$\frac{-f(e+fx)^2\log\left(\sqrt{1-d^2x^2}\sqrt{f^2-d^2e^2}+d^2ex+f\right)\left(d^2\left(A\left(2d^2e^2+f^2\right)-3Bef\right)+C\left(d^2e^2+2f^2\right)\right)+f(e+fx)^2\log(e+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^3),x]
```

```
[Out] (Sqrt[-(d^2*e^2) + f^2]*Sqrt[1 - d^2*x^2]*(-(B*(d^2*e^2*f*(2*e +
f*x) + f^3*(e + 2*f*x))) + f*(-(A*f^3) + A*d^2*e*f*(4*e + 3*f*x)
+ C*e*(3*e*f - d^2*e^2*x + 4*f^2*x))) + f*(C*(d^2*e^2 + 2*f^2) +
d^2*(-3*B*e*f + A*(2*d^2*e^2 + f^2)))*(e + f*x)^2*Log[e + f*x] -
f*(C*(d^2*e^2 + 2*f^2) + d^2*(-3*B*e*f + A*(2*d^2*e^2 + f^2)))*(e
 + f*x)^2*Log[f + d^2*e*x + Sqrt[-(d^2*e^2) + f^2]*Sqrt[1 - d^2*x
^2]])/(2*f*(-(d^2*e^2) + f^2)^(5/2)*(e + f*x)^2)
```

Maple [C] time = 0.065, size = 1449, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)^3/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] -1/2*(-3*A*x*d^2*e*f^3*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1
/2)+B*x*d^2*e^2*f^2*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)
+C*x*d^2*e^3*f*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)+A*ln
(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f
*x+e))*d^2*e^2*f^2-3*B*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^
2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x^2*d^2*e*f^3+C*ln(2*(d^2*e*x+(-d
^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x^2*d^2*
e^2*f^2+2*A*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)
^(1/2)*f+f)/(f*x+e))*x*d^2*e*f^3-6*B*ln(2*(d^2*e*x+(-d^2*x^2+1)^(
1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d^2*e^2*f^2+2*C*l
n(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(
f*x+e))*x*d^2*e^3*f-4*A*d^2*e^2*f^2*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2
-f^2)/f^2)^(1/2)+2*B*d^2*e^3*f*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)
/f^2)^(1/2)-4*C*x*e*f^3*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(
1/2)+2*A*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1
/2)*f+f)/(f*x+e))*x^2*d^4*e^2*f^2+4*A*ln(2*(d^2*e*x+(-d^2*x^2+1)^
(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d^4*e^3*f+A*f^4*
(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)+2*A*ln(2*(d^2*e*x+(
-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^4*e^
4+2*C*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)
*f+f)/(f*x+e))*x^2*f^4+C*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*
e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^2*e^4+2*C*ln(2*(d^2*e*x+(-d^2
*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*e^2*f^2-3*
B*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f
)/(f*x+e))*d^2*e^3*f+4*C*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*
e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*e*f^3+2*B*x*f^4*(-d^2*x^2+1)^
(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)+B*e*f^3*(-d^2*x^2+1)^(1/2)*(-(d^
2*e^2-f^2)/f^2)^(1/2)-3*C*e^2*f^2*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f
^2)/f^2)^(1/2)+A*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)
/f^2)^(1/2)*f+f)/(f*x+e))*x^2*d^2*f^4)*csgn(d)^2*(d*x+1)^(1/2)*(-
d*x+1)^(1/2)/(-d^2*x^2+1)^(1/2)/(d*e+f)/(d*e-f)/(d^2*e^2-f^2)/(-(
d^2*e^2-f^2)/f^2)^(1/2)/(f*x+e)^2/f
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3),x, algorith
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.275026, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3),x, algorith

[Out] [-1/2*(sqrt(-d^2*e^2 + f^2)*((C*d^4*e^5 + B*d^4*e^4*f + 2*B*d^2*e
^2*f^3 - (3*A*d^4 + 4*C*d^2)*e^3*f^2)*x^3 + (2*B*d^4*e^5 + 5*B*d^
2*e^3*f^2 - (4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6*C)*e^2*f^3 +
 2*B*e*f^4 + 2*A*f^5)*x^2 - 2*(C*d^2*e^5 - 3*B*d^2*e^4*f + (5*A*d
^2 + 2*C)*e^3*f^2 - 2*A*e*f^4)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) -
(6*B*d^2*e^5*f - 2*(2*A*d^4 + C*d^2)*e^6 - 2*(A*d^2 + 2*C)*e^4*f^
2 - (3*B*d^4*e^3*f^3 - (2*A*d^6 + C*d^4)*e^4*f^2 - (A*d^4 + 2*C*d
^2)*e^2*f^4)*x^4 - 2*(3*B*d^4*e^4*f^2 - (2*A*d^6 + C*d^4)*e^5*f -
 (A*d^4 + 2*C*d^2)*e^3*f^3)*x^3 - (3*B*d^4*e^5*f + 3*A*d^4*e^4*f^
2 - 6*B*d^2*e^3*f^3 - (2*A*d^6 + C*d^4)*e^6 + 2*(A*d^2 + 2*C)*e^2
*f^4)*x^2 - 2*(3*B*d^2*e^5*f - (2*A*d^4 + C*d^2)*e^6 - (A*d^2 + 2
*C)*e^4*f^2 + (3*B*d^2*e^3*f^3 - (2*A*d^4 + C*d^2)*e^4*f^2 - (A*d
^2 + 2*C)*e^2*f^4)*x^2 + 2*(3*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e
^5*f - (A*d^2 + 2*C)*e^3*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 4
*(3*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e^5*f - (A*d^2 + 2*C)*e^3*f
^3)*x)*log(-((d^2*e^2*f - f^3)*x^2 + (d^2*e^3 - e*f^2)*x + sqrt(-
d^2*e^2 + f^2)*(e*f*x - (d^2*e^2 - f^2)*x^2 + e^2) - ((d^2*e^3 -
e*f^2)*sqrt(-d*x + 1)*x + sqrt(-d^2*e^2 + f^2)*(e*f*x + e^2)*sqrt
(-d*x + 1))*sqrt(d*x + 1))/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e
) - f*x - e)) + ((2*B*d^4*e^3*f^2 + B*d^2*e*f^4 + A*d^2*f^5 - (4*
A*d^4 + 3*C*d^2)*e^2*f^3)*x^4 - 2*(C*d^4*e^5 - B*d^4*e^4*f + B*d^
2*e^2*f^3 - A*d^2*e*f^4 + (A*d^4 - C*d^2)*e^3*f^2)*x^3 - (2*B*d^4
*e^5 + 5*B*d^2*e^3*f^2 - (4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6
*C)*e^2*f^3 + 2*B*e*f^4 + 2*A*f^5)*x^2 + 2*(C*d^2*e^5 - 3*B*d^2*e
^4*f + (5*A*d^2 + 2*C)*e^3*f^2 - 2*A*e*f^4)*x)*sqrt(-d^2*e^2 + f^
2))/(2*(d^4*e^8 - 2*d^2*e^6*f^2 + e^4*f^4 + (d^4*e^6*f^2 - 2*d^2*
e^4*f^4 + e^2*f^6)*x^2 + 2*(d^4*e^7*f - 2*d^2*e^5*f^3 + e^3*f^5)*
x)*sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1) - (2*d^4*e^8
 - 4*d^2*e^6*f^2 + 2*e^4*f^4 - (d^6*e^6*f^2 - 2*d^4*e^4*f^4 + d^2
*e^2*f^6)*x^4 - 2*(d^6*e^7*f - 2*d^4*e^5*f^3 + d^2*e^3*f^5)*x^3 -
 (d^6*e^8 - 4*d^4*e^6*f^2 + 5*d^2*e^4*f^4 - 2*e^2*f^6)*x^2 + 4*(d
^4*e^7*f - 2*d^2*e^5*f^3 + e^3*f^5)*x)*sqrt(-d^2*e^2 + f^2)), -1/
2*(sqrt(d^2*e^2 - f^2)*((C*d^4*e^5 + B*d^4*e^4*f + 2*B*d^2*e^2*f^
3 - (3*A*d^4 + 4*C*d^2)*e^3*f^2)*x^3 + (2*B*d^4*e^5 + 5*B*d^2*e^3
*f^2 - (4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6*C)*e^2*f^3 + 2*B*
e*f^4 + 2*A*f^5)*x^2 - 2*(C*d^2*e^5 - 3*B*d^2*e^4*f + (5*A*d^2 +
2*C)*e^3*f^2 - 2*A*e*f^4)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) - 2*(6*
B*d^2*e^5*f - 2*(2*A*d^4 + C*d^2)*e^6 - 2*(A*d^2 + 2*C)*e^4*f^2 -
 (3*B*d^4*e^3*f^3 - (2*A*d^6 + C*d^4)*e^4*f^2 - (A*d^4 + 2*C*d^2)
*e^2*f^4)*x^4 - 2*(3*B*d^4*e^4*f^2 - (2*A*d^6 + C*d^4)*e^5*f - (A
*d^4 + 2*C*d^2)*e^3*f^3)*x^3 - (3*B*d^4*e^5*f + 3*A*d^4*e^4*f^2 -
 6*B*d^2*e^3*f^3 - (2*A*d^6 + C*d^4)*e^6 + 2*(A*d^2 + 2*C)*e^2*f^
4)*x^2 - 2*(3*B*d^2*e^5*f - (2*A*d^4 + C*d^2)*e^6 - (A*d^2 + 2*C)
*e^4*f^2 + (3*B*d^2*e^3*f^3 - (2*A*d^4 + C*d^2)*e^4*f^2 - (A*d^2
+ 2*C)*e^2*f^4)*x^2 + 2*(3*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e^5*
f - (A*d^2 + 2*C)*e^3*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 4*(3
*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e^5*f - (A*d^2 + 2*C)*e^3*f^3)
*x)*arctan(-(sqrt(d^2*e^2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*e -
 sqrt(d^2*e^2 - f^2)*(f*x + e))/((d^2*e^2 - f^2)*x)) + ((2*B*d^4*
e^3*f^2 + B*d^2*e*f^4 + A*d^2*f^5 - (4*A*d^4 + 3*C*d^2)*e^2*f^3)*
x^4 - 2*(C*d^4*e^5 - B*d^4*e^4*f + B*d^2*e^2*f^3 - A*d^2*e*f^4 +
```

```
(A*d^4 - C*d^2)*e^3*f^2)*x^3 - (2*B*d^4*e^5 + 5*B*d^2*e^3*f^2 - (
4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6*C)*e^2*f^3 + 2*B*e*f^4 +
2*A*f^5)*x^2 + 2*(C*d^2*e^5 - 3*B*d^2*e^4*f + (5*A*d^2 + 2*C)*e^3
*f^2 - 2*A*e*f^4)*x)*sqrt(d^2*e^2 - f^2))/(2*(d^4*e^8 - 2*d^2*e^6
*f^2 + e^4*f^4 + (d^4*e^6*f^2 - 2*d^2*e^4*f^4 + e^2*f^6)*x^2 + 2*
(d^4*e^7*f - 2*d^2*e^5*f^3 + e^3*f^5)*x)*sqrt(d^2*e^2 - f^2)*sqrt
(d*x + 1)*sqrt(-d*x + 1) - (2*d^4*e^8 - 4*d^2*e^6*f^2 + 2*e^4*f^4
 - (d^6*e^6*f^2 - 2*d^4*e^4*f^4 + d^2*e^2*f^6)*x^4 - 2*(d^6*e^7*f
 - 2*d^4*e^5*f^3 + d^2*e^3*f^5)*x^3 - (d^6*e^8 - 4*d^4*e^6*f^2 +
5*d^2*e^4*f^4 - 2*e^2*f^6)*x^2 + 4*(d^4*e^7*f - 2*d^2*e^5*f^3 + e
^3*f^5)*x)*sqrt(d^2*e^2 - f^2))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**3/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3),x, algorith
```

```
[Out] Exception raised: TypeError
```

3.42 $\int \frac{(e+fx)^3(A+Bx+Cx^2)}{\sqrt{1-dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=340

$$-\frac{\sqrt{1-d^2x^2}(e+fx)^2\left(4f^2\left(5Ad^2+4C\right)-3d^2e(Ce-5Bf)\right)}{60d^4f}+\frac{\sqrt{1-d^2x^2}\left(d^2fx\left(-100Ad^2ef^2-30Bd^2e^2f-45Bf^3+6Cd^2e^3-71Cef^2\right)+4\left(C\left(3d^4e^4-52d^2e^2f^2-16f^4\right)-5d^2f\left(4A\right.\right.\right.}{120d^6f}$$
$$+\frac{\sin^{-1}(dx)\left(8Ad^4e^3+12Ad^2ef^2+12Bd^2e^2f+3Bf^3+4Cd^2e^3+9Cef^2\right)}{8d^5}$$
$$+\frac{\sqrt{1-d^2x^2}(e+fx)^3(Ce-5Bf)}{20d^2f}-\frac{C\sqrt{1-d^2x^2}(e+fx)^4}{5d^2f}$$

```
[Out] -((4*(4*C + 5*A*d^2)*f^2 - 3*d^2*e*(C*e - 5*B*f))*(e + f*x)^2*Sqr
t[1 - d^2*x^2])/(60*d^4*f) + ((C*e - 5*B*f)*(e + f*x)^3*Sqrt[1 -
d^2*x^2])/(20*d^2*f) - (C*(e + f*x)^4*Sqrt[1 - d^2*x^2])/(5*d^2*f
) + ((4*(C*(3*d^4*e^4 - 52*d^2*e^2*f^2 - 16*f^4) - 5*d^2*f*(4*A*f
*(4*d^2*e^2 + f^2) + 3*B*(d^2*e^3 + 4*e*f^2))) + d^2*f*(6*C*d^2*e
^3 - 30*B*d^2*e^2*f - 71*C*e*f^2 - 100*A*d^2*e*f^2 - 45*B*f^3)*x)
*Sqrt[1 - d^2*x^2])/(120*d^6*f) + ((4*C*d^2*e^3 + 8*A*d^4*e^3 + 1
2*B*d^2*e^2*f + 9*C*e*f^2 + 12*A*d^2*e*f^2 + 3*B*f^3)*ArcSin[d*x]
)/(8*d^5)
```

Rubi [A] time = 1.37909, antiderivative size = 340, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.135$

$$-\frac{\sqrt{1-d^2x^2}(e+fx)^2\left(5f(4Af+3Be)-C\left(3e^2-\frac{16f^2}{d^2}\right)\right)}{60d^2f}+\frac{\sqrt{1-d^2x^2}\left(d^2fx\left(-100Ad^2ef^2-30Bd^2e^2f-45Bf^3+6Cd^2e^3-71Cef^2\right)+4\left(C\left(3d^4e^4-52d^2e^2f^2-16f^4\right)-5d^2f\left(4A\right.\right.\right.}{120d^6f}$$
$$+\frac{\sin^{-1}(dx)\left(8Ad^4e^3+12Ad^2ef^2+12Bd^2e^2f+3Bf^3+4Cd^2e^3+9Cef^2\right)}{8d^5}$$
$$+\frac{\sqrt{1-d^2x^2}(e+fx)^3(Ce-5Bf)}{20d^2f}-\frac{C\sqrt{1-d^2x^2}(e+fx)^4}{5d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[((e + f*x)^3*(A + B*x + C*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] -((5*f*(3*B*e + 4*A*f) - C*(3*e^2 - (16*f^2)/d^2))*(e + f*x)^2*Sq
rt[1 - d^2*x^2])/(60*d^2*f) + ((C*e - 5*B*f)*(e + f*x)^3*Sqrt[1 -
 d^2*x^2])/(20*d^2*f) - (C*(e + f*x)^4*Sqrt[1 - d^2*x^2])/(5*d^2*
f) + ((4*(C*(3*d^4*e^4 - 52*d^2*e^2*f^2 - 16*f^4) - 5*d^2*f*(4*A*
f*(4*d^2*e^2 + f^2) + 3*B*(d^2*e^3 + 4*e*f^2))) + d^2*f*(6*C*d^2*
```

```
e^3 - 30*B*d^2*e^2*f - 71*C*e*f^2 - 100*A*d^2*e*f^2 - 45*B*f^3)*x
)*Sqrt[1 - d^2*x^2])/(120*d^6*f) + ((4*C*d^2*e^3 + 8*A*d^4*e^3 +
12*B*d^2*e^2*f + 9*C*e*f^2 + 12*A*d^2*e*f^2 + 3*B*f^3)*ArcSin[d*x
])/(8*d^5)
```

Rubi in Sympy [A] time = 144.536, size = 337, normalized size = 0.99

$$-\frac{C(e+fx)^4\sqrt{-d^2x^2+1}}{5d^2f}-\frac{(e+fx)^3(5Bf-Ce)\sqrt{-d^2x^2+1}}{20d^2f}$$
$$-\frac{(e+fx)^2\sqrt{-d^2x^2+1}\left(d^2e(5Bf-Ce)+\frac{f^2(20Ad^2+16C)}{3}\right)}{20d^4f}$$
$$+\frac{\left(8Ad^4e^3+12Ad^2ef^2+12Bd^2e^2f+3Bf^3+4Cd^2e^3+9Cef^2\right)\operatorname{asin}(dx)}{8d^5}$$
$$-\frac{\sqrt{-d^2x^2+1}\left(320Ad^4e^2f^2+80Ad^2f^4+60Bd^4e^3f+240Bd^2ef^3-12Cd^4e^4+208Cd^2e^2f^2+64Cf^4+d^2fx\left(100Ad^2ef^2+3\right.\right.}{120d^6f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)**3*(C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -C*(e + f*x)**4*sqrt(-d**2*x**2 + 1)/(5*d**2*f) - (e + f*x)**3*(5
*B*f - C*e)*sqrt(-d**2*x**2 + 1)/(20*d**2*f) - (e + f*x)**2*sqrt(
-d**2*x**2 + 1)*(d**2*e*(5*B*f - C*e) + f**2*(20*A*d**2 + 16*C)/3
)/(20*d**4*f) + (8*A*d**4*e**3 + 12*A*d**2*e*f**2 + 12*B*d**2*e**
2*f + 3*B*f**3 + 4*C*d**2*e**3 + 9*C*e*f**2)*asin(d*x)/(8*d**5) -
 sqrt(-d**2*x**2 + 1)*(320*A*d**4*e**2*f**2 + 80*A*d**2*f**4 + 60
*B*d**4*e**3*f + 240*B*d**2*e*f**3 - 12*C*d**4*e**4 + 208*C*d**2*
e**2*f**2 + 64*C*f**4 + d**2*f*x*(100*A*d**2*e*f**2 + 30*B*d**2*e
**2*f + 45*B*f**3 - 6*C*d**2*e**3 + 71*C*e*f**2))/(120*d**6*f)
```

Mathematica [A] time = 0.468019, size = 241, normalized size = 0.71

$$\frac{15d\sin^{-1}(dx)\left(8Ad^4e^3+12Ad^2ef^2+12Bd^2e^2f+3Bf^3+4Cd^2e^3+9Cef^2\right)-\sqrt{1-d^2x^2}\left(20Ad^2f\left(d^2\left(18e^2+9efx+2f^2x\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e + f*x)^3*(A + B*x + C*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] (-(Sqrt[1 - d^2*x^2]*(20*A*d^2*f*(4*f^2 + d^2*(18*e^2 + 9*e*f*x +
 2*f^2*x^2)) + 15*B*(d^2*f^2*(16*e + 3*f*x) + 2*d^4*(4*e^3 + 6*e^
2*f*x + 4*e*f^2*x^2 + f^3*x^3)) + C*(64*f^3 + d^2*f*(240*e^2 + 13
5*e*f*x + 32*f^2*x^2) + 6*d^4*x*(10*e^3 + 20*e^2*f*x + 15*e*f^2*x
^2 + 4*f^3*x^3)))) + 15*d*(4*C*d^2*e^3 + 8*A*d^4*e^3 + 12*B*d^2*e
```

```
^2*f + 9*C*e*f^2 + 12*A*d^2*e*f^2 + 3*B*f^3)*ArcSin[d*x])/(120*d^
6)
```

Maple [C] time = 0.038, size = 643, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)^3*(C*x^2+B*x+A)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] -1/120*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(24*C*(-d^2*x^2+1)^(1/2)*csgn
(d)*x^4*d^4*f^3+30*B*(-d^2*x^2+1)^(1/2)*csgn(d)*x^3*d^4*f^3+90*C*
(-d^2*x^2+1)^(1/2)*csgn(d)*x^3*d^4*e*f^2+40*A*(-d^2*x^2+1)^(1/2)*
csgn(d)*x^2*d^4*f^3+120*B*(-d^2*x^2+1)^(1/2)*csgn(d)*x^2*d^4*e*f^
2+120*C*(-d^2*x^2+1)^(1/2)*csgn(d)*x^2*d^4*e^2*f+180*A*(-d^2*x^2+
1)^(1/2)*csgn(d)*x*d^4*e*f^2+180*B*(-d^2*x^2+1)^(1/2)*csgn(d)*x*d
^4*e^2*f+60*C*(-d^2*x^2+1)^(1/2)*csgn(d)*x*d^4*e^3+360*A*(-d^2*x^
2+1)^(1/2)*csgn(d)*d^4*e^2*f-120*A*arctan(csgn(d)*d*x/(-d^2*x^2+1
)^(1/2))*d^5*e^3+120*B*(-d^2*x^2+1)^(1/2)*csgn(d)*d^4*e^3+32*C*(-
d^2*x^2+1)^(1/2)*csgn(d)*x^2*d^2*f^3+45*B*(-d^2*x^2+1)^(1/2)*csgn
(d)*x*d^2*f^3+135*C*(-d^2*x^2+1)^(1/2)*csgn(d)*x*d^2*e*f^2+80*A*(
-d^2*x^2+1)^(1/2)*csgn(d)*d^2*f^3-180*A*arctan(csgn(d)*d*x/(-d^2*
x^2+1)^(1/2))*d^3*e*f^2+240*B*(-d^2*x^2+1)^(1/2)*csgn(d)*d^2*e*f^
2-180*B*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^3*e^2*f+240*C*(-
d^2*x^2+1)^(1/2)*csgn(d)*d^2*e^2*f-60*C*arctan(csgn(d)*d*x/(-d^2*
x^2+1)^(1/2))*d^3*e^3-45*B*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))
*d*f^3+64*C*(-d^2*x^2+1)^(1/2)*csgn(d)*f^3-135*C*arctan(csgn(d)*d
*x/(-d^2*x^2+1)^(1/2))*d*e*f^2)*csgn(d)/d^6/(-d^2*x^2+1)^(1/2)
```

Maxima [A] time = 1.5056, size = 524, normalized size = 1.54

$$-\frac{\sqrt{-d^2x^2+1}Cf^3x^4}{5\,d^2}+\frac{Ae^3\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}}-\frac{\sqrt{-d^2x^2+1}Be^3}{d^2}$$
$$-\frac{3\sqrt{-d^2x^2+1}Ae^2f}{d^2}-\frac{4\sqrt{-d^2x^2+1}Cf^3x^2}{15\,d^4}-\frac{\left(3\,Cef^2+Bf^3\right)\sqrt{-d^2x^2+1}x^3}{4\,d^2}$$
$$-\frac{\left(3\,Ce^2f+3\,Bef^2+Af^3\right)\sqrt{-d^2x^2+1}x^2}{3\,d^2}-\frac{\left(Ce^3+3\,Be^2f+3\,Aef^2\right)\sqrt{-d^2x^2+1}x}{2\,d^2}$$
$$+\frac{\left(Ce^3+3\,Be^2f+3\,Aef^2\right)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\,\sqrt{d^2}d^2}-\frac{8\sqrt{-d^2x^2+1}Cf^3}{15\,d^6}-\frac{3\left(3\,Cef^2+Bf^3\right)\sqrt{-d^2x^2+1}x}{8\,d^4}$$
$$-\frac{2\left(3\,Ce^2f+3\,Bef^2+Af^3\right)\sqrt{-d^2x^2+1}}{3\,d^4}+\frac{3\left(3\,Cef^2+Bf^3\right)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{8\,\sqrt{d^2}d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(f*x + e)^3/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="maxima")
```

```
[Out] -1/5*sqrt(-d^2*x^2 + 1)*C*f^3*x^4/d^2 + A*e^3*arcsin(d^2*x/sqrt(d
^2))/sqrt(d^2) - sqrt(-d^2*x^2 + 1)*B*e^3/d^2 - 3*sqrt(-d^2*x^2 +
 1)*A*e^2*f/d^2 - 4/15*sqrt(-d^2*x^2 + 1)*C*f^3*x^2/d^4 - 1/4*(3*
C*e*f^2 + B*f^3)*sqrt(-d^2*x^2 + 1)*x^3/d^2 - 1/3*(3*C*e^2*f + 3*
B*e*f^2 + A*f^3)*sqrt(-d^2*x^2 + 1)*x^2/d^2 - 1/2*(C*e^3 + 3*B*e^
2*f + 3*A*e*f^2)*sqrt(-d^2*x^2 + 1)*x/d^2 + 1/2*(C*e^3 + 3*B*e^2*
f + 3*A*e*f^2)*arcsin(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^2) - 8/15*sqr
t(-d^2*x^2 + 1)*C*f^3/d^6 - 3/8*(3*C*e*f^2 + B*f^3)*sqrt(-d^2*x^2
 + 1)*x/d^4 - 2/3*(3*C*e^2*f + 3*B*e*f^2 + A*f^3)*sqrt(-d^2*x^2 +
 1)/d^4 + 3/8*(3*C*e*f^2 + B*f^3)*arcsin(d^2*x/sqrt(d^2))/(sqrt(d
^2)*d^4)
```

Fricas [A] time = 0.24456, size = 1621, normalized size = 4.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(f*x + e)^3/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="fricas")
```

```
[Out] -1/120*(24*C*d^9*f^3*x^10 + 30*(3*C*d^9*e*f^2 + B*d^9*f^3)*x^9 +
40*(3*C*d^9*e^2*f + 3*B*d^9*e*f^2 + (A*d^9 - 7*C*d^7)*f^3)*x^8 +
15*(4*C*d^9*e^3 + 12*B*d^9*e^2*f - 23*B*d^7*f^3 + 3*(4*A*d^9 - 23
*C*d^7)*e*f^2)*x^7 + 40*(3*B*d^9*e^3 - 33*B*d^7*e*f^2 + 3*(3*A*d^
9 - 11*C*d^7)*e^2*f - (11*A*d^7 - 8*C*d^5)*f^3)*x^6 - 15*(52*C*d^
7*e^3 + 156*B*d^7*e^2*f - 17*B*d^5*f^3 + 3*(52*A*d^7 - 17*C*d^5)*
e*f^2)*x^5 - 480*(2*B*d^7*e^3 - 3*B*d^5*e*f^2 - A*d^5*f^3 + 3*(2*
A*d^7 - C*d^5)*e^2*f)*x^4 + 60*(28*C*d^5*e^3 + 84*B*d^5*e^2*f + 1
3*B*d^3*f^3 + 3*(28*A*d^5 + 13*C*d^3)*e*f^2)*x^3 + 960*(B*d^5*e^3
 + 3*A*d^5*e^2*f)*x^2 + 5*(24*C*d^7*f^3*x^8 + 30*(3*C*d^7*e*f^2 +
 B*d^7*f^3)*x^7 + 8*(15*C*d^7*e^2*f + 15*B*d^7*e*f^2 + (5*A*d^7 -
 8*C*d^5)*f^3)*x^6 + 15*(4*C*d^7*e^3 + 12*B*d^7*e^2*f - 5*B*d^5*f
^3 + 3*(4*A*d^7 - 5*C*d^5)*e*f^2)*x^5 + 96*(B*d^7*e^3 - 3*B*d^5*e
*f^2 - A*d^5*f^3 + 3*(A*d^7 - C*d^5)*e^2*f)*x^4 - 12*(20*C*d^5*e^
3 + 60*B*d^5*e^2*f + 7*B*d^3*f^3 + 3*(20*A*d^5 + 7*C*d^3)*e*f^2)*
x^3 - 192*(B*d^5*e^3 + 3*A*d^5*e^2*f)*x^2 + 48*(4*C*d^3*e^3 + 12*
B*d^3*e^2*f + 3*B*d*f^3 + 3*(4*A*d^3 + 3*C*d)*e*f^2)*x)*sqrt(d*x
+ 1)*sqrt(-d*x + 1) - 240*(4*C*d^3*e^3 + 12*B*d^3*e^2*f + 3*B*d*f
^3 + 3*(4*A*d^3 + 3*C*d)*e*f^2)*x + 30*(192*B*d^2*e^2*f + 5*(12*B
*d^6*e^2*f + 3*B*d^4*f^3 + 4*(2*A*d^8 + C*d^6)*e^3 + 3*(4*A*d^6 +
 3*C*d^4)*e*f^2)*x^4 + 64*(2*A*d^4 + C*d^2)*e^3 + 48*(4*A*d^2 + 3
*C)*e*f^2 + 48*B*f^3 - 20*(12*B*d^4*e^2*f + 3*B*d^2*f^3 + 4*(2*A*
d^6 + C*d^4)*e^3 + 3*(4*A*d^4 + 3*C*d^2)*e*f^2)*x^2 - (192*B*d^2*
e^2*f + (12*B*d^6*e^2*f + 3*B*d^4*f^3 + 4*(2*A*d^8 + C*d^6)*e^3 +
 3*(4*A*d^6 + 3*C*d^4)*e*f^2)*x^4 + 64*(2*A*d^4 + C*d^2)*e^3 + 48
*(4*A*d^2 + 3*C)*e*f^2 + 48*B*f^3 - 12*(12*B*d^4*e^2*f + 3*B*d^2*
f^3 + 4*(2*A*d^6 + C*d^4)*e^3 + 3*(4*A*d^4 + 3*C*d^2)*e*f^2)*x^2)
```

```
*sqrt(d*x + 1)*sqrt(-d*x + 1))*arctan((sqrt(d*x + 1)*sqrt(-d*x +
1) - 1)/(d*x)))/(5*d^9*x^4 - 20*d^7*x^2 + 16*d^5 - (d^9*x^4 - 12*
d^7*x^2 + 16*d^5)*sqrt(d*x + 1)*sqrt(-d*x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**3*(C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.245146, size = 551, normalized size = 1.62

$$-\frac{\left(360\,Ad^{29}fe^{2}-180\,Ad^{28}f^{2}e+120\,Ad^{27}f^{3}+120\,Bd^{29}e^{3}-180\,Bd^{28}fe^{2}+360\,Bd^{27}f^{2}e-75\,Bd^{26}f^{3}-60\,Cd^{28}e^{3}+360\,Cd^{2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(f*x + e)^3/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="giac")
```

```
[Out] -1/2211840*((360*A*d^29*f*e^2 - 180*A*d^28*f^2*e + 120*A*d^27*f^3
 + 120*B*d^29*e^3 - 180*B*d^28*f*e^2 + 360*B*d^27*f^2*e - 75*B*d^
26*f^3 - 60*C*d^28*e^3 + 360*C*d^27*f*e^2 - 225*C*d^26*f^2*e + 12
0*C*d^25*f^3 + (180*A*d^28*f^2*e - 80*A*d^27*f^3 + 180*B*d^28*f*e
^2 - 240*B*d^27*f^2*e + 135*B*d^26*f^3 + 60*C*d^28*e^3 - 240*C*d^
27*f*e^2 + 405*C*d^26*f^2*e - 160*C*d^25*f^3 + 2*(20*A*d^27*f^3 +
 60*B*d^27*f^2*e - 45*B*d^26*f^3 + 60*C*d^27*f*e^2 - 135*C*d^26*f
^2*e + 88*C*d^25*f^3 + 3*(4*(d*x + 1)*C*d^25*f^3 + 5*B*d^26*f^3 +
 15*C*d^26*f^2*e - 16*C*d^25*f^3)*(d*x + 1))*(d*x + 1))*(d*x + 1)
)*sqrt(d*x + 1)*sqrt(-d*x + 1) - 30*(8*A*d^30*e^3 + 12*A*d^28*f^2
*e + 12*B*d^28*f*e^2 + 3*B*d^26*f^3 + 4*C*d^28*e^3 + 9*C*d^26*f^2
*e)*arcsin(1/2*sqrt(2)*sqrt(d*x + 1)))/d
```

3.43 $\int \frac{(e+fx)^2(A+Bx+Cx^2)}{\sqrt{1-dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=228

$$\frac{\sin^{-1}(dx)\left(4d^2\left(A\left(2d^2e^2+f^2\right)+2Bef\right)+C\left(4d^2e^2+3f^2\right)\right)}{8d^5}+\frac{\sqrt{1-d^2x^2}\left(4\left(C\left(d^2e^3-8ef^2\right)-4f\left(3Ad^2ef+B\left(d^2e^2+f^2\right)\right)\right)-fx\left(3f^2\left(4Ad^2+3C\right)-2d^2e(Ce-4Bf)\right)\right)}{24d^4f}+\frac{\sqrt{1-d^2x^2}(e+fx)^2(Ce-4Bf)}{12d^2f}-\frac{C\sqrt{1-d^2x^2}(e+fx)^3}{4d^2f}$$

```
[Out] ((C*e - 4*B*f)*(e + f*x)^2*Sqrt[1 - d^2*x^2])/(12*d^2*f) - (C*(e
+ f*x)^3*Sqrt[1 - d^2*x^2])/(4*d^2*f) + ((4*(C*(d^2*e^3 - 8*e*f^2
) - 4*f*(3*A*d^2*e*f + B*(d^2*e^2 + f^2))) - f*(3*(3*C + 4*A*d^2)
*f^2 - 2*d^2*e*(C*e - 4*B*f))*x)*Sqrt[1 - d^2*x^2])/(24*d^4*f) +
((C*(4*d^2*e^2 + 3*f^2) + 4*d^2*(2*B*e*f + A*(2*d^2*e^2 + f^2)))*
ArcSin[d*x])/(8*d^5)
```

Rubi [A] time = 1.03938, antiderivative size = 228, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.135$

$$\frac{\sin^{-1}(dx)\left(4d^2\left(A\left(2d^2e^2+f^2\right)+2Bef\right)+C\left(4d^2e^2+3f^2\right)\right)}{8d^5}+\frac{\sqrt{1-d^2x^2}\left(4\left(C\left(d^2e^3-8ef^2\right)-4f\left(3Ad^2ef+B\left(d^2e^2+f^2\right)\right)\right)-fx\left(3f^2\left(4Ad^2+3C\right)-2d^2e(Ce-4Bf)\right)\right)}{24d^4f}+\frac{\sqrt{1-d^2x^2}(e+fx)^2(Ce-4Bf)}{12d^2f}-\frac{C\sqrt{1-d^2x^2}(e+fx)^3}{4d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[((e + f*x)^2*(A + B*x + C*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```


```
[Out] ((C*e - 4*B*f)*(e + f*x)^2*Sqrt[1 - d^2*x^2])/(12*d^2*f) - (C*(e
+ f*x)^3*Sqrt[1 - d^2*x^2])/(4*d^2*f) + ((4*(C*(d^2*e^3 - 8*e*f^2
) - 4*f*(3*A*d^2*e*f + B*(d^2*e^2 + f^2))) - f*(3*(3*C + 4*A*d^2)
*f^2 - 2*d^2*e*(C*e - 4*B*f))*x)*Sqrt[1 - d^2*x^2])/(24*d^4*f) +
((C*(4*d^2*e^2 + 3*f^2) + 4*d^2*(2*B*e*f + A*(2*d^2*e^2 + f^2)))*
ArcSin[d*x])/(8*d^5)
```

Rubi in Sympy [A] time = 86.4899, size = 218, normalized size = 0.96

$$-\frac{C(e+fx)^3\sqrt{-d^2x^2+1}}{4d^2f}-\frac{(e+fx)^2(4Bf-Ce)\sqrt{-d^2x^2+1}}{12d^2f}-\frac{\sqrt{-d^2x^2+1}\left(48Ad^2ef^2+16Bd^2e^2f+16Bf^3-4Cd^2e^3+32Cef^2+fx\left(2d^2e(4Bf-Ce)+f^2\left(12Ad^2+9C\right)\right)\right)}{24d^4f}+\frac{\left(8Ad^4e^2+4Ad^2f^2+8Bd^2ef+4Cd^2e^2+3Cf^2\right)\operatorname{asin}(dx)}{8d^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)**2*(C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -C*(e + f*x)**3*sqrt(-d**2*x**2 + 1)/(4*d**2*f) - (e + f*x)**2*(4
*B*f - C*e)*sqrt(-d**2*x**2 + 1)/(12*d**2*f) - sqrt(-d**2*x**2 +
1)*(48*A*d**2*e*f**2 + 16*B*d**2*e**2*f + 16*B*f**3 - 4*C*d**2*e*
*3 + 32*C*e*f**2 + f*x*(2*d**2*e*(4*B*f - C*e) + f**2*(12*A*d**2
+ 9*C)))/(24*d**4*f) + (8*A*d**4*e**2 + 4*A*d**2*f**2 + 8*B*d**2*
e*f + 4*C*d**2*e**2 + 3*C*f**2)*asin(d*x)/(8*d**5)
```

Mathematica [A] time = 0.326114, size = 160, normalized size = 0.7

$$\frac{3\sin^{-1}(dx)\left(4d^2\left(A\left(2d^2e^2+f^2\right)+2Bef\right)+C\left(4d^2e^2+3f^2\right)\right)-d\sqrt{1-d^2x^2}\left(12Ad^2f(4e+fx)+8B\left(d^2\left(3e^2+3efx+f^2x\right.\right.\right.}{24d^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e + f*x)^2*(A + B*x + C*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] (-(d*Sqrt[1 - d^2*x^2]*(12*A*d^2*f*(4*e + f*x) + C*(12*d^2*e^2*x
+ 16*e*f*(2 + d^2*x^2) + 3*f^2*x*(3 + 2*d^2*x^2)) + 8*B*(2*f^2 +
d^2*(3*e^2 + 3*e*f*x + f^2*x^2)))) + 3*(C*(4*d^2*e^2 + 3*f^2) + 4
*d^2*(2*B*e*f + A*(2*d^2*e^2 + f^2)))*ArcSin[d*x])/(24*d^5)
```

Maple [C] time = 0.034, size = 423, normalized size = 1.9

$$-\frac{csgn(d)}{24\,d^5}\sqrt{-dx+1}\sqrt{dx+1}\left(6\,Cf^2x^3\sqrt{-d^2x^2+1}d^3\,csgn(d)+8\,Bcsgn(d)\,d^3\sqrt{-d^2x^2+1}x^2f^2+16\,Ccsgn(d)\,d^3\sqrt{-d^2x^2+1}x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)^2*(C*x^2+B*x+A)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] -1/24*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(6*C*f^2*x^3*(-d^2*x^2+1)^(1/2
)*d^3*csgn(d)+8*B*csgn(d)*d^3*(-d^2*x^2+1)^(1/2)*x^2*f^2+16*C*csg
n(d)*d^3*(-d^2*x^2+1)^(1/2)*x^2*e*f+12*x*(-d^2*x^2+1)^(1/2)*A*f^2
*d^3*csgn(d)+24*x*(-d^2*x^2+1)^(1/2)*B*e*f*d^3*csgn(d)+12*x*(-d^2
*x^2+1)^(1/2)*C*e^2*d^3*csgn(d)+48*A*csgn(d)*d^3*(-d^2*x^2+1)^(1/
2)*e*f-24*A*e^2*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^4+24*B*c
sgn(d)*d^3*(-d^2*x^2+1)^(1/2)*e^2+9*C*f^2*x*(-d^2*x^2+1)^(1/2)*cs
gn(d)*d-12*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*A*f^2*d^2+16*B*
csgn(d)*d*(-d^2*x^2+1)^(1/2)*f^2-24*arctan(csgn(d)*d*x/(-d^2*x^2+
1)^(1/2))*B*e*f*d^2+32*C*csgn(d)*d*(-d^2*x^2+1)^(1/2)*e*f-12*arct
an(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*C*e^2*d^2-9*C*f^2*arctan(csgn(
d)*d*x/(-d^2*x^2+1)^(1/2)))*csgn(d)/(-d^2*x^2+1)^(1/2)/d^5
```

Maxima [A] time = 1.51715, size = 356, normalized size = 1.56

$$-\frac{\sqrt{-d^2x^2+1}Cf^2x^3}{4\,d^2}+\frac{Ae^2\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}}-\frac{\sqrt{-d^2x^2+1}Be^2}{d^2}-\frac{2\sqrt{-d^2x^2+1}Aef}{d^2}-\frac{\sqrt{-d^2x^2+1}\left(2\,Cef+Bf^2\right)x^2}{3\,d^2}-\frac{\sqrt{-d^2x^2+1}\left(Ce^2+2\,Bef+Af^2\right)x}{2\,d^2}-\frac{3\sqrt{-d^2x^2+1}Cf^2x}{8\,d^4}+\frac{\left(Ce^2+2\,Bef+Af^2\right)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\sqrt{d^2}d^2}+\frac{3\,Cf^2\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{8\sqrt{d^2}d^4}-\frac{2\sqrt{-d^2x^2+1}\left(2\,Cef+Bf^2\right)}{3\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((C*x^2 + B*x + A)*(f*x + e)^2/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="maxima")
```

```
[Out] -1/4*sqrt(-d^2*x^2 + 1)*C*f^2*x^3/d^2 + A*e^2*arcsin(d^2*x/sqrt(d
^2))/sqrt(d^2) - sqrt(-d^2*x^2 + 1)*B*e^2/d^2 - 2*sqrt(-d^2*x^2 +
 1)*A*e*f/d^2 - 1/3*sqrt(-d^2*x^2 + 1)*(2*C*e*f + B*f^2)*x^2/d^2
- 1/2*sqrt(-d^2*x^2 + 1)*(C*e^2 + 2*B*e*f + A*f^2)*x/d^2 - 3/8*sq
rt(-d^2*x^2 + 1)*C*f^2*x/d^4 + 1/2*(C*e^2 + 2*B*e*f + A*f^2)*arcs
in(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^2) + 3/8*C*f^2*arcsin(d^2*x/sqrt
(d^2))/(sqrt(d^2)*d^4) - 2/3*sqrt(-d^2*x^2 + 1)*(2*C*e*f + B*f^2)
/d^4
```

Fricas [A] time = 0.245524, size = 1035, normalized size = 4.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((C*x^2 + B*x + A)*(f*x + e)^2/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="fricas")
```

```
[Out] 1/24*(24*C*d^7*f^2*x^7 + 32*(2*C*d^7*e*f + B*d^7*f^2)*x^6 + 12*(4
*C*d^7*e^2 + 8*B*d^7*e*f + (4*A*d^7 - 3*C*d^5)*f^2)*x^5 + 24*(3*B
*d^7*e^2 - 2*B*d^5*f^2 + 2*(3*A*d^7 - 2*C*d^5)*e*f)*x^4 - 12*(12*
C*d^5*e^2 + 24*B*d^5*e*f + (12*A*d^5 + 5*C*d^3)*f^2)*x^3 - 96*(B*
d^5*e^2 + 2*A*d^5*e*f)*x^2 - (6*C*d^7*f^2*x^7 + 8*(2*C*d^7*e*f +
B*d^7*f^2)*x^6 + 3*(4*C*d^7*e^2 + 8*B*d^7*e*f + (4*A*d^7 - 13*C*d
^5)*f^2)*x^5 + 24*(B*d^7*e^2 - 2*B*d^5*f^2 + 2*(A*d^7 - 2*C*d^5)*
e*f)*x^4 - 24*(4*C*d^5*e^2 + 8*B*d^5*e*f + (4*A*d^5 + C*d^3)*f^2)
*x^3 - 96*(B*d^5*e^2 + 2*A*d^5*e*f)*x^2 + 24*(4*C*d^3*e^2 + 8*B*d
^3*e*f + (4*A*d^3 + 3*C*d)*f^2)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) +
 24*(4*C*d^3*e^2 + 8*B*d^3*e*f + (4*A*d^3 + 3*C*d)*f^2)*x - 6*(64
*B*d^2*e*f + (8*B*d^6*e*f + 4*(2*A*d^8 + C*d^6)*e^2 + (4*A*d^6 +
3*C*d^4)*f^2)*x^4 + 32*(2*A*d^4 + C*d^2)*e^2 + 8*(4*A*d^2 + 3*C)*
f^2 - 8*(8*B*d^4*e*f + 4*(2*A*d^6 + C*d^4)*e^2 + (4*A*d^4 + 3*C*d
^2)*f^2)*x^2 - 4*(16*B*d^2*e*f + 8*(2*A*d^4 + C*d^2)*e^2 + 2*(4*A
*d^2 + 3*C)*f^2 - (8*B*d^4*e*f + 4*(2*A*d^6 + C*d^4)*e^2 + (4*A*d
^4 + 3*C*d^2)*f^2)*x^2)*sqrt(d*x + 1)*sqrt(-d*x + 1))*arctan((sqr
t(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(d^9*x^4 - 8*d^7*x^2 + 8*d
^5 + 4*(d^7*x^2 - 2*d^5)*sqrt(d*x + 1)*sqrt(-d*x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*(C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.224605, size = 352, normalized size = 1.54

$$-\frac{\left(48\,Ad^{19}fe - 12\,Ad^{18}f^2 + 24\,Bd^{19}e^2 - 24\,Bd^{18}fe + 24\,Bd^{17}f^2 - 12\,Cd^{18}e^2 + 48\,Cd^{17}fe - 15\,Cd^{16}f^2 + \left(12\,Ad^{18}f^2 + 24\,Bd\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(f*x + e)^2/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="giac")
```

```
[Out] -1/86016*((48*A*d^19*f*e - 12*A*d^18*f^2 + 24*B*d^19*e^2 - 24*B*d
^18*f*e + 24*B*d^17*f^2 - 12*C*d^18*e^2 + 48*C*d^17*f*e - 15*C*d^
16*f^2 + (12*A*d^18*f^2 + 24*B*d^18*f*e - 16*B*d^17*f^2 + 12*C*d^
18*e^2 - 32*C*d^17*f*e + 27*C*d^16*f^2 + 2*(3*(d*x + 1)*C*d^16*f^
2 + 4*B*d^17*f^2 + 8*C*d^17*f*e - 9*C*d^16*f^2)*(d*x + 1))*(d*x +
 1))*sqrt(d*x + 1)*sqrt(-d*x + 1) - 6*(8*A*d^20*e^2 + 4*A*d^18*f^
```

```
2 + 8*B*d^18*f*e + 4*C*d^18*e^2 + 3*C*d^16*f^2)*arcsin(1/2*sqrt(2
)*sqrt(d*x + 1)))/d
```

3.44 $\int \frac{(e+fx)\left(A+Bx+Cx^2\right)}{\sqrt{1-dx}\sqrt{1+dx}}\, dx$

Optimal. Leaf size=130

$$-\frac{\sqrt{1-d^2x^2}\left(2\left(3d^2f(Af+Be)-C\left(d^2e^2-2f^2\right)\right)-d^2fx(Ce-3Bf)\right)}{6d^4f}+\frac{\sin^{-1}(dx)\left(2Ad^2e+Bf+Ce\right)}{2d^3}-\frac{C\sqrt{1-d^2x^2}(e+fx)^2}{3d^2f}$$

```
[Out] -(C*(e + f*x)^2*Sqrt[1 - d^2*x^2])/(3*d^2*f) - ((2*(3*d^2*f*(B*e
+ A*f) - C*(d^2*e^2 - 2*f^2)) - d^2*f*(C*e - 3*B*f)*x)*Sqrt[1 - d
^2*x^2])/(6*d^4*f) + ((C*e + 2*A*d^2*e + B*f)*ArcSin[d*x])/(2*d^3
)
```

Rubi [A] time = 0.449046, antiderivative size = 133, normalized size of antiderivative = 1.02, number of steps used = 4, number of rules used = 4, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.114

$$-\frac{\sqrt{1-d^2x^2}\left(2\left(3d^2f(Af+Be)-\frac{1}{2}C\left(2d^2e^2-4f^2\right)\right)-d^2fx(Ce-3Bf)\right)}{6d^4f}+\frac{\sin^{-1}(dx)\left(2Ad^2e+Bf+Ce\right)}{2d^3}-\frac{C\sqrt{1-d^2x^2}(e+fx)^2}{3d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[((e + f*x)*(A + B*x + C*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] -(C*(e + f*x)^2*Sqrt[1 - d^2*x^2])/(3*d^2*f) - ((2*(3*d^2*f*(B*e
+ A*f) - (C*(2*d^2*e^2 - 4*f^2))/2) - d^2*f*(C*e - 3*B*f)*x)*Sqrt
[1 - d^2*x^2])/(6*d^4*f) + ((C*e + 2*A*d^2*e + B*f)*ArcSin[d*x])/
(2*d^3)
```

Rubi in Sympy [A] time = 43.239, size = 116, normalized size = 0.89

$$-\frac{C\left(e+fx\right)^2\sqrt{-d^2x^2+1}}{3d^2f}+\frac{\left(2Ad^2e+Bf+Ce\right)\operatorname{asin}\left(dx\right)}{2d^3}-\frac{\sqrt{-d^2x^2+1}\left(2d^2e\left(3Bf-Ce\right)+d^2fx\left(3Bf-Ce\right)+2f^2\left(3Ad^2+2C\right)\right)}{6d^4f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)*(C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -C*(e + f*x)**2*sqrt(-d**2*x**2 + 1)/(3*d**2*f) + (2*A*d**2*e + B
*f + C*e)*asin(d*x)/(2*d**3) - sqrt(-d**2*x**2 + 1)*(2*d**2*e*(3*
B*f - C*e) + d**2*f*x*(3*B*f - C*e) + 2*f**2*(3*A*d**2 + 2*C))/(6
*d**4*f)
```

Mathematica [A] time = 0.16652, size = 88, normalized size = 0.68

$$\frac{3d\sin^{-1}(dx)\left(2Ad^2e+Bf+Ce\right)-\sqrt{1-d^2x^2}\left(6Ad^2f+3Bd^2(2e+fx)+C\left(3d^2ex+2d^2fx^2+4f\right)\right)}{6d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e + f*x)*(A + B*x + C*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] (-(Sqrt[1 - d^2*x^2]*(6*A*d^2*f + 3*B*d^2*(2*e + f*x) + C*(4*f +
3*d^2*e*x + 2*d^2*f*x^2))) + 3*d*(C*e + 2*A*d^2*e + B*f)*ArcSin[d
*x])/(6*d^4)
```

Maple [C] time = 0.028, size = 235, normalized size = 1.8

$$-\frac{csgn(d)}{6\,d^4}\sqrt{-dx+1}\sqrt{dx+1}\left(2\,Ccsgn(d)\,\sqrt{-d^2x^2+1}x^2d^2f+3\,Bcsgn(d)\,\sqrt{-d^2x^2+1}xd^2f+3\,Ccsgn(d)\,\sqrt{-d^2x^2+1}xd^2e+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x+e)*(C*x^2+B*x+A)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] -1/6*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(2*C*csgn(d)*(-d^2*x^2+1)^(1/2)
*x^2*d^2*f+3*B*csgn(d)*(-d^2*x^2+1)^(1/2)*x*d^2*f+3*C*csgn(d)*(-d
^2*x^2+1)^(1/2)*x*d^2*e+6*A*csgn(d)*(-d^2*x^2+1)^(1/2)*d^2*f-6*A*
arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^3*e+6*B*csgn(d)*(-d^2*x^
2+1)^(1/2)*d^2*e-3*B*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*f+4
*C*csgn(d)*(-d^2*x^2+1)^(1/2)*f-3*C*arctan(csgn(d)*d*x/(-d^2*x^2+
1)^(1/2))*d*e)*csgn(d)/d^4/(-d^2*x^2+1)^(1/2)
```

Maxima [A] time = 1.498, size = 205, normalized size = 1.58

$$-\frac{\sqrt{-d^2x^2+1}Cfx^2}{3\,d^2}+\frac{Ae\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}}-\frac{\sqrt{-d^2x^2+1}Be}{d^2}-\frac{\sqrt{-d^2x^2+1}Af}{d^2}$$
$$-\frac{\sqrt{-d^2x^2+1}(Ce+Bf)x}{2\,d^2}+\frac{(Ce+Bf)\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\,\sqrt{d^2}d^2}-\frac{2\,\sqrt{-d^2x^2+1}Cf}{3\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((C*x^2 + B*x + A)*(f*x + e)/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="maxima")
```

```
[Out] -1/3*sqrt(-d^2*x^2 + 1)*C*f*x^2/d^2 + A*e*arcsin(d^2*x/sqrt(d^2))
/sqrt(d^2) - sqrt(-d^2*x^2 + 1)*B*e/d^2 - sqrt(-d^2*x^2 + 1)*A*f/
d^2 - 1/2*sqrt(-d^2*x^2 + 1)*(C*e + B*f)*x/d^2 + 1/2*(C*e + B*f)*
arcsin(d^2*x/sqrt(d^2))/(sqrt(d^2)*d^2) - 2/3*sqrt(-d^2*x^2 + 1)*
C*f/d^4
```

Fricas [A] time = 0.231752, size = 479, normalized size = 3.68

$$-\frac{2\,Cd^5fx^6+3\left(Cd^5e+Bd^5f\right)x^5+6\left(Bd^5e+\left(Ad^5-Cd^3\right)f\right)x^4-15\left(Cd^3e+Bd^3f\right)x^3-12\left(Bd^3e+Ad^3f\right)x^2+3\left(2\,Cd^3fx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((C*x^2 + B*x + A)*(f*x + e)/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="fricas")
```

```
[Out] -1/6*(2*C*d^5*f*x^6 + 3*(C*d^5*e + B*d^5*f)*x^5 + 6*(B*d^5*e + (A
*d^5 - C*d^3)*f)*x^4 - 15*(C*d^3*e + B*d^3*f)*x^3 - 12*(B*d^3*e +
 A*d^3*f)*x^2 + 3*(2*C*d^3*f*x^4 + 3*(C*d^3*e + B*d^3*f)*x^3 + 4*
(B*d^3*e + A*d^3*f)*x^2 - 4*(C*d*e + B*d*f)*x)*sqrt(d*x + 1)*sqrt
(-d*x + 1) + 12*(C*d*e + B*d*f)*x + 6*(3*(B*d^2*f + (2*A*d^4 + C*
d^2)*e)*x^2 - ((B*d^2*f + (2*A*d^4 + C*d^2)*e)*x^2 - 4*(2*A*d^2 +
 C)*e - 4*B*f)*sqrt(d*x + 1)*sqrt(-d*x + 1) - 4*(2*A*d^2 + C)*e -
 4*B*f)*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(3*d^5*
x^2 - 4*d^3 - (d^5*x^2 - 4*d^3)*sqrt(d*x + 1)*sqrt(-d*x + 1))
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x+e)*(C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.225, size = 186, normalized size = 1.43

$$-\frac{\left(6\,Ad^{11}f+6\,Bd^{11}e-3\,Bd^{10}f-3\,Cd^{10}e+6\,Cd^{9}f+\left(2\,(dx+1)Cd^{9}f+3\,Bd^{10}f+3\,Cd^{10}e-4\,Cd^{9}f\right)(dx+1)\right)\sqrt{dx+1}\sqrt{-d}}{3840\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(f*x + e)/(sqrt(d*x + 1)*sqrt(-
d*x + 1)),x, algorithm="giac")
```

```
[Out] -1/3840*((6*A*d^11*f + 6*B*d^11*e - 3*B*d^10*f - 3*C*d^10*e + 6*C
*d^9*f + (2*(d*x + 1)*C*d^9*f + 3*B*d^10*f + 3*C*d^10*e - 4*C*d^9
*f)*(d*x + 1))*sqrt(d*x + 1)*sqrt(-d*x + 1) - 6*(2*A*d^12*e + B*d
^10*f + C*d^10*e)*arcsin(1/2*sqrt(2)*sqrt(d*x + 1)))/d
```

3.45 $\int \frac{A+Bx+Cx^2}{\sqrt{1-dx}\sqrt{1+dx}} \, dx$

Optimal. Leaf size=63

$$\frac{(2Ad^2+C)\sin^{-1}(dx)}{2d^3}-\frac{B\sqrt{1-d^2x^2}}{d^2}-\frac{Cx\sqrt{1-d^2x^2}}{2d^2}$$

```
[Out] -((B*Sqrt[1 - d^2*x^2])/d^2) - (C*x*Sqrt[1 - d^2*x^2])/(2*d^2) +
((C + 2*A*d^2)*ArcSin[d*x])/(2*d^3)
```

Rubi [A] time = 0.137221, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$

$$\frac{(2Ad^2+C)\sin^{-1}(dx)}{2d^3}-\frac{B\sqrt{1-d^2x^2}}{d^2}-\frac{Cx\sqrt{1-d^2x^2}}{2d^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] -((B*Sqrt[1 - d^2*x^2])/d^2) - (C*x*Sqrt[1 - d^2*x^2])/(2*d^2) +
((C + 2*A*d^2)*ArcSin[d*x])/(2*d^3)
```

Rubi in Sympy [A] time = 15.2679, size = 41, normalized size = 0.65

$$-\frac{(2B+Cx)\sqrt{-d^2x^2+1}}{2d^2}+\frac{(2Ad^2+C)\operatorname{asin}(dx)}{2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -(2*B + C*x)*sqrt(-d**2*x**2 + 1)/(2*d**2) + (2*A*d**2 + C)*asin(
d*x)/(2*d**3)
```

Mathematica [A] time = 0.0639585, size = 45, normalized size = 0.71

$$\frac{(2Ad^2+C)\sin^{-1}(dx)-d\sqrt{1-d^2x^2}(2B+Cx)}{2d^3}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] (-(d*(2*B + C*x)*Sqrt[1 - d^2*x^2]) + (C + 2*A*d^2)*ArcSin[d*x])/
(2*d^3)
```

Maple [C] time = 0.023, size = 117, normalized size = 1.9

$$\frac{csgn(d)}{2\,d^3}\sqrt{-dx+1}\sqrt{dx+1}\left(2\,A\arctan\left(\frac{csgn(d)\,dx}{\sqrt{-d^2x^2+1}}\right)d^2-Cx\sqrt{-d^2x^2+1}csgn(d)\,d-2\,B\sqrt{-d^2x^2+1}csgn(d)\,d+C\arctan\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] 1/2*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(2*A*arctan(csgn(d)*d*x/(-d^2*x^
2+1)^(1/2))*d^2-C*x*(-d^2*x^2+1)^(1/2)*csgn(d)*d-2*B*(-d^2*x^2+1)
^(1/2)*csgn(d)*d+C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2)))/(-d^2*
x^2+1)^(1/2)/d^3*csgn(d)
```

Maxima [A] time = 1.49925, size = 105, normalized size = 1.67

$$\frac{A\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}}-\frac{\sqrt{-d^2x^2+1}Cx}{2\,d^2}-\frac{\sqrt{-d^2x^2+1}B}{d^2}+\frac{C\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\,\sqrt{d^2}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)),x, algorithm="maxima")
```

```
[Out] A*arcsin(d^2*x/sqrt(d^2))/sqrt(d^2) - 1/2*sqrt(-d^2*x^2 + 1)*C*x/
d^2 - sqrt(-d^2*x^2 + 1)*B/d^2 + 1/2*C*arcsin(d^2*x/sqrt(d^2))/(s
qrt(d^2)*d^2)
```

Fricas [A] time = 0.231548, size = 244, normalized size = 3.87

$$\frac{2\,Cd^3x^3+2\,Bd^3x^2-2\,Cdx-\left(Cd^3x^3+2\,Bd^3x^2-2\,Cdx\right)\sqrt{dx+1}\sqrt{-dx+1}+2\left(4\,Ad^2-\left(2\,Ad^4+Cd^2\right)x^2-2\left(2\,Ad^2+C\right)\right.}{2\left(d^5x^2+2\,\sqrt{dx+1}\sqrt{-dx+1}d^3-2\,d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)),x, algorithm="fricas")
```

```
[Out] 1/2*(2*C*d^3*x^3 + 2*B*d^3*x^2 - 2*C*d*x - (C*d^3*x^3 + 2*B*d^3*x
^2 - 2*C*d*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 2*(4*A*d^2 - (2*A*d^
4 + C*d^2)*x^2 - 2*(2*A*d^2 + C)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 2
*C)*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(d^5*x^2 +
2*sqrt(d*x + 1)*sqrt(-d*x + 1)*d^3 - 2*d^3)
```

Sympy [A] time = 54.2803, size = 282, normalized size = 4.48

$$-\frac{iAG_{6,6}^{6,2}\left(\begin{matrix}\frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1\\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}+\frac{AG_{6,6}^{2,6}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}-\frac{iBG_{6,6}^{6,2}\left(\begin{matrix}-\frac{1}{4},\frac{1}{4} & 0,0,\frac{1}{2},1\\ -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}-\frac{BG_{6,6}^{2,6}\left(\begin{matrix}-1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,1 & \\ -\frac{3}{4},-\frac{1}{4} & -1,-\frac{1}{2},-\frac{1}{2},0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}-\frac{iCG_{6,6}^{6,2}\left(\begin{matrix}-\frac{3}{4},-\frac{1}{4} & -\frac{1}{2},-\frac{1}{2},0,1\\ -1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}+\frac{CG_{6,6}^{2,6}\left(\begin{matrix}-\frac{3}{2},-\frac{5}{4},-1,-\frac{3}{4},-\frac{1}{2},1 & \\ -\frac{5}{4},-\frac{3}{4} & -\frac{3}{2},-1,-1,0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -I*A*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4,
1, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) + A*meijerg(((-1/2, -1
/4, 0, 1/4, 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_pol
ar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d) - I*B*meijerg(((-1/4, 1/
4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4, 1/2, 0), ()), 1/(d**2*
x**2))/(4*pi**(3/2)*d**2) - B*meijerg(((-1, -3/4, -1/2, -1/4, 0,
1), ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)), exp_polar(-2*I*pi)/
(d**2*x**2))/(4*pi**(3/2)*d**2) - I*C*meijerg(((-3/4, -1/4), (-1/
2, -1/2, 0, 1)), ((-1, -3/4, -1/2, -1/4, 0, 0), ()), 1/(d**2*x**2
))/(4*pi**(3/2)*d**3) + C*meijerg(((-3/2, -5/4, -1, -3/4, -1/2, 1
), ()), ((-5/4, -3/4), (-3/2, -1, -1, 0)), exp_polar(-2*I*pi)/(d*
*2*x**2))/(4*pi**(3/2)*d**3)
```

GIAC/XCAS [A] time = 0.222581, size = 97, normalized size = 1.54

$$-\frac{\left((dx+1)Cd^4+2\,Bd^5-Cd^4\right)\sqrt{dx+1}\sqrt{-dx+1}-2\left(2\,Ad^6+Cd^4\right)\arcsin\left(\frac{1}{2}\sqrt{2}\sqrt{dx+1}\right)}{192\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)),x, algorithm="giac")
```

```
[Out] -1/192*(((d*x + 1)*C*d^4 + 2*B*d^5 - C*d^4)*sqrt(d*x + 1)*sqrt(-d
*x + 1) - 2*(2*A*d^6 + C*d^4)*arcsin(1/2*sqrt(2)*sqrt(d*x + 1)))/
d
```

3.46 $\int \frac{A+Bx+Cx^2}{\sqrt{1-dx}\sqrt{1+dx}(e+fx)}\,dx$

Optimal. Leaf size=122

$$\frac{\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)}{f^2\sqrt{d^2e^2-f^2}}-\frac{\sin^{-1}(dx)(Ce-Bf)}{df^2}-\frac{C\sqrt{1-d^2x^2}}{d^2f}$$

```
[Out] -((C*Sqrt[1 - d^2*x^2])/(d^2*f)) - ((C*e - B*f)*ArcSin[d*x])/(d*f
^2) + ((C*e^2 - B*e*f + A*f^2)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2
 - f^2]*Sqrt[1 - d^2*x^2])])/(f^2*Sqrt[d^2*e^2 - f^2])
```

Rubi [A] time = 0.54446, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.162

$$\frac{\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)}{f^2\sqrt{d^2e^2-f^2}}-\frac{\sin^{-1}(dx)(Ce-Bf)}{df^2}-\frac{C\sqrt{1-d^2x^2}}{d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)),x]
```


```
[Out] -((C*Sqrt[1 - d^2*x^2])/(d^2*f)) - ((C*e - B*f)*ArcSin[d*x])/(d*f
^2) + ((C*e^2 - B*e*f + A*f^2)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2
 - f^2]*Sqrt[1 - d^2*x^2])])/(f^2*Sqrt[d^2*e^2 - f^2])
```

Rubi in Sympy [A] time = 69.1284, size = 109, normalized size = 0.89

$$-\frac{C\sqrt{-d^2x^2+1}}{d^2f}-\frac{\left(Af^2-Bef+Ce^2\right)\operatorname{atanh}\left(\frac{d^2ex+f}{\sqrt{-de+f}\sqrt{de+f}\sqrt{-d^2x^2+1}}\right)}{f^2\sqrt{-de+f}\sqrt{de+f}}+\frac{(Bf-Ce)\operatorname{asin}(dx)}{df^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)/(f*x+e)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -C*sqrt(-d**2*x**2 + 1)/(d**2*f) - (A*f**2 - B*e*f + C*e**2)*atan
h((d**2*e*x + f)/(sqrt(-d*e + f)*sqrt(d*e + f)*sqrt(-d**2*x**2 +
1)))/(f**2*sqrt(-d*e + f)*sqrt(d*e + f)) + (B*f - C*e)*asin(d*x)/
(d*f**2)
```

Mathematica [A] time = 0.322192, size = 155, normalized size = 1.27

$$\frac{-\frac{(f(Af-Be)+Ce^2)\log\left(\sqrt{1-d^2x^2}\sqrt{f^2-d^2e^2}+d^2ex+f\right)}{\sqrt{f^2-d^2e^2}}+\frac{\log(e+fx)(f(Af-Be)+Ce^2)}{\sqrt{f^2-d^2e^2}}+\frac{\sin^{-1}(dx)(Bf-Ce)}{d}-\frac{Cf\sqrt{1-d^2x^2}}{d^2}}{f^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)),x]
```

```
[Out] (-((C*f*Sqrt[1 - d^2*x^2])/d^2) + ((-(C*e) + B*f)*ArcSin[d*x])/d
+ ((C*e^2 + f*(-(B*e) + A*f))*Log[e + f*x])/Sqrt[-(d^2*e^2) + f^2
] - ((C*e^2 + f*(-(B*e) + A*f))*Log[f + d^2*e*x + Sqrt[-(d^2*e^2)
 + f^2]*Sqrt[1 - d^2*x^2]])/Sqrt[-(d^2*e^2) + f^2])/f^2
```

Maple [C] time = 0., size = 373, normalized size = 3.1

$$\frac{csgn(d)}{f^3d^2}\left(-Acsgn(d)\ln\left(2\frac{1}{fx+e}\left(d^2ex+\sqrt{-d^2x^2+1}\sqrt{-\frac{d^2e^2-f^2}{f^2}}f+f\right)\right)d^2f^2+Bcsgn(d)\ln\left(2\frac{1}{fx+e}\left(d^2ex+\sqrt{-d^2x\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] (-A*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)
^(1/2)*f+f)/(f*x+e))*d^2*f^2+B*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)
^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^2*e*f-C*csgn(d)
*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)
/(f*x+e))*d^2*e^2+B*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*f^2*
(-(d^2*e^2-f^2)/f^2)^(1/2)-C*csgn(d)*f^2*(-d^2*x^2+1)^(1/2)*(-(d^
2*e^2-f^2)/f^2)^(1/2)-C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d*
e*f*(-(d^2*e^2-f^2)/f^2)^(1/2))*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*csgn
(d)/(-(d^2*e^2-f^2)/f^2)^(1/2)/f^3/(-d^2*x^2+1)^(1/2)/d^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)),x, algorithm=
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 7.87552, size = 1, normalized size = 0.01

$$\left[\frac{\sqrt{-d^2e^2+f^2}Cdfx^2+2\left(\sqrt{-d^2e^2+f^2}(Ce-Bf)\sqrt{dx+1}\sqrt{-dx+1}-\sqrt{-d^2e^2+f^2}(Ce-Bf)\right)\arctan\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{dx}\right)-(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)),x, algorithm=
```

```
[Out] [(sqrt(-d^2*e^2 + f^2)*C*d*f*x^2 + 2*(sqrt(-d^2*e^2 + f^2)*(C*e -
 B*f)*sqrt(d*x + 1)*sqrt(-d*x + 1) - sqrt(-d^2*e^2 + f^2)*(C*e -
B*f))*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)) - (C*d*e^2
 - B*d*e*f + A*d*f^2 - (C*d*e^2 - B*d*e*f + A*d*f^2)*sqrt(d*x + 1
)*sqrt(-d*x + 1))*log(-((d^2*e^2*f - f^3)*x^2 + (d^2*e^3 - e*f^2)
*x + sqrt(-d^2*e^2 + f^2)*(e*f*x - (d^2*e^2 - f^2)*x^2 + e^2) - (
(d^2*e^3 - e*f^2)*sqrt(-d*x + 1)*x + sqrt(-d^2*e^2 + f^2)*(e*f*x
+ e^2)*sqrt(-d*x + 1))*sqrt(d*x + 1))/(sqrt(d*x + 1)*sqrt(-d*x +
1)*(f*x + e) - f*x - e)))/(sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)*sqr
t(-d*x + 1)*d*f^2 - sqrt(-d^2*e^2 + f^2)*d*f^2), (sqrt(d^2*e^2 -
f^2)*C*d*f*x^2 - 2*(C*d*e^2 - B*d*e*f + A*d*f^2 - (C*d*e^2 - B*d*
e*f + A*d*f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1))*arctan(-(sqrt(d^2*e^
2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*e - sqrt(d^2*e^2 - f^2)*(f*
x + e))/((d^2*e^2 - f^2)*x)) + 2*(sqrt(d^2*e^2 - f^2)*(C*e - B*f)
*sqrt(d*x + 1)*sqrt(-d*x + 1) - sqrt(d^2*e^2 - f^2)*(C*e - B*f))*
arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(sqrt(d^2*e^2 -
 f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*d*f^2 - sqrt(d^2*e^2 - f^2)*d*
f^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A+Bx+Cx^2}{(e+fx)\sqrt{-dx+1}\sqrt{dx+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Integral((A + B*x + C*x**2)/((e + f*x)*sqrt(-d*x + 1)*sqrt(d*x +
1)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)),x, algorithm=
```

```
[Out] Exception raised: TypeError
```

3.47 $\int \frac{A+Bx+Cx^2}{\sqrt{1-dx}\sqrt{1+dx}(e+fx)^2}\,dx$

Optimal. Leaf size=163

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{f\left(d^2e^2-f^2\right)(e+fx)} - \frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{f^2\left(d^2e^2-f^2\right)^{3/2}} + \frac{C\sin^{-1}(dx)}{df^2}$$

```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(f*(d^2*e^2 - f^2)*(e
 + f*x)) + (C*ArcSin[d*x])/(d*f^2) - ((C*d^2*e^3 - 2*C*e*f^2 - A*
d^2*e*f^2 + B*f^3)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt
[1 - d^2*x^2])])/(f^2*(d^2*e^2 - f^2)^(3/2))
```

Rubi [A] time = 0.584769, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}} = 0.162$

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{f\left(d^2e^2-f^2\right)(e+fx)} - \frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{f^2\left(d^2e^2-f^2\right)^{3/2}} + \frac{C\sin^{-1}(dx)}{df^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^2),x]
```

```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(f*(d^2*e^2 - f^2)*(e
 + f*x)) + (C*ArcSin[d*x])/(d*f^2) - ((C*d^2*e^3 - 2*C*e*f^2 - A*
d^2*e*f^2 + B*f^3)*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt
[1 - d^2*x^2])])/(f^2*(d^2*e^2 - f^2)^(3/2))
```

Rubi in Sympy [A] time = 90.9699, size = 146, normalized size = 0.9

$$\frac{C\,\mathrm{asin}\,(dx)}{df^2} - \frac{\sqrt{-d^2x^2+1}\left(Af^2-Bef+Ce^2\right)}{f\,(e+fx)\left(-d^2e^2+f^2\right)} - \frac{\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)\mathrm{atanh}\left(\frac{d^2ex+f}{\sqrt{-de+f}\sqrt{de+f}\sqrt{-d^2x^2+1}}\right)}{f^2\,(-de+f)^{\frac{3}{2}}\,(de+f)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**2/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] C*asin(d*x)/(d*f**2) - sqrt(-d**2*x**2 + 1)*(A*f**2 - B*e*f + C*e
**2)/(f*(e + f*x)*(-d**2*e**2 + f**2)) - (-A*d**2*e*f**2 + B*f**3
 + C*d**2*e**3 - 2*C*e*f**2)*atanh((d**2*e*x + f)/(sqrt(-d*e + f)
*sqrt(d*e + f)*sqrt(-d**2*x**2 + 1)))/(f**2*(-d*e + f)**(3/2)*(d*
e + f)**(3/2))
```

Mathematica [A] time = 0.526313, size = 211, normalized size = 1.29

$$\frac{-\frac{f\sqrt{1-d^2x^2}\left(f(Af-Be)+Ce^2\right)}{(f^2-d^2e^2)(e+fx)}-\frac{\log\left(\sqrt{1-d^2x^2}\sqrt{f^2-d^2e^2}+d^2ex+f\right)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{(f^2-d^2e^2)^{3/2}}+\frac{\log(e+fx)\left(-Ad^2ef^2+Bf^3+Cd^2e^3-2Cef^2\right)}{(f^2-d^2e^2)^{3/2}}+\frac{C\sin}{}}{f^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^2),x]
```

```
[Out] (-((f*(C*e^2 + f*(-(B*e) + A*f))*Sqrt[1 - d^2*x^2])/((-(d^2*e^2)
+ f^2)*(e + f*x))) + (C*ArcSin[d*x])/d + ((C*d^2*e^3 - 2*C*e*f^2
- A*d^2*e*f^2 + B*f^3)*Log[e + f*x])/(-(d^2*e^2) + f^2)^(3/2) - (
(C*d^2*e^3 - 2*C*e*f^2 - A*d^2*e*f^2 + B*f^3)*Log[f + d^2*e*x + S
qrt[-(d^2*e^2) + f^2]*Sqrt[1 - d^2*x^2]])/(-(d^2*e^2) + f^2)^(3/2
))/f^2
```

Maple [C] time = 0., size = 899, normalized size = 5.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)/(f*x+e)^2/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] (-A*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)
^(1/2)*f+f)/(f*x+e))*x*d^3*e*f^3+C*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^
2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d^3*e^3*f-A
*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1
/2)*f+f)/(f*x+e))*d^3*e^2*f^2+C*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1
)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^3*e^4+C*arctan
(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*x*d^2*e^2*f^2*(-(d^2*e^2-f^2)/f^
2)^(1/2)+A*csgn(d)*d*f^4*(-(d^2*e^2-f^2)/f^2)^(1/2)*(-d^2*x^2+1)^
(1/2)+B*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/
f^2)^(1/2)*f+f)/(f*x+e))*x*d*f^4-B*csgn(d)*d*e*f^3*(-(d^2*e^2-f^2
)/f^2)^(1/2)*(-d^2*x^2+1)^(1/2)-2*C*csgn(d)*ln(2*(d^2*e*x+(-d^2*x
^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d*e*f^3+C*
csgn(d)*d*e^2*f^2*(-(d^2*e^2-f^2)/f^2)^(1/2)*(-d^2*x^2+1)^(1/2)+C
```

```
*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*d^2*e^3*f*(-(d^2*e^2-f^2)
/f^2)^(1/2)+B*csgn(d)*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2
-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d*e*f^3-2*C*csgn(d)*ln(2*(d^2*e*x+
(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d*e^2
*f^2-C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*x*f^4*(-(d^2*e^2-f^
2)/f^2)^(1/2)-C*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2))*e*f^3*(-(d
^2*e^2-f^2)/f^2)^(1/2))*csgn(d)*(d*x+1)^(1/2)*(-d*x+1)^(1/2)/(-d^
2*x^2+1)^(1/2)/(d*e-f)/(d*e+f)/d/(-(d^2*e^2-f^2)/f^2)^(1/2)/f^3/(
f*x+e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2),x, algorith

[Out] Exception raised: ValueError
```

Fricas [A] time = 30.3043, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2),x, algorith

[Out] [((C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4)*sqrt(-d^2*e^2 + f^2)*sqrt(d
*x + 1)*sqrt(-d*x + 1)*x - 2*((C*d^2*e^4 - C*e^2*f^2 + (C*d^2*e^3
*f - C*e*f^3)*x)*sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1
) - (C*d^2*e^4 - C*e^2*f^2 + (C*d^2*e^3*f - C*e*f^3)*x)*sqrt(-d^2
*e^2 + f^2))*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)) - (
C*d^3*e^5 + B*d*e^2*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 - (C*d^3*e^5 +
B*d*e^2*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 + (C*d^3*e^4*f + B*d*e*f^4
- (A*d^3 + 2*C*d)*e^2*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + (C*d
^3*e^4*f + B*d*e*f^4 - (A*d^3 + 2*C*d)*e^2*f^3)*x)*log(((d^2*e^2*
f - f^3)*x^2 + (d^2*e^3 - e*f^2)*x - sqrt(-d^2*e^2 + f^2)*(e*f*x
- (d^2*e^2 - f^2)*x^2 + e^2) - ((d^2*e^3 - e*f^2)*sqrt(-d*x + 1)*
x - sqrt(-d^2*e^2 + f^2)*(e*f*x + e^2)*sqrt(-d*x + 1))*sqrt(d*x +
 1))/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e) - f*x - e)) - sqrt(-
d^2*e^2 + f^2)*((C*d^3*e^3*f - B*d^3*e^2*f^2 + A*d^3*e*f^3)*x^2 +
 (C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4)*x))/((d^3*e^4*f^2 - d*e^2*f^
4 + (d^3*e^3*f^3 - d*e*f^5)*x)*sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)
*sqrt(-d*x + 1) - (d^3*e^4*f^2 - d*e^2*f^4 + (d^3*e^3*f^3 - d*e*f
^5)*x)*sqrt(-d^2*e^2 + f^2)), ((C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4
)*sqrt(d^2*e^2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*x + 2*(C*d^3*e
```

```
^5 + B*d*e^2*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 - (C*d^3*e^5 + B*d*e^2
*f^3 - (A*d^3 + 2*C*d)*e^3*f^2 + (C*d^3*e^4*f + B*d*e*f^4 - (A*d^
3 + 2*C*d)*e^2*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + (C*d^3*e^4*
f + B*d*e*f^4 - (A*d^3 + 2*C*d)*e^2*f^3)*x)*arctan(-(sqrt(d^2*e^2
 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*e - sqrt(d^2*e^2 - f^2)*(f*x
 + e))/((d^2*e^2 - f^2)*x)) - 2*((C*d^2*e^4 - C*e^2*f^2 + (C*d^2*
e^3*f - C*e*f^3)*x)*sqrt(d^2*e^2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x +
 1) - (C*d^2*e^4 - C*e^2*f^2 + (C*d^2*e^3*f - C*e*f^3)*x)*sqrt(d^
2*e^2 - f^2))*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)) -
sqrt(d^2*e^2 - f^2)*((C*d^3*e^3*f - B*d^3*e^2*f^2 + A*d^3*e*f^3)*
x^2 + (C*d*e^2*f^2 - B*d*e*f^3 + A*d*f^4)*x))/((d^3*e^4*f^2 - d*e
^2*f^4 + (d^3*e^3*f^3 - d*e*f^5)*x)*sqrt(d^2*e^2 - f^2)*sqrt(d*x
+ 1)*sqrt(-d*x + 1) - (d^3*e^4*f^2 - d*e^2*f^4 + (d^3*e^3*f^3 - d
*e*f^5)*x)*sqrt(d^2*e^2 - f^2))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**2/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^2),x, algorith
```

```
[Out] Exception raised: TypeError
```

3.48 $\int \frac{A+Bx+Cx^2}{\sqrt{1-dx}\sqrt{1+dx}(e+fx)^3}\,dx$

Optimal. Leaf size=248

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{2f\left(d^2e^2-f^2\right)(e+fx)^2}+\frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(C\left(d^2e^2+2f^2\right)-d^2\left(3Bef-A\left(2d^2e^2+f^2\right)\right)\right)}{2\left(d^2e^2-f^2\right)^{5/2}}-\frac{\sqrt{1-d^2x^2}\left(-3Ad^2ef^2+Bd^2e^2f+2Bf^3+Cd^2e^3-4Cef^2\right)}{2f\left(d^2e^2-f^2\right)^2(e+fx)}$$

```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)*
(e + f*x)^2) - ((C*d^2*e^3 + B*d^2*e^2*f - 4*C*e*f^2 - 3*A*d^2*e*
f^2 + 2*B*f^3)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)^2*(e + f*x
)) + ((C*(d^2*e^2 + 2*f^2) - d^2*(3*B*e*f - A*(2*d^2*e^2 + f^2)))
*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt[1 - d^2*x^2])])/(
2*(d^2*e^2 - f^2)^(5/2))
```

Rubi [A] time = 0.71787, antiderivative size = 248, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 37, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.135

$$\frac{\sqrt{1-d^2x^2}\left(Af^2-Bef+Ce^2\right)}{2f\left(d^2e^2-f^2\right)(e+fx)^2}+\frac{\tan^{-1}\left(\frac{d^2ex+f}{\sqrt{1-d^2x^2}\sqrt{d^2e^2-f^2}}\right)\left(C\left(d^2e^2+2f^2\right)-d^2\left(3Bef-A\left(2d^2e^2+f^2\right)\right)\right)}{2\left(d^2e^2-f^2\right)^{5/2}}-\frac{\sqrt{1-d^2x^2}\left(-3Ad^2ef^2+Bd^2e^2f+2Bf^3+Cd^2e^3-4Cef^2\right)}{2f\left(d^2e^2-f^2\right)^2(e+fx)}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^3),x]
```


```
[Out] ((C*e^2 - B*e*f + A*f^2)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)*
(e + f*x)^2) - ((C*d^2*e^3 + B*d^2*e^2*f - 4*C*e*f^2 - 3*A*d^2*e*
f^2 + 2*B*f^3)*Sqrt[1 - d^2*x^2])/(2*f*(d^2*e^2 - f^2)^2*(e + f*x
)) + ((C*(d^2*e^2 + 2*f^2) - d^2*(3*B*e*f - A*(2*d^2*e^2 + f^2)))
*ArcTan[(f + d^2*e*x)/(Sqrt[d^2*e^2 - f^2]*Sqrt[1 - d^2*x^2])])/(
2*(d^2*e^2 - f^2)^(5/2))
```

Rubi in Sympy [A] time = 170.195, size = 230, normalized size = 0.93

$$-\frac{\left(2Ad^4e^2+Ad^2f^2-3Bd^2ef+Cd^2e^2+2Cf^2\right)\operatorname{atanh}\left(\frac{d^2ex+f}{\sqrt{-de+f}\sqrt{de+f}\sqrt{-d^2x^2+1}}\right)}{2\left(-de+f\right)^{\frac{5}{2}}\left(de+f\right)^{\frac{5}{2}}}-\frac{\sqrt{-d^2x^2+1}\left(-3Ad^2ef^2+Bd^2e^2f+2Bf^3+Cd^2e^3-4Cef^2\right)}{2f\left(e+fx\right)\left(-de+f\right)^2\left(de+f\right)^2}-\frac{\sqrt{-d^2x^2+1}\left(Af^2-Bef+Ce^2\right)}{2f\left(e+fx\right)^2\left(-d^2e^2+f^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**3/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -(2*A*d**4*e**2 + A*d**2*f**2 - 3*B*d**2*e*f + C*d**2*e**2 + 2*C*
f**2)*atanh((d**2*e*x + f)/(sqrt(-d*e + f)*sqrt(d*e + f)*sqrt(-d*
*2*x**2 + 1)))/(2*(-d*e + f)**(5/2)*(d*e + f)**(5/2)) - sqrt(-d**
2*x**2 + 1)*(-3*A*d**2*e*f**2 + B*d**2*e**2*f + 2*B*f**3 + C*d**2
*e**3 - 4*C*e*f**2)/(2*f*(e + f*x)*(-d*e + f)**2*(d*e + f)**2) -
sqrt(-d**2*x**2 + 1)*(A*f**2 - B*e*f + C*e**2)/(2*f*(e + f*x)**2*
(-d**2*e**2 + f**2))
```

Mathematica [A] time = 0.568352, size = 284, normalized size = 1.15

$$\frac{-f(e+fx)^2\log\left(\sqrt{1-d^2x^2}\sqrt{f^2-d^2e^2}+d^2ex+f\right)\left(d^2\left(A\left(2d^2e^2+f^2\right)-3Bef\right)+C\left(d^2e^2+2f^2\right)\right)+f(e+fx)^2\log(e+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]*(e + f*x)^3),x]
```

```
[Out] (Sqrt[-(d^2*e^2) + f^2]*Sqrt[1 - d^2*x^2]*(-(B*(d^2*e^2*f*(2*e +
f*x) + f^3*(e + 2*f*x))) + f*(-(A*f^3) + A*d^2*e*f*(4*e + 3*f*x)
+ C*e*(3*e*f - d^2*e^2*x + 4*f^2*x))) + f*(C*(d^2*e^2 + 2*f^2) +
d^2*(-3*B*e*f + A*(2*d^2*e^2 + f^2)))*(e + f*x)^2*Log[e + f*x] -
f*(C*(d^2*e^2 + 2*f^2) + d^2*(-3*B*e*f + A*(2*d^2*e^2 + f^2)))*(e
 + f*x)^2*Log[f + d^2*e*x + Sqrt[-(d^2*e^2) + f^2]*Sqrt[1 - d^2*x
^2]])/(2*f*(-(d^2*e^2) + f^2)^(5/2)*(e + f*x)^2)
```

Maple [C] time = 0., size = 1449, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)^3/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

```
[Out] -1/2*(-3*A*x*d^2*e*f^3*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1
/2)+B*x*d^2*e^2*f^2*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)
+C*x*d^2*e^3*f*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)+A*ln
(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f
*x+e))*d^2*e^2*f^2-3*B*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^
2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x^2*d^2*e*f^3+C*ln(2*(d^2*e*x+(-d
^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x^2*d^2*
e^2*f^2+2*A*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)
^(1/2)*f+f)/(f*x+e))*x*d^2*e*f^3-6*B*ln(2*(d^2*e*x+(-d^2*x^2+1)^(
1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d^2*e^2*f^2+2*C*l
n(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(
f*x+e))*x*d^2*e^3*f-4*A*d^2*e^2*f^2*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2
-f^2)/f^2)^(1/2)+2*B*d^2*e^3*f*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)
/f^2)^(1/2)-4*C*x*e*f^3*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(
1/2)+2*A*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1
/2)*f+f)/(f*x+e))*x^2*d^4*e^2*f^2+4*A*ln(2*(d^2*e*x+(-d^2*x^2+1)^
(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*d^4*e^3*f+A*f^4*
(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)+2*A*ln(2*(d^2*e*x+(
-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^4*e^
4+2*C*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)
*f+f)/(f*x+e))*x^2*f^4+C*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*
e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*d^2*e^4+2*C*ln(2*(d^2*e*x+(-d^2
*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*e^2*f^2-3*
B*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)*f+f
)/(f*x+e))*d^2*e^3*f+4*C*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*
e^2-f^2)/f^2)^(1/2)*f+f)/(f*x+e))*x*e*f^3+2*B*x*f^4*(-d^2*x^2+1)^
(1/2)*(-(d^2*e^2-f^2)/f^2)^(1/2)+B*e*f^3*(-d^2*x^2+1)^(1/2)*(-(d^
2*e^2-f^2)/f^2)^(1/2)-3*C*e^2*f^2*(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f
^2)/f^2)^(1/2)+A*ln(2*(d^2*e*x+(-d^2*x^2+1)^(1/2)*(-(d^2*e^2-f^2)
/f^2)^(1/2)*f+f)/(f*x+e))*x^2*d^2*f^4)*csgn(d)^2*(d*x+1)^(1/2)*(-
d*x+1)^(1/2)/(-d^2*x^2+1)^(1/2)/(d*e+f)/(d*e-f)/(d^2*e^2-f^2)/(-(
d^2*e^2-f^2)/f^2)^(1/2)/(f*x+e)^2/f
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3),x, algorit
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.273565, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3),x, algorith
```

```
[Out] [-1/2*(sqrt(-d^2*e^2 + f^2)*((C*d^4*e^5 + B*d^4*e^4*f + 2*B*d^2*e
^2*f^3 - (3*A*d^4 + 4*C*d^2)*e^3*f^2)*x^3 + (2*B*d^4*e^5 + 5*B*d^
2*e^3*f^2 - (4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6*C)*e^2*f^3 +
 2*B*e*f^4 + 2*A*f^5)*x^2 - 2*(C*d^2*e^5 - 3*B*d^2*e^4*f + (5*A*d
^2 + 2*C)*e^3*f^2 - 2*A*e*f^4)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) -
(6*B*d^2*e^5*f - 2*(2*A*d^4 + C*d^2)*e^6 - 2*(A*d^2 + 2*C)*e^4*f^
2 - (3*B*d^4*e^3*f^3 - (2*A*d^6 + C*d^4)*e^4*f^2 - (A*d^4 + 2*C*d
^2)*e^2*f^4)*x^4 - 2*(3*B*d^4*e^4*f^2 - (2*A*d^6 + C*d^4)*e^5*f -
 (A*d^4 + 2*C*d^2)*e^3*f^3)*x^3 - (3*B*d^4*e^5*f + 3*A*d^4*e^4*f^
2 - 6*B*d^2*e^3*f^3 - (2*A*d^6 + C*d^4)*e^6 + 2*(A*d^2 + 2*C)*e^2
*f^4)*x^2 - 2*(3*B*d^2*e^5*f - (2*A*d^4 + C*d^2)*e^6 - (A*d^2 + 2
*C)*e^4*f^2 + (3*B*d^2*e^3*f^3 - (2*A*d^4 + C*d^2)*e^4*f^2 - (A*d
^2 + 2*C)*e^2*f^4)*x^2 + 2*(3*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e
^5*f - (A*d^2 + 2*C)*e^3*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 4
*(3*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e^5*f - (A*d^2 + 2*C)*e^3*f
^3)*x)*log(-((d^2*e^2*f - f^3)*x^2 + (d^2*e^3 - e*f^2)*x + sqrt(-
d^2*e^2 + f^2)*(e*f*x - (d^2*e^2 - f^2)*x^2 + e^2) - ((d^2*e^3 -
e*f^2)*sqrt(-d*x + 1)*x + sqrt(-d^2*e^2 + f^2)*(e*f*x + e^2)*sqrt
(-d*x + 1))*sqrt(d*x + 1))/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e
) - f*x - e)) + ((2*B*d^4*e^3*f^2 + B*d^2*e*f^4 + A*d^2*f^5 - (4*
A*d^4 + 3*C*d^2)*e^2*f^3)*x^4 - 2*(C*d^4*e^5 - B*d^4*e^4*f + B*d^
2*e^2*f^3 - A*d^2*e*f^4 + (A*d^4 - C*d^2)*e^3*f^2)*x^3 - (2*B*d^4
*e^5 + 5*B*d^2*e^3*f^2 - (4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6
*C)*e^2*f^3 + 2*B*e*f^4 + 2*A*f^5)*x^2 + 2*(C*d^2*e^5 - 3*B*d^2*e
^4*f + (5*A*d^2 + 2*C)*e^3*f^2 - 2*A*e*f^4)*x)*sqrt(-d^2*e^2 + f^
2))/(2*(d^4*e^8 - 2*d^2*e^6*f^2 + e^4*f^4 + (d^4*e^6*f^2 - 2*d^2*
e^4*f^4 + e^2*f^6)*x^2 + 2*(d^4*e^7*f - 2*d^2*e^5*f^3 + e^3*f^5)*
x)*sqrt(-d^2*e^2 + f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1) - (2*d^4*e^8
 - 4*d^2*e^6*f^2 + 2*e^4*f^4 - (d^6*e^6*f^2 - 2*d^4*e^4*f^4 + d^2
*e^2*f^6)*x^4 - 2*(d^6*e^7*f - 2*d^4*e^5*f^3 + d^2*e^3*f^5)*x^3 -
 (d^6*e^8 - 4*d^4*e^6*f^2 + 5*d^2*e^4*f^4 - 2*e^2*f^6)*x^2 + 4*(d
^4*e^7*f - 2*d^2*e^5*f^3 + e^3*f^5)*x)*sqrt(-d^2*e^2 + f^2)), -1/
2*(sqrt(d^2*e^2 - f^2)*((C*d^4*e^5 + B*d^4*e^4*f + 2*B*d^2*e^2*f^
3 - (3*A*d^4 + 4*C*d^2)*e^3*f^2)*x^3 + (2*B*d^4*e^5 + 5*B*d^2*e^3
*f^2 - (4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6*C)*e^2*f^3 + 2*B*
e*f^4 + 2*A*f^5)*x^2 - 2*(C*d^2*e^5 - 3*B*d^2*e^4*f + (5*A*d^2 +
2*C)*e^3*f^2 - 2*A*e*f^4)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) - 2*(6*
B*d^2*e^5*f - 2*(2*A*d^4 + C*d^2)*e^6 - 2*(A*d^2 + 2*C)*e^4*f^2 -
 (3*B*d^4*e^3*f^3 - (2*A*d^6 + C*d^4)*e^4*f^2 - (A*d^4 + 2*C*d^2)
*e^2*f^4)*x^4 - 2*(3*B*d^4*e^4*f^2 - (2*A*d^6 + C*d^4)*e^5*f - (A
*d^4 + 2*C*d^2)*e^3*f^3)*x^3 - (3*B*d^4*e^5*f + 3*A*d^4*e^4*f^2 -
 6*B*d^2*e^3*f^3 - (2*A*d^6 + C*d^4)*e^6 + 2*(A*d^2 + 2*C)*e^2*f^
4)*x^2 - 2*(3*B*d^2*e^5*f - (2*A*d^4 + C*d^2)*e^6 - (A*d^2 + 2*C)
*e^4*f^2 + (3*B*d^2*e^3*f^3 - (2*A*d^4 + C*d^2)*e^4*f^2 - (A*d^2
+ 2*C)*e^2*f^4)*x^2 + 2*(3*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e^5*
f - (A*d^2 + 2*C)*e^3*f^3)*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 4*(3
*B*d^2*e^4*f^2 - (2*A*d^4 + C*d^2)*e^5*f - (A*d^2 + 2*C)*e^3*f^3)
*x)*arctan(-(sqrt(d^2*e^2 - f^2)*sqrt(d*x + 1)*sqrt(-d*x + 1)*e -
 sqrt(d^2*e^2 - f^2)*(f*x + e))/((d^2*e^2 - f^2)*x)) + ((2*B*d^4*
e^3*f^2 + B*d^2*e*f^4 + A*d^2*f^5 - (4*A*d^4 + 3*C*d^2)*e^2*f^3)*
x^4 - 2*(C*d^4*e^5 - B*d^4*e^4*f + B*d^2*e^2*f^3 - A*d^2*e*f^4 +
```

```
(A*d^4 - C*d^2)*e^3*f^2)*x^3 - (2*B*d^4*e^5 + 5*B*d^2*e^3*f^2 - (
4*A*d^4 + 3*C*d^2)*e^4*f - (7*A*d^2 + 6*C)*e^2*f^3 + 2*B*e*f^4 +
2*A*f^5)*x^2 + 2*(C*d^2*e^5 - 3*B*d^2*e^4*f + (5*A*d^2 + 2*C)*e^3
*f^2 - 2*A*e*f^4)*x)*sqrt(d^2*e^2 - f^2))/(2*(d^4*e^8 - 2*d^2*e^6
*f^2 + e^4*f^4 + (d^4*e^6*f^2 - 2*d^2*e^4*f^4 + e^2*f^6)*x^2 + 2*
(d^4*e^7*f - 2*d^2*e^5*f^3 + e^3*f^5)*x)*sqrt(d^2*e^2 - f^2)*sqrt
(d*x + 1)*sqrt(-d*x + 1) - (2*d^4*e^8 - 4*d^2*e^6*f^2 + 2*e^4*f^4
 - (d^6*e^6*f^2 - 2*d^4*e^4*f^4 + d^2*e^2*f^6)*x^4 - 2*(d^6*e^7*f
 - 2*d^4*e^5*f^3 + d^2*e^3*f^5)*x^3 - (d^6*e^8 - 4*d^4*e^6*f^2 +
5*d^2*e^4*f^4 - 2*e^2*f^6)*x^2 + 4*(d^4*e^7*f - 2*d^2*e^5*f^3 + e
^3*f^5)*x)*sqrt(d^2*e^2 - f^2))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**3/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)

[Out] Exception raised: ValueError
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + 1)*sqrt(-d*x + 1)*(f*x + e)^3),x, algorith

[Out] Exception raised: TypeError
```

3.49 $\int \frac{x(a+bx+cx^2)}{\sqrt{1-dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=79

$$-\frac{\sqrt{1-d^2x^2}\left(2\left(3ad^2+2c\right)+3bd^2x\right)}{6d^4}+\frac{b\sin^{-1}(dx)}{2d^3}-\frac{cx^2\sqrt{1-d^2x^2}}{3d^2}$$

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

Rubi [A] time = 0.252987, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$

$$-\frac{\sqrt{1-d^2x^2}\left(2\left(3ad^2+2c\right)+3bd^2x\right)}{6d^4}+\frac{b\sin^{-1}(dx)}{2d^3}-\frac{cx^2\sqrt{1-d^2x^2}}{3d^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(x*(a + b*x + c*x^2))/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 26.4531, size = 68, normalized size = 0.86

$$\frac{b\,\mathrm{asin}\,(dx)}{2d^3}-\frac{cx^2\sqrt{-d^2x^2+1}}{3d^2}-\frac{\sqrt{-d^2x^2+1}\left(6ad^2+3bd^2x+4c\right)}{6d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(c*x**2+b*x+a)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] b*asin(d*x)/(2*d**3) - c*x**2*sqrt(-d**2*x**2 + 1)/(3*d**2) - sqr
t(-d**2*x**2 + 1)*(6*a*d**2 + 3*b*d**2*x + 4*c)/(6*d**4)
```

Mathematica [A] time = 0.0918098, size = 57, normalized size = 0.72

$$\frac{3bd\sin^{-1}(dx)-\sqrt{1-d^2x^2}\left(3d^2(2a+bx)+2c\left(d^2x^2+2\right)\right)}{6d^4}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0., size = 139, normalized size = 1.8

$$-\frac{csgn(d)}{6\,d^4}\sqrt{-dx+1}\sqrt{dx+1}\left(2\,csgn(d)\,x^2cd^2\sqrt{-d^2x^2+1}+3\,csgn(d)\,\sqrt{-d^2x^2+1}xbd^2+6\,csgn(d)\,\sqrt{-d^2x^2+1}ad^2+4\,csgn(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A] time = 1.5115, size = 134, normalized size = 1.7

$$-\frac{\sqrt{-d^2x^2+1}cx^2}{3\,d^2}-\frac{\sqrt{-d^2x^2+1}bx}{2\,d^2}-\frac{\sqrt{-d^2x^2+1}a}{d^2}+\frac{b\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{2\,\sqrt{d^2}d^2}-\frac{2\,\sqrt{-d^2x^2+1}c}{3\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.233505, size = 306, normalized size = 3.87

$$-\frac{2\,cd^5x^6+3\,bd^5x^5-15\,bd^3x^3-12\,ad^3x^2+6\left(ad^5-cd^3\right)x^4+12\,bdx+3\left(2\,cd^3x^4+3\,bd^3x^3+4\,ad^3x^2-4\,bdx\right)\sqrt{dx+1}\sqrt{-}}{6\left(3\,d^5x^2-4\,d^3-(d^5x^2-4\,d^3)\sqrt{dx+1}\sqrt{-}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*(2*c*d^5*x^6 + 3*b*d^5*x^5 - 15*b*d^3*x^3 - 12*a*d^3*x^2 + 6
*(a*d^5 - c*d^3)*x^4 + 12*b*d*x + 3*(2*c*d^3*x^4 + 3*b*d^3*x^3 +
4*a*d^3*x^2 - 4*b*d*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 6*(3*b*d^2*
x^2 - (b*d^2*x^2 - 4*b)*sqrt(d*x + 1)*sqrt(-d*x + 1) - 4*b)*arcta
n((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(3*d^5*x^2 - 4*d^3 -
 (d^5*x^2 - 4*d^3)*sqrt(d*x + 1)*sqrt(-d*x + 1))
```

Sympy [A] time = 108.768, size = 313, normalized size = 3.96

$$- \frac{iaG_{6,6}^{6,2}\left(\begin{matrix} -\frac{1}{4}, \frac{1}{4} & 0, 0, \frac{1}{2}, 1 \\ -\frac{1}{2}, -\frac{1}{4}, 0, \frac{1}{4}, \frac{1}{2}, 0 & \end{matrix} \middle| {\frac{1}{d^{2} x^{2}}} \right)}{4 \pi^{\frac{3}{2}} d^{2}} - \frac{aG_{6,6}^{2,6}\left(\begin{matrix} -1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0, 1 & \\ -\frac{3}{4}, -\frac{1}{4} & -1, -\frac{1}{2}, -\frac{1}{2}, 0 \end{matrix} \middle| {\frac{e^{- 2 i \pi}}{d^{2} x^{2}}} \right)}{4 \pi^{\frac{3}{2}} d^{2}} - \frac{ibG_{6,6}^{6,2}\left(\begin{matrix} -\frac{3}{4}, -\frac{1}{4} & -\frac{1}{2}, -\frac{1}{2}, 0, 1 \\ -1, -\frac{3}{4}, -\frac{1}{2}, -\frac{1}{4}, 0, 0 & \end{matrix} \middle| {\frac{1}{d^{2} x^{2}}} \right)}{4 \pi^{\frac{3}{2}} d^{3}} + \frac{bG_{6,6}^{2,6}\left(\begin{matrix} -\frac{3}{2}, -\frac{5}{4}, -1, -\frac{3}{4}, -\frac{1}{2}, 1 & \\ -\frac{5}{4}, -\frac{3}{4} & -\frac{3}{2}, -1, -1, 0 \end{matrix} \middle| {\frac{e^{- 2 i \pi}}{d^{2} x^{2}}} \right)}{4 \pi^{\frac{3}{2}} d^{3}} - \frac{icG_{6,6}^{6,2}\left(\begin{matrix} -\frac{5}{4}, -\frac{3}{4} & -1, -1, -\frac{1}{2}, 1 \\ -\frac{3}{2}, -\frac{5}{4}, -1, -\frac{3}{4}, -\frac{1}{2}, 0 & \end{matrix} \middle| {\frac{1}{d^{2} x^{2}}} \right)}{4 \pi^{\frac{3}{2}} d^{4}} - \frac{cG_{6,6}^{2,6}\left(\begin{matrix} -2, -\frac{7}{4}, -\frac{3}{2}, -\frac{5}{4}, -1, 1 & \\ -\frac{7}{4}, -\frac{5}{4} & -2, -\frac{3}{2}, -\frac{3}{2}, 0 \end{matrix} \middle| {\frac{e^{- 2 i \pi}}{d^{2} x^{2}}} \right)}{4 \pi^{\frac{3}{2}} d^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(c*x**2+b*x+a)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -I*a*meijerg(((-1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4,
 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) - a*meijerg(((-1
, -3/4, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0
)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2) - I*b*meij
erg(((-3/4, -1/4), (-1/2, -1/2, 0, 1)), ((-1, -3/4, -1/2, -1/4, 0
, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**3) + b*meijerg(((-3/2,
-5/4, -1, -3/4, -1/2, 1), ()), ((-5/4, -3/4), (-3/2, -1, -1, 0)),
 exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**3) - I*c*meijerg
(((-5/4, -3/4), (-1, -1, -1/2, 1)), ((-3/2, -5/4, -1, -3/4, -1/2,
 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**4) - c*meijerg(((-2, -7/
4, -3/2, -5/4, -1, 1), ()), ((-7/4, -5/4), (-2, -3/2, -3/2, 0)),
exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**4)
```

GIAC/XCAS [A] time = 0.215714, size = 123, normalized size = 1.56

$$\frac{6\,bd^{10}\arcsin\left(\frac{1}{2}\,\sqrt{2}\sqrt{dx+1}\right)-\left(6\,ad^{11}-3\,bd^{10}+6\,cd^{9}+\left(2\,(dx+1)cd^{9}+3\,bd^{10}-4\,cd^{9}\right)(dx+1)\right)\sqrt{dx+1}\sqrt{-dx+1}}{3840\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3840*(6*b*d^10*arcsin(1/2*sqrt(2)*sqrt(d*x + 1)) - (6*a*d^11 -
3*b*d^10 + 6*c*d^9 + (2*(d*x + 1)*c*d^9 + 3*b*d^10 - 4*c*d^9)*(d*
x + 1))*sqrt(d*x + 1)*sqrt(-d*x + 1))/d
```

3.50 $\int \frac{a+bx+cx^2}{\sqrt{1-dx}\sqrt{1+dx}} dx$

Optimal. Leaf size=63

$$\frac{\left(2ad^2+c\right)\sin^{-1}(dx)}{2d^3}-\frac{b\sqrt{1-d^2x^2}}{d^2}-\frac{cx\sqrt{1-d^2x^2}}{2d^2}$$

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

Rubi [A] time = 0.136446, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{\left(2ad^2+c\right)\sin^{-1}(dx)}{2d^3}-\frac{b\sqrt{1-d^2x^2}}{d^2}-\frac{cx\sqrt{1-d^2x^2}}{2d^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 15.2808, size = 41, normalized size = 0.65

$$-\frac{(2b+cx)\sqrt{-d^2x^2+1}}{2d^2}+\frac{\left(2ad^2+c\right)\operatorname{asin}(dx)}{2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -(2*b + c*x)*sqrt(-d**2*x**2 + 1)/(2*d**2) + (2*a*d**2 + c)*asin(
d*x)/(2*d**3)
```

Mathematica [A] time = 0.0615839, size = 45, normalized size = 0.71

$$\frac{\left(2ad^2+c\right)\sin^{-1}(dx)-d\sqrt{1-d^2x^2}(2b+cx)}{2d^3}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0., size = 117, normalized size = 1.9

$$-\frac{csgn(d)}{2\,d^3}\sqrt{-dx+1}\sqrt{dx+1}\left(cx\sqrt{-d^2x^2+1}csgn(d)\,d+2\,\sqrt{-d^2x^2+1}bcsgn(d)\,d-2\,\arctan\left(\frac{csgn(d)\,dx}{\sqrt{-d^2x^2+1}}\right)ad^2-c\arctan\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(-d*x+1)^(1/2)*(d*x+1)^(1/2)*(c*x*(-d^2*x^2+1)^(1/2)*csgn(d)
*d+2*(-d^2*x^2+1)^(1/2)*b*csgn(d)*d-2*arctan(csgn(d)*d*x/(-d^2*x^
2+1)^(1/2))*a*d^2-c*arctan(csgn(d)*d*x/(-d^2*x^2+1)^(1/2)))*csgn(
d)/(-d^2*x^2+1)^(1/2)/d^3
```

Maxima [A] time = 1.50066, size = 105, normalized size = 1.67

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.226457, size = 244, normalized size = 3.87

$$\frac{2\,cd^3x^3+2\,bd^3x^2-2\,cdx-\left(cd^3x^3+2\,bd^3x^2-2\,cdx\right)\sqrt{dx+1}\sqrt{-dx+1}+2\left(4\,ad^2-\left(2\,ad^4+cd^2\right)x^2-2\left(2\,ad^2+c\right)\sqrt{dx+\right.\right.}{2\left(d^5x^2+2\,\sqrt{dx+1}\sqrt{-dx+1}d^3-2\,d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(2*c*d^3*x^3 + 2*b*d^3*x^2 - 2*c*d*x - (c*d^3*x^3 + 2*b*d^3*x
^2 - 2*c*d*x)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 2*(4*a*d^2 - (2*a*d^
4 + c*d^2)*x^2 - 2*(2*a*d^2 + c)*sqrt(d*x + 1)*sqrt(-d*x + 1) + 2
*c)*arctan((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/(d*x)))/(d^5*x^2 +
2*sqrt(d*x + 1)*sqrt(-d*x + 1)*d^3 - 2*d^3)
```

Sympy [A] time = 54.838, size = 282, normalized size = 4.48

$$-\frac{iaG_{6,6}^{6,2}\left(\begin{matrix}\frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1\\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}+\frac{aG_{6,6}^{2,6}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}-\frac{ibG_{6,6}^{6,2}\left(\begin{matrix}-\frac{1}{4},\frac{1}{4} & 0,0,\frac{1}{2},1\\ -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}-\frac{bG_{6,6}^{2,6}\left(\begin{matrix}-1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,1 & \\ -\frac{3}{4},-\frac{1}{4} & -1,-\frac{1}{2},-\frac{1}{2},0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}-\frac{icG_{6,6}^{6,2}\left(\begin{matrix}-\frac{3}{4},-\frac{1}{4} & -\frac{1}{2},-\frac{1}{2},0,1\\ -1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}+\frac{cG_{6,6}^{2,6}\left(\begin{matrix}-\frac{3}{2},-\frac{5}{4},-1,-\frac{3}{4},-\frac{1}{2},1 & \\ -\frac{5}{4},-\frac{3}{4} & -\frac{3}{2},-1,-1,0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -I*a*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4,
1, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) + a*meijerg(((-1/2, -1
/4, 0, 1/4, 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_pol
ar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d) - I*b*meijerg(((-1/4, 1/
4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4, 1/2, 0), ()), 1/(d**2*
x**2))/(4*pi**(3/2)*d**2) - b*meijerg(((-1, -3/4, -1/2, -1/4, 0,
1), ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)), exp_polar(-2*I*pi)/
(d**2*x**2))/(4*pi**(3/2)*d**2) - I*c*meijerg(((-3/4, -1/4), (-1/
2, -1/2, 0, 1)), ((-1, -3/4, -1/2, -1/4, 0, 0), ()), 1/(d**2*x**2
))/(4*pi**(3/2)*d**3) + c*meijerg(((-3/2, -5/4, -1, -3/4, -1/2, 1
), ()), ((-5/4, -3/4), (-3/2, -1, -1, 0)), exp_polar(-2*I*pi)/(d*
*2*x**2))/(4*pi**(3/2)*d**3)
```

GIAC/XCAS [A] time = 0.231855, size = 97, normalized size = 1.54

$$-\frac{\left((dx+1)cd^4+2\,bd^5-cd^4\right)\sqrt{dx+1}\sqrt{-dx+1}-2\left(2\,ad^6+cd^4\right)\arcsin\left(\frac{1}{2}\sqrt{2}\sqrt{dx+1}\right)}{192\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/192*(((d*x + 1)*c*d^4 + 2*b*d^5 - c*d^4)*sqrt(d*x + 1)*sqrt(-d
*x + 1) - 2*(2*a*d^6 + c*d^4)*arcsin(1/2*sqrt(2)*sqrt(d*x + 1)))/
d
```

3.51 $\int \frac{a+bx+cx^2}{x\sqrt{1-dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=48

$$-a\tanh^{-1}\left(\sqrt{1-d^2x^2}\right)+\frac{b\sin^{-1}(dx)}{d}-\frac{c\sqrt{1-d^2x^2}}{d^2}$$

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

Rubi [A] time = 0.329796, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.212

$$-a\tanh^{-1}\left(\sqrt{1-d^2x^2}\right)+\frac{b\sin^{-1}(dx)}{d}-\frac{c\sqrt{1-d^2x^2}}{d^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(x*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 30.0362, size = 39, normalized size = 0.81

$$-a\,\operatorname{atanh}\left(\sqrt{-d^2x^2+1}\right)+\frac{b\,\operatorname{asin}(dx)}{d}-\frac{c\sqrt{-d^2x^2+1}}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)/x/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -a*atanh(sqrt(-d**2*x**2 + 1)) + b*asin(d*x)/d - c*sqrt(-d**2*x**
2 + 1)/d**2
```

Mathematica [A] time = 0.067671, size = 54, normalized size = 1.12

$$-a\log\left(\sqrt{1-d^2x^2}+1\right)+a\log(x)+\frac{b\sin^{-1}(dx)}{d}-\frac{c\sqrt{1-d^2x^2}}{d^2}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0., size = 94, normalized size = 2.

$$\frac{csgn(d)}{d^2}\sqrt{-dx+1}\sqrt{dx+1}\left(-csgn(d)\,Artanh\left(\frac{1}{\sqrt{-d^2x^2+1}}\right)ad^2+\arctan\left(csgn(d)\,dx\frac{1}{\sqrt{-d^2x^2+1}}\right)bd-csgn(d)\sqrt{-d^2x^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A] time = 1.48913, size = 89, normalized size = 1.85

$$-a\log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{b\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}}-\frac{\sqrt{-d^2x^2+1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*log(2*sqrt(-d^2*x^2 + 1)/abs(x) + 2/abs(x)) + b*arcsin(d^2*x/s
qrt(d^2))/sqrt(d^2) - sqrt(-d^2*x^2 + 1)*c/d^2
```

Fricas [A] time = 0.236511, size = 171, normalized size = 3.56

$$\frac{cdx^2-2\left(\sqrt{dx+1}\sqrt{-dx+1}b-b\right)\arctan\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{dx}\right)+\left(\sqrt{dx+1}\sqrt{-dx+1}ad-ad\right)\log\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{x}\right)}{\sqrt{dx+1}\sqrt{-dx+1}d-d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 58.6066, size = 245, normalized size = 5.1

$$\frac{iaG_{6,6}^{5,3}\left(\begin{matrix} \frac{3}{4},\frac{5}{4},1 & 1,1,\frac{3}{2} \\ \frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2} & 0 \end{matrix}\middle| \frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} - \frac{aG_{6,6}^{2,6}\left(\begin{matrix} 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,1 & \\ \frac{1}{4},\frac{3}{4} & 0,\frac{1}{2},\frac{1}{2},0 \end{matrix}\middle| \frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}} - \frac{ibG_{6,6}^{6,2}\left(\begin{matrix} \frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1 \\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle| \frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d} + \frac{bG_{6,6}^{2,6}\left(\begin{matrix} -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0 \end{matrix}\middle| \frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d} - \frac{icG_{6,6}^{6,2}\left(\begin{matrix} -\frac{1}{4},\frac{1}{4} & 0,0,\frac{1}{2},1 \\ -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},0 & \end{matrix}\middle| \frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2} - \frac{cG_{6,6}^{2,6}\left(\begin{matrix} -1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,1 & \\ -\frac{3}{4},-\frac{1}{4} & -1,-\frac{1}{2},-\frac{1}{2},0 \end{matrix}\middle| \frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/x/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] I*a*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2
), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - a*meijerg(((0, 1/4, 1/2,
 3/4, 1, 1), ()), ((1/4, 3/4), (0, 1/2, 1/2, 0)), exp_polar(-2*I*
pi)/(d**2*x**2))/(4*pi**(3/2)) - I*b*meijerg(((1/4, 3/4), (1/2, 1
/2, 1, 1)), ((0, 1/4, 1/2, 3/4, 1, 0), ()), 1/(d**2*x**2))/(4*pi*
*(3/2)*d) + b*meijerg(((-1/2, -1/4, 0, 1/4, 1/2, 1), ()), ((-1/4,
 1/4), (-1/2, 0, 0, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(
3/2)*d) - I*c*meijerg(((-1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4
, 0, 1/4, 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) - c*mei
jerg(((-1, -3/4, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-1, -1/2
, -1/2, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: NotImplementedError
```

3.52 $\int \frac{a+bx+cx^2}{x^2\sqrt{1-dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=48

$$-\frac{a\sqrt{1-d^2x^2}}{x}-b\tanh^{-1}\left(\sqrt{1-d^2x^2}\right)+\frac{c\sin^{-1}(dx)}{d}$$

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

Rubi [A] time = 0.321695, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.212$

$$-\frac{a\sqrt{1-d^2x^2}}{x}-b\tanh^{-1}\left(\sqrt{1-d^2x^2}\right)+\frac{c\sin^{-1}(dx)}{d}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(x^2*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 27.2794, size = 37, normalized size = 0.77

$$-\frac{a\sqrt{-d^2x^2+1}}{x}-b\,\mathrm{atanh}\left(\sqrt{-d^2x^2+1}\right)+\frac{c\,\mathrm{asin}\,(dx)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)/x**2/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -a*sqrt(-d**2*x**2 + 1)/x - b*atanh(sqrt(-d**2*x**2 + 1)) + c*asi
n(d*x)/d
```

Mathematica [A] time = 0.0851936, size = 54, normalized size = 1.12

$$-\frac{a\sqrt{1-d^2x^2}}{x}-b\log\left(\sqrt{1-d^2x^2}+1\right)+b\log(x)+\frac{c\sin^{-1}(dx)}{d}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0., size = 97, normalized size = 2.

$$\frac{csgn(d)}{dx}\left(-bx\,csgn(d)\,dArtanh\left(\frac{1}{\sqrt{-d^2x^2+1}}\right)-a\sqrt{-d^2x^2+1}csgn(d)\,d+c\arctan\left(csgn(d)\,dx\frac{1}{\sqrt{-d^2x^2+1}}\right)x\right)\sqrt{-dx+1}\sqrt{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A] time = 1.49843, size = 89, normalized size = 1.85

$$-b\log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|}+\frac{2}{|x|}\right)+\frac{c\arcsin\left(\frac{d^2x}{\sqrt{d^2}}\right)}{\sqrt{d^2}}-\frac{\sqrt{-d^2x^2+1}a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*log(2*sqrt(-d^2*x^2 + 1)/abs(x) + 2/abs(x)) + c*arcsin(d^2*x/s
qrt(d^2))/sqrt(d^2) - sqrt(-d^2*x^2 + 1)*a/x
```

Fricas [A] time = 0.236247, size = 212, normalized size = 4.42

$$\frac{ad^3x^2+\sqrt{dx+1}\sqrt{-dx+1}ad-ad-2\left(\sqrt{dx+1}\sqrt{-dx+1}cx-cx\right)\arctan\left(\frac{\sqrt{dx+1}\sqrt{-dx+1}-1}{dx}\right)+\left(\sqrt{dx+1}\sqrt{-dx+1}bdx-bd\right.}{\sqrt{dx+1}\sqrt{-dx+1}dx-dx}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (a*d^3*x^2 + sqrt(d*x + 1)*sqrt(-d*x + 1)*a*d - a*d - 2*(sqrt(d*x
 + 1)*sqrt(-d*x + 1)*c*x - c*x)*arctan((sqrt(d*x + 1)*sqrt(-d*x +
 1) - 1)/(d*x)) + (sqrt(d*x + 1)*sqrt(-d*x + 1)*b*d*x - b*d*x)*lo
g((sqrt(d*x + 1)*sqrt(-d*x + 1) - 1)/x))/(sqrt(d*x + 1)*sqrt(-d*x
 + 1)*d*x - d*x)
```

Sympy [A] time = 65.6606, size = 221, normalized size = 4.6

$$\frac{iadG_{6,6}^{5,3}\left(\begin{matrix}\frac{5}{4},\frac{7}{4},1 & \frac{3}{2},\frac{3}{2},2\\ 1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2 & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{adG_{6,6}^{2,6}\left(\begin{matrix}\frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2},1 & \\ \frac{3}{4},\frac{5}{4} & \frac{1}{2},1,1,0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{ibG_{6,6}^{5,3}\left(\begin{matrix}\frac{3}{4},\frac{5}{4},1 & 1,1,\frac{3}{2}\\ \frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{bG_{6,6}^{2,6}\left(\begin{matrix}0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,1 & \\ \frac{1}{4},\frac{3}{4} & 0,\frac{1}{2},\frac{1}{2},0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{icG_{6,6}^{6,2}\left(\begin{matrix}\frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1\\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}+\frac{cG_{6,6}^{2,6}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/x**2/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] I*a*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4,
 2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + a*d*meijerg(((1/2, 3/4
, 1, 5/4, 3/2, 1), ()), ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(-
2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) + I*b*meijerg(((3/4, 5/4, 1),
(1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2), (0,)), 1/(d**2*x**2))/(4*
pi**(3/2)) - b*meijerg(((0, 1/4, 1/2, 3/4, 1, 1), ()), ((1/4, 3/4
), (0, 1/2, 1/2, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2
)) - I*c*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3
/4, 1, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) + c*meijerg(((-1/2
, -1/4, 0, 1/4, 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp
_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: NotImplementedError
```

3.53 $\int \frac{a+bx+cx^2}{x^3\sqrt{1-dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=71

$$-\frac{1}{2}\left(ad^2+2c\right)\tanh^{-1}\left(\sqrt{1-d^2x^2}\right)-\frac{a\sqrt{1-d^2x^2}}{2x^2}-\frac{b\sqrt{1-d^2x^2}}{x}$$

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

Rubi [A] time = 0.345256, antiderivative size = 71, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182

$$-\frac{1}{2}\left(ad^2+2c\right)\tanh^{-1}\left(\sqrt{1-d^2x^2}\right)-\frac{a\sqrt{1-d^2x^2}}{2x^2}-\frac{b\sqrt{1-d^2x^2}}{x}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(x^3*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 26.871, size = 56, normalized size = 0.79

$$-\frac{a\sqrt{-d^2x^2+1}}{2x^2}-\frac{b\sqrt{-d^2x^2+1}}{x}-\left(\frac{ad^2}{2}+c\right)\operatorname{atanh}\left(\sqrt{-d^2x^2+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**2+b*x+a)/x**3/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -a*sqrt(-d**2*x**2 + 1)/(2*x**2) - b*sqrt(-d**2*x**2 + 1)/x - (a*
d**2/2 + c)*atanh(sqrt(-d**2*x**2 + 1))
```

Mathematica [A] time = 0.104087, size = 70, normalized size = 0.99

$$\frac{1}{2}\left(-\frac{\sqrt{1-d^2x^2}(a+2bx)}{x^2}-\left(ad^2+2c\right)\log\left(\sqrt{1-d^2x^2}+1\right)+\log(x)\left(ad^2+2c\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x + c*x^2)/(x^3*Sqrt[1 - d*x]*Sqrt[1 + d*x]),x]
```

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

Maple [C] time = 0., size = 108, normalized size = 1.5

$$-\frac{(csgn(d))^2}{2x^2}\sqrt{-dx+1}\sqrt{dx+1}\left(Artanh\left(\frac{1}{\sqrt{-d^2x^2+1}}\right)x^2ad^2+2\,Artanh\left(\frac{1}{\sqrt{-d^2x^2+1}}\right)x^2c+2\,bx\sqrt{-d^2x^2+1}+\sqrt{-d^2x^2+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^2+b*x+a)/x^3/(-d*x+1)^(1/2)/(d*x+1)^(1/2),x)
```

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

Maxima [A] time = 1.50378, size = 132, normalized size = 1.86

$$-\frac{1}{2}ad^2\log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|}+\frac{2}{|x|}\right)-c\log\left(\frac{2\sqrt{-d^2x^2+1}}{|x|}+\frac{2}{|x|}\right)-\frac{\sqrt{-d^2x^2+1}b}{x}-\frac{\sqrt{-d^2x^2+1}a}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*a*d^2*log(2*sqrt(-d^2*x^2 + 1)/abs(x) + 2/abs(x)) - c*log(2*
sqrt(-d^2*x^2 + 1)/abs(x) + 2/abs(x)) - sqrt(-d^2*x^2 + 1)*b/x -
1/2*sqrt(-d^2*x^2 + 1)*a/x^2
```

Fricas [A] time = 0.227784, size = 255, normalized size = 3.59

$$\frac{4\,bd^2x^3+2\,ad^2x^2-\left(2\,bd^2x^3+ad^2x^2-4\,bx-2\,a\right)\sqrt{dx+1}\sqrt{-dx+1}-4\,bx+\left(\left(ad^4+2\,cd^2\right)x^4+2\left(ad^2+2\,c\right)\sqrt{dx+1}\sqrt{-c}\right.}{2\left(d^2x^4+2\sqrt{dx+1}\sqrt{-dx+1}x^2-2\,x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 81.9541, size = 218, normalized size = 3.07

$$\frac{iad^2G_{6,6}^{5,3}\left(\begin{matrix}\frac{7}{4},\frac{9}{4},1 & 2,2,\frac{5}{2}\\ \frac{3}{2},\frac{7}{4},2,\frac{9}{4},\frac{5}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{ad^2G_{6,6}^{2,6}\left(\begin{matrix}1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2,1 & \\ \frac{5}{4},\frac{7}{4} & 1,\frac{3}{2},\frac{3}{2},0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{ibdG_{6,6}^{5,3}\left(\begin{matrix}\frac{5}{4},\frac{7}{4},1 & \frac{3}{2},\frac{3}{2},2\\ 1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2 & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{bdG_{6,6}^{2,6}\left(\begin{matrix}\frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2},1 & \\ \frac{3}{4},\frac{5}{4} & \frac{1}{2},1,1,0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{icG_{6,6}^{5,3}\left(\begin{matrix}\frac{3}{4},\frac{5}{4},1 & 1,1,\frac{3}{2}\\ \frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{cG_{6,6}^{2,6}\left(\begin{matrix}0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,1 & \\ \frac{1}{4},\frac{3}{4} & 0,\frac{1}{2},\frac{1}{2},0\end{matrix}\middle|\frac{e^{-2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/x**3/(-d*x+1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] I*a*d**2*meijerg(((7/4, 9/4, 1), (2, 2, 5/2)), ((3/2, 7/4, 2, 9/4
, 5/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - a*d**2*meijerg(((1,
 5/4, 3/2, 7/4, 2, 1), ()), ((5/4, 7/4), (1, 3/2, 3/2, 0)), exp_p
olar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) + I*b*d*meijerg(((5/4, 7
/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4, 2), (0,)), 1/(d**2*x*
*2))/(4*pi**(3/2)) + b*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1), ())
, ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(-2*I*pi)/(d**2*x**2))/(
4*pi**(3/2)) + I*c*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3
/4, 1, 5/4, 3/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - c*meijerg
(((0, 1/4, 1/2, 3/4, 1, 1), ()), ((1/4, 3/4), (0, 1/2, 1/2, 0)),
exp_polar(-2*I*pi)/(d**2*x**2))/(4*pi**(3/2))
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: NotImplementedError
```

3.54 $\int \sqrt{a+bx}\sqrt{ac-bcx}(e+fx)^3\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=591

$$-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^2\sqrt{ac-bcx}\left(8a^2Cf^2-b^2\left(3Ce^2-7f(2Af+Be)\right)\right)}{70b^4f}+\frac{x\sqrt{a+bx}\sqrt{ac-bcx}\left(A\left(6a^2b^2ef^2+8b^4e^3\right)+a^2\left(a^2f^2(Bf+3Ce)+2b^2e^2(3Bf+Ce)\right)\right)}{16b^4}+\frac{a^2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(A\left(6a^2b^2ef^2+8b^4e^3\right)+a^2\left(a^2f^2(Bf+3Ce)+2b^2e^2(3Bf+Ce)\right)\right)}{16b^5\sqrt{a^2c-b^2cx^2}}+\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^3\sqrt{ac-bcx}(3Ce-7Bf)}{42b^2f}-\frac{C\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^4\sqrt{ac-bcx}}{7b^2f}-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}\left(3b^2fx\left(a^2f^2(35Bf+41Ce)-2b^2e\left(3Ce^2-7f(7Af+Be)\right)\right)+8\left(8a^4Cf^4+2a^2b^2f^2\left(7f\right.\right.\right.}{840b^6f}$$

```
[Out] ((A*(8*b^4*e^3 + 6*a^2*b^2*e*f^2) + a^2*(a^2*f^2*(3*C*e + B*f) +
2*b^2*e^2*(C*e + 3*B*f)))*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])/(16*
b^4) - ((8*a^2*C*f^2 - b^2*(3*C*e^2 - 7*f*(B*e + 2*A*f)))*Sqrt[a
+ b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(a^2 - b^2*x^2))/(70*b^4*f)
+ ((3*C*e - 7*B*f)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3*(a
^2 - b^2*x^2))/(42*b^2*f) - (C*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e
 + f*x)^4*(a^2 - b^2*x^2))/(7*b^2*f) - (Sqrt[a + b*x]*Sqrt[a*c -
b*c*x]*(8*(8*a^4*C*f^4 + 2*a^2*b^2*f^2*(15*C*e^2 + 7*f*(3*B*e + A
*f)) - b^4*e^2*(3*C*e^2 - 7*f*(B*e + 12*A*f))) + 3*b^2*f*(a^2*f^2
*(41*C*e + 35*B*f) - 2*b^2*e*(3*C*e^2 - 7*f*(B*e + 7*A*f)))*x)*(a
^2 - b^2*x^2))/(840*b^6*f) + (a^2*Sqrt[c]*(A*(8*b^4*e^3 + 6*a^2*b
^2*e*f^2) + a^2*(a^2*f^2*(3*C*e + B*f) + 2*b^2*e^2*(C*e + 3*B*f))
)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c
 - b^2*c*x^2]])/(16*b^5*Sqrt[a^2*c - b^2*c*x^2])
```

Rubi [A] time = 3.13538, antiderivative size = 584, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$

$$\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^2\sqrt{ac-bcx}\left(-\frac{8a^2Cf^2}{b^2}-7f(2Af+Be)+3Ce^2\right)}{70b^2f}+\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^3\sqrt{ac-bcx}(3Ce-7Bf)}{42b^2f}-\frac{C\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^4\sqrt{ac-bcx}}{7b^2f}+\frac{x\sqrt{a+bx}\sqrt{ac-bcx}\left(a^4f^2(Bf+3Ce)+A\left(6a^2b^2ef^2+8b^4e^3\right)+2a^2b^2e^2(3Bf+Ce)\right)}{16b^4}-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}\left(3b^2fx\left(a^2f^2(35Bf+41Ce)-b^2\left(6Ce^3-14ef(7Af+Be)\right)\right)+8\left(8a^4Cf^4+2a^2b^2f^2\left(7f\right.\right.\right.}{840b^6f}+\frac{a^2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(a^4f^2(Bf+3Ce)+A\left(6a^2b^2ef^2+8b^4e^3\right)+2a^2b^2e^2(3Bf+Ce)\right)}{16b^5\sqrt{a^2c-b^2cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3*(A + B*x + C*x^2),x]
```

```
[Out] ((a^4*f^2*(3*C*e + B*f) + 2*a^2*b^2*e^2*(C*e + 3*B*f) + A*(8*b^4*
e^3 + 6*a^2*b^2*e*f^2))*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])/(16*b^
4) + ((3*C*e^2 - (8*a^2*C*f^2)/b^2 - 7*f*(B*e + 2*A*f))*Sqrt[a +
b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(a^2 - b^2*x^2))/(70*b^2*f) +
((3*C*e - 7*B*f)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3*(a^2
 - b^2*x^2))/(42*b^2*f) - (C*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e +
 f*x)^4*(a^2 - b^2*x^2))/(7*b^2*f) - (Sqrt[a + b*x]*Sqrt[a*c - b*
c*x]*(8*(8*a^4*C*f^4 + 2*a^2*b^2*f^2*(15*C*e^2 + 7*f*(3*B*e + A*f
)) - b^4*(3*C*e^4 - 7*e^2*f*(B*e + 12*A*f))) + 3*b^2*f*(a^2*f^2*(
41*C*e + 35*B*f) - b^2*(6*C*e^3 - 14*e*f*(B*e + 7*A*f)))*x)*(a^2
- b^2*x^2))/(840*b^6*f) + (a^2*Sqrt[c]*(a^4*f^2*(3*C*e + B*f) + 2
*a^2*b^2*e^2*(C*e + 3*B*f) + A*(8*b^4*e^3 + 6*a^2*b^2*e*f^2))*Sqr
t[a + b*x]*Sqrt[a*c - b*c*x]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^
2*c*x^2]])/(16*b^5*Sqrt[a^2*c - b^2*c*x^2])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x+e)**3*(C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.11409, size = 397, normalized size = 0.67

$$\frac{1}{16}\sqrt{c(a-bx)}\left(\frac{a^2\tan^{-1}\left(\frac{bx}{\sqrt{a-bx}\sqrt{a+bx}}\right)\left(a^4f^2(Bf+3Ce)+A\left(6a^2b^2ef^2+8b^4e^3\right)+2a^2b^2e^2(3Bf+Ce)\right)}{b^5\sqrt{a-bx}}\right.$$
$$-\frac{\sqrt{a+bx}\left(128a^6Cf^3+a^4b^2f\left(7f(32Af+96Be+15Bfx)+C\left(672e^2+315efx+64f^2x^2\right)\right)+2a^2b^4\left(7Af\left(120e^2+45efx\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3*(A + B*x + C*x^2),x]
```

```
[Out] (Sqrt[c*(a - b*x)]*(-(Sqrt[a + b*x]*(128*a^6*C*f^3 + a^4*b^2*f*(7
*f*(96*B*e + 32*A*f + 15*B*f*x) + C*(672*e^2 + 315*e*f*x + 64*f^2
*x^2)) + 2*a^2*b^4*(7*A*f*(120*e^2 + 45*e*f*x + 8*f^2*x^2) + 7*B*
```

```
(40*e^3 + 45*e^2*f*x + 24*e*f^2*x^2 + 5*f^3*x^3) + 3*C*x*(35*e^3
+ 56*e^2*f*x + 35*e*f^2*x^2 + 8*f^3*x^3)) - 4*b^6*x*(21*A*(10*e^3
 + 20*e^2*f*x + 15*e*f^2*x^2 + 4*f^3*x^3) + x*(7*B*(20*e^3 + 45*e
^2*f*x + 36*e*f^2*x^2 + 10*f^3*x^3) + 3*C*x*(35*e^3 + 84*e^2*f*x
+ 70*e*f^2*x^2 + 20*f^3*x^3)))))/(105*b^6) + (a^2*(a^4*f^2*(3*C*e
 + B*f) + 2*a^2*b^2*e^2*(C*e + 3*B*f) + A*(8*b^4*e^3 + 6*a^2*b^2*
e*f^2))*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/(b^5*Sqrt[a
- b*x])))/16
```

Maple [B] time = 0.064, size = 1446, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)^3*(C*x^2+B*x+A)*(b*x+a)^(1/2)*(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/1680*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)*(-630*a^2*x*(-c*(b^2*x^2-
a^2))^(1/2)*A*e*f^2*(b^2*c)^(1/2)*b^4-1680*A*a^2*b^4*e^2*f*(-c*(b
^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)-672*B*a^4*b^2*e*f^2*(-c*(b^2*x^2
-a^2))^(1/2)*(b^2*c)^(1/2)-672*C*a^4*b^2*e^2*f*(-c*(b^2*x^2-a^2))
^(1/2)*(b^2*c)^(1/2)+630*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^
2-a^2))^(1/2))*A*e*f^2*b^4+630*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(
b^2*x^2-a^2))^(1/2))*B*e^2*f*b^4+315*a^6*c*arctan((b^2*c)^(1/2)*x
/(-c*(b^2*x^2-a^2))^(1/2))*C*e*f^2*b^2-210*a^2*x*(-c*(b^2*x^2-a^2
))^(1/2)*C*e^3*(b^2*c)^(1/2)*b^4-630*a^2*x*(-c*(b^2*x^2-a^2))^(1/
2)*B*e^2*f*(b^2*c)^(1/2)*b^4-315*a^4*x*(-c*(b^2*x^2-a^2))^(1/2)*C
*e*f^2*(b^2*c)^(1/2)*b^2-210*C*x^3*a^2*b^4*e*f^2*(-c*(b^2*x^2-a^2
))^(1/2)*(b^2*c)^(1/2)-336*B*x^2*a^2*b^4*e*f^2*(-c*(b^2*x^2-a^2))
^(1/2)*(b^2*c)^(1/2)-336*C*x^2*a^2*b^4*e^2*f*(-c*(b^2*x^2-a^2))^(
1/2)*(b^2*c)^(1/2)-128*C*a^6*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)
^(1/2)-105*a^4*x*(-c*(b^2*x^2-a^2))^(1/2)*B*f^3*(b^2*c)^(1/2)*b^2
+840*C*x^5*b^6*e*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+1008*
B*x^4*b^6*e*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)-48*C*x^4*a
^2*b^4*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+1008*C*x^4*b^6*
e^2*f*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+1260*A*x^3*b^6*e*f^2
*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)-70*B*x^3*a^2*b^4*f^3*(-c*
(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+1260*B*x^3*b^6*e^2*f*(-c*(b^2*
x^2-a^2))^(1/2)*(b^2*c)^(1/2)-112*A*x^2*a^2*b^4*f^3*(-c*(b^2*x^2-
a^2))^(1/2)*(b^2*c)^(1/2)+1680*A*x^2*b^6*e^2*f*(-c*(b^2*x^2-a^2))
^(1/2)*(b^2*c)^(1/2)-64*C*x^2*a^4*b^2*f^3*(-c*(b^2*x^2-a^2))^(1/2
)*(b^2*c)^(1/2)+840*A*e^3*x*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2
)*b^6+240*C*x^6*b^6*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+28
0*B*x^5*b^6*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+336*A*x^4*
b^6*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+420*C*x^3*b^6*e^3*
(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)+560*B*x^2*b^6*e^3*(-c*(b^2
*x^2-a^2))^(1/2)*(b^2*c)^(1/2)-224*A*a^4*b^2*f^3*(-c*(b^2*x^2-a^2
))^(1/2)*(b^2*c)^(1/2)-560*B*a^2*b^4*e^3*(-c*(b^2*x^2-a^2))^(1/2)
*(b^2*c)^(1/2)+840*A*e^3*c*a^2*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^
2-a^2))^(1/2))*b^6+105*a^6*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-
a^2))^(1/2))*B*f^3*b^2+210*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*
x^2-a^2))^(1/2))*C*e^3*b^4)/(-c*(b^2*x^2-a^2))^(1/2)/(b^2*c)^(1/2
```

```
)/b^6
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e)^3,x, algori
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.306773, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e)^3,x, algori
```

```
[Out] [1/3360*(105*(6*B*a^4*b^3*e^2*f + B*a^6*b*f^3 + 2*(C*a^4*b^3 + 4*
A*a^2*b^5)*e^3 + 3*(C*a^6*b + 2*A*a^4*b^3)*e*f^2)*sqrt(-c)*log(2*
b^2*c*x^2 + 2*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*b*sqrt(-c)*x - a^2
*c) + 2*(240*C*b^6*f^3*x^6 - 560*B*a^2*b^4*e^3 - 672*B*a^4*b^2*e*
f^2 + 280*(3*C*b^6*e*f^2 + B*b^6*f^3)*x^5 + 48*(21*C*b^6*e^2*f +
21*B*b^6*e*f^2 - (C*a^2*b^4 - 7*A*b^6)*f^3)*x^4 - 336*(2*C*a^4*b^
2 + 5*A*a^2*b^4)*e^2*f - 32*(4*C*a^6 + 7*A*a^4*b^2)*f^3 + 70*(6*C
*b^6*e^3 + 18*B*b^6*e^2*f - B*a^2*b^4*f^3 - 3*(C*a^2*b^4 - 6*A*b^
6)*e*f^2)*x^3 + 16*(35*B*b^6*e^3 - 21*B*a^2*b^4*e*f^2 - 21*(C*a^2
*b^4 - 5*A*b^6)*e^2*f - (4*C*a^4*b^2 + 7*A*a^2*b^4)*f^3)*x^2 - 10
5*(6*B*a^2*b^4*e^2*f + B*a^4*b^2*f^3 + 2*(C*a^2*b^4 - 4*A*b^6)*e^
3 + 3*(C*a^4*b^2 + 2*A*a^2*b^4)*e*f^2)*x)*sqrt(-b*c*x + a*c)*sqrt
(b*x + a))/b^6, 1/1680*(105*(6*B*a^4*b^3*e^2*f + B*a^6*b*f^3 + 2*
(C*a^4*b^3 + 4*A*a^2*b^5)*e^3 + 3*(C*a^6*b + 2*A*a^4*b^3)*e*f^2)*
sqrt(c)*arctan(b*sqrt(c)*x/(sqrt(-b*c*x + a*c)*sqrt(b*x + a))) +
(240*C*b^6*f^3*x^6 - 560*B*a^2*b^4*e^3 - 672*B*a^4*b^2*e*f^2 + 28
0*(3*C*b^6*e*f^2 + B*b^6*f^3)*x^5 + 48*(21*C*b^6*e^2*f + 21*B*b^6
*e*f^2 - (C*a^2*b^4 - 7*A*b^6)*f^3)*x^4 - 336*(2*C*a^4*b^2 + 5*A*
a^2*b^4)*e^2*f - 32*(4*C*a^6 + 7*A*a^4*b^2)*f^3 + 70*(6*C*b^6*e^3
 + 18*B*b^6*e^2*f - B*a^2*b^4*f^3 - 3*(C*a^2*b^4 - 6*A*b^6)*e*f^2
)*x^3 + 16*(35*B*b^6*e^3 - 21*B*a^2*b^4*e*f^2 - 21*(C*a^2*b^4 - 5
*A*b^6)*e^2*f - (4*C*a^4*b^2 + 7*A*a^2*b^4)*f^3)*x^2 - 105*(6*B*a
^2*b^4*e^2*f + B*a^4*b^2*f^3 + 2*(C*a^2*b^4 - 4*A*b^6)*e^3 + 3*(C
*a^4*b^2 + 2*A*a^2*b^4)*e*f^2)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a
))/b^6]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**3*(C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e)^3,x, algori
```

```
[Out] Timed out
```

3.55 $\int \sqrt{a+bx}\sqrt{ac-bcx}(e+fx)^2\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=451

$$-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}\left(3fx\left(5a^2Cf^2-b^2\left(2Ce^2-2f(5Af+2Be)\right)\right)+8\left(2a^2f^2(Bf+2Ce)-b^2e\left(Ce^2-2f(5Af\right.\right.\right.}{120b^4f}$$
$$+\frac{x\sqrt{a+bx}\sqrt{ac-bcx}\left(2A\left(a^2b^2f^2+4b^4e^2\right)+a^2\left(a^2Cf^2+2b^2e(2Bf+Ce)\right)\right)}{16b^4}$$
$$+\frac{a^2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(2A\left(a^2b^2f^2+4b^4e^2\right)+a^2\left(a^2Cf^2+2b^2e(2Bf+Ce)\right)\right)}{16b^5\sqrt{a^2c-b^2cx^2}}$$
$$+\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^2\sqrt{ac-bcx}(Ce-2Bf)}{10b^2f}-\frac{C\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^3\sqrt{ac-bcx}}{6b^2f}$$

```
[Out] ((2*A*(4*b^4*e^2 + a^2*b^2*f^2) + a^2*(a^2*C*f^2 + 2*b^2*e*(C*e +
 2*B*f)))*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])/(16*b^4) + ((C*e - 2
*B*f)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(a^2 - b^2*x^2)
)/(10*b^2*f) - (C*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3*(a^
2 - b^2*x^2))/(6*b^2*f) - (Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(8*(2*
a^2*f^2*(2*C*e + B*f) - b^2*e*(C*e^2 - 2*f*(B*e + 5*A*f))) + 3*f*
(5*a^2*C*f^2 - b^2*(2*C*e^2 - 2*f*(2*B*e + 5*A*f)))*x)*(a^2 - b^2
*x^2))/(120*b^4*f) + (a^2*Sqrt[c]*(2*A*(4*b^4*e^2 + a^2*b^2*f^2)
+ a^2*(a^2*C*f^2 + 2*b^2*e*(C*e + 2*B*f)))*Sqrt[a + b*x]*Sqrt[a*c
 - b*c*x]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(16*b^5*
Sqrt[a^2*c - b^2*c*x^2])
```

Rubi [A] time = 2.0392, antiderivative size = 450, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$

$$-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}\left(8\left(2a^2f^2(Bf+2Ce)-\frac{1}{8}b^2\left(8Ce^3-16ef(5Af+Be)\right)\right)+3fx\left(5a^2Cf^2-b^2\left(2Ce^2-2f(5\right.\right.\right.}{120b^4f}$$
$$+\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^2\sqrt{ac-bcx}(Ce-2Bf)}{10b^2f}-\frac{C\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^3\sqrt{ac-bcx}}{6b^2f}$$
$$+\frac{x\sqrt{a+bx}\sqrt{ac-bcx}\left(a^4Cf^2+2A\left(a^2b^2f^2+4b^4e^2\right)+2a^2b^2e(2Bf+Ce)\right)}{16b^4}$$
$$+\frac{a^2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(a^4Cf^2+2A\left(a^2b^2f^2+4b^4e^2\right)+2a^2b^2e(2Bf+Ce)\right)}{16b^5\sqrt{a^2c-b^2cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(A + B*x + C*x^2),x]
```

```
[Out] ((a^4*C*f^2 + 2*a^2*b^2*e*(C*e + 2*B*f) + 2*A*(4*b^4*e^2 + a^2*b^
2*f^2))*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])/(16*b^4) + ((C*e - 2*B
*f)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(a^2 - b^2*x^2))/
```

```
(10*b^2*f) - (C*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3*(a^2
- b^2*x^2))/(6*b^2*f) - (Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(8*(2*a^
2*f^2*(2*C*e + B*f) - (b^2*(8*C*e^3 - 16*e*f*(B*e + 5*A*f)))/8) +
 3*f*(5*a^2*C*f^2 - b^2*(2*C*e^2 - 2*f*(2*B*e + 5*A*f)))*x)*(a^2
- b^2*x^2))/(120*b^4*f) + (a^2*Sqrt[c]*(a^4*C*f^2 + 2*a^2*b^2*e*(
C*e + 2*B*f) + 2*A*(4*b^4*e^2 + a^2*b^2*f^2))*Sqrt[a + b*x]*Sqrt[
a*c - b*c*x]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(16*b
^5*Sqrt[a^2*c - b^2*c*x^2])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)**2*(C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.687751, size = 281, normalized size = 0.62

$$\frac{1}{16}\sqrt{c(a-bx)}\left(\frac{a^2\tan^{-1}\left(\frac{bx}{\sqrt{a-bx}\sqrt{a+bx}}\right)\left(a^4Cf^2+2A\left(a^2b^2f^2+4b^4e^2\right)+2a^2b^2e(2Bf+Ce)\right)}{b^5\sqrt{a-bx}}\right.$$
$$-\frac{\sqrt{a+bx}\left(a^4f(32Bf+64Ce+15Cfx)+2a^2b^2\left(5Af(16e+3fx)+B\left(40e^2+30efx+8f^2x^2\right)+Cx\left(15e^2+16efx+5f^2x^2\right.\right.\right.}{15b^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(A + B*x + C*x^2),x]
```

```
[Out] (Sqrt[c*(a - b*x)]*(-(Sqrt[a + b*x]*(a^4*f*(64*C*e + 32*B*f + 15*
C*f*x) + 2*a^2*b^2*(5*A*f*(16*e + 3*f*x) + C*x*(15*e^2 + 16*e*f*x
 + 5*f^2*x^2) + B*(40*e^2 + 30*e*f*x + 8*f^2*x^2)) - 4*b^4*x*(5*A
*(6*e^2 + 8*e*f*x + 3*f^2*x^2) + x*(2*B*(10*e^2 + 15*e*f*x + 6*f^
2*x^2) + C*x*(15*e^2 + 24*e*f*x + 10*f^2*x^2)))))/(15*b^4) + (a^2
*(a^4*C*f^2 + 2*a^2*b^2*e*(C*e + 2*B*f) + 2*A*(4*b^4*e^2 + a^2*b^
2*f^2))*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/(b^5*Sqrt[a
- b*x])))/16
```

Maple [B] time = 0.024, size = 987, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)^2*(C*x^2+B*x+A)*(b*x+a)^(1/2)*(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/240*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)*(-32*C*x^2*a^2*b^2*e*f*(b^
2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+15*C*f^2*a^6*c*arctan((b^2*c)
^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))-60*a^2*x*(-c*(b^2*x^2-a^2))^(1
/2)*B*e*f*(b^2*c)^(1/2)*b^2-32*B*a^4*f^2*(b^2*c)^(1/2)*(-c*(b^2*x
^2-a^2))^(1/2)-30*a^2*x*(-c*(b^2*x^2-a^2))^(1/2)*A*f^2*(b^2*c)^(1
/2)*b^2-30*a^2*x*(-c*(b^2*x^2-a^2))^(1/2)*C*e^2*(b^2*c)^(1/2)*b^2
+160*A*x^2*b^4*e*f*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)-16*B*x^
2*a^2*b^2*f^2*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)-160*A*a^2*b^
2*e*f*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+60*a^4*c*arctan((b^2
*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*B*e*f*b^2+96*C*x^4*b^4*e*f*
(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+120*B*x^3*b^4*e*f*(b^2*c)^
(1/2)*(-c*(b^2*x^2-a^2))^(1/2)-10*C*x^3*a^2*b^2*f^2*(b^2*c)^(1/2)
*(-c*(b^2*x^2-a^2))^(1/2)+120*A*e^2*x*(-c*(b^2*x^2-a^2))^(1/2)*(b
^2*c)^(1/2)*b^4-15*C*f^2*a^4*x*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(
1/2)+40*C*x^5*b^4*f^2*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+48*B
*x^4*b^4*f^2*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+60*A*x^3*b^4*
f^2*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+60*C*x^3*b^4*e^2*(b^2*
c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+80*B*x^2*b^4*e^2*(b^2*c)^(1/2)*
(-c*(b^2*x^2-a^2))^(1/2)-80*B*a^2*b^2*e^2*(b^2*c)^(1/2)*(-c*(b^2*
x^2-a^2))^(1/2)-64*C*a^4*e*f*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/
2)+30*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*A*f^
2*b^2+120*A*e^2*c*a^2*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(
1/2))*b^4+30*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2
))*C*e^2*b^2)/(-c*(b^2*x^2-a^2))^(1/2)/(b^2*c)^(1/2)/b^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e)^2,x, algori
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.283302, size = 1, normalized size = 0.

$$\left[\frac{15\left(4\,Ba^4b^2ef + 2\left(Ca^4b^2 + 4\,Aa^2b^4\right)e^2 + \left(Ca^6 + 2\,Aa^4b^2\right)f^2\right)\sqrt{-c}\log\left(2\,b^2cx^2 + 2\,\sqrt{-bcx + ac}\sqrt{bx + a}b\sqrt{-c}x - a^2c\right) + 2}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e)^2,x, algori
```

```
[Out] [1/480*(15*(4*B*a^4*b^2*e*f + 2*(C*a^4*b^2 + 4*A*a^2*b^4)*e^2 + (
C*a^6 + 2*A*a^4*b^2)*f^2)*sqrt(-c)*log(2*b^2*c*x^2 + 2*sqrt(-b*c*
x + a*c)*sqrt(b*x + a)*b*sqrt(-c)*x - a^2*c) + 2*(40*C*b^5*f^2*x^
5 - 80*B*a^2*b^3*e^2 - 32*B*a^4*b*f^2 + 48*(2*C*b^5*e*f + B*b^5*f
^2)*x^4 + 10*(6*C*b^5*e^2 + 12*B*b^5*e*f - (C*a^2*b^3 - 6*A*b^5)*
f^2)*x^3 - 32*(2*C*a^4*b + 5*A*a^2*b^3)*e*f + 16*(5*B*b^5*e^2 - B
*a^2*b^3*f^2 - 2*(C*a^2*b^3 - 5*A*b^5)*e*f)*x^2 - 15*(4*B*a^2*b^3
*e*f + 2*(C*a^2*b^3 - 4*A*b^5)*e^2 + (C*a^4*b + 2*A*a^2*b^3)*f^2)
*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a))/b^5, 1/240*(15*(4*B*a^4*b^2
*e*f + 2*(C*a^4*b^2 + 4*A*a^2*b^4)*e^2 + (C*a^6 + 2*A*a^4*b^2)*f^
2)*sqrt(c)*arctan(b*sqrt(c)*x/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)))
 + (40*C*b^5*f^2*x^5 - 80*B*a^2*b^3*e^2 - 32*B*a^4*b*f^2 + 48*(2*
C*b^5*e*f + B*b^5*f^2)*x^4 + 10*(6*C*b^5*e^2 + 12*B*b^5*e*f - (C*
a^2*b^3 - 6*A*b^5)*f^2)*x^3 - 32*(2*C*a^4*b + 5*A*a^2*b^3)*e*f +
16*(5*B*b^5*e^2 - B*a^2*b^3*f^2 - 2*(C*a^2*b^3 - 5*A*b^5)*e*f)*x^
2 - 15*(4*B*a^2*b^3*e*f + 2*(C*a^2*b^3 - 4*A*b^5)*e^2 + (C*a^4*b
+ 2*A*a^2*b^3)*f^2)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a))/b^5]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c\left(-a+bx\right)}\sqrt{a+bx}\,(e+fx)^2\left(A+Bx+Cx^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*(C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Integral(sqrt(-c*(-a + b*x))*sqrt(a + b*x)*(e + f*x)**2*(A + B*x
+ C*x**2), x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e)^2,x, algori
```

```
[Out] Timed out
```

3.56 $\int \sqrt{a+bx}\sqrt{ac-bcx}(e+fx)\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=300

$$\frac{x\sqrt{a+bx}\sqrt{ac-bcx}\left(a^2(Bf+Ce)+4Ab^2e\right)}{8b^2}-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}\left(4\left(2a^2Cf^2-b^2\left(3Ce^2-5f(Af+Be)\right)\right)-3b^2fx(3Ce-5Bf)\right)}{60b^4f}+\frac{a^2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(a^2(Bf+Ce)+4Ab^2e\right)}{8b^3\sqrt{a^2c-b^2cx^2}}-\frac{C\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^2\sqrt{ac-bcx}}{5b^2f}$$

```
[Out] ((4*A*b^2*e + a^2*(C*e + B*f))*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
/(8*b^2) - (C*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(a^2 -
b^2*x^2))/(5*b^2*f) - (Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(4*(2*a^2*
C*f^2 - b^2*(3*C*e^2 - 5*f*(B*e + A*f))) - 3*b^2*f*(3*C*e - 5*B*f
)*x)*(a^2 - b^2*x^2))/(60*b^4*f) + (a^2*Sqrt[c]*(4*A*b^2*e + a^2*
(C*e + B*f))*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*ArcTan[(b*Sqrt[c]*x)
/Sqrt[a^2*c - b^2*c*x^2]])/(8*b^3*Sqrt[a^2*c - b^2*c*x^2])
```

Rubi [A] time = 0.865239, antiderivative size = 297, normalized size of antiderivative = 0.99, number of steps used = 6, number of rules used = 6, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158

$$\frac{1}{8}x\sqrt{a+bx}\sqrt{ac-bcx}\left(\frac{a^2(Bf+Ce)}{b^2}+4Ae\right)-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}\left(4\left(2a^2Cf^2-b^2\left(3Ce^2-5f(Af+Be)\right)\right)-3b^2fx(3Ce-5Bf)\right)}{60b^4f}+\frac{a^2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(a^2(Bf+Ce)+4Ab^2e\right)}{8b^3\sqrt{a^2c-b^2cx^2}}-\frac{C\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^2\sqrt{ac-bcx}}{5b^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)*(A + B*x + C*x^2),x]
```

```
[Out] ((4*A*e + (a^2*(C*e + B*f))/b^2)*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x
])/8 - (C*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2*(a^2 - b^2*
x^2))/(5*b^2*f) - (Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(4*(2*a^2*C*f^
2 - b^2*(3*C*e^2 - 5*f*(B*e + A*f))) - 3*b^2*f*(3*C*e - 5*B*f)*x)
*(a^2 - b^2*x^2))/(60*b^4*f) + (a^2*Sqrt[c]*(4*A*b^2*e + a^2*(C*e
 + B*f))*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*ArcTan[(b*Sqrt[c]*x)/Sqr
```

```
t[a^2*c - b^2*c*x^2]])/(8*b^3*Sqrt[a^2*c - b^2*c*x^2])
```

Rubi in Sympy [A] time = 93.5357, size = 286, normalized size = 0.95

$$-\frac{C\sqrt{a+bx}\left(a^2-b^2x^2\right)(e+fx)^2\sqrt{ac-bcx}}{5b^2f}+\frac{a^2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\left(4Ab^2e+Ba^2f+Ca^2e\right)\operatorname{atan}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{8b^3\sqrt{a^2c-b^2cx^2}}+\frac{x\sqrt{a+bx}\sqrt{ac-bcx}\left(4Ab^2e+Ba^2f+Ca^2e\right)}{8b^2}-\frac{\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}\left(4b^2e(5Bf-3Ce)+3b^2fx(5Bf-3Ce)+4f^2\left(5Ab^2+2Ca^2\right)\right)}{60b^4f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)*(C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] -C*sqrt(a + b*x)*(a**2 - b**2*x**2)*(e + f*x)**2*sqrt(a*c - b*c*x
)/(5*b**2*f) + a**2*sqrt(c)*sqrt(a + b*x)*sqrt(a*c - b*c*x)*(4*A*
b**2*e + B*a**2*f + C*a**2*e)*atan(b*sqrt(c)*x/sqrt(a**2*c - b**2
*c*x**2))/(8*b**3*sqrt(a**2*c - b**2*c*x**2)) + x*sqrt(a + b*x)*s
qrt(a*c - b*c*x)*(4*A*b**2*e + B*a**2*f + C*a**2*e)/(8*b**2) - sq
rt(a + b*x)*(a**2 - b**2*x**2)*sqrt(a*c - b*c*x)*(4*b**2*e*(5*B*f
 - 3*C*e) + 3*b**2*f*x*(5*B*f - 3*C*e) + 4*f**2*(5*A*b**2 + 2*C*a
**2))/(60*b**4*f)
```

Mathematica [A] time = 0.428941, size = 178, normalized size = 0.59

$$\frac{1}{8}\sqrt{c(a-bx)}\left(\frac{a^2\tan^{-1}\left(\frac{bx}{\sqrt{a-bx}\sqrt{a+bx}}\right)\left(a^2(Bf+Ce)+4Ab^2e\right)}{b^3\sqrt{a-bx}}-\frac{\sqrt{a+bx}\left(16a^4Cf+a^2b^2(40Af+5B(8e+3fx)+Cx(15e+8fx))-2b^4x(10A(3e+2fx)+x(5B(4e+3fx)+3Cx(5e+4fx\right.}{15b^4}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)*(A + B*x + C*x^2),x]
```

```
[Out] (Sqrt[c*(a - b*x)]*(-(Sqrt[a + b*x]*(16*a^4*C*f + a^2*b^2*(40*A*f
 + 5*B*(8*e + 3*f*x) + C*x*(15*e + 8*f*x)) - 2*b^4*x*(10*A*(3*e +
 2*f*x) + x*(5*B*(4*e + 3*f*x) + 3*C*x*(5*e + 4*f*x)))))/(15*b^4)
 + (a^2*(4*A*b^2*e + a^2*(C*e + B*f))*ArcTan[(b*x)/(Sqrt[a - b*x]
```

```
*Sqrt[a + b*x])])/(b^3*Sqrt[a - b*x])))/8
```

Maple [B] time = 0.018, size = 588, normalized size = 2.

$$\frac{1}{120\,b^4}\sqrt{bx+a}\sqrt{-c\,(bx-a)}\left(24\,Cx^4b^4f\sqrt{b^2c}\sqrt{-c\,(b^2x^2-a^2)}+30\,Bx^3b^4f\sqrt{b^2c}\sqrt{-c\,(b^2x^2-a^2)}+30\,Cx^3b^4e\sqrt{b^2c}\sqrt{-c\,(b^2x^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)*(C*x^2+B*x+A)*(b*x+a)^(1/2)*(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/120*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)*(24*C*x^4*b^4*f*(b^2*c)^(1
/2)*(-c*(b^2*x^2-a^2))^(1/2)+30*B*x^3*b^4*f*(b^2*c)^(1/2)*(-c*(b^
2*x^2-a^2))^(1/2)+30*C*x^3*b^4*e*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))
^(1/2)+60*e*A*c*a^2*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/
2))*b^4+40*A*x^2*b^4*f*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+15*
a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*B*f*b^2+40
*B*x^2*b^4*e*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+15*a^4*c*arct
an((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*C*e*b^2-8*C*x^2*a^2*
b^2*f*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+60*e*A*x*(-c*(b^2*x^
2-a^2))^(1/2)*(b^2*c)^(1/2)*b^4-15*a^2*x*(-c*(b^2*x^2-a^2))^(1/2)
*B*f*(b^2*c)^(1/2)*b^2-15*a^2*x*(-c*(b^2*x^2-a^2))^(1/2)*C*e*(b^2
*c)^(1/2)*b^2-40*A*a^2*b^2*f*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/
2)-40*B*a^2*b^2*e*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)-16*C*a^4
*f*(b^2*c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2))/(-c*(b^2*x^2-a^2))^(1/
2)/(b^2*c)^(1/2)/b^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e),x, algorith
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.255654, size = 1, normalized size = 0.

$$\left[\frac{15\left(Ba^4bf+\left(Ca^4b+4\,Aa^2b^3\right)e\right)\sqrt{-c}\log\left(2\,b^2cx^2+2\sqrt{-bcx+ac}\sqrt{bx+a}b\sqrt{-c}x-a^2c\right)+2\left(24\,Cb^4fx^4-40\,Ba^2b^2e+30\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e),x, algorith
```

```
[Out] [1/240*(15*(B*a^4*b*f + (C*a^4*b + 4*A*a^2*b^3)*e)*sqrt(-c)*log(2
*b^2*c*x^2 + 2*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*b*sqrt(-c)*x - a^
2*c) + 2*(24*C*b^4*f*x^4 - 40*B*a^2*b^2*e + 30*(C*b^4*e + B*b^4*f
)*x^3 + 8*(5*B*b^4*e - (C*a^2*b^2 - 5*A*b^4)*f)*x^2 - 8*(2*C*a^4
+ 5*A*a^2*b^2)*f - 15*(B*a^2*b^2*f + (C*a^2*b^2 - 4*A*b^4)*e)*x)*
sqrt(-b*c*x + a*c)*sqrt(b*x + a))/b^4, 1/120*(15*(B*a^4*b*f + (C*
a^4*b + 4*A*a^2*b^3)*e)*sqrt(c)*arctan(b*sqrt(c)*x/(sqrt(-b*c*x +
 a*c)*sqrt(b*x + a))) + (24*C*b^4*f*x^4 - 40*B*a^2*b^2*e + 30*(C*
b^4*e + B*b^4*f)*x^3 + 8*(5*B*b^4*e - (C*a^2*b^2 - 5*A*b^4)*f)*x^
2 - 8*(2*C*a^4 + 5*A*a^2*b^2)*f - 15*(B*a^2*b^2*f + (C*a^2*b^2 -
4*A*b^4)*e)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a))/b^4]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c\left(-a+bx\right)}\sqrt{a+bx}\left(e+fx\right)\left(A+Bx+Cx^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Integral(sqrt(-c*(-a + b*x))*sqrt(a + b*x)*(e + f*x)*(A + B*x + C
*x**2), x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a)*(f*x + e),x, algorith
```

```
[Out] Timed out
```

3.57 $\int \sqrt{a+bx}\sqrt{ac-bcx}\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=221

$$\frac{1}{8}x\sqrt{a+bx}\left(\frac{a^2C}{b^2}+4A\right)\sqrt{ac-bcx}+\frac{a^2\sqrt{c}\sqrt{a+bx}\left(a^2C+4Ab^2\right)\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{8b^3\sqrt{a^2c-b^2cx^2}}-\frac{B\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}}{3b^2}-\frac{Cx\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}}{4b^2}$$

```
[Out] ((4*A + (a^2*C)/b^2)*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])/8 - (B*Sq
rt[a + b*x]*Sqrt[a*c - b*c*x]*(a^2 - b^2*x^2))/(3*b^2) - (C*x*Sqr
t[a + b*x]*Sqrt[a*c - b*c*x]*(a^2 - b^2*x^2))/(4*b^2) + (a^2*Sqrt
[c]*(4*A*b^2 + a^2*C)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*ArcTan[(b*S
qrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(8*b^3*Sqrt[a^2*c - b^2*c*x^2
])
```

Rubi [A] time = 0.313048, antiderivative size = 221, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$

$$\frac{1}{8}x\sqrt{a+bx}\left(\frac{a^2C}{b^2}+4A\right)\sqrt{ac-bcx}+\frac{a^2\sqrt{c}\sqrt{a+bx}\left(a^2C+4Ab^2\right)\sqrt{ac-bcx}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{8b^3\sqrt{a^2c-b^2cx^2}}-\frac{B\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}}{3b^2}-\frac{Cx\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}}{4b^2}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(A + B*x + C*x^2),x]
```

```
[Out] ((4*A + (a^2*C)/b^2)*x*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])/8 - (B*Sq
rt[a + b*x]*Sqrt[a*c - b*c*x]*(a^2 - b^2*x^2))/(3*b^2) - (C*x*Sqr
t[a + b*x]*Sqrt[a*c - b*c*x]*(a^2 - b^2*x^2))/(4*b^2) + (a^2*Sqrt
[c]*(4*A*b^2 + a^2*C)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*ArcTan[(b*S
qrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(8*b^3*Sqrt[a^2*c - b^2*c*x^2
])
```

Rubi in Sympy [A] time = 35.242, size = 172, normalized size = 0.78

$$\frac{a^2\sqrt{c}\sqrt{a+bx}\left(4Ab^2+Ca^2\right)\sqrt{ac-bcx}\operatorname{atan}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{8b^3\sqrt{a^2c-b^2cx^2}}+\frac{x\sqrt{a+bx}\left(4Ab^2+Ca^2\right)\sqrt{ac-bcx}}{8b^2}-\frac{(4B+3Cx)\sqrt{a+bx}\left(a^2-b^2x^2\right)\sqrt{ac-bcx}}{12b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] a**2*sqrt(c)*sqrt(a + b*x)*(4*A*b**2 + C*a**2)*sqrt(a*c - b*c*x)*
atan(b*sqrt(c)*x/sqrt(a**2*c - b**2*c*x**2))/(8*b**3*sqrt(a**2*c
- b**2*c*x**2)) + x*sqrt(a + b*x)*(4*A*b**2 + C*a**2)*sqrt(a*c -
b*c*x)/(8*b**2) - (4*B + 3*C*x)*sqrt(a + b*x)*(a**2 - b**2*x**2)*
sqrt(a*c - b*c*x)/(12*b**2)
```

Mathematica [A] time = 0.28605, size = 125, normalized size = 0.57

$$\frac{\sqrt{c(a-bx)}\left(b\sqrt{a-bx}\sqrt{a+bx}\left(2b^2x(6A+x(4B+3Cx))-a^2(8B+3Cx)\right)+3a^2\left(a^2C+4Ab^2\right)\tan^{-1}\left(\frac{bx}{\sqrt{a-bx}\sqrt{a+bx}}\right)\right)}{24b^3\sqrt{a-bx}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(A + B*x + C*x^2),x]
```

```
[Out] (Sqrt[c*(a - b*x)]*(b*Sqrt[a - b*x]*Sqrt[a + b*x]*(-(a^2*(8*B + 3
*C*x)) + 2*b^2*x*(6*A + x*(4*B + 3*C*x))) + 3*a^2*(4*A*b^2 + a^2*
C)*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])]))/(24*b^3*Sqrt[a -
 b*x])
```

Maple [A] time = 0.016, size = 287, normalized size = 1.3

$$\frac{1}{24\,b^2}\sqrt{bx+a}\sqrt{-c\,(bx-a)}\left(6\,Cx^3b^2\sqrt{-c\,(b^2x^2-a^2)}\sqrt{b^2c}+12\,Aca^2\arctan\left(\frac{\sqrt{b^2c}x}{\sqrt{-c\,(b^2x^2-a^2)}}\right)b^2+8\,Bx^2b^2\sqrt{-c\,(b^2x^2-a^2)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(b*x+a)^(1/2)*(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/24*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)*(6*C*x^3*b^2*(-c*(b^2*x^2-a
^2))^(1/2)*(b^2*c)^(1/2)+12*A*c*a^2*arctan((b^2*c)^(1/2)*x/(-c*(b
^2*x^2-a^2))^(1/2))*b^2+8*B*x^2*b^2*(-c*(b^2*x^2-a^2))^(1/2)*(b^2
*c)^(1/2)+3*C*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/
2))+12*A*x*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)*b^2-3*C*a^2*x*(
-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)-8*B*a^2*(-c*(b^2*x^2-a^2))^
(1/2)*(b^2*c)^(1/2))/(-c*(b^2*x^2-a^2))^(1/2)/(b^2*c)^(1/2)/b^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a),x, algorithm="maxima
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.242365, size = 1, normalized size = 0.

$$\left[\frac{3\left(Ca^4+4\,Aa^2b^2\right)\sqrt{-c}\log\left(2\,b^2cx^2+2\,\sqrt{-bcx+ac}\sqrt{bx+a}b\sqrt{-c}x-a^2c\right)+2\left(6\,Cb^3x^3+8\,Bb^3x^2-8\,Ba^2b-3\left(Ca^2b-4\,A\right.\right.}{48\,b^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a),x, algorithm="fricas
```

```
[Out] [1/48*(3*(C*a^4 + 4*A*a^2*b^2)*sqrt(-c)*log(2*b^2*c*x^2 + 2*sqrt(
-b*c*x + a*c)*sqrt(b*x + a)*b*sqrt(-c)*x - a^2*c) + 2*(6*C*b^3*x^
3 + 8*B*b^3*x^2 - 8*B*a^2*b - 3*(C*a^2*b - 4*A*b^3)*x)*sqrt(-b*c*
x + a*c)*sqrt(b*x + a))/b^3, 1/24*(3*(C*a^4 + 4*A*a^2*b^2)*sqrt(c
)*arctan(b*sqrt(c)*x/(sqrt(-b*c*x + a*c)*sqrt(b*x + a))) + (6*C*b
^3*x^3 + 8*B*b^3*x^2 - 8*B*a^2*b - 3*(C*a^2*b - 4*A*b^3)*x)*sqrt(
-b*c*x + a*c)*sqrt(b*x + a))/b^3]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{-c\left(-a+bx\right)}\sqrt{a+bx}\left(A+Bx+Cx^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)*(b*x+a)**(1/2)*(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Integral(sqrt(-c*(-a + b*x))*sqrt(a + b*x)*(A + B*x + C*x**2), x)
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(-b*c*x + a*c)*(C*x^2 + B*x + A)*sqrt(b*x + a),x, algorithm="giac")
```

[Out] Timed out

3.58 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{ac-bcx}(e+fx)} dx$

Optimal. Leaf size=278

$$\frac{\sqrt{a^2c-b^2cx^2}\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\sqrt{b^2e^2-a^2f^2}} - \frac{\sqrt{a^2c-b^2cx^2}(Ce-Bf)\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}} - \frac{C\left(a^2-b^2x^2\right)}{b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] -((C*(a^2 - b^2*x^2))/(b^2*f*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])) -
((C*e - B*f)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^
2*c - b^2*c*x^2]])/(b*Sqrt[c]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]
) + ((C*e^2 - B*e*f + A*f^2)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt
[c]*(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*
c*x^2])])/(Sqrt[c]*f^2*Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a + b*x]*Sqrt
[a*c - b*c*x])
```

Rubi [A] time = 0.93887, antiderivative size = 278, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$

$$\frac{\sqrt{a^2c-b^2cx^2}\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\sqrt{b^2e^2-a^2f^2}} - \frac{\sqrt{a^2c-b^2cx^2}(Ce-Bf)\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}} - \frac{C\left(a^2-b^2x^2\right)}{b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)),x]
```


```
[Out] -((C*(a^2 - b^2*x^2))/(b^2*f*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])) -
((C*e - B*f)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^
2*c - b^2*c*x^2]])/(b*Sqrt[c]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]
) + ((C*e^2 - B*e*f + A*f^2)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt
[c]*(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*
c*x^2])])/(Sqrt[c]*f^2*Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a + b*x]*Sqrt
[a*c - b*c*x])
```

Rubi in Sympy [A] time = 108.046, size = 219, normalized size = 0.79

$$\frac{2Ca\,\mathrm{atan}\left(\frac{\sqrt{ac-bcx}}{\sqrt{c}\sqrt{a+bx}}\right)}{b^2\sqrt{c}f}-\frac{C\sqrt{a+bx}\sqrt{ac-bcx}}{b^2cf}-\frac{2\left(Af^2-Bef+Ce^2\right)\mathrm{atanh}\left(\frac{\sqrt{c}\sqrt{a+bx}\sqrt{af+be}}{\sqrt{ac-bcx}\sqrt{af-be}}\right)}{\sqrt{c}f^2\sqrt{af-be}\sqrt{af+be}}-\frac{2\left(Bbf+Caf-Cbe\right)\mathrm{atan}\left(\frac{\sqrt{ac-bcx}}{\sqrt{c}\sqrt{a+bx}}\right)}{b^2\sqrt{c}f^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] 2*C*a*atan(sqrt(a*c - b*c*x)/(sqrt(c)*sqrt(a + b*x)))/(b**2*sqrt(
c)*f) - C*sqrt(a + b*x)*sqrt(a*c - b*c*x)/(b**2*c*f) - 2*(A*f**2
- B*e*f + C*e**2)*atanh(sqrt(c)*sqrt(a + b*x)*sqrt(a*f + b*e)/(sq
rt(a*c - b*c*x)*sqrt(a*f - b*e)))/(sqrt(c)*f**2*sqrt(a*f - b*e)*s
qrt(a*f + b*e)) - 2*(B*b*f + C*a*f - C*b*e)*atan(sqrt(a*c - b*c*x
)/(sqrt(c)*sqrt(a + b*x)))/(b**2*sqrt(c)*f**2)
```

Mathematica [A] time = 0.721681, size = 238, normalized size = 0.86

$$\frac{\frac{\sqrt{a-bx}\log(e+fx)\left(f(Af-Be)+Ce^2\right)}{\sqrt{a^2f^2-b^2e^2}}-\frac{\sqrt{a-bx}\left(f(Af-Be)+Ce^2\right)\log\left(\sqrt{a-bx}\sqrt{a+bx}\sqrt{a^2f^2-b^2e^2}+a^2f+b^2ex\right)}{\sqrt{a^2f^2-b^2e^2}}+\frac{Cf\sqrt{a+bx}(bx-a)}{b^2}+\frac{\sqrt{a-bx}\tan^{-1}\left(\frac{b}{\sqrt{a-bx}}\right.}{b}}{f^2\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)),x]
```

```
[Out] ((C*f*(-a + b*x)*Sqrt[a + b*x])/b^2 + ((-(C*e) + B*f)*Sqrt[a - b*
x]*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/b + ((C*e^2 + f*(
-(B*e) + A*f))*Sqrt[a - b*x]*Log[e + f*x])/Sqrt[-(b^2*e^2) + a^2*
f^2] - ((C*e^2 + f*(-(B*e) + A*f))*Sqrt[a - b*x]*Log[a^2*f + b^2*
e*x + Sqrt[-(b^2*e^2) + a^2*f^2]*Sqrt[a - b*x]*Sqrt[a + b*x]])/Sq
rt[-(b^2*e^2) + a^2*f^2])/(f^2*Sqrt[c*(a - b*x)])
```

Maple [B] time = 0.069, size = 503, normalized size = 1.8

$$\frac{1}{b^2f^3c}\left(-A\ln\left(2\frac{1}{fx+e}\left(b^2cex+a^2cf+\sqrt{-c\left(b^2x^2-a^2\right)}\sqrt{\frac{c\left(a^2f^2-b^2e^2\right)}{f^2}}f\right)\right)b^2cf^2\sqrt{b^2c}+B\ln\left(2\frac{1}{fx+e}\left(b^2cex+a^2cf\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] (-A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-
b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*b^2*c*f^2*(b^2*c)^(1/2)+B*ln(2*(b
^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^
2)^(1/2)*f)/(f*x+e))*b^2*c*e*f*(b^2*c)^(1/2)+B*arctan((b^2*c)^(1/
2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2*c*f^2*(c*(a^2*f^2-b^2*e^2)/f^2
)^(1/2)-C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^
2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*b^2*c*e^2*(b^2*c)^(1/2)-C*a
rctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2*c*e*f*(c*(a^2
*f^2-b^2*e^2)/f^2)^(1/2)-C*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f
^2-b^2*e^2)/f^2)^(1/2)*(b^2*c)^(1/2))*(b*x+a)^(1/2)*(-c*(b*x-a))^
(1/2)/b^2/(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)/(b^2*c)^(1/2)/f^3/c/(-c
*(b^2*x^2-a^2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)),x, algori
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)),x, algori
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Bx + Cx^2}{\sqrt{-c\left(-a + bx\right)}\sqrt{a + bx}\left(e + fx\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Integral((A + B*x + C*x**2)/(sqrt(-c*(-a + b*x))*sqrt(a + b*x)*(e
 + f*x)), x)
```

GIAC/XCAS [A] time = 0.263815, size = 358, normalized size = 1.29

$$-\frac{\left(B\sqrt{-c}f - C\sqrt{-c}e\right)\ln\left(\left(\sqrt{-bcx + ac}\sqrt{-c} - \sqrt{2\,ac^2 + (bcx - ac)c}\right)^2\right)}{bf^2|c|} - \frac{\sqrt{2\,ac^2 + (bcx - ac)c}\sqrt{-bcx + ac}C|c|}{b^2c^3f} - \frac{2\left(A\sqrt{-c}c^2f^2 - B\sqrt{-c}c^2fe + C\sqrt{-c}c^2e^2\right)\arctan\left(\frac{2\,bc^2e + \left(\sqrt{-bcx+ac}\sqrt{-c} - \sqrt{2\,ac^2 + (bcx-ac)c}\right)^2f}{2\sqrt{a^2f^2 - b^2e^2}c^2}\right)}{\sqrt{a^2f^2 - b^2e^2}c^2f^2|c|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)),x, algori
```

```
[Out] -(B*sqrt(-c)*f - C*sqrt(-c)*e)*ln((sqrt(-b*c*x + a*c)*sqrt(-c) -
sqrt(2*a*c^2 + (b*c*x - a*c)*c))^2)/(b*f^2*abs(c)) - sqrt(2*a*c^2
 + (b*c*x - a*c)*c)*sqrt(-b*c*x + a*c)*C*abs(c)/(b^2*c^3*f) - 2*(
A*sqrt(-c)*c^2*f^2 - B*sqrt(-c)*c^2*f*e + C*sqrt(-c)*c^2*e^2)*arc
tan(1/2*(2*b*c^2*e + (sqrt(-b*c*x + a*c)*sqrt(-c) - sqrt(2*a*c^2
+ (b*c*x - a*c)*c))^2*f)/(sqrt(a^2*f^2 - b^2*e^2)*c^2))/(sqrt(a^2
*f^2 - b^2*e^2)*c^2*f^2*abs(c))
```

3.59 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{ac-bcx}(e+fx)^2}\,dx$

Optimal. Leaf size=322

$$\frac{f\left(a^2-b^2x^2\right)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)}+\frac{\sqrt{a^2c-b^2cx^2}\left(a^2f^2(2Ce-Bf)-b^2\left(Ce^3-Aef^2\right)\right)\tan^{-1}\left(\frac{\sqrt{c}(a^2f+b^2ex)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)^{3/2}}+\frac{C\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/((b^2*e^2 - a^2*f^2
)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)) + (C*Sqrt[a^2*c - b^
2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(b*Sqrt[c
]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((a^2*f^2*(2*C*e - B*f)
- b^2*(C*e^3 - A*e*f^2))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*
(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^
2])])/(Sqrt[c]*f^2*(b^2*e^2 - a^2*f^2)^(3/2)*Sqrt[a + b*x]*Sqrt[a
*c - b*c*x])
```

Rubi [A] time = 1.13756, antiderivative size = 322, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.175

$$\frac{f\left(a^2-b^2x^2\right)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)}+\frac{\sqrt{a^2c-b^2cx^2}\left(a^2f^2(2Ce-Bf)-b^2\left(Ce^3-Aef^2\right)\right)\tan^{-1}\left(\frac{\sqrt{c}(a^2f+b^2ex)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)^{3/2}}+\frac{C\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2),x]
```

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/((b^2*e^2 - a^2*f^2
)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)) + (C*Sqrt[a^2*c - b^
2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(b*Sqrt[c
]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((a^2*f^2*(2*C*e - B*f)
- b^2*(C*e^3 - A*e*f^2))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*
(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^
```

```
2])])/(Sqrt[c]*f^2*(b^2*e^2 - a^2*f^2)^(3/2)*Sqrt[a + b*x]*Sqrt[a
*c - b*c*x])
```

Rubi in Sympy [A] time = 126.292, size = 282, normalized size = 0.88

$$-\frac{2C\operatorname{atan}\left(\frac{\sqrt{ac-bcx}}{\sqrt{c}\sqrt{a+bx}}\right)}{b\sqrt{c}f^2}+\frac{2b^2e\left(Af^2-Bef+Ce^2\right)\operatorname{atanh}\left(\frac{\sqrt{c}\sqrt{a+bx}\sqrt{af+be}}{\sqrt{ac-bcx}\sqrt{af-be}}\right)}{\sqrt{c}f^2\left(af-be\right)^{\frac{3}{2}}\left(af+be\right)^{\frac{3}{2}}}-\frac{\sqrt{a+bx}\sqrt{ac-bcx}\left(Af^2-Bef+Ce^2\right)}{cf\left(e+fx\right)\left(af-be\right)\left(af+be\right)}-\frac{2\left(Bf-2Ce\right)\operatorname{atanh}\left(\frac{\sqrt{c}\sqrt{a+bx}\sqrt{af+be}}{\sqrt{ac-bcx}\sqrt{af-be}}\right)}{\sqrt{c}f^2\sqrt{af-be}\sqrt{af+be}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**2/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] -2*C*atan(sqrt(a*c - b*c*x)/(sqrt(c)*sqrt(a + b*x)))/(b*sqrt(c)*f
**2) + 2*b**2*e*(A*f**2 - B*e*f + C*e**2)*atanh(sqrt(c)*sqrt(a +
b*x)*sqrt(a*f + b*e)/(sqrt(a*c - b*c*x)*sqrt(a*f - b*e)))/(sqrt(c
)*f**2*(a*f - b*e)**(3/2)*(a*f + b*e)**(3/2)) - sqrt(a + b*x)*sqr
t(a*c - b*c*x)*(A*f**2 - B*e*f + C*e**2)/(c*f*(e + f*x)*(a*f - b*
e)*(a*f + b*e)) - 2*(B*f - 2*C*e)*atanh(sqrt(c)*sqrt(a + b*x)*sqr
t(a*f + b*e)/(sqrt(a*c - b*c*x)*sqrt(a*f - b*e)))/(sqrt(c)*f**2*s
qrt(a*f - b*e)*sqrt(a*f + b*e))
```

Mathematica [A] time = 1.13075, size = 340, normalized size = 1.06

$$\frac{\frac{f\sqrt{a+bx}(bx-a)\left(f(Af-Be)+Ce^2\right)}{(e+fx)\left(a^2f^2-b^2e^2\right)}-\frac{\sqrt{a-bx}\log(e+fx)\left(a^2f^2(Bf-2Ce)+b^2\left(Ce^3-Aef^2\right)\right)}{(be-af)(af+be)\sqrt{a^2f^2-b^2e^2}}+\frac{\sqrt{a-bx}\log\left(\sqrt{a-bx}\sqrt{a+bx}\sqrt{a^2f^2-b^2e^2}+a^2f+b^2ex\right)\left(a^2f^2(Bf-\right.}{(be-af)(af+be)\sqrt{a^2f^2-b^2e^2}}}{f^2\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2),x]
```

```
[Out] ((f*(C*e^2 + f*(-(B*e) + A*f))*(-a + b*x)*Sqrt[a + b*x])/((-(b^2*
e^2) + a^2*f^2)*(e + f*x)) + (C*Sqrt[a - b*x]*ArcTan[(b*x)/(Sqrt[
a - b*x]*Sqrt[a + b*x])])/b - ((a^2*f^2*(-2*C*e + B*f) + b^2*(C*e
^3 - A*e*f^2))*Sqrt[a - b*x]*Log[e + f*x])/((b*e - a*f)*(b*e + a*
f)*Sqrt[-(b^2*e^2) + a^2*f^2]) + ((a^2*f^2*(-2*C*e + B*f) + b^2*(
C*e^3 - A*e*f^2))*Sqrt[a - b*x]*Log[a^2*f + b^2*e*x + Sqrt[-(b^2*
e^2) + a^2*f^2]*Sqrt[a - b*x]*Sqrt[a + b*x]])/((b*e - a*f)*(b*e +
 a*f)*Sqrt[-(b^2*e^2) + a^2*f^2]))/(f^2*Sqrt[c*(a - b*x)])
```

Maple [B] time = 0.066, size = 1200, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)^2/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] (A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b
^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*b^2*c*e*f^3*(b^2*c)^(1/2)-B*ln(2
*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)
/f^2)^(1/2)*f)/(f*x+e))*x*a^2*c*f^4*(b^2*c)^(1/2)+C*arctan((b^2*c
)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*x*a^2*c*f^4*(c*(a^2*f^2-b^2*e
^2)/f^2)^(1/2)-C*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))
*x*b^2*c*e^2*f^2*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+2*C*ln(2*(b^2*c*
e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1
/2)*f)/(f*x+e))*x*a^2*c*e*f^3*(b^2*c)^(1/2)-C*ln(2*(b^2*c*e*x+a^2
*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/
(f*x+e))*x*b^2*c*e^3*f*(b^2*c)^(1/2)+A*ln(2*(b^2*c*e*x+a^2*c*f+(-
c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e)
)*b^2*c*e^2*f^2*(b^2*c)^(1/2)-B*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*
x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^2*c
*e*f^3*(b^2*c)^(1/2)+C*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^
(1/2))*a^2*c*e*f^3*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)-C*arctan((b^2*
c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2*c*e^3*f*(c*(a^2*f^2-b^2*
e^2)/f^2)^(1/2)+2*C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1
/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^2*c*e^2*f^2*(b^
2*c)^(1/2)-C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*
(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*b^2*c*e^4*(b^2*c)^(1/2)-
A*f^4*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*(b
^2*c)^(1/2)+B*e*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)
/f^2)^(1/2)*(b^2*c)^(1/2)-C*e^2*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(c*(
a^2*f^2-b^2*e^2)/f^2)^(1/2)*(b^2*c)^(1/2))/c*(-c*(b*x-a))^(1/2)*(
b*x+a)^(1/2)/(-c*(b^2*x^2-a^2))^(1/2)/(a*f+b*e)/(a*f-b*e)/(f*x+e)
/f^3/(b^2*c)^(1/2)/(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^2),x, algo
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^2),x, algo
```

```
[Out] Timed out
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**2/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [A] time = 0.600939, size = 4, normalized size = 0.01

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^2),x, algo
```

```
[Out] sage0*x
```

3.60 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{ac-bcx}(e+fx)^3}\,dx$

Optimal. Leaf size=363

$$\frac{(a^2-b^2x^2)\left(2a^2f^2(2Ce-Bf)-b^2e\left(f(Be-3Af)+Ce^2\right)\right)}{2f\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)^2}+\frac{f\,(a^2-b^2x^2)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{2\sqrt{a+bx}(e+fx)^2\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)}$$
$$+\frac{\sqrt{a^2c-b^2cx^2}\left(A\left(a^2b^2f^2+2b^4e^2\right)+a^2\left(2a^2Cf^2+b^2e(Ce-3Bf)\right)\right)\tan^{-1}\left(\frac{\sqrt{c}(a^2f+b^2ex)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)^{5/2}}$$

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/(2*(b^2*e^2 - a^2*f
^2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2) + ((2*a^2*f^2*(2
*C*e - B*f) - b^2*e*(C*e^2 + f*(B*e - 3*A*f)))*(a^2 - b^2*x^2))/(
2*f*(b^2*e^2 - a^2*f^2)^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*
x)) + ((A*(2*b^4*e^2 + a^2*b^2*f^2) + a^2*(2*a^2*C*f^2 + b^2*e*(C
*e - 3*B*f)))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*(a^2*f + b^
2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^2])])/(2*Sq
rt[c]*(b^2*e^2 - a^2*f^2)^(5/2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi [A] time = 1.38057, antiderivative size = 361, normalized size of antiderivative = 0.99, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$\frac{f\,(a^2-b^2x^2)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{2\sqrt{a+bx}(e+fx)^2\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)}+\frac{(a^2-b^2x^2)\left(2a^2f^2(2Ce-Bf)-b^2\left(ef(Be-3Af)+Ce^3\right)\right)}{2f\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)^2}$$
$$+\frac{\sqrt{a^2c-b^2cx^2}\left(2a^4Cf^2+A\left(a^2b^2f^2+2b^4e^2\right)+a^2b^2e(Ce-3Bf)\right)\tan^{-1}\left(\frac{\sqrt{c}(a^2f+b^2ex)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\,(b^2e^2-a^2f^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3),x]
```

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/(2*(b^2*e^2 - a^2*f
^2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2) + ((2*a^2*f^2*(2
*C*e - B*f) - b^2*(C*e^3 + e*f*(B*e - 3*A*f)))*(a^2 - b^2*x^2))/(
2*f*(b^2*e^2 - a^2*f^2)^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*
x)) + ((2*a^4*C*f^2 + a^2*b^2*e*(C*e - 3*B*f) + A*(2*b^4*e^2 + a^
2*b^2*f^2))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*(a^2*f + b^2*
e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^2])])/(2*Sqrt
[c]*(b^2*e^2 - a^2*f^2)^(5/2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**3/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.31546, size = 380, normalized size = 1.05

$$\frac{\frac{(bx-a)\sqrt{a+bx}\left(a^2f(f(Af+B(e+2fx))-Ce(3e+4fx))+b^2e\left(-Af(4e+3fx)+Be(2e+fx)+Ce^2x\right)\right)}{(e+fx)^2\left(b^2e^2-a^2f^2\right)^2}+\frac{\sqrt{a-bx}\log(e+fx)\left(2a^4Cf^2+A\left(a^2b^2f^2+2b^4e^2\right)+a^2b^2e(Ce-3B\cdots\right.}{(be-af)^2(af+be)^2\sqrt{a^2f^2-b^2e^2}}\cdots}{2\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3),x]
```

```
[Out] (((-a + b*x)*Sqrt[a + b*x]*(b^2*e*(C*e^2*x + B*e*(2*e + f*x) - A*
f*(4*e + 3*f*x)) + a^2*f*(-(C*e*(3*e + 4*f*x)) + f*(A*f + B*(e +
2*f*x)))))/((b^2*e^2 - a^2*f^2)^2*(e + f*x)^2) + ((2*a^4*C*f^2 +
a^2*b^2*e*(C*e - 3*B*f) + A*(2*b^4*e^2 + a^2*b^2*f^2))*Sqrt[a - b
*x]*Log[e + f*x])/((b*e - a*f)^2*(b*e + a*f)^2*Sqrt[-(b^2*e^2) +
a^2*f^2]) - ((2*a^4*C*f^2 + a^2*b^2*e*(C*e - 3*B*f) + A*(2*b^4*e^
2 + a^2*b^2*f^2))*Sqrt[a - b*x]*Log[a^2*f + b^2*e*x + Sqrt[-(b^2*
e^2) + a^2*f^2]*Sqrt[a - b*x]*Sqrt[a + b*x]])/((b*e - a*f)^2*(b*e
 + a*f)^2*Sqrt[-(b^2*e^2) + a^2*f^2]))/(2*Sqrt[c*(a - b*x)])
```

Maple [B] time = 0.075, size = 1848, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)/(f*x+e)^3/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] -1/2*(-3*B*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a
^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x^2*a^2*b^2*c*e*f^3+2*A*ln
(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^
2)/f^2)^(1/2)*f)/(f*x+e))*b^4*c*e^4+A*a^2*f^4*(-c*(b^2*x^2-a^2))^
(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+B*x*b^2*e^2*f^2*(-c*(b^2*x^
2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)-4*C*x*a^2*e*f^3*(-c
```

```
*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+C*x*b^2*e^3
*f*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+A*ln(
2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2
)/f^2)^(1/2)*f)/(f*x+e))*x^2*a^2*b^2*c*f^4+2*A*ln(2*(b^2*c*e*x+a^
2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)
/(f*x+e))*x^2*b^4*c*e^2*f^2+4*A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*
x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*b^4
*c*e^3*f+4*C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*
(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*a^4*c*e*f^3+A*ln(2*(b^
2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2
)^(1/2)*f)/(f*x+e))*a^2*b^2*c*e^2*f^2-3*B*ln(2*(b^2*c*e*x+a^2*c*f
+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x
+e))*a^2*b^2*c*e^3*f-3*A*x*b^2*e*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(c*
(a^2*f^2-b^2*e^2)/f^2)^(1/2)+C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x
^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x^2*a^
2*b^2*c*e^2*f^2+2*A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1
/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*a^2*b^2*c*e*f^3
-6*B*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2
-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*a^2*b^2*c*e^2*f^2+2*C*ln(2*(b^
2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2
)^(1/2)*f)/(f*x+e))*x*a^2*b^2*c*e^3*f+2*C*ln(2*(b^2*c*e*x+a^2*c*f
+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x
+e))*x^2*a^4*c*f^4+2*C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))
^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^4*c*e^2*f^2+
C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^
2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^2*b^2*c*e^4+2*B*x*a^2*f^4*(-c*(b^
2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)-4*A*b^2*e^2*f^2
*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+B*a^2*e
*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+2*B
*b^2*e^3*f*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/
2)-3*C*a^2*e^2*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/
f^2)^(1/2))/c*(-c*(b*x-a))^(1/2)*(b*x+a)^(1/2)/(-c*(b^2*x^2-a^2))
^(1/2)/(a*f+b*e)/(a*f-b*e)/(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)/(a^2*f
^2-b^2*e^2)/(f*x+e)^2/f
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^3),x, algo

[Out] Exception raised: ValueError
```

Fricas [A] time = 8.95438, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^3),x, algo
```

```
[Out] [-1/4*(2*(2*B*b^2*e^3 + B*a^2*e*f^2 + A*a^2*f^3 - (3*C*a^2 + 4*A*
b^2)*e^2*f + (C*b^2*e^3 + B*b^2*e^2*f + 2*B*a^2*f^3 - (4*C*a^2 +
3*A*b^2)*e*f^2)*x)*sqrt(-b^2*c*e^2 + a^2*c*f^2)*sqrt(-b*c*x + a*c
)*sqrt(b*x + a) + (3*B*a^2*b^2*c*e^3*f - (C*a^2*b^2 + 2*A*b^4)*c*
e^4 - (2*C*a^4 + A*a^2*b^2)*c*e^2*f^2 + (3*B*a^2*b^2*c*e*f^3 - (C
*a^2*b^2 + 2*A*b^4)*c*e^2*f^2 - (2*C*a^4 + A*a^2*b^2)*c*f^4)*x^2
+ 2*(3*B*a^2*b^2*c*e^2*f^2 - (C*a^2*b^2 + 2*A*b^4)*c*e^3*f - (2*C
*a^4 + A*a^2*b^2)*c*e*f^3)*x)*log((2*(a^2*b^2*e^2*f - a^4*f^3 + (
b^4*e^3 - a^2*b^2*e*f^2)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a) + (2
*a^2*b^2*e*f*x - a^2*b^2*e^2 + 2*a^4*f^2 + (2*b^4*e^2 - a^2*b^2*f
^2)*x^2)*sqrt(-b^2*c*e^2 + a^2*c*f^2))/(f^2*x^2 + 2*e*f*x + e^2))
)/((b^4*c*e^6 - 2*a^2*b^2*c*e^4*f^2 + a^4*c*e^2*f^4 + (b^4*c*e^4*
f^2 - 2*a^2*b^2*c*e^2*f^4 + a^4*c*f^6)*x^2 + 2*(b^4*c*e^5*f - 2*a
^2*b^2*c*e^3*f^3 + a^4*c*e*f^5)*x)*sqrt(-b^2*c*e^2 + a^2*c*f^2)),
 -1/2*((2*B*b^2*e^3 + B*a^2*e*f^2 + A*a^2*f^3 - (3*C*a^2 + 4*A*b^
2)*e^2*f + (C*b^2*e^3 + B*b^2*e^2*f + 2*B*a^2*f^3 - (4*C*a^2 + 3*
A*b^2)*e*f^2)*x)*sqrt(b^2*c*e^2 - a^2*c*f^2)*sqrt(-b*c*x + a*c)*s
qrt(b*x + a) - (3*B*a^2*b^2*c*e^3*f - (C*a^2*b^2 + 2*A*b^4)*c*e^4
 - (2*C*a^4 + A*a^2*b^2)*c*e^2*f^2 + (3*B*a^2*b^2*c*e*f^3 - (C*a^
2*b^2 + 2*A*b^4)*c*e^2*f^2 - (2*C*a^4 + A*a^2*b^2)*c*f^4)*x^2 + 2
*(3*B*a^2*b^2*c*e^2*f^2 - (C*a^2*b^2 + 2*A*b^4)*c*e^3*f - (2*C*a^
4 + A*a^2*b^2)*c*e*f^3)*x)*arctan(-sqrt(b^2*c*e^2 - a^2*c*f^2)*(b
^2*e*x + a^2*f)/((b^2*e^2 - a^2*f^2)*sqrt(-b*c*x + a*c)*sqrt(b*x
+ a))))/((b^4*c*e^6 - 2*a^2*b^2*c*e^4*f^2 + a^4*c*e^2*f^4 + (b^4*
c*e^4*f^2 - 2*a^2*b^2*c*e^2*f^4 + a^4*c*f^6)*x^2 + 2*(b^4*c*e^5*f
 - 2*a^2*b^2*c*e^3*f^3 + a^4*c*e*f^5)*x)*sqrt(b^2*c*e^2 - a^2*c*f
^2))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**3/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [A] time = 1.30891, size = 4, normalized size = 0.01

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^3),x, algo
```

```
[Out] sage0*x
```

3.61 $\int \frac{(e+fx)^3(A+Bx+Cx^2)}{\sqrt{a+bx}\sqrt{ac-bcx}}\,dx$

Optimal. Leaf size=501

$$-\frac{(a^2-b^2x^2)(e+fx)^2(16a^2Cf^2-b^2(3Ce^2-5f(4Af+3Be)))}{60b^4f\sqrt{a+bx}\sqrt{ac-bcx}}+\frac{\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)(4A(3a^2b^2ef^2+2b^4e^3)+a^2(3a^2f^2(Bf+3Ce)+4b^2e^2(3Bf+Ce)))}{8b^5\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}+\frac{(a^2-b^2x^2)(e+fx)^3(Ce-5Bf)}{20b^2f\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C(a^2-b^2x^2)(e+fx)^4}{5b^2f\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{(a^2-b^2x^2)(b^2fx(a^2f^2(45Bf+71Ce)-2b^2e(3Ce^2-5f(10Af+3Be)))+4(16a^4Cf^4+4a^2b^2f^2(5f(Af+3Be)+13C}{120b^6f\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] -((16*a^2*C*f^2 - b^2*(3*C*e^2 - 5*f*(3*B*e + 4*A*f)))*(e + f*x)^
2*(a^2 - b^2*x^2))/(60*b^4*f*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + (
(C*e - 5*B*f)*(e + f*x)^3*(a^2 - b^2*x^2))/(20*b^2*f*Sqrt[a + b*x
]*Sqrt[a*c - b*c*x]) - (C*(e + f*x)^4*(a^2 - b^2*x^2))/(5*b^2*f*S
qrt[a + b*x]*Sqrt[a*c - b*c*x]) - ((4*(16*a^4*C*f^4 + 4*a^2*b^2*f
^2*(13*C*e^2 + 5*f*(3*B*e + A*f)) - b^4*e^2*(3*C*e^2 - 5*f*(3*B*e
 + 16*A*f))) + b^2*f*(a^2*f^2*(71*C*e + 45*B*f) - 2*b^2*e*(3*C*e^
2 - 5*f*(3*B*e + 10*A*f)))*x)*(a^2 - b^2*x^2))/(120*b^6*f*Sqrt[a
+ b*x]*Sqrt[a*c - b*c*x]) + ((4*A*(2*b^4*e^3 + 3*a^2*b^2*e*f^2) +
 a^2*(3*a^2*f^2*(3*C*e + B*f) + 4*b^2*e^2*(C*e + 3*B*f)))*Sqrt[a^
2*c - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(
8*b^5*Sqrt[c]*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi [A] time = 2.67029, antiderivative size = 496, normalized size of antiderivative = 0.99, number of steps used = 7, number of rules used = 6, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.15$

$$\frac{(a^2-b^2x^2)(e+fx)^2\left(-\frac{16a^2Cf^2}{b^2}-5f(4Af+3Be)+3Ce^2\right)}{60b^2f\sqrt{a+bx}\sqrt{ac-bcx}}+\frac{(a^2-b^2x^2)(e+fx)^3(Ce-5Bf)}{20b^2f\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C(a^2-b^2x^2)(e+fx)^4}{5b^2f\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{(a^2-b^2x^2)(b^2fx(a^2f^2(45Bf+71Ce)-b^2(6Ce^3-10ef(10Af+3Be)))+4(16a^4Cf^4+4a^2b^2f^2(5f(Af+3Be)+13C}{120b^6f\sqrt{a+bx}\sqrt{ac-bcx}}+\frac{\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)(3a^4f^2(Bf+3Ce)+4A(3a^2b^2ef^2+2b^4e^3)+4a^2b^2e^2(3Bf+Ce))}{8b^5\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In] Int[((e + f*x)^3*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] ((3*C*e^2 - (16*a^2*C*f^2)/b^2 - 5*f*(3*B*e + 4*A*f))*(e + f*x)^2
*(a^2 - b^2*x^2))/(60*b^2*f*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((
C*e - 5*B*f)*(e + f*x)^3*(a^2 - b^2*x^2))/(20*b^2*f*Sqrt[a + b*x]
*Sqrt[a*c - b*c*x]) - (C*(e + f*x)^4*(a^2 - b^2*x^2))/(5*b^2*f*Sq
rt[a + b*x]*Sqrt[a*c - b*c*x]) - ((4*(16*a^4*C*f^4 + 4*a^2*b^2*f^
2*(13*C*e^2 + 5*f*(3*B*e + A*f)) - b^4*e^2*(3*C*e^2 - 5*f*(3*B*e
+ 16*A*f))) + b^2*f*(a^2*f^2*(71*C*e + 45*B*f) - b^2*(6*C*e^3 - 1
0*e*f*(3*B*e + 10*A*f)))*x)*(a^2 - b^2*x^2))/(120*b^6*f*Sqrt[a +
b*x]*Sqrt[a*c - b*c*x]) + ((3*a^4*f^2*(3*C*e + B*f) + 4*a^2*b^2*e
^2*(C*e + 3*B*f) + 4*A*(2*b^4*e^3 + 3*a^2*b^2*e*f^2))*Sqrt[a^2*c
- b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(8*b^
5*Sqrt[c]*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)**3*(C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.901538, size = 289, normalized size = 0.58

$$\frac{\frac{(bx-a)\sqrt{a+bx}\left(64a^4Cf^3+a^2b^2f\left(5f(16Af+48Be+9Bfx)+C\left(240e^2+135efx+32f^2x^2\right)\right)+2b^4\left(10Af\left(18e^2+9efx+2f^2x^2\right)+15B\left(4e^3+6e^2fx+4ef^2x^2+f^3x^3\right)+3Cx(1\right.\right.}{15b^6}}{8\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e + f*x)^3*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] (((-a + b*x)*Sqrt[a + b*x]*(64*a^4*C*f^3 + a^2*b^2*f*(5*f*(48*B*e
 + 16*A*f + 9*B*f*x) + C*(240*e^2 + 135*e*f*x + 32*f^2*x^2)) + 2*
b^4*(10*A*f*(18*e^2 + 9*e*f*x + 2*f^2*x^2) + 15*B*(4*e^3 + 6*e^2*
f*x + 4*e*f^2*x^2 + f^3*x^3) + 3*C*x*(10*e^3 + 20*e^2*f*x + 15*e*
f^2*x^2 + 4*f^3*x^3))))/(15*b^6) + ((3*a^4*f^2*(3*C*e + B*f) + 4*
a^2*b^2*e^2*(C*e + 3*B*f) + 4*A*(2*b^4*e^3 + 3*a^2*b^2*e*f^2))*Sq
rt[a - b*x]*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/b^5)/(8*
Sqrt[c*(a - b*x)])
```

Maple [B] time = 0.04, size = 965, normalized size = 1.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)^3*(C*x^2+B*x+A)/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/120*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)/c*(-24*C*x^4*b^4*f^3*(b^2*
c)^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)-30*B*x^3*b^4*f^3*(b^2*c)^(1/2)*
(-c*(b^2*x^2-a^2))^(1/2)-90*C*x^3*b^4*e*f^2*(b^2*c)^(1/2)*(-c*(b^
2*x^2-a^2))^(1/2)+180*f^2*A*e*c*a^2*arctan((b^2*c)^(1/2)*x/(-c*(b
^2*x^2-a^2))^(1/2))*b^4+120*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2
-a^2))^(1/2))*A*e^3*b^6-40*A*x^2*b^4*f^3*(b^2*c)^(1/2)*(-c*(b^2*x
^2-a^2))^(1/2)+45*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))
^(1/2))*B*f^3*b^2+180*B*f*e^2*c*a^2*arctan((b^2*c)^(1/2)*x/(-c*(b
^2*x^2-a^2))^(1/2))*b^4-120*B*x^2*b^4*e*f^2*(b^2*c)^(1/2)*(-c*(b^
2*x^2-a^2))^(1/2)+135*a^4*c*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a
^2))^(1/2))*C*e*f^2*b^2+60*e^3*C*c*a^2*arctan((b^2*c)^(1/2)*x/(-c
*(b^2*x^2-a^2))^(1/2))*b^4-32*C*x^2*a^2*b^2*f^3*(b^2*c)^(1/2)*(-c
*(b^2*x^2-a^2))^(1/2)-120*C*x^2*b^4*e^2*f*(b^2*c)^(1/2)*(-c*(b^2*
x^2-a^2))^(1/2)-180*f^2*A*e*x*(-c*(b^2*x^2-a^2))^(1/2)*b^4*(b^2*c
)^(1/2)-45*a^2*x*(-c*(b^2*x^2-a^2))^(1/2)*B*f^3*b^2*(b^2*c)^(1/2)
-180*B*f*e^2*x*(-c*(b^2*x^2-a^2))^(1/2)*b^4*(b^2*c)^(1/2)-135*a^2
*x*(-c*(b^2*x^2-a^2))^(1/2)*C*e*f^2*b^2*(b^2*c)^(1/2)-60*e^3*C*x*
(-c*(b^2*x^2-a^2))^(1/2)*b^4*(b^2*c)^(1/2)-80*a^2*(-c*(b^2*x^2-a^
2))^(1/2)*A*f^3*b^2*(b^2*c)^(1/2)-360*(-c*(b^2*x^2-a^2))^(1/2)*A*
e^2*f*b^4*(b^2*c)^(1/2)-240*a^2*(-c*(b^2*x^2-a^2))^(1/2)*B*e*f^2*
b^2*(b^2*c)^(1/2)-120*(-c*(b^2*x^2-a^2))^(1/2)*B*e^3*b^4*(b^2*c)^
(1/2)-64*a^4*(-c*(b^2*x^2-a^2))^(1/2)*C*f^3*(b^2*c)^(1/2)-240*a^2
*(-c*(b^2*x^2-a^2))^(1/2)*C*e^2*f*b^2*(b^2*c)^(1/2))/(-c*(b^2*x^2
-a^2))^(1/2)/b^6/(b^2*c)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(f*x + e)^3/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algo
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.288362, size = 1, normalized size = 0.

$$\left[-\frac{2\left(24\,Cb^4f^3x^4+120\,Bb^4e^3+240\,Ba^2b^2ef^2+120\left(2\,Ca^2b^2+3\,Ab^4\right)e^2f+16\left(4\,Ca^4+5\,Aa^2b^2\right)f^3+30\left(3\,Cb^4ef^2+Bb^4f\right.\right.}{}\right.$$

$$-\frac{\left(24\,Cb^4f^3x^4+120\,Bb^4e^3+240\,Ba^2b^2ef^2+120\left(2\,Ca^2b^2+3\,Ab^4\right)e^2f+16\left(4\,Ca^4+5\,Aa^2b^2\right)f^3+30\left(3\,Cb^4ef^2+Bb^4f^3\right)x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(f*x + e)^3/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algo
```

```
[Out] [-1/240*(2*(24*C*b^4*f^3*x^4 + 120*B*b^4*e^3 + 240*B*a^2*b^2*e*f^
2 + 120*(2*C*a^2*b^2 + 3*A*b^4)*e^2*f + 16*(4*C*a^4 + 5*A*a^2*b^2
)*f^3 + 30*(3*C*b^4*e*f^2 + B*b^4*f^3)*x^3 + 8*(15*C*b^4*e^2*f +
15*B*b^4*e*f^2 + (4*C*a^2*b^2 + 5*A*b^4)*f^3)*x^2 + 15*(4*C*b^4*e
^3 + 12*B*b^4*e^2*f + 3*B*a^2*b^2*f^3 + 3*(3*C*a^2*b^2 + 4*A*b^4)
*e*f^2)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*sqrt(-c) - 15*(12*B*a
^2*b^3*c*e^2*f + 3*B*a^4*b*c*f^3 + 4*(C*a^2*b^3 + 2*A*b^5)*c*e^3
+ 3*(3*C*a^4*b + 4*A*a^2*b^3)*c*e*f^2)*log(2*sqrt(-b*c*x + a*c)*s
qrt(b*x + a)*b*x + (2*b^2*x^2 - a^2)*sqrt(-c)))/(b^6*sqrt(-c)*c),
 -1/120*((24*C*b^4*f^3*x^4 + 120*B*b^4*e^3 + 240*B*a^2*b^2*e*f^2
+ 120*(2*C*a^2*b^2 + 3*A*b^4)*e^2*f + 16*(4*C*a^4 + 5*A*a^2*b^2)*
f^3 + 30*(3*C*b^4*e*f^2 + B*b^4*f^3)*x^3 + 8*(15*C*b^4*e^2*f + 15
*B*b^4*e*f^2 + (4*C*a^2*b^2 + 5*A*b^4)*f^3)*x^2 + 15*(4*C*b^4*e^3
 + 12*B*b^4*e^2*f + 3*B*a^2*b^2*f^3 + 3*(3*C*a^2*b^2 + 4*A*b^4)*e
*f^2)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*sqrt(c) - 15*(12*B*a^2*
b^3*c*e^2*f + 3*B*a^4*b*c*f^3 + 4*(C*a^2*b^3 + 2*A*b^5)*c*e^3 + 3
*(3*C*a^4*b + 4*A*a^2*b^3)*c*e*f^2)*arctan(b*sqrt(c)*x/(sqrt(-b*c
*x + a*c)*sqrt(b*x + a))))/(b^6*c^(3/2))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x+e)**3*(C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(f*x + e)^3/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algo
```

```
[Out] Timed out
```

3.62 $\int \frac{(e+fx)^2(A+Bx+Cx^2)}{\sqrt{a+bx}\sqrt{ac-bcx}}\,dx$

Optimal. Leaf size=368

$$-\frac{(a^2-b^2x^2)\left(fx\left(9a^2Cf^2-b^2\left(2Ce^2-4f(3Af+2Be)\right)\right)+4\left(4a^2f^2(Bf+2Ce)-b^2e\left(Ce^2-4f(3Af+Be)\right)\right)\right)}{24b^4f\sqrt{a+bx}\sqrt{ac-bcx}}$$
$$+\frac{\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(4A\left(a^2b^2f^2+2b^4e^2\right)+a^2\left(3a^2Cf^2+4b^2e(2Bf+Ce)\right)\right)}{8b^5\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}$$
$$+\frac{(a^2-b^2x^2)(e+fx)^2(Ce-4Bf)}{12b^2f\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C(a^2-b^2x^2)(e+fx)^3}{4b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] ((C*e - 4*B*f)*(e + f*x)^2*(a^2 - b^2*x^2))/(12*b^2*f*Sqrt[a + b*
x]*Sqrt[a*c - b*c*x]) - (C*(e + f*x)^3*(a^2 - b^2*x^2))/(4*b^2*f*
Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) - ((4*(4*a^2*f^2*(2*C*e + B*f) -
 b^2*e*(C*e^2 - 4*f*(B*e + 3*A*f))) + f*(9*a^2*C*f^2 - b^2*(2*C*e
^2 - 4*f*(2*B*e + 3*A*f)))*x)*(a^2 - b^2*x^2))/(24*b^4*f*Sqrt[a +
 b*x]*Sqrt[a*c - b*c*x]) + ((4*A*(2*b^4*e^2 + a^2*b^2*f^2) + a^2*
(3*a^2*C*f^2 + 4*b^2*e*(C*e + 2*B*f)))*Sqrt[a^2*c - b^2*c*x^2]*Ar
cTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(8*b^5*Sqrt[c]*Sqrt[
a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi [A] time = 1.8231, antiderivative size = 369, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.15$

$$-\frac{(a^2-b^2x^2)\left(4\left(4a^2f^2(Bf+2Ce)-\frac{1}{4}b^2\left(4Ce^3-16ef(3Af+Be)\right)\right)+fx\left(9a^2Cf^2-b^2\left(2Ce^2-4f(3Af+2Be)\right)\right)\right)}{24b^4f\sqrt{a+bx}\sqrt{ac-bcx}}$$
$$+\frac{(a^2-b^2x^2)(e+fx)^2(Ce-4Bf)}{12b^2f\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C(a^2-b^2x^2)(e+fx)^3}{4b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$
$$+\frac{\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(3a^4Cf^2+4A\left(a^2b^2f^2+2b^4e^2\right)+4a^2b^2e(2Bf+Ce)\right)}{8b^5\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In] Int[((e + f*x)^2*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] ((C*e - 4*B*f)*(e + f*x)^2*(a^2 - b^2*x^2))/(12*b^2*f*Sqrt[a + b*
x]*Sqrt[a*c - b*c*x]) - (C*(e + f*x)^3*(a^2 - b^2*x^2))/(4*b^2*f*
Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) - ((4*(4*a^2*f^2*(2*C*e + B*f) -
 (b^2*(4*C*e^3 - 16*e*f*(B*e + 3*A*f)))/4) + f*(9*a^2*C*f^2 - b^2
*(2*C*e^2 - 4*f*(2*B*e + 3*A*f)))*x)*(a^2 - b^2*x^2))/(24*b^4*f*S
qrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((3*a^4*C*f^2 + 4*a^2*b^2*e*(C*
e + 2*B*f) + 4*A*(2*b^4*e^2 + a^2*b^2*f^2))*Sqrt[a^2*c - b^2*c*x^
2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(8*b^5*Sqrt[c]*
```

```
Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi in Sympy [A] time = 170.581, size = 337, normalized size = 0.92

$$-\frac{C\sqrt{a+bx}\,(e+fx)^3\,\sqrt{ac-bcx}}{4b^2cf}-\frac{\sqrt{a+bx}\,(e+fx)^2\,(4Bf-Ce)\,\sqrt{ac-bcx}}{12b^2cf}$$
$$-\frac{\sqrt{a+bx}\sqrt{ac-bcx}\,\left(48Ab^2ef^2+16Ba^2f^3+16Bb^2e^2f+32Ca^2ef^2-4Cb^2e^3+fx\left(2b^2e\,(4Bf-Ce)+f^2\left(12Ab^2+9Ca^2\right)\right)}{24b^4cf}$$
$$+\frac{\sqrt{a+bx}\sqrt{ac-bcx}\,\left(4Aa^2b^2f^2+8Ab^4e^2+8Ba^2b^2ef+3Ca^4f^2+4Ca^2b^2e^2\right)\operatorname{atan}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{8b^5\sqrt{c}\sqrt{a^2c-b^2cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)**2*(C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] -C*sqrt(a + b*x)*(e + f*x)**3*sqrt(a*c - b*c*x)/(4*b**2*c*f) - sq
rt(a + b*x)*(e + f*x)**2*(4*B*f - C*e)*sqrt(a*c - b*c*x)/(12*b**2
*c*f) - sqrt(a + b*x)*sqrt(a*c - b*c*x)*(48*A*b**2*e*f**2 + 16*B*
a**2*f**3 + 16*B*b**2*e**2*f + 32*C*a**2*e*f**2 - 4*C*b**2*e**3 +
 f*x*(2*b**2*e*(4*B*f - C*e) + f**2*(12*A*b**2 + 9*C*a**2)))/(24*
b**4*c*f) + sqrt(a + b*x)*sqrt(a*c - b*c*x)*(4*A*a**2*b**2*f**2 +
 8*A*b**4*e**2 + 8*B*a**2*b**2*e*f + 3*C*a**4*f**2 + 4*C*a**2*b**
2*e**2)*atan(b*sqrt(c)*x/sqrt(a**2*c - b**2*c*x**2))/(8*b**5*sqrt
(c)*sqrt(a**2*c - b**2*c*x**2))
```

Mathematica [A] time = 0.685117, size = 202, normalized size = 0.55

$$\frac{3\sqrt{a-bx}\tan^{-1}\left(\frac{bx}{\sqrt{a-bx}\sqrt{a+bx}}\right)\left(3a^4Cf^2+4A\left(a^2b^2f^2+2b^4e^2\right)+4a^2b^2e(2Bf+Ce)\right)-b(a-bx)\sqrt{a+bx}\left(a^2f(16Bf+32C\right.}{24b^5\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e + f*x)^2*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] (-(b*(a - b*x)*Sqrt[a + b*x]*(a^2*f*(32*C*e + 16*B*f + 9*C*f*x) +
 2*b^2*(6*A*f*(4*e + f*x) + 4*B*(3*e^2 + 3*e*f*x + f^2*x^2) + C*x
*(6*e^2 + 8*e*f*x + 3*f^2*x^2)))) + 3*(3*a^4*C*f^2 + 4*a^2*b^2*e*
(C*e + 2*B*f) + 4*A*(2*b^4*e^2 + a^2*b^2*f^2))*Sqrt[a - b*x]*ArcT
an[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/(24*b^5*Sqrt[c*(a - b*x)
])
```

Maple [A] time = 0.036, size = 635, normalized size = 1.7

$$\frac{1}{24\,b^4c}\sqrt{bx+a}\sqrt{-c\,(bx-a)}\left(-6\,Cx^3b^2f^2\sqrt{b^2c}\sqrt{-c\,(b^2x^2-a^2)}+12\,f^2Aca^2\arctan\left(\frac{\sqrt{b^2c}x}{\sqrt{-c\,(b^2x^2-a^2)}}\right)b^2+24\,c\arctan\left(\frac{}{\sqrt{-}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)^2*(C*x^2+B*x+A)/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/24*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)/c*(-6*C*x^3*b^2*f^2*(b^2*c)
^(1/2)*(-c*(b^2*x^2-a^2))^(1/2)+12*f^2*A*c*a^2*arctan((b^2*c)^(1/
2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2+24*c*arctan((b^2*c)^(1/2)*x/(-
c*(b^2*x^2-a^2))^(1/2))*A*e^2*b^4+24*B*f*e*c*a^2*arctan((b^2*c)^(
1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2-8*B*x^2*b^2*f^2*(b^2*c)^(1/2
)*(-c*(b^2*x^2-a^2))^(1/2)+9*a^4*C*f^2*c*arctan((b^2*c)^(1/2)*x/(
-c*(b^2*x^2-a^2))^(1/2))+12*e^2*C*c*a^2*arctan((b^2*c)^(1/2)*x/(-
c*(b^2*x^2-a^2))^(1/2))*b^2-16*C*x^2*b^2*e*f*(b^2*c)^(1/2)*(-c*(b
^2*x^2-a^2))^(1/2)-12*f^2*A*x*(-c*(b^2*x^2-a^2))^(1/2)*b^2*(b^2*c
)^(1/2)-24*B*f*e*x*(-c*(b^2*x^2-a^2))^(1/2)*b^2*(b^2*c)^(1/2)-9*a
^2*C*f^2*x*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2)-12*e^2*C*x*(-c*
(b^2*x^2-a^2))^(1/2)*b^2*(b^2*c)^(1/2)-48*(-c*(b^2*x^2-a^2))^(1/2
)*A*e*f*b^2*(b^2*c)^(1/2)-16*a^2*(-c*(b^2*x^2-a^2))^(1/2)*B*f^2*(
b^2*c)^(1/2)-24*(-c*(b^2*x^2-a^2))^(1/2)*B*e^2*b^2*(b^2*c)^(1/2)-
32*a^2*(-c*(b^2*x^2-a^2))^(1/2)*C*e*f*(b^2*c)^(1/2))/(-c*(b^2*x^2
-a^2))^(1/2)/b^4/(b^2*c)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(f*x + e)^2/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algo
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.271191, size = 1, normalized size = 0.

$$\left[-\frac{2\left(6\,Cb^3f^2x^3+24\,Bb^3e^2+16\,Ba^2bf^2+16\left(2\,Ca^2b+3\,Ab^3\right)ef+8\left(2\,Cb^3ef+Bb^3f^2\right)x^2+3\left(4\,Cb^3e^2+8\,Bb^3ef+\left(3\,Ca^2\right.\right.\right.}{}\right.$$

$$-\frac{\left(6\,Cb^3f^2x^3+24\,Bb^3e^2+16\,Ba^2bf^2+16\left(2\,Ca^2b+3\,Ab^3\right)ef+8\left(2\,Cb^3ef+Bb^3f^2\right)x^2+3\left(4\,Cb^3e^2+8\,Bb^3ef+\left(3\,Ca^2b+\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(f*x + e)^2/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algo
```

```
[Out] [-1/48*(2*(6*C*b^3*f^2*x^3 + 24*B*b^3*e^2 + 16*B*a^2*b*f^2 + 16*(
2*C*a^2*b + 3*A*b^3)*e*f + 8*(2*C*b^3*e*f + B*b^3*f^2)*x^2 + 3*(4
*C*b^3*e^2 + 8*B*b^3*e*f + (3*C*a^2*b + 4*A*b^3)*f^2)*x)*sqrt(-b*
c*x + a*c)*sqrt(b*x + a)*sqrt(-c) - 3*(8*B*a^2*b^2*c*e*f + 4*(C*a
^2*b^2 + 2*A*b^4)*c*e^2 + (3*C*a^4 + 4*A*a^2*b^2)*c*f^2)*log(2*sq
rt(-b*c*x + a*c)*sqrt(b*x + a)*b*x + (2*b^2*x^2 - a^2)*sqrt(-c)))
/(b^5*sqrt(-c)*c), -1/24*((6*C*b^3*f^2*x^3 + 24*B*b^3*e^2 + 16*B*
a^2*b*f^2 + 16*(2*C*a^2*b + 3*A*b^3)*e*f + 8*(2*C*b^3*e*f + B*b^3
*f^2)*x^2 + 3*(4*C*b^3*e^2 + 8*B*b^3*e*f + (3*C*a^2*b + 4*A*b^3)*
f^2)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*sqrt(c) - 3*(8*B*a^2*b^2
*c*e*f + 4*(C*a^2*b^2 + 2*A*b^4)*c*e^2 + (3*C*a^4 + 4*A*a^2*b^2)*
c*f^2)*arctan(b*sqrt(c)*x/(sqrt(-b*c*x + a*c)*sqrt(b*x + a))))/(b
^5*c^(3/2))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)**2*(C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(f*x + e)^2/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algo
```

```
[Out] Timed out
```

3.63 $\int \frac{(e+fx)(A+Bx+Cx^2)}{\sqrt{a+bx}\sqrt{ac-bcx}}\,dx$

Optimal. Leaf size=246

$$-\frac{(a^2-b^2x^2)\left(2\left(2a^2Cf^2-b^2\left(Ce^2-3f(Af+Be)\right)\right)-b^2fx(Ce-3Bf)\right)}{6b^4f\sqrt{a+bx}\sqrt{ac-bcx}}+\frac{\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(a^2(Bf+Ce)+2Ab^2e\right)}{2b^3\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C(a^2-b^2x^2)(e+fx)^2}{3b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] -(C*(e + f*x)^2*(a^2 - b^2*x^2))/(3*b^2*f*Sqrt[a + b*x]*Sqrt[a*c
- b*c*x]) - ((2*(2*a^2*C*f^2 - b^2*(C*e^2 - 3*f*(B*e + A*f))) - b
^2*f*(C*e - 3*B*f)*x)*(a^2 - b^2*x^2))/(6*b^4*f*Sqrt[a + b*x]*Sqr
t[a*c - b*c*x]) + ((2*A*b^2*e + a^2*(C*e + B*f))*Sqrt[a^2*c - b^2
*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(2*b^3*Sqr
t[c]*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi [A] time = 0.817934, antiderivative size = 249, normalized size of antiderivative = 1.01, number of steps used = 5, number of rules used = 5, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.132$

$$-\frac{(a^2-b^2x^2)\left(2\left(2a^2Cf^2-\frac{1}{2}b^2\left(2Ce^2-6f(Af+Be)\right)\right)-b^2fx(Ce-3Bf)\right)}{6b^4f\sqrt{a+bx}\sqrt{ac-bcx}}+\frac{\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)\left(a^2(Bf+Ce)+2Ab^2e\right)}{2b^3\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C(a^2-b^2x^2)(e+fx)^2}{3b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In] Int[((e + f*x)*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] -(C*(e + f*x)^2*(a^2 - b^2*x^2))/(3*b^2*f*Sqrt[a + b*x]*Sqrt[a*c
- b*c*x]) - ((2*(2*a^2*C*f^2 - (b^2*(2*C*e^2 - 6*f*(B*e + A*f)))/
2) - b^2*f*(C*e - 3*B*f)*x)*(a^2 - b^2*x^2))/(6*b^4*f*Sqrt[a + b*
x]*Sqrt[a*c - b*c*x]) + ((2*A*b^2*e + a^2*(C*e + B*f))*Sqrt[a^2*c
 - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(2*b
^3*Sqrt[c]*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi in Sympy [A] time = 85.4478, size = 211, normalized size = 0.86

$$-\frac{C\sqrt{a+bx}\,(e+fx)^2\sqrt{ac-bcx}}{3b^2cf}+\frac{\sqrt{a+bx}\sqrt{ac-bcx}\,(2Ab^2e+Ba^2f+Ca^2e)\operatorname{atan}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{2b^3\sqrt{c}\sqrt{a^2c-b^2cx^2}}-\frac{\sqrt{a+bx}\sqrt{ac-bcx}\left(2b^2e\,(3Bf-Ce)+b^2fx\,(3Bf-Ce)+2f^2\left(3Ab^2+2Ca^2\right)\right)}{6b^4cf}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((f*x+e)*(C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] -C*sqrt(a + b*x)*(e + f*x)**2*sqrt(a*c - b*c*x)/(3*b**2*c*f) + sq
rt(a + b*x)*sqrt(a*c - b*c*x)*(2*A*b**2*e + B*a**2*f + C*a**2*e)*
atan(b*sqrt(c)*x/sqrt(a**2*c - b**2*c*x**2))/(2*b**3*sqrt(c)*sqrt
(a**2*c - b**2*c*x**2)) - sqrt(a + b*x)*sqrt(a*c - b*c*x)*(2*b**2
*e*(3*B*f - C*e) + b**2*f*x*(3*B*f - C*e) + 2*f**2*(3*A*b**2 + 2*
C*a**2))/(6*b**4*c*f)
```

Mathematica [A] time = 0.372752, size = 130, normalized size = 0.53

$$\frac{3b\sqrt{a-bx}\tan^{-1}\left(\frac{bx}{\sqrt{a-bx}\sqrt{a+bx}}\right)\left(a^2(Bf+Ce)+2Ab^2e\right)-(a-bx)\sqrt{a+bx}\left(4a^2Cf+b^2\left(6Af+6Be+3Bfx+3Cex+2Cf\right.\right.}{6b^4\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((e + f*x)*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] (-((a - b*x)*Sqrt[a + b*x]*(4*a^2*C*f + b^2*(6*B*e + 6*A*f + 3*C*
e*x + 3*B*f*x + 2*C*f*x^2))) + 3*b*(2*A*b^2*e + a^2*(C*e + B*f))*
Sqrt[a - b*x]*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/(6*b^4
*Sqrt[c*(a - b*x)])
```

Maple [A] time = 0.03, size = 365, normalized size = 1.5

$$\frac{1}{6\,b^4c}\sqrt{bx+a}\sqrt{-c\,(bx-a)}\left(6\,c\arctan\left(\frac{\sqrt{b^2c}x}{\sqrt{-c\,(b^2x^2-a^2)}}\right)Aeb^4+3\,Bfca^2\arctan\left(\frac{\sqrt{b^2c}x}{\sqrt{-c\,(b^2x^2-a^2)}}\right)b^2+3\,Ceca^2\arctan\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x+e)*(C*x^2+B*x+A)/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/6*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)/c*(6*c*arctan((b^2*c)^(1/2)*
x/(-c*(b^2*x^2-a^2))^(1/2))*A*e*b^4+3*B*f*c*a^2*arctan((b^2*c)^(1
/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2+3*C*e*c*a^2*arctan((b^2*c)^(1
/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2-2*C*x^2*b^2*f*(b^2*c)^(1/2)*(
-c*(b^2*x^2-a^2))^(1/2)-3*B*f*x*(-c*(b^2*x^2-a^2))^(1/2)*b^2*(b^2
*c)^(1/2)-3*C*e*x*(-c*(b^2*x^2-a^2))^(1/2)*b^2*(b^2*c)^(1/2)-6*(-
c*(b^2*x^2-a^2))^(1/2)*A*f*b^2*(b^2*c)^(1/2)-6*(-c*(b^2*x^2-a^2))
^(1/2)*B*e*b^2*(b^2*c)^(1/2)-4*a^2*(-c*(b^2*x^2-a^2))^(1/2)*C*f*(
b^2*c)^(1/2))/(-c*(b^2*x^2-a^2))^(1/2)/b^4/(b^2*c)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(f*x + e)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algori
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.258428, size = 1, normalized size = 0.

$$\left[-\frac{2\left(2\,Cb^2fx^2+6\,Bb^2e+2\left(2\,Ca^2+3\,Ab^2\right)f+3\left(Cb^2e+Bb^2f\right)x\right)\sqrt{-bcx+ac}\sqrt{bx+a}\sqrt{-c}-3\left(Ba^2bcf+\left(Ca^2b+2\,Ab^3\right)\right.}{12\,b^4\sqrt{-c}c}\right.$$

$$-\frac{\left(2\,Cb^2fx^2+6\,Bb^2e+2\left(2\,Ca^2+3\,Ab^2\right)f+3\left(Cb^2e+Bb^2f\right)x\right)\sqrt{-bcx+ac}\sqrt{bx+a}\sqrt{c}-3\left(Ba^2bcf+\left(Ca^2b+2\,Ab^3\right)ce\right)}{6\,b^4c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(f*x + e)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algori
```

```
[Out] [-1/12*(2*(2*C*b^2*f*x^2 + 6*B*b^2*e + 2*(2*C*a^2 + 3*A*b^2)*f +
3*(C*b^2*e + B*b^2*f)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*sqrt(-c
) - 3*(B*a^2*b*c*f + (C*a^2*b + 2*A*b^3)*c*e)*log(2*sqrt(-b*c*x +
 a*c)*sqrt(b*x + a)*b*x + (2*b^2*x^2 - a^2)*sqrt(-c)))/(b^4*sqrt(
-c)*c), -1/6*((2*C*b^2*f*x^2 + 6*B*b^2*e + 2*(2*C*a^2 + 3*A*b^2)*
f + 3*(C*b^2*e + B*b^2*f)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*sqr
t(c) - 3*(B*a^2*b*c*f + (C*a^2*b + 2*A*b^3)*c*e)*arctan(b*sqrt(c)
*x/(sqrt(-b*c*x + a*c)*sqrt(b*x + a))))/(b^4*c^(3/2))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x+e)*(C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(f*x + e)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algori
```

```
[Out] Timed out
```

3.64 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{ac-bcx}}\,dx$

Optimal. Leaf size=177

$$\frac{\left(a^2C+2Ab^2\right)\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{2b^3\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{B\left(a^2-b^2x^2\right)}{b^2\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{Cx\left(a^2-b^2x^2\right)}{2b^2\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] -((B*(a^2 - b^2*x^2))/(b^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])) - (C
*x*(a^2 - b^2*x^2))/(2*b^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((2
*A*b^2 + a^2*C)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt
[a^2*c - b^2*c*x^2]])/(2*b^3*Sqrt[c]*Sqrt[a + b*x]*Sqrt[a*c - b*c
*x])
```

Rubi [A] time = 0.266017, antiderivative size = 177, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}} = 0.152$

$$\frac{\left(a^2C+2Ab^2\right)\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{2b^3\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{B\left(a^2-b^2x^2\right)}{b^2\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{Cx\left(a^2-b^2x^2\right)}{2b^2\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] -((B*(a^2 - b^2*x^2))/(b^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])) - (C
*x*(a^2 - b^2*x^2))/(2*b^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((2
*A*b^2 + a^2*C)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt
[a^2*c - b^2*c*x^2]])/(2*b^3*Sqrt[c]*Sqrt[a + b*x]*Sqrt[a*c - b*c
*x])
```

Rubi in Sympy [A] time = 30.0162, size = 119, normalized size = 0.67

$$-\frac{(2B+Cx)\sqrt{a+bx}\sqrt{ac-bcx}}{2b^2c}+\frac{\sqrt{a+bx}\left(2Ab^2+Ca^2\right)\sqrt{ac-bcx}\,\mathrm{atan}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{2b^3\sqrt{c}\sqrt{a^2c-b^2cx^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] -(2*B + C*x)*sqrt(a + b*x)*sqrt(a*c - b*c*x)/(2*b**2*c) + sqrt(a
+ b*x)*(2*A*b**2 + C*a**2)*sqrt(a*c - b*c*x)*atan(b*sqrt(c)*x/sqr
t(a**2*c - b**2*c*x**2))/(2*b**3*sqrt(c)*sqrt(a**2*c - b**2*c*x**
```

```
2))
```

Mathematica [A] time = 0.165481, size = 91, normalized size = 0.51

$$\frac{\sqrt{a-bx}\left(a^2C+2Ab^2\right)\tan^{-1}\left(\frac{bx}{\sqrt{a-bx}\sqrt{a+bx}}\right)+b(bx-a)\sqrt{a+bx}(2B+Cx)}{2b^3\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]),x]
```

```
[Out] (b*(-a + b*x)*Sqrt[a + b*x]*(2*B + C*x) + (2*A*b^2 + a^2*C)*Sqrt[
a - b*x]*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/(2*b^3*Sqrt
[c*(a - b*x)])
```

Maple [A] time = 0.024, size = 180, normalized size = 1.

$$\frac{1}{2\,b^2c}\sqrt{bx+a}\sqrt{-c\,(bx-a)}\left(2\,c\arctan\left(\frac{\sqrt{b^2c}x}{\sqrt{-c\,(b^2x^2-a^2)}}\right)Ab^2+Cca^2\arctan\left(x\sqrt{b^2c}\frac{1}{\sqrt{-c\,(b^2x^2-a^2)}}\right)-Cx\sqrt{-c\,(b^2x^2-a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] 1/2*(b*x+a)^(1/2)*(-c*(b*x-a))^(1/2)*(2*c*arctan((b^2*c)^(1/2)*x/
(-c*(b^2*x^2-a^2))^(1/2))*A*b^2+C*c*a^2*arctan((b^2*c)^(1/2)*x/(-
c*(b^2*x^2-a^2))^(1/2))-C*x*(-c*(b^2*x^2-a^2))^(1/2)*(b^2*c)^(1/2
)-2*(-c*(b^2*x^2-a^2))^(1/2)*B*(b^2*c)^(1/2))/(-c*(b^2*x^2-a^2))^
(1/2)/c/b^2/(b^2*c)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algorithm="maxi
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.250577, size = 1, normalized size = 0.01

$$\left[\frac{\left(Ca^2 + 2\,Ab^2\right)c\log\left(2\,\sqrt{-bcx+ac}\sqrt{bx+a}bx + \left(2\,b^2x^2 - a^2\right)\sqrt{-c}\right) - 2\,(Cbx + 2\,Bb)\sqrt{-bcx+ac}\sqrt{bx+a}\sqrt{-c}}{4\,b^3\sqrt{-c}c}, \frac{\left(Ca^2 + 2\,Ab\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algorithm="fric
```

```
[Out] [1/4*((C*a^2 + 2*A*b^2)*c*log(2*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*
b*x + (2*b^2*x^2 - a^2)*sqrt(-c)) - 2*(C*b*x + 2*B*b)*sqrt(-b*c*x
 + a*c)*sqrt(b*x + a)*sqrt(-c))/(b^3*sqrt(-c)*c), 1/2*((C*a^2 + 2
*A*b^2)*c*arctan(b*sqrt(c)*x/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)))
- (C*b*x + 2*B*b)*sqrt(-b*c*x + a*c)*sqrt(b*x + a)*sqrt(c))/(b^3*
c^(3/2))]
```

Sympy [A] time = 90.8131, size = 338, normalized size = 1.91

$$-\frac{iAG_{6,6}^{6,2}\left(\begin{matrix}\frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1\\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle|\frac{a^2}{b^2x^2}\right)}{4\pi^{\frac{3}{2}}b\sqrt{c}} + \frac{AG_{6,6}^{2,6}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0\end{matrix}\middle|\frac{a^2e^{-2i\pi}}{b^2x^2}\right)}{4\pi^{\frac{3}{2}}b\sqrt{c}} - \frac{iBaG_{6,6}^{6,2}\left(\begin{matrix}-\frac{1}{4},\frac{1}{4} & 0,0,\frac{1}{2},1\\ -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},0 & \end{matrix}\middle|\frac{a^2}{b^2x^2}\right)}{4\pi^{\frac{3}{2}}b^2\sqrt{c}} - \frac{BaG_{6,6}^{2,6}\left(\begin{matrix}-1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,1 & \\ -\frac{3}{4},-\frac{1}{4} & -1,-\frac{1}{2},-\frac{1}{2},0\end{matrix}\middle|\frac{a^2e^{-2i\pi}}{b^2x^2}\right)}{4\pi^{\frac{3}{2}}b^2\sqrt{c}} - \frac{iCa^2G_{6,6}^{6,2}\left(\begin{matrix}-\frac{3}{4},-\frac{1}{4} & -\frac{1}{2},-\frac{1}{2},0,1\\ -1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,0 & \end{matrix}\middle|\frac{a^2}{b^2x^2}\right)}{4\pi^{\frac{3}{2}}b^3\sqrt{c}} + \frac{Ca^2G_{6,6}^{2,6}\left(\begin{matrix}-\frac{3}{2},-\frac{5}{4},-1,-\frac{3}{4},-\frac{1}{2},1 & \\ -\frac{5}{4},-\frac{3}{4} & -\frac{3}{2},-1,-1,0\end{matrix}\middle|\frac{a^2e^{-2i\pi}}{b^2x^2}\right)}{4\pi^{\frac{3}{2}}b^3\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] -I*A*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4,
1, 0), ()), a**2/(b**2*x**2))/(4*pi**(3/2)*b*sqrt(c)) + A*meijerg
```

```
(((-1/2, -1/4, 0, 1/4, 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0
)), a**2*exp_polar(-2*I*pi)/(b**2*x**2))/(4*pi**(3/2)*b*sqrt(c))
- I*B*a*meijerg(((-1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1
/4, 1/2, 0), ()), a**2/(b**2*x**2))/(4*pi**(3/2)*b**2*sqrt(c)) -
B*a*meijerg(((-1, -3/4, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-
1, -1/2, -1/2, 0)), a**2*exp_polar(-2*I*pi)/(b**2*x**2))/(4*pi**(
3/2)*b**2*sqrt(c)) - I*C*a**2*meijerg(((-3/4, -1/4), (-1/2, -1/2,
 0, 1)), ((-1, -3/4, -1/2, -1/4, 0, 0), ()), a**2/(b**2*x**2))/(4
*pi**(3/2)*b**3*sqrt(c)) + C*a**2*meijerg(((-3/2, -5/4, -1, -3/4,
 -1/2, 1), ()), ((-5/4, -3/4), (-3/2, -1, -1, 0)), a**2*exp_polar
(-2*I*pi)/(b**2*x**2))/(4*pi**(3/2)*b**3*sqrt(c))
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)),x, algorithm="giac
```

```
[Out] Timed out
```

3.65 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{ac-bcx}(e+fx)}\,dx$

Optimal. Leaf size=278

$$\frac{\sqrt{a^2c-b^2cx^2}\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\sqrt{b^2e^2-a^2f^2}}-\frac{\sqrt{a^2c-b^2cx^2}(Ce-Bf)\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C\left(a^2-b^2x^2\right)}{b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] -((C*(a^2 - b^2*x^2))/(b^2*f*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])) -
((C*e - B*f)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^
2*c - b^2*c*x^2]])/(b*Sqrt[c]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]
) + ((C*e^2 - B*e*f + A*f^2)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt
[c]*(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*
c*x^2])])/(Sqrt[c]*f^2*Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a + b*x]*Sqrt
[a*c - b*c*x])
```

Rubi [A] time = 0.916448, antiderivative size = 278, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$

$$\frac{\sqrt{a^2c-b^2cx^2}\left(Af^2-Bef+Ce^2\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\sqrt{b^2e^2-a^2f^2}}-\frac{\sqrt{a^2c-b^2cx^2}(Ce-Bf)\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}}-\frac{C\left(a^2-b^2x^2\right)}{b^2f\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)),x]
```

```
[Out] -((C*(a^2 - b^2*x^2))/(b^2*f*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])) -
((C*e - B*f)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^
2*c - b^2*c*x^2]])/(b*Sqrt[c]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]
) + ((C*e^2 - B*e*f + A*f^2)*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt
[c]*(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*
c*x^2])])/(Sqrt[c]*f^2*Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a + b*x]*Sqrt
[a*c - b*c*x])
```

Rubi in Sympy [A] time = 108.663, size = 219, normalized size = 0.79

$$\frac{2Ca\,\text{atan}\left(\frac{\sqrt{ac-bcx}}{\sqrt{c}\sqrt{a+bx}}\right)}{b^2\sqrt{c}f}-\frac{C\sqrt{a+bx}\sqrt{ac-bcx}}{b^2cf}-\frac{2\left(Af^2-Bef+Ce^2\right)\text{atanh}\left(\frac{\sqrt{c}\sqrt{a+bx}\sqrt{af+be}}{\sqrt{ac-bcx}\sqrt{af-be}}\right)}{\sqrt{c}f^2\sqrt{af-be}\sqrt{af+be}}-\frac{2\left(Bbf+Caf-Cbe\right)\text{atan}\left(\frac{\sqrt{ac-bcx}}{\sqrt{c}\sqrt{a+bx}}\right)}{b^2\sqrt{c}f^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] 2*C*a*atan(sqrt(a*c - b*c*x)/(sqrt(c)*sqrt(a + b*x)))/(b**2*sqrt(
c)*f) - C*sqrt(a + b*x)*sqrt(a*c - b*c*x)/(b**2*c*f) - 2*(A*f**2
- B*e*f + C*e**2)*atanh(sqrt(c)*sqrt(a + b*x)*sqrt(a*f + b*e)/(sq
rt(a*c - b*c*x)*sqrt(a*f - b*e)))/(sqrt(c)*f**2*sqrt(a*f - b*e)*s
qrt(a*f + b*e)) - 2*(B*b*f + C*a*f - C*b*e)*atan(sqrt(a*c - b*c*x
)/(sqrt(c)*sqrt(a + b*x)))/(b**2*sqrt(c)*f**2)
```

Mathematica [A] time = 0.7064, size = 238, normalized size = 0.86

$$\frac{\frac{\sqrt{a-bx}\log(e+fx)(f(Af-Be)+Ce^2)}{\sqrt{a^2f^2-b^2e^2}}-\frac{\sqrt{a-bx}(f(Af-Be)+Ce^2)\log\left(\sqrt{a-bx}\sqrt{a+bx}\sqrt{a^2f^2-b^2e^2}+a^2f+b^2ex\right)}{\sqrt{a^2f^2-b^2e^2}}+\frac{Cf\sqrt{a+bx}(bx-a)}{b^2}+\frac{\sqrt{a-bx}\tan^{-1}\left(\frac{b}{\sqrt{a-bx}}\right.}{b}}{f^2\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)),x]
```

```
[Out] ((C*f*(-a + b*x)*Sqrt[a + b*x])/b^2 + ((-(C*e) + B*f)*Sqrt[a - b*
x]*ArcTan[(b*x)/(Sqrt[a - b*x]*Sqrt[a + b*x])])/b + ((C*e^2 + f*(
-(B*e) + A*f))*Sqrt[a - b*x]*Log[e + f*x])/Sqrt[-(b^2*e^2) + a^2*
f^2] - ((C*e^2 + f*(-(B*e) + A*f))*Sqrt[a - b*x]*Log[a^2*f + b^2*
e*x + Sqrt[-(b^2*e^2) + a^2*f^2]*Sqrt[a - b*x]*Sqrt[a + b*x]])/Sq
rt[-(b^2*e^2) + a^2*f^2])/(f^2*Sqrt[c*(a - b*x)])
```

Maple [B] time = 0., size = 503, normalized size = 1.8

$$\frac{1}{b^2f^3c}\left(-A\ln\left(2\frac{1}{fx+e}\left(b^2cex+a^2cf+\sqrt{-c\left(b^2x^2-a^2\right)}\sqrt{\frac{c\left(a^2f^2-b^2e^2\right)}{f^2}}f\right)\right)b^2cf^2\sqrt{b^2c}+B\ln\left(2\frac{1}{fx+e}\left(b^2cex+a^2cf\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] (-A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-
b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*b^2*c*f^2*(b^2*c)^(1/2)+B*ln(2*(b
^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^
2)^(1/2)*f)/(f*x+e))*b^2*c*e*f*(b^2*c)^(1/2)+B*arctan((b^2*c)^(1/
2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2*c*f^2*(c*(a^2*f^2-b^2*e^2)/f^2
)^(1/2)-C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^
2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*b^2*c*e^2*(b^2*c)^(1/2)-C*a
rctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2*c*e*f*(c*(a^2
*f^2-b^2*e^2)/f^2)^(1/2)-C*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f
^2-b^2*e^2)/f^2)^(1/2)*(b^2*c)^(1/2))*(b*x+a)^(1/2)*(-c*(b*x-a))^
(1/2)/b^2/(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)/(b^2*c)^(1/2)/f^3/c/(-c
*(b^2*x^2-a^2))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)),x, algori
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)),x, algori
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Bx + Cx^2}{\sqrt{-c\left(-a + bx\right)}\sqrt{a + bx}\left(e + fx\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Integral((A + B*x + C*x**2)/(sqrt(-c*(-a + b*x))*sqrt(a + b*x)*(e
 + f*x)), x)
```

GIAC/XCAS [A] time = 0.279442, size = 358, normalized size = 1.29

$$-\frac{\left(B\sqrt{-c}f - C\sqrt{-c}e\right)\ln\left(\left(\sqrt{-bcx+ac}\sqrt{-c} - \sqrt{2\,ac^2 + (bcx-ac)c}\right)^2\right)}{bf^2|c|} - \frac{\sqrt{2\,ac^2 + (bcx-ac)c}\sqrt{-bcx+ac}C|c|}{b^2c^3f} - \frac{2\left(A\sqrt{-c}c^2f^2 - B\sqrt{-c}c^2fe + C\sqrt{-c}c^2e^2\right)\arctan\left(\frac{2\,bc^2e+\left(\sqrt{-bcx+ac}\sqrt{-c}-\sqrt{2\,ac^2+(bcx-ac)c}\right)^2f}{2\sqrt{a^2f^2-b^2e^2}c^2}\right)}{\sqrt{a^2f^2-b^2e^2}c^2f^2|c|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)),x, algori
```

```
[Out] -(B*sqrt(-c)*f - C*sqrt(-c)*e)*ln((sqrt(-b*c*x + a*c)*sqrt(-c) -
sqrt(2*a*c^2 + (b*c*x - a*c)*c))^2)/(b*f^2*abs(c)) - sqrt(2*a*c^2
 + (b*c*x - a*c)*c)*sqrt(-b*c*x + a*c)*C*abs(c)/(b^2*c^3*f) - 2*(
A*sqrt(-c)*c^2*f^2 - B*sqrt(-c)*c^2*f*e + C*sqrt(-c)*c^2*e^2)*arc
tan(1/2*(2*b*c^2*e + (sqrt(-b*c*x + a*c)*sqrt(-c) - sqrt(2*a*c^2
+ (b*c*x - a*c)*c))^2*f)/(sqrt(a^2*f^2 - b^2*e^2)*c^2))/(sqrt(a^2
*f^2 - b^2*e^2)*c^2*f^2*abs(c))
```

3.66 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{ac-bcx}(e+fx)^2}\,dx$

Optimal. Leaf size=322

$$\frac{f\left(a^2-b^2x^2\right)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)}+\frac{\sqrt{a^2c-b^2cx^2}\left(a^2f^2(2Ce-Bf)-b^2\left(Ce^3-Aef^2\right)\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)^{3/2}}+\frac{C\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}}$$

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/((b^2*e^2 - a^2*f^2
)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)) + (C*Sqrt[a^2*c - b^
2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(b*Sqrt[c
]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((a^2*f^2*(2*C*e - B*f)
- b^2*(C*e^3 - A*e*f^2))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*
(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^
2])])/(Sqrt[c]*f^2*(b^2*e^2 - a^2*f^2)^(3/2)*Sqrt[a + b*x]*Sqrt[a
*c - b*c*x])
```

Rubi [A] time = 1.05388, antiderivative size = 322, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.175

$$\frac{f\left(a^2-b^2x^2\right)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)}+\frac{\sqrt{a^2c-b^2cx^2}\left(a^2f^2(2Ce-Bf)-b^2\left(Ce^3-Aef^2\right)\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)^{3/2}}+\frac{C\sqrt{a^2c-b^2cx^2}\tan^{-1}\left(\frac{b\sqrt{c}x}{\sqrt{a^2c-b^2cx^2}}\right)}{b\sqrt{c}f^2\sqrt{a+bx}\sqrt{ac-bcx}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2),x]
```

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/((b^2*e^2 - a^2*f^2
)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)) + (C*Sqrt[a^2*c - b^
2*c*x^2]*ArcTan[(b*Sqrt[c]*x)/Sqrt[a^2*c - b^2*c*x^2]])/(b*Sqrt[c
]*f^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]) + ((a^2*f^2*(2*C*e - B*f)
- b^2*(C*e^3 - A*e*f^2))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*
(a^2*f + b^2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^
```

```
2])])/(Sqrt[c]*f^2*(b^2*e^2 - a^2*f^2)^(3/2)*Sqrt[a + b*x]*Sqrt[a
*c - b*c*x])
```

Rubi in Sympy [A] time = 126.464, size = 282, normalized size = 0.88

$$-\frac{2C\,\mathrm{atan}\left(\frac{\sqrt{ac-bcx}}{\sqrt{c}\sqrt{a+bx}}\right)}{b\sqrt{c}f^2}+\frac{2b^2e\left(Af^2-Bef+Ce^2\right)\mathrm{atanh}\left(\frac{\sqrt{c}\sqrt{a+bx}\sqrt{af+be}}{\sqrt{ac-bcx}\sqrt{af-be}}\right)}{\sqrt{c}f^2\left(af-be\right)^{\frac{3}{2}}\left(af+be\right)^{\frac{3}{2}}}-\frac{\sqrt{a+bx}\sqrt{ac-bcx}\left(Af^2-Bef+Ce^2\right)}{cf\left(e+fx\right)\left(af-be\right)\left(af+be\right)}-\frac{2\left(Bf-2Ce\right)\mathrm{atanh}\left(\frac{\sqrt{c}\sqrt{a+bx}\sqrt{af+be}}{\sqrt{ac-bcx}\sqrt{af-be}}\right)}{\sqrt{c}f^2\sqrt{af-be}\sqrt{af+be}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**2/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] -2*C*atan(sqrt(a*c - b*c*x)/(sqrt(c)*sqrt(a + b*x)))/(b*sqrt(c)*f
**2) + 2*b**2*e*(A*f**2 - B*e*f + C*e**2)*atanh(sqrt(c)*sqrt(a +
b*x)*sqrt(a*f + b*e)/(sqrt(a*c - b*c*x)*sqrt(a*f - b*e)))/(sqrt(c
)*f**2*(a*f - b*e)**(3/2)*(a*f + b*e)**(3/2)) - sqrt(a + b*x)*sqr
t(a*c - b*c*x)*(A*f**2 - B*e*f + C*e**2)/(c*f*(e + f*x)*(a*f - b*
e)*(a*f + b*e)) - 2*(B*f - 2*C*e)*atanh(sqrt(c)*sqrt(a + b*x)*sqr
t(a*f + b*e)/(sqrt(a*c - b*c*x)*sqrt(a*f - b*e)))/(sqrt(c)*f**2*s
qrt(a*f - b*e)*sqrt(a*f + b*e))
```

Mathematica [A] time = 1.12558, size = 340, normalized size = 1.06

$$\frac{\frac{f\sqrt{a+bx}(bx-a)(f(Af-Be)+Ce^2)}{(e+fx)(a^2f^2-b^2e^2)}-\frac{\sqrt{a-bx}\log(e+fx)\left(a^2f^2(Bf-2Ce)+b^2\left(Ce^3-Aef^2\right)\right)}{(be-af)(af+be)\sqrt{a^2f^2-b^2e^2}}+\frac{\sqrt{a-bx}\log\left(\sqrt{a-bx}\sqrt{a+bx}\sqrt{a^2f^2-b^2e^2}+a^2f+b^2ex\right)\left(a^2f^2(Bf-\right.}{(be-af)(af+be)\sqrt{a^2f^2-b^2e^2}}}{f^2\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2),x]
```

```
[Out] ((f*(C*e^2 + f*(-(B*e) + A*f))*(-a + b*x)*Sqrt[a + b*x])/((-(b^2*
e^2) + a^2*f^2)*(e + f*x)) + (C*Sqrt[a - b*x]*ArcTan[(b*x)/(Sqrt[
a - b*x]*Sqrt[a + b*x])])/b - ((a^2*f^2*(-2*C*e + B*f) + b^2*(C*e
^3 - A*e*f^2))*Sqrt[a - b*x]*Log[e + f*x])/((b*e - a*f)*(b*e + a*
f)*Sqrt[-(b^2*e^2) + a^2*f^2]) + ((a^2*f^2*(-2*C*e + B*f) + b^2*(
C*e^3 - A*e*f^2))*Sqrt[a - b*x]*Log[a^2*f + b^2*e*x + Sqrt[-(b^2*
e^2) + a^2*f^2]*Sqrt[a - b*x]*Sqrt[a + b*x]])/((b*e - a*f)*(b*e +
 a*f)*Sqrt[-(b^2*e^2) + a^2*f^2]))/(f^2*Sqrt[c*(a - b*x)])
```

Maple [B] time = 0., size = 1200, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(f*x+e)^2/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] (A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b
^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*b^2*c*e*f^3*(b^2*c)^(1/2)-B*ln(2
*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)
/f^2)^(1/2)*f)/(f*x+e))*x*a^2*c*f^4*(b^2*c)^(1/2)+C*arctan((b^2*c
)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*x*a^2*c*f^4*(c*(a^2*f^2-b^2*e
^2)/f^2)^(1/2)-C*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))
*x*b^2*c*e^2*f^2*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+2*C*ln(2*(b^2*c*
e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1
/2)*f)/(f*x+e))*x*a^2*c*e*f^3*(b^2*c)^(1/2)-C*ln(2*(b^2*c*e*x+a^2
*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/
(f*x+e))*x*b^2*c*e^3*f*(b^2*c)^(1/2)+A*ln(2*(b^2*c*e*x+a^2*c*f+(-
c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e)
)*b^2*c*e^2*f^2*(b^2*c)^(1/2)-B*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*
x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^2*c
*e*f^3*(b^2*c)^(1/2)+C*arctan((b^2*c)^(1/2)*x/(-c*(b^2*x^2-a^2))^
(1/2))*a^2*c*e*f^3*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)-C*arctan((b^2*
c)^(1/2)*x/(-c*(b^2*x^2-a^2))^(1/2))*b^2*c*e^3*f*(c*(a^2*f^2-b^2*
e^2)/f^2)^(1/2)+2*C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1
/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^2*c*e^2*f^2*(b^
2*c)^(1/2)-C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*
(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*b^2*c*e^4*(b^2*c)^(1/2)-
A*f^4*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*(b
^2*c)^(1/2)+B*e*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)
/f^2)^(1/2)*(b^2*c)^(1/2)-C*e^2*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(c*(
a^2*f^2-b^2*e^2)/f^2)^(1/2)*(b^2*c)^(1/2))/c*(-c*(b*x-a))^(1/2)*(
b*x+a)^(1/2)/(-c*(b^2*x^2-a^2))^(1/2)/(a*f+b*e)/(a*f-b*e)/(f*x+e)
/f^3/(b^2*c)^(1/2)/(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^2),x, algo
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^2),x, algo
```

```
[Out] Timed out
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**2/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [A] time = 0.62315, size = 4, normalized size = 0.01

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^2),x, algo
```

```
[Out] sage0*x
```

3.67 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{ac-bcx}(e+fx)^3}\,dx$

Optimal. Leaf size=363

$$\frac{\left(a^2-b^2x^2\right)\left(2a^2f^2(2Ce-Bf)-b^2e\left(f(Be-3Af)+Ce^2\right)\right)}{2f\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)^2}+\frac{f\left(a^2-b^2x^2\right)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{2\sqrt{a+bx}(e+fx)^2\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)}$$
$$+\frac{\sqrt{a^2c-b^2cx^2}\left(A\left(a^2b^2f^2+2b^4e^2\right)+a^2\left(2a^2Cf^2+b^2e(Ce-3Bf)\right)\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)^{5/2}}$$

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/(2*(b^2*e^2 - a^2*f
^2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2) + ((2*a^2*f^2*(2
*C*e - B*f) - b^2*e*(C*e^2 + f*(B*e - 3*A*f)))*(a^2 - b^2*x^2))/(
2*f*(b^2*e^2 - a^2*f^2)^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*
x)) + ((A*(2*b^4*e^2 + a^2*b^2*f^2) + a^2*(2*a^2*C*f^2 + b^2*e*(C
*e - 3*B*f)))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*(a^2*f + b^
2*e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^2])])/(2*Sq
rt[c]*(b^2*e^2 - a^2*f^2)^(5/2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi [A] time = 1.28006, antiderivative size = 361, normalized size of antiderivative = 0.99, number of steps used = 5, number of rules used = 5, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$

$$\frac{f\left(a^2-b^2x^2\right)\left(A+\frac{e(Ce-Bf)}{f^2}\right)}{2\sqrt{a+bx}(e+fx)^2\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)}+\frac{\left(a^2-b^2x^2\right)\left(2a^2f^2(2Ce-Bf)-b^2\left(ef(Be-3Af)+Ce^3\right)\right)}{2f\sqrt{a+bx}(e+fx)\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)^2}$$
$$+\frac{\sqrt{a^2c-b^2cx^2}\left(2a^4Cf^2+A\left(a^2b^2f^2+2b^4e^2\right)+a^2b^2e(Ce-3Bf)\right)\tan^{-1}\left(\frac{\sqrt{c}\left(a^2f+b^2ex\right)}{\sqrt{a^2c-b^2cx^2}\sqrt{b^2e^2-a^2f^2}}\right)}{2\sqrt{c}\sqrt{a+bx}\sqrt{ac-bcx}\left(b^2e^2-a^2f^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3),x]
```

```
[Out] (f*(A + (e*(C*e - B*f))/f^2)*(a^2 - b^2*x^2))/(2*(b^2*e^2 - a^2*f
^2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^2) + ((2*a^2*f^2*(2
*C*e - B*f) - b^2*(C*e^3 + e*f*(B*e - 3*A*f)))*(a^2 - b^2*x^2))/(
2*f*(b^2*e^2 - a^2*f^2)^2*Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*
x)) + ((2*a^4*C*f^2 + a^2*b^2*e*(C*e - 3*B*f) + A*(2*b^4*e^2 + a^
2*b^2*f^2))*Sqrt[a^2*c - b^2*c*x^2]*ArcTan[(Sqrt[c]*(a^2*f + b^2*
e*x))/(Sqrt[b^2*e^2 - a^2*f^2]*Sqrt[a^2*c - b^2*c*x^2])])/(2*Sqrt
[c]*(b^2*e^2 - a^2*f^2)^(5/2)*Sqrt[a + b*x]*Sqrt[a*c - b*c*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(f*x+e)**3/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.3028, size = 380, normalized size = 1.05

$$\frac{\frac{(bx-a)\sqrt{a+bx}\left(a^2f(f(Af+B(e+2fx))-Ce(3e+4fx))+b^2e\left(-Af(4e+3fx)+Be(2e+fx)+Ce^2x\right)\right)}{(e+fx)^2(b^2e^2-a^2f^2)^2}+\frac{\sqrt{a-bx}\log(e+fx)\left(2a^4Cf^2+A\left(a^2b^2f^2+2b^4e^2\right)+a^2b^2e(Ce-3B\cdots\right.}{(be-af)^2(af+be)^2\sqrt{a^2f^2-b^2e^2}}\cdots}{2\sqrt{c(a-bx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[a*c - b*c*x]*(e + f*x)^3),x]
```

```
[Out] (((-a + b*x)*Sqrt[a + b*x]*(b^2*e*(C*e^2*x + B*e*(2*e + f*x) - A*
f*(4*e + 3*f*x)) + a^2*f*(-(C*e*(3*e + 4*f*x)) + f*(A*f + B*(e +
2*f*x)))))/((b^2*e^2 - a^2*f^2)^2*(e + f*x)^2) + ((2*a^4*C*f^2 +
a^2*b^2*e*(C*e - 3*B*f) + A*(2*b^4*e^2 + a^2*b^2*f^2))*Sqrt[a - b
*x]*Log[e + f*x])/((b*e - a*f)^2*(b*e + a*f)^2*Sqrt[-(b^2*e^2) +
a^2*f^2]) - ((2*a^4*C*f^2 + a^2*b^2*e*(C*e - 3*B*f) + A*(2*b^4*e^
2 + a^2*b^2*f^2))*Sqrt[a - b*x]*Log[a^2*f + b^2*e*x + Sqrt[-(b^2*
e^2) + a^2*f^2]*Sqrt[a - b*x]*Sqrt[a + b*x]])/((b*e - a*f)^2*(b*e
 + a*f)^2*Sqrt[-(b^2*e^2) + a^2*f^2]))/(2*Sqrt[c*(a - b*x)])
```

Maple [B] time = 0., size = 1848, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)/(f*x+e)^3/(b*x+a)^(1/2)/(-b*c*x+a*c)^(1/2),x)
```

```
[Out] -1/2*(-3*B*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a
^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x^2*a^2*b^2*c*e*f^3+2*A*ln
(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^
2)/f^2)^(1/2)*f)/(f*x+e))*b^4*c*e^4+A*a^2*f^4*(-c*(b^2*x^2-a^2))^
(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+B*x*b^2*e^2*f^2*(-c*(b^2*x^
2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)-4*C*x*a^2*e*f^3*(-c
```

```
*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+C*x*b^2*e^3
*f*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+A*ln(
2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2
)/f^2)^(1/2)*f)/(f*x+e))*x^2*a^2*b^2*c*f^4+2*A*ln(2*(b^2*c*e*x+a^
2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)
/(f*x+e))*x^2*b^4*c*e^2*f^2+4*A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*
x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*b^4
*c*e^3*f+4*C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*
(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*a^4*c*e*f^3+A*ln(2*(b^
2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2
)^(1/2)*f)/(f*x+e))*a^2*b^2*c*e^2*f^2-3*B*ln(2*(b^2*c*e*x+a^2*c*f
+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x
+e))*a^2*b^2*c*e^3*f-3*A*x*b^2*e*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(c*
(a^2*f^2-b^2*e^2)/f^2)^(1/2)+C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x
^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x^2*a^
2*b^2*c*e^2*f^2+2*A*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1
/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*a^2*b^2*c*e*f^3
-6*B*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2
-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*x*a^2*b^2*c*e^2*f^2+2*C*ln(2*(b^
2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2
)^(1/2)*f)/(f*x+e))*x*a^2*b^2*c*e^3*f+2*C*ln(2*(b^2*c*e*x+a^2*c*f
+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x
+e))*x^2*a^4*c*f^4+2*C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))
^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^4*c*e^2*f^2+
C*ln(2*(b^2*c*e*x+a^2*c*f+(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^
2*e^2)/f^2)^(1/2)*f)/(f*x+e))*a^2*b^2*c*e^4+2*B*x*a^2*f^4*(-c*(b^
2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)-4*A*b^2*e^2*f^2
*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+B*a^2*e
*f^3*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)+2*B
*b^2*e^3*f*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/f^2)^(1/
2)-3*C*a^2*e^2*f^2*(-c*(b^2*x^2-a^2))^(1/2)*(c*(a^2*f^2-b^2*e^2)/
f^2)^(1/2))/c*(-c*(b*x-a))^(1/2)*(b*x+a)^(1/2)/(-c*(b^2*x^2-a^2))
^(1/2)/(a*f+b*e)/(a*f-b*e)/(c*(a^2*f^2-b^2*e^2)/f^2)^(1/2)/(a^2*f
^2-b^2*e^2)/(f*x+e)^2/f
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^3),x, algo
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 8.99133, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^3),x, algo
```

```
[Out] [-1/4*(2*(2*B*b^2*e^3 + B*a^2*e*f^2 + A*a^2*f^3 - (3*C*a^2 + 4*A*
b^2)*e^2*f + (C*b^2*e^3 + B*b^2*e^2*f + 2*B*a^2*f^3 - (4*C*a^2 +
3*A*b^2)*e*f^2)*x)*sqrt(-b^2*c*e^2 + a^2*c*f^2)*sqrt(-b*c*x + a*c
)*sqrt(b*x + a) + (3*B*a^2*b^2*c*e^3*f - (C*a^2*b^2 + 2*A*b^4)*c*
e^4 - (2*C*a^4 + A*a^2*b^2)*c*e^2*f^2 + (3*B*a^2*b^2*c*e*f^3 - (C
*a^2*b^2 + 2*A*b^4)*c*e^2*f^2 - (2*C*a^4 + A*a^2*b^2)*c*f^4)*x^2
+ 2*(3*B*a^2*b^2*c*e^2*f^2 - (C*a^2*b^2 + 2*A*b^4)*c*e^3*f - (2*C
*a^4 + A*a^2*b^2)*c*e*f^3)*x)*log((2*(a^2*b^2*e^2*f - a^4*f^3 + (
b^4*e^3 - a^2*b^2*e*f^2)*x)*sqrt(-b*c*x + a*c)*sqrt(b*x + a) + (2
*a^2*b^2*e*f*x - a^2*b^2*e^2 + 2*a^4*f^2 + (2*b^4*e^2 - a^2*b^2*f
^2)*x^2)*sqrt(-b^2*c*e^2 + a^2*c*f^2))/(f^2*x^2 + 2*e*f*x + e^2))
)/((b^4*c*e^6 - 2*a^2*b^2*c*e^4*f^2 + a^4*c*e^2*f^4 + (b^4*c*e^4*
f^2 - 2*a^2*b^2*c*e^2*f^4 + a^4*c*f^6)*x^2 + 2*(b^4*c*e^5*f - 2*a
^2*b^2*c*e^3*f^3 + a^4*c*e*f^5)*x)*sqrt(-b^2*c*e^2 + a^2*c*f^2)),
 -1/2*((2*B*b^2*e^3 + B*a^2*e*f^2 + A*a^2*f^3 - (3*C*a^2 + 4*A*b^
2)*e^2*f + (C*b^2*e^3 + B*b^2*e^2*f + 2*B*a^2*f^3 - (4*C*a^2 + 3*
A*b^2)*e*f^2)*x)*sqrt(b^2*c*e^2 - a^2*c*f^2)*sqrt(-b*c*x + a*c)*s
qrt(b*x + a) - (3*B*a^2*b^2*c*e^3*f - (C*a^2*b^2 + 2*A*b^4)*c*e^4
 - (2*C*a^4 + A*a^2*b^2)*c*e^2*f^2 + (3*B*a^2*b^2*c*e*f^3 - (C*a^
2*b^2 + 2*A*b^4)*c*e^2*f^2 - (2*C*a^4 + A*a^2*b^2)*c*f^4)*x^2 + 2
*(3*B*a^2*b^2*c*e^2*f^2 - (C*a^2*b^2 + 2*A*b^4)*c*e^3*f - (2*C*a^
4 + A*a^2*b^2)*c*e*f^3)*x)*arctan(-sqrt(b^2*c*e^2 - a^2*c*f^2)*(b
^2*e*x + a^2*f)/((b^2*e^2 - a^2*f^2)*sqrt(-b*c*x + a*c)*sqrt(b*x
+ a))))/((b^4*c*e^6 - 2*a^2*b^2*c*e^4*f^2 + a^4*c*e^2*f^4 + (b^4*
c*e^4*f^2 - 2*a^2*b^2*c*e^2*f^4 + a^4*c*f^6)*x^2 + 2*(b^4*c*e^5*f
 - 2*a^2*b^2*c*e^3*f^3 + a^4*c*e*f^5)*x)*sqrt(b^2*c*e^2 - a^2*c*f
^2))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(f*x+e)**3/(b*x+a)**(1/2)/(-b*c*x+a*c)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [A] time = 1.46163, size = 4, normalized size = 0.01

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(-b*c*x + a*c)*sqrt(b*x + a)*(f*x + e)^3),x, algo
```

```
[Out] sage0*x
```

3.68 $\int \frac{x(a+bx+cx^2)}{\sqrt{-1+dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=87

$$\frac{\sqrt{dx-1}\sqrt{dx+1}\left(2\left(3ad^2+2c\right)+3bd^2x\right)}{6d^4}+\frac{b\cosh^{-1}(dx)}{2d^3}+\frac{cx^2\sqrt{dx-1}\sqrt{dx+1}}{3d^2}$$

```
[Out] (c*x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/(3*d^2) + (Sqrt[-1 + d*x]*Sq
rt[1 + d*x]*(2*(2*c + 3*a*d^2) + 3*b*d^2*x))/(6*d^4) + (b*ArcCosh
[d*x])/(2*d^3)
```

Rubi [A] time = 0.278479, antiderivative size = 151, normalized size of antiderivative = 1.74, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167

$$-\frac{\left(1-d^2x^2\right)\left(2\left(3ad^2+2c\right)+3bd^2x\right)}{6d^4\sqrt{dx-1}\sqrt{dx+1}}+\frac{b\sqrt{d^2x^2-1}\tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{2d^3\sqrt{dx-1}\sqrt{dx+1}}-\frac{cx^2\left(1-d^2x^2\right)}{3d^2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(x*(a + b*x + c*x^2))/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 28.6739, size = 119, normalized size = 1.37

$$\frac{b\sqrt{dx-1}\sqrt{dx+1}\operatorname{atanh}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{2d^3\sqrt{d^2x^2-1}}+\frac{cx^2\sqrt{dx-1}\sqrt{dx+1}}{3d^2}+\frac{\sqrt{dx-1}\sqrt{dx+1}\left(6ad^2+3bd^2x+4c\right)}{6d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(x*(c*x**2+b*x+a)/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] b*sqrt(d*x - 1)*sqrt(d*x + 1)*atanh(d*x/sqrt(d**2*x**2 - 1))/(2*d
**3*sqrt(d**2*x**2 - 1)) + c*x**2*sqrt(d*x - 1)*sqrt(d*x + 1)/(3*
d**2) + sqrt(d*x - 1)*sqrt(d*x + 1)*(6*a*d**2 + 3*b*d**2*x + 4*c)
/(6*d**4)
```

Mathematica [A] time = 0.12924, size = 80, normalized size = 0.92

$$\frac{\sqrt{dx-1}\sqrt{dx+1}\left(3d^2(2a+bx)+2c\left(d^2x^2+2\right)\right)+3bd\log\left(dx+\sqrt{dx-1}\sqrt{dx+1}\right)}{6d^4}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0., size = 137, normalized size = 1.6

$$\frac{csgn(d)}{6\,d^4}\sqrt{dx-1}\sqrt{dx+1}\left(2\,csgn(d)\,x^2cd^2\sqrt{d^2x^2-1}+3\,csgn(d)\,\sqrt{d^2x^2-1}xbd^2+6\,csgn(d)\,\sqrt{d^2x^2-1}ad^2+4\,csgn(d)\,\sqrt{d^2x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A] time = 1.35501, size = 147, normalized size = 1.69

$$\frac{\sqrt{d^2x^2-1}cx^2}{3\,d^2}+\frac{\sqrt{d^2x^2-1}bx}{2\,d^2}+\frac{\sqrt{d^2x^2-1}a}{d^2}+\frac{b\log\left(2\,d^2x+2\,\sqrt{d^2x^2-1}\sqrt{d^2}\right)}{2\,\sqrt{d^2}d^2}+\frac{2\,\sqrt{d^2x^2-1}c}{3\,d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.236631, size = 370, normalized size = 4.25

$$-\frac{8\,cd^6x^6+12\,bd^6x^5-15\,bd^4x^3+6\left(4\,ad^6+cd^4\right)x^4+3\,bd^2x+6\,ad^2-6\left(5\,ad^4+3\,cd^2\right)x^2-\left(8\,cd^5x^5+12\,bd^5x^4-9\,bd^3x^2\right.}{6\left(4\,d^7x^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*(8*c*d^6*x^6 + 12*b*d^6*x^5 - 15*b*d^4*x^3 + 6*(4*a*d^6 + c*
d^4)*x^4 + 3*b*d^2*x + 6*a*d^2 - 6*(5*a*d^4 + 3*c*d^2)*x^2 - (8*c
*d^5*x^5 + 12*b*d^5*x^4 - 9*b*d^3*x^2 + 2*(12*a*d^5 + 5*c*d^3)*x^
3 - 6*(3*a*d^3 + 2*c*d)*x)*sqrt(d*x + 1)*sqrt(d*x - 1) + 3*(4*b*d
^4*x^3 - 3*b*d^2*x - (4*b*d^3*x^2 - b*d)*sqrt(d*x + 1)*sqrt(d*x -
 1))*log(-d*x + sqrt(d*x + 1)*sqrt(d*x - 1)) + 4*c)/(4*d^7*x^3 -
3*d^5*x - (4*d^6*x^2 - d^4)*sqrt(d*x + 1)*sqrt(d*x - 1))
```

Sympy [A] time = 107.638, size = 308, normalized size = 3.54

$$\frac{aG_{6,6}^{6,2}\left(\begin{matrix}-\frac{1}{4},\frac{1}{4} & 0,0,\frac{1}{2},1\\ -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}+\frac{iaG_{6,6}^{2,6}\left(\begin{matrix}-1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,1 & \\ -\frac{3}{4},-\frac{1}{4} & -1,-\frac{1}{2},-\frac{1}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}$$
$$+\frac{bG_{6,6}^{6,2}\left(\begin{matrix}-\frac{3}{4},-\frac{1}{4} & -\frac{1}{2},-\frac{1}{2},0,1\\ -1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}$$
$$-\frac{ibG_{6,6}^{2,6}\left(\begin{matrix}-\frac{3}{2},-\frac{5}{4},-1,-\frac{3}{4},-\frac{1}{2},1 & \\ -\frac{5}{4},-\frac{3}{4} & -\frac{3}{2},-1,-1,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}$$
$$+\frac{cG_{6,6}^{6,2}\left(\begin{matrix}-\frac{5}{4},-\frac{3}{4} & -1,-1,-\frac{1}{2},1\\ -\frac{3}{2},-\frac{5}{4},-1,-\frac{3}{4},-\frac{1}{2},0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^4}$$
$$+\frac{icG_{6,6}^{2,6}\left(\begin{matrix}-2,-\frac{7}{4},-\frac{3}{2},-\frac{5}{4},-1,1 & \\ -\frac{7}{4},-\frac{5}{4} & -2,-\frac{3}{2},-\frac{3}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(x*(c*x**2+b*x+a)/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] a*meijerg(((-1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4, 1/
2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) + I*a*meijerg(((-1,
 -3/4, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)
```

```
), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2) + b*meijerg(
((-3/4, -1/4), (-1/2, -1/2, 0, 1)), ((-1, -3/4, -1/2, -1/4, 0, 0)
, ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**3) - I*b*meijerg(((-3/2, -5
/4, -1, -3/4, -1/2, 1), ()), ((-5/4, -3/4), (-3/2, -1, -1, 0)), e
xp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**3) + c*meijerg(((-5
/4, -3/4), (-1, -1, -1/2, 1)), ((-3/2, -5/4, -1, -3/4, -1/2, 0),
()), 1/(d**2*x**2))/(4*pi**(3/2)*d**4) + I*c*meijerg(((-2, -7/4,
-3/2, -5/4, -1, 1), ()), ((-7/4, -5/4), (-2, -3/2, -3/2, 0)), exp
_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**4)
```

GIAC/XCAS [A] time = 0.281473, size = 130, normalized size = 1.49

$$-\frac{6\,bd^{10}\ln\left(\left|-\sqrt{dx+1}+\sqrt{dx-1}\right|\right)-\left(6\,ad^{11}-3\,bd^{10}+6\,cd^{9}+\left(2\,(dx+1)cd^{9}+3\,bd^{10}-4\,cd^{9}\right)(dx+1)\right)\sqrt{dx+1}\sqrt{dx-1}}{3840\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3840*(6*b*d^10*ln(abs(-sqrt(d*x + 1) + sqrt(d*x - 1))) - (6*a*
d^11 - 3*b*d^10 + 6*c*d^9 + (2*(d*x + 1)*c*d^9 + 3*b*d^10 - 4*c*d
^9)*(d*x + 1))*sqrt(d*x + 1)*sqrt(d*x - 1))/d
```

3.69 $\int \frac{a+bx+cx^2}{\sqrt{-1+dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=52

$$\frac{(2ad^2+c)\cosh^{-1}(dx)}{2d^3}+\frac{\sqrt{dx-1}\sqrt{dx+1}(2b+cx)}{2d^2}$$

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

Rubi [B] time = 0.163503, antiderivative size = 135, normalized size of antiderivative = 2.6, number of steps used = 5, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172

$$\frac{\sqrt{d^2x^2-1}\,(2ad^2+c)\tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{2d^3\sqrt{dx-1}\sqrt{dx+1}}-\frac{b\,(1-d^2x^2)}{d^2\sqrt{dx-1}\sqrt{dx+1}}-\frac{cx\,(1-d^2x^2)}{2d^2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

```
[Out] -((b*(1 - d^2*x^2))/(d^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x])) - (c*x*(1
 - d^2*x^2))/(2*d^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x]) + ((c + 2*a*d^2
)*Sqrt[-1 + d^2*x^2]*ArcTanh[(d*x)/Sqrt[-1 + d^2*x^2]])/(2*d^3*Sq
rt[-1 + d*x]*Sqrt[1 + d*x])
```

Rubi in Sympy [A] time = 17.1683, size = 87, normalized size = 1.67

$$\frac{(2b+cx)\sqrt{dx-1}\sqrt{dx+1}}{2d^2}+\frac{(2ad^2+c)\sqrt{dx-1}\sqrt{dx+1}\,\operatorname{atanh}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{2d^3\sqrt{d^2x^2-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] (2*b + c*x)*sqrt(d*x - 1)*sqrt(d*x + 1)/(2*d**2) + (2*a*d**2 + c)
*sqrt(d*x - 1)*sqrt(d*x + 1)*atanh(d*x/sqrt(d**2*x**2 - 1))/(2*d*
*3*sqrt(d**2*x**2 - 1))
```

Mathematica [A] time = 0.0852009, size = 68, normalized size = 1.31

$$\frac{(2ad^2+c)\log\left(dx+\sqrt{dx-1}\sqrt{dx+1}\right)+d\sqrt{dx-1}\sqrt{dx+1}(2b+cx)}{2d^3}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0., size = 120, normalized size = 2.3

$$\frac{csgn(d)}{2\,d^3}\sqrt{dx-1}\sqrt{dx+1}\left(cx\sqrt{d^2x^2-1}csgn(d)\,d+2\,\ln\left(\left(csgn(d)\sqrt{d^2x^2-1}+dx\right)csgn(d)\right)ad^2+2\,\sqrt{d^2x^2-1}bcsgn(d)\,d\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(d*x-1)^(1/2)*(d*x+1)^(1/2)*(c*x*(d^2*x^2-1)^(1/2)*csgn(d)*d+
2*ln((csgn(d)*(d^2*x^2-1)^(1/2)+d*x)*csgn(d))*a*d^2+2*(d^2*x^2-1)
^(1/2)*b*csgn(d)*d+c*ln((csgn(d)*(d^2*x^2-1)^(1/2)+d*x)*csgn(d)))
/(d^2*x^2-1)^(1/2)/d^3*csgn(d)
```

Maxima [A] time = 1.36094, size = 142, normalized size = 2.73

$$\frac{a\log\left(2\,d^2x+2\,\sqrt{d^2x^2-1}\sqrt{d^2}\right)}{\sqrt{d^2}}+\frac{\sqrt{d^2x^2-1}cx}{2\,d^2}+\frac{\sqrt{d^2x^2-1}b}{d^2}+\frac{c\log\left(2\,d^2x+2\,\sqrt{d^2x^2-1}\sqrt{d^2}\right)}{2\,\sqrt{d^2}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*log(2*d^2*x + 2*sqrt(d^2*x^2 - 1)*sqrt(d^2))/sqrt(d^2) + 1/2*sq
rt(d^2*x^2 - 1)*c*x/d^2 + sqrt(d^2*x^2 - 1)*b/d^2 + 1/2*c*log(2*d
^2*x + 2*sqrt(d^2*x^2 - 1)*sqrt(d^2))/(sqrt(d^2)*d^2)
```

Fricas [A] time = 0.236151, size = 259, normalized size = 4.98

$$-\frac{2\,cd^4x^4+4\,bd^4x^3-2\,cd^2x^2-4\,bd^2x-\left(2\,cd^3x^3+4\,bd^3x^2-cdx-2\,bd\right)\sqrt{dx+1}\sqrt{dx-1}-\left(2\,ad^2+2\left(2\,ad^3+cd\right)\sqrt{dx+\right.}{2\left(2\,d^5x^2-2\,\sqrt{dx+1}\sqrt{dx-1}d^4x-d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(2*c*d^4*x^4 + 4*b*d^4*x^3 - 2*c*d^2*x^2 - 4*b*d^2*x - (2*c*
d^3*x^3 + 4*b*d^3*x^2 - c*d*x - 2*b*d)*sqrt(d*x + 1)*sqrt(d*x - 1
) - (2*a*d^2 + 2*(2*a*d^3 + c*d)*sqrt(d*x + 1)*sqrt(d*x - 1)*x -
2*(2*a*d^4 + c*d^2)*x^2 + c)*log(-d*x + sqrt(d*x + 1)*sqrt(d*x -
1)))/(2*d^5*x^2 - 2*sqrt(d*x + 1)*sqrt(d*x - 1)*d^4*x - d^3)
```

Sympy [A] time = 54.7001, size = 277, normalized size = 5.33

$$\frac{aG_{6,6}^{6,2}\left(\begin{matrix}\frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1\\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}-\frac{iaG_{6,6}^{2,6}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}+\frac{bG_{6,6}^{6,2}\left(\begin{matrix}-\frac{1}{4},\frac{1}{4} & 0,0,\frac{1}{2},1\\ -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}+\frac{ibG_{6,6}^{2,6}\left(\begin{matrix}-1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,1 & \\ -\frac{3}{4},-\frac{1}{4} & -1,-\frac{1}{2},-\frac{1}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}+\frac{cG_{6,6}^{6,2}\left(\begin{matrix}-\frac{3}{4},-\frac{1}{4} & -\frac{1}{2},-\frac{1}{2},0,1\\ -1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}-\frac{icG_{6,6}^{2,6}\left(\begin{matrix}-\frac{3}{2},-\frac{5}{4},-1,-\frac{3}{4},-\frac{1}{2},1 & \\ -\frac{5}{4},-\frac{3}{4} & -\frac{3}{2},-1,-1,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x**2+b*x+a)/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] a*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4, 1,
0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) - I*a*meijerg(((-1/2, -1/
4, 0, 1/4, 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_pola
r(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d) + b*meijerg(((-1/4, 1/4),
(0, 0, 1/2, 1)), ((-1/2, -1/4, 0, 1/4, 1/2, 0), ()), 1/(d**2*x**2
))/(4*pi**(3/2)*d**2) + I*b*meijerg(((-1, -3/4, -1/2, -1/4, 0, 1)
, ()), ((-3/4, -1/4), (-1, -1/2, -1/2, 0)), exp_polar(2*I*pi)/(d*
*2*x**2))/(4*pi**(3/2)*d**2) + c*meijerg(((-3/4, -1/4), (-1/2, -1
/2, 0, 1)), ((-1, -3/4, -1/2, -1/4, 0, 0), ()), 1/(d**2*x**2))/(4
*pi**(3/2)*d**3) - I*c*meijerg(((-3/2, -5/4, -1, -3/4, -1/2, 1),
()), ((-5/4, -3/4), (-3/2, -1, -1, 0)), exp_polar(2*I*pi)/(d**2*x
**2))/(4*pi**(3/2)*d**3)
```

GIAC/XCAS [A] time = 0.260496, size = 104, normalized size = 2.

$$\frac{\left((dx+1)cd^4+2\,bd^5-cd^4\right)\sqrt{dx+1}\sqrt{dx-1}-2\left(2\,ad^6+cd^4\right)\ln\left(\left|-\sqrt{dx+1}+\sqrt{dx-1}\right|\right)}{192\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/192*(((d*x + 1)*c*d^4 + 2*b*d^5 - c*d^4)*sqrt(d*x + 1)*sqrt(d*x
 - 1) - 2*(2*a*d^6 + c*d^4)*ln(abs(-sqrt(d*x + 1) + sqrt(d*x - 1)
)))/d
```

3.70 $\int \frac{a+bx+cx^2}{x\sqrt{-1+dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=55

$$a\tan^{-1}\left(\sqrt{dx-1}\sqrt{dx+1}\right)+\frac{b\cosh^{-1}(dx)}{d}+\frac{c\sqrt{dx-1}\sqrt{dx+1}}{d^2}$$

```
[Out] (c*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/d^2 + (b*ArcCosh[d*x])/d + a*Arc
Tan[Sqrt[-1 + d*x]*Sqrt[1 + d*x]]
```

Rubi [B] time = 0.354064, antiderivative size = 135, normalized size of antiderivative = 2.45, number of steps used = 8, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$\frac{a\sqrt{d^2x^2-1}\tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{\sqrt{dx-1}\sqrt{dx+1}}+\frac{b\sqrt{d^2x^2-1}\tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{d\sqrt{dx-1}\sqrt{dx+1}}-\frac{c\left(1-d^2x^2\right)}{d^2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(x*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 21.2297, size = 65, normalized size = 1.18

$$a\,\mathrm{atan}\left(\sqrt{dx-1}\sqrt{dx+1}\right)+\frac{c\sqrt{dx-1}\sqrt{dx+1}}{d^2}-\frac{c\,\mathrm{acosh}\,(dx)}{d^2}+\frac{(bd+c)\,\mathrm{acosh}\,(dx)}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)/x/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] a*atan(sqrt(d*x - 1)*sqrt(d*x + 1)) + c*sqrt(d*x - 1)*sqrt(d*x +
1)/d**2 - c*acosh(d*x)/d**2 + (b*d + c)*acosh(d*x)/d**2
```

Mathematica [A] time = 0.107443, size = 76, normalized size = 1.38

$$-a\tan^{-1}\left(\frac{1}{\sqrt{dx-1}\sqrt{dx+1}}\right)+\frac{b\log\left(dx+\sqrt{dx-1}\sqrt{dx+1}\right)}{d}+\frac{c\sqrt{dx-1}\sqrt{dx+1}}{d^2}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0., size = 93, normalized size = 1.7

$$\frac{csgn(d)}{d^2}\sqrt{dx-1}\sqrt{dx+1}\left(-csgn(d)\arctan\left(\frac{1}{\sqrt{d^2x^2-1}}\right)ad^2+\ln\left(\left(csgn(d)\sqrt{d^2x^2-1}+dx\right)csgn(d)\right)bd+csgn(d)\sqrt{d^2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Maxima [A] time = 1.49751, size = 86, normalized size = 1.56

$$-a\arcsin\left(\frac{1}{\sqrt{d^2}|x|}\right)+\frac{b\log\left(2\,d^2x+2\,\sqrt{d^2x^2-1}\sqrt{d^2}\right)}{\sqrt{d^2}}+\frac{\sqrt{d^2x^2-1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.246562, size = 212, normalized size = 3.85

$$-\frac{cd^2x^2-\sqrt{dx+1}\sqrt{dx-1}cdx-2\left(ad^3x-\sqrt{dx+1}\sqrt{dx-1}ad^2\right)\arctan\left(-dx+\sqrt{dx+1}\sqrt{dx-1}\right)+\left(bd^2x-\sqrt{dx+1}\sqrt{dx}\right.}{d^3x-\sqrt{dx+1}\sqrt{dx-1}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(c*d^2*x^2 - sqrt(d*x + 1)*sqrt(d*x - 1)*c*d*x - 2*(a*d^3*x - sq
rt(d*x + 1)*sqrt(d*x - 1)*a*d^2)*arctan(-d*x + sqrt(d*x + 1)*sqrt
(d*x - 1)) + (b*d^2*x - sqrt(d*x + 1)*sqrt(d*x - 1)*b*d)*log(-d*x
 + sqrt(d*x + 1)*sqrt(d*x - 1)) - c)/(d^3*x - sqrt(d*x + 1)*sqrt(
d*x - 1)*d^2)
```

Sympy [A] time = 57.3745, size = 240, normalized size = 4.36

$$-\frac{aG_{6,6}^{5,3}\left(\begin{matrix}\frac{3}{4},\frac{5}{4},1 & 1,1,\frac{3}{2}\\ \frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{iaG_{6,6}^{2,6}\left(\begin{matrix}0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,1 & \\ \frac{1}{4},\frac{3}{4} & 0,\frac{1}{2},\frac{1}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{bG_{6,6}^{6,2}\left(\begin{matrix}\frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1\\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}-\frac{ibG_{6,6}^{2,6}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}+\frac{cG_{6,6}^{6,2}\left(\begin{matrix}-\frac{1}{4},\frac{1}{4} & 0,0,\frac{1}{2},1\\ -\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}+\frac{icG_{6,6}^{2,6}\left(\begin{matrix}-1,-\frac{3}{4},-\frac{1}{2},-\frac{1}{4},0,1 & \\ -\frac{3}{4},-\frac{1}{4} & -1,-\frac{1}{2},-\frac{1}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/x/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -a*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2)
, (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + I*a*meijerg(((0, 1/4, 1/2
, 3/4, 1, 1), ()), ((1/4, 3/4), (0, 1/2, 1/2, 0)), exp_polar(2*I*
pi)/(d**2*x**2))/(4*pi**(3/2)) + b*meijerg(((1/4, 3/4), (1/2, 1/2
, 1, 1)), ((0, 1/4, 1/2, 3/4, 1, 0), ()), 1/(d**2*x**2))/(4*pi**(
3/2)*d) - I*b*meijerg(((-1/2, -1/4, 0, 1/4, 1/2, 1), ()), ((-1/4,
 1/4), (-1/2, 0, 0, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3
/2)*d) + c*meijerg(((-1/4, 1/4), (0, 0, 1/2, 1)), ((-1/2, -1/4, 0
, 1/4, 1/2, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d**2) + I*c*meij
erg(((-1, -3/4, -1/2, -1/4, 0, 1), ()), ((-3/4, -1/4), (-1, -1/2,
 -1/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d**2)
```

GIAC/XCAS [A] time = 0.22993, size = 96, normalized size = 1.75

$$-2\,a\arctan\left(\frac{1}{2}\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^2\right)-\frac{b\ln\left(\left(\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^2\right)\right)}{d}+\frac{\sqrt{dx+1}\sqrt{dx-1}c}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.71 $\int \frac{a+bx+cx^2}{x^2\sqrt{-1+dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=55

$$\frac{a\sqrt{dx-1}\sqrt{dx+1}}{x}+b\tan^{-1}\left(\sqrt{dx-1}\sqrt{dx+1}\right)+\frac{c\cosh^{-1}(dx)}{d}$$

```
[Out] (a*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/x + (c*ArcCosh[d*x])/d + b*ArcTa
n[Sqrt[-1 + d*x]*Sqrt[1 + d*x]]
```

Rubi [B] time = 0.345473, antiderivative size = 135, normalized size of antiderivative = 2.45, number of steps used = 8, number of rules used = 8, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25

$$-\frac{a\left(1-d^2x^2\right)}{x\sqrt{dx-1}\sqrt{dx+1}}+\frac{b\sqrt{d^2x^2-1}\tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{\sqrt{dx-1}\sqrt{dx+1}}+\frac{c\sqrt{d^2x^2-1}\tanh^{-1}\left(\frac{dx}{\sqrt{d^2x^2-1}}\right)}{d\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(x^2*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 17.7158, size = 48, normalized size = 0.87

$$\frac{a\sqrt{dx-1}\sqrt{dx+1}}{x}+b\,\mathrm{atan}\left(\sqrt{dx-1}\sqrt{dx+1}\right)+\frac{c\,\mathrm{acosh}\,(dx)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**2+b*x+a)/x**2/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] a*sqrt(d*x - 1)*sqrt(d*x + 1)/x + b*atan(sqrt(d*x - 1)*sqrt(d*x +
 1)) + c*acosh(d*x)/d
```

Mathematica [A] time = 0.0978332, size = 76, normalized size = 1.38

$$\frac{a\sqrt{dx-1}\sqrt{dx+1}}{x}-b\tan^{-1}\left(\frac{1}{\sqrt{dx-1}\sqrt{dx+1}}\right)+\frac{c\log\left(dx+\sqrt{dx-1}\sqrt{dx+1}\right)}{d}$$

Antiderivative was successfully verified.

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

```
[Out] (a*Sqrt[-1 + d*x]*Sqrt[1 + d*x])/x - b*ArcTan[1/(Sqrt[-1 + d*x]*S
qrt[1 + d*x])] + (c*Log[d*x + Sqrt[-1 + d*x]*Sqrt[1 + d*x]])/d
```

Maple [C] time = 0., size = 96, normalized size = 1.8

$$\frac{csgn(d)}{dx}\left(-b\arctan\left(\frac{1}{\sqrt{d^2x^2-1}}\right)x\,csgn(d)\,d+a\sqrt{d^2x^2-1}\,csgn(d)\,d+c\ln\left(\left(csgn(d)\sqrt{d^2x^2-1}+dx\right)csgn(d)\right)x\right)\sqrt{dx-$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (-b*arctan(1/(d^2*x^2-1)^(1/2))*x*csgn(d)*d+a*(d^2*x^2-1)^(1/2)*c
sgn(d)*d+c*ln((csgn(d)*(d^2*x^2-1)^(1/2)+d*x)*csgn(d))*x)*(d*x-1)
^(1/2)*(d*x+1)^(1/2)*csgn(d)/(d^2*x^2-1)^(1/2)/x/d
```

Maxima [A] time = 1.5538, size = 86, normalized size = 1.56

$$-b\arcsin\left(\frac{1}{\sqrt{d^2}|x|}\right)+\frac{c\log\left(2\,d^2x+2\,\sqrt{d^2x^2-1}\sqrt{d^2}\right)}{\sqrt{d^2}}+\frac{\sqrt{d^2x^2-1}a}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.248084, size = 178, normalized size = 3.24

$$\frac{ad+2\left(bd^2x^2-\sqrt{dx+1}\sqrt{dx-1}bdx\right)\arctan\left(-dx+\sqrt{dx+1}\sqrt{dx-1}\right)-\left(cdx^2-\sqrt{dx+1}\sqrt{dx-1}cx\right)\log\left(-dx+\sqrt{dx+\right.}{d^2x^2-\sqrt{dx+1}\sqrt{dx-1}dx}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (a*d + 2*(b*d^2*x^2 - sqrt(d*x + 1)*sqrt(d*x - 1)*b*d*x)*arctan(-
d*x + sqrt(d*x + 1)*sqrt(d*x - 1)) - (c*d*x^2 - sqrt(d*x + 1)*sqr
t(d*x - 1)*c*x)*log(-d*x + sqrt(d*x + 1)*sqrt(d*x - 1)))/(d^2*x^2
 - sqrt(d*x + 1)*sqrt(d*x - 1)*d*x)
```

Sympy [A] time = 66.4465, size = 216, normalized size = 3.93

$$-\frac{adG_{6,6}^{5,3}\left(\begin{matrix}\frac{5}{4},\frac{7}{4},1 & \frac{3}{2},\frac{3}{2},2\\ 1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2 & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{iadG_{6,6}^{2,6}\left(\begin{matrix}\frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2},1 & \\ \frac{3}{4},\frac{5}{4} & \frac{1}{2},1,1,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{bG_{6,6}^{5,3}\left(\begin{matrix}\frac{3}{4},\frac{5}{4},1 & 1,1,\frac{3}{2}\\ \frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{ibG_{6,6}^{2,6}\left(\begin{matrix}0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,1 & \\ \frac{1}{4},\frac{3}{4} & 0,\frac{1}{2},\frac{1}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{cG_{6,6}^{6,2}\left(\begin{matrix}\frac{1}{4},\frac{3}{4} & \frac{1}{2},\frac{1}{2},1,1\\ 0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,0 & \end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}-\frac{icG_{6,6}^{2,6}\left(\begin{matrix}-\frac{1}{2},-\frac{1}{4},0,\frac{1}{4},\frac{1}{2},1 & \\ -\frac{1}{4},\frac{1}{4} & -\frac{1}{2},0,0,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/x**2/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -a*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4,
2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - I*a*d*meijerg(((1/2, 3/
4, 1, 5/4, 3/2, 1), ()), ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(
2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) - b*meijerg(((3/4, 5/4, 1), (1
, 1, 3/2)), ((1/2, 3/4, 1, 5/4, 3/2), (0,)), 1/(d**2*x**2))/(4*pi
**(3/2)) + I*b*meijerg(((0, 1/4, 1/2, 3/4, 1, 1), ()), ((1/4, 3/4
), (0, 1/2, 1/2, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)
) + c*meijerg(((1/4, 3/4), (1/2, 1/2, 1, 1)), ((0, 1/4, 1/2, 3/4,
 1, 0), ()), 1/(d**2*x**2))/(4*pi**(3/2)*d) - I*c*meijerg(((-1/2,
 -1/4, 0, 1/4, 1/2, 1), ()), ((-1/4, 1/4), (-1/2, 0, 0, 0)), exp_
polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)*d)
```

GIAC/XCAS [A] time = 0.234307, size = 112, normalized size = 2.04

$$-\frac{2\,bd\arctan\left(\frac{1}{2}\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^2\right)-\frac{8\,ad^2}{\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^4+4}+c\ln\left(\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^2\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(2*b*d*arctan(1/2*(sqrt(d*x + 1) - sqrt(d*x - 1))^2) - 8*a*d^2/(
(sqrt(d*x + 1) - sqrt(d*x - 1))^4 + 4) + c*ln((sqrt(d*x + 1) - sq
rt(d*x - 1))^2))/d
```

3.72 $\int \frac{a+bx+cx^2}{x^3\sqrt{-1+dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=83

$$\frac{1}{2}\left(ad^2+2c\right)\tan^{-1}\left(\sqrt{dx-1}\sqrt{dx+1}\right)+\frac{a\sqrt{dx-1}\sqrt{dx+1}}{2x^2}+\frac{b\sqrt{dx-1}\sqrt{dx+1}}{x}$$

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

Rubi [A] time = 0.348408, antiderivative size = 129, normalized size of antiderivative = 1.55, number of steps used = 6, number of rules used = 6, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.188

$$\frac{\sqrt{d^2x^2-1}\left(ad^2+2c\right)\tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{2\sqrt{dx-1}\sqrt{dx+1}}-\frac{a\left(1-d^2x^2\right)}{2x^2\sqrt{dx-1}\sqrt{dx+1}}-\frac{b\left(1-d^2x^2\right)}{x\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(x^3*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 20.5309, size = 88, normalized size = 1.06

$$\frac{ad^2\,\mathrm{atan}\left(\sqrt{dx-1}\sqrt{dx+1}\right)}{2}+\frac{a\sqrt{dx-1}\sqrt{dx+1}}{2x^2}+\frac{b\sqrt{dx-1}\sqrt{dx+1}}{x}+c\,\mathrm{atan}\left(\sqrt{dx-1}\sqrt{dx+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**2+b*x+a)/x**3/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] a*d**2*atan(sqrt(d*x - 1)*sqrt(d*x + 1))/2 + a*sqrt(d*x - 1)*sqrt
(d*x + 1)/(2*x**2) + b*sqrt(d*x - 1)*sqrt(d*x + 1)/x + c*atan(sqr
t(d*x - 1)*sqrt(d*x + 1))
```

Mathematica [A] time = 0.111744, size = 64, normalized size = 0.77

$$\frac{1}{2}\left(\frac{\sqrt{dx-1}\sqrt{dx+1}(a+2bx)}{x^2}-\left(ad^2+2c\right)\tan^{-1}\left(\frac{1}{\sqrt{dx-1}\sqrt{dx+1}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x + c*x^2)/(x^3*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

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

Maple [C] time = 0., size = 103, normalized size = 1.2

$$-\frac{(csgn(d))^2}{2x^2}\sqrt{dx-1}\sqrt{dx+1}\left(\arctan\left(\frac{1}{\sqrt{d^2x^2-1}}\right)x^2ad^2+2\arctan\left(\frac{1}{\sqrt{d^2x^2-1}}\right)x^2c-2bx\sqrt{d^2x^2-1}-a\sqrt{d^2x^2-1}\right)\frac{}{\sqrt{a}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^2+b*x+a)/x^3/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)
```

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

Maxima [A] time = 1.49797, size = 88, normalized size = 1.06

$$-\frac{1}{2}ad^2\arcsin\left(\frac{1}{\sqrt{d^2}|x|}\right)-c\arcsin\left(\frac{1}{\sqrt{d^2}|x|}\right)+\frac{\sqrt{d^2x^2-1}b}{x}+\frac{\sqrt{d^2x^2-1}a}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.237194, size = 238, normalized size = 2.87

$$-\frac{2ad^3x^3-2bdx^2-2adx-\left(2ad^2x^2-2bx-a\right)\sqrt{dx+1}\sqrt{dx-1}+2\left(2\left(ad^3+2cd\right)\sqrt{dx+1}\sqrt{dx-1}x^3-2\left(ad^4+2cd^2\right)\right.}{2\left(2d^2x^4-2\sqrt{dx+1}\sqrt{dx-1}dx^3-x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 82.1259, size = 212, normalized size = 2.55

$$-\frac{ad^2G_{6,6}^{5,3}\left(\begin{matrix}\frac{7}{4},\frac{9}{4},1 & 2,2,\frac{5}{2}\\ \frac{3}{2},\frac{7}{4},2,\frac{9}{4},\frac{5}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{iad^2G_{6,6}^{2,6}\left(\begin{matrix}1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2,1 & \\ \frac{5}{4},\frac{7}{4} & 1,\frac{3}{2},\frac{3}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{bdG_{6,6}^{5,3}\left(\begin{matrix}\frac{5}{4},\frac{7}{4},1 & \frac{3}{2},\frac{3}{2},2\\ 1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2 & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{ibdG_{6,6}^{2,6}\left(\begin{matrix}\frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2},1 & \\ \frac{3}{4},\frac{5}{4} & \frac{1}{2},1,1,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{cG_{6,6}^{5,3}\left(\begin{matrix}\frac{3}{4},\frac{5}{4},1 & 1,1,\frac{3}{2}\\ \frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{icG_{6,6}^{2,6}\left(\begin{matrix}0,\frac{1}{4},\frac{1}{2},\frac{3}{4},1,1 & \\ \frac{1}{4},\frac{3}{4} & 0,\frac{1}{2},\frac{1}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/x**3/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -a*d**2*meijerg(((7/4, 9/4, 1), (2, 2, 5/2)), ((3/2, 7/4, 2, 9/4,
 5/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + I*a*d**2*meijerg(((1
, 5/4, 3/2, 7/4, 2, 1), ()), ((5/4, 7/4), (1, 3/2, 3/2, 0)), exp_
polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) - b*d*meijerg(((5/4, 7/4
, 1), (3/2, 3/2, 2)), ((1, 5/4, 3/2, 7/4, 2), (0,)), 1/(d**2*x**2
))/(4*pi**(3/2)) - I*b*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1), ())
, ((3/4, 5/4), (1/2, 1, 1, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4
*pi**(3/2)) - c*meijerg(((3/4, 5/4, 1), (1, 1, 3/2)), ((1/2, 3/4,
 1, 5/4, 3/2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) + I*c*meijerg(
((0, 1/4, 1/2, 3/4, 1, 1), ()), ((1/4, 3/4), (0, 1/2, 1/2, 0)), e
xp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2))
```

GIAC/XCAS [A] time = 0.235281, size = 196, normalized size = 2.36

$$-\frac{\left(ad^3+2\,cd\right)\arctan\left(\frac{1}{2}\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^2\right)+\frac{2\left(ad^3\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^6-4\,bd^2\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^4-4\,ad^3\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^2-16\,bd^2\right)}{\left(\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^4+4\right)^2}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -((a*d^3 + 2*c*d)*arctan(1/2*(sqrt(d*x + 1) - sqrt(d*x - 1))^2) +
 2*(a*d^3*(sqrt(d*x + 1) - sqrt(d*x - 1))^6 - 4*b*d^2*(sqrt(d*x +
 1) - sqrt(d*x - 1))^4 - 4*a*d^3*(sqrt(d*x + 1) - sqrt(d*x - 1))^
2 - 16*b*d^2)/((sqrt(d*x + 1) - sqrt(d*x - 1))^4 + 4)^2)/d
```

3.73 $\int \frac{a+bx+cx^2}{x^4\sqrt{-1+dx}\sqrt{1+dx}}\,dx$

Optimal. Leaf size=116

$$\frac{\sqrt{dx-1}\sqrt{dx+1}\left(2ad^2+3c\right)}{3x}+\frac{a\sqrt{dx-1}\sqrt{dx+1}}{3x^3}+\frac{1}{2}bd^2\tan^{-1}\left(\sqrt{dx-1}\sqrt{dx+1}\right)+\frac{b\sqrt{dx-1}\sqrt{dx+1}}{2x^2}$$

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

Rubi [A] time = 0.433207, antiderivative size = 171, normalized size of antiderivative = 1.47, number of steps used = 7, number of rules used = 7, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.219$

$$-\frac{\left(1-d^2x^2\right)\left(2ad^2+3c\right)}{3x\sqrt{dx-1}\sqrt{dx+1}}-\frac{a\left(1-d^2x^2\right)}{3x^3\sqrt{dx-1}\sqrt{dx+1}}-\frac{b\left(1-d^2x^2\right)}{2x^2\sqrt{dx-1}\sqrt{dx+1}}+\frac{bd^2\sqrt{d^2x^2-1}\tan^{-1}\left(\sqrt{d^2x^2-1}\right)}{2\sqrt{dx-1}\sqrt{dx+1}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + c*x^2)/(x^4*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

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

Rubi in Sympy [A] time = 24.9163, size = 119, normalized size = 1.03

$$\frac{2ad^2\sqrt{dx-1}\sqrt{dx+1}}{3x}+\frac{a\sqrt{dx-1}\sqrt{dx+1}}{3x^3}+\frac{bd^2\,\mathrm{atan}\left(\sqrt{dx-1}\sqrt{dx+1}\right)}{2}+\frac{b\sqrt{dx-1}\sqrt{dx+1}}{2x^2}+\frac{c\sqrt{dx-1}\sqrt{dx+1}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**2+b*x+a)/x**4/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] 2*a*d**2*sqrt(d*x - 1)*sqrt(d*x + 1)/(3*x) + a*sqrt(d*x - 1)*sqrt
(d*x + 1)/(3*x**3) + b*d**2*atan(sqrt(d*x - 1)*sqrt(d*x + 1))/2 +
 b*sqrt(d*x - 1)*sqrt(d*x + 1)/(2*x**2) + c*sqrt(d*x - 1)*sqrt(d*
x + 1)/x
```

Mathematica [A] time = 0.141758, size = 75, normalized size = 0.65

$$\frac{1}{6}\left(\frac{\sqrt{dx-1}\sqrt{dx+1}\left(a\left(4d^2x^2+2\right)+3x(b+2cx)\right)}{x^3}-3bd^2\tan^{-1}\left(\frac{1}{\sqrt{dx-1}\sqrt{dx+1}}\right)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x + c*x^2)/(x^4*Sqrt[-1 + d*x]*Sqrt[1 + d*x]),x]
```

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

Maple [C] time = 0., size = 123, normalized size = 1.1

$$-\frac{(csgn(d))^2}{6x^3}\sqrt{dx-1}\sqrt{dx+1}\left(3\arctan\left(\frac{1}{\sqrt{d^2x^2-1}}\right)x^3bd^2-4\sqrt{d^2x^2-1}x^2ad^2-6\sqrt{d^2x^2-1}x^2c-3bx\sqrt{d^2x^2-1}-2a\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^2+b*x+a)/x^4/(d*x-1)^(1/2)/(d*x+1)^(1/2),x)
```

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

Maxima [A] time = 1.48418, size = 119, normalized size = 1.03

$$-\frac{1}{2}bd^2\arcsin\left(\frac{1}{\sqrt{d^2}|x|}\right)+\frac{2\sqrt{d^2x^2-1}ad^2}{3x}+\frac{\sqrt{d^2x^2-1}c}{x}+\frac{\sqrt{d^2x^2-1}b}{2x^2}+\frac{\sqrt{d^2x^2-1}a}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.237353, size = 297, normalized size = 2.56

$$-\frac{12\,bd^4x^5-12\,cd^2x^4-15\,bd^2x^3-6\left(ad^2-c\right)x^2-3\left(4\,bd^3x^4-4\,cdx^3-3\,bdx^2-2\,adx\right)\sqrt{dx+1}\sqrt{dx-1}+3\,bx-6\left(4\,ba\right.}{6\left(4\,d^3x^6-3\,dx^4-(4\,d^2x^5-x^3)\sqrt{dx+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*(12*b*d^4*x^5 - 12*c*d^2*x^4 - 15*b*d^2*x^3 - 6*(a*d^2 - c)*
x^2 - 3*(4*b*d^3*x^4 - 4*c*d*x^3 - 3*b*d*x^2 - 2*a*d*x)*sqrt(d*x
+ 1)*sqrt(d*x - 1) + 3*b*x - 6*(4*b*d^5*x^6 - 3*b*d^3*x^4 - (4*b*
d^4*x^5 - b*d^2*x^3)*sqrt(d*x + 1)*sqrt(d*x - 1))*arctan(-d*x + s
qrt(d*x + 1)*sqrt(d*x - 1)) + 2*a)/(4*d^3*x^6 - 3*d*x^4 - (4*d^2*
x^5 - x^3)*sqrt(d*x + 1)*sqrt(d*x - 1))
```

Sympy [A] time = 156.866, size = 219, normalized size = 1.89

$$-\frac{ad^3G_{6,6}^{5,3}\left(\begin{matrix}\frac{9}{4},\frac{11}{4},1 & \frac{5}{2},\frac{5}{2},3\\ 2,\frac{9}{4},\frac{5}{2},\frac{11}{4},3 & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{iad^3G_{6,6}^{2,6}\left(\begin{matrix}\frac{3}{2},\frac{7}{4},2,\frac{9}{4},\frac{5}{2},1 & \\ \frac{7}{4},\frac{9}{4} & \frac{3}{2},2,2,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{bd^2G_{6,6}^{5,3}\left(\begin{matrix}\frac{7}{4},\frac{9}{4},1 & 2,2,\frac{5}{2}\\ \frac{3}{2},\frac{7}{4},2,\frac{9}{4},\frac{5}{2} & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}+\frac{ibd^2G_{6,6}^{2,6}\left(\begin{matrix}1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2,1 & \\ \frac{5}{4},\frac{7}{4} & 1,\frac{3}{2},\frac{3}{2},0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{cdG_{6,6}^{5,3}\left(\begin{matrix}\frac{5}{4},\frac{7}{4},1 & \frac{3}{2},\frac{3}{2},2\\ 1,\frac{5}{4},\frac{3}{2},\frac{7}{4},2 & 0\end{matrix}\middle|\frac{1}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}-\frac{icdG_{6,6}^{2,6}\left(\begin{matrix}\frac{1}{2},\frac{3}{4},1,\frac{5}{4},\frac{3}{2},1 & \\ \frac{3}{4},\frac{5}{4} & \frac{1}{2},1,1,0\end{matrix}\middle|\frac{e^{2i\pi}}{d^2x^2}\right)}{4\pi^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/x**4/(d*x-1)**(1/2)/(d*x+1)**(1/2),x)
```

```
[Out] -a*d**3*meijerg(((9/4, 11/4, 1), (5/2, 5/2, 3)), ((2, 9/4, 5/2, 1
1/4, 3), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - I*a*d**3*meijerg((
(3/2, 7/4, 2, 9/4, 5/2, 1), ()), ((7/4, 9/4), (3/2, 2, 2, 0)), ex
p_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2)) - b*d**2*meijerg(((7/4
, 9/4, 1), (2, 2, 5/2)), ((3/2, 7/4, 2, 9/4, 5/2), (0,)), 1/(d**2
*x**2))/(4*pi**(3/2)) + I*b*d**2*meijerg(((1, 5/4, 3/2, 7/4, 2, 1
), ()), ((5/4, 7/4), (1, 3/2, 3/2, 0)), exp_polar(2*I*pi)/(d**2*x
**2))/(4*pi**(3/2)) - c*d*meijerg(((5/4, 7/4, 1), (3/2, 3/2, 2)),
 ((1, 5/4, 3/2, 7/4, 2), (0,)), 1/(d**2*x**2))/(4*pi**(3/2)) - I*
c*d*meijerg(((1/2, 3/4, 1, 5/4, 3/2, 1), ()), ((3/4, 5/4), (1/2,
1, 1, 0)), exp_polar(2*I*pi)/(d**2*x**2))/(4*pi**(3/2))
```

GIAC/XCAS [A] time = 0.232116, size = 266, normalized size = 2.29

$$-\frac{3\,bd^3\arctan\left(\frac{1}{2}\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^2\right)+\frac{2\left(3\,bd^3\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^{10}-12\,cd^2\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^{8}-96\,ad^4\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^{4}-96\,cd^2\left(\sqrt{dx+1}-\right.\right.}{\left(\left(\sqrt{dx+1}-\sqrt{dx-1}\right)^4+4\right)^3}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*(3*b*d^3*arctan(1/2*(sqrt(d*x + 1) - sqrt(d*x - 1))^2) + 2*(
3*b*d^3*(sqrt(d*x + 1) - sqrt(d*x - 1))^10 - 12*c*d^2*(sqrt(d*x +
 1) - sqrt(d*x - 1))^8 - 96*a*d^4*(sqrt(d*x + 1) - sqrt(d*x - 1))
^4 - 96*c*d^2*(sqrt(d*x + 1) - sqrt(d*x - 1))^4 - 48*b*d^3*(sqrt(
d*x + 1) - sqrt(d*x - 1))^2 - 128*a*d^4 - 192*c*d^2)/((sqrt(d*x +
 1) - sqrt(d*x - 1))^4 + 4)^3)/d
```

3.74 $\int \frac{a+bx+cx^2}{\sqrt{-1+x}\sqrt{1+x}(d+ex)^3}\,dx$

Optimal. Leaf size=199

$$-\frac{\sqrt{x-1}\sqrt{x+1}\left(ae^2-bde+cd^2\right)}{2e\left(d^2-e^2\right)(d+ex)^2}+\frac{\tanh^{-1}\left(\frac{\sqrt{x+1}\sqrt{d+e}}{\sqrt{x-1}\sqrt{d-e}}\right)\left(d^2(2a+c)+e^2(a+2c)-3bde\right)}{(d-e)^{5/2}(d+e)^{5/2}}+\frac{\sqrt{x-1}\sqrt{x+1}\left(-de^2(3a+4c)+bd^2e+2be^3+cd^3\right)}{2e\left(d^2-e^2\right)^2(d+ex)}$$

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

Rubi [A] time = 0.652254, antiderivative size = 242, normalized size of antiderivative = 1.22, number of steps used = 5, number of rules used = 5, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.156$

$$\frac{\left(1-x^2\right)\left(ae^2-bde+cd^2\right)}{2e\sqrt{x-1}\sqrt{x+1}\left(d^2-e^2\right)(d+ex)^2}-\frac{\sqrt{x^2-1}\tanh^{-1}\left(\frac{dx+e}{\sqrt{x^2-1}\sqrt{d^2-e^2}}\right)\left(-a\left(2d^2+e^2\right)+3bde-c\left(d^2+2e^2\right)\right)}{2\sqrt{x-1}\sqrt{x+1}\left(d^2-e^2\right)^{5/2}}-\frac{\left(1-x^2\right)\left(c\left(d^3-4de^2\right)-e\left(3ade-b\left(d^2+2e^2\right)\right)\right)}{2e\sqrt{x-1}\sqrt{x+1}\left(d^2-e^2\right)^2(d+ex)}$$

Antiderivative was successfully verified.

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

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

Rubi in Sympy [A] time = 84.8412, size = 306, normalized size = 1.54

$$\frac{2c\operatorname{atanh}\left(\frac{\sqrt{d+e}\sqrt{x+1}}{\sqrt{d-e}\sqrt{x-1}}\right)}{e^2\sqrt{d-e}\sqrt{d+e}}-\frac{3d\sqrt{x-1}\sqrt{x+1}\left(ae^2-bde+cd^2\right)}{2e(d+ex)\left(d^2-e^2\right)^2}+\frac{2d(be-2cd)\operatorname{atanh}\left(\frac{\sqrt{d+e}\sqrt{x+1}}{\sqrt{d-e}\sqrt{x-1}}\right)}{e^2(d-e)^{\frac{3}{2}}(d+e)^{\frac{3}{2}}}-\frac{\sqrt{x-1}\sqrt{x+1}(be-2cd)}{e(d+ex)\left(d^2-e^2\right)}-\frac{\sqrt{x-1}\sqrt{x+1}\left(ae^2-bde+cd^2\right)}{2e(d+ex)^2\left(d^2-e^2\right)}+\frac{\left(2d^2+e^2\right)\left(ae^2-bde+cd^2\right)\operatorname{atanh}\left(\frac{\sqrt{d+e}\sqrt{x+1}}{\sqrt{d-e}\sqrt{x-1}}\right)}{e^2(d-e)^{\frac{5}{2}}(d+e)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((c*x**2+b*x+a)/(e*x+d)**3/(-1+x)**(1/2)/(1+x)**(1/2),x)
```

```
[Out] 2*c*atanh(sqrt(d + e)*sqrt(x + 1)/(sqrt(d - e)*sqrt(x - 1)))/(e**
2*sqrt(d - e)*sqrt(d + e)) - 3*d*sqrt(x - 1)*sqrt(x + 1)*(a*e**2
- b*d*e + c*d**2)/(2*e*(d + e*x)*(d**2 - e**2)**2) + 2*d*(b*e - 2
*c*d)*atanh(sqrt(d + e)*sqrt(x + 1)/(sqrt(d - e)*sqrt(x - 1)))/(e
**2*(d - e)**(3/2)*(d + e)**(3/2)) - sqrt(x - 1)*sqrt(x + 1)*(b*e
 - 2*c*d)/(e*(d + e*x)*(d**2 - e**2)) - sqrt(x - 1)*sqrt(x + 1)*(
a*e**2 - b*d*e + c*d**2)/(2*e*(d + e*x)**2*(d**2 - e**2)) + (2*d*
*2 + e**2)*(a*e**2 - b*d*e + c*d**2)*atanh(sqrt(d + e)*sqrt(x + 1
)/(sqrt(d - e)*sqrt(x - 1)))/(e**2*(d - e)**(5/2)*(d + e)**(5/2))
```

Mathematica [A] time = 0.709456, size = 178, normalized size = 0.89

$$\frac{\frac{2\tan^{-1}\left(\frac{\sqrt{\frac{x-1}{x+1}}\sqrt{e-d}}{\sqrt{d+e}}\right)\left(a\left(2d^2+e^2\right)-3bde+c\left(d^2+2e^2\right)\right)}{\sqrt{e-d}(d+e)^{5/2}}+\frac{\sqrt{x-1}\sqrt{x+1}\left(ae\left(-4d^2-3dex+e^2\right)+b\left(2d^3+d^2ex+de^2+2e^3x\right)+cd\left(d^2x-3de-4e^2x\right)\right)}{(d+e)^2(d+ex)^2}}{2(d-e)^2}$$

Warning: Unable to verify antiderivative.

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

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

Maple [B] time = 0.075, size = 1095, normalized size = 5.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^2+b*x+a)/(e*x+d)^3/(-1+x)^(1/2)/(1+x)^(1/2),x)
```

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

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.271378, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] [1/2*((2*b*d^3*e^2 - (4*a + 3*c)*d^2*e^3 + b*d*e^4 + a*e^5 + 2*(2
*c*d^4*e - (2*a + 5*c)*d^2*e^3 + 3*b*d*e^4 - a*e^5)*x^2 + (2*c*d^
5 + 2*b*d^4*e - (6*a + 7*c)*d^3*e^2 + 5*b*d^2*e^3 - (3*a + 4*c)*d
*e^4 + 2*b*e^5)*x)*sqrt(d^2 - e^2)*sqrt(x + 1)*sqrt(x - 1) + ((2*
a + c)*d^4*e^2 - 3*b*d^3*e^3 + (a + 2*c)*d^2*e^4 - 2*((2*a + c)*d
^2*e^4 - 3*b*d*e^5 + (a + 2*c)*e^6)*x^4 - 4*((2*a + c)*d^3*e^3 -
3*b*d^2*e^4 + (a + 2*c)*d*e^5)*x^3 - (2*(2*a + c)*d^4*e^2 - 6*b*d
^3*e^3 + 3*c*d^2*e^4 + 3*b*d*e^5 - (a + 2*c)*e^6)*x^2 + 2*(((2*a
+ c)*d^2*e^4 - 3*b*d*e^5 + (a + 2*c)*e^6)*x^3 + 2*((2*a + c)*d^3*
e^3 - 3*b*d^2*e^4 + (a + 2*c)*d*e^5)*x^2 + ((2*a + c)*d^4*e^2 - 3
*b*d^3*e^3 + (a + 2*c)*d^2*e^4)*x)*sqrt(x + 1)*sqrt(x - 1) + 2*((
2*a + c)*d^3*e^3 - 3*b*d^2*e^4 + (a + 2*c)*d*e^5)*x)*log((d^3 - d
*e^2 - (d^2*e - e^3 + (e^2*x + d*e)*sqrt(d^2 - e^2))*sqrt(x + 1)*
sqrt(x - 1) + (d^2*e - e^3)*x + (e^2*x^2 + d*e*x + d^2 - e^2)*sqr
t(d^2 - e^2))/(e*x^2 - (e*x + d)*sqrt(x + 1)*sqrt(x - 1) + d*x))
+ (c*d^5 + b*d^4*e - (3*a + 4*c)*d^3*e^2 + 2*b*d^2*e^3 - 2*(2*c*d
^4*e - (2*a + 5*c)*d^2*e^3 + 3*b*d*e^4 - a*e^5)*x^3 - (2*c*d^5 +
2*b*d^4*e - (6*a + 7*c)*d^3*e^2 + 5*b*d^2*e^3 - (3*a + 4*c)*d*e^4
 + 2*b*e^5)*x^2 + 2*(c*d^4*e - b*d^3*e^2 + (a - c)*d^2*e^3 + b*d*
e^4 - a*e^5)*x)*sqrt(d^2 - e^2))/(2*((d^4*e^4 - 2*d^2*e^6 + e^8)*
x^3 + 2*(d^5*e^3 - 2*d^3*e^5 + d*e^7)*x^2 + (d^6*e^2 - 2*d^4*e^4
+ d^2*e^6)*x)*sqrt(d^2 - e^2)*sqrt(x + 1)*sqrt(x - 1) + (d^6*e^2
- 2*d^4*e^4 + d^2*e^6 - 2*(d^4*e^4 - 2*d^2*e^6 + e^8)*x^4 - 4*(d^
5*e^3 - 2*d^3*e^5 + d*e^7)*x^3 - (2*d^6*e^2 - 5*d^4*e^4 + 4*d^2*e
^6 - e^8)*x^2 + 2*(d^5*e^3 - 2*d^3*e^5 + d*e^7)*x)*sqrt(d^2 - e^2
)), 1/2*((2*b*d^3*e^2 - (4*a + 3*c)*d^2*e^3 + b*d*e^4 + a*e^5 + 2
*(2*c*d^4*e - (2*a + 5*c)*d^2*e^3 + 3*b*d*e^4 - a*e^5)*x^2 + (2*c
*d^5 + 2*b*d^4*e - (6*a + 7*c)*d^3*e^2 + 5*b*d^2*e^3 - (3*a + 4*c
)*d*e^4 + 2*b*e^5)*x)*sqrt(-d^2 + e^2)*sqrt(x + 1)*sqrt(x - 1) +
2*((2*a + c)*d^4*e^2 - 3*b*d^3*e^3 + (a + 2*c)*d^2*e^4 - 2*((2*a
+ c)*d^2*e^4 - 3*b*d*e^5 + (a + 2*c)*e^6)*x^4 - 4*((2*a + c)*d^3*
e^3 - 3*b*d^2*e^4 + (a + 2*c)*d*e^5)*x^3 - (2*(2*a + c)*d^4*e^2 -
 6*b*d^3*e^3 + 3*c*d^2*e^4 + 3*b*d*e^5 - (a + 2*c)*e^6)*x^2 + 2*(
((2*a + c)*d^2*e^4 - 3*b*d*e^5 + (a + 2*c)*e^6)*x^3 + 2*((2*a + c
)*d^3*e^3 - 3*b*d^2*e^4 + (a + 2*c)*d*e^5)*x^2 + ((2*a + c)*d^4*e
^2 - 3*b*d^3*e^3 + (a + 2*c)*d^2*e^4)*x)*sqrt(x + 1)*sqrt(x - 1)
+ 2*((2*a + c)*d^3*e^3 - 3*b*d^2*e^4 + (a + 2*c)*d*e^5)*x)*arctan
(-(sqrt(-d^2 + e^2)*e*sqrt(x + 1)*sqrt(x - 1) - sqrt(-d^2 + e^2)*
(e*x + d))/(d^2 - e^2)) + (c*d^5 + b*d^4*e - (3*a + 4*c)*d^3*e^2
+ 2*b*d^2*e^3 - 2*(2*c*d^4*e - (2*a + 5*c)*d^2*e^3 + 3*b*d*e^4 -
a*e^5)*x^3 - (2*c*d^5 + 2*b*d^4*e - (6*a + 7*c)*d^3*e^2 + 5*b*d^2
*e^3 - (3*a + 4*c)*d*e^4 + 2*b*e^5)*x^2 + 2*(c*d^4*e - b*d^3*e^2
+ (a - c)*d^2*e^3 + b*d*e^4 - a*e^5)*x)*sqrt(-d^2 + e^2))/(2*((d^
4*e^4 - 2*d^2*e^6 + e^8)*x^3 + 2*(d^5*e^3 - 2*d^3*e^5 + d*e^7)*x^
2 + (d^6*e^2 - 2*d^4*e^4 + d^2*e^6)*x)*sqrt(-d^2 + e^2)*sqrt(x +
1)*sqrt(x - 1) + (d^6*e^2 - 2*d^4*e^4 + d^2*e^6 - 2*(d^4*e^4 - 2*
d^2*e^6 + e^8)*x^4 - 4*(d^5*e^3 - 2*d^3*e^5 + d*e^7)*x^3 - (2*d^6
*e^2 - 5*d^4*e^4 + 4*d^2*e^6 - e^8)*x^2 + 2*(d^5*e^3 - 2*d^3*e^5
+ d*e^7)*x)*sqrt(-d^2 + e^2))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)/(e*x+d)**3/(-1+x)**(1/2)/(1+x)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.409886, size = 817, normalized size = 4.11

$$-\frac{\left(2\,ad^2+cd^2-3\,bde+ae^2+2\,ce^2\right)\arctan\left(\frac{\left(\sqrt{x+1}-\sqrt{x-1}\right)^2e+2\,d}{2\,\sqrt{-d^2+e^2}}\right)}{\left(d^4-2\,d^2e^2+e^4\right)\sqrt{-d^2+e^2}}+\frac{2\left(2\,cd^4\left(\sqrt{x+1}-\sqrt{x-1}\right)^6e+4\,cd^5\left(\sqrt{x+1}-\sqrt{x-1}\right)^4-2\,ad^2\left(\sqrt{x+1}-\sqrt{x-1}\right)^6e^3-5\,cd^2\left(\sqrt{x+1}-\sqrt{x-1}\right)^6e^3+4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(2*a*d^2 + c*d^2 - 3*b*d*e + a*e^2 + 2*c*e^2)*arctan(1/2*((sqrt(
x + 1) - sqrt(x - 1))^2*e + 2*d)/sqrt(-d^2 + e^2))/((d^4 - 2*d^2*
e^2 + e^4)*sqrt(-d^2 + e^2)) + 2*(2*c*d^4*(sqrt(x + 1) - sqrt(x -
 1))^6*e + 4*c*d^5*(sqrt(x + 1) - sqrt(x - 1))^4 - 2*a*d^2*(sqrt(
x + 1) - sqrt(x - 1))^6*e^3 - 5*c*d^2*(sqrt(x + 1) - sqrt(x - 1))
^6*e^3 + 4*b*d^4*(sqrt(x + 1) - sqrt(x - 1))^4*e + 3*b*d*(sqrt(x
+ 1) - sqrt(x - 1))^6*e^4 - 12*a*d^3*(sqrt(x + 1) - sqrt(x - 1))^
4*e^2 - 14*c*d^3*(sqrt(x + 1) - sqrt(x - 1))^4*e^2 - a*(sqrt(x +
1) - sqrt(x - 1))^6*e^5 + 10*b*d^2*(sqrt(x + 1) - sqrt(x - 1))^4*
e^3 + 8*c*d^4*(sqrt(x + 1) - sqrt(x - 1))^2*e - 6*a*d*(sqrt(x + 1
) - sqrt(x - 1))^4*e^4 - 8*c*d*(sqrt(x + 1) - sqrt(x - 1))^4*e^4
+ 16*b*d^3*(sqrt(x + 1) - sqrt(x - 1))^2*e^2 + 4*b*(sqrt(x + 1) -
 sqrt(x - 1))^4*e^5 - 40*a*d^2*(sqrt(x + 1) - sqrt(x - 1))^2*e^3
- 44*c*d^2*(sqrt(x + 1) - sqrt(x - 1))^2*e^3 + 20*b*d*(sqrt(x + 1
) - sqrt(x - 1))^2*e^4 + 8*c*d^3*e^2 + 4*a*(sqrt(x + 1) - sqrt(x
- 1))^2*e^5 + 8*b*d^2*e^3 - 24*a*d*e^4 - 32*c*d*e^4 + 16*b*e^5)/(
(d^4*e^2 - 2*d^2*e^4 + e^6)*((sqrt(x + 1) - sqrt(x - 1))^4*e + 4*
d*(sqrt(x + 1) - sqrt(x - 1))^2 + 4*e)^2)
```

3.75 $\int (a+bx)^2\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=1348

result too large to display

```
[Out] ((d*e - c*f)*(8*a^2*d^2*f^2*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2
) + 8*d*f*(2*A*d*f - B*(d*e + c*f))) - 8*a*b*d*f*(C*(7*d^3*e^3 +
9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e
+ c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))) + b^2*(C*(21*d^4
*e^4 + 28*c*d^3*e^3*f + 30*c^2*d^2*e^2*f^2 + 28*c^3*d*e*f^3 + 21*
c^4*f^4) + 4*d*f*(2*A*d*f*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) - B
*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3))))*Sqrt[
c + d*x]*Sqrt[e + f*x])/(512*d^5*f^5) + ((8*a^2*d^2*f^2*(C*(5*d^2
*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*e + c*f)))
- 8*a*b*d*f*(C*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3
*f^3) + 2*d*f*(8*A*d*f*(d*e + c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5
*c^2*f^2))) + b^2*(C*(21*d^4*e^4 + 28*c*d^3*e^3*f + 30*c^2*d^2*e^
2*f^2 + 28*c^3*d*e*f^3 + 21*c^4*f^4) + 4*d*f*(2*A*d*f*(5*d^2*e^2
+ 6*c*d*e*f + 5*c^2*f^2) - B*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d
*e*f^2 + 7*c^3*f^3))))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(256*d^5*f^
4) - ((2*a*C*d*f - b*(4*B*d*f - 3*C*(d*e + c*f)))*(a + b*x)^2*(c
+ d*x)^(3/2)*(e + f*x)^(3/2))/(20*b*d^2*f^2) + (C*(a + b*x)^3*(c
+ d*x)^(3/2)*(e + f*x)^(3/2))/(6*b*d*f) - ((c + d*x)^(3/2)*(e + f
*x)^(3/2)*(64*a^3*C*d^3*f^3 - 8*a^2*b*d^2*f^2*(16*B*d*f - 7*C*(d*
e + c*f)) - 8*a*b^2*d*f*(C*(35*d^2*e^2 + 38*c*d*e*f + 35*c^2*f^2)
 + 10*d*f*(8*A*d*f - 5*B*(d*e + c*f))) + b^3*(7*C*(15*d^3*e^3 + 1
7*c*d^2*e^2*f + 17*c^2*d*e*f^2 + 15*c^3*f^3) + 4*d*f*(50*A*d*f*(d
*e + c*f) - B*(35*d^2*e^2 + 38*c*d*e*f + 35*c^2*f^2))) + 6*b*d*f*
(10*b*d*f*(2*b*c*C*e + a*C*d*e + a*c*C*f - 4*A*b*d*f) + (4*a*d*f
- 7*b*(d*e + c*f))*(2*a*C*d*f - b*(4*B*d*f - 3*C*(d*e + c*f))))*x
))/(960*b*d^4*f^4) - ((d*e - c*f)^2*(8*a^2*d^2*f^2*(C*(5*d^2*e^2
+ 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*e + c*f))) - 8*a
*b*d*f*(C*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3)
 + 2*d*f*(8*A*d*f*(d*e + c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*
f^2))) + b^2*(C*(21*d^4*e^4 + 28*c*d^3*e^3*f + 30*c^2*d^2*e^2*f^2
 + 28*c^3*d*e*f^3 + 21*c^4*f^4) + 4*d*f*(2*A*d*f*(5*d^2*e^2 + 6*c
*d*e*f + 5*c^2*f^2) - B*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^
2 + 7*c^3*f^3))))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e
 + f*x])])/(512*d^(11/2)*f^(11/2))
```

Rubi [A] time = 6.34984, antiderivative size = 1345, normalized size of antiderivative = 1., number

of steps used = 7, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{C(c+dx)^{3/2}(e+fx)^{3/2}(a+bx)^3}{6bdf} + \frac{(4bBdf-2aCdf-3bC(de+cf))(c+dx)^{3/2}(e+fx)^{3/2}(a+bx)^2}{20bd^2f^2}$$

$$-\frac{(c+dx)^{3/2}(e+fx)^{3/2}\left(\left(7C\left(15d^3e^3+17cd^2fe^2+17c^2df^2e+15c^3f^3\right)+4df\left(50Adf(de+cf)-B\left(35d^2e^2+38cdfe+35\right.\right.\right.\right.}{}$$

$$-\frac{(de-cf)^2\left(\left(C\left(21d^4e^4+28cd^3fe^3+30c^2d^2f^2e^2+28c^3df^3e+21c^4f^4\right)+4df\left(2Adf\left(5d^2e^2+6cdfe+5c^2f^2\right)-B\left(7d^3e\right.\right.\right.\right.}{}$$

$$+\frac{\left(\left(C\left(21d^4e^4+28cd^3fe^3+30c^2d^2f^2e^2+28c^3df^3e+21c^4f^4\right)+4df\left(2Adf\left(5d^2e^2+6cdfe+5c^2f^2\right)-B\left(7d^3e^3+9cd^2fe^2\right.\right.\right.\right.}{}$$

$$+\frac{(de-cf)\left(\left(C\left(21d^4e^4+28cd^3fe^3+30c^2d^2f^2e^2+28c^3df^3e+21c^4f^4\right)+4df\left(2Adf\left(5d^2e^2+6cdfe+5c^2f^2\right)-B\left(7d^3e^3\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] ((d*e - c*f)*(8*a^2*d^2*f^2*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2
) + 8*d*f*(2*A*d*f - B*(d*e + c*f))) - 8*a*b*d*f*(C*(7*d^3*e^3 +
9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e
+ c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))) + b^2*(C*(21*d^4
*e^4 + 28*c*d^3*e^3*f + 30*c^2*d^2*e^2*f^2 + 28*c^3*d*e*f^3 + 21*
c^4*f^4) + 4*d*f*(2*A*d*f*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) - B
*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3))))*Sqrt[
c + d*x]*Sqrt[e + f*x])/(512*d^5*f^5) + ((8*a^2*d^2*f^2*(C*(5*d^2
*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*e + c*f)))
- 8*a*b*d*f*(C*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3
*f^3) + 2*d*f*(8*A*d*f*(d*e + c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5
*c^2*f^2))) + b^2*(C*(21*d^4*e^4 + 28*c*d^3*e^3*f + 30*c^2*d^2*e^
2*f^2 + 28*c^3*d*e*f^3 + 21*c^4*f^4) + 4*d*f*(2*A*d*f*(5*d^2*e^2
+ 6*c*d*e*f + 5*c^2*f^2) - B*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d
*e*f^2 + 7*c^3*f^3))))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(256*d^5*f^
4) + ((4*b*B*d*f - 2*a*C*d*f - 3*b*C*(d*e + c*f))*(a + b*x)^2*(c
+ d*x)^(3/2)*(e + f*x)^(3/2))/(20*b*d^2*f^2) + (C*(a + b*x)^3*(c
+ d*x)^(3/2)*(e + f*x)^(3/2))/(6*b*d*f) - ((c + d*x)^(3/2)*(e + f
*x)^(3/2)*(64*a^3*C*d^3*f^3 - 8*a^2*b*d^2*f^2*(16*B*d*f - 7*C*(d*
e + c*f)) - 8*a*b^2*d*f*(C*(35*d^2*e^2 + 38*c*d*e*f + 35*c^2*f^2)
 + 10*d*f*(8*A*d*f - 5*B*(d*e + c*f))) + b^3*(7*C*(15*d^3*e^3 + 1
7*c*d^2*e^2*f + 17*c^2*d*e*f^2 + 15*c^3*f^3) + 4*d*f*(50*A*d*f*(d
*e + c*f) - B*(35*d^2*e^2 + 38*c*d*e*f + 35*c^2*f^2))) + 6*b*d*f*
(10*b*d*f*(2*b*c*C*e + a*C*d*e + a*c*C*f - 4*A*b*d*f) - (4*a*d*f
- 7*b*(d*e + c*f))*(4*b*B*d*f - 2*a*C*d*f - 3*b*C*(d*e + c*f)))*x
))/(960*b*d^4*f^4) - ((d*e - c*f)^2*(8*a^2*d^2*f^2*(C*(5*d^2*e^2
+ 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*e + c*f))) - 8*a
*b*d*f*(C*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3)
 + 2*d*f*(8*A*d*f*(d*e + c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*
f^2))) + b^2*(C*(21*d^4*e^4 + 28*c*d^3*e^3*f + 30*c^2*d^2*e^2*f^2
 + 28*c^3*d*e*f^3 + 21*c^4*f^4) + 4*d*f*(2*A*d*f*(5*d^2*e^2 + 6*c
*d*e*f + 5*c^2*f^2) - B*(7*d^3*e^3 + 9*c*d^2*e^2*f + 9*c^2*d*e*f^
2 + 7*c^3*f^3))))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e
```

```
 + f*x])])/(512*d^(11/2)*f^(11/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**2*(C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 6.53181, size = 1801, normalized size = 1.34

$$\sqrt{c+dx}\sqrt{e+fx}\left(\frac{1}{6}b^2Cx^5+\frac{b(bCde+bcCf+12bBdf+24aCdf)x^4}{60df}\right.$$
$$+\frac{\left(-9Cd^2e^2b^2+120Ad^2f^2b^2-9c^2Cf^2b^2+12Bcdf^2b^2+12Bd^2efb^2+2cCdefb^2+240aBd^2f^2b+24acCdf^2b+24aCd^2efb\right.}{480d^2f^2}$$
$$+\frac{\left(21b^2Ce^3d^3+640aAbf^3d^3+320a^2Bf^3d^3+40Ab^2ef^2d^3+80abBef^2d^3+40a^2Cef^2d^3-28b^2Be^2fd^3-56abCe^2fd^3+40A\right.}{}$$
$$+\frac{\left(-105b^2Ce^4d^4+1920a^2Af^4d^4+640aAbef^3d^4+320a^2Bef^3d^4-200Ab^2e^2f^2d^4-400abBe^2f^2d^4-200a^2Ce^2f^2d^4+140b\right.}{}$$
$$+\frac{315b^2Ce^5d^5+1920a^2Aef^4d^5-1920aAbe^2f^3d^5-960a^2Be^2f^3d^5+600Ab^2e^3f^2d^5+1200abBe^3f^2d^5+600a^2Ce^3f^2d^5-42}{}$$
$$-\frac{(de-cf)^2\left(21b^2Ce^4d^4+128a^2Af^4d^4-128aAbef^3d^4-64a^2Bef^3d^4+40Ab^2e^2f^2d^4+80abBe^2f^2d^4+40a^2Ce^2f^2d^4-28\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] Sqrt[c + d*x]*Sqrt[e + f*x]*((315*b^2*C*d^5*e^5 - 105*b^2*c*C*d^4
*e^4*f - 420*b^2*B*d^5*e^4*f - 840*a*b*C*d^5*e^4*f - 82*b^2*c^2*C
*d^3*e^3*f^2 + 160*b^2*B*c*d^4*e^3*f^2 + 320*a*b*c*C*d^4*e^3*f^2
+ 600*A*b^2*d^5*e^3*f^2 + 1200*a*b*B*d^5*e^3*f^2 + 600*a^2*C*d^5*
e^3*f^2 - 82*b^2*c^3*C*d^2*e^2*f^3 + 136*b^2*B*c^2*d^3*e^2*f^3 +
272*a*b*c^2*C*d^3*e^2*f^3 - 280*A*b^2*c*d^4*e^2*f^3 - 560*a*b*B*c
*d^4*e^2*f^3 - 280*a^2*c*C*d^4*e^2*f^3 - 1920*a*A*b*d^5*e^2*f^3 -
 960*a^2*B*d^5*e^2*f^3 - 105*b^2*c^4*C*d*e*f^4 + 160*b^2*B*c^3*d^
2*e*f^4 + 320*a*b*c^3*C*d^2*e*f^4 - 280*A*b^2*c^2*d^3*e*f^4 - 560
*a*b*B*c^2*d^3*e*f^4 - 280*a^2*c^2*C*d^3*e*f^4 + 1280*a*A*b*c*d^4
*e*f^4 + 640*a^2*B*c*d^4*e*f^4 + 1920*a^2*A*d^5*e*f^4 + 315*b^2*c
^5*C*f^5 - 420*b^2*B*c^4*d*f^5 - 840*a*b*c^4*C*d*f^5 + 600*A*b^2*
```

```
c^3*d^2*f^5 + 1200*a*b*B*c^3*d^2*f^5 + 600*a^2*c^3*C*d^2*f^5 - 19
20*a*A*b*c^2*d^3*f^5 - 960*a^2*B*c^2*d^3*f^5 + 1920*a^2*A*c*d^4*f
^5)/(7680*d^5*f^5) + ((-105*b^2*C*d^4*e^4 + 28*b^2*c*C*d^3*e^3*f
+ 140*b^2*B*d^4*e^3*f + 280*a*b*C*d^4*e^3*f + 26*b^2*c^2*C*d^2*e^
2*f^2 - 44*b^2*B*c*d^3*e^2*f^2 - 88*a*b*c*C*d^3*e^2*f^2 - 200*A*b
^2*d^4*e^2*f^2 - 400*a*b*B*d^4*e^2*f^2 - 200*a^2*C*d^4*e^2*f^2 +
28*b^2*c^3*C*d*e*f^3 - 44*b^2*B*c^2*d^2*e*f^3 - 88*a*b*c^2*C*d^2*
e*f^3 + 80*A*b^2*c*d^3*e*f^3 + 160*a*b*B*c*d^3*e*f^3 + 80*a^2*c*C
*d^3*e*f^3 + 640*a*A*b*d^4*e*f^3 + 320*a^2*B*d^4*e*f^3 - 105*b^2*
c^4*C*f^4 + 140*b^2*B*c^3*d*f^4 + 280*a*b*c^3*C*d*f^4 - 200*A*b^2
*c^2*d^2*f^4 - 400*a*b*B*c^2*d^2*f^4 - 200*a^2*c^2*C*d^2*f^4 + 64
0*a*A*b*c*d^3*f^4 + 320*a^2*B*c*d^3*f^4 + 1920*a^2*A*d^4*f^4)*x)/
(3840*d^4*f^4) + ((21*b^2*C*d^3*e^3 - 5*b^2*c*C*d^2*e^2*f - 28*b^
2*B*d^3*e^2*f - 56*a*b*C*d^3*e^2*f - 5*b^2*c^2*C*d*e*f^2 + 8*b^2*
B*c*d^2*e*f^2 + 16*a*b*c*C*d^2*e*f^2 + 40*A*b^2*d^3*e*f^2 + 80*a*
b*B*d^3*e*f^2 + 40*a^2*C*d^3*e*f^2 + 21*b^2*c^3*C*f^3 - 28*b^2*B*
c^2*d*f^3 - 56*a*b*c^2*C*d*f^3 + 40*A*b^2*c*d^2*f^3 + 80*a*b*B*c*
d^2*f^3 + 40*a^2*c*C*d^2*f^3 + 640*a*A*b*d^3*f^3 + 320*a^2*B*d^3*
f^3)*x^2)/(960*d^3*f^3) + ((-9*b^2*C*d^2*e^2 + 2*b^2*c*C*d*e*f +
12*b^2*B*d^2*e*f + 24*a*b*C*d^2*e*f - 9*b^2*c^2*C*f^2 + 12*b^2*B*
c*d*f^2 + 24*a*b*c*C*d*f^2 + 120*A*b^2*d^2*f^2 + 240*a*b*B*d^2*f^
2 + 120*a^2*C*d^2*f^2)*x^3)/(480*d^2*f^2) + (b*(b*C*d*e + b*c*C*f
 + 12*b*B*d*f + 24*a*C*d*f)*x^4)/(60*d*f) + (b^2*C*x^5)/6) - ((d*
e - c*f)^2*(21*b^2*C*d^4*e^4 + 28*b^2*c*C*d^3*e^3*f - 28*b^2*B*d^
4*e^3*f - 56*a*b*C*d^4*e^3*f + 30*b^2*c^2*C*d^2*e^2*f^2 - 36*b^2*
B*c*d^3*e^2*f^2 - 72*a*b*c*C*d^3*e^2*f^2 + 40*A*b^2*d^4*e^2*f^2 +
 80*a*b*B*d^4*e^2*f^2 + 40*a^2*C*d^4*e^2*f^2 + 28*b^2*c^3*C*d*e*f
^3 - 36*b^2*B*c^2*d^2*e*f^3 - 72*a*b*c^2*C*d^2*e*f^3 + 48*A*b^2*c
*d^3*e*f^3 + 96*a*b*B*c*d^3*e*f^3 + 48*a^2*c*C*d^3*e*f^3 - 128*a*
A*b*d^4*e*f^3 - 64*a^2*B*d^4*e*f^3 + 21*b^2*c^4*C*f^4 - 28*b^2*B*
c^3*d*f^4 - 56*a*b*c^3*C*d*f^4 + 40*A*b^2*c^2*d^2*f^4 + 80*a*b*B*
c^2*d^2*f^4 + 40*a^2*c^2*C*d^2*f^4 - 128*a*A*b*c*d^3*f^4 - 64*a^2
*B*c*d^3*f^4 + 128*a^2*A*d^4*f^4)*Log[d*e + c*f + 2*d*f*x + 2*Sqr
t[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(1024*d^(11/2)*f^(11/2
))
```

Maple [B] time = 0.062, size = 6728, normalized size = 5.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^2*(C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm='
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.4495, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm='
```

```
[Out] [1/30720*(4*(1280*C*b^2*d^5*f^5*x^5 + 315*C*b^2*d^5*e^5 - 105*(C*
b^2*c*d^4 + 4*(2*C*a*b + B*b^2)*d^5)*e^4*f - 2*(41*C*b^2*c^2*d^3
- 80*(2*C*a*b + B*b^2)*c*d^4 - 300*(C*a^2 + 2*B*a*b + A*b^2)*d^5)
*e^3*f^2 - 2*(41*C*b^2*c^3*d^2 - 68*(2*C*a*b + B*b^2)*c^2*d^3 + 1
40*(C*a^2 + 2*B*a*b + A*b^2)*c*d^4 + 480*(B*a^2 + 2*A*a*b)*d^5)*e
^2*f^3 - 5*(21*C*b^2*c^4*d - 384*A*a^2*d^5 - 32*(2*C*a*b + B*b^2)
*c^3*d^2 + 56*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 - 128*(B*a^2 + 2*
A*a*b)*c*d^4)*e*f^4 + 15*(21*C*b^2*c^5 + 128*A*a^2*c*d^4 - 28*(2*
C*a*b + B*b^2)*c^4*d + 40*(C*a^2 + 2*B*a*b + A*b^2)*c^3*d^2 - 64*
(B*a^2 + 2*A*a*b)*c^2*d^3)*f^5 + 128*(C*b^2*d^5*e*f^4 + (C*b^2*c*
d^4 + 12*(2*C*a*b + B*b^2)*d^5)*f^5)*x^4 - 16*(9*C*b^2*d^5*e^2*f^
3 - 2*(C*b^2*c*d^4 + 6*(2*C*a*b + B*b^2)*d^5)*e*f^4 + 3*(3*C*b^2*
c^2*d^3 - 4*(2*C*a*b + B*b^2)*c*d^4 - 40*(C*a^2 + 2*B*a*b + A*b^2
)*d^5)*f^5)*x^3 + 8*(21*C*b^2*d^5*e^3*f^2 - (5*C*b^2*c*d^4 + 28*(
2*C*a*b + B*b^2)*d^5)*e^2*f^3 - (5*C*b^2*c^2*d^3 - 8*(2*C*a*b + B
*b^2)*c*d^4 - 40*(C*a^2 + 2*B*a*b + A*b^2)*d^5)*e*f^4 + (21*C*b^2
*c^3*d^2 - 28*(2*C*a*b + B*b^2)*c^2*d^3 + 40*(C*a^2 + 2*B*a*b + A
*b^2)*c*d^4 + 320*(B*a^2 + 2*A*a*b)*d^5)*f^5)*x^2 - 2*(105*C*b^2*
d^5*e^4*f - 28*(C*b^2*c*d^4 + 5*(2*C*a*b + B*b^2)*d^5)*e^3*f^2 -
2*(13*C*b^2*c^2*d^3 - 22*(2*C*a*b + B*b^2)*c*d^4 - 100*(C*a^2 + 2
*B*a*b + A*b^2)*d^5)*e^2*f^3 - 4*(7*C*b^2*c^3*d^2 - 11*(2*C*a*b +
 B*b^2)*c^2*d^3 + 20*(C*a^2 + 2*B*a*b + A*b^2)*c*d^4 + 80*(B*a^2
+ 2*A*a*b)*d^5)*e*f^4 + 5*(21*C*b^2*c^4*d - 384*A*a^2*d^5 - 28*(2
*C*a*b + B*b^2)*c^3*d^2 + 40*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 -
64*(B*a^2 + 2*A*a*b)*c*d^4)*f^5)*x)*sqrt(d*f)*sqrt(d*x + c)*sqrt(
f*x + e) + 15*(21*C*b^2*d^6*e^6 - 14*(C*b^2*c*d^5 + 2*(2*C*a*b +
B*b^2)*d^6)*e^5*f - 5*(C*b^2*c^2*d^4 - 4*(2*C*a*b + B*b^2)*c*d^5
- 8*(C*a^2 + 2*B*a*b + A*b^2)*d^6)*e^4*f^2 - 4*(C*b^2*c^3*d^3 - 2
*(2*C*a*b + B*b^2)*c^2*d^4 + 8*(C*a^2 + 2*B*a*b + A*b^2)*c*d^5 +
16*(B*a^2 + 2*A*a*b)*d^6)*e^3*f^3 - (5*C*b^2*c^4*d^2 - 128*A*a^2*
d^6 - 8*(2*C*a*b + B*b^2)*c^3*d^3 + 16*(C*a^2 + 2*B*a*b + A*b^2)*
c^2*d^4 - 64*(B*a^2 + 2*A*a*b)*c*d^5)*e^2*f^4 - 2*(7*C*b^2*c^5*d
+ 128*A*a^2*c*d^5 - 10*(2*C*a*b + B*b^2)*c^4*d^2 + 16*(C*a^2 + 2*
B*a*b + A*b^2)*c^3*d^3 - 32*(B*a^2 + 2*A*a*b)*c^2*d^4)*e*f^5 + (2
1*C*b^2*c^6 + 128*A*a^2*c^2*d^4 - 28*(2*C*a*b + B*b^2)*c^5*d + 40
*(C*a^2 + 2*B*a*b + A*b^2)*c^4*d^2 - 64*(B*a^2 + 2*A*a*b)*c^3*d^3
)*f^6)*log(-4*(2*d^2*f^2*x + d^2*e*f + c*d*f^2)*sqrt(d*x + c)*sqr
```

```
t(f*x + e) + (8*d^2*f^2*x^2 + d^2*e^2 + 6*c*d*e*f + c^2*f^2 + 8*(
d^2*e*f + c*d*f^2)*x)*sqrt(d*f)))/(sqrt(d*f)*d^5*f^5), 1/15360*(2
*(1280*C*b^2*d^5*f^5*x^5 + 315*C*b^2*d^5*e^5 - 105*(C*b^2*c*d^4 +
 4*(2*C*a*b + B*b^2)*d^5)*e^4*f - 2*(41*C*b^2*c^2*d^3 - 80*(2*C*a
*b + B*b^2)*c*d^4 - 300*(C*a^2 + 2*B*a*b + A*b^2)*d^5)*e^3*f^2 -
2*(41*C*b^2*c^3*d^2 - 68*(2*C*a*b + B*b^2)*c^2*d^3 + 140*(C*a^2 +
 2*B*a*b + A*b^2)*c*d^4 + 480*(B*a^2 + 2*A*a*b)*d^5)*e^2*f^3 - 5*
(21*C*b^2*c^4*d - 384*A*a^2*d^5 - 32*(2*C*a*b + B*b^2)*c^3*d^2 +
56*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 - 128*(B*a^2 + 2*A*a*b)*c*d^
4)*e*f^4 + 15*(21*C*b^2*c^5 + 128*A*a^2*c*d^4 - 28*(2*C*a*b + B*b
^2)*c^4*d + 40*(C*a^2 + 2*B*a*b + A*b^2)*c^3*d^2 - 64*(B*a^2 + 2*
A*a*b)*c^2*d^3)*f^5 + 128*(C*b^2*d^5*e*f^4 + (C*b^2*c*d^4 + 12*(2
*C*a*b + B*b^2)*d^5)*f^5)*x^4 - 16*(9*C*b^2*d^5*e^2*f^3 - 2*(C*b^
2*c*d^4 + 6*(2*C*a*b + B*b^2)*d^5)*e*f^4 + 3*(3*C*b^2*c^2*d^3 - 4
*(2*C*a*b + B*b^2)*c*d^4 - 40*(C*a^2 + 2*B*a*b + A*b^2)*d^5)*f^5)
*x^3 + 8*(21*C*b^2*d^5*e^3*f^2 - (5*C*b^2*c*d^4 + 28*(2*C*a*b + B
*b^2)*d^5)*e^2*f^3 - (5*C*b^2*c^2*d^3 - 8*(2*C*a*b + B*b^2)*c*d^4
 - 40*(C*a^2 + 2*B*a*b + A*b^2)*d^5)*e*f^4 + (21*C*b^2*c^3*d^2 -
28*(2*C*a*b + B*b^2)*c^2*d^3 + 40*(C*a^2 + 2*B*a*b + A*b^2)*c*d^4
 + 320*(B*a^2 + 2*A*a*b)*d^5)*f^5)*x^2 - 2*(105*C*b^2*d^5*e^4*f -
 28*(C*b^2*c*d^4 + 5*(2*C*a*b + B*b^2)*d^5)*e^3*f^2 - 2*(13*C*b^2
*c^2*d^3 - 22*(2*C*a*b + B*b^2)*c*d^4 - 100*(C*a^2 + 2*B*a*b + A*
b^2)*d^5)*e^2*f^3 - 4*(7*C*b^2*c^3*d^2 - 11*(2*C*a*b + B*b^2)*c^2
*d^3 + 20*(C*a^2 + 2*B*a*b + A*b^2)*c*d^4 + 80*(B*a^2 + 2*A*a*b)*
d^5)*e*f^4 + 5*(21*C*b^2*c^4*d - 384*A*a^2*d^5 - 28*(2*C*a*b + B*
b^2)*c^3*d^2 + 40*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^3 - 64*(B*a^2 +
 2*A*a*b)*c*d^4)*f^5)*x)*sqrt(-d*f)*sqrt(d*x + c)*sqrt(f*x + e) -
 15*(21*C*b^2*d^6*e^6 - 14*(C*b^2*c*d^5 + 2*(2*C*a*b + B*b^2)*d^6
)*e^5*f - 5*(C*b^2*c^2*d^4 - 4*(2*C*a*b + B*b^2)*c*d^5 - 8*(C*a^2
 + 2*B*a*b + A*b^2)*d^6)*e^4*f^2 - 4*(C*b^2*c^3*d^3 - 2*(2*C*a*b
+ B*b^2)*c^2*d^4 + 8*(C*a^2 + 2*B*a*b + A*b^2)*c*d^5 + 16*(B*a^2
+ 2*A*a*b)*d^6)*e^3*f^3 - (5*C*b^2*c^4*d^2 - 128*A*a^2*d^6 - 8*(2
*C*a*b + B*b^2)*c^3*d^3 + 16*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^4 -
64*(B*a^2 + 2*A*a*b)*c*d^5)*e^2*f^4 - 2*(7*C*b^2*c^5*d + 128*A*a^
2*c*d^5 - 10*(2*C*a*b + B*b^2)*c^4*d^2 + 16*(C*a^2 + 2*B*a*b + A*
b^2)*c^3*d^3 - 32*(B*a^2 + 2*A*a*b)*c^2*d^4)*e*f^5 + (21*C*b^2*c^
6 + 128*A*a^2*c^2*d^4 - 28*(2*C*a*b + B*b^2)*c^5*d + 40*(C*a^2 +
2*B*a*b + A*b^2)*c^4*d^2 - 64*(B*a^2 + 2*A*a*b)*c^3*d^3)*f^6)*arc
tan(1/2*(2*d*f*x + d*e + c*f)*sqrt(-d*f)/(sqrt(d*x + c)*sqrt(f*x
+ e)*d*f)))/(sqrt(-d*f)*d^5*f^5)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a+bx)^2 \sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*x)**2*sqrt(c + d*x)*sqrt(e + f*x)*(A + B*x + C*x*
*2), x)
```

GIAC/XCAS [A] time = 0.480446, size = 1, normalized size = 0.

$$Done$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm='
```

```
[Out] Done
```

3.76 $\int (a+bx)\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=721

$$-\frac{(c+dx)^{3/2}(e+fx)^{3/2}\left(48a^2Cd^2f^2+6bdfx(6aCdf-b(10Bdf-7C(cf+de)))-10abdf(8Bdf-5C(cf+de))+b^2\left(-\left(1\right.\right.\right.}{240bd^3f^3}$$

$$-\frac{(de-cf)^2\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(2adf\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)-b\left(2df\left(8Adf(cf+de)-\right.\right.\right.}{128d^{9/2}f^{9/2}}$$

$$+\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(2adf\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)-b\left(2df\left(8Adf(cf+de)-B\left(5c^2f^2+\right.\right.\right.\right.}{64d^4f^3}$$

$$+\frac{\sqrt{c+dx}\sqrt{e+fx}(de-cf)\left(2adf\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)-b\left(2df\left(8Adf(cf+de)-B\left(\right.\right.\right.\right.}{128d^4f^4}$$

$$+\frac{C(a+bx)^2(c+dx)^{3/2}(e+fx)^{3/2}}{5bdf}$$

```
[Out] ((d*e - c*f)*(2*a*d*f*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*
d*f*(2*A*d*f - B*(d*e + c*f))) - b*(C*(7*d^3*e^3 + 9*c*d^2*e^2*f
+ 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e + c*f) - B*(5*
d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))))*Sqrt[c + d*x]*Sqrt[e + f*x])/
(128*d^4*f^4) + ((2*a*d*f*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2)
+ 8*d*f*(2*A*d*f - B*(d*e + c*f))) - b*(C*(7*d^3*e^3 + 9*c*d^2*e^
2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e + c*f) - B
*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))))*(c + d*x)^(3/2)*Sqrt[e +
f*x])/(64*d^4*f^3) + (C*(a + b*x)^2*(c + d*x)^(3/2)*(e + f*x)^(3/
2))/(5*b*d*f) - ((c + d*x)^(3/2)*(e + f*x)^(3/2)*(48*a^2*C*d^2*f^
2 - 10*a*b*d*f*(8*B*d*f - 5*C*(d*e + c*f)) - b^2*(C*(35*d^2*e^2 +
 38*c*d*e*f + 35*c^2*f^2) + 10*d*f*(8*A*d*f - 5*B*(d*e + c*f))) +
 6*b*d*f*(6*a*C*d*f - b*(10*B*d*f - 7*C*(d*e + c*f)))*x))/(240*b*
d^3*f^3) - ((d*e - c*f)^2*(2*a*d*f*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*
c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*e + c*f))) - b*(C*(7*d^3*e^3 + 9
*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e +
 c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))))*ArcTanh[(Sqrt[f]
*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(128*d^(9/2)*f^(9/2))
```

Rubi [A] time = 2.36849, antiderivative size = 719, normalized size of antiderivative = 1., number of

steps used = 6, number of rules used = 5, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.147$

$$-\frac{(c+dx)^{3/2}(e+fx)^{3/2}\left(48a^2Cd^2f^2-6bdfx(-6aCdf+10bBdf-7bC(cf+de))-10abdf(8Bdf-5C(cf+de))+b^2\left(-\right.\right.}{240bd^3f^3}$$

$$-\frac{(de-cf)^2\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(2adf\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)-b\left(2df\left(8Adf(cf+de)-\right.\right.\right.}{128d^{9/2}f^{9/2}}$$

$$+\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(2adf\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)-b\left(2df\left(8Adf(cf+de)-B\left(5c^2f^2+\right.\right.\right.\right.}{64d^4f^3}$$

$$+\frac{\sqrt{c+dx}\sqrt{e+fx}(de-cf)\left(2adf\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)-b\left(2df\left(8Adf(cf+de)-B\left(\right.\right.\right.\right.}{128d^4f^4}$$

$$+\frac{C(a+bx)^2(c+dx)^{3/2}(e+fx)^{3/2}}{5bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] ((d*e - c*f)*(2*a*d*f*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*
d*f*(2*A*d*f - B*(d*e + c*f))) - b*(C*(7*d^3*e^3 + 9*c*d^2*e^2*f
+ 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e + c*f) - B*(5*
d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))))*Sqrt[c + d*x]*Sqrt[e + f*x])/
(128*d^4*f^4) + ((2*a*d*f*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2)
+ 8*d*f*(2*A*d*f - B*(d*e + c*f))) - b*(C*(7*d^3*e^3 + 9*c*d^2*e^
2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e + c*f) - B
*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))))*(c + d*x)^(3/2)*Sqrt[e +
f*x])/(64*d^4*f^3) + (C*(a + b*x)^2*(c + d*x)^(3/2)*(e + f*x)^(3/
2))/(5*b*d*f) - ((c + d*x)^(3/2)*(e + f*x)^(3/2)*(48*a^2*C*d^2*f^
2 - 10*a*b*d*f*(8*B*d*f - 5*C*(d*e + c*f)) - b^2*(C*(35*d^2*e^2 +
 38*c*d*e*f + 35*c^2*f^2) + 10*d*f*(8*A*d*f - 5*B*(d*e + c*f))) -
 6*b*d*f*(10*b*B*d*f - 6*a*C*d*f - 7*b*C*(d*e + c*f))*x))/(240*b*
d^3*f^3) - ((d*e - c*f)^2*(2*a*d*f*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*
c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*e + c*f))) - b*(C*(7*d^3*e^3 + 9
*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e +
 c*f) - B*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))))*ArcTanh[(Sqrt[f]
*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(128*d^(9/2)*f^(9/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)*(C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 3.17688, size = 675, normalized size = 0.94

$$\frac{(de-cf)^2\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(b\left(2df\left(8Adf(cf+de)-B\left(5c^2f^2+6cdef+5d^2e^2\right)\right)+C\left(7c\right.\right.\right.}{256d^{9/2}f^{9/2}}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(10adf\left(8df\left(6Adf(cf+d(e+2fx))+B\left(-3c^2f^2+2cdf(e+fx)+d^2\left(-3e^2+2efx+8f^2x^2\right)\right)\right)+C\left(1\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] (Sqrt[c + d*x]*Sqrt[e + f*x]*(10*a*d*f*(C*(15*c^3*f^3 - c^2*d*f^2
*(7*e + 10*f*x) + c*d^2*f*(-7*e^2 + 4*e*f*x + 8*f^2*x^2) + d^3*(1
5*e^3 - 10*e^2*f*x + 8*e*f^2*x^2 + 48*f^3*x^3)) + 8*d*f*(6*A*d*f*
(c*f + d*(e + 2*f*x)) + B*(-3*c^2*f^2 + 2*c*d*f*(e + f*x) + d^2*(
-3*e^2 + 2*e*f*x + 8*f^2*x^2)))) + b*(C*(-105*c^4*f^4 + 10*c^3*d*
f^3*(4*e + 7*f*x) - 2*c^2*d^2*f^2*(-17*e^2 + 11*e*f*x + 28*f^2*x^
2) + 2*c*d^3*f*(20*e^3 - 11*e^2*f*x + 8*e*f^2*x^2 + 24*f^3*x^3) +
 d^4*(-105*e^4 + 70*e^3*f*x - 56*e^2*f^2*x^2 + 48*e*f^3*x^3 + 384
*f^4*x^4)) + 10*d*f*(8*A*d*f*(-3*c^2*f^2 + 2*c*d*f*(e + f*x) + d^
2*(-3*e^2 + 2*e*f*x + 8*f^2*x^2)) + B*(15*c^3*f^3 - c^2*d*f^2*(7*
e + 10*f*x) + c*d^2*f*(-7*e^2 + 4*e*f*x + 8*f^2*x^2) + d^3*(15*e^
3 - 10*e^2*f*x + 8*e*f^2*x^2 + 48*f^3*x^3))))))/(1920*d^4*f^4) +
((d*e - c*f)^2*(-2*a*d*f*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) +
 8*d*f*(2*A*d*f - B*(d*e + c*f))) + b*(C*(7*d^3*e^3 + 9*c*d^2*e^2
*f + 9*c^2*d*e*f^2 + 7*c^3*f^3) + 2*d*f*(8*A*d*f*(d*e + c*f) - B*
(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2))))*Log[d*e + c*f + 2*d*f*x +
2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(256*d^(9/2)*f^(9
/2))
```

Maple [B] time = 0.037, size = 3571, normalized size = 5.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2),x)
```

```
[Out] -1/3840*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(480*a*A*f^5*ln(1/2*(2*d*f*x+
2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2
))*c^2*d^3-105*b*C*f^5*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e
)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^5-240*f^5*ln(1/2*(2*d
*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)
^(1/2))*c^3*B*a*d^2-240*d^5*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*
x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*e^3*B*a*f^2+150*f^
5*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c
```

```
*f+d*e)/(f*d)^(1/2))*c^4*b*B*d+150*d^5*ln(1/2*(2*d*f*x+2*(d*f*x^2
+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*e^4*b*B
*f+150*f^5*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d
)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^4*a*C*d+150*d^5*ln(1/2*(2*d*f*x+2
*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2)
)*e^4*a*C*f+210*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^4*f^4*(f*d)
^(1/2)+210*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*e^4*(f*d)^(1/2)*d^
4-96*C*x^3*b*c*d^3*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2
)-1280*A*x^2*b*d^4*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2
)-1280*B*x^2*a*d^4*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2
)+480*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^2*B*a*f^4*(f*d)^(1/2)*d^2
+480*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*e^2*B*a*f^2*(f*d)^(1/2)*d^4-
300*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^3*b*B*f^4*(f*d)^(1/2)*d-300
*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*e^3*b*B*f*(f*d)^(1/2)*d^4-300*(d
*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^3*a*C*f^4*(f*d)^(1/2)*d-300*(d*f*
x^2+c*f*x+d*e*x+c*e)^(1/2)*e^3*a*C*f*(f*d)^(1/2)*d^4-96*C*x^3*b*d
^4*e*f^3*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)-160*B*x^2*b*
c*d^3*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)-160*B*x^2*b
*d^4*e*f^3*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)-160*C*x^2*
a*c*d^3*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)-160*C*x^2
*a*d^4*e*f^3*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+112*C*x^
2*b*c^2*d^2*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+112*C
*x^2*b*d^4*e^2*f^2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)-68
*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^2*e^2*f^2*(f*d)^(1/2)*d^2-
80*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e^3*f*(f*d)^(1/2)*d^3-32
0*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e*B*a*f^3*(f*d)^(1/2)*d^3+140
*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^2*e*b*B*f^3*(f*d)^(1/2)*d^2+14
0*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e^2*b*B*f^2*(f*d)^(1/2)*d^3+1
40*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^2*e*a*C*f^3*(f*d)^(1/2)*d^2+
140*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e^2*a*C*f^2*(f*d)^(1/2)*d^3
-80*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^3*e*f^3*(f*d)^(1/2)*d-3
20*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e*A*b*f^3*(f*d)^(1/2)*d^3+20
0*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e^2*a*C*f^2*(f*d)^(1/2)*d^4-1
40*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c^3*f^4*(f*d)^(1/2)*d-14
0*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e^3*f*(f*d)^(1/2)*d^4+200
*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c^2*a*C*f^4*(f*d)^(1/2)*d^2-32
0*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e*B*a*f^3*(f*d)^(1/2)*d^4+200
*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c^2*b*B*f^4*(f*d)^(1/2)*d^2+20
0*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e^2*b*B*f^2*(f*d)^(1/2)*d^4-3
20*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c*B*a*f^4*(f*d)^(1/2)*d^3-32
0*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c*A*b*f^4*(f*d)^(1/2)*d^3-320
*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e*A*b*f^3*(f*d)^(1/2)*d^4-80*(
d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c*e*b*B*f^3*(f*d)^(1/2)*d^3-80*(
d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c*e*a*C*f^3*(f*d)^(1/2)*d^3+44*b
*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c^2*e*f^3*(f*d)^(1/2)*d^2+44
*b*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c*e^2*f^2*(f*d)^(1/2)*d^3-
32*C*x^2*b*c*d^3*e*f^3*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2
)-120*c^3*e*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*
d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*C*f^4*d^2-60*ln(1/2*(2*d*f*x+2*(
d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*
c^2*e^2*a*C*f^3*d^3-120*c*e^3*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*
e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*C*f^2*d^4+75*b
*C*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+
c*f+d*e)/(f*d)^(1/2))*c^4*e*f^4*d+30*b*C*ln(1/2*(2*d*f*x+2*(d*f*x
^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*e
^2*f^3*d^2+30*b*C*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/
```

```
2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e^3*f^2*d^3+75*b*C*ln(1/
2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)
/(f*d)^(1/2))*e^4*c*f*d^4-960*a*A*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)
*c*f^4*(f*d)^(1/2)*d^3-960*a*A*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*e*
f^3*(f*d)^(1/2)*d^4+480*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^2*A*b*f
^4*(f*d)^(1/2)*d^2+480*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*e^2*A*b*f^
2*(f*d)^(1/2)*d^4-1920*a*A*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*f^4*
(f*d)^(1/2)*d^4-960*a*A*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*
e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*f^4*d^4+240*ln(1/2
*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/
(f*d)^(1/2))*c^2*e*A*b*f^4*d^3+240*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f
*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e^2*A*b*f
^3*d^4+240*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d
)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e*B*a*f^4*d^3+240*ln(1/2*(2*d*f
*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(
1/2))*c*e^2*B*a*f^3*d^4-120*c^3*e*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*
x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b*B*f^4*d^2-
60*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+
c*f+d*e)/(f*d)^(1/2))*c^2*e^2*b*B*f^3*d^3-120*c*e^3*ln(1/2*(2*d*f
*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(
1/2))*b*B*f^2*d^4-768*C*x^4*b*d^4*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(
1/2)*(f*d)^(1/2)-960*B*x^3*b*d^4*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1
/2)*(f*d)^(1/2)-960*C*x^3*a*d^4*f^4*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/
2)*(f*d)^(1/2)-105*b*C*d^5*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x
+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*e^5+480*a*A*d^5*ln(
1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*
e)/(f*d)^(1/2))*e^2*f^3-240*f^5*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+
d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*A*b*d^2-24
0*d^5*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/
2)+c*f+d*e)/(f*d)^(1/2))*e^3*A*b*f^2)/(d*f*x^2+c*f*x+d*e*x+c*e)^(
1/2)/f^4/(f*d)^(1/2)/d^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0.889006, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm="fr
```

```
[Out] [1/7680*(4*(384*C*b*d^4*f^4*x^4 - 105*C*b*d^4*e^4 + 10*(4*C*b*c*d
^3 + 15*(C*a + B*b)*d^4)*e^3*f + 2*(17*C*b*c^2*d^2 - 35*(C*a + B*
b)*c*d^3 - 120*(B*a + A*b)*d^4)*e^2*f^2 + 10*(4*C*b*c^3*d + 48*A*
a*d^4 - 7*(C*a + B*b)*c^2*d^2 + 16*(B*a + A*b)*c*d^3)*e*f^3 - 15*
(7*C*b*c^4 - 32*A*a*c*d^3 - 10*(C*a + B*b)*c^3*d + 16*(B*a + A*b)
*c^2*d^2)*f^4 + 48*(C*b*d^4*e*f^3 + (C*b*c*d^3 + 10*(C*a + B*b)*d
^4)*f^4)*x^3 - 8*(7*C*b*d^4*e^2*f^2 - 2*(C*b*c*d^3 + 5*(C*a + B*b
)*d^4)*e*f^3 + (7*C*b*c^2*d^2 - 10*(C*a + B*b)*c*d^3 - 80*(B*a +
A*b)*d^4)*f^4)*x^2 + 2*(35*C*b*d^4*e^3*f - (11*C*b*c*d^3 + 50*(C*
a + B*b)*d^4)*e^2*f^2 - (11*C*b*c^2*d^2 - 20*(C*a + B*b)*c*d^3 -
80*(B*a + A*b)*d^4)*e*f^3 + 5*(7*C*b*c^3*d + 96*A*a*d^4 - 10*(C*a
 + B*b)*c^2*d^2 + 16*(B*a + A*b)*c*d^3)*f^4)*x)*sqrt(d*f)*sqrt(d*
x + c)*sqrt(f*x + e) - 15*(7*C*b*d^5*e^5 - 5*(C*b*c*d^4 + 2*(C*a
+ B*b)*d^5)*e^4*f - 2*(C*b*c^2*d^3 - 4*(C*a + B*b)*c*d^4 - 8*(B*a
 + A*b)*d^5)*e^3*f^2 - 2*(C*b*c^3*d^2 + 16*A*a*d^5 - 2*(C*a + B*b
)*c^2*d^3 + 8*(B*a + A*b)*c*d^4)*e^2*f^3 - (5*C*b*c^4*d - 64*A*a*
c*d^4 - 8*(C*a + B*b)*c^3*d^2 + 16*(B*a + A*b)*c^2*d^3)*e*f^4 + (
7*C*b*c^5 - 32*A*a*c^2*d^3 - 10*(C*a + B*b)*c^4*d + 16*(B*a + A*b
)*c^3*d^2)*f^5)*log(-4*(2*d^2*f^2*x + d^2*e*f + c*d*f^2)*sqrt(d*x
 + c)*sqrt(f*x + e) + (8*d^2*f^2*x^2 + d^2*e^2 + 6*c*d*e*f + c^2*
f^2 + 8*(d^2*e*f + c*d*f^2)*x)*sqrt(d*f)))/(sqrt(d*f)*d^4*f^4), 1
/3840*(2*(384*C*b*d^4*f^4*x^4 - 105*C*b*d^4*e^4 + 10*(4*C*b*c*d^3
 + 15*(C*a + B*b)*d^4)*e^3*f + 2*(17*C*b*c^2*d^2 - 35*(C*a + B*b)
*c*d^3 - 120*(B*a + A*b)*d^4)*e^2*f^2 + 10*(4*C*b*c^3*d + 48*A*a*
d^4 - 7*(C*a + B*b)*c^2*d^2 + 16*(B*a + A*b)*c*d^3)*e*f^3 - 15*(7
*C*b*c^4 - 32*A*a*c*d^3 - 10*(C*a + B*b)*c^3*d + 16*(B*a + A*b)*c
^2*d^2)*f^4 + 48*(C*b*d^4*e*f^3 + (C*b*c*d^3 + 10*(C*a + B*b)*d^4
)*f^4)*x^3 - 8*(7*C*b*d^4*e^2*f^2 - 2*(C*b*c*d^3 + 5*(C*a + B*b)*
d^4)*e*f^3 + (7*C*b*c^2*d^2 - 10*(C*a + B*b)*c*d^3 - 80*(B*a + A*
b)*d^4)*f^4)*x^2 + 2*(35*C*b*d^4*e^3*f - (11*C*b*c*d^3 + 50*(C*a
+ B*b)*d^4)*e^2*f^2 - (11*C*b*c^2*d^2 - 20*(C*a + B*b)*c*d^3 - 80
*(B*a + A*b)*d^4)*e*f^3 + 5*(7*C*b*c^3*d + 96*A*a*d^4 - 10*(C*a +
 B*b)*c^2*d^2 + 16*(B*a + A*b)*c*d^3)*f^4)*x)*sqrt(-d*f)*sqrt(d*x
 + c)*sqrt(f*x + e) + 15*(7*C*b*d^5*e^5 - 5*(C*b*c*d^4 + 2*(C*a +
 B*b)*d^5)*e^4*f - 2*(C*b*c^2*d^3 - 4*(C*a + B*b)*c*d^4 - 8*(B*a
+ A*b)*d^5)*e^3*f^2 - 2*(C*b*c^3*d^2 + 16*A*a*d^5 - 2*(C*a + B*b)
*c^2*d^3 + 8*(B*a + A*b)*c*d^4)*e^2*f^3 - (5*C*b*c^4*d - 64*A*a*c
*d^4 - 8*(C*a + B*b)*c^3*d^2 + 16*(B*a + A*b)*c^2*d^3)*e*f^4 + (7
*C*b*c^5 - 32*A*a*c^2*d^3 - 10*(C*a + B*b)*c^4*d + 16*(B*a + A*b)
*c^3*d^2)*f^5)*arctan(1/2*(2*d*f*x + d*e + c*f)*sqrt(-d*f)/(sqrt(
d*x + c)*sqrt(f*x + e)*d*f)))/(sqrt(-d*f)*d^4*f^4)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a+bx)\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)*(C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] Integral((a + b*x)*sqrt(c + d*x)*sqrt(e + f*x)*(A + B*x + C*x**2)
, x)
```

GIAC/XCAS [A] time = 0.379413, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm="gi
```

```
[Out] Done
```

3.77 $\int \sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=330

$$-\frac{(de-cf)^2\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)}{64d^{7/2}f^{7/2}}+\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)}{32d^3f^2}+\frac{\sqrt{c+dx}\sqrt{e+fx}(de-cf)\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)}{64d^3f^3}-\frac{(c+dx)^{3/2}(e+fx)^{3/2}(-8Bdf+11cCf+5Cde)}{24d^2f^2}+\frac{C(c+dx)^{5/2}(e+fx)^{3/2}}{4d^2f}$$

```
[Out] ((d*e - c*f)*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*
d*f - B*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(64*d^3*f^3) +
 ((C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*
e + c*f)))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(32*d^3*f^2) - ((5*C*d*
e + 11*c*C*f - 8*B*d*f)*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(24*d^2*
f^2) + (C*(c + d*x)^(5/2)*(e + f*x)^(3/2))/(4*d^2*f) - ((d*e - c*
f)^2*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*
(d*e + c*f)))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f
*x])])/(64*d^(7/2)*f^(7/2))
```

Rubi [A] time = 0.761505, antiderivative size = 330, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.172

$$-\frac{(de-cf)^2\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)}{64d^{7/2}f^{7/2}}+\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)}{32d^3f^2}+\frac{\sqrt{c+dx}\sqrt{e+fx}(de-cf)\left(8df(2Adf-B(cf+de))+C\left(5c^2f^2+6cdef+5d^2e^2\right)\right)}{64d^3f^3}-\frac{(c+dx)^{3/2}(e+fx)^{3/2}(-8Bdf+11cCf+5Cde)}{24d^2f^2}+\frac{C(c+dx)^{5/2}(e+fx)^{3/2}}{4d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] ((d*e - c*f)*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*
d*f - B*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(64*d^3*f^3) +
 ((C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*
e + c*f)))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(32*d^3*f^2) - ((5*C*d*
```

```
e + 11*c*C*f - 8*B*d*f)*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(24*d^2*
f^2) + (C*(c + d*x)^(5/2)*(e + f*x)^(3/2))/(4*d^2*f) - ((d*e - c*
f)^2*(C*(5*d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*
(d*e + c*f)))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f
*x])])/(64*d^(7/2)*f^(7/2))
```

Rubi in Sympy [A] time = 68.6257, size = 405, normalized size = 1.23

$$\frac{B(c+dx)^{\frac{3}{2}}(e+fx)^{\frac{3}{2}}}{3df}+\frac{Cx(c+dx)^{\frac{3}{2}}(e+fx)^{\frac{3}{2}}}{4df}-\frac{5C(c+dx)^{\frac{3}{2}}(e+fx)^{\frac{3}{2}}(cf+de)}{24d^2f^2}-\frac{C\sqrt{c+dx}(e+fx)^{\frac{3}{2}}\left(4cdef-5(cf+de)^2\right)}{32d^2f^3}-\frac{C\sqrt{c+dx}\sqrt{e+fx}(cf-de)\left(4cdef-5(cf+de)^2\right)}{64d^3f^3}+\frac{C(cf-de)^2\left(4cdef-5(cf+de)^2\right)\operatorname{atanh}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{64d^{\frac{7}{2}}f^{\frac{7}{2}}}-\frac{\sqrt{c+dx}(e+fx)^{\frac{3}{2}}\left(-Adf+\frac{B(cf+de)}{2}\right)}{2df^2}+\frac{\sqrt{c+dx}\sqrt{e+fx}(cf-de)(2Adf-Bcf-Bde)}{8d^2f^2}+\frac{(cf-de)^2\left(-Adf+\frac{B(cf+de)}{2}\right)\operatorname{atanh}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{4d^{\frac{5}{2}}f^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] B*(c + d*x)**(3/2)*(e + f*x)**(3/2)/(3*d*f) + C*x*(c + d*x)**(3/2
)*(e + f*x)**(3/2)/(4*d*f) - 5*C*(c + d*x)**(3/2)*(e + f*x)**(3/2
)*(c*f + d*e)/(24*d**2*f**2) - C*sqrt(c + d*x)*(e + f*x)**(3/2)*(
4*c*d*e*f - 5*(c*f + d*e)**2)/(32*d**2*f**3) - C*sqrt(c + d*x)*sq
rt(e + f*x)*(c*f - d*e)*(4*c*d*e*f - 5*(c*f + d*e)**2)/(64*d**3*f
**3) + C*(c*f - d*e)**2*(4*c*d*e*f - 5*(c*f + d*e)**2)*atanh(sqrt
(f)*sqrt(c + d*x)/(sqrt(d)*sqrt(e + f*x)))/(64*d**(7/2)*f**(7/2))
 - sqrt(c + d*x)*(e + f*x)**(3/2)*(-A*d*f + B*(c*f + d*e)/2)/(2*d
*f**2) + sqrt(c + d*x)*sqrt(e + f*x)*(c*f - d*e)*(2*A*d*f - B*c*f
 - B*d*e)/(8*d**2*f**2) + (c*f - d*e)**2*(-A*d*f + B*(c*f + d*e)/
2)*atanh(sqrt(f)*sqrt(c + d*x)/(sqrt(d)*sqrt(e + f*x)))/(4*d**(5/
2)*f**(5/2))
```

Mathematica [A] time = 0.63256, size = 300, normalized size = 0.91

$$2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}\left(8df\left(6Adf(cf+d(e+2fx))+B\left(-3c^2f^2+2cdf(e+fx)+d^2\left(-3e^2+2efx+8f^2x^2\right)\right)\right)+C\left(15\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] (2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]*(C*(15*c^3*f^3 - c
^2*d*f^2*(7*e + 10*f*x) + c*d^2*f*(-7*e^2 + 4*e*f*x + 8*f^2*x^2)
+ d^3*(15*e^3 - 10*e^2*f*x + 8*e*f^2*x^2 + 48*f^3*x^3)) + 8*d*f*(
6*A*d*f*(c*f + d*(e + 2*f*x)) + B*(-3*c^2*f^2 + 2*c*d*f*(e + f*x)
 + d^2*(-3*e^2 + 2*e*f*x + 8*f^2*x^2)))) - 3*(d*e - c*f)^2*(C*(5*
d^2*e^2 + 6*c*d*e*f + 5*c^2*f^2) + 8*d*f*(2*A*d*f - B*(d*e + c*f)
))*Log[d*e + c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt
[e + f*x]])/(384*d^(7/2)*f^(7/2))
```

Maple [B] time = 0.023, size = 1431, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2),x)
```

```
[Out] -1/384*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(-96*C*x^3*d^3*f^3*(d*f*x^2+c*
f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)-8*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1
/2)*x*c*e*d^2*f^2*(f*d)^(1/2)+48*A*d^4*ln(1/2*(2*d*f*x+2*(d*f*x^2
+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*e^2*f^2
-24*B*f^4*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)
^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*d-24*B*d^4*ln(1/2*(2*d*f*x+2*(d*
f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*e^
3*f-30*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^3*f^3*(f*d)^(1/2)+15*C
*f^4*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2
)+c*f+d*e)/(f*d)^(1/2))*c^4+15*C*d^4*ln(1/2*(2*d*f*x+2*(d*f*x^2+c
*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*e^4+48*A*
f^4*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)
+c*f+d*e)/(f*d)^(1/2))*c^2*d^2-30*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/
2)*e^3*d^3*(f*d)^(1/2)-128*B*x^2*d^3*f^3*(d*f*x^2+c*f*x+d*e*x+c*e
)^(1/2)*(f*d)^(1/2)-12*C*c*e^3*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d
*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^3*f-96*A*(d*f
*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*d^2*f^3*(f*d)^(1/2)-96*A*(d*f*x^2+c
*f*x+d*e*x+c*e)^(1/2)*e*d^3*f^2*(f*d)^(1/2)+48*B*(d*f*x^2+c*f*x+d
*e*x+c*e)^(1/2)*c^2*d*f^3*(f*d)^(1/2)+48*B*(d*f*x^2+c*f*x+d*e*x+c
*e)^(1/2)*e^2*d^3*f*(f*d)^(1/2)+24*B*ln(1/2*(2*d*f*x+2*(d*f*x^2+c
*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e*d^2
*f^3+24*B*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)
^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e^2*d^3*f^2-12*C*c^3*e*ln(1/2*(2*d
*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)
^(1/2))*d*f^3-6*C*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/
2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e^2*d^2*f^2-96*A*ln(1/2*
(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(
f*d)^(1/2))*c*e*d^3*f^3-192*A*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*d
^3*f^3*(f*d)^(1/2)-32*B*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e*d^3*f
^2*(f*d)^(1/2)+20*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c^2*d*f^3*(
```

```
f*d)^(1/2)+20*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e^2*d^3*f*(f*d)
^(1/2)-32*B*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e*d^2*f^2*(f*d)^(1/
2)+14*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^2*e*d*f^2*(f*d)^(1/2)-3
2*B*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*c*d^2*f^3*(f*d)^(1/2)+14*C*
(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e^2*d^2*f*(f*d)^(1/2)-16*C*x^2*
c*d^2*f^3*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)-16*C*x^2*d^
3*e*f^2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2))/(d*f*x^2+c*f
*x+d*e*x+c*e)^(1/2)/d^3/f^3/(f*d)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.324899, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm="fricas")

[Out] [1/768*(4*(48*C*d^3*f^3*x^3 + 15*C*d^3*e^3 - (7*C*c*d^2 + 24*B*d^
3)*e^2*f - (7*C*c^2*d - 16*B*c*d^2 - 48*A*d^3)*e*f^2 + 3*(5*C*c^3
 - 8*B*c^2*d + 16*A*c*d^2)*f^3 + 8*(C*d^3*e*f^2 + (C*c*d^2 + 8*B*
d^3)*f^3)*x^2 - 2*(5*C*d^3*e^2*f - 2*(C*c*d^2 + 4*B*d^3)*e*f^2 +
(5*C*c^2*d - 8*B*c*d^2 - 48*A*d^3)*f^3)*x)*sqrt(d*f)*sqrt(d*x + c
)*sqrt(f*x + e) + 3*(5*C*d^4*e^4 - 4*(C*c*d^3 + 2*B*d^4)*e^3*f -
2*(C*c^2*d^2 - 4*B*c*d^3 - 8*A*d^4)*e^2*f^2 - 4*(C*c^3*d - 2*B*c^
2*d^2 + 8*A*c*d^3)*e*f^3 + (5*C*c^4 - 8*B*c^3*d + 16*A*c^2*d^2)*f
^4)*log(-4*(2*d^2*f^2*x + d^2*e*f + c*d*f^2)*sqrt(d*x + c)*sqrt(f
*x + e) + (8*d^2*f^2*x^2 + d^2*e^2 + 6*c*d*e*f + c^2*f^2 + 8*(d^2
*e*f + c*d*f^2)*x)*sqrt(d*f)))/(sqrt(d*f)*d^3*f^3), 1/384*(2*(48*
C*d^3*f^3*x^3 + 15*C*d^3*e^3 - (7*C*c*d^2 + 24*B*d^3)*e^2*f - (7*
C*c^2*d - 16*B*c*d^2 - 48*A*d^3)*e*f^2 + 3*(5*C*c^3 - 8*B*c^2*d +
 16*A*c*d^2)*f^3 + 8*(C*d^3*e*f^2 + (C*c*d^2 + 8*B*d^3)*f^3)*x^2
- 2*(5*C*d^3*e^2*f - 2*(C*c*d^2 + 4*B*d^3)*e*f^2 + (5*C*c^2*d - 8
*B*c*d^2 - 48*A*d^3)*f^3)*x)*sqrt(-d*f)*sqrt(d*x + c)*sqrt(f*x +
e) - 3*(5*C*d^4*e^4 - 4*(C*c*d^3 + 2*B*d^4)*e^3*f - 2*(C*c^2*d^2
- 4*B*c*d^3 - 8*A*d^4)*e^2*f^2 - 4*(C*c^3*d - 2*B*c^2*d^2 + 8*A*c
*d^3)*e*f^3 + (5*C*c^4 - 8*B*c^3*d + 16*A*c^2*d^2)*f^4)*arctan(1/
2*(2*d*f*x + d*e + c*f)*sqrt(-d*f)/(sqrt(d*x + c)*sqrt(f*x + e)*d
```

```
*f)))/(sqrt(-d*f)*d^3*f^3)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] Integral(sqrt(c + d*x)*sqrt(e + f*x)*(A + B*x + C*x**2), x)
```

GIAC/XCAS [A] time = 0.297458, size = 856, normalized size = 2.59

$$\frac{\frac{20\left(\sqrt{(dx+c)df-cdf+d^2e}\sqrt{dx+c}\left(\frac{2(dx+c)}{d^4f^2}-\frac{cf^2-dfe}{d^4f^4}\right)+\frac{\left(c^2f^2-2\,cdfe+d^2e^2\right)\ln\left(\left|-\sqrt{df}\sqrt{dx+c}+\sqrt{(dx+c)df-cdf+d^2e}\right|\right)}{\sqrt{df}\,d^3f^3}\right)A|d|}{d^2}+\frac{10\left(\sqrt{(dx+c)df-cdf+d^2e}\left(2\,(dx+c)\left(4\right.\right.\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm="giac")
```

```
[Out] 1/1920*(20*(sqrt((d*x + c)*d*f - c*d*f + d^2*e)*sqrt(d*x + c)*(2*
(d*x + c)/(d^4*f^2) - (c*f^2 - d*f*e)/(d^4*f^4)) + (c^2*f^2 - 2*c
*d*f*e + d^2*e^2)*ln(abs(-sqrt(d*f)*sqrt(d*x + c) + sqrt((d*x + c
)*d*f - c*d*f + d^2*e)))/(sqrt(d*f)*d^3*f^3))*A*abs(d)/d^2 + 10*(
sqrt((d*x + c)*d*f - c*d*f + d^2*e)*(2*(d*x + c)*(4*(d*x + c)*(6*
(d*x + c)/d^2 - (17*c*d^6*f^6 - d^7*f^5*e)/(d^8*f^6)) + (59*c^2*d
^6*f^6 - 6*c*d^7*f^5*e - 5*d^8*f^4*e^2)/(d^8*f^6)) - 3*(5*c^3*d^6
*f^6 + c^2*d^7*f^5*e - c*d^8*f^4*e^2 - 5*d^9*f^3*e^3)/(d^8*f^6))*
sqrt(d*x + c) + 3*(5*c^4*f^4 - 4*c^3*d*f^3*e - 2*c^2*d^2*f^2*e^2
- 4*c*d^3*f*e^3 + 5*d^4*e^4)*ln(abs(-sqrt(d*f)*sqrt(d*x + c) + sq
rt((d*x + c)*d*f - c*d*f + d^2*e)))/(sqrt(d*f)*d*f^3))*C*abs(d)/d
^2 + (sqrt((d*x + c)*d*f - c*d*f + d^2*e)*sqrt(d*x + c)*(2*(d*x +
 c)*(4*(d*x + c)/(d^6*f^2) - (7*c*f^4 - d*f^3*e)/(d^6*f^6)) + 3*(
c^2*f^4 - d^2*f^2*e^2)/(d^6*f^6)) - 3*(c^3*f^3 - c^2*d*f^2*e - c*
d^2*f*e^2 + d^3*e^3)*ln(abs(-sqrt(d*f)*sqrt(d*x + c) + sqrt((d*x
+ c)*d*f - c*d*f + d^2*e)))/(sqrt(d*f)*d^5*f^4))*B*abs(d)/d^3)/d
```

3.78 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}(A+Bx+Cx^2)}{a+bx}\,dx$

Optimal. Leaf size=450

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(16a^3Cd^3f^3-8a^2bd^2f^2(2Bdf+cCf+Cde)-2ab^2df\left(C(de-cf)^2-4df(2Adf+Bcf+Bde)\right)+b^3\right.}{8b^4d^{5/2}f^{5/2}}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}(4bdf(2Abdf-aC(cf+de))+(4adf-bcf+bde)(2aCdf+b(-2Bdf+cCf+Cde)))}{8b^3d^2f^2}$$
$$-\frac{2\sqrt{bc-ad}\sqrt{be-af}\left(Ab^2-a(bB-aC)\right)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)}{b^4}$$
$$-\frac{\sqrt{c+dx}(e+fx)^{3/2}(2aCdf+b(-2Bdf+cCf+Cde))}{4b^2df^2}+\frac{C(c+dx)^{3/2}(e+fx)^{3/2}}{3bdf}$$

```
[Out] ((4*b*d*f*(2*A*b*d*f - a*C*(d*e + c*f)) + (b*d*e - b*c*f + 4*a*d*
f)*(2*a*C*d*f + b*(C*d*e + c*C*f - 2*B*d*f)))*Sqrt[c + d*x]*Sqrt[
e + f*x])/(8*b^3*d^2*f^2) - ((2*a*C*d*f + b*(C*d*e + c*C*f - 2*B*
d*f))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(4*b^2*d*f^2) + (C*(c + d*x)
^(3/2)*(e + f*x)^(3/2))/(3*b*d*f) - ((16*a^3*C*d^3*f^3 - 8*a^2*b*
d^2*f^2*(C*d*e + c*C*f + 2*B*d*f) - 2*a*b^2*d*f*(C*(d*e - c*f)^2
- 4*d*f*(B*d*e + B*c*f + 2*A*d*f)) - b^3*(C*(d*e - c*f)^2*(d*e +
c*f) - 2*d*f*(B*(d*e - c*f)^2 - 4*A*d*f*(d*e + c*f))))*ArcTanh[(S
qrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(8*b^4*d^(5/2)*f^
(5/2)) - (2*(A*b^2 - a*(b*B - a*C))*Sqrt[b*c - a*d]*Sqrt[b*e - a*
f]*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[
e + f*x])])/b^4
```

Rubi [A] time = 3.58878, antiderivative size = 453, normalized size of antiderivative = 1.01, number of steps used = 8, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(16a^3Cd^3f^3-8a^2bd^2f^2(2Bdf+cCf+Cde)-2ab^2df\left(C(de-cf)^2-4df(2Adf+Bcf+Bde)\right)+b^3\right.}{8b^4d^{5/2}f^{5/2}}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(\frac{(4adf-bcf+bde)(2aCdf+b(-2Bdf+cCf+Cde))}{bdf}-4aC(cf+de)+8Abdf\right)}{8b^2df}$$
$$-\frac{2\sqrt{bc-ad}\sqrt{be-af}\left(Ab^2-a(bB-aC)\right)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)}{b^4}$$
$$-\frac{\sqrt{c+dx}(e+fx)^{3/2}(2aCdf+b(-2Bdf+cCf+Cde))}{4b^2df^2}+\frac{C(c+dx)^{3/2}(e+fx)^{3/2}}{3bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x),x]
```

```
[Out] ((8*A*b*d*f - 4*a*C*(d*e + c*f) + ((b*d*e - b*c*f + 4*a*d*f)*(2*a
*C*d*f + b*(C*d*e + c*C*f - 2*B*d*f)))/(b*d*f))*Sqrt[c + d*x]*Sqr
t[e + f*x])/(8*b^2*d*f) - ((2*a*C*d*f + b*(C*d*e + c*C*f - 2*B*d*
f))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(4*b^2*d*f^2) + (C*(c + d*x)^(
3/2)*(e + f*x)^(3/2))/(3*b*d*f) - ((16*a^3*C*d^3*f^3 - 8*a^2*b*d^
2*f^2*(C*d*e + c*C*f + 2*B*d*f) - 2*a*b^2*d*f*(C*(d*e - c*f)^2 -
4*d*f*(B*d*e + B*c*f + 2*A*d*f)) - b^3*(C*(d*e - c*f)^2*(d*e + c*
f) - 2*d*f*(B*(d*e - c*f)^2 - 4*A*d*f*(d*e + c*f))))*ArcTanh[(Sqr
t[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(8*b^4*d^(5/2)*f^(5
/2)) - (2*(A*b^2 - a*(b*B - a*C))*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]
*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e
+ f*x])])/b^4
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.72083, size = 498, normalized size = 1.11

$$\frac{\frac{2b\sqrt{c+dx}\sqrt{e+fx}\left(24a^2Cd^2f^2-6abdf(4Bdf+cCf+Cd(e+2fx))+b^2\left(6df(4Adf+Bcf+Bd(e+2fx))+C\left(-3c^2f^2+2cdf(e+fx)+d^2\left(-3e^2+2efx+8f^2x^2\right)\right)\right)\right)}{d^2f^2}+\frac{3\log\cdots}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x),x]
```

```
[Out] ((2*b*Sqrt[c + d*x]*Sqrt[e + f*x]*(24*a^2*C*d^2*f^2 - 6*a*b*d*f*(
c*C*f + 4*B*d*f + C*d*(e + 2*f*x)) + b^2*(6*d*f*(B*c*f + 4*A*d*f
+ B*d*(e + 2*f*x)) + C*(-3*c^2*f^2 + 2*c*d*f*(e + f*x) + d^2*(-3*
e^2 + 2*e*f*x + 8*f^2*x^2)))))/(d^2*f^2) + 48*(A*b^2 + a*(-(b*B)
+ a*C))*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Log[a + b*x] + (3*(-16*a^
3*C*d^3*f^3 + 8*a^2*b*d^2*f^2*(C*d*e + c*C*f + 2*B*d*f) + 2*a*b^2
*d*f*(C*(d*e - c*f)^2 - 4*d*f*(B*d*e + B*c*f + 2*A*d*f)) + b^3*(C
*(d*e - c*f)^2*(d*e + c*f) + 2*d*f*(-(B*(d*e - c*f)^2) + 4*A*d*f*
(d*e + c*f))))*Log[d*e + c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c
 + d*x]*Sqrt[e + f*x]])/(d^(5/2)*f^(5/2)) - 48*(A*b^2 + a*(-(b*B)
 + a*C))*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Log[2*Sqrt[b*c - a*d]*Sq
rt[b*e - a*f]*Sqrt[c + d*x]*Sqrt[e + f*x] + b*(2*c*e + d*e*x + c*
f*x) - a*(d*e + c*f + 2*d*f*x)])/(48*b^4)
```

Maple [B] time = 0.062, size = 4227, normalized size = 9.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a),x)
```

```
[Out] -1/48*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(48*ln((-2*a*d*f*x+b*c*f*x+b*d*
e*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b
^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*f^3*d^3*a^4*C*
(f*d)^(1/2)-16*C*x^2*b^4*d^2*f^2*(f*d)^(1/2)*(d*f*x^2+c*f*x+d*e*x
+c*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)+6*C*(d*
f*x^2+c*f*x+d*e*x+c*e)^(1/2)*e^2*b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^
2*c*e)/b^2)^(1/2)*d^2*(f*d)^(1/2)+48*ln((-2*a*d*f*x+b*c*f*x+b*d*e
*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^
2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*f^3*d^3*a^2*A*b
^2*(f*d)^(1/2)+48*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/
2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*d^3*f^3*A*b^3*((a^2*d*f-a*
b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-24*ln(1/2*(2*d*f*x+2*(d*f*x^2+c
*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*f^3*A*b
^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2-24*ln(1/2*(2
*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*
d)^(1/2))*d^3*e*A*b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/
2)*f^2-48*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*(d*f*x^2+c*f*x+d*e*x+c
*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a
*e*d+2*b*c*e)/(b*x+a))*f^3*d^3*a^3*B*b*(f*d)^(1/2)-48*ln(1/2*(2*d
*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)
^(1/2))*a^2*d^3*f^3*B*b^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)
^(1/2)+6*B*f^3*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*
(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*b^4*((a^2*d*f-a*b*c*f-a*b*d
*e+b^2*c*e)/b^2)^(1/2)*d+12*C*a*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+
d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*b^3*((a^2*
d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2*f^2+12*C*a*(d*f*x^2+c
*f*x+d*e*x+c*e)^(1/2)*c*b^3*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^
2)^(1/2)*d*(f*d)^(1/2)*f^2+12*C*a*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)
*e*b^3*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2*(f*d)^(1
/2)*f-4*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c*e*b^4*((a^2*d*f-a*b*c
*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d*(f*d)^(1/2)*f-4*C*(d*f*x^2+c*f*x
+d*e*x+c*e)^(1/2)*x*c*b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)
^(1/2)*d*(f*d)^(1/2)*f^2-4*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*e*
b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2*(f*d)^(1/2)
*f-48*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^
(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d
+2*b*c*e)/(b*x+a))*c*e*B*a*b^3*d^2*(f*d)^(1/2)*f^2+24*C*a*(d*f*x^
2+c*f*x+d*e*x+c*e)^(1/2)*x*b^3*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)
/b^2)^(1/2)*d^2*(f*d)^(1/2)*f^2+48*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x
+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*
c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*c*e*C*a^2*b^2*d^2
*(f*d)^(1/2)*f^2-24*B*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*x*b^4*((a^2
*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2*(f*d)^(1/2)*f^2+48*l
n((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(
(a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*
```

e)/(b*x+a))*a^2*c*f^3*B*b^2*d^2*(f*d)^(1/2)+48*ln((-2*a*d*f*x+b*c
*f*x+b*d*e*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*((a^2*d*f-a*b*c*f-
a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^2*d
^3*e*B*b^2*(f*d)^(1/2)*f^2+24*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*
e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*f^3*B*a*b^3*((
a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2+24*ln(1/2*(2*d*f*
x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1
/2))*d^3*e*B*a*b^3*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*
f^2-12*B*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^
(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^2
*c*e)/b^2)^(1/2)*d^2*f^2-48*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*(d*f
*x^2+c*f*x+d*e*x+c*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^
2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^3*c*f^3*C*b*d^2*(f*d)^
(1/2)-48*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*(d*f*x^2+c*f*x+d*e*x+c*
e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*
e*d+2*b*c*e)/(b*x+a))*a^3*d^3*e*C*b*(f*d)^(1/2)*f^2-24*ln(1/2*(2*
d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d
)^(1/2))*c*f^3*C*a^2*b^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^
(1/2)*d^2-24*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f
*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^3*e*C*a^2*b^2*((a^2*d*f-a*b*c*f
-a*b*d*e+b^2*c*e)/b^2)^(1/2)*f^2-6*C*a*f^3*ln(1/2*(2*d*f*x+2*(d*f
*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2
b^3((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d-6*C*a*d^3*ln
(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d
*e)/(f*d)^(1/2))*e^2*b^3*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^
(1/2)*f+3*C*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*
d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e*b^4*((a^2*d*f-a*b*c*f-a*b*d*
e+b^2*c*e)/b^2)^(1/2)*d*f^2+3*C*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+
d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e^2*b^4*((a^
2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2*f+48*(d*f*x^2+c*f*x
+d*e*x+c*e)^(1/2)*B*a*b^3*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)
^(1/2)*d^2*(f*d)^(1/2)*f^2-12*B*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c
b^4((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d*(f*d)^(1/2)*
f^2-12*B*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*e*b^4*((a^2*d*f-a*b*c*f-
a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2*(f*d)^(1/2)*f-48*(d*f*x^2+c*f*x+d
*e*x+c*e)^(1/2)*C*a^2*b^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)
^(1/2)*d^2*(f*d)^(1/2)*f^2-48*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*(d
*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/
b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*c*f^3*A*b^3*d^2*(f*d
)^(1/2)-48*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*(d*f*x^2+c*f*x+d*e*x+
c*e)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-
a*e*d+2*b*c*e)/(b*x+a))*a*d^3*e*A*b^3*(f*d)^(1/2)*f^2+48*ln((-2*a
*d*f*x+b*c*f*x+b*d*e*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*((a^2*d*
f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x
+a))*c*e*A*b^4*d^2*(f*d)^(1/2)*f^2-3*C*f^3*ln(1/2*(2*d*f*x+2*(d*f
*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3
b^4((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-3*C*d^3*ln(1/2
*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)^(1/2)+c*f+d*e)/
(f*d)^(1/2))*e^3*b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2
)+6*B*d^3*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*(f*d)
^(1/2)+c*f+d*e)/(f*d)^(1/2))*e^2*b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^
2*c*e)/b^2)^(1/2)*f+48*ln(1/2*(2*d*f*x+2*(d*f*x^2+c*f*x+d*e*x+c*e
)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a^3*d^3*f^3*C*b*((a^2*d
*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-48*(d*f*x^2+c*f*x+d*e*x+c*
e)^(1/2)*A*b^4*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*d^2*
(f*d)^(1/2)*f^2+6*C*(d*f*x^2+c*f*x+d*e*x+c*e)^(1/2)*c^2*b^4*((a^2

```
*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*(f*d)^(1/2)*f^2)/(d*f*x^
2+c*f*x+d*e*x+c*e)^(1/2)/b^5/((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b
^2)^(1/2)/d^2/(f*d)^(1/2)/f^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a),x, algorithm="fr
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.429151, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a),x, algorithm="gi
```

```
[Out] Done
```

3.79 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}(A+Bx+Cx^2)}{(a+bx)^2}\,dx$

Optimal. Leaf size=521

$$\frac{\sqrt{c+dx}(e+fx)^{3/2}\left(3a^2Cdf-ab(2Bdf+cCf+Cde)+b^2(2Adf+cCe)\right)}{2b^2f(bc-ad)(be-af)}$$
$$+\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(24a^2Cd^2f^2-8abdf(2Bdf+cCf+Cde)+b^2\left(-\left(C(de-cf)^2-4df(2Adf+Bcf+Bde)\right)\right)\right)}{4b^4d^{3/2}f^{3/2}}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(12a^2Cdf^2-abf(8Bdf+cCf+7Cde)+b^2(4df(Af+Be)-Ce(de-cf))\right)}{4b^3df(be-af)}$$
$$+\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(6a^3Cdf-a^2b(4Bdf+5C(cf+de))+ab^2(2Adf+3Bcf+3Bde+4cCe)-b^3(Acf+Ade+2Bce)\right)}{b^4\sqrt{bc-ad}\sqrt{be-af}}$$
$$-\frac{(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{b(a+bx)(bc-ad)(be-af)}$$

```
[Out] ((12*a^2*C*d*f^2 - a*b*f*(7*C*d*e + c*C*f + 8*B*d*f) + b^2*(4*d*f
*(B*e + A*f) - C*e*(d*e - c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*
b^3*d*f*(b*e - a*f)) + ((3*a^2*C*d*f + b^2*(c*C*e + 2*A*d*f) - a*
b*(C*d*e + c*C*f + 2*B*d*f))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(2*b^
2*(b*c - a*d)*f*(b*e - a*f)) - ((A*b^2 - a*(b*B - a*C))*(c + d*x)
^(3/2)*(e + f*x)^(3/2))/(b*(b*c - a*d)*(b*e - a*f)*(a + b*x)) + (
(24*a^2*C*d^2*f^2 - 8*a*b*d*f*(C*d*e + c*C*f + 2*B*d*f) - b^2*(C*
(d*e - c*f)^2 - 4*d*f*(B*d*e + B*c*f + 2*A*d*f)))*ArcTanh[(Sqrt[f
]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(4*b^4*d^(3/2)*f^(3/2)
) + ((6*a^3*C*d*f - b^3*(2*B*c*e + A*d*e + A*c*f) + a*b^2*(4*c*C*
e + 3*B*d*e + 3*B*c*f + 2*A*d*f) - a^2*b*(4*B*d*f + 5*C*(d*e + c*
f)))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqr
t[e + f*x])])/(b^4*Sqrt[b*c - a*d]*Sqrt[b*e - a*f])
```

Rubi [A] time = 4.62405, antiderivative size = 521, normalized size of antiderivative = 1., number of

steps used = 8, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{\sqrt{c+dx}(e+fx)^{3/2}\left(3a^2Cdf-ab(2Bdf+cCf+Cde)+b^2(2Adf+cCe)\right)}{2b^2f(bc-ad)(be-af)}$$
$$+\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(24a^2Cd^2f^2-8abdf(2Bdf+cCf+Cde)+b^2\left(-\left(C(de-cf)^2-4df(2Adf+Bcf+Bde)\right)\right)\right)}{4b^4d^{3/2}f^{3/2}}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(12a^2Cdf^2-abf(8Bdf+cCf+7Cde)+b^2(4df(Af+Be)-Ce(de-cf))\right)}{4b^3df(be-af)}$$
$$+\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(6a^3Cdf-a^2b(4Bdf+5C(cf+de))+ab^2(2Adf+3Bcf+3Bde+4cCe)-b^3(Acf+Ade+2Bce)\right)}{b^4\sqrt{bc-ad}\sqrt{be-af}}$$
$$-\frac{(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{b(a+bx)(bc-ad)(be-af)}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^2,x]
```

```
[Out] ((12*a^2*C*d*f^2 - a*b*f*(7*C*d*e + c*C*f + 8*B*d*f) + b^2*(4*d*f
*(B*e + A*f) - C*e*(d*e - c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*
b^3*d*f*(b*e - a*f)) + ((3*a^2*C*d*f + b^2*(c*C*e + 2*A*d*f) - a*
b*(C*d*e + c*C*f + 2*B*d*f))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(2*b^
2*(b*c - a*d)*f*(b*e - a*f)) - ((A*b^2 - a*(b*B - a*C))*(c + d*x)
^(3/2)*(e + f*x)^(3/2))/(b*(b*c - a*d)*(b*e - a*f)*(a + b*x)) + (
(24*a^2*C*d^2*f^2 - 8*a*b*d*f*(C*d*e + c*C*f + 2*B*d*f) - b^2*(C*
(d*e - c*f)^2 - 4*d*f*(B*d*e + B*c*f + 2*A*d*f)))*ArcTanh[(Sqrt[f
]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(4*b^4*d^(3/2)*f^(3/2)
) + ((6*a^3*C*d*f - b^3*(2*B*c*e + A*d*e + A*c*f) + a*b^2*(4*c*C*
e + 3*B*d*e + 3*B*c*f + 2*A*d*f) - a^2*b*(4*B*d*f + 5*C*(d*e + c*
f)))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqr
t[e + f*x])])/(b^4*Sqrt[b*c - a*d]*Sqrt[b*e - a*f])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.68288, size = 489, normalized size = 0.94

$$-\frac{\frac{\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(-24a^2Cd^2f^2+8abdf(2Bdf+cCf+Cde)+b^2\left(C(de-cf)^2-4df(2Adf+Bcf+Bde)\right)\right)}{d^{3/2}f^{3/2}}+\frac{4\log(a+bx)\left(-6a^3Cdf+a^2b\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^2,x]
```

```
[Out] (2*b*Sqrt[c + d*x]*Sqrt[e + f*x]*(-8*a*C + b*(4*B + (c*C)/d + (C*
e)/f) + 2*b*C*x - (4*(A*b^2 + a*(-(b*B) + a*C)))/(a + b*x)) + (4*
(-6*a^3*C*d*f + b^3*(2*B*c*e + A*d*e + A*c*f) - a*b^2*(4*c*C*e +
3*B*d*e + 3*B*c*f + 2*A*d*f) + a^2*b*(4*B*d*f + 5*C*(d*e + c*f)))
*Log[a + b*x])/(Sqrt[b*c - a*d]*Sqrt[b*e - a*f]) - ((-24*a^2*C*d^
2*f^2 + 8*a*b*d*f*(C*d*e + c*C*f + 2*B*d*f) + b^2*(C*(d*e - c*f)^
2 - 4*d*f*(B*d*e + B*c*f + 2*A*d*f)))*Log[d*e + c*f + 2*d*f*x + 2
*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(d^(3/2)*f^(3/2))
- (4*(-6*a^3*C*d*f + b^3*(2*B*c*e + A*d*e + A*c*f) - a*b^2*(4*c*C
*e + 3*B*d*e + 3*B*c*f + 2*A*d*f) + a^2*b*(4*B*d*f + 5*C*(d*e + c
*f)))*Log[2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sqrt[c + d*x]*Sqrt[e
+ f*x] + b*(2*c*e + d*e*x + c*f*x) - a*(d*e + c*f + 2*d*f*x)])/(S
qrt[b*c - a*d]*Sqrt[b*e - a*f]))/(8*b^4)
```

Maple [B] time = 0.06, size = 5051, normalized size = 9.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a)^2,x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^2,x, algorithm='
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^2,x, algorithm='
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.743129, size = 4, normalized size = 0.01

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^2,x, algorithm='
```

```
[Out] sage0*x
```

3.80 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)}{(a+bx)^3}\,dx$

Optimal. Leaf size=658

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(12a^3Cdf^2-a^2bf(4Bdf+11cCf+17Cde)+ab^2(Bf(3cf+5de)+4Ce(4cf+de))-b^3\left(c\left(-Af^2+4Be\right.\right.\right.}{4b^3(bc-ad)(be-af)^2}$$
$$+\frac{\sqrt{c+dx}(e+fx)^{3/2}\left(6a^3Cdf-a^2b(2Bdf+7C(cf+de))+ab^2(-2Adf+3Bcf+3Bde+8cCe)-b^3(-Acf-Ade+4Bce)\right)}{4b^2(a+bx)(bc-ad)(be-af)^2}$$
$$-\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(24a^4Cd^2f^2-8a^3bdf(Bdf+5C(cf+de))+3a^2b^2\left(4Bdf(cf+de)+C\left(5c^2f^2+22cdef+5d^2e^2\right)\right.\right.}{4b^4(bc-ad)^{3/}}$$
$$-\frac{(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{2b(a+bx)^2(bc-ad)(be-af)}-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(6aCdf-b(2Bdf+cCf+Cde))}{b^4\sqrt{d}\sqrt{f}}$$

```
[Out] -((12*a^3*C*d*f^2 - a^2*b*f*(17*C*d*e + 11*c*C*f + 4*B*d*f) + a*b
^2*(B*f*(5*d*e + 3*c*f) + 4*C*e*(d*e + 4*c*f)) - b^3*(A*d*e*f + c
*(4*C*e^2 + 4*B*e*f - A*f^2)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*b^
3*(b*c - a*d)*(b*e - a*f)^2) + ((6*a^3*C*d*f - b^3*(4*B*c*e - A*d
*e - A*c*f) + a*b^2*(8*c*C*e + 3*B*d*e + 3*B*c*f - 2*A*d*f) - a^2
*b*(2*B*d*f + 7*C*(d*e + c*f)))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(4
*b^2*(b*c - a*d)*(b*e - a*f)^2*(a + b*x)) - ((A*b^2 - a*(b*B - a*
C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(2*b*(b*c - a*d)*(b*e - a*f)
*(a + b*x)^2) - ((6*a*C*d*f - b*(C*d*e + c*C*f + 2*B*d*f))*ArcTan
h[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(b^4*Sqrt[d]*
Sqrt[f]) - ((24*a^4*C*d^2*f^2 - 3*a*b^3*(B*d^2*e^2 + c^2*f*(8*C*e
 + B*f) + 2*c*d*e*(4*C*e + 3*B*f)) - 8*a^3*b*d*f*(B*d*f + 5*C*(d*
e + c*f)) - b^4*(A*d^2*e^2 - 2*c*d*e*(2*B*e + A*f) - c^2*(8*C*e^2
 + 4*B*e*f - A*f^2)) + 3*a^2*b^2*(4*B*d*f*(d*e + c*f) + C*(5*d^2*
e^2 + 22*c*d*e*f + 5*c^2*f^2)))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c +
 d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(4*b^4*(b*c - a*d)^(3/2)
*(b*e - a*f)^(3/2))
```

Rubi [A] time = 6.50657, antiderivative size = 657, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.194$

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(12a^3Cdf^2-a^2bf(4Bdf+11cCf+17Cde)+ab^2(Bf(3cf+5de)+4Ce(4cf+de))-b^3\left(cf(4Be-Af)\right.\right.}{4b^3(bc-ad)(be-af)^2}$$
$$+\frac{\sqrt{c+dx}(e+fx)^{3/2}\left(6a^3Cdf-a^2b(2Bdf+7C(cf+de))+ab^2(-2Adf+3Bcf+3Bde+8cCe)-b^3(-Acf-Ade+4Bce)\right)}{4b^2(a+bx)(bc-ad)(be-af)^2}$$
$$-\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(24a^4Cd^2f^2-8a^3bdf(Bdf+5C(cf+de))+3a^2b^2\left(4Bdf(cf+de)+C\left(5c^2f^2+22cdef+5d^2e^2\right)\right.\right.}{4b^4(bc-ad)^{3/}}$$
$$-\frac{(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{2b(a+bx)^2(bc-ad)(be-af)}-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(6aCdf-b(2Bdf+cCf+Cde))}{b^4\sqrt{d}\sqrt{f}}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^3,x]
```

```
[Out] -((12*a^3*C*d*f^2 - a^2*b*f*(17*C*d*e + 11*c*C*f + 4*B*d*f) - b^3
*(4*c*C*e^2 + A*d*e*f + c*f*(4*B*e - A*f)) + a*b^2*(B*f*(5*d*e +
3*c*f) + 4*C*e*(d*e + 4*c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*b^
3*(b*c - a*d)*(b*e - a*f)^2) + ((6*a^3*C*d*f - b^3*(4*B*c*e - A*d
*e - A*c*f) + a*b^2*(8*c*C*e + 3*B*d*e + 3*B*c*f - 2*A*d*f) - a^2
*b*(2*B*d*f + 7*C*(d*e + c*f)))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(4
*b^2*(b*c - a*d)*(b*e - a*f)^2*(a + b*x)) - ((A*b^2 - a*(b*B - a*
C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(2*b*(b*c - a*d)*(b*e - a*f)
*(a + b*x)^2) - ((6*a*C*d*f - b*(C*d*e + c*C*f + 2*B*d*f))*ArcTan
h[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(b^4*Sqrt[d]*
Sqrt[f]) - ((24*a^4*C*d^2*f^2 - 3*a*b^3*(B*d^2*e^2 + c^2*f*(8*C*e
 + B*f) + 2*c*d*e*(4*C*e + 3*B*f)) - 8*a^3*b*d*f*(B*d*f + 5*C*(d*
e + c*f)) - b^4*(A*d^2*e^2 - 2*c*d*e*(2*B*e + A*f) - c^2*(8*C*e^2
 + 4*B*e*f - A*f^2)) + 3*a^2*b^2*(4*B*d*f*(d*e + c*f) + C*(5*d^2*
e^2 + 22*c*d*e*f + 5*c^2*f^2)))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c +
 d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(4*b^4*(b*c - a*d)^(3/2)
*(b*e - a*f)^(3/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**3,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 6.85631, size = 1165, normalized size = 1.77

$$\sqrt{c+dx}\sqrt{e+fx}\left(\frac{C}{b^3}\right.$$
$$+\frac{10Cdfa^3-9bCdea^2-9bcCfa^2-6bBdfa^2+8b^2cCea+5b^2Bdea+5b^2Bcfa+2Ab^2dfa-4b^3Bce-Ab^3de-Ab^3cf}{4b^3(bc-ad)(be-af)(a+bx)}$$
$$\left.+\frac{-Ca^2+bBa-Ab^2}{2b^3(a+bx)^2}\right)$$
$$+\frac{\left(24Cd^2f^2a^4-8bBd^2f^2a^3-40bcCdf^2a^3-40bCd^2efa^3+15b^2Cd^2e^2a^2+15b^2c^2Cf^2a^2+12b^2Bcdf^2a^2+12b^2Bd^2efa^2+\right.}{}$$
$$+\frac{\left(-\frac{3Cd^2f^2a^3}{b^4(bc-ad)(be-af)}+\frac{Bd^2f^2a^2}{b^3(bc-ad)(be-af)}-\frac{df(4cCe+Bde+Bcf)a}{b^2(bc-ad)(be-af)}+\frac{Cefc^2+Cde^2c}{2b(bc-ad)(be-af)}+\frac{-aCd^2e^2-ac^2Cf^2}{2b^2(bc-ad)(be-af)}+\frac{7\left(a^2Cefd^2+a^2cCf^2d\right)}{2b^3(bc-ad)(be-af)}+\frac{}{b(bc}\right.}{\sqrt{d}\sqrt{f}}$$
$$-\frac{\left(24Cd^2f^2a^4-8bBd^2f^2a^3-40bcCdf^2a^3-40bCd^2efa^3+15b^2Cd^2e^2a^2+15b^2c^2Cf^2a^2+12b^2Bcdf^2a^2+12b^2Bd^2efa^2+\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^3,x]
```

```
[Out] Sqrt[c + d*x]*Sqrt[e + f*x]*(C/b^3 + (-(A*b^2) + a*b*B - a^2*C)/(
2*b^3*(a + b*x)^2) + (-4*b^3*B*c*e + 8*a*b^2*c*C*e - A*b^3*d*e +
5*a*b^2*B*d*e - 9*a^2*b*C*d*e - A*b^3*c*f + 5*a*b^2*B*c*f - 9*a^2
*b*c*C*f + 2*a*A*b^2*d*f - 6*a^2*b*B*d*f + 10*a^3*C*d*f)/(4*b^3*(
b*c - a*d)*(b*e - a*f)*(a + b*x))) + ((8*b^4*c^2*C*e^2 + 4*b^4*B*
c*d*e^2 - 24*a*b^3*c*C*d*e^2 - A*b^4*d^2*e^2 - 3*a*b^3*B*d^2*e^2
+ 15*a^2*b^2*C*d^2*e^2 + 4*b^4*B*c^2*e*f - 24*a*b^3*c^2*C*e*f + 2
*A*b^4*c*d*e*f - 18*a*b^3*B*c*d*e*f + 66*a^2*b^2*c*C*d*e*f + 12*a
^2*b^2*B*d^2*e*f - 40*a^3*b*C*d^2*e*f - A*b^4*c^2*f^2 - 3*a*b^3*B
*c^2*f^2 + 15*a^2*b^2*c^2*C*f^2 + 12*a^2*b^2*B*c*d*f^2 - 40*a^3*b
*c*C*d*f^2 - 8*a^3*b*B*d^2*f^2 + 24*a^4*C*d^2*f^2)*Log[a + b*x])/
(8*b^4*(b*c - a*d)^(3/2)*(b*e - a*f)^(3/2)) + (((B*c*d*e*f)/(b*(b
*c - a*d)*(b*e - a*f)) + (a^2*B*d^2*f^2)/(b^3*(b*c - a*d)*(b*e -
a*f)) - (3*a^3*C*d^2*f^2)/(b^4*(b*c - a*d)*(b*e - a*f)) - (a*d*f*
(4*c*C*e + B*d*e + B*c*f))/(b^2*(b*c - a*d)*(b*e - a*f)) + (c*C*d
*e^2 + c^2*C*e*f)/(2*b*(b*c - a*d)*(b*e - a*f)) + (-(a*C*d^2*e^2)
 - a*c^2*C*f^2)/(2*b^2*(b*c - a*d)*(b*e - a*f)) + (7*(a^2*C*d^2*e
*f + a^2*c*C*d*f^2))/(2*b^3*(b*c - a*d)*(b*e - a*f)))*Log[d*e + c
*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(S
qrt[d]*Sqrt[f]) - ((8*b^4*c^2*C*e^2 + 4*b^4*B*c*d*e^2 - 24*a*b^3*
c*C*d*e^2 - A*b^4*d^2*e^2 - 3*a*b^3*B*d^2*e^2 + 15*a^2*b^2*C*d^2*
e^2 + 4*b^4*B*c^2*e*f - 24*a*b^3*c^2*C*e*f + 2*A*b^4*c*d*e*f - 18
*a*b^3*B*c*d*e*f + 66*a^2*b^2*c*C*d*e*f + 12*a^2*b^2*B*d^2*e*f -
40*a^3*b*C*d^2*e*f - A*b^4*c^2*f^2 - 3*a*b^3*B*c^2*f^2 + 15*a^2*b
^2*c^2*C*f^2 + 12*a^2*b^2*B*c*d*f^2 - 40*a^3*b*c*C*d*f^2 - 8*a^3*
b*B*d^2*f^2 + 24*a^4*C*d^2*f^2)*Log[2*b*c*e - a*d*e - a*c*f + b*d
*e*x + b*c*f*x - 2*a*d*f*x + 2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sq
rt[c + d*x]*Sqrt[e + f*x]])/(8*b^4*(b*c - a*d)^(3/2)*(b*e - a*f)^
(3/2))
```

Maple [B] time = 0.089, size = 12065, normalized size = 18.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a)^3,x)

[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^3,x, algorithm='

[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^3,x, algorithm='

[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**3,x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.752322, size = 4, normalized size = 0.01

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^3,x, algorithm='
```

```
[Out] sage0*x
```

3.81 $\int \frac{(a+bx)^2\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{\sqrt{e+fx}}\,dx$

Optimal. Leaf size=1032

$$\frac{C(c+dx)^{3/2}\sqrt{e+fx}(a+bx)^3}{5bdf}-\frac{(4aCdf+b(9Cde+7cCf-10Bdf))(c+dx)^{3/2}\sqrt{e+fx}(a+bx)^2}{40bd^2f^2}$$
$$-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(\left(C\left(315d^3e^3+203cd^2fe^2+145c^2df^2e+105c^3f^3\right)+10df\left(8Adf(5de+3cf)-B\left(35d^2e^2+22cdfe\cdots\right.\right.\right.\right.}{}$$
$$+\frac{(de-cf)\left(-\left(C\left(63d^4e^4+28cd^3fe^3+18c^2d^2f^2e^2+12c^3df^3e+7c^4f^4\right)+2df\left(8Adf\left(5d^2e^2+2cdfe+c^2f^2\right)-B\left(35d^3e^3\cdots\right.\right.\right.\right.}{}$$
$$-\frac{\left(-\left(C\left(63d^4e^4+28cd^3fe^3+18c^2d^2f^2e^2+12c^3df^3e+7c^4f^4\right)+2df\left(8Adf\left(5d^2e^2+2cdfe+c^2f^2\right)-B\left(35d^3e^3+15cd^2f\cdots\right.\right.\right.\right.}{}$$

```
[Out] -((16*a^2*d^2*f^2*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e
^2 + 2*c*d*e*f + c^2*f^2)) + 4*a*b*d*f*(C*(35*d^3*e^3 + 15*c*d^2*
e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*f)
 - B*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2))) - b^2*(C*(63*d^4*e^4 + 2
8*c*d^3*e^3*f + 18*c^2*d^2*e^2*f^2 + 12*c^3*d*e*f^3 + 7*c^4*f^4)
+ 2*d*f*(8*A*d*f*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2) - B*(35*d^3*e^
3 + 15*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3))))*Sqrt[c + d*x]*
Sqrt[e + f*x])/(128*d^4*f^5) - ((4*a*C*d*f + b*(9*C*d*e + 7*c*C*f
 - 10*B*d*f))*(a + b*x)^2*(c + d*x)^(3/2)*Sqrt[e + f*x])/(40*b*d^
2*f^2) + (C*(a + b*x)^3*(c + d*x)^(3/2)*Sqrt[e + f*x])/(5*b*d*f)
- ((c + d*x)^(3/2)*Sqrt[e + f*x]*(96*a^3*C*d^3*f^3 + 8*a^2*b*d^2*
f^2*(23*C*d*e + 9*c*C*f - 30*B*d*f) + 20*a*b^2*d*f*(8*d*f*(5*B*d*
e + 3*B*c*f - 6*A*d*f) - C*(35*d^2*e^2 + 22*c*d*e*f + 15*c^2*f^2)
) + b^3*(C*(315*d^3*e^3 + 203*c*d^2*e^2*f + 145*c^2*d*e*f^2 + 105
*c^3*f^3) + 10*d*f*(8*A*d*f*(5*d*e + 3*c*f) - B*(35*d^2*e^2 + 22*
c*d*e*f + 15*c^2*f^2))) + 4*b*d*f*(8*b*d*f*(6*b*c*C*e + 3*a*C*d*e
 + a*c*C*f - 10*A*b*d*f) - (7*b*d*e + 5*b*c*f - 4*a*d*f)*(4*a*C*d
*f + b*(9*C*d*e + 7*c*C*f - 10*B*d*f)))*x))/(960*b*d^4*f^4) + ((d
*e - c*f)*(16*a^2*d^2*f^2*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*
(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2)) + 4*a*b*d*f*(C*(35*d^3*e^3 + 1
5*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*
e + c*f) - B*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2))) - b^2*(C*(63*d^4
*e^4 + 28*c*d^3*e^3*f + 18*c^2*d^2*e^2*f^2 + 12*c^3*d*e*f^3 + 7*c
^4*f^4) + 2*d*f*(8*A*d*f*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2) - B*(3
5*d^3*e^3 + 15*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3))))*ArcTan
h[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(128*d^(9/2)*
f^(11/2))
```

Rubi [A] time = 5.05731, antiderivative size = 1032, normalized size of antiderivative = 1., number

of steps used = 6, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{C(c+dx)^{3/2}\sqrt{e+fx}(a+bx)^3}{5bdf} - \frac{(4aCdf+b(9Cde+7cCf-10Bdf))(c+dx)^{3/2}\sqrt{e+fx}(a+bx)^2}{40bd^2f^2}$$
$$- \frac{(c+dx)^{3/2}\sqrt{e+fx}\left(\left(C\left(315d^3e^3+203cd^2fe^2+145c^2df^2e+105c^3f^3\right)+10df\left(8Adf(5de+3cf)-B\left(35d^2e^2+22cdfe\right.\right.\right.\right.}{}$$
$$+ \frac{(de-cf)\left(-\left(C\left(63d^4e^4+28cd^3fe^3+18c^2d^2f^2e^2+12c^3df^3e+7c^4f^4\right)+2df\left(8Adf\left(5d^2e^2+2cdfe+c^2f^2\right)-B\left(35d^3e^3\right.\right.\right.\right.}{}$$
$$- \frac{\left(-\left(C\left(63d^4e^4+28cd^3fe^3+18c^2d^2f^2e^2+12c^3df^3e+7c^4f^4\right)+2df\left(8Adf\left(5d^2e^2+2cdfe+c^2f^2\right)-B\left(35d^3e^3+15cd^2f\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^2*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] -((16*a^2*d^2*f^2*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e
^2 + 2*c*d*e*f + c^2*f^2)) + 4*a*b*d*f*(C*(35*d^3*e^3 + 15*c*d^2*
e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*f)
 - B*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2))) - b^2*(C*(63*d^4*e^4 + 2
8*c*d^3*e^3*f + 18*c^2*d^2*e^2*f^2 + 12*c^3*d*e*f^3 + 7*c^4*f^4)
+ 2*d*f*(8*A*d*f*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2) - B*(35*d^3*e^
3 + 15*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3))))*Sqrt[c + d*x]*
Sqrt[e + f*x])/(128*d^4*f^5) - ((4*a*C*d*f + b*(9*C*d*e + 7*c*C*f
 - 10*B*d*f))*(a + b*x)^2*(c + d*x)^(3/2)*Sqrt[e + f*x])/(40*b*d^
2*f^2) + (C*(a + b*x)^3*(c + d*x)^(3/2)*Sqrt[e + f*x])/(5*b*d*f)
- ((c + d*x)^(3/2)*Sqrt[e + f*x]*(96*a^3*C*d^3*f^3 + 8*a^2*b*d^2*
f^2*(23*C*d*e + 9*c*C*f - 30*B*d*f) + 20*a*b^2*d*f*(8*d*f*(5*B*d*
e + 3*B*c*f - 6*A*d*f) - C*(35*d^2*e^2 + 22*c*d*e*f + 15*c^2*f^2)
) + b^3*(C*(315*d^3*e^3 + 203*c*d^2*e^2*f + 145*c^2*d*e*f^2 + 105
*c^3*f^3) + 10*d*f*(8*A*d*f*(5*d*e + 3*c*f) - B*(35*d^2*e^2 + 22*
c*d*e*f + 15*c^2*f^2))) + 4*b*d*f*(8*b*d*f*(6*b*c*C*e + 3*a*C*d*e
 + a*c*C*f - 10*A*b*d*f) - (7*b*d*e + 5*b*c*f - 4*a*d*f)*(4*a*C*d
*f + b*(9*C*d*e + 7*c*C*f - 10*B*d*f)))*x))/(960*b*d^4*f^4) + ((d
*e - c*f)*(16*a^2*d^2*f^2*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*
(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2)) + 4*a*b*d*f*(C*(35*d^3*e^3 + 1
5*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*
e + c*f) - B*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2))) - b^2*(C*(63*d^4
*e^4 + 28*c*d^3*e^3*f + 18*c^2*d^2*e^2*f^2 + 12*c^3*d*e*f^3 + 7*c
^4*f^4) + 2*d*f*(8*A*d*f*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2) - B*(3
5*d^3*e^3 + 15*c*d^2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3))))*ArcTan
h[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(128*d^(9/2)*
f^(11/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**2*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 4.37819, size = 901, normalized size = 0.87

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(\left(C\left(\left(945e^4-630fxe^3+504f^2x^2e^2-432f^3x^3e+384f^4x^4\right)d^4+2cf\left(-105e^3+49fxe^2-32f^2x^2e+24f\right.\right.\right.\right.}{}$$

$$-\frac{(de-cf)\left(\left(C\left(63d^4e^4+28cd^3fe^3+18c^2d^2f^2e^2+12c^3df^3e+7c^4f^4\right)+2df\left(8Adf\left(5d^2e^2+2cdfe+c^2f^2\right)-B\left(35d^3e^3+\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)^2*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] (Sqrt[c + d*x]*Sqrt[e + f*x]*(80*a^2*d^2*f^2*(6*d*f*(4*A*d*f + B*
(-3*d*e + c*f + 2*d*f*x)) + C*(-3*c^2*f^2 + 2*c*d*f*(-2*e + f*x)
+ d^2*(15*e^2 - 10*e*f*x + 8*f^2*x^2))) + 20*a*b*d*f*(C*(15*c^3*f
^3 + c^2*d*f^2*(17*e - 10*f*x) + c*d^2*f*(25*e^2 - 12*e*f*x + 8*f
^2*x^2) + d^3*(-105*e^3 + 70*e^2*f*x - 56*e*f^2*x^2 + 48*f^3*x^3)
) + 8*d*f*(6*A*d*f*(-3*d*e + c*f + 2*d*f*x) + B*(-3*c^2*f^2 + 2*c
*d*f*(-2*e + f*x) + d^2*(15*e^2 - 10*e*f*x + 8*f^2*x^2)))) + b^2*
(C*(-105*c^4*f^4 + 10*c^3*d*f^3*(-11*e + 7*f*x) - 2*c^2*d^2*f^2*(
68*e^2 - 39*e*f*x + 28*f^2*x^2) + 2*c*d^3*f*(-105*e^3 + 49*e^2*f*
x - 32*e*f^2*x^2 + 24*f^3*x^3) + d^4*(945*e^4 - 630*e^3*f*x + 504
*e^2*f^2*x^2 - 432*e*f^3*x^3 + 384*f^4*x^4)) + 10*d*f*(8*A*d*f*(-
3*c^2*f^2 + 2*c*d*f*(-2*e + f*x) + d^2*(15*e^2 - 10*e*f*x + 8*f^2
*x^2)) + B*(15*c^3*f^3 + c^2*d*f^2*(17*e - 10*f*x) + c*d^2*f*(25*
e^2 - 12*e*f*x + 8*f^2*x^2) + d^3*(-105*e^3 + 70*e^2*f*x - 56*e*f
^2*x^2 + 48*f^3*x^3))))))/(1920*d^4*f^5) - ((d*e - c*f)*(16*a^2*d
^2*f^2*(2*d*f*(-3*B*d*e - B*c*f + 4*A*d*f) + C*(5*d^2*e^2 + 2*c*d
*e*f + c^2*f^2)) - 4*a*b*d*f*(C*(35*d^3*e^3 + 15*c*d^2*e^2*f + 9*
c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*f) - B*(5*d^
2*e^2 + 2*c*d*e*f + c^2*f^2))) + b^2*(C*(63*d^4*e^4 + 28*c*d^3*e^
3*f + 18*c^2*d^2*e^2*f^2 + 12*c^3*d*e*f^3 + 7*c^4*f^4) + 2*d*f*(8
*A*d*f*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2) - B*(35*d^3*e^3 + 15*c*d
^2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3))))*Log[d*e + c*f + 2*d*f*x
+ 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(256*d^(9/2)*f^
(11/2))
```

Maple [B] time = 0.059, size = 3958, normalized size = 3.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^2*(C*x^2+B*x+A)*(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] 1/3840*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(-1920*ln(1/2*(2*d*f*x+2*((d*x
+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*A*a*b*e*d^
4*f^4+105*C*b^2*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(
1/2)+c*f+d*e)/(f*d)^(1/2))*c^5*f^5-480*((d*x+c)*(f*x+e))^(1/2)*x*
c*C*a*b*e*d^3*f^3*(f*d)^(1/2)-945*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x
+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^5*e^5*C*b^2+1920*l
n(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*
d)^(1/2))*c*A*a^2*d^4*f^5+75*C*b^2*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*
x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^4*e*d*f^4+90*ln(1
/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^
(1/2))*c^3*C*b^2*e^2*d^2*f^3+150*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+
e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*C*b^2*e^3*d^3*f^2
+2880*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d
*e)/(f*d)^(1/2))*d^5*e^2*A*a*b*f^3+720*ln(1/2*(2*d*f*x+2*((d*x+c)
*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*A*b^2*e^2*d^4
*f^3-960*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*c*B*a^2*e*d^4*f^4-2400*ln(1/2*(2*d*f*x+2*((d*
x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^5*e^3*B*a
*b*f^2-600*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+
c*f+d*e)/(f*d)^(1/2))*c*B*b^2*e^3*d^4*f^2+1050*ln(1/2*(2*d*f*x+2*
((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^5*e^4
*B*b^2*f-1200*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/
2)+c*f+d*e)/(f*d)^(1/2))*d^5*e^3*C*a^2*f^2+3840*((d*x+c)*(f*x+e))
^(1/2)*A*a^2*d^4*f^4*(f*d)^(1/2)+1890*((d*x+c)*(f*x+e))^(1/2)*C*b
^2*e^4*d^4*(f*d)^(1/2)-1920*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(
1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^5*e*A*a^2*f^4+240*ln(1/2
*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1
/2))*c^3*A*b^2*d^2*f^5-480*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1
/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*B*a^2*d^3*f^5-150*b^2*l
n(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*
d)^(1/2))*c^4*B*d*f^5+240*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/
2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*a^2*C*d^2*f^5-210*C*b^2*
((d*x+c)*(f*x+e))^(1/2)*c^4*f^4*(f*d)^(1/2)-1200*ln(1/2*(2*d*f*x+
2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^5*e
^3*A*b^2*f^2+1440*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)
^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^5*e^2*B*a^2*f^3+1440*ln(1/2*(2*d*f
*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*
B*a*b*e^2*d^4*f^3-1200*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*
(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*C*a*b*e^3*d^4*f^2-640*((d*x+c
)*(f*x+e))^(1/2)*c*C*a^2*e*d^3*f^3*(f*d)^(1/2)+600*b*((d*x+c)*(f*
x+e))^(1/2)*c^3*C*a*d*f^4*(f*d)^(1/2)-220*C*b^2*((d*x+c)*(f*x+e))
^(1/2)*c^3*e*d*f^3*(f*d)^(1/2)-272*((d*x+c)*(f*x+e))^(1/2)*c^2*C*
b^2*e^2*d^2*f^2*(f*d)^(1/2)-420*((d*x+c)*(f*x+e))^(1/2)*c*C*b^2*e
^3*d^3*f*(f*d)^(1/2)-1600*((d*x+c)*(f*x+e))^(1/2)*x*A*b^2*e*d^4*f
^3*(f*d)^(1/2)+196*((d*x+c)*(f*x+e))^(1/2)*x*c*C*b^2*e^2*d^3*f^2*
(f*d)^(1/2)-1280*((d*x+c)*(f*x+e))^(1/2)*c*B*a*b*e*d^3*f^3*(f*d)^
(1/2)+680*((d*x+c)*(f*x+e))^(1/2)*c^2*C*a*b*e*d^2*f^3*(f*d)^(1/2)
+1000*((d*x+c)*(f*x+e))^(1/2)*c*C*a*b*e^2*d^3*f^2*(f*d)^(1/2)+320
*C*x^2*a*b*c*d^3*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)-2240*C*x
^2*a*b*d^4*e*f^3*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)-128*C*x^2*b^
2*c*d^3*e*f^3*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+640*((d*x+c)*(f
*x+e))^(1/2)*x*c*B*a*b*d^3*f^4*(f*d)^(1/2)-3200*((d*x+c)*(f*x+e))
^(1/2)*x*B*a*b*e*d^4*f^3*(f*d)^(1/2)-240*((d*x+c)*(f*x+e))^(1/2)*
```

x*c*B*b^2*e*d^3*f^3*(f*d)^(1/2)-400*b*((d*x+c)*(f*x+e))^(1/2)*x*c
^2*C*a*d^2*f^4*(f*d)^(1/2)+2800*((d*x+c)*(f*x+e))^(1/2)*x*C*a*b*e
^2*d^4*f^2*(f*d)^(1/2)+156*C*b^2*((d*x+c)*(f*x+e))^(1/2)*x*c^2*e*
d^2*f^3*(f*d)^(1/2)+768*C*x^4*b^2*d^4*f^4*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)+960*B*x^3*b^2*d^4*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^
(1/2)+1280*A*x^2*b^2*d^4*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+
1280*C*x^2*a^2*d^4*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+720*ln
(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d
)^(1/2))*c*C*a^2*e^2*d^4*f^3+2100*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x
+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^5*e^4*C*a*b*f+525*
ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f
*d)^(1/2))*c*C*b^2*e^4*d^4*f+2400*((d*x+c)*(f*x+e))^(1/2)*A*b^2*e
^2*d^4*f^2*(f*d)^(1/2)-2880*((d*x+c)*(f*x+e))^(1/2)*B*a^2*e*d^4*f
^3*(f*d)^(1/2)-2100*((d*x+c)*(f*x+e))^(1/2)*B*b^2*e^3*d^4*f*(f*d)
^(1/2)+2400*((d*x+c)*(f*x+e))^(1/2)*C*a^2*e^2*d^4*f^2*(f*d)^(1/2)
-480*((d*x+c)*(f*x+e))^(1/2)*c^2*A*b^2*d^2*f^4*(f*d)^(1/2)+960*((
d*x+c)*(f*x+e))^(1/2)*c*B*a^2*d^3*f^4*(f*d)^(1/2)+300*b^2*((d*x+c
)*(f*x+e))^(1/2)*c^3*B*d*f^4*(f*d)^(1/2)-960*ln(1/2*(2*d*f*x+2*((
d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*A*a*b
*d^3*f^5+240*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2
)+c*f+d*e)/(f*d)^(1/2))*c^2*A*b^2*e*d^3*f^4-480*((d*x+c)*(f*x+e))
^(1/2)*c^2*a^2*C*d^2*f^4*(f*d)^(1/2)+480*ln(1/2*(2*d*f*x+2*((d*x+
c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*B*a*b*d^2
*f^5-120*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*c^3*B*b^2*e*d^2*f^4-180*ln(1/2*(2*d*f*x+2*((d
x+c)(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*B*b^2*
e^2*d^3*f^3+1920*((d*x+c)*(f*x+e))^(1/2)*x*B*a^2*d^4*f^4*(f*d)^(1
/2)+240*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f
+d*e)/(f*d)^(1/2))*c^2*C*a^2*e*d^3*f^4-300*b*ln(1/2*(2*d*f*x+2*((
d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^4*C*a*d
*f^5+480*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*c^2*B*a*b*e*d^3*f^4-200*b^2*((d*x+c)*(f*x+e))
^(1/2)*x*c^2*B*d^2*f^4*(f*d)^(1/2)+1400*((d*x+c)*(f*x+e))^(1/2)*x
*B*b^2*e^2*d^4*f^2*(f*d)^(1/2)-240*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*
x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*C*a*b*e*d^2*f^4
-360*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*
e)/(f*d)^(1/2))*c^2*C*a*b*e^2*d^3*f^3+320*((d*x+c)*(f*x+e))^(1/2)
*x*c*a^2*C*d^3*f^4*(f*d)^(1/2)-1600*((d*x+c)*(f*x+e))^(1/2)*x*C*a
^2*e*d^4*f^3*(f*d)^(1/2)+140*C*b^2*((d*x+c)*(f*x+e))^(1/2)*x*c^3*
d*f^4*(f*d)^(1/2)-1260*((d*x+c)*(f*x+e))^(1/2)*x*C*b^2*e^3*d^4*f*
(f*d)^(1/2)+1920*((d*x+c)*(f*x+e))^(1/2)*c*A*a*b*d^3*f^4*(f*d)^(1
/2)-640*((d*x+c)*(f*x+e))^(1/2)*c*A*b^2*e*d^3*f^3*(f*d)^(1/2)-960
*((d*x+c)*(f*x+e))^(1/2)*c^2*B*a*b*d^2*f^4*(f*d)^(1/2)+340*((d*x+
c)*(f*x+e))^(1/2)*c^2*B*b^2*e*d^2*f^3*(f*d)^(1/2)+500*((d*x+c)*(f
*x+e))^(1/2)*c*B*b^2*e^2*d^3*f^2*(f*d)^(1/2)-5760*((d*x+c)*(f*x+e
))^(1/2)*A*a*b*e*d^4*f^3*(f*d)^(1/2)+4800*((d*x+c)*(f*x+e))^(1/2)
*B*a*b*e^2*d^4*f^2*(f*d)^(1/2)-4200*((d*x+c)*(f*x+e))^(1/2)*C*a*b
*e^3*d^4*f*(f*d)^(1/2)+3840*((d*x+c)*(f*x+e))^(1/2)*x*A*a*b*d^4*f
^4*(f*d)^(1/2)+320*((d*x+c)*(f*x+e))^(1/2)*x*c*A*b^2*d^3*f^4*(f*d
)^(1/2)+1008*C*x^2*b^2*d^4*e^2*f^2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^
(1/2)+1920*C*x^3*a*b*d^4*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+
96*C*x^3*b^2*c*d^3*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)-864*C*
x^3*b^2*d^4*e*f^3*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+2560*B*x^2*
a*b*d^4*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+160*B*x^2*b^2*c*d
^3*f^4*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)-1120*B*x^2*b^2*d^4*e*f
^3*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)-112*C*x^2*b^2*c^2*d^2*f^4*

```
((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2))/((d*x+c)*(f*x+e))^(1/2)/d^4/
f^5/(f*d)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^2*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm='

[Out] Exception raised: ValueError
```

Fricas [A] time = 31.0436, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^2*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm='

[Out] [1/7680*(4*(384*C*b^2*d^4*f^4*x^4 + 945*C*b^2*d^4*e^4 - 210*(C*b^
2*c*d^3 + 5*(2*C*a*b + B*b^2)*d^4)*e^3*f - 2*(68*C*b^2*c^2*d^2 -
125*(2*C*a*b + B*b^2)*c*d^3 - 600*(C*a^2 + 2*B*a*b + A*b^2)*d^4)*
e^2*f^2 - 10*(11*C*b^2*c^3*d - 17*(2*C*a*b + B*b^2)*c^2*d^2 + 32*
(C*a^2 + 2*B*a*b + A*b^2)*c*d^3 + 144*(B*a^2 + 2*A*a*b)*d^4)*e*f^
3 - 15*(7*C*b^2*c^4 - 128*A*a^2*d^4 - 10*(2*C*a*b + B*b^2)*c^3*d
+ 16*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^2 - 32*(B*a^2 + 2*A*a*b)*c*d
^3)*f^4 - 48*(9*C*b^2*d^4*e*f^3 - (C*b^2*c*d^3 + 10*(2*C*a*b + B*
b^2)*d^4)*f^4)*x^3 + 8*(63*C*b^2*d^4*e^2*f^2 - 2*(4*C*b^2*c*d^3 +
 35*(2*C*a*b + B*b^2)*d^4)*e*f^3 - (7*C*b^2*c^2*d^2 - 10*(2*C*a*b
 + B*b^2)*c*d^3 - 80*(C*a^2 + 2*B*a*b + A*b^2)*d^4)*f^4)*x^2 - 2*
(315*C*b^2*d^4*e^3*f - 7*(7*C*b^2*c*d^3 + 50*(2*C*a*b + B*b^2)*d^
4)*e^2*f^2 - (39*C*b^2*c^2*d^2 - 60*(2*C*a*b + B*b^2)*c*d^3 - 400
*(C*a^2 + 2*B*a*b + A*b^2)*d^4)*e*f^3 - 5*(7*C*b^2*c^3*d - 10*(2*
C*a*b + B*b^2)*c^2*d^2 + 16*(C*a^2 + 2*B*a*b + A*b^2)*c*d^3 + 96*
(B*a^2 + 2*A*a*b)*d^4)*f^4)*x)*sqrt(d*f)*sqrt(d*x + c)*sqrt(f*x +
 e) - 15*(63*C*b^2*d^5*e^5 - 35*(C*b^2*c*d^4 + 2*(2*C*a*b + B*b^2
)*d^5)*e^4*f - 10*(C*b^2*c^2*d^3 - 4*(2*C*a*b + B*b^2)*c*d^4 - 8*
(C*a^2 + 2*B*a*b + A*b^2)*d^5)*e^3*f^2 - 6*(C*b^2*c^3*d^2 - 2*(2*
C*a*b + B*b^2)*c^2*d^3 + 8*(C*a^2 + 2*B*a*b + A*b^2)*c*d^4 + 16*(
B*a^2 + 2*A*a*b)*d^5)*e^2*f^3 - (5*C*b^2*c^4*d - 128*A*a^2*d^5 -
8*(2*C*a*b + B*b^2)*c^3*d^2 + 16*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^
3 - 64*(B*a^2 + 2*A*a*b)*c*d^4)*e*f^4 - (7*C*b^2*c^5 + 128*A*a^2*
c*d^4 - 10*(2*C*a*b + B*b^2)*c^4*d + 16*(C*a^2 + 2*B*a*b + A*b^2)
*c^3*d^2 - 32*(B*a^2 + 2*A*a*b)*c^2*d^3)*f^5)*log(4*(2*d^2*f^2*x
+ d^2*e*f + c*d*f^2)*sqrt(d*x + c)*sqrt(f*x + e) + (8*d^2*f^2*x^2
```

```
 + d^2*e^2 + 6*c*d*e*f + c^2*f^2 + 8*(d^2*e*f + c*d*f^2)*x)*sqrt(
d*f)))/(sqrt(d*f)*d^4*f^5), 1/3840*(2*(384*C*b^2*d^4*f^4*x^4 + 94
5*C*b^2*d^4*e^4 - 210*(C*b^2*c*d^3 + 5*(2*C*a*b + B*b^2)*d^4)*e^3
*f - 2*(68*C*b^2*c^2*d^2 - 125*(2*C*a*b + B*b^2)*c*d^3 - 600*(C*a
^2 + 2*B*a*b + A*b^2)*d^4)*e^2*f^2 - 10*(11*C*b^2*c^3*d - 17*(2*C
*a*b + B*b^2)*c^2*d^2 + 32*(C*a^2 + 2*B*a*b + A*b^2)*c*d^3 + 144*
(B*a^2 + 2*A*a*b)*d^4)*e*f^3 - 15*(7*C*b^2*c^4 - 128*A*a^2*d^4 -
10*(2*C*a*b + B*b^2)*c^3*d + 16*(C*a^2 + 2*B*a*b + A*b^2)*c^2*d^2
 - 32*(B*a^2 + 2*A*a*b)*c*d^3)*f^4 - 48*(9*C*b^2*d^4*e*f^3 - (C*b
^2*c*d^3 + 10*(2*C*a*b + B*b^2)*d^4)*f^4)*x^3 + 8*(63*C*b^2*d^4*e
^2*f^2 - 2*(4*C*b^2*c*d^3 + 35*(2*C*a*b + B*b^2)*d^4)*e*f^3 - (7*
C*b^2*c^2*d^2 - 10*(2*C*a*b + B*b^2)*c*d^3 - 80*(C*a^2 + 2*B*a*b
+ A*b^2)*d^4)*f^4)*x^2 - 2*(315*C*b^2*d^4*e^3*f - 7*(7*C*b^2*c*d^
3 + 50*(2*C*a*b + B*b^2)*d^4)*e^2*f^2 - (39*C*b^2*c^2*d^2 - 60*(2
*C*a*b + B*b^2)*c*d^3 - 400*(C*a^2 + 2*B*a*b + A*b^2)*d^4)*e*f^3
- 5*(7*C*b^2*c^3*d - 10*(2*C*a*b + B*b^2)*c^2*d^2 + 16*(C*a^2 + 2
*B*a*b + A*b^2)*c*d^3 + 96*(B*a^2 + 2*A*a*b)*d^4)*f^4)*x)*sqrt(-d
*f)*sqrt(d*x + c)*sqrt(f*x + e) - 15*(63*C*b^2*d^5*e^5 - 35*(C*b^
2*c*d^4 + 2*(2*C*a*b + B*b^2)*d^5)*e^4*f - 10*(C*b^2*c^2*d^3 - 4*
(2*C*a*b + B*b^2)*c*d^4 - 8*(C*a^2 + 2*B*a*b + A*b^2)*d^5)*e^3*f^
2 - 6*(C*b^2*c^3*d^2 - 2*(2*C*a*b + B*b^2)*c^2*d^3 + 8*(C*a^2 + 2
*B*a*b + A*b^2)*c*d^4 + 16*(B*a^2 + 2*A*a*b)*d^5)*e^2*f^3 - (5*C*
b^2*c^4*d - 128*A*a^2*d^5 - 8*(2*C*a*b + B*b^2)*c^3*d^2 + 16*(C*a
^2 + 2*B*a*b + A*b^2)*c^2*d^3 - 64*(B*a^2 + 2*A*a*b)*c*d^4)*e*f^4
 - (7*C*b^2*c^5 + 128*A*a^2*c*d^4 - 10*(2*C*a*b + B*b^2)*c^4*d +
16*(C*a^2 + 2*B*a*b + A*b^2)*c^3*d^2 - 32*(B*a^2 + 2*A*a*b)*c^2*d
^3)*f^5)*arctan(1/2*(2*d*f*x + d*e + c*f)*sqrt(-d*f)/(sqrt(d*x +
c)*sqrt(f*x + e)*d*f)))/(sqrt(-d*f)*d^4*f^5)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**2*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.308596, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(b*x + a)^2*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm='
```

```
[Out] Done
```

3.82 $\int \frac{(a+bx)\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{\sqrt{e+fx}}\,dx$

Optimal. Leaf size=540

$$-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(24a^2Cd^2f^2+4bdfx(4aCdf+b(-8Bdf+5cCf+7Cde))+8abdf(-6Bdf+3cCf+5Cde)+b^2\left(8df\right.\right.}{96bd^3f^3}$$
$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(8adf\left(2df(-4Adf+Bcf+3Bde)-C\left(c^2f^2+2cdef+5d^2e^2\right)\right)+b\left(8df\left(2Adf(cf+3de)-B\left(c^2f^2+\right.\right.\right.\right.}{64d^3f^4}$$
$$+\frac{(de-cf)\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(8adf\left(2df(-4Adf+Bcf+3Bde)-C\left(c^2f^2+2cdef+5d^2e^2\right)\right)+b\left(8df\left(2Adf(cf+3de)\right.\right.\right.}{64d^{7/2}f^{9/2}}$$
$$+\frac{C(a+bx)^2(c+dx)^{3/2}\sqrt{e+fx}}{4bdf}$$

```
[Out] -((8*a*d*f*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e^2 + 2*
c*d*e*f + c^2*f^2)) + b*(C*(35*d^3*e^3 + 15*c*d^2*e^2*f + 9*c^2*d
*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*f) - B*(5*d^2*e^2
 + 2*c*d*e*f + c^2*f^2))))*Sqrt[c + d*x]*Sqrt[e + f*x])/(64*d^3*f
^4) + (C*(a + b*x)^2*(c + d*x)^(3/2)*Sqrt[e + f*x])/(4*b*d*f) - (
(c + d*x)^(3/2)*Sqrt[e + f*x]*(24*a^2*C*d^2*f^2 + 8*a*b*d*f*(5*C*
d*e + 3*c*C*f - 6*B*d*f) + b^2*(8*d*f*(5*B*d*e + 3*B*c*f - 6*A*d*
f) - C*(35*d^2*e^2 + 22*c*d*e*f + 15*c^2*f^2)) + 4*b*d*f*(4*a*C*d
*f + b*(7*C*d*e + 5*c*C*f - 8*B*d*f))*x))/(96*b*d^3*f^3) + ((d*e
- c*f)*(8*a*d*f*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e^2
 + 2*c*d*e*f + c^2*f^2)) + b*(C*(35*d^3*e^3 + 15*c*d^2*e^2*f + 9*
c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*f) - B*(5*d^
2*e^2 + 2*c*d*e*f + c^2*f^2))))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(
Sqrt[d]*Sqrt[e + f*x])])/(64*d^(7/2)*f^(9/2))
```

Rubi [A] time = 1.79833, antiderivative size = 540, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.147$

$$-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(24a^2Cd^2f^2+4bdfx(4aCdf+b(-8Bdf+5cCf+7Cde))+8abdf(-6Bdf+3cCf+5Cde)+b^2\left(8df\right.\right.}{96bd^3f^3}$$
$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(8adf\left(2df(-4Adf+Bcf+3Bde)-C\left(c^2f^2+2cdef+5d^2e^2\right)\right)+b\left(8df\left(2Adf(cf+3de)-B\left(c^2f^2+\right.\right.\right.\right.}{64d^3f^4}$$
$$+\frac{(de-cf)\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(8adf\left(2df(-4Adf+Bcf+3Bde)-C\left(c^2f^2+2cdef+5d^2e^2\right)\right)+b\left(8df\left(2Adf(cf+3de)\right.\right.\right.}{64d^{7/2}f^{9/2}}$$
$$+\frac{C(a+bx)^2(c+dx)^{3/2}\sqrt{e+fx}}{4bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] -((8*a*d*f*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e^2 + 2*
c*d*e*f + c^2*f^2)) + b*(C*(35*d^3*e^3 + 15*c*d^2*e^2*f + 9*c^2*d
*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*f) - B*(5*d^2*e^2
 + 2*c*d*e*f + c^2*f^2))))*Sqrt[c + d*x]*Sqrt[e + f*x])/(64*d^3*f
^4) + (C*(a + b*x)^2*(c + d*x)^(3/2)*Sqrt[e + f*x])/(4*b*d*f) - (
(c + d*x)^(3/2)*Sqrt[e + f*x]*(24*a^2*C*d^2*f^2 + 8*a*b*d*f*(5*C*
d*e + 3*c*C*f - 6*B*d*f) + b^2*(8*d*f*(5*B*d*e + 3*B*c*f - 6*A*d*
f) - C*(35*d^2*e^2 + 22*c*d*e*f + 15*c^2*f^2)) + 4*b*d*f*(4*a*C*d
*f + b*(7*C*d*e + 5*c*C*f - 8*B*d*f))*x))/(96*b*d^3*f^3) + ((d*e
- c*f)*(8*a*d*f*(2*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e^2
 + 2*c*d*e*f + c^2*f^2)) + b*(C*(35*d^3*e^3 + 15*c*d^2*e^2*f + 9*
c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*f) - B*(5*d^
2*e^2 + 2*c*d*e*f + c^2*f^2))))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(
Sqrt[d]*Sqrt[e + f*x])])/(64*d^(7/2)*f^(9/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.5515, size = 470, normalized size = 0.87

$$3(de-cf)\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(b\left(8df\left(2Adf(cf+3de)-B\left(c^2f^2+2cdef+5d^2e^2\right)\right)+C\left(5c\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[((a + b*x)*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] (-2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]*(-8*a*d*f*(6*d*f*
(4*A*d*f + B*(-3*d*e + c*f + 2*d*f*x)) + C*(-3*c^2*f^2 + 2*c*d*f*
(-2*e + f*x) + d^2*(15*e^2 - 10*e*f*x + 8*f^2*x^2))) + b*(C*(-15*
c^3*f^3 + c^2*d*f^2*(-17*e + 10*f*x) + c*d^2*f*(-25*e^2 + 12*e*f*
x - 8*f^2*x^2) + d^3*(105*e^3 - 70*e^2*f*x + 56*e*f^2*x^2 - 48*f^
3*x^3)) - 8*d*f*(6*A*d*f*(-3*d*e + c*f + 2*d*f*x) + B*(-3*c^2*f^2
 + 2*c*d*f*(-2*e + f*x) + d^2*(15*e^2 - 10*e*f*x + 8*f^2*x^2)))))
 + 3*(d*e - c*f)*(-8*a*d*f*(2*d*f*(-3*B*d*e - B*c*f + 4*A*d*f) +
C*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2)) + b*(C*(35*d^3*e^3 + 15*c*d^
```

```
2*e^2*f + 9*c^2*d*e*f^2 + 5*c^3*f^3) + 8*d*f*(2*A*d*f*(3*d*e + c*
f) - B*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2))))*Log[d*e + c*f + 2*d*f
*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(384*d^(7/2)
*f^(9/2))
```

Maple [B] time = 0.043, size = 2002, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(C*x^2+B*x+A)*(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] 1/384*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(192*ln(1/2*(2*d*f*x+2*((d*x+c)
*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*A*a*f^4*d^3+9
6*C*x^3*b*d^3*f^3*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+128*B*x^2*b
*d^3*f^3*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+128*C*x^2*a*d^3*f^3*
((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+72*ln(1/2*(2*d*f*x+2*((d*x+c)
*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*C*a*e^2*f^2*d
^3-60*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d
*e)/(f*d)^(1/2))*c*C*b*e^3*f*d^3-288*((d*x+c)*(f*x+e))^(1/2)*A*b*
e*f^2*d^3*(f*d)^(1/2)-288*((d*x+c)*(f*x+e))^(1/2)*B*a*e*f^2*d^3*(
f*d)^(1/2)+240*((d*x+c)*(f*x+e))^(1/2)*B*b*e^2*f*d^3*(f*d)^(1/2)+
240*((d*x+c)*(f*x+e))^(1/2)*C*a*e^2*f*d^3*(f*d)^(1/2)-96*ln(1/2*(
2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2
))*c*A*b*e*f^3*d^3-96*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(
f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*B*a*e*f^3*d^3+72*ln(1/2*(2*d*f
*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*
B*b*e^2*f^2*d^3+96*A*b*((d*x+c)*(f*x+e))^(1/2)*c*f^3*d^2*(f*d)^(1
/2)+96*B*a*((d*x+c)*(f*x+e))^(1/2)*c*f^3*d^2*(f*d)^(1/2)-48*((d*x
+c)*(f*x+e))^(1/2)*c^2*B*b*f^3*d*(f*d)^(1/2)-48*((d*x+c)*(f*x+e))
^(1/2)*c^2*C*a*f^3*d*(f*d)^(1/2)+192*A*b*((d*x+c)*(f*x+e))^(1/2)*
x*f^3*d^3*(f*d)^(1/2)+192*B*a*((d*x+c)*(f*x+e))^(1/2)*x*f^3*d^3*(
f*d)^(1/2)+24*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/
2)+c*f+d*e)/(f*d)^(1/2))*c^2*e*B*b*f^3*d^2+24*ln(1/2*(2*d*f*x+2*(
(d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e*C*
a*f^3*d^2-12*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2
)+c*f+d*e)/(f*d)^(1/2))*c^3*C*b*e*f^3*d-18*ln(1/2*(2*d*f*x+2*((d*
x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e^2*C*b
*f^2*d^2-15*C*b*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(
1/2)+c*f+d*e)/(f*d)^(1/2))*c^4*f^4+16*C*x^2*b*c*d^2*f^3*((d*x+c)*
(f*x+e))^(1/2)*(f*d)^(1/2)+32*((d*x+c)*(f*x+e))^(1/2)*x*c*C*a*f^3
*d^2*(f*d)^(1/2)-160*((d*x+c)*(f*x+e))^(1/2)*x*e*C*a*f^2*d^3*(f*d
)^(1/2)-20*C*b*((d*x+c)*(f*x+e))^(1/2)*x*c^2*f^3*d*(f*d)^(1/2)-11
2*C*x^2*b*d^3*e*f^2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+140*((d*x
+c)*(f*x+e))^(1/2)*x*e^2*C*b*f*d^3*(f*d)^(1/2)-64*((d*x+c)*(f*x+e
))^(1/2)*c*e*B*b*f^2*d^2*(f*d)^(1/2)-64*((d*x+c)*(f*x+e))^(1/2)*c
*e*C*a*f^2*d^2*(f*d)^(1/2)+34*((d*x+c)*(f*x+e))^(1/2)*c^2*C*b*e*f
^2*d*(f*d)^(1/2)+50*((d*x+c)*(f*x+e))^(1/2)*c*e^2*C*b*f*d^2*(f*d)
^(1/2)+32*((d*x+c)*(f*x+e))^(1/2)*x*c*B*b*f^3*d^2*(f*d)^(1/2)-160
*((d*x+c)*(f*x+e))^(1/2)*x*e*B*b*f^2*d^3*(f*d)^(1/2)+105*ln(1/2*(
2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2
```

```
))*d^4*e^4*C*b-24*((d*x+c)*(f*x+e))^(1/2)*x*c*C*b*e*f^2*d^2*(f*d)
^(1/2)-120*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+
c*f+d*e)/(f*d)^(1/2))*d^4*e^3*B*b*f-120*ln(1/2*(2*d*f*x+2*((d*x+c
)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^4*e^3*C*a*f+
384*((d*x+c)*(f*x+e))^(1/2)*A*a*f^3*d^3*(f*d)^(1/2)-210*((d*x+c)*
(f*x+e))^(1/2)*C*b*e^3*d^3*(f*d)^(1/2)-192*ln(1/2*(2*d*f*x+2*((d*
x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^4*e*A*a*f
^3+144*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+
d*e)/(f*d)^(1/2))*d^4*e^2*A*b*f^2+30*C*b*((d*x+c)*(f*x+e))^(1/2)*
c^3*f^3*(f*d)^(1/2)-48*A*b*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1
/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*f^4*d^2-48*B*a*ln(1/2*(
2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2
))*c^2*f^4*d^2+24*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)
^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*B*b*f^4*d+24*ln(1/2*(2*d*f*x+2*(
(d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^3*C*a*
f^4*d+144*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c
*f+d*e)/(f*d)^(1/2))*d^4*e^2*B*a*f^2)/((d*x+c)*(f*x+e))^(1/2)/f^4
/d^3/(f*d)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm="ma
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 22.9898, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm="fr
```

```
[Out] [1/768*(4*(48*C*b*d^3*f^3*x^3 - 105*C*b*d^3*e^3 + 5*(5*C*b*c*d^2
+ 24*(C*a + B*b)*d^3)*e^2*f + (17*C*b*c^2*d - 32*(C*a + B*b)*c*d^
2 - 144*(B*a + A*b)*d^3)*e*f^2 + 3*(5*C*b*c^3 + 64*A*a*d^3 - 8*(C
*a + B*b)*c^2*d + 16*(B*a + A*b)*c*d^2)*f^3 - 8*(7*C*b*d^3*e*f^2
- (C*b*c*d^2 + 8*(C*a + B*b)*d^3)*f^3)*x^2 + 2*(35*C*b*d^3*e^2*f
- 2*(3*C*b*c*d^2 + 20*(C*a + B*b)*d^3)*e*f^2 - (5*C*b*c^2*d - 8*(
C*a + B*b)*c*d^2 - 48*(B*a + A*b)*d^3)*f^3)*x)*sqrt(d*f)*sqrt(d*x
 + c)*sqrt(f*x + e) + 3*(35*C*b*d^4*e^4 - 20*(C*b*c*d^3 + 2*(C*a
+ B*b)*d^4)*e^3*f - 6*(C*b*c^2*d^2 - 4*(C*a + B*b)*c*d^3 - 8*(B*a
 + A*b)*d^4)*e^2*f^2 - 4*(C*b*c^3*d + 16*A*a*d^4 - 2*(C*a + B*b)*
```

```
c^2*d^2 + 8*(B*a + A*b)*c*d^3)*e*f^3 - (5*C*b*c^4 - 64*A*a*c*d^3
- 8*(C*a + B*b)*c^3*d + 16*(B*a + A*b)*c^2*d^2)*f^4)*log(4*(2*d^2
*f^2*x + d^2*e*f + c*d*f^2)*sqrt(d*x + c)*sqrt(f*x + e) + (8*d^2*
f^2*x^2 + d^2*e^2 + 6*c*d*e*f + c^2*f^2 + 8*(d^2*e*f + c*d*f^2)*x
)*sqrt(d*f)))/(sqrt(d*f)*d^3*f^4), 1/384*(2*(48*C*b*d^3*f^3*x^3 -
 105*C*b*d^3*e^3 + 5*(5*C*b*c*d^2 + 24*(C*a + B*b)*d^3)*e^2*f + (
17*C*b*c^2*d - 32*(C*a + B*b)*c*d^2 - 144*(B*a + A*b)*d^3)*e*f^2
+ 3*(5*C*b*c^3 + 64*A*a*d^3 - 8*(C*a + B*b)*c^2*d + 16*(B*a + A*b
)*c*d^2)*f^3 - 8*(7*C*b*d^3*e*f^2 - (C*b*c*d^2 + 8*(C*a + B*b)*d^
3)*f^3)*x^2 + 2*(35*C*b*d^3*e^2*f - 2*(3*C*b*c*d^2 + 20*(C*a + B*
b)*d^3)*e*f^2 - (5*C*b*c^2*d - 8*(C*a + B*b)*c*d^2 - 48*(B*a + A*
b)*d^3)*f^3)*x)*sqrt(-d*f)*sqrt(d*x + c)*sqrt(f*x + e) + 3*(35*C*
b*d^4*e^4 - 20*(C*b*c*d^3 + 2*(C*a + B*b)*d^4)*e^3*f - 6*(C*b*c^2
*d^2 - 4*(C*a + B*b)*c*d^3 - 8*(B*a + A*b)*d^4)*e^2*f^2 - 4*(C*b*
c^3*d + 16*A*a*d^4 - 2*(C*a + B*b)*c^2*d^2 + 8*(B*a + A*b)*c*d^3)
*e*f^3 - (5*C*b*c^4 - 64*A*a*c*d^3 - 8*(C*a + B*b)*c^3*d + 16*(B*
a + A*b)*c^2*d^2)*f^4)*arctan(1/2*(2*d*f*x + d*e + c*f)*sqrt(-d*f
)/(sqrt(d*x + c)*sqrt(f*x + e)*d*f)))/(sqrt(-d*f)*d^3*f^4)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.28132, size = 994, normalized size = 1.84

$$\frac{\left(\sqrt{(dx+c)df - cdf + d^2e}\left(2\,(dx+c)\left(4\,(dx+c)\left(\frac{6\,(dx+c)Cb}{d^4f} - \frac{17\,Cbcd^{12}f^6-8\,Cad^{13}f^6-8\,Bbd^{13}f^6+7\,Cbd^{13}f^5e}{d^{16}f^7}\right) + \frac{59\,Cbc^2d^{12}f^6-56\,Cacd\cdots}{\cdots}\right.\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(b*x + a)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm="gi

[Out] 1/192*(sqrt((d*x + c)*d*f - c*d*f + d^2*e)*(2*(d*x + c)*(4*(d*x +
 c)*(6*(d*x + c)*C*b/(d^4*f) - (17*C*b*c*d^12*f^6 - 8*C*a*d^13*f^
6 - 8*B*b*d^13*f^6 + 7*C*b*d^13*f^5*e)/(d^16*f^7)) + (59*C*b*c^2*
d^12*f^6 - 56*C*a*c*d^13*f^6 - 56*B*b*c*d^13*f^6 + 48*B*a*d^14*f^
6 + 48*A*b*d^14*f^6 + 50*C*b*c*d^13*f^5*e - 40*C*a*d^14*f^5*e - 4
0*B*b*d^14*f^5*e + 35*C*b*d^14*f^4*e^2)/(d^16*f^7)) - 3*(5*C*b*c^
3*d^12*f^6 - 8*C*a*c^2*d^13*f^6 - 8*B*b*c^2*d^13*f^6 + 16*B*a*c*d
```

```
^14*f^6 + 16*A*b*c*d^14*f^6 - 64*A*a*d^15*f^6 + 9*C*b*c^2*d^13*f^
5*e - 16*C*a*c*d^14*f^5*e - 16*B*b*c*d^14*f^5*e + 48*B*a*d^15*f^5
*e + 48*A*b*d^15*f^5*e + 15*C*b*c*d^14*f^4*e^2 - 40*C*a*d^15*f^4*
e^2 - 40*B*b*d^15*f^4*e^2 + 35*C*b*d^15*f^3*e^3)/(d^16*f^7))*sqrt
(d*x + c) + 3*(5*C*b*c^4*f^4 - 8*C*a*c^3*d*f^4 - 8*B*b*c^3*d*f^4
+ 16*B*a*c^2*d^2*f^4 + 16*A*b*c^2*d^2*f^4 - 64*A*a*c*d^3*f^4 + 4*
C*b*c^3*d*f^3*e - 8*C*a*c^2*d^2*f^3*e - 8*B*b*c^2*d^2*f^3*e + 32*
B*a*c*d^3*f^3*e + 32*A*b*c*d^3*f^3*e + 64*A*a*d^4*f^3*e + 6*C*b*c
^2*d^2*f^2*e^2 - 24*C*a*c*d^3*f^2*e^2 - 24*B*b*c*d^3*f^2*e^2 - 48
*B*a*d^4*f^2*e^2 - 48*A*b*d^4*f^2*e^2 + 20*C*b*c*d^3*f*e^3 + 40*C
*a*d^4*f*e^3 + 40*B*b*d^4*f*e^3 - 35*C*b*d^4*e^4)*ln(abs(-sqrt(d*
f)*sqrt(d*x + c) + sqrt((d*x + c)*d*f - c*d*f + d^2*e)))/(sqrt(d*
f)*d^3*f^4))*d/abs(d)
```

3.83 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{\sqrt{e+fx}}\,dx$

Optimal. Leaf size=246

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(2df(4Adf-B(cf+3de))+C\left(c^2f^2+2cdef+5d^2e^2\right)\right)}{8d^2f^3}-\frac{(de-cf)\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(2df(4Adf-B(cf+3de))+C\left(c^2f^2+2cdef+5d^2e^2\right)\right)}{8d^{5/2}f^{7/2}}-\frac{(c+dx)^{3/2}\sqrt{e+fx}(-6Bdf+7cCf+5Cde)}{12d^2f^2}+\frac{C(c+dx)^{5/2}\sqrt{e+fx}}{3d^2f}$$

```
[Out] ((C*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2) + 2*d*f*(4*A*d*f - B*(3*d*e
 + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(8*d^2*f^3) - ((5*C*d*e +
7*c*C*f - 6*B*d*f)*(c + d*x)^(3/2)*Sqrt[e + f*x])/(12*d^2*f^2) +
(C*(c + d*x)^(5/2)*Sqrt[e + f*x])/(3*d^2*f) - ((d*e - c*f)*(C*(5*
d^2*e^2 + 2*c*d*e*f + c^2*f^2) + 2*d*f*(4*A*d*f - B*(3*d*e + c*f)
))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(8*d
^(5/2)*f^(7/2))
```

Rubi [A] time = 0.580217, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(2df(4Adf-B(cf+3de))+C\left(c^2f^2+2cdef+5d^2e^2\right)\right)}{8d^2f^3}-\frac{(de-cf)\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(2df(4Adf-B(cf+3de))+C\left(c^2f^2+2cdef+5d^2e^2\right)\right)}{8d^{5/2}f^{7/2}}-\frac{(c+dx)^{3/2}\sqrt{e+fx}(-6Bdf+7cCf+5Cde)}{12d^2f^2}+\frac{C(c+dx)^{5/2}\sqrt{e+fx}}{3d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```


```
[Out] ((C*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2) + 2*d*f*(4*A*d*f - B*(3*d*e
 + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(8*d^2*f^3) - ((5*C*d*e +
7*c*C*f - 6*B*d*f)*(c + d*x)^(3/2)*Sqrt[e + f*x])/(12*d^2*f^2) +
(C*(c + d*x)^(5/2)*Sqrt[e + f*x])/(3*d^2*f) - ((d*e - c*f)*(C*(5*
d^2*e^2 + 2*c*d*e*f + c^2*f^2) + 2*d*f*(4*A*d*f - B*(3*d*e + c*f)
))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(8*d
^(5/2)*f^(7/2))
```

Rubi in Sympy [A] time = 48.632, size = 318, normalized size = 1.29

$$\frac{B(c+dx)^{\frac{3}{2}}\sqrt{e+fx}}{2df}+\frac{Cx(c+dx)^{\frac{3}{2}}\sqrt{e+fx}}{3df}-\frac{C(c+dx)^{\frac{3}{2}}\sqrt{e+fx}\,(3cf+5de)}{12d^2f^2}+\frac{C\sqrt{c+dx}\sqrt{e+fx}\,(c^2f^2+2cdef+5d^2e^2)}{8d^2f^3}+\frac{C(cf-de)(c^2f^2+2cdef+5d^2e^2)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{8d^{\frac{5}{2}}f^{\frac{7}{2}}}+\frac{\sqrt{c+dx}\sqrt{e+fx}\,(4Adf-Bcf-3Bde)}{4df^2}+\frac{(cf-de)(4Adf-Bcf-3Bde)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{4d^{\frac{3}{2}}f^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] B*(c + d*x)**(3/2)*sqrt(e + f*x)/(2*d*f) + C*x*(c + d*x)**(3/2)*s
qrt(e + f*x)/(3*d*f) - C*(c + d*x)**(3/2)*sqrt(e + f*x)*(3*c*f +
5*d*e)/(12*d**2*f**2) + C*sqrt(c + d*x)*sqrt(e + f*x)*(c**2*f**2
+ 2*c*d*e*f + 5*d**2*e**2)/(8*d**2*f**3) + C*(c*f - d*e)*(c**2*f*
*2 + 2*c*d*e*f + 5*d**2*e**2)*atanh(sqrt(d)*sqrt(e + f*x)/(sqrt(f
)*sqrt(c + d*x)))/(8*d**(5/2)*f**(7/2)) + sqrt(c + d*x)*sqrt(e +
f*x)*(4*A*d*f - B*c*f - 3*B*d*e)/(4*d*f**2) + (c*f - d*e)*(4*A*d*
f - B*c*f - 3*B*d*e)*atanh(sqrt(d)*sqrt(e + f*x)/(sqrt(f)*sqrt(c
+ d*x)))/(4*d**(3/2)*f**(5/2))
```

Mathematica [A] time = 0.306874, size = 212, normalized size = 0.86

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(6df(4Adf+B(cf-3de+2dfx))+C\left(-3c^2f^2+2cdf(fx-2e)+d^2\left(15e^2-10efx+8f^2x^2\right)\right)\right)}{24d^2f^3}-\frac{(de-cf)\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(2df(4Adf-B(cf+3de))+C\left(c^2f^2+2cdef+5d^2e^2\right)\right)}{16d^{5/2}f^{7/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] (Sqrt[c + d*x]*Sqrt[e + f*x]*(6*d*f*(4*A*d*f + B*(-3*d*e + c*f +
2*d*f*x)) + C*(-3*c^2*f^2 + 2*c*d*f*(-2*e + f*x) + d^2*(15*e^2 -
10*e*f*x + 8*f^2*x^2))))/(24*d^2*f^3) - ((d*e - c*f)*(C*(5*d^2*e^
2 + 2*c*d*e*f + c^2*f^2) + 2*d*f*(4*A*d*f - B*(3*d*e + c*f)))*Log
[d*e + c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f
*x]])/(16*d^(5/2)*f^(7/2))
```

Maple [B] time = 0.031, size = 763, normalized size = 3.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] 1/48*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(16*C*x^2*d^2*f^2*(f*d)^(1/2)*((
d*x+c)*(f*x+e))^(1/2)+24*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2
)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*A*f^3*d^2-24*ln(1/2*(2*d*f*
x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^3
*e*A*f^2-6*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2
)+c*f+d*e)/(f*d)^(1/2))*c^2*f^3*d-12*ln(1/2*(2*d*f*x+2*((d*x+c)*(
f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*B*e*f^2*d^2+18*
ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f
*d)^(1/2))*d^3*e^2*B*f+24*B*((d*x+c)*(f*x+e))^(1/2)*x*f^2*d^2*(f*
d)^(1/2)+3*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2
)+c*f+d*e)/(f*d)^(1/2))*c^3*f^3+3*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f
*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e*f^2*d+9*ln(1
/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^
(1/2))*c*C*e^2*f*d^2-15*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^3*e^3*C+4*C*((d*x+c)*(f*x+e)
)^(1/2)*x*c*f^2*d*(f*d)^(1/2)-20*C*((d*x+c)*(f*x+e))^(1/2)*x*e*f*
d^2*(f*d)^(1/2)+48*((d*x+c)*(f*x+e))^(1/2)*A*f^2*d^2*(f*d)^(1/2)+
12*B*((d*x+c)*(f*x+e))^(1/2)*c*f^2*d*(f*d)^(1/2)-36*((d*x+c)*(f*x
+e))^(1/2)*B*e*f*d^2*(f*d)^(1/2)-6*C*((d*x+c)*(f*x+e))^(1/2)*c^2*
f^2*(f*d)^(1/2)-8*C*((d*x+c)*(f*x+e))^(1/2)*c*e*f*d*(f*d)^(1/2)+3
0*((d*x+c)*(f*x+e))^(1/2)*C*e^2*d^2*(f*d)^(1/2))/((d*x+c)*(f*x+e)
)^(1/2)/f^3/d^2/(f*d)^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.2951, size = 1, normalized size = 0.

$$\left[\frac{4\left(8\,Cd^2f^2x^2+15\,Cd^2e^2-2\left(2\,Ccd+9\,Bd^2\right)ef-3\left(Cc^2-2\,Bcd-8\,Ad^2\right)f^2-2\left(5\,Cd^2ef-\left(Ccd+6\,Bd^2\right)f^2\right)x\right)\sqrt{df}\sqrt{d}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm="fricas")
```

```
[Out] [1/96*(4*(8*C*d^2*f^2*x^2 + 15*C*d^2*e^2 - 2*(2*C*c*d + 9*B*d^2)*
e*f - 3*(C*c^2 - 2*B*c*d - 8*A*d^2)*f^2 - 2*(5*C*d^2*e*f - (C*c*d
 + 6*B*d^2)*f^2)*x)*sqrt(d*f)*sqrt(d*x + c)*sqrt(f*x + e) - 3*(5*
C*d^3*e^3 - 3*(C*c*d^2 + 2*B*d^3)*e^2*f - (C*c^2*d - 4*B*c*d^2 -
8*A*d^3)*e*f^2 - (C*c^3 - 2*B*c^2*d + 8*A*c*d^2)*f^3)*log(4*(2*d^
2*f^2*x + d^2*e*f + c*d*f^2)*sqrt(d*x + c)*sqrt(f*x + e) + (8*d^2
*f^2*x^2 + d^2*e^2 + 6*c*d*e*f + c^2*f^2 + 8*(d^2*e*f + c*d*f^2)*
x)*sqrt(d*f)))/(sqrt(d*f)*d^2*f^3), 1/48*(2*(8*C*d^2*f^2*x^2 + 15
*C*d^2*e^2 - 2*(2*C*c*d + 9*B*d^2)*e*f - 3*(C*c^2 - 2*B*c*d - 8*A
*d^2)*f^2 - 2*(5*C*d^2*e*f - (C*c*d + 6*B*d^2)*f^2)*x)*sqrt(-d*f)
*sqrt(d*x + c)*sqrt(f*x + e) - 3*(5*C*d^3*e^3 - 3*(C*c*d^2 + 2*B*
d^3)*e^2*f - (C*c^2*d - 4*B*c*d^2 - 8*A*d^3)*e*f^2 - (C*c^3 - 2*B
*c^2*d + 8*A*c*d^2)*f^3)*arctan(1/2*(2*d*f*x + d*e + c*f)*sqrt(-d
*f)/(sqrt(d*x + c)*sqrt(f*x + e)*d*f)))/(sqrt(-d*f)*d^2*f^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.261266, size = 425, normalized size = 1.73

$$\frac{\left(\sqrt{(dx+c)df-cdf+d^2e}\sqrt{dx+c}\left(2\,(dx+c)\left(\frac{4\,(dx+c)C}{d^3f}-\frac{7\,Ccd^6f^4-6\,Bd^7f^4+5\,Cd^7f^3e}{d^9f^5}\right)+\frac{3\left(Cc^2d^6f^4-2\,Bcd^7f^4+8\,Ad^8f^4+2\,Ccd^7f^3e-6\,B\right.}{d^9f^5}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm="giac")
```

```
[Out] 1/24*(sqrt((d*x + c)*d*f - c*d*f + d^2*e)*sqrt(d*x + c)*(2*(d*x +
 c)*(4*(d*x + c)*C/(d^3*f) - (7*C*c*d^6*f^4 - 6*B*d^7*f^4 + 5*C*d
^7*f^3*e)/(d^9*f^5)) + 3*(C*c^2*d^6*f^4 - 2*B*c*d^7*f^4 + 8*A*d^8
*f^4 + 2*C*c*d^7*f^3*e - 6*B*d^8*f^3*e + 5*C*d^8*f^2*e^2)/(d^9*f^
5)) - 3*(C*c^3*f^3 - 2*B*c^2*d*f^3 + 8*A*c*d^2*f^3 + C*c^2*d*f^2*
e - 4*B*c*d^2*f^2*e - 8*A*d^3*f^2*e + 3*C*c*d^2*f*e^2 + 6*B*d^3*f
*e^2 - 5*C*d^3*e^3)*ln(abs(-sqrt(d*f)*sqrt(d*x + c) + sqrt((d*x +
 c)*d*f - c*d*f + d^2*e)))/(sqrt(d*f)*d^2*f^3))*d/abs(d)
```

3.84 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{(a+bx)\sqrt{e+fx}}\,dx$

Optimal. Leaf size=290

$$\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(2bdf(4Abdf-aC(cf+3de))+(2adf-bcf+bde)(4aCdf+b(-4Bdf+cCf+3Cde)))}{4b^3d^{3/2}f^{5/2}} - \frac{2\sqrt{bc-ad}\left(Ab^2-a(bB-aC)\right)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)}{b^3\sqrt{be-af}} - \frac{\sqrt{c+dx}\sqrt{e+fx}(4aCdf+b(-4Bdf+cCf+3Cde))}{4b^2df^2} + \frac{C(c+dx)^{3/2}\sqrt{e+fx}}{2bdf}$$

```
[Out] -((4*a*C*d*f + b*(3*C*d*e + c*C*f - 4*B*d*f))*Sqrt[c + d*x]*Sqrt[
e + f*x])/(4*b^2*d*f^2) + (C*(c + d*x)^(3/2)*Sqrt[e + f*x])/(2*b*
d*f) + ((2*b*d*f*(4*A*b*d*f - a*C*(3*d*e + c*f)) + (b*d*e - b*c*f
 + 2*a*d*f)*(4*a*C*d*f + b*(3*C*d*e + c*C*f - 4*B*d*f)))*ArcTanh[
(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(4*b^3*d^(3/2)*
f^(5/2)) - (2*(A*b^2 - a*(b*B - a*C))*Sqrt[b*c - a*d]*ArcTanh[(Sq
rt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(b
^3*Sqrt[b*e - a*f])
```

Rubi [A] time = 1.64104, antiderivative size = 290, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(2bdf(4Abdf-aC(cf+3de))+(2adf-bcf+bde)(4aCdf+b(-4Bdf+cCf+3Cde)))}{4b^3d^{3/2}f^{5/2}} - \frac{2\sqrt{bc-ad}\left(Ab^2-a(bB-aC)\right)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)}{b^3\sqrt{be-af}} - \frac{\sqrt{c+dx}\sqrt{e+fx}(4aCdf+b(-4Bdf+cCf+3Cde))}{4b^2df^2} + \frac{C(c+dx)^{3/2}\sqrt{e+fx}}{2bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)*Sqrt[e + f*x]),x]
```



```
[Out] -((4*a*C*d*f + b*(3*C*d*e + c*C*f - 4*B*d*f))*Sqrt[c + d*x]*Sqrt[
e + f*x])/(4*b^2*d*f^2) + (C*(c + d*x)^(3/2)*Sqrt[e + f*x])/(2*b*
d*f) + ((2*b*d*f*(4*A*b*d*f - a*C*(3*d*e + c*f)) + (b*d*e - b*c*f
 + 2*a*d*f)*(4*a*C*d*f + b*(3*C*d*e + c*C*f - 4*B*d*f)))*ArcTanh[
(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(4*b^3*d^(3/2)*
f^(5/2)) - (2*(A*b^2 - a*(b*B - a*C))*Sqrt[b*c - a*d]*ArcTanh[(Sq
```

```
rt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(b
^3*Sqrt[b*e - a*f])
```

Rubi in Sympy [A] time = 106.287, size = 354, normalized size = 1.22

$$\frac{C\left(c+dx\right)^{\frac{3}{2}}\sqrt{e+fx}}{2bdf}-\frac{C\sqrt{c+dx}\sqrt{e+fx}\left(cf-de\right)}{4bdf^{2}}-\frac{C\left(cf-de\right)^{2}\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{4bd^{\frac{3}{2}}f^{\frac{5}{2}}}+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Bbf-Caf-Cbe\right)}{b^{2}f^{2}}+\frac{\left(cf-de\right)\left(Bbf-Caf-Cbe\right)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{b^{2}\sqrt{d}f^{\frac{5}{2}}}+\frac{2\sqrt{d}\left(Ab^{2}-Bab+Ca^{2}\right)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{b^{3}\sqrt{f}}-\frac{2\sqrt{ad-bc}\left(Ab^{2}-Bab+Ca^{2}\right)\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^{3}\sqrt{af-be}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)/(f*x+e)**(1/2),x)
```

```
[Out] C*(c + d*x)**(3/2)*sqrt(e + f*x)/(2*b*d*f) - C*sqrt(c + d*x)*sqrt
(e + f*x)*(c*f - d*e)/(4*b*d*f**2) - C*(c*f - d*e)**2*atanh(sqrt(
d)*sqrt(e + f*x)/(sqrt(f)*sqrt(c + d*x)))/(4*b*d**(3/2)*f**(5/2))
 + sqrt(c + d*x)*sqrt(e + f*x)*(B*b*f - C*a*f - C*b*e)/(b**2*f**2
) + (c*f - d*e)*(B*b*f - C*a*f - C*b*e)*atanh(sqrt(d)*sqrt(e + f*
x)/(sqrt(f)*sqrt(c + d*x)))/(b**2*sqrt(d)*f**(5/2)) + 2*sqrt(d)*(
A*b**2 - B*a*b + C*a**2)*atanh(sqrt(d)*sqrt(e + f*x)/(sqrt(f)*sqr
t(c + d*x)))/(b**3*sqrt(f)) - 2*sqrt(a*d - b*c)*(A*b**2 - B*a*b +
 C*a**2)*atanh(sqrt(c + d*x)*sqrt(a*f - b*e)/(sqrt(e + f*x)*sqrt(
a*d - b*c)))/(b**3*sqrt(a*f - b*e))
```

Mathematica [A] time = 0.764149, size = 367, normalized size = 1.27

$$\frac{\frac{\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(8a^{2}Cd^{2}f^{2}-4abdf(2Bdf+cCf-Cde)+b^{2}\left(4df(2Adf+Bcf-Bde)+C\left(-c^{2}f^{2}-2cdef+3d^{2}e^{2}\right)\right)\right)}{d^{3/2}f^{5/2}}+\frac{8\sqrt{bc-ad}\log(a+}{\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)*Sqrt[e + f*x]),x]
```

```
[Out] ((2*b*Sqrt[c + d*x]*Sqrt[e + f*x]*(4*b*B*d*f - 4*a*C*d*f + b*C*(-
3*d*e + c*f + 2*d*f*x)))/(d*f^2) + (8*(A*b^2 + a*(-(b*B) + a*C))*
Sqrt[b*c - a*d]*Log[a + b*x])/Sqrt[b*e - a*f] + ((8*a^2*C*d^2*f^2
 - 4*a*b*d*f*(-(C*d*e) + c*C*f + 2*B*d*f) + b^2*(4*d*f*(-(B*d*e)
```

```
+ B*c*f + 2*A*d*f) + C*(3*d^2*e^2 - 2*c*d*e*f - c^2*f^2)))*Log[d*
e + c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]
])/(d^(3/2)*f^(5/2)) - (8*(A*b^2 + a*(-(b*B) + a*C))*Sqrt[b*c - a
*d]*Log[2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sqrt[c + d*x]*Sqrt[e +
f*x] + b*(2*c*e + d*e*x + c*f*x) - a*(d*e + c*f + 2*d*f*x)])/Sqrt
[b*e - a*f])/(8*b^3)
```

Maple [B] time = 0.046, size = 1822, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)/(f*x+e)^(1/2),x)
```

```
[Out] 1/8*(8*A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)
*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*
c*e)/(b*x+a))*a*b^2*d^2*f^2*(f*d)^(1/2)-8*A*ln((-2*a*d*f*x+b*c*f*
x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2
*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*b^3*c*d*f^2*(f*d
)^(1/2)+8*A*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)
+c*f+d*e)/(f*d)^(1/2))*b^3*d^2*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*
c*e)/b^2)^(1/2)-8*B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*
x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f
-a*e*d+2*b*c*e)/(b*x+a))*a^2*b*d^2*f^2*(f*d)^(1/2)+8*B*ln((-2*a*d
*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-
a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*b^2
*c*d*f^2*(f*d)^(1/2)-8*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2
)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b^2*d^2*f^2*((a^2*d*f-a*b*c
*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)+4*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*
x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^3*c*d*f^2*((a^2*d
*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-4*B*ln(1/2*(2*d*f*x+2*((d*
x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^3*d^2*e*f
*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)+8*C*ln((-2*a*d*f*x
+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*
d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^3*d^2*f
^2*(f*d)^(1/2)-8*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x
+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-
a*e*d+2*b*c*e)/(b*x+a))*a^2*b*c*d*f^2*(f*d)^(1/2)+8*C*ln(1/2*(2*d
*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*
a^2*b*d^2*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-4*C*l
n(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*
d)^(1/2))*a*b^2*c*d*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(
1/2)+4*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*a*b^2*d^2*e*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c
*e)/b^2)^(1/2)-C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^
(1/2)+c*f+d*e)/(f*d)^(1/2))*b^3*c^2*f^2*((a^2*d*f-a*b*c*f-a*b*d*e
+b^2*c*e)/b^2)^(1/2)-2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2
)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^3*c*d*e*f*((a^2*d*f-a*b*c*f
-a*b*d*e+b^2*c*e)/b^2)^(1/2)+3*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+
e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^3*d^2*e^2*((a^2*d*f
-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)+4*C*x*b^3*d*f*((a^2*d*f-a*b*
```

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

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{c + dx} \left(A + Bx + Cx^{2}\right)}{\left(a + bx\right) \sqrt{e + fx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)/(f*x+e)**(1/2),x)
```

```
[Out] Integral(sqrt(c + d*x)*(A + B*x + C*x**2)/((a + b*x)*sqrt(e + f*x
)), x)
```

GIAC/XCAS [A] time = 0.363483, size = 797, normalized size = 2.75

$$\frac{1}{4}\sqrt{(dx+c)df-cdf+d^2e}\sqrt{dx+c}\left(\frac{2(dx+c)C}{bdf|d|}-\frac{Cb^5cd^3f^2+4Cab^4d^4f^2-4Bb^5d^4f^2+3Cb^5d^4fe}{b^6d^4f^3|d|}\right)$$
$$-\frac{2\left(\sqrt{df}Ca^2bcd^2-\sqrt{df}Bab^2cd^2+\sqrt{df}Ab^3cd^2-\sqrt{df}Ca^3d^3+\sqrt{df}Ba^2bd^3-\sqrt{df}Aab^2d^3\right)\arctan\left(-\frac{bcdf-2ad^2f+bd^2e-(\sqrt{\cdots}}{2\sqrt{abcdf^2-a\cdots}}\right.}{\sqrt{abcdf^2-a^2d^2f^2-b^2cdfe+abd^2fe}b^3d|d|}$$
$$+\frac{\left(\sqrt{df}Cb^2c^2f^2+4\sqrt{df}Cabcdf^2-4\sqrt{df}Bb^2cdf^2-8\sqrt{df}Ca^2d^2f^2+8\sqrt{df}Babd^2f^2-8\sqrt{df}Ab^2d^2f^2+2\sqrt{df}Cb^2cdfe\cdots\right.}{8b^3df^3|d|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] 1/4*sqrt((d*x + c)*d*f - c*d*f + d^2*e)*sqrt(d*x + c)*(2*(d*x + c
)*C/(b*d*f*abs(d)) - (C*b^5*c*d^3*f^2 + 4*C*a*b^4*d^4*f^2 - 4*B*b
^5*d^4*f^2 + 3*C*b^5*d^4*f*e)/(b^6*d^4*f^3*abs(d))) - 2*(sqrt(d*f
)*C*a^2*b*c*d^2 - sqrt(d*f)*B*a*b^2*c*d^2 + sqrt(d*f)*A*b^3*c*d^2
 - sqrt(d*f)*C*a^3*d^3 + sqrt(d*f)*B*a^2*b*d^3 - sqrt(d*f)*A*a*b^
2*d^3)*arctan(-1/2*(b*c*d*f - 2*a*d^2*f + b*d^2*e - (sqrt(d*f)*sq
rt(d*x + c) - sqrt((d*x + c)*d*f - c*d*f + d^2*e))^2*b)/(sqrt(a*b
*c*d*f^2 - a^2*d^2*f^2 - b^2*c*d*f*e + a*b*d^2*f*e)*d))/(sqrt(a*b
*c*d*f^2 - a^2*d^2*f^2 - b^2*c*d*f*e + a*b*d^2*f*e)*b^3*d*abs(d))
 + 1/8*(sqrt(d*f)*C*b^2*c^2*f^2 + 4*sqrt(d*f)*C*a*b*c*d*f^2 - 4*s
qrt(d*f)*B*b^2*c*d*f^2 - 8*sqrt(d*f)*C*a^2*d^2*f^2 + 8*sqrt(d*f)*
B*a*b*d^2*f^2 - 8*sqrt(d*f)*A*b^2*d^2*f^2 + 2*sqrt(d*f)*C*b^2*c*d
*f*e - 4*sqrt(d*f)*C*a*b*d^2*f*e + 4*sqrt(d*f)*B*b^2*d^2*f*e - 3*
sqrt(d*f)*C*b^2*d^2*e^2)*ln((sqrt(d*f)*sqrt(d*x + c) - sqrt((d*x
+ c)*d*f - c*d*f + d^2*e))^2)/(b^3*d*f^3*abs(d))
```

3.85 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{(a+bx)^2\sqrt{e+fx}}\,dx$

Optimal. Leaf size=364

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(2a^2Cdf-ab(Bdf+cCf+Cde)+b^2(Adf+cCe)\right)}{b^2f(bc-ad)(be-af)}+\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(4a^3Cdf-a^2b(2Bdf+3cCf+5Cde)+ab^2(Bcf+3Bde+4cCe)-b^3(-Acf+Ade+2Bce)\right)}{b^3\sqrt{bc-ad}(be-af)^{3/2}}-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b(a+bx)(bc-ad)(be-af)}-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(4aCdf+b(-2Bdf-cCf+Cde))}{b^3\sqrt{d}f^{3/2}}$$

```
[Out] ((2*a^2*C*d*f + b^2*(c*C*e + A*d*f) - a*b*(C*d*e + c*C*f + B*d*f)
)*Sqrt[c + d*x]*Sqrt[e + f*x])/(b^2*(b*c - a*d)*f*(b*e - a*f)) -
((A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(b*(b*c -
 a*d)*(b*e - a*f)*(a + b*x)) - ((4*a*C*d*f + b*(C*d*e - c*C*f - 2
*B*d*f))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])]
)/(b^3*Sqrt[d]*f^(3/2)) + ((4*a^3*C*d*f - b^3*(2*B*c*e + A*d*e -
A*c*f) + a*b^2*(4*c*C*e + 3*B*d*e + B*c*f) - a^2*b*(5*C*d*e + 3*c
*C*f + 2*B*d*f))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*
c - a*d]*Sqrt[e + f*x])])/(b^3*Sqrt[b*c - a*d]*(b*e - a*f)^(3/2))
```

Rubi [A] time = 2.62415, antiderivative size = 364, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(2a^2Cdf-ab(Bdf+cCf+Cde)+b^2(Adf+cCe)\right)}{b^2f(bc-ad)(be-af)}+\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(4a^3Cdf-a^2b(2Bdf+3cCf+5Cde)+ab^2(Bcf+3Bde+4cCe)-b^3(-Acf+Ade+2Bce)\right)}{b^3\sqrt{bc-ad}(be-af)^{3/2}}-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b(a+bx)(bc-ad)(be-af)}-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(4aCdf+b(-2Bdf-cCf+Cde))}{b^3\sqrt{d}f^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^2*Sqrt[e + f*x]),x]
```

```
[Out] ((2*a^2*C*d*f + b^2*(c*C*e + A*d*f) - a*b*(C*d*e + c*C*f + B*d*f)
)*Sqrt[c + d*x]*Sqrt[e + f*x])/(b^2*(b*c - a*d)*f*(b*e - a*f)) -
((A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(b*(b*c -
 a*d)*(b*e - a*f)*(a + b*x)) - ((4*a*C*d*f + b*(C*d*e - c*C*f - 2
*B*d*f))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])]
```

```
)/(b^3*Sqrt[d]*f^(3/2)) + ((4*a^3*C*d*f - b^3*(2*B*c*e + A*d*e -
A*c*f) + a*b^2*(4*c*C*e + 3*B*d*e + B*c*f) - a^2*b*(5*C*d*e + 3*c
*C*f + 2*B*d*f))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*
c - a*d]*Sqrt[e + f*x])])/(b^3*Sqrt[b*c - a*d]*(b*e - a*f)^(3/2))
```

Rubi in Sympy [A] time = 96.4609, size = 332, normalized size = 0.91

$$\frac{C\sqrt{c+dx}\sqrt{e+fx}}{b^2 f}+\frac{C\left(cf-de\right)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{b^2\sqrt{d}f^{\frac{3}{2}}}+\frac{\left(cf-de\right)\left(Ab^2-Bab+Ca^2\right)\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^2\sqrt{ad-bc}\left(af-be\right)^{\frac{3}{2}}}+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-Bab+Ca^2\right)}{b^2\left(a+bx\right)\left(af-be\right)}+\frac{2\sqrt{d}\left(Bb-2Ca\right)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{b^3\sqrt{f}}-\frac{2\left(Bb-2Ca\right)\sqrt{ad-bc}\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^3\sqrt{af-be}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**2/(f*x+e)**(1/2),x)
```

```
[Out] C*sqrt(c + d*x)*sqrt(e + f*x)/(b**2*f) + C*(c*f - d*e)*atanh(sqrt
(d)*sqrt(e + f*x)/(sqrt(f)*sqrt(c + d*x)))/(b**2*sqrt(d)*f**(3/2)
) + (c*f - d*e)*(A*b**2 - B*a*b + C*a**2)*atanh(sqrt(c + d*x)*sqr
t(a*f - b*e)/(sqrt(e + f*x)*sqrt(a*d - b*c)))/(b**2*sqrt(a*d - b*
c)*(a*f - b*e)**(3/2)) + sqrt(c + d*x)*sqrt(e + f*x)*(A*b**2 - B*
a*b + C*a**2)/(b**2*(a + b*x)*(a*f - b*e)) + 2*sqrt(d)*(B*b - 2*C
*a)*atanh(sqrt(d)*sqrt(e + f*x)/(sqrt(f)*sqrt(c + d*x)))/(b**3*sq
rt(f)) - 2*(B*b - 2*C*a)*sqrt(a*d - b*c)*atanh(sqrt(c + d*x)*sqrt
(a*f - b*e)/(sqrt(e + f*x)*sqrt(a*d - b*c)))/(b**3*sqrt(a*f - b*e
))
```

Mathematica [A] time = 1.78906, size = 421, normalized size = 1.16

$$\frac{\frac{\log(a+bx)\left(-4a^3Cdf+a^2b(2Bdf+3cCf+5Cde)-ab^2(Bcf+3Bde+4cCe)+b^3(-Acf+Ade+2Bce)\right)}{\sqrt{bc-ad}(be-af)^{3/2}}-\frac{\log\left(2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}\sqrt{be-af}-a(cf+de+2dfx)+b\ldots\right.}{\ldots}}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^2*Sqrt[e + f*x]),x]
```

```
[Out] (2*b*Sqrt[c + d*x]*Sqrt[e + f*x]*(C/f + (-(A*b^2) + a*(b*B - a*C)
)/((b*e - a*f)*(a + b*x))) + ((-4*a^3*C*d*f + b^3*(2*B*c*e + A*d*
```

```
e - A*c*f) - a*b^2*(4*c*C*e + 3*B*d*e + B*c*f) + a^2*b*(5*C*d*e +
 3*c*C*f + 2*B*d*f))*Log[a + b*x])/(Sqrt[b*c - a*d]*(b*e - a*f)^(
3/2)) + ((-4*a*C*d*f + b*(-(C*d*e) + c*C*f + 2*B*d*f))*Log[d*e +
c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(
Sqrt[d]*f^(3/2)) - ((-4*a^3*C*d*f + b^3*(2*B*c*e + A*d*e - A*c*f)
 - a*b^2*(4*c*C*e + 3*B*d*e + B*c*f) + a^2*b*(5*C*d*e + 3*c*C*f +
 2*B*d*f))*Log[2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sqrt[c + d*x]*Sq
rt[e + f*x] + b*(2*c*e + d*e*x + c*f*x) - a*(d*e + c*f + 2*d*f*x)
])/(Sqrt[b*c - a*d]*(b*e - a*f)^(3/2)))/(2*b^3)
```

Maple [B] time = 0.063, size = 3670, normalized size = 10.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)^2/(f*x+e)^(1/2),x)
```

```
[Out] -1/2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(-2*A*b^4*f*((a^2*d*f-a*b*c*f-a*
b*d*e+b^2*c*e)/b^2)^(1/2)*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+2*C
*x*b^4*e*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*((d*x+c)*(
f*x+e))^(1/2)*(f*d)^(1/2)+2*B*a*b^3*f*((a^2*d*f-a*b*c*f-a*b*d*e+b
^2*c*e)/b^2)^(1/2)*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)-4*C*a^2*b^
2*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*((d*x+c)*(f*x+e
))^(1/2)*(f*d)^(1/2)+2*C*a*b^3*e*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*
e)/b^2)^(1/2)*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+A*ln((-2*a*d*f*
x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b
*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*b^4*c*
f^2*(f*d)^(1/2)-C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)
^(1/2)+c*f+d*e)/(f*d)^(1/2))*x*b^4*d*e^2*((a^2*d*f-a*b*c*f-a*b*d*
e+b^2*c*e)/b^2)^(1/2)+A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)
*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a
*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*b^3*c*f^2*(f*d)^(1/2)-2*B*ln(1/2*(
2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2
))*a^2*b^2*d*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-2*
B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*
d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b
*x+a))*a^3*b*d*f^2*(f*d)^(1/2)+B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2
*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^
(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^2*b^2*c*f^2*(f*d)^(1/2)+4
*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)
/(f*d)^(1/2))*a^3*b*d*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)
^(1/2)-C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*a^2*b^2*c*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c
*e)/b^2)^(1/2)-C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^
(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b^3*d*e^2*((a^2*d*f-a*b*c*f-a*b*d*e
+b^2*c*e)/b^2)^(1/2)-3*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c
)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-
a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^3*b*c*f^2*(f*d)^(1/2)-C*ln(1/2*(2
*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2)
)*x*a*b^3*c*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)+3*B
*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d
```

```
*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*
x+a))*x*a*b^3*d*e*f*(f*d)^(1/2)-3*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f
*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*x*a*b^3*d*e*f*((a^
2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-5*C*ln((-2*a*d*f*x+b*c*
f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b
^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a^2*b^2*d*e*
f*(f*d)^(1/2)+4*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+
e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a
*e*d+2*b*c*e)/(b*x+a))*x*a*b^3*c*e*f*(f*d)^(1/2)+4*C*ln((-2*a*d*f
*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*
b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^2*b^2
*c*e*f*(f*d)^(1/2)-2*C*x*a*b^3*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*
e)/b^2)^(1/2)*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)-A*ln((-2*a*d*f*
x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b
*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*b^4*d*
e*f*(f*d)^(1/2)-2*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*
d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*x*a*b^3*d*f^2*((a^2*d*f-a*b*c*f-a*
b*d*e+b^2*c*e)/b^2)^(1/2)+2*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))
^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*x*b^4*d*e*f*((a^2*d*f-a*
b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-2*B*ln((-2*a*d*f*x+b*c*f*x+b*d*
e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/
b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a^2*b^2*d*f^2*(f*d)^
(1/2)+B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*
((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c
*e)/(b*x+a))*x*a*b^3*c*f^2*(f*d)^(1/2)-2*B*ln((-2*a*d*f*x+b*c*f*x
+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*
c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*b^4*c*e*f*(f*d)
^(1/2)+4*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+
c*f+d*e)/(f*d)^(1/2))*x*a^2*b^2*d*f^2*((a^2*d*f-a*b*c*f-a*b*d*e+b
^2*c*e)/b^2)^(1/2)+C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f
*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*x*b^4*c*e*f*((a^2*d*f-a*b*c*f-a*b
*d*e+b^2*c*e)/b^2)^(1/2)+4*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d
*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2
)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a^3*b*d*f^2*(f*d)^(1/2)-3*C*l
n((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f
-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+
a))*x*a^2*b^2*c*f^2*(f*d)^(1/2)-A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+
2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)
^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*b^3*d*e*f*(f*d)^(1/2)+2*
B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/
(f*d)^(1/2))*a*b^3*d*e*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^
(1/2)+3*B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2
)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b
*c*e)/(b*x+a))*a^2*b^2*d*e*f*(f*d)^(1/2)-2*B*ln((-2*a*d*f*x+b*c*f
*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^
2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*b^3*c*e*f*(f*
d)^(1/2)-3*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2
)+c*f+d*e)/(f*d)^(1/2))*a^2*b^2*d*e*f*((a^2*d*f-a*b*c*f-a*b*d*e+b
^2*c*e)/b^2)^(1/2)+C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f
*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b^3*c*e*f*((a^2*d*f-a*b*c*f-a*b
*d*e+b^2*c*e)/b^2)^(1/2)-5*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d
*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2
)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^3*b*d*e*f*(f*d)^(1/2)+4*C*ln(
(-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a
*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a)
)*a^4*d*f^2*(f*d)^(1/2))/((d*x+c)*(f*x+e))^(1/2)/b^4/(a*f-b*e)/(f
```

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

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^2*sqrt(f*x + e)),x, algorithm
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^2*sqrt(f*x + e)),x, algorithm
```

```
[Out] Timed out
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**2/(f*x+e)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [A] time = 0.667036, size = 4, normalized size = 0.01

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^2*sqrt(f*x + e)),x, algorithm
```

```
[Out] sage0*x
```

3.86 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{(a+bx)^3\sqrt{e+fx}}\,dx$

Optimal. Leaf size=484

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(4a^3Cdf-a^2bC(5cf+7de)+ab^2(-4Adf+Bcf+3Bde+8cCe)-b^3(-3Acf-Ade+4Bce)\right)}{4b^2(a+bx)(bc-ad)(be-af)^2}$$

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(8a^4Cd^2f^2-4a^3bCdf(3cf+5de)+3a^2b^2C\left(c^2f^2+10cdef+5d^2e^2\right)-ab^3\left(2cd\left(2Af^2-Bef+\right.\right.\right.}{4b^3(bc-ad)^{3/2}(be}$$

$$-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{2b(a+bx)^2(bc-ad)(be-af)}+\frac{2C\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{b^3\sqrt{f}}$$

```
[Out] ((4*a^3*C*d*f - a^2*b*C*(7*d*e + 5*c*f) - b^3*(4*B*c*e - A*d*e -
3*A*c*f) + a*b^2*(8*c*C*e + 3*B*d*e + B*c*f - 4*A*d*f))*Sqrt[c +
d*x]*Sqrt[e + f*x])/(4*b^2*(b*c - a*d)*(b*e - a*f)^2*(a + b*x)) -
 ((A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(2*b*(b*
c - a*d)*(b*e - a*f)*(a + b*x)^2) + (2*C*Sqrt[d]*ArcTanh[(Sqrt[f]
*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(b^3*Sqrt[f]) - ((8*a^4
*C*d^2*f^2 - 4*a^3*b*C*d*f*(5*d*e + 3*c*f) + 3*a^2*b^2*C*(5*d^2*e
^2 + 10*c*d*e*f + c^2*f^2) - a*b^3*(d^2*e*(3*B*e - 4*A*f) + c^2*f
*(8*C*e - B*f) + 2*c*d*(12*C*e^2 - B*e*f + 2*A*f^2)) - b^4*(A*d^2
*e^2 - 2*c*d*e*(2*B*e - A*f) - c^2*(8*C*e^2 - 4*B*e*f + 3*A*f^2))
)*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e
 + f*x])])/(4*b^3*(b*c - a*d)^(3/2)*(b*e - a*f)^(5/2))
```

Rubi [A] time = 3.66635, antiderivative size = 484, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(4a^3Cdf-a^2bC(5cf+7de)+ab^2(-4Adf+Bcf+3Bde+8cCe)-b^3(-3Acf-Ade+4Bce)\right)}{4b^2(a+bx)(bc-ad)(be-af)^2}$$

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(8a^4Cd^2f^2-4a^3bCdf(3cf+5de)+3a^2b^2C\left(c^2f^2+10cdef+5d^2e^2\right)-ab^3\left(2cd\left(2Af^2-Bef+\right.\right.\right.}{4b^3(bc-ad)^{3/2}(be}$$

$$-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{2b(a+bx)^2(bc-ad)(be-af)}+\frac{2C\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{b^3\sqrt{f}}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^3*Sqrt[e + f*x]),x]
```

```
[Out] ((4*a^3*C*d*f - a^2*b*C*(7*d*e + 5*c*f) - b^3*(4*B*c*e - A*d*e -
3*A*c*f) + a*b^2*(8*c*C*e + 3*B*d*e + B*c*f - 4*A*d*f))*Sqrt[c +
```

```
d*x]*Sqrt[e + f*x])/(4*b^2*(b*c - a*d)*(b*e - a*f)^2*(a + b*x)) -
 ((A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(2*b*(b*
c - a*d)*(b*e - a*f)*(a + b*x)^2) + (2*C*Sqrt[d]*ArcTanh[(Sqrt[f]
*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(b^3*Sqrt[f]) - ((8*a^4
*C*d^2*f^2 - 4*a^3*b*C*d*f*(5*d*e + 3*c*f) + 3*a^2*b^2*C*(5*d^2*e
^2 + 10*c*d*e*f + c^2*f^2) - a*b^3*(d^2*e*(3*B*e - 4*A*f) + c^2*f
*(8*C*e - B*f) + 2*c*d*(12*C*e^2 - B*e*f + 2*A*f^2)) - b^4*(A*d^2
*e^2 - 2*c*d*e*(2*B*e - A*f) - c^2*(8*C*e^2 - 4*B*e*f + 3*A*f^2))
)*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e
 + f*x])])/(4*b^3*(b*c - a*d)^(3/2)*(b*e - a*f)^(5/2))
```

Rubi in Sympy [A] time = 155.302, size = 468, normalized size = 0.97

$$\frac{2C\sqrt{d}\,\operatorname{atanh}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{b^3\sqrt{f}} - \frac{2C\sqrt{ad-bc}\,\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^3\sqrt{af-be}} - \frac{(c+dx)^{\frac{3}{2}}\sqrt{e+fx}\left(Ab^2-Bab+Ca^2\right)}{2b(a+bx)^2(ad-bc)(af-be)} + \frac{(Bb-2Ca)(cf-de)\,\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^2\sqrt{ad-bc}\,(af-be)^{\frac{3}{2}}} + \frac{(cf-de)\left(Ab^2-Bab+Ca^2\right)(4adf-3bcf-bde)\,\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{4b^2(ad-bc)^{\frac{3}{2}}(af-be)^{\frac{5}{2}}} + \frac{\sqrt{c+dx}\sqrt{e+fx}\,(Bb-2Ca)}{b^2(a+bx)(af-be)} + \frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-Bab+Ca^2\right)(4adf-3bcf-bde)}{4b^2(a+bx)(ad-bc)(af-be)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**3/(f*x+e)**(1/2),x)
```

```
[Out] 2*C*sqrt(d)*atanh(sqrt(f)*sqrt(c + d*x)/(sqrt(d)*sqrt(e + f*x)))/
(b**3*sqrt(f)) - 2*C*sqrt(a*d - b*c)*atanh(sqrt(c + d*x)*sqrt(a*f
 - b*e)/(sqrt(e + f*x)*sqrt(a*d - b*c)))/(b**3*sqrt(a*f - b*e)) -
 (c + d*x)**(3/2)*sqrt(e + f*x)*(A*b**2 - B*a*b + C*a**2)/(2*b*(a
 + b*x)**2*(a*d - b*c)*(a*f - b*e)) + (B*b - 2*C*a)*(c*f - d*e)*a
tanh(sqrt(c + d*x)*sqrt(a*f - b*e)/(sqrt(e + f*x)*sqrt(a*d - b*c)
))/(b**2*sqrt(a*d - b*c)*(a*f - b*e)**(3/2)) + (c*f - d*e)*(A*b**
2 - B*a*b + C*a**2)*(4*a*d*f - 3*b*c*f - b*d*e)*atanh(sqrt(c + d*
x)*sqrt(a*f - b*e)/(sqrt(e + f*x)*sqrt(a*d - b*c)))/(4*b**2*(a*d
- b*c)**(3/2)*(a*f - b*e)**(5/2)) + sqrt(c + d*x)*sqrt(e + f*x)*(
B*b - 2*C*a)/(b**2*(a + b*x)*(a*f - b*e)) + sqrt(c + d*x)*sqrt(e
+ f*x)*(A*b**2 - B*a*b + C*a**2)*(4*a*d*f - 3*b*c*f - b*d*e)/(4*b
**2*(a + b*x)*(a*d - b*c)*(a*f - b*e)**2)
```

Mathematica [B] time = 6.75626, size = 979, normalized size = 2.02

$$\sqrt{c+dx}\sqrt{e+fx}\left(\frac{-Ca^2+bBa-Ab^2}{2b^2(be-af)(a+bx)^2}\right.$$
$$\left.+\frac{6Cdfa^3-9bCdea^2-5bcCfa^2-2bBdfa^2+8b^2cCea+5b^2Bdea+b^2Bcfa-2Ab^2dfa-4b^3Bce-Ab^3de+3Ab^3cf}{4b^2(bc-ad)(be-af)^2(a+bx)}\right)$$
$$+\frac{(8Cd^2f^2a^4-12bcCdf^2a^3-20bCd^2efa^3+15b^2Cd^2e^2a^2+3b^2c^2Cf^2a^2+30b^2cCdefa^2-3b^3Bd^2e^2a-24b^3cCde^2a+b^3B\ldots}{8b\ldots}$$
$$+\frac{\left(-\frac{Cd^2f^2a^3}{b^3(bc-ad)(be-af)^2}+\frac{Cdf(2de+cf)a^2}{b^2(bc-ad)(be-af)^2}+\frac{-aCd^2e^2+bcCde^2-2acCdfe}{b(bc-ad)(be-af)^2}\right)\log\left(de+cf+2dfx+2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}\right)}{\sqrt{d}\sqrt{f}}$$
$$-\frac{(8Cd^2f^2a^4-12bcCdf^2a^3-20bCd^2efa^3+15b^2Cd^2e^2a^2+3b^2c^2Cf^2a^2+30b^2cCdefa^2-3b^3Bd^2e^2a-24b^3cCde^2a+b^3B\ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^3*Sqrt[e + f*x]),x]
```

```
[Out] Sqrt[c + d*x]*Sqrt[e + f*x]*((-(A*b^2) + a*b*B - a^2*C)/(2*b^2*(b
*e - a*f)*(a + b*x)^2) + (-4*b^3*B*c*e + 8*a*b^2*c*C*e - A*b^3*d*
e + 5*a*b^2*B*d*e - 9*a^2*b*C*d*e + 3*A*b^3*c*f + a*b^2*B*c*f - 5
*a^2*b*c*C*f - 2*a*A*b^2*d*f - 2*a^2*b*B*d*f + 6*a^3*C*d*f)/(4*b^
2*(b*c - a*d)*(b*e - a*f)^2*(a + b*x))) + ((8*b^4*c^2*C*e^2 + 4*b
^4*B*c*d*e^2 - 24*a*b^3*c*C*d*e^2 - A*b^4*d^2*e^2 - 3*a*b^3*B*d^2
*e^2 + 15*a^2*b^2*C*d^2*e^2 - 4*b^4*B*c^2*e*f - 8*a*b^3*c^2*C*e*f
 - 2*A*b^4*c*d*e*f + 2*a*b^3*B*c*d*e*f + 30*a^2*b^2*c*C*d*e*f + 4
*a*A*b^3*d^2*e*f - 20*a^3*b*C*d^2*e*f + 3*A*b^4*c^2*f^2 + a*b^3*B
*c^2*f^2 + 3*a^2*b^2*c^2*C*f^2 - 4*a*A*b^3*c*d*f^2 - 12*a^3*b*c*C
*d*f^2 + 8*a^4*C*d^2*f^2)*Log[a + b*x])/(8*b^3*(b*c - a*d)^(3/2)*
(b*e - a*f)^(5/2)) + ((-((a^3*C*d^2*f^2)/(b^3*(b*c - a*d)*(b*e -
a*f)^2)) + (a^2*C*d*f*(2*d*e + c*f))/(b^2*(b*c - a*d)*(b*e - a*f)
^2) + (b*c*C*d*e^2 - a*C*d^2*e^2 - 2*a*c*C*d*e*f)/(b*(b*c - a*d)*
(b*e - a*f)^2))*Log[d*e + c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[
c + d*x]*Sqrt[e + f*x]])/(Sqrt[d]*Sqrt[f]) - ((8*b^4*c^2*C*e^2 +
4*b^4*B*c*d*e^2 - 24*a*b^3*c*C*d*e^2 - A*b^4*d^2*e^2 - 3*a*b^3*B*
d^2*e^2 + 15*a^2*b^2*C*d^2*e^2 - 4*b^4*B*c^2*e*f - 8*a*b^3*c^2*C*
e*f - 2*A*b^4*c*d*e*f + 2*a*b^3*B*c*d*e*f + 30*a^2*b^2*c*C*d*e*f
+ 4*a*A*b^3*d^2*e*f - 20*a^3*b*C*d^2*e*f + 3*A*b^4*c^2*f^2 + a*b^
3*B*c^2*f^2 + 3*a^2*b^2*c^2*C*f^2 - 4*a*A*b^3*c*d*f^2 - 12*a^3*b*
c*C*d*f^2 + 8*a^4*C*d^2*f^2)*Log[2*b*c*e - a*d*e - a*c*f + b*d*e*
x + b*c*f*x - 2*a*d*f*x + 2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sqrt[
c + d*x]*Sqrt[e + f*x]])/(8*b^3*(b*c - a*d)^(3/2)*(b*e - a*f)^(5/
2))
```

Maple [B] time = 0.123, size = 9100, normalized size = 18.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)^3/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^3*sqrt(f*x + e)),x, algorithm
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^3*sqrt(f*x + e)),x, algorithm
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**3/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^3*sqrt(f*x + e)),x, algorithm
```

```
[Out] Timed out
```

3.87 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{(a+bx)^4\sqrt{e+fx}}\,dx$

Optimal. Leaf size=685

$$-\frac{(de-cf)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(a^2\left(-\left(2df(-4Adf+Bcf+3Bde)-C\left(c^2f^2+2cdef+5d^2e^2\right)\right)\right)+ab\left(-2cd\left(6Af^2-7\right.\right.\right.}{8(bc-ad)^{5/2}(be}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(4a^3Cdf-a^2b(-2Bdf+7cCf+9Cde)+ab^2(-8Adf+Bcf+3Bde+12cCe)-b^3(-5Acf-3Ade+6Bc\right.}{12b^2(a+bx)^2(bc-ad)(be-af)^2}$$
$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(8a^4Cd^2f^2-2a^3bdf(-2Bdf+7cCf+13Cde)-a^2b^2\left(4df(-2Adf+Bcf+4Bde)-C\left(3c^2f^2+44cdef\right.\right.\right.}{}$$
$$-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{3b(a+bx)^3(bc-ad)(be-af)}$$

```
[Out] ((4*a^3*C*d*f - b^3*(6*B*c*e - 3*A*d*e - 5*A*c*f) + a*b^2*(12*c*C
*e + 3*B*d*e + B*c*f - 8*A*d*f) - a^2*b*(9*C*d*e + 7*c*C*f - 2*B*
d*f))*Sqrt[c + d*x]*Sqrt[e + f*x])/(12*b^2*(b*c - a*d)*(b*e - a*f
)^2*(a + b*x)^2) - ((8*a^4*C*d^2*f^2 - 2*a^3*b*d*f*(13*C*d*e + 7*
c*C*f - 2*B*d*f) - b^4*(3*A*d^2*e^2 - 2*c*d*e*(3*B*e - 2*A*f) - 3
*c^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) - a*b^3*(d^2*e*(3*B*e - 10*A*
f) + 3*c^2*f*(4*C*e - B*f) + 2*c*d*(30*C*e^2 - 14*B*e*f + 13*A*f^
2)) - a^2*b^2*(4*d*f*(4*B*d*e + B*c*f - 2*A*d*f) - C*(33*d^2*e^2
+ 44*c*d*e*f + 3*c^2*f^2)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(24*b^2*
(b*c - a*d)^2*(b*e - a*f)^3*(a + b*x)) - ((A*b^2 - a*(b*B - a*C))
*(c + d*x)^(3/2)*Sqrt[e + f*x])/(3*b*(b*c - a*d)*(b*e - a*f)*(a +
 b*x)^3) - ((d*e - c*f)*(b^2*(A*d^2*e^2 - 2*c*d*e*(B*e - A*f) + c
^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) + a*b*(d^2*e*(B*e - 4*A*f) - c^
2*f*(4*C*e - B*f) - 2*c*d*(6*C*e^2 - 7*B*e*f + 6*A*f^2)) - a^2*(2
*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e^2 + 2*c*d*e*f + c^2
*f^2)))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*
Sqrt[e + f*x])])/(8*(b*c - a*d)^(5/2)*(b*e - a*f)^(7/2))
```

Rubi [A] time = 4.90162, antiderivative size = 685, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$-\frac{(de-cf)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(a^2\left(-\left(2df(-4Adf+Bcf+3Bde)-C\left(c^2f^2+2cdef+5d^2e^2\right)\right)\right)+ab\left(-2cd\left(6Af^2-7\right.\right.\right.}{8(bc-ad)^{5/2}(be}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(4a^3Cdf-a^2b(-2Bdf+7cCf+9Cde)+ab^2(-8Adf+Bcf+3Bde+12cCe)-b^3(-5Acf-3Ade+6Bc\right.}{12b^2(a+bx)^2(bc-ad)(be-af)^2}$$
$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(8a^4Cd^2f^2-2a^3bdf(-2Bdf+7cCf+13Cde)-a^2b^2\left(4df(-2Adf+Bcf+4Bde)-C\left(3c^2f^2+44cdef\right.\right.\right.}{}$$
$$-\frac{(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{3b(a+bx)^3(bc-ad)(be-af)}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^4*Sqrt[e + f*x]),x]
```

```
[Out] ((4*a^3*C*d*f - b^3*(6*B*c*e - 3*A*d*e - 5*A*c*f) + a*b^2*(12*c*C
*e + 3*B*d*e + B*c*f - 8*A*d*f) - a^2*b*(9*C*d*e + 7*c*C*f - 2*B*
d*f))*Sqrt[c + d*x]*Sqrt[e + f*x])/(12*b^2*(b*c - a*d)*(b*e - a*f
)^2*(a + b*x)^2) - ((8*a^4*C*d^2*f^2 - 2*a^3*b*d*f*(13*C*d*e + 7*
c*C*f - 2*B*d*f) - b^4*(3*A*d^2*e^2 - 2*c*d*e*(3*B*e - 2*A*f) - 3
*c^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) - a*b^3*(d^2*e*(3*B*e - 10*A*
f) + 3*c^2*f*(4*C*e - B*f) + 2*c*d*(30*C*e^2 - 14*B*e*f + 13*A*f^
2)) - a^2*b^2*(4*d*f*(4*B*d*e + B*c*f - 2*A*d*f) - C*(33*d^2*e^2
+ 44*c*d*e*f + 3*c^2*f^2)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(24*b^2*
(b*c - a*d)^2*(b*e - a*f)^3*(a + b*x)) - ((A*b^2 - a*(b*B - a*C))
*(c + d*x)^(3/2)*Sqrt[e + f*x])/(3*b*(b*c - a*d)*(b*e - a*f)*(a +
 b*x)^3) - ((d*e - c*f)*(b^2*(A*d^2*e^2 - 2*c*d*e*(B*e - A*f) + c
^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) + a*b*(d^2*e*(B*e - 4*A*f) - c^
2*f*(4*C*e - B*f) - 2*c*d*(6*C*e^2 - 7*B*e*f + 6*A*f^2)) - a^2*(2
*d*f*(3*B*d*e + B*c*f - 4*A*d*f) - C*(5*d^2*e^2 + 2*c*d*e*f + c^2
*f^2)))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*
Sqrt[e + f*x])])/(8*(b*c - a*d)^(5/2)*(b*e - a*f)^(7/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**4/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 6.05357, size = 847, normalized size = 1.24

$$\frac{3b^2(de-cf)\left(\left(2df(-3Bde-Bcf+4Adf)+C\left(5d^2e^2+2cdfe+c^2f^2\right)\right)a^2+b\left(f(Bf-4Ce)c^2-2d\left(6Ce^2-7Bfe+6Af^2\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^4*Sqrt[e + f*x]),x]
```

```
[Out] (-2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sqrt[c + d*x]*Sqrt[e + f*x]*(
8*(A*b^2 + a*(-(b*B) + a*C))*(b*c - a*d)^2*(b*e - a*f)^2 + 2*(b*c
 - a*d)*(b*e - a*f)*(-8*a^3*C*d*f + b^3*(6*B*c*e + A*d*e - 5*A*c*
f) - a*b^2*(12*c*C*e + 7*B*d*e + B*c*f - 4*A*d*f) + a^2*b*(13*C*d
*e + 7*c*C*f + 2*B*d*f))*(a + b*x) + (8*a^4*C*d^2*f^2 + 2*a^3*b*d
```

```
*f*(-13*C*d*e - 7*c*C*f + 2*B*d*f) + b^4*(-3*A*d^2*e^2 + 2*c*d*e*
(3*B*e - 2*A*f) + 3*c^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) + a*b^3*(d
^2*e*(-3*B*e + 10*A*f) + 3*c^2*f*(-4*C*e + B*f) - 2*c*d*(30*C*e^2
 - 14*B*e*f + 13*A*f^2)) + a^2*b^2*(4*d*f*(-4*B*d*e - B*c*f + 2*A
*d*f) + C*(33*d^2*e^2 + 44*c*d*e*f + 3*c^2*f^2)))*(a + b*x)^2) +
3*b^2*(d*e - c*f)*(b^2*(A*d^2*e^2 + 2*c*d*e*(-(B*e) + A*f) + c^2*
(8*C*e^2 - 6*B*e*f + 5*A*f^2)) + a*b*(d^2*e*(B*e - 4*A*f) + c^2*f
*(-4*C*e + B*f) - 2*c*d*(6*C*e^2 - 7*B*e*f + 6*A*f^2)) + a^2*(2*d
*f*(-3*B*d*e - B*c*f + 4*A*d*f) + C*(5*d^2*e^2 + 2*c*d*e*f + c^2*
f^2)))*(a + b*x)^3*Log[a + b*x] - 3*b^2*(d*e - c*f)*(b^2*(A*d^2*e
^2 + 2*c*d*e*(-(B*e) + A*f) + c^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2))
+ a*b*(d^2*e*(B*e - 4*A*f) + c^2*f*(-4*C*e + B*f) - 2*c*d*(6*C*e^
2 - 7*B*e*f + 6*A*f^2)) + a^2*(2*d*f*(-3*B*d*e - B*c*f + 4*A*d*f)
 + C*(5*d^2*e^2 + 2*c*d*e*f + c^2*f^2)))*(a + b*x)^3*Log[2*Sqrt[b
*c - a*d]*Sqrt[b*e - a*f]*Sqrt[c + d*x]*Sqrt[e + f*x] + b*(2*c*e
+ d*e*x + c*f*x) - a*(d*e + c*f + 2*d*f*x)])/(48*b^2*(b*c - a*d)^
(5/2)*(b*e - a*f)^(7/2)*(a + b*x)^3)
```

Maple [B] time = 0.223, size = 15990, normalized size = 23.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)^4/(f*x+e)^(1/2),x)

[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^4*sqrt(f*x + e)),x, algorithm

[Out] Exception raised: ValueError
```

Fricas [A] time = 80.8873, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^4*sqrt(f*x + e)),x, algorithm

[Out] [-1/96*(4*((4*(2*C*a^2*b^2 + B*a*b^3 + 2*A*b^4)*c^2 - 2*(13*C*a^3
*b + 2*B*a^2*b^2 + 7*A*a*b^3)*c*d + 3*(5*C*a^4 + B*a^3*b + A*a^2*
b^2)*d^2)*e^2 + 2*((5*C*a^3*b - 8*B*a^2*b^2 - 13*A*a*b^3)*c^2 - 2
*(C*a^4 - 7*B*a^3*b - 11*A*a^2*b^2)*c*d - 3*(3*B*a^4 + 2*A*a^3*b)
*d^2)*e*f + 3*(8*A*a^4*d^2 - (C*a^4 + B*a^3*b - 11*A*a^2*b^2)*c^2
 + 2*(B*a^4 - 10*A*a^3*b)*c*d)*f^2 + (3*(8*C*b^4*c^2 - 2*(10*C*a*
b^3 - B*b^4)*c*d + (11*C*a^2*b^2 - B*a*b^3 - A*b^4)*d^2)*e^2 - 2*
(3*(2*C*a*b^3 + 3*B*b^4)*c^2 - 2*(11*C*a^2*b^2 + 7*B*a*b^3 - A*b^
4)*c*d + (13*C*a^3*b + 8*B*a^2*b^2 - 5*A*a*b^3)*d^2)*e*f + (3*(C*
a^2*b^2 + B*a*b^3 + 5*A*b^4)*c^2 - 2*(7*C*a^3*b + 2*B*a^2*b^2 + 1
3*A*a*b^3)*c*d + 4*(2*C*a^4 + B*a^3*b + 2*A*a^2*b^2)*d^2)*f^2)*x^
2 + 2*((6*(2*C*a*b^3 + B*b^4)*c^2 - (35*C*a^2*b^2 + 7*B*a*b^3 - A
*b^4)*c*d + 4*(5*C*a^3*b + B*a^2*b^2 - A*a*b^3)*d^2)*e^2 + ((7*C*
a^2*b^2 - 25*B*a*b^3 - 5*A*b^4)*c^2 + 4*(C*a^3*b + 11*B*a^2*b^2 +
 A*a*b^3)*c*d - (5*C*a^4 + 25*B*a^3*b - 7*A*a^2*b^2)*d^2)*e*f - (
4*(C*a^3*b - B*a^2*b^2 - 5*A*a*b^3)*c^2 - (C*a^4 - 7*B*a^3*b - 35
*A*a^2*b^2)*c*d - 6*(B*a^4 + 2*A*a^3*b)*d^2)*f^2)*x)*sqrt((b^2*c
- a*b*d)*e - (a*b*c - a^2*d)*f)*sqrt(d*x + c)*sqrt(f*x + e) - 3*(
(8*C*a^3*b^2*c^2*d - 2*(6*C*a^4*b + B*a^3*b^2)*c*d^2 + (5*C*a^5 +
 B*a^4*b + A*a^3*b^2)*d^3)*e^3 - (8*C*a^3*b^2*c^3 - 4*(2*C*a^4*b
- B*a^3*b^2)*c^2*d + (3*C*a^5 - 13*B*a^4*b - A*a^3*b^2)*c*d^2 + 2
*(3*B*a^5 + 2*A*a^4*b)*d^3)*e^2*f + (8*A*a^5*d^3 + 2*(2*C*a^4*b +
 3*B*a^3*b^2)*c^3 - (C*a^5 + 13*B*a^4*b - 3*A*a^3*b^2)*c^2*d + 4*
(B*a^5 - 2*A*a^4*b)*c*d^2)*e*f^2 - (8*A*a^5*c*d^2 + (C*a^5 + B*a^
4*b + 5*A*a^3*b^2)*c^3 - 2*(B*a^5 + 6*A*a^4*b)*c^2*d)*f^3 + ((8*C
*b^5*c^2*d - 2*(6*C*a*b^4 + B*b^5)*c*d^2 + (5*C*a^2*b^3 + B*a*b^4
 + A*b^5)*d^3)*e^3 - (8*C*b^5*c^3 - 4*(2*C*a*b^4 - B*b^5)*c^2*d +
 (3*C*a^2*b^3 - 13*B*a*b^4 - A*b^5)*c*d^2 + 2*(3*B*a^2*b^3 + 2*A*
a*b^4)*d^3)*e^2*f + (8*A*a^2*b^3*d^3 + 2*(2*C*a*b^4 + 3*B*b^5)*c^
3 - (C*a^2*b^3 + 13*B*a*b^4 - 3*A*b^5)*c^2*d + 4*(B*a^2*b^3 - 2*A
*a*b^4)*c*d^2)*e*f^2 - (8*A*a^2*b^3*c*d^2 + (C*a^2*b^3 + B*a*b^4
+ 5*A*b^5)*c^3 - 2*(B*a^2*b^3 + 6*A*a*b^4)*c^2*d)*f^3)*x^3 + 3*((
8*C*a*b^4*c^2*d - 2*(6*C*a^2*b^3 + B*a*b^4)*c*d^2 + (5*C*a^3*b^2
+ B*a^2*b^3 + A*a*b^4)*d^3)*e^3 - (8*C*a*b^4*c^3 - 4*(2*C*a^2*b^3
 - B*a*b^4)*c^2*d + (3*C*a^3*b^2 - 13*B*a^2*b^3 - A*a*b^4)*c*d^2
+ 2*(3*B*a^3*b^2 + 2*A*a^2*b^3)*d^3)*e^2*f + (8*A*a^3*b^2*d^3 + 2
*(2*C*a^2*b^3 + 3*B*a*b^4)*c^3 - (C*a^3*b^2 + 13*B*a^2*b^3 - 3*A*
a*b^4)*c^2*d + 4*(B*a^3*b^2 - 2*A*a^2*b^3)*c*d^2)*e*f^2 - (8*A*a^
3*b^2*c*d^2 + (C*a^3*b^2 + B*a^2*b^3 + 5*A*a*b^4)*c^3 - 2*(B*a^3*
b^2 + 6*A*a^2*b^3)*c^2*d)*f^3)*x^2 + 3*((8*C*a^2*b^3*c^2*d - 2*(6
*C*a^3*b^2 + B*a^2*b^3)*c*d^2 + (5*C*a^4*b + B*a^3*b^2 + A*a^2*b^
3)*d^3)*e^3 - (8*C*a^2*b^3*c^3 - 4*(2*C*a^3*b^2 - B*a^2*b^3)*c^2*
d + (3*C*a^4*b - 13*B*a^3*b^2 - A*a^2*b^3)*c*d^2 + 2*(3*B*a^4*b +
 2*A*a^3*b^2)*d^3)*e^2*f + (8*A*a^4*b*d^3 + 2*(2*C*a^3*b^2 + 3*B*
a^2*b^3)*c^3 - (C*a^4*b + 13*B*a^3*b^2 - 3*A*a^2*b^3)*c^2*d + 4*(
B*a^4*b - 2*A*a^3*b^2)*c*d^2)*e*f^2 - (8*A*a^4*b*c*d^2 + (C*a^4*b
 + B*a^3*b^2 + 5*A*a^2*b^3)*c^3 - 2*(B*a^4*b + 6*A*a^3*b^2)*c^2*d
)*f^3)*x)*log(-(4*((2*b^3*c^2 - 3*a*b^2*c*d + a^2*b*d^2)*e^2 - (3
*a*b^2*c^2 - 4*a^2*b*c*d + a^3*d^2)*e*f + (a^2*b*c^2 - a^3*c*d)*f
^2 + ((b^3*c*d - a*b^2*d^2)*e^2 + (b^3*c^2 - 4*a*b^2*c*d + 3*a^2*
b*d^2)*e*f - (a*b^2*c^2 - 3*a^2*b*c*d + 2*a^3*d^2)*f^2)*x)*sqrt(d
*x + c)*sqrt(f*x + e) - (a^2*c^2*f^2 + (8*b^2*c^2 - 8*a*b*c*d + a
^2*d^2)*e^2 - 2*(4*a*b*c^2 - 3*a^2*c*d)*e*f + (b^2*d^2*e^2 + 2*(3
```

*b^2*c*d - 4*a*b*d^2)*e*f + (b^2*c^2 - 8*a*b*c*d + 8*a^2*d^2)*f^2
)*x^2 + 2*((4*b^2*c*d - 3*a*b*d^2)*e^2 + 2*(2*b^2*c^2 - 5*a*b*c*d
 + 2*a^2*d^2)*e*f - (3*a*b*c^2 - 4*a^2*c*d)*f^2)*x)*sqrt((b^2*c -
 a*b*d)*e - (a*b*c - a^2*d)*f))/(b^2*x^2 + 2*a*b*x + a^2)))/(((a^
3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*e^3 - 3*(a^4*b^4*c^2 - 2
*a^5*b^3*c*d + a^6*b^2*d^2)*e^2*f + 3*(a^5*b^3*c^2 - 2*a^6*b^2*c*
d + a^7*b*d^2)*e*f^2 - (a^6*b^2*c^2 - 2*a^7*b*c*d + a^8*d^2)*f^3
+ ((b^8*c^2 - 2*a*b^7*c*d + a^2*b^6*d^2)*e^3 - 3*(a*b^7*c^2 - 2*a
^2*b^6*c*d + a^3*b^5*d^2)*e^2*f + 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d
+ a^4*b^4*d^2)*e*f^2 - (a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2
)*f^3)*x^3 + 3*((a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*e^3 - 3
*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*e^2*f + 3*(a^3*b^5*c
^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*e*f^2 - (a^4*b^4*c^2 - 2*a^5*b^
3*c*d + a^6*b^2*d^2)*f^3)*x^2 + 3*((a^2*b^6*c^2 - 2*a^3*b^5*c*d +
 a^4*b^4*d^2)*e^3 - 3*(a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)
*e^2*f + 3*(a^4*b^4*c^2 - 2*a^5*b^3*c*d + a^6*b^2*d^2)*e*f^2 - (a
^5*b^3*c^2 - 2*a^6*b^2*c*d + a^7*b*d^2)*f^3)*x)*sqrt((b^2*c - a*b
*d)*e - (a*b*c - a^2*d)*f)), -1/48*(2*((4*(2*C*a^2*b^2 + B*a*b^3
+ 2*A*b^4)*c^2 - 2*(13*C*a^3*b + 2*B*a^2*b^2 + 7*A*a*b^3)*c*d + 3
*(5*C*a^4 + B*a^3*b + A*a^2*b^2)*d^2)*e^2 + 2*((5*C*a^3*b - 8*B*a
^2*b^2 - 13*A*a*b^3)*c^2 - 2*(C*a^4 - 7*B*a^3*b - 11*A*a^2*b^2)*c
d - 3(3*B*a^4 + 2*A*a^3*b)*d^2)*e*f + 3*(8*A*a^4*d^2 - (C*a^4 +
 B*a^3*b - 11*A*a^2*b^2)*c^2 + 2*(B*a^4 - 10*A*a^3*b)*c*d)*f^2 +
(3*(8*C*b^4*c^2 - 2*(10*C*a*b^3 - B*b^4)*c*d + (11*C*a^2*b^2 - B*
a*b^3 - A*b^4)*d^2)*e^2 - 2*(3*(2*C*a*b^3 + 3*B*b^4)*c^2 - 2*(11*
C*a^2*b^2 + 7*B*a*b^3 - A*b^4)*c*d + (13*C*a^3*b + 8*B*a^2*b^2 -
5*A*a*b^3)*d^2)*e*f + (3*(C*a^2*b^2 + B*a*b^3 + 5*A*b^4)*c^2 - 2*
(7*C*a^3*b + 2*B*a^2*b^2 + 13*A*a*b^3)*c*d + 4*(2*C*a^4 + B*a^3*b
 + 2*A*a^2*b^2)*d^2)*f^2)*x^2 + 2*((6*(2*C*a*b^3 + B*b^4)*c^2 - (
35*C*a^2*b^2 + 7*B*a*b^3 - A*b^4)*c*d + 4*(5*C*a^3*b + B*a^2*b^2
- A*a*b^3)*d^2)*e^2 + ((7*C*a^2*b^2 - 25*B*a*b^3 - 5*A*b^4)*c^2 +
 4*(C*a^3*b + 11*B*a^2*b^2 + A*a*b^3)*c*d - (5*C*a^4 + 25*B*a^3*b
 - 7*A*a^2*b^2)*d^2)*e*f - (4*(C*a^3*b - B*a^2*b^2 - 5*A*a*b^3)*c
^2 - (C*a^4 - 7*B*a^3*b - 35*A*a^2*b^2)*c*d - 6*(B*a^4 + 2*A*a^3*
b)*d^2)*f^2)*x)*sqrt(-(b^2*c - a*b*d)*e + (a*b*c - a^2*d)*f)*sqrt
(d*x + c)*sqrt(f*x + e) - 3*((8*C*a^3*b^2*c^2*d - 2*(6*C*a^4*b +
B*a^3*b^2)*c*d^2 + (5*C*a^5 + B*a^4*b + A*a^3*b^2)*d^3)*e^3 - (8*
C*a^3*b^2*c^3 - 4*(2*C*a^4*b - B*a^3*b^2)*c^2*d + (3*C*a^5 - 13*B
*a^4*b - A*a^3*b^2)*c*d^2 + 2*(3*B*a^5 + 2*A*a^4*b)*d^3)*e^2*f +
(8*A*a^5*d^3 + 2*(2*C*a^4*b + 3*B*a^3*b^2)*c^3 - (C*a^5 + 13*B*a^
4*b - 3*A*a^3*b^2)*c^2*d + 4*(B*a^5 - 2*A*a^4*b)*c*d^2)*e*f^2 - (
8*A*a^5*c*d^2 + (C*a^5 + B*a^4*b + 5*A*a^3*b^2)*c^3 - 2*(B*a^5 +
6*A*a^4*b)*c^2*d)*f^3 + ((8*C*b^5*c^2*d - 2*(6*C*a*b^4 + B*b^5)*c
*d^2 + (5*C*a^2*b^3 + B*a*b^4 + A*b^5)*d^3)*e^3 - (8*C*b^5*c^3 -
4*(2*C*a*b^4 - B*b^5)*c^2*d + (3*C*a^2*b^3 - 13*B*a*b^4 - A*b^5)*
c*d^2 + 2*(3*B*a^2*b^3 + 2*A*a*b^4)*d^3)*e^2*f + (8*A*a^2*b^3*d^3
 + 2*(2*C*a*b^4 + 3*B*b^5)*c^3 - (C*a^2*b^3 + 13*B*a*b^4 - 3*A*b^
5)*c^2*d + 4*(B*a^2*b^3 - 2*A*a*b^4)*c*d^2)*e*f^2 - (8*A*a^2*b^3*
c*d^2 + (C*a^2*b^3 + B*a*b^4 + 5*A*b^5)*c^3 - 2*(B*a^2*b^3 + 6*A*
a*b^4)*c^2*d)*f^3)*x^3 + 3*((8*C*a*b^4*c^2*d - 2*(6*C*a^2*b^3 + B
*a*b^4)*c*d^2 + (5*C*a^3*b^2 + B*a^2*b^3 + A*a*b^4)*d^3)*e^3 - (8
*C*a*b^4*c^3 - 4*(2*C*a^2*b^3 - B*a*b^4)*c^2*d + (3*C*a^3*b^2 - 1
3*B*a^2*b^3 - A*a*b^4)*c*d^2 + 2*(3*B*a^3*b^2 + 2*A*a^2*b^3)*d^3)
*e^2*f + (8*A*a^3*b^2*d^3 + 2*(2*C*a^2*b^3 + 3*B*a*b^4)*c^3 - (C*
a^3*b^2 + 13*B*a^2*b^3 - 3*A*a*b^4)*c^2*d + 4*(B*a^3*b^2 - 2*A*a^
2*b^3)*c*d^2)*e*f^2 - (8*A*a^3*b^2*c*d^2 + (C*a^3*b^2 + B*a^2*b^3

```
 + 5*A*a*b^4)*c^3 - 2*(B*a^3*b^2 + 6*A*a^2*b^3)*c^2*d)*f^3)*x^2 +
 3*((8*C*a^2*b^3*c^2*d - 2*(6*C*a^3*b^2 + B*a^2*b^3)*c*d^2 + (5*C
*a^4*b + B*a^3*b^2 + A*a^2*b^3)*d^3)*e^3 - (8*C*a^2*b^3*c^3 - 4*(
2*C*a^3*b^2 - B*a^2*b^3)*c^2*d + (3*C*a^4*b - 13*B*a^3*b^2 - A*a^
2*b^3)*c*d^2 + 2*(3*B*a^4*b + 2*A*a^3*b^2)*d^3)*e^2*f + (8*A*a^4*
b*d^3 + 2*(2*C*a^3*b^2 + 3*B*a^2*b^3)*c^3 - (C*a^4*b + 13*B*a^3*b
^2 - 3*A*a^2*b^3)*c^2*d + 4*(B*a^4*b - 2*A*a^3*b^2)*c*d^2)*e*f^2
- (8*A*a^4*b*c*d^2 + (C*a^4*b + B*a^3*b^2 + 5*A*a^2*b^3)*c^3 - 2*
(B*a^4*b + 6*A*a^3*b^2)*c^2*d)*f^3)*x)*arctan(1/2*(a*c*f - (2*b*c
 - a*d)*e - (b*d*e + (b*c - 2*a*d)*f)*x)*sqrt(-(b^2*c - a*b*d)*e
+ (a*b*c - a^2*d)*f)/(((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f)*sqr
t(d*x + c)*sqrt(f*x + e))))/(((a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*
b^3*d^2)*e^3 - 3*(a^4*b^4*c^2 - 2*a^5*b^3*c*d + a^6*b^2*d^2)*e^2*
f + 3*(a^5*b^3*c^2 - 2*a^6*b^2*c*d + a^7*b*d^2)*e*f^2 - (a^6*b^2*
c^2 - 2*a^7*b*c*d + a^8*d^2)*f^3 + ((b^8*c^2 - 2*a*b^7*c*d + a^2*
b^6*d^2)*e^3 - 3*(a*b^7*c^2 - 2*a^2*b^6*c*d + a^3*b^5*d^2)*e^2*f
+ 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*e*f^2 - (a^3*b^5*
c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*f^3)*x^3 + 3*((a*b^7*c^2 - 2*a
^2*b^6*c*d + a^3*b^5*d^2)*e^3 - 3*(a^2*b^6*c^2 - 2*a^3*b^5*c*d +
a^4*b^4*d^2)*e^2*f + 3*(a^3*b^5*c^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2
)*e*f^2 - (a^4*b^4*c^2 - 2*a^5*b^3*c*d + a^6*b^2*d^2)*f^3)*x^2 +
3*((a^2*b^6*c^2 - 2*a^3*b^5*c*d + a^4*b^4*d^2)*e^3 - 3*(a^3*b^5*c
^2 - 2*a^4*b^4*c*d + a^5*b^3*d^2)*e^2*f + 3*(a^4*b^4*c^2 - 2*a^5*
b^3*c*d + a^6*b^2*d^2)*e*f^2 - (a^5*b^3*c^2 - 2*a^6*b^2*c*d + a^7
*b*d^2)*f^3)*x)*sqrt(-(b^2*c - a*b*d)*e + (a*b*c - a^2*d)*f))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**4/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^4*sqrt(f*x + e)),x, algorithm
```

```
[Out] Timed out
```

3.88 $\int \frac{(a+bx)^2(A+Bx+Cx^2)}{\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=718

$$\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(16a^2d^2f^2\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)-16abdf\left(2df\left(4Adf(cf+de)-B\right.\right.\right.}{}$$

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(32a^3Cd^3f^3-8a^2bd^2f^2(16Bdf-11C(cf+de))-16ab^2df\left(6df(4Adf-3B(cf+de))+C\left(15c^2f^2+1\right.\right.\right.}{}$$

$$-\frac{(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}(2aCdf-b(8Bdf-7C(cf+de)))}{24bd^2f^2}+\frac{C(a+bx)^3\sqrt{c+dx}\sqrt{e+fx}}{4bdf}$$

```
[Out] -((2*a*C*d*f - b*(8*B*d*f - 7*C*(d*e + c*f)))*(a + b*x)^2*Sqrt[c
+ d*x]*Sqrt[e + f*x])/(24*b*d^2*f^2) + (C*(a + b*x)^3*Sqrt[c + d*
x]*Sqrt[e + f*x])/(4*b*d*f) - (Sqrt[c + d*x]*Sqrt[e + f*x]*(32*a^
3*C*d^3*f^3 - 8*a^2*b*d^2*f^2*(16*B*d*f - 11*C*(d*e + c*f)) - 16*
a*b^2*d*f*(C*(15*d^2*e^2 + 14*c*d*e*f + 15*c^2*f^2) + 6*d*f*(4*A*
d*f - 3*B*(d*e + c*f))) + b^3*(5*C*(21*d^3*e^3 + 19*c*d^2*e^2*f +
 19*c^2*d*e*f^2 + 21*c^3*f^3) + 8*d*f*(18*A*d*f*(d*e + c*f) - B*(
15*d^2*e^2 + 14*c*d*e*f + 15*c^2*f^2))) + 2*b*d*f*(6*b*d*f*(6*b*c
*C*e + a*C*d*e + a*c*C*f - 8*A*b*d*f) + (4*a*d*f - 5*b*(d*e + c*f
))*(2*a*C*d*f - b*(8*B*d*f - 7*C*(d*e + c*f))))*x))/(192*b*d^4*f^
4) + ((16*a^2*d^2*f^2*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*
d*f*(2*A*d*f - B*(d*e + c*f))) - 16*a*b*d*f*(C*(5*d^3*e^3 + 3*c*d
^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3) + 2*d*f*(4*A*d*f*(d*e + c*f
) - B*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2))) + b^2*(C*(35*d^4*e^4
+ 20*c*d^3*e^3*f + 18*c^2*d^2*e^2*f^2 + 20*c^3*d*e*f^3 + 35*c^4*f
^4) + 8*d*f*(2*A*d*f*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) - B*(5*d
^3*e^3 + 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3))))*ArcTanh[(S
qrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(64*d^(9/2)*f^(9/
2))
```

Rubi [A] time = 3.39722, antiderivative size = 715, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.139$

$$\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(16a^2d^2f^2\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)-16abdf\left(2df\left(4Adf(cf+de)-B\right.\right.\right.}{}$$

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(32a^3Cd^3f^3-8a^2bd^2f^2(16Bdf-11C(cf+de))-16ab^2df\left(6df(4Adf-3B(cf+de))+C\left(15c^2f^2+1\right.\right.\right.}{}$$

$$+\frac{(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}(-2aCdf+8bBdf-7bC(cf+de))}{24bd^2f^2}+\frac{C(a+bx)^3\sqrt{c+dx}\sqrt{e+fx}}{4bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^2*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] ((8*b*B*d*f - 2*a*C*d*f - 7*b*C*(d*e + c*f))*(a + b*x)^2*Sqrt[c +
 d*x]*Sqrt[e + f*x])/(24*b*d^2*f^2) + (C*(a + b*x)^3*Sqrt[c + d*x
]*Sqrt[e + f*x])/(4*b*d*f) - (Sqrt[c + d*x]*Sqrt[e + f*x]*(32*a^3
*C*d^3*f^3 - 8*a^2*b*d^2*f^2*(16*B*d*f - 11*C*(d*e + c*f)) - 16*a
*b^2*d*f*(C*(15*d^2*e^2 + 14*c*d*e*f + 15*c^2*f^2) + 6*d*f*(4*A*d
*f - 3*B*(d*e + c*f))) + b^3*(5*C*(21*d^3*e^3 + 19*c*d^2*e^2*f +
19*c^2*d*e*f^2 + 21*c^3*f^3) + 8*d*f*(18*A*d*f*(d*e + c*f) - B*(1
5*d^2*e^2 + 14*c*d*e*f + 15*c^2*f^2))) + 2*b*d*f*(6*b*d*f*(6*b*c*
C*e + a*C*d*e + a*c*C*f - 8*A*b*d*f) - (4*a*d*f - 5*b*(d*e + c*f)
)*(8*b*B*d*f - 2*a*C*d*f - 7*b*C*(d*e + c*f)))*x))/(192*b*d^4*f^4
) + ((16*a^2*d^2*f^2*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*d
*f*(2*A*d*f - B*(d*e + c*f))) - 16*a*b*d*f*(C*(5*d^3*e^3 + 3*c*d^
2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3) + 2*d*f*(4*A*d*f*(d*e + c*f)
 - B*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2))) + b^2*(C*(35*d^4*e^4 +
 20*c*d^3*e^3*f + 18*c^2*d^2*e^2*f^2 + 20*c^3*d*e*f^3 + 35*c^4*f^
4) + 8*d*f*(2*A*d*f*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) - B*(5*d^
3*e^3 + 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3))))*ArcTanh[(Sq
rt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(64*d^(9/2)*f^(9/2
))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**2*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.61591, size = 645, normalized size = 0.9

$$\frac{3\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(16a^2d^2f^2\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)-16\cdots\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)^2*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (-2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]*(-48*a^2*d^2*f^2*
(4*B*d*f + C*(-3*d*e - 3*c*f + 2*d*f*x)) - 16*a*b*d*f*(6*d*f*(4*A
*d*f + B*(-3*d*e - 3*c*f + 2*d*f*x)) + C*(15*c^2*f^2 + 2*c*d*f*(7
*e - 5*f*x) + d^2*(15*e^2 - 10*e*f*x + 8*f^2*x^2))) + b^2*(C*(105
*c^3*f^3 + 5*c^2*d*f^2*(19*e - 14*f*x) + c*d^2*f*(95*e^2 - 68*e*f
*x + 56*f^2*x^2) + d^3*(105*e^3 - 70*e^2*f*x + 56*e*f^2*x^2 - 48*
f^3*x^3)) - 8*d*f*(6*A*d*f*(-3*d*e - 3*c*f + 2*d*f*x) + B*(15*c^2
```

```
*f^2 + 2*c*d*f*(7*e - 5*f*x) + d^2*(15*e^2 - 10*e*f*x + 8*f^2*x^2
))))) + 3*(16*a^2*d^2*f^2*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2)
+ 4*d*f*(2*A*d*f - B*(d*e + c*f))) - 16*a*b*d*f*(C*(5*d^3*e^3 + 3
*c*d^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3) + 2*d*f*(4*A*d*f*(d*e +
 c*f) - B*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2))) + b^2*(C*(35*d^4*
e^4 + 20*c*d^3*e^3*f + 18*c^2*d^2*e^2*f^2 + 20*c^3*d*e*f^3 + 35*c
^4*f^4) + 8*d*f*(2*A*d*f*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) - B*
(5*d^3*e^3 + 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3)))))*Log[d*
e + c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]
])/(384*d^(9/2)*f^(9/2))
```

Maple [B] time = 0.059, size = 2528, normalized size = 3.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^2*(C*x^2+B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] 1/384*(384*A*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2
)+c*f+d*e)/(f*d)^(1/2))*a^2*d^4*f^4+105*C*ln(1/2*(2*d*f*x+2*((d*x
+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^2*c^4*f^4+
105*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d
*e)/(f*d)^(1/2))*b^2*d^4*e^4+144*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*
x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a^2*c^2*d^2*f^4-576
*B*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*b*c*d^2*f^3+448*C*((d*x+
c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*b*c*d^2*e*f^2-320*((d*x+c)*(f*x+e
))^(1/2)*x*C*a*b*c*f^3*d^2*(f*d)^(1/2)-320*((d*x+c)*(f*x+e))^(1/2
)*x*C*a*b*e*f^2*d^3*(f*d)^(1/2)+136*((d*x+c)*(f*x+e))^(1/2)*x*C*b
^2*c*e*f^2*d^2*(f*d)^(1/2)+140*((d*x+c)*(f*x+e))^(1/2)*x*C*b^2*c^
2*f^3*d*(f*d)^(1/2)+140*((d*x+c)*(f*x+e))^(1/2)*x*C*b^2*e^2*f*d^3
*(f*d)^(1/2)-576*B*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*b*d^3*e*
f^2+224*B*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*b^2*c*d^2*e*f^2+480
*C*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*b*c^2*d*f^3+480*C*((d*x+
c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*b*d^3*e^2*f-190*C*((d*x+c)*(f*x+e
))^(1/2)*(f*d)^(1/2)*b^2*c^2*d*e*f^2-190*C*((d*x+c)*(f*x+e))^(1/2
)*(f*d)^(1/2)*b^2*c*d^2*e^2*f+256*C*x^2*a*b*d^3*f^3*((d*x+c)*(f*x
+e))^(1/2)*(f*d)^(1/2)-112*C*x^2*b^2*c*d^2*f^3*((d*x+c)*(f*x+e))^
(1/2)*(f*d)^(1/2)-112*C*x^2*b^2*d^3*e*f^2*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)+192*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^
(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*B*a*b*f^3*d^3+384*((d*x+c)*(f*x+e
))^(1/2)*x*B*a*b*f^3*d^3*(f*d)^(1/2)-160*((d*x+c)*(f*x+e))^(1/2)*
x*B*b^2*c*f^3*d^2*(f*d)^(1/2)-160*((d*x+c)*(f*x+e))^(1/2)*x*B*b^2
*e*f^2*d^3*(f*d)^(1/2)-144*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1
/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*C*a*b*e*f^3*d^2-144*ln(
1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)
^(1/2))*c*e^2*C*a*b*f^2*d^3+96*C*x^3*b^2*d^3*f^3*((d*x+c)*(f*x+e)
)^(1/2)*(f*d)^(1/2)+128*B*x^2*b^2*d^3*f^3*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)-384*A*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d
)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b*c*d^3*f^4-384*A*ln(1/2*(2*d*f*x
+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b*
d^4*e*f^3+288*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(
```

```
1/2)+c*f+d*e)/(f*d)^(1/2))*a*b*c^2*d^2*f^4+288*B*ln(1/2*(2*d*f*x+
2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b*d
^4*e^2*f^2+96*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/
2)+c*f+d*e)/(f*d)^(1/2))*c*e*A*b^2*f^3*d^3+192*((d*x+c)*(f*x+e))^
(1/2)*x*A*b^2*f^3*d^3*(f*d)^(1/2)-72*ln(1/2*(2*d*f*x+2*((d*x+c)*(
f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*B*b^2*e*f^3*d
^2-240*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*a*b*c^3*d*f^4-240*C*ln(1/2*(2*d*f*x+2*((d*x+c
)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b*d^4*e^3*f+
768*A*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*b*d^3*f^3-288*A*((d*x
+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*b^2*c*d^2*f^3-288*A*((d*x+c)*(f*x+
e))^(1/2)*(f*d)^(1/2)*b^2*d^3*e*f^2+240*B*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)*b^2*c^2*d*f^3+240*B*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1
/2)*b^2*d^3*e^2*f-288*C*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a^2*c
*d^2*f^3-288*C*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a^2*d^3*e*f^2-
72*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)
/(f*d)^(1/2))*c*e^2*B*b^2*f^2*d^3+96*ln(1/2*(2*d*f*x+2*((d*x+c)*(
f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*a^2*C*f^3*d^3
+60*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e
)/(f*d)^(1/2))*c^3*C*b^2*e*f^3*d+54*C*b^2*ln(1/2*(2*d*f*x+2*((d*x
+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c^2*e^2*f^2*
d^2+60*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+
d*e)/(f*d)^(1/2))*c*e^3*C*b^2*f*d^3+192*((d*x+c)*(f*x+e))^(1/2)*x
*a^2*C*f^3*d^3*(f*d)^(1/2)+144*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+
e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a^2*d^4*e^2*f^2+384*B
*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a^2*d^3*f^3-210*C*((d*x+c)*(
f*x+e))^(1/2)*(f*d)^(1/2)*b^2*c^3*f^3-210*C*((d*x+c)*(f*x+e))^(1/
2)*(f*d)^(1/2)*b^2*d^3*e^3+144*A*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+
e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^2*c^2*d^2*f^4+144*A
*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(
f*d)^(1/2))*b^2*d^4*e^2*f^2-192*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x
+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a^2*c*d^3*f^4-192*B*
ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f
*d)^(1/2))*a^2*d^4*e*f^3-120*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e)
)^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^2*c^3*d*f^4-120*B*ln(
1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)
^(1/2))*b^2*d^4*e^3*f)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(f*d)^(1/2)/d^
4/f^4/((d*x+c)*(f*x+e))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 35.095, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] [1/768*(4*(48*C*b^2*d^3*f^3*x^3 - 105*C*b^2*d^3*e^3 - 5*(19*C*b^2
*c*d^2 - 24*(2*C*a*b + B*b^2)*d^3)*e^2*f - (95*C*b^2*c^2*d - 112*
(2*C*a*b + B*b^2)*c*d^2 + 144*(C*a^2 + 2*B*a*b + A*b^2)*d^3)*e*f^
2 - 3*(35*C*b^2*c^3 - 40*(2*C*a*b + B*b^2)*c^2*d + 48*(C*a^2 + 2*
B*a*b + A*b^2)*c*d^2 - 64*(B*a^2 + 2*A*a*b)*d^3)*f^3 - 8*(7*C*b^2
*d^3*e*f^2 + (7*C*b^2*c*d^2 - 8*(2*C*a*b + B*b^2)*d^3)*f^3)*x^2 +
 2*(35*C*b^2*d^3*e^2*f + 2*(17*C*b^2*c*d^2 - 20*(2*C*a*b + B*b^2)
*d^3)*e*f^2 + (35*C*b^2*c^2*d - 40*(2*C*a*b + B*b^2)*c*d^2 + 48*(
C*a^2 + 2*B*a*b + A*b^2)*d^3)*f^3)*x)*sqrt(d*f)*sqrt(d*x + c)*sqr
t(f*x + e) + 3*(35*C*b^2*d^4*e^4 + 20*(C*b^2*c*d^3 - 2*(2*C*a*b +
 B*b^2)*d^4)*e^3*f + 6*(3*C*b^2*c^2*d^2 - 4*(2*C*a*b + B*b^2)*c*d
^3 + 8*(C*a^2 + 2*B*a*b + A*b^2)*d^4)*e^2*f^2 + 4*(5*C*b^2*c^3*d
- 6*(2*C*a*b + B*b^2)*c^2*d^2 + 8*(C*a^2 + 2*B*a*b + A*b^2)*c*d^3
 - 16*(B*a^2 + 2*A*a*b)*d^4)*e*f^3 + (35*C*b^2*c^4 + 128*A*a^2*d^
4 - 40*(2*C*a*b + B*b^2)*c^3*d + 48*(C*a^2 + 2*B*a*b + A*b^2)*c^2
*d^2 - 64*(B*a^2 + 2*A*a*b)*c*d^3)*f^4)*log(4*(2*d^2*f^2*x + d^2*
e*f + c*d*f^2)*sqrt(d*x + c)*sqrt(f*x + e) + (8*d^2*f^2*x^2 + d^2
*e^2 + 6*c*d*e*f + c^2*f^2 + 8*(d^2*e*f + c*d*f^2)*x)*sqrt(d*f)))
/(sqrt(d*f)*d^4*f^4), 1/384*(2*(48*C*b^2*d^3*f^3*x^3 - 105*C*b^2*
d^3*e^3 - 5*(19*C*b^2*c*d^2 - 24*(2*C*a*b + B*b^2)*d^3)*e^2*f - (
95*C*b^2*c^2*d - 112*(2*C*a*b + B*b^2)*c*d^2 + 144*(C*a^2 + 2*B*a
*b + A*b^2)*d^3)*e*f^2 - 3*(35*C*b^2*c^3 - 40*(2*C*a*b + B*b^2)*c
^2*d + 48*(C*a^2 + 2*B*a*b + A*b^2)*c*d^2 - 64*(B*a^2 + 2*A*a*b)*
d^3)*f^3 - 8*(7*C*b^2*d^3*e*f^2 + (7*C*b^2*c*d^2 - 8*(2*C*a*b + B
*b^2)*d^3)*f^3)*x^2 + 2*(35*C*b^2*d^3*e^2*f + 2*(17*C*b^2*c*d^2 -
 20*(2*C*a*b + B*b^2)*d^3)*e*f^2 + (35*C*b^2*c^2*d - 40*(2*C*a*b
+ B*b^2)*c*d^2 + 48*(C*a^2 + 2*B*a*b + A*b^2)*d^3)*f^3)*x)*sqrt(-
d*f)*sqrt(d*x + c)*sqrt(f*x + e) + 3*(35*C*b^2*d^4*e^4 + 20*(C*b^
2*c*d^3 - 2*(2*C*a*b + B*b^2)*d^4)*e^3*f + 6*(3*C*b^2*c^2*d^2 - 4
*(2*C*a*b + B*b^2)*c*d^3 + 8*(C*a^2 + 2*B*a*b + A*b^2)*d^4)*e^2*f
^2 + 4*(5*C*b^2*c^3*d - 6*(2*C*a*b + B*b^2)*c^2*d^2 + 8*(C*a^2 +
2*B*a*b + A*b^2)*c*d^3 - 16*(B*a^2 + 2*A*a*b)*d^4)*e*f^3 + (35*C*
b^2*c^4 + 128*A*a^2*d^4 - 40*(2*C*a*b + B*b^2)*c^3*d + 48*(C*a^2
+ 2*B*a*b + A*b^2)*c^2*d^2 - 64*(B*a^2 + 2*A*a*b)*c*d^3)*f^4)*arc
tan(1/2*(2*d*f*x + d*e + c*f)*sqrt(-d*f)/(sqrt(d*x + c)*sqrt(f*x
+ e)*d*f)))/(sqrt(-d*f)*d^4*f^4)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((b*x+a)**2*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.3357, size = 1, normalized size = 0.

$$Done$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] Done
```

3.89 $\int \frac{(a+bx)(A+Bx+Cx^2)}{\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=371

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(8a^2Cd^2f^2+2bdfx(2aCdf-b(6Bdf-5C(cf+de)))-6abdf(4Bdf-3C(cf+de))+b^2\left(-\left(6df(4Ad\right.\right.\right.}{24bd^3f^3}$$

$$+\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(2adf\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)-b\left(2df\left(4Adf(cf+de)-B\left(3c^2f^2+\right.\right.\right.\right.}{8d^{7/2}f^{7/2}}$$

$$+\frac{C(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}}{3bdf}$$

```
[Out] (C*(a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*d*f) - (Sqrt[c +
 d*x]*Sqrt[e + f*x]*(8*a^2*C*d^2*f^2 - 6*a*b*d*f*(4*B*d*f - 3*C*(
d*e + c*f)) - b^2*(C*(15*d^2*e^2 + 14*c*d*e*f + 15*c^2*f^2) + 6*d
*f*(4*A*d*f - 3*B*(d*e + c*f))) + 2*b*d*f*(2*a*C*d*f - b*(6*B*d*f
 - 5*C*(d*e + c*f)))*x))/(24*b*d^3*f^3) + ((2*a*d*f*(C*(3*d^2*e^2
 + 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*(2*A*d*f - B*(d*e + c*f))) - b*
(C*(5*d^3*e^3 + 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3) + 2*d*
f*(4*A*d*f*(d*e + c*f) - B*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2))))
*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(8*d^(
7/2)*f^(7/2))
```

Rubi [A] time = 1.20453, antiderivative size = 369, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 4, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.118$

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(8a^2Cd^2f^2-2bdfx(-2aCdf+6bBdf-5bC(cf+de))-6abdf(4Bdf-3C(cf+de))+b^2\left(-\left(6df(4A\right.\right.\right.}{24bd^3f^3}$$

$$+\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(2adf\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)-b\left(2df\left(4Adf(cf+de)-B\left(3c^2f^2+\right.\right.\right.\right.}{8d^{7/2}f^{7/2}}$$

$$+\frac{C(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}}{3bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (C*(a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*d*f) - (Sqrt[c +
 d*x]*Sqrt[e + f*x]*(8*a^2*C*d^2*f^2 - 6*a*b*d*f*(4*B*d*f - 3*C*(
d*e + c*f)) - b^2*(C*(15*d^2*e^2 + 14*c*d*e*f + 15*c^2*f^2) + 6*d
*f*(4*A*d*f - 3*B*(d*e + c*f))) - 2*b*d*f*(6*b*B*d*f - 2*a*C*d*f
- 5*b*C*(d*e + c*f))*x))/(24*b*d^3*f^3) + ((2*a*d*f*(C*(3*d^2*e^2
 + 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*(2*A*d*f - B*(d*e + c*f))) - b*
(C*(5*d^3*e^3 + 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3) + 2*d*
```

```
f*(4*A*d*f*(d*e + c*f) - B*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2))))
*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(8*d^(
7/2)*f^(7/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.775439, size = 328, normalized size = 0.88

$$\frac{\sqrt{c+dx}\sqrt{e+fx}\left(6adf(4Bdf+C(-3cf-3de+2dfx))+b\left(6df(4Adf+B(-3cf-3de+2dfx))+C\left(15c^2f^2+2cdf(7e-\right.\right.\right.}{24d^3f^3}$$
$$+\frac{\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(2adf\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)-b\left(2df\right.\right.}{16d^{7/2}f^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (Sqrt[c + d*x]*Sqrt[e + f*x]*(6*a*d*f*(4*B*d*f + C*(-3*d*e - 3*c*
f + 2*d*f*x)) + b*(6*d*f*(4*A*d*f + B*(-3*d*e - 3*c*f + 2*d*f*x))
 + C*(15*c^2*f^2 + 2*c*d*f*(7*e - 5*f*x) + d^2*(15*e^2 - 10*e*f*x
 + 8*f^2*x^2)))))/(24*d^3*f^3) + ((2*a*d*f*(C*(3*d^2*e^2 + 2*c*d*
e*f + 3*c^2*f^2) + 4*d*f*(2*A*d*f - B*(d*e + c*f))) - b*(C*(5*d^3
*e^3 + 3*c*d^2*e^2*f + 3*c^2*d*e*f^2 + 5*c^3*f^3) + 2*d*f*(4*A*d*
f*(d*e + c*f) - B*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2))))*Log[d*e
+ c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])
/(16*d^(7/2)*f^(7/2))
```

Maple [B] time = 0.043, size = 1199, normalized size = 3.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(C*x^2+B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] 1/48*(48*A*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+
c*f+d*e)/(f*d)^(1/2))*a*d^3*f^3-20*C*b*((d*x+c)*(f*x+e))^(1/2)*x*
c*d*f^2*(f*d)^(1/2)-20*C*b*((d*x+c)*(f*x+e))^(1/2)*x*e*d^2*f*(f*d
)^(1/2)+28*C*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*b*c*d*e*f-15*C*l
n(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*
d)^(1/2))*b*c^3*f^3-15*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2
)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b*d^3*e^3-24*A*ln(1/2*(2*d*f*
x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b*c
*d^2*f^3-24*A*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/
2)+c*f+d*e)/(f*d)^(1/2))*b*d^3*e*f^2-24*B*ln(1/2*(2*d*f*x+2*((d*x
+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*c*d^2*f^3-
24*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*
e)/(f*d)^(1/2))*a*d^3*e*f^2+18*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+
e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b*c^2*d*f^3+18*B*ln(1
/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^
(1/2))*b*d^3*e^2*f+18*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*c^2*d*f^3+18*C*ln(1/2*(2*d*f
*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*
d^3*e^2*f+48*A*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*b*d^2*f^2+48*B
*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*d^2*f^2+30*C*((d*x+c)*(f*x
+e))^(1/2)*(f*d)^(1/2)*b*c^2*f^2+30*C*((d*x+c)*(f*x+e))^(1/2)*(f*
d)^(1/2)*b*d^2*e^2+12*b*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/
2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*d^2*f^2+24*a*C*((d*x+c)*
(f*x+e))^(1/2)*x*d^2*f^2*(f*d)^(1/2)+12*a*C*ln(1/2*(2*d*f*x+2*((d
*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*d^2*f^
2-9*C*b*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f
+d*e)/(f*d)^(1/2))*c^2*e*d*f^2-9*C*b*ln(1/2*(2*d*f*x+2*((d*x+c)*(
f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e^2*d^2*f+16*C*
x^2*b*d^2*f^2*(f*d)^(1/2)*((d*x+c)*(f*x+e))^(1/2)-36*C*((d*x+c)*(
f*x+e))^(1/2)*(f*d)^(1/2)*a*d^2*e*f+24*b*B*((d*x+c)*(f*x+e))^(1/2
)*x*d^2*f^2*(f*d)^(1/2)-36*B*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*
b*c*d*f^2-36*B*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*b*d^2*e*f-36*C
*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*a*c*d*f^2)*(d*x+c)^(1/2)*(f*
x+e)^(1/2)/(f*d)^(1/2)/f^3/d^3/((d*x+c)*(f*x+e))^(1/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 26.6856, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] [1/96*(4*(8*C*b*d^2*f^2*x^2 + 15*C*b*d^2*e^2 + 2*(7*C*b*c*d - 9*(
C*a + B*b)*d^2)*e*f + 3*(5*C*b*c^2 - 6*(C*a + B*b)*c*d + 8*(B*a +
 A*b)*d^2)*f^2 - 2*(5*C*b*d^2*e*f + (5*C*b*c*d - 6*(C*a + B*b)*d^
2)*f^2)*x)*sqrt(d*f)*sqrt(d*x + c)*sqrt(f*x + e) - 3*(5*C*b*d^3*e
^3 + 3*(C*b*c*d^2 - 2*(C*a + B*b)*d^3)*e^2*f + (3*C*b*c^2*d - 4*(
C*a + B*b)*c*d^2 + 8*(B*a + A*b)*d^3)*e*f^2 + (5*C*b*c^3 - 16*A*a
*d^3 - 6*(C*a + B*b)*c^2*d + 8*(B*a + A*b)*c*d^2)*f^3)*log(4*(2*d
^2*f^2*x + d^2*e*f + c*d*f^2)*sqrt(d*x + c)*sqrt(f*x + e) + (8*d^
2*f^2*x^2 + d^2*e^2 + 6*c*d*e*f + c^2*f^2 + 8*(d^2*e*f + c*d*f^2)
*x)*sqrt(d*f)))/(sqrt(d*f)*d^3*f^3), 1/48*(2*(8*C*b*d^2*f^2*x^2 +
 15*C*b*d^2*e^2 + 2*(7*C*b*c*d - 9*(C*a + B*b)*d^2)*e*f + 3*(5*C*
b*c^2 - 6*(C*a + B*b)*c*d + 8*(B*a + A*b)*d^2)*f^2 - 2*(5*C*b*d^2
*e*f + (5*C*b*c*d - 6*(C*a + B*b)*d^2)*f^2)*x)*sqrt(-d*f)*sqrt(d*
x + c)*sqrt(f*x + e) - 3*(5*C*b*d^3*e^3 + 3*(C*b*c*d^2 - 2*(C*a +
 B*b)*d^3)*e^2*f + (3*C*b*c^2*d - 4*(C*a + B*b)*c*d^2 + 8*(B*a +
A*b)*d^3)*e*f^2 + (5*C*b*c^3 - 16*A*a*d^3 - 6*(C*a + B*b)*c^2*d +
 8*(B*a + A*b)*c*d^2)*f^3)*arctan(1/2*(2*d*f*x + d*e + c*f)*sqrt(
-d*f)/(sqrt(d*x + c)*sqrt(f*x + e)*d*f)))/(sqrt(-d*f)*d^3*f^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.320601, size = 603, normalized size = 1.63

$$\frac{\left(\sqrt{(dx+c)df - cdf + d^2e}\sqrt{dx+c}\left(2\,(dx+c)\left(\frac{4\,(dx+c)Cb}{d^4f} - \frac{13\,Cbcd^{11}f^4 - 6\,Cad^{12}f^4 - 6\,Bbd^{12}f^4 + 5\,Cbd^{12}f^3e}{d^{15}f^5}\right) + \frac{3\,(11\,Cbc^2d^{11}f^4 - 10\,Cacd}{}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] 1/24*(sqrt((d*x + c)*d*f - c*d*f + d^2*e)*sqrt(d*x + c)*(2*(d*x +
 c)*(4*(d*x + c)*C*b/(d^4*f) - (13*C*b*c*d^11*f^4 - 6*C*a*d^12*f^
4 - 6*B*b*d^12*f^4 + 5*C*b*d^12*f^3*e)/(d^15*f^5)) + 3*(11*C*b*c^
2*d^11*f^4 - 10*C*a*c*d^12*f^4 - 10*B*b*c*d^12*f^4 + 8*B*a*d^13*f
```

```
^4 + 8*A*b*d^13*f^4 + 8*C*b*c*d^12*f^3*e - 6*C*a*d^13*f^3*e - 6*B
*b*d^13*f^3*e + 5*C*b*d^13*f^2*e^2)/(d^15*f^5)) + 3*(5*C*b*c^3*f^
3 - 6*C*a*c^2*d*f^3 - 6*B*b*c^2*d*f^3 + 8*B*a*c*d^2*f^3 + 8*A*b*c
*d^2*f^3 - 16*A*a*d^3*f^3 + 3*C*b*c^2*d*f^2*e - 4*C*a*c*d^2*f^2*e
 - 4*B*b*c*d^2*f^2*e + 8*B*a*d^3*f^2*e + 8*A*b*d^3*f^2*e + 3*C*b*
c*d^2*f*e^2 - 6*C*a*d^3*f*e^2 - 6*B*b*d^3*f*e^2 + 5*C*b*d^3*e^3)*
ln(abs(-sqrt(d*f)*sqrt(d*x + c) + sqrt((d*x + c)*d*f - c*d*f + d^
2*e)))/(sqrt(d*f)*d^3*f^3))*d/abs(d)
```

3.90 $\int \frac{A+Bx+Cx^2}{\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=164

$$\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)}{4d^{5/2}f^{5/2}}-\frac{\sqrt{c+dx}\sqrt{e+fx}(-4Bdf+5cCf+3Cde)}{4d^2f^2}+\frac{C(c+dx)^{3/2}\sqrt{e+fx}}{2d^2f}$$

```
[Out] -((3*C*d*e + 5*c*C*f - 4*B*d*f)*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*d
^2*f^2) + (C*(c + d*x)^(3/2)*Sqrt[e + f*x])/(2*d^2*f) + ((C*(3*d^
2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*(2*A*d*f - B*(d*e + c*f)))
*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(4*d^(
5/2)*f^(5/2))
```

Rubi [A] time = 0.385665, antiderivative size = 164, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138

$$\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)}{4d^{5/2}f^{5/2}}-\frac{\sqrt{c+dx}\sqrt{e+fx}(-4Bdf+5cCf+3Cde)}{4d^2f^2}+\frac{C(c+dx)^{3/2}\sqrt{e+fx}}{2d^2f}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] -((3*C*d*e + 5*c*C*f - 4*B*d*f)*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*d
^2*f^2) + (C*(c + d*x)^(3/2)*Sqrt[e + f*x])/(2*d^2*f) + ((C*(3*d^
2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*(2*A*d*f - B*(d*e + c*f)))
*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt[e + f*x])])/(4*d^(
5/2)*f^(5/2))
```

Rubi in Sympy [A] time = 35.9556, size = 199, normalized size = 1.21

$$\frac{B\sqrt{c+dx}\sqrt{e+fx}}{df}+\frac{Cx\sqrt{c+dx}\sqrt{e+fx}}{2df}-\frac{3C\sqrt{c+dx}\sqrt{e+fx}\,(cf+de)}{4d^2f^2}-\frac{C\left(4cdef-3\,(cf+de)^2\right)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{4d^{\frac{5}{2}}f^{\frac{5}{2}}}-\frac{2\left(-Adf+\frac{B(cf+de)}{2}\right)\operatorname{atanh}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{f}\sqrt{c+dx}}\right)}{d^{\frac{3}{2}}f^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] B*sqrt(c + d*x)*sqrt(e + f*x)/(d*f) + C*x*sqrt(c + d*x)*sqrt(e +
f*x)/(2*d*f) - 3*C*sqrt(c + d*x)*sqrt(e + f*x)*(c*f + d*e)/(4*d**
2*f**2) - C*(4*c*d*e*f - 3*(c*f + d*e)**2)*atanh(sqrt(d)*sqrt(e +
 f*x)/(sqrt(f)*sqrt(c + d*x)))/(4*d**(5/2)*f**(5/2)) - 2*(-A*d*f
+ B*(c*f + d*e)/2)*atanh(sqrt(d)*sqrt(e + f*x)/(sqrt(f)*sqrt(c +
d*x)))/(d**(3/2)*f**(3/2))
```

Mathematica [A] time = 0.192523, size = 154, normalized size = 0.94

$$\frac{\log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+fx}+cf+de+2dfx\right)\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)}{8d^{5/2}f^{5/2}}+\frac{\sqrt{c+dx}\sqrt{e+fx}(4Bdf+C(-3cf-3de+2dfx))}{4d^2f^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2)/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (Sqrt[c + d*x]*Sqrt[e + f*x]*(4*B*d*f + C*(-3*d*e - 3*c*f + 2*d*f
*x)))/(4*d^2*f^2) + ((C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*d
*f*(2*A*d*f - B*(d*e + c*f)))*Log[d*e + c*f + 2*d*f*x + 2*Sqrt[d]
*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(8*d^(5/2)*f^(5/2))
```

Maple [B] time = 0.032, size = 425, normalized size = 2.6

$$\frac{1}{8\,d^2f^2}\left(8\,A\ln\left(1/2\,\frac{2\,dfx+2\,\sqrt{(dx+c)(fx+e)}\sqrt{fd}+cf+de}{\sqrt{fd}}\right)d^2f^2-4\,B\ln\left(1/2\,\frac{2\,dfx+2\,\sqrt{(dx+c)(fx+e)}\sqrt{fd}+cf}{\sqrt{fd}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] 1/8*(8*A*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*d^2*f^2-4*B*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e
))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*c*d*f^2-4*B*ln(1/2*(2*
d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))
*d^2*e*f+4*C*((d*x+c)*(f*x+e))^(1/2)*x*f*d*(f*d)^(1/2)+3*C*ln(1/2
*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1
/2))*c^2*f^2+2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^
(1/2)+c*f+d*e)/(f*d)^(1/2))*c*e*f*d+3*C*ln(1/2*(2*d*f*x+2*((d*x+c
```

```
)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*d^2*e^2+8*B*((
d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*d*f-6*C*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)*c*f-6*C*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)*d*e)*(d*
x+c)^(1/2)*(f*x+e)^(1/2)/(f*d)^(1/2)/d^2/f^2/((d*x+c)*(f*x+e))^(1
/2)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.43053, size = 1, normalized size = 0.01

$$\left[\frac{4\left(2\,Cdfx-3\,Cde-(3\,Cc-4\,Bd)f\right)\sqrt{df}\sqrt{dx+c}\sqrt{fx+e}+\left(3\,Cd^2e^2+2\left(Ccd-2\,Bd^2\right)ef+\left(3\,Cc^2-4\,Bcd+8\,Ad^2\right)f^2\right)\,\mathrm{l}\cdots}{16\,\sqrt{df}\,d^2f\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm="fricas")
```

```
[Out] [1/16*(4*(2*C*d*f*x - 3*C*d*e - (3*C*c - 4*B*d)*f)*sqrt(d*f)*sqrt
(d*x + c)*sqrt(f*x + e) + (3*C*d^2*e^2 + 2*(C*c*d - 2*B*d^2)*e*f
+ (3*C*c^2 - 4*B*c*d + 8*A*d^2)*f^2)*log(4*(2*d^2*f^2*x + d^2*e*f
 + c*d*f^2)*sqrt(d*x + c)*sqrt(f*x + e) + (8*d^2*f^2*x^2 + d^2*e^
2 + 6*c*d*e*f + c^2*f^2 + 8*(d^2*e*f + c*d*f^2)*x)*sqrt(d*f)))/(s
qrt(d*f)*d^2*f^2), 1/8*(2*(2*C*d*f*x - 3*C*d*e - (3*C*c - 4*B*d)*
f)*sqrt(-d*f)*sqrt(d*x + c)*sqrt(f*x + e) + (3*C*d^2*e^2 + 2*(C*c
*d - 2*B*d^2)*e*f + (3*C*c^2 - 4*B*c*d + 8*A*d^2)*f^2)*arctan(1/2
*(2*d*f*x + d*e + c*f)*sqrt(-d*f)/(sqrt(d*x + c)*sqrt(f*x + e)*d*
f)))/(sqrt(-d*f)*d^2*f^2)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A+Bx+Cx^2}{\sqrt{c+dx}\sqrt{e+fx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Integral((A + B*x + C*x**2)/(sqrt(c + d*x)*sqrt(e + f*x)), x)
```

GIAC/XCAS [A] time = 0.301845, size = 262, normalized size = 1.6

$$\frac{\left(\sqrt{(dx+c)df-cdf+d^2e}\sqrt{dx+c}\left(\frac{2\,(dx+c)C}{d^3f}-\frac{5\,Ccd^5f^2-4\,Bd^6f^2+3\,Cd^6fe}{d^8f^3}\right)-\frac{\left(3\,Cc^2f^2-4\,Bcdf^2+8\,Ad^2f^2+2\,Ccdfe-4\,Bd^2fe+3\,Cd^2e^2\right)\ln\left(\left|\cdots\right.\right.}{\sqrt{df}\,d^2f^2}\right.}{4\,|d|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm="giac")
```

```
[Out] 1/4*(sqrt((d*x + c)*d*f - c*d*f + d^2*e)*sqrt(d*x + c)*(2*(d*x +
c)*C/(d^3*f) - (5*C*c*d^5*f^2 - 4*B*d^6*f^2 + 3*C*d^6*f*e)/(d^8*f
^3)) - (3*C*c^2*f^2 - 4*B*c*d*f^2 + 8*A*d^2*f^2 + 2*C*c*d*f*e - 4
*B*d^2*f*e + 3*C*d^2*e^2)*ln(abs(-sqrt(d*f)*sqrt(d*x + c) + sqrt(
(d*x + c)*d*f - c*d*f + d^2*e)))/(sqrt(d*f)*d^2*f^2))*d/abs(d)
```

3.91 $\int \frac{A+Bx+Cx^2}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=188

$$-\frac{2\left(Ab^2-a(bB-aC)\right)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)}{b^2\sqrt{bc-ad}\sqrt{be-af}}-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(2aCdf+b(-2Bdf+cCf+Cde))}{b^2d^{3/2}f^{3/2}}+\frac{C\sqrt{c+dx}\sqrt{e+fx}}{bdf}$$

```
[Out] (C*Sqrt[c + d*x]*Sqrt[e + f*x])/(b*d*f) - ((2*a*C*d*f + b*(C*d*e
+ c*C*f - 2*B*d*f))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt
[e + f*x])])/(b^2*d^(3/2)*f^(3/2)) - (2*(A*b^2 - a*(b*B - a*C))*A
rcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e +
f*x])])/(b^2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f])
```

Rubi [A] time = 0.78729, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.139

$$-\frac{2\left(Ab^2-a(bB-aC)\right)\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)}{b^2\sqrt{bc-ad}\sqrt{be-af}}-\frac{\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)(2aCdf+b(-2Bdf+cCf+Cde))}{b^2d^{3/2}f^{3/2}}+\frac{C\sqrt{c+dx}\sqrt{e+fx}}{bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (C*Sqrt[c + d*x]*Sqrt[e + f*x])/(b*d*f) - ((2*a*C*d*f + b*(C*d*e
+ c*C*f - 2*B*d*f))*ArcTanh[(Sqrt[f]*Sqrt[c + d*x])/(Sqrt[d]*Sqrt
[e + f*x])])/(b^2*d^(3/2)*f^(3/2)) - (2*(A*b^2 - a*(b*B - a*C))*A
rcTanh[(Sqrt[b*e - a*f]*Sqrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e +
f*x])])/(b^2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f])
```

Rubi in Sympy [A] time = 74.3497, size = 211, normalized size = 1.12

$$\frac{C\sqrt{c+dx}\sqrt{e+fx}}{bdf} - \frac{C(cf-de)\operatorname{atanh}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{bd^{\frac{3}{2}}f^{\frac{3}{2}}} + \frac{2\left(Ab^2-Bab+Ca^2\right)\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^2\sqrt{ad-bc}\sqrt{af-be}} + \frac{2(Bbf-Caf-Cbe)\operatorname{atanh}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{b^2\sqrt{d}f^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] C*sqrt(c + d*x)*sqrt(e + f*x)/(b*d*f) - C*(c*f - d*e)*atanh(sqrt(
f)*sqrt(c + d*x)/(sqrt(d)*sqrt(e + f*x)))/(b*d**(3/2)*f**(3/2)) +
 2*(A*b**2 - B*a*b + C*a**2)*atanh(sqrt(c + d*x)*sqrt(a*f - b*e)/
(sqrt(e + f*x)*sqrt(a*d - b*c)))/(b**2*sqrt(a*d - b*c)*sqrt(a*f -
 b*e)) + 2*(B*b*f - C*a*f - C*b*e)*atanh(sqrt(f)*sqrt(c + d*x)/(s
qrt(d)*sqrt(e + f*x)))/(b**2*sqrt(d)*f**(3/2))
```

Mathematica [A] time = 0.52783, size = 280, normalized size = 1.49

$$\frac{\frac{2\log(a+bx)\left(a(aC-bB)+Ab^2\right)}{\sqrt{bc-ad}\sqrt{be-af}} - \frac{2\left(a(aC-bB)+Ab^2\right)\log\left(2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}\sqrt{be-af}-a(cf+de+2dfx)+b(2ce+cfx+dex)\right)}{\sqrt{bc-ad}\sqrt{be-af}} - \log\left(2\sqrt{d}\sqrt{f}\sqrt{c+dx}\sqrt{e+f\right.}{2b^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] ((2*b*C*Sqrt[c + d*x]*Sqrt[e + f*x])/(d*f) + (2*(A*b^2 + a*(-(b*B
) + a*C))*Log[a + b*x])/(Sqrt[b*c - a*d]*Sqrt[b*e - a*f]) - ((2*a
*C*d*f + b*(C*d*e + c*C*f - 2*B*d*f))*Log[d*e + c*f + 2*d*f*x + 2
*Sqrt[d]*Sqrt[f]*Sqrt[c + d*x]*Sqrt[e + f*x]])/(d^(3/2)*f^(3/2))
- (2*(A*b^2 + a*(-(b*B) + a*C))*Log[2*Sqrt[b*c - a*d]*Sqrt[b*e -
a*f]*Sqrt[c + d*x]*Sqrt[e + f*x] + b*(2*c*e + d*e*x + c*f*x) - a*
(d*e + c*f + 2*d*f*x)])/(Sqrt[b*c - a*d]*Sqrt[b*e - a*f]))/(2*b^2
)
```

Maple [B] time = 0.049, size = 746, normalized size = 4.

$$-\frac{1}{2fdb^3}\left(2A\ln\left(\frac{1}{bx+a}\left(-2adfx+bcfx+bdex+2\sqrt{(dx+c)(fx+e)}\sqrt{\frac{fda^2-abcf-abde+b^2ce}{b^2}}b-acf-aed+2b\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] -1/2*(2*A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2
)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b
*c*e)/(b*x+a))*b^2*d*f*(f*d)^(1/2)-2*B*ln(1/2*(2*d*f*x+2*((d*x+c)
*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*b^2*d*f*((a^2*d
*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-2*B*ln((-2*a*d*f*x+b*c*f*x
+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*
c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*b*d*f*(f*d)^(1/
2)+2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+
d*e)/(f*d)^(1/2))*a*b*d*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)
^(1/2)+C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*b^2*c*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^
2)^(1/2)+C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+
c*f+d*e)/(f*d)^(1/2))*b^2*d*e*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/
b^2)^(1/2)+2*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))
^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*
d+2*b*c*e)/(b*x+a))*a^2*d*f*(f*d)^(1/2)-2*C*b^2*(f*d)^(1/2)*((d*x
+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2))
*(f*x+e)^(1/2)*(d*x+c)^(1/2)/((d*x+c)*(f*x+e))^(1/2)/d/(f*d)^(1/2
)/f/((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)/b^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Bx + Cx^2}{(a + bx)\sqrt{c + dx}\sqrt{e + fx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x**2+B*x+A)/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Integral((A + B*x + C*x**2)/((a + b*x)*sqrt(c + d*x)*sqrt(e + f*x
)), x)
```

GIAC/XCAS [A] time = 0.448894, size = 467, normalized size = 2.48

$$\frac{\sqrt{(dx+c)df - cdf + d^2e}\sqrt{dx+c}C|d|}{bd^3f} - \frac{2\left(\sqrt{df}Ca^2d^2 - \sqrt{df}Babd^2 + \sqrt{df}Ab^2d^2\right)\arctan\left(-\frac{bcdf - 2\,ad^2f + bd^2e - \left(\sqrt{df}\sqrt{dx+c} - \sqrt{(dx+c)df - cdf + d^2e}\right)^2 b}{2\sqrt{abcdf^2 - a^2d^2f^2 - b^2cdfe + abd^2fed}}\right)}{\sqrt{abcdf^2 - a^2d^2f^2 - b^2cdfe + abd^2fe}b^2d|d|} + \frac{\left(\sqrt{df}Cbcf + 2\sqrt{df}Cadf - 2\sqrt{df}Bbdf + \sqrt{df}Cbde\right)\ln\left(\left(\sqrt{df}\sqrt{dx+c} - \sqrt{(dx+c)df - cdf + d^2e}\right)^2\right)}{2\,b^2df^2|d|}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm='
```

```
[Out] sqrt((d*x + c)*d*f - c*d*f + d^2*e)*sqrt(d*x + c)*C*abs(d)/(b*d^3
*f) - 2*(sqrt(d*f)*C*a^2*d^2 - sqrt(d*f)*B*a*b*d^2 + sqrt(d*f)*A*
b^2*d^2)*arctan(-1/2*(b*c*d*f - 2*a*d^2*f + b*d^2*e - (sqrt(d*f)*
sqrt(d*x + c) - sqrt((d*x + c)*d*f - c*d*f + d^2*e))^2*b)/(sqrt(a
*b*c*d*f^2 - a^2*d^2*f^2 - b^2*c*d*f*e + a*b*d^2*f*e)*d))/(sqrt(a
*b*c*d*f^2 - a^2*d^2*f^2 - b^2*c*d*f*e + a*b*d^2*f*e)*b^2*d*abs(d
)) + 1/2*(sqrt(d*f)*C*b*c*f + 2*sqrt(d*f)*C*a*d*f - 2*sqrt(d*f)*B
*b*d*f + sqrt(d*f)*C*b*d*e)*ln((sqrt(d*f)*sqrt(d*x + c) - sqrt((d
*x + c)*d*f - c*d*f + d^2*e))^2)/(b^2*d*f^2*abs(d))
```

3.92 $\int \frac{A+Bx+Cx^2}{(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=254

$$\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(2a^3Cdf-3a^2bC(cf+de)+ab^2(-2Adf+Bcf+Bde+4cCe)-b^3(-Acf-Ade+2Bce)\right)}{b^2(bc-ad)^{3/2}(be-af)^{3/2}}-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b(a+bx)(bc-ad)(be-af)}+\frac{2C\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{b^2\sqrt{d}\sqrt{f}}$$

```
[Out] -(((A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(b*(b*c -
 a*d)*(b*e - a*f)*(a + b*x))) + (2*C*ArcTanh[(Sqrt[f]*Sqrt[c + d*
x])/(Sqrt[d]*Sqrt[e + f*x])])/(b^2*Sqrt[d]*Sqrt[f]) + ((2*a^3*C*d
*f - 3*a^2*b*C*(d*e + c*f) - b^3*(2*B*c*e - A*d*e - A*c*f) + a*b^
2*(4*c*C*e + B*d*e + B*c*f - 2*A*d*f))*ArcTanh[(Sqrt[b*e - a*f]*S
qrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(b^2*(b*c - a*d)^
(3/2)*(b*e - a*f)^(3/2))
```

Rubi [A] time = 1.46804, antiderivative size = 254, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.139$

$$\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(2a^3Cdf-3a^2bC(cf+de)+ab^2(-2Adf+Bcf+Bde+4cCe)-b^3(-Acf-Ade+2Bce)\right)}{b^2(bc-ad)^{3/2}(be-af)^{3/2}}-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b(a+bx)(bc-ad)(be-af)}+\frac{2C\tanh^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{b^2\sqrt{d}\sqrt{f}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] -(((A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(b*(b*c -
 a*d)*(b*e - a*f)*(a + b*x))) + (2*C*ArcTanh[(Sqrt[f]*Sqrt[c + d*
x])/(Sqrt[d]*Sqrt[e + f*x])])/(b^2*Sqrt[d]*Sqrt[f]) + ((2*a^3*C*d
*f - 3*a^2*b*C*(d*e + c*f) - b^3*(2*B*c*e - A*d*e - A*c*f) + a*b^
2*(4*c*C*e + B*d*e + B*c*f - 2*A*d*f))*ArcTanh[(Sqrt[b*e - a*f]*S
qrt[c + d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(b^2*(b*c - a*d)^
(3/2)*(b*e - a*f)^(3/2))
```

Rubi in Sympy [A] time = 95.0619, size = 265, normalized size = 1.04

$$\frac{2C\operatorname{atanh}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{d}\sqrt{e+fx}}\right)}{b^2\sqrt{d}\sqrt{f}}-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-Bab+Ca^2\right)}{b\left(a+bx\right)\left(ad-bc\right)\left(af-be\right)}+\frac{2\left(Bb-2Ca\right)\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^2\sqrt{ad-bc}\sqrt{af-be}}+\frac{\left(Ab^2-Bab+Ca^2\right)\left(2adf-bcf-bde\right)\operatorname{atanh}\left(\frac{\sqrt{c+dx}\sqrt{af-be}}{\sqrt{e+fx}\sqrt{ad-bc}}\right)}{b^2\left(ad-bc\right)^{\frac{3}{2}}\left(af-be\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] 2*C*atanh(sqrt(f)*sqrt(c + d*x)/(sqrt(d)*sqrt(e + f*x)))/(b**2*sq
rt(d)*sqrt(f)) - sqrt(c + d*x)*sqrt(e + f*x)*(A*b**2 - B*a*b + C*
a**2)/(b*(a + b*x)*(a*d - b*c)*(a*f - b*e)) + 2*(B*b - 2*C*a)*ata
nh(sqrt(c + d*x)*sqrt(a*f - b*e)/(sqrt(e + f*x)*sqrt(a*d - b*c)))
/(b**2*sqrt(a*d - b*c)*sqrt(a*f - b*e)) + (A*b**2 - B*a*b + C*a**
2)*(2*a*d*f - b*c*f - b*d*e)*atanh(sqrt(c + d*x)*sqrt(a*f - b*e)/
(sqrt(e + f*x)*sqrt(a*d - b*c)))/(b**2*(a*d - b*c)**(3/2)*(a*f -
b*e)**(3/2))
```

Mathematica [A] time = 2.04449, size = 397, normalized size = 1.56

$$\frac{\frac{\log(a+bx)\left(-2a^3Cdf+3a^2bC(cf+de)-ab^2(-2Adf+Bcf+Bde+4cCe)+b^3(2Bce-A(cf+de))\right)}{(bc-ad)^{3/2}(be-af)^{3/2}}-\frac{\log\left(2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}\sqrt{be-af}-a(cf+de+2dfx)+b(2ce\ldots\right.}{\ldots}}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] ((-2*b*(A*b^2 + a*(-(b*B) + a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/((
b*c - a*d)*(b*e - a*f)*(a + b*x)) + ((-2*a^3*C*d*f + 3*a^2*b*C*(d
*e + c*f) - a*b^2*(4*c*C*e + B*d*e + B*c*f - 2*A*d*f) + b^3*(2*B*
c*e - A*(d*e + c*f)))*Log[a + b*x])/((b*c - a*d)^(3/2)*(b*e - a*f
)^(3/2)) + (2*C*Log[d*e + c*f + 2*d*f*x + 2*Sqrt[d]*Sqrt[f]*Sqrt[
c + d*x]*Sqrt[e + f*x]])/(Sqrt[d]*Sqrt[f]) - ((-2*a^3*C*d*f + 3*a
^2*b*C*(d*e + c*f) - a*b^2*(4*c*C*e + B*d*e + B*c*f - 2*A*d*f) +
b^3*(2*B*c*e - A*(d*e + c*f)))*Log[2*Sqrt[b*c - a*d]*Sqrt[b*e - a
*f]*Sqrt[c + d*x]*Sqrt[e + f*x] + b*(2*c*e + d*e*x + c*f*x) - a*(
d*e + c*f + 2*d*f*x)])/((b*c - a*d)^(3/2)*(b*e - a*f)^(3/2)))/(2*
b^2)
```

Maple [B] time = 0.074, size = 2973, normalized size = 11.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^2/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] -1/2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(-2*B*a*b^3*(f*d)^(1/2)*((a^2*d*
f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*((d*x+c)*(f*x+e))^(1/2)+2*A
*b^4*(f*d)^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*((
d*x+c)*(f*x+e))^(1/2)+2*A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+
c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b
-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a*b^3*d*f*(f*d)^(1/2)-B*ln((-2*a
*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*
f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a
*b^3*c*f*(f*d)^(1/2)-B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*
(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*
c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a*b^3*d*e*(f*d)^(1/2)-2*C*ln(1/2*(2
*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2)
)*x*a^2*b^2*d*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)+2*C
*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(
f*d)^(1/2))*x*a*b^3*c*f*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(
1/2)+2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*
f+d*e)/(f*d)^(1/2))*x*a*b^3*d*e*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e
)/b^2)^(1/2)-2*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e
))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*
e*d+2*b*c*e)/(b*x+a))*x*a^3*b*d*f*(f*d)^(1/2)+3*C*ln((-2*a*d*f*x+
b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d
*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a^2*b^2*
c*f*(f*d)^(1/2)+3*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*
x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f
-a*e*d+2*b*c*e)/(b*x+a))*x*a^2*b^2*d*e*(f*d)^(1/2)-4*C*ln((-2*a*d
*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-
a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*a*b
^3*c*e*(f*d)^(1/2)-2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*
(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*x*b^4*c*e*((a^2*d*f-a*b*c*f-a*b
*d*e+b^2*c*e)/b^2)^(1/2)+2*A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d
*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2
)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^2*b^2*d*f*(f*d)^(1/2)-A*ln((-
2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b
*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*
a*b^3*c*f*(f*d)^(1/2)-A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)
*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a
*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*b^3*d*e*(f*d)^(1/2)-B*ln((-2*a*d*f
*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*
b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^2*b^2
*c*f*(f*d)^(1/2)-B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x
+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-
a*e*d+2*b*c*e)/(b*x+a))*a^2*b^2*d*e*(f*d)^(1/2)+2*B*ln((-2*a*d*f*
x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b
*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a*b^3*c*
e*(f*d)^(1/2)-2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)*(f*d)
^(1/2)+c*f+d*e)/(f*d)^(1/2))*a^3*b*d*f*((a^2*d*f-a*b*c*f-a*b*d*e+
```

```
b^2*c*e)/b^2)^(1/2)+2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e))^(1/2)
*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a^2*b^2*c*f*((a^2*d*f-a*b*c*f-
a*b*d*e+b^2*c*e)/b^2)^(1/2)+2*C*ln(1/2*(2*d*f*x+2*((d*x+c)*(f*x+e
))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a^2*b^2*d*e*((a^2*d*f-
a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)-2*C*ln(1/2*(2*d*f*x+2*((d*x+c
)*(f*x+e))^(1/2)*(f*d)^(1/2)+c*f+d*e)/(f*d)^(1/2))*a*b^3*c*e*((a^
2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)+3*C*ln((-2*a*d*f*x+b*c*
f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b
^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^3*b*c*f*(f*d
)^(1/2)+3*C*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1
/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2
*b*c*e)/(b*x+a))*a^3*b*d*e*(f*d)^(1/2)-4*C*ln((-2*a*d*f*x+b*c*f*x
+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*
c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*a^2*b^2*c*e*(f*d)
^(1/2)-A*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)
*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*
c*e)/(b*x+a))*x*b^4*c*f*(f*d)^(1/2)-A*ln((-2*a*d*f*x+b*c*f*x+b*d*
e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/
b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+a))*x*b^4*d*e*(f*d)^(1/2)+
2*B*ln((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^
2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/
(b*x+a))*x*b^4*c*e*(f*d)^(1/2)+2*C*a^2*b^2*(f*d)^(1/2)*((a^2*d*f-
a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*((d*x+c)*(f*x+e))^(1/2)-2*C*l
n((-2*a*d*f*x+b*c*f*x+b*d*e*x+2*((d*x+c)*(f*x+e))^(1/2)*((a^2*d*f
-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)*b-a*c*f-a*e*d+2*b*c*e)/(b*x+
a))*a^4*d*f*(f*d)^(1/2))/((d*x+c)*(f*x+e))^(1/2)/(a*d-b*c)/(a*f-b
*e)/(f*d)^(1/2)/((a^2*d*f-a*b*c*f-a*b*d*e+b^2*c*e)/b^2)^(1/2)/b^3
/(b*x+a)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] Timed out
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(b*x+a)**2/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [A] time = 0.727274, size = 4, normalized size = 0.02

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] sage0*x
```

3.93 $\int \frac{A+Bx+Cx^2}{(a+bx)^3\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=424

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(a^2\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)+ab\left(-2cd\left(4Af^2-7Bef+4Ce^2\right)+\right.\right.}{4(bc-ad)^{5/2}(be-af)^5}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(2a^3Cdf+a^2b(2Bdf-5C(cf+de))+ab^2(-6Adf+Bcf+Bde+8cCe)-b^3(4Bce-3A(cf+de))\right)}{4b(a+bx)(bc-ad)^2(be-af)^2}$$
$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{2b(a+bx)^2(bc-ad)(be-af)}$$

```
[Out] -((A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(2*b*(b*c
- a*d)*(b*e - a*f)*(a + b*x)^2) + ((2*a^3*C*d*f + a*b^2*(8*c*C*e
+ B*d*e + B*c*f - 6*A*d*f) - b^3*(4*B*c*e - 3*A*(d*e + c*f)) + a^
2*b*(2*B*d*f - 5*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*
b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x)) - ((b^2*(3*A*d^2*e^2 - 2
*c*d*e*(2*B*e - A*f) + c^2*(8*C*e^2 - 4*B*e*f + 3*A*f^2)) + a*b*(
d^2*e*(B*e - 8*A*f) - c^2*f*(8*C*e - B*f) - 2*c*d*(4*C*e^2 - 7*B*
e*f + 4*A*f^2)) + a^2*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*
d*f*(2*A*d*f - B*(d*e + c*f))))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c +
 d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(4*(b*c - a*d)^(5/2)*(b*
e - a*f)^(5/2))
```

Rubi [A] time = 2.35524, antiderivative size = 424, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.139$

$$-\frac{\tanh^{-1}\left(\frac{\sqrt{c+dx}\sqrt{be-af}}{\sqrt{e+fx}\sqrt{bc-ad}}\right)\left(a^2\left(4df(2Adf-B(cf+de))+C\left(3c^2f^2+2cdef+3d^2e^2\right)\right)+ab\left(-2cd\left(4Af^2-7Bef+4Ce^2\right)+\right.\right.}{4(bc-ad)^{5/2}(be-af)^5}$$
$$+\frac{\sqrt{c+dx}\sqrt{e+fx}\left(2a^3Cdf+a^2b(2Bdf-5C(cf+de))+ab^2(-6Adf+Bcf+Bde+8cCe)-b^3(4Bce-3A(cf+de))\right)}{4b(a+bx)(bc-ad)^2(be-af)^2}$$
$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{2b(a+bx)^2(bc-ad)(be-af)}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/((a + b*x)^3*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] -((A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(2*b*(b*c
- a*d)*(b*e - a*f)*(a + b*x)^2) + ((2*a^3*C*d*f + a*b^2*(8*c*C*e
+ B*d*e + B*c*f - 6*A*d*f) - b^3*(4*B*c*e - 3*A*(d*e + c*f)) + a^
2*b*(2*B*d*f - 5*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(4*
b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x)) - ((b^2*(3*A*d^2*e^2 - 2
*c*d*e*(2*B*e - A*f) + c^2*(8*C*e^2 - 4*B*e*f + 3*A*f^2)) + a*b*(
```

```
d^2*e*(B*e - 8*A*f) - c^2*f*(8*C*e - B*f) - 2*c*d*(4*C*e^2 - 7*B*
e*f + 4*A*f^2)) + a^2*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*
d*f*(2*A*d*f - B*(d*e + c*f))))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c +
 d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(4*(b*c - a*d)^(5/2)*(b*
e - a*f)^(5/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 2.70396, size = 604, normalized size = 1.42

$$\frac{b(a+bx)^2 \log(a+bx) \left(a^2 \left(4df(2Adf - B(cf+de)) + C\left(3c^2f^2 + 2cdef + 3d^2e^2\right)\right) + ab\left(-2cd\left(4Af^2 - 7Bef + 4Ce^2\right) + d^2 \cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/((a + b*x)^3*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (-2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sqrt[c + d*x]*Sqrt[e + f*x]*(
2*(A*b^2 + a*(-(b*B) + a*C))*(b*c - a*d)*(b*e - a*f) + (-2*a^3*C*
d*f - a*b^2*(8*c*C*e + B*d*e + B*c*f - 6*A*d*f) + b^3*(4*B*c*e -
3*A*(d*e + c*f)) + a^2*b*(-2*B*d*f + 5*C*(d*e + c*f)))*(a + b*x))
 + b*(b^2*(3*A*d^2*e^2 + 2*c*d*e*(-2*B*e + A*f) + c^2*(8*C*e^2 -
4*B*e*f + 3*A*f^2)) + a*b*(d^2*e*(B*e - 8*A*f) + c^2*f*(-8*C*e +
B*f) - 2*c*d*(4*C*e^2 - 7*B*e*f + 4*A*f^2)) + a^2*(C*(3*d^2*e^2 +
 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*(2*A*d*f - B*(d*e + c*f))))*(a +
b*x)^2*Log[a + b*x] - b*(b^2*(3*A*d^2*e^2 + 2*c*d*e*(-2*B*e + A*f
) + c^2*(8*C*e^2 - 4*B*e*f + 3*A*f^2)) + a*b*(d^2*e*(B*e - 8*A*f)
 + c^2*f*(-8*C*e + B*f) - 2*c*d*(4*C*e^2 - 7*B*e*f + 4*A*f^2)) +
a^2*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*(2*A*d*f - B*(
d*e + c*f))))*(a + b*x)^2*Log[2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*S
qrt[c + d*x]*Sqrt[e + f*x] + b*(2*c*e + d*e*x + c*f*x) - a*(d*e +
 c*f + 2*d*f*x)])/(8*b*(b*c - a*d)^(5/2)*(b*e - a*f)^(5/2)*(a + b
*x)^2)
```

Maple [B] time = 0.165, size = 7119, normalized size = 16.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^3/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^3*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 32.6876, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^3*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] [1/16*(4*sqrt((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f)*((2*(3*C*a^2
*b - B*a*b^2 - A*b^3)*c - (3*C*a^3 + B*a^2*b - 5*A*a*b^2)*d)*e -
((3*C*a^3 + B*a^2*b - 5*A*a*b^2)*c - 4*(B*a^3 - 2*A*a^2*b)*d)*f +
 ((4*(2*C*a*b^2 - B*b^3)*c - (5*C*a^2*b - B*a*b^2 - 3*A*b^3)*d)*e
 - ((5*C*a^2*b - B*a*b^2 - 3*A*b^3)*c - 2*(C*a^3 + B*a^2*b - 3*A*
a*b^2)*d)*f)*x)*sqrt(d*x + c)*sqrt(f*x + e) + ((8*C*a^2*b^2*c^2 -
 4*(2*C*a^3*b + B*a^2*b^2)*c*d + (3*C*a^4 + B*a^3*b + 3*A*a^2*b^2
)*d^2)*e^2 - 2*(2*(2*C*a^3*b + B*a^2*b^2)*c^2 - (C*a^4 + 7*B*a^3*
b + A*a^2*b^2)*c*d + 2*(B*a^4 + 2*A*a^3*b)*d^2)*e*f + (8*A*a^4*d^
2 + (3*C*a^4 + B*a^3*b + 3*A*a^2*b^2)*c^2 - 4*(B*a^4 + 2*A*a^3*b)
*c*d)*f^2 + ((8*C*b^4*c^2 - 4*(2*C*a*b^3 + B*b^4)*c*d + (3*C*a^2*
b^2 + B*a*b^3 + 3*A*b^4)*d^2)*e^2 - 2*(2*(2*C*a*b^3 + B*b^4)*c^2
- (C*a^2*b^2 + 7*B*a*b^3 + A*b^4)*c*d + 2*(B*a^2*b^2 + 2*A*a*b^3)
*d^2)*e*f + (8*A*a^2*b^2*d^2 + (3*C*a^2*b^2 + B*a*b^3 + 3*A*b^4)*
c^2 - 4*(B*a^2*b^2 + 2*A*a*b^3)*c*d)*f^2)*x^2 + 2*((8*C*a*b^3*c^2
 - 4*(2*C*a^2*b^2 + B*a*b^3)*c*d + (3*C*a^3*b + B*a^2*b^2 + 3*A*a
*b^3)*d^2)*e^2 - 2*(2*(2*C*a^2*b^2 + B*a*b^3)*c^2 - (C*a^3*b + 7*
B*a^2*b^2 + A*a*b^3)*c*d + 2*(B*a^3*b + 2*A*a^2*b^2)*d^2)*e*f + (
8*A*a^3*b*d^2 + (3*C*a^3*b + B*a^2*b^2 + 3*A*a*b^3)*c^2 - 4*(B*a^
3*b + 2*A*a^2*b^2)*c*d)*f^2)*x)*log(-(4*((2*b^3*c^2 - 3*a*b^2*c*d
 + a^2*b*d^2)*e^2 - (3*a*b^2*c^2 - 4*a^2*b*c*d + a^3*d^2)*e*f + (
a^2*b*c^2 - a^3*c*d)*f^2 + ((b^3*c*d - a*b^2*d^2)*e^2 + (b^3*c^2
```

```
- 4*a*b^2*c*d + 3*a^2*b*d^2)*e*f - (a*b^2*c^2 - 3*a^2*b*c*d + 2*a
^3*d^2)*f^2)*x)*sqrt(d*x + c)*sqrt(f*x + e) - (a^2*c^2*f^2 + (8*b
^2*c^2 - 8*a*b*c*d + a^2*d^2)*e^2 - 2*(4*a*b*c^2 - 3*a^2*c*d)*e*f
 + (b^2*d^2*e^2 + 2*(3*b^2*c*d - 4*a*b*d^2)*e*f + (b^2*c^2 - 8*a*
b*c*d + 8*a^2*d^2)*f^2)*x^2 + 2*((4*b^2*c*d - 3*a*b*d^2)*e^2 + 2*
(2*b^2*c^2 - 5*a*b*c*d + 2*a^2*d^2)*e*f - (3*a*b*c^2 - 4*a^2*c*d)
*f^2)*x)*sqrt((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f))/(b^2*x^2 +
2*a*b*x + a^2)))/(((a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*e^
2 - 2*(a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*e*f + (a^4*b^2*c^
2 - 2*a^5*b*c*d + a^6*d^2)*f^2 + ((b^6*c^2 - 2*a*b^5*c*d + a^2*b^
4*d^2)*e^2 - 2*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*e*f + (a
^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*f^2)*x^2 + 2*((a*b^5*c^
2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*e^2 - 2*(a^2*b^4*c^2 - 2*a^3*b^3
*c*d + a^4*b^2*d^2)*e*f + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^
2)*f^2)*x)*sqrt((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f)), 1/8*(2*s
qrt(-(b^2*c - a*b*d)*e + (a*b*c - a^2*d)*f)*((2*(3*C*a^2*b - B*a*
b^2 - A*b^3)*c - (3*C*a^3 + B*a^2*b - 5*A*a*b^2)*d)*e - ((3*C*a^3
 + B*a^2*b - 5*A*a*b^2)*c - 4*(B*a^3 - 2*A*a^2*b)*d)*f + ((4*(2*C
*a*b^2 - B*b^3)*c - (5*C*a^2*b - B*a*b^2 - 3*A*b^3)*d)*e - ((5*C*
a^2*b - B*a*b^2 - 3*A*b^3)*c - 2*(C*a^3 + B*a^2*b - 3*A*a*b^2)*d)
*f)*x)*sqrt(d*x + c)*sqrt(f*x + e) + ((8*C*a^2*b^2*c^2 - 4*(2*C*a
^3*b + B*a^2*b^2)*c*d + (3*C*a^4 + B*a^3*b + 3*A*a^2*b^2)*d^2)*e^
2 - 2*(2*(2*C*a^3*b + B*a^2*b^2)*c^2 - (C*a^4 + 7*B*a^3*b + A*a^2
*b^2)*c*d + 2*(B*a^4 + 2*A*a^3*b)*d^2)*e*f + (8*A*a^4*d^2 + (3*C*
a^4 + B*a^3*b + 3*A*a^2*b^2)*c^2 - 4*(B*a^4 + 2*A*a^3*b)*c*d)*f^2
 + ((8*C*b^4*c^2 - 4*(2*C*a*b^3 + B*b^4)*c*d + (3*C*a^2*b^2 + B*a
*b^3 + 3*A*b^4)*d^2)*e^2 - 2*(2*(2*C*a*b^3 + B*b^4)*c^2 - (C*a^2*
b^2 + 7*B*a*b^3 + A*b^4)*c*d + 2*(B*a^2*b^2 + 2*A*a*b^3)*d^2)*e*f
 + (8*A*a^2*b^2*d^2 + (3*C*a^2*b^2 + B*a*b^3 + 3*A*b^4)*c^2 - 4*(
B*a^2*b^2 + 2*A*a*b^3)*c*d)*f^2)*x^2 + 2*((8*C*a*b^3*c^2 - 4*(2*C
*a^2*b^2 + B*a*b^3)*c*d + (3*C*a^3*b + B*a^2*b^2 + 3*A*a*b^3)*d^2
)*e^2 - 2*(2*(2*C*a^2*b^2 + B*a*b^3)*c^2 - (C*a^3*b + 7*B*a^2*b^2
 + A*a*b^3)*c*d + 2*(B*a^3*b + 2*A*a^2*b^2)*d^2)*e*f + (8*A*a^3*b
*d^2 + (3*C*a^3*b + B*a^2*b^2 + 3*A*a*b^3)*c^2 - 4*(B*a^3*b + 2*A
*a^2*b^2)*c*d)*f^2)*x)*arctan(1/2*(a*c*f - (2*b*c - a*d)*e - (b*d
*e + (b*c - 2*a*d)*f)*x)*sqrt(-(b^2*c - a*b*d)*e + (a*b*c - a^2*d
)*f)/(((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f)*sqrt(d*x + c)*sqrt(
f*x + e))))/(((a^2*b^4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*e^2 - 2
*(a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*e*f + (a^4*b^2*c^2 - 2
*a^5*b*c*d + a^6*d^2)*f^2 + ((b^6*c^2 - 2*a*b^5*c*d + a^2*b^4*d^2
)*e^2 - 2*(a*b^5*c^2 - 2*a^2*b^4*c*d + a^3*b^3*d^2)*e*f + (a^2*b^
4*c^2 - 2*a^3*b^3*c*d + a^4*b^2*d^2)*f^2)*x^2 + 2*((a*b^5*c^2 - 2
*a^2*b^4*c*d + a^3*b^3*d^2)*e^2 - 2*(a^2*b^4*c^2 - 2*a^3*b^3*c*d
+ a^4*b^2*d^2)*e*f + (a^3*b^3*c^2 - 2*a^4*b^2*c*d + a^5*b*d^2)*f^
2)*x)*sqrt(-(b^2*c - a*b*d)*e + (a*b*c - a^2*d)*f))]
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(b*x+a)**3/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^3*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] Timed out
```

3.94 $\int \frac{A+Bx+Cx^2}{(a+bx)^4\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=826

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{3b(bc-ad)(be-af)(a+bx)^3}$$

$$+\frac{\left(-2df\left(C\left(3d^2e^2+2cdfe+3c^2f^2\right)+4df(2Adf-B(de+cf))\right)a^3+b\left(C\left(d^3e^3+23cd^2fe^2+23c^2df^2e+c^3f^3\right)+4df\left(6A\right.\right.\right.}{}$$

$$+\frac{\left(4Cd^2f^2a^4+8bdf(Bdf-2C(de+cf))a^3-b^2\left(C\left(3d^2e^2-34cdfe+3c^2f^2\right)+2df(22Adf-5B(de+cf))\right)a^2-b^3\left(-3f(\right.\right.}{2}$$

$$+\frac{\left(2Cdfa^3+b(4Bdf-7C(de+cf))a^2+b^2(12cCe+Bde+Bcf-10Adf)a-b^3(6Bce-5A(de+cf))\right)\sqrt{c+dx}\sqrt{e+fx}}{12b(bc-ad)^2(be-af)^2(a+bx)^2}$$

```
[Out] -((A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*(b*c
- a*d)*(b*e - a*f)*(a + b*x)^3) + ((2*a^3*C*d*f + a*b^2*(12*c*C*e
 + B*d*e + B*c*f - 10*A*d*f) - b^3*(6*B*c*e - 5*A*(d*e + c*f)) +
a^2*b*(4*B*d*f - 7*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(
12*b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x)^2) + ((4*a^4*C*d^2*f^2
 + 8*a^3*b*d*f*(B*d*f - 2*C*(d*e + c*f)) - b^4*(15*A*d^2*e^2 - 2*
c*d*e*(9*B*e - 7*A*f) + 3*c^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) - a*
b^3*(d^2*e*(3*B*e - 44*A*f) - 3*c^2*f*(4*C*e - B*f) - 2*c*d*(6*C*
e^2 - 29*B*e*f + 22*A*f^2)) - a^2*b^2*(C*(3*d^2*e^2 - 34*c*d*e*f
+ 3*c^2*f^2) + 2*d*f*(22*A*d*f - 5*B*(d*e + c*f))))*Sqrt[c + d*x]
*Sqrt[e + f*x])/(24*b*(b*c - a*d)^3*(b*e - a*f)^3*(a + b*x)) + ((
b^3*(5*A*d^3*e^3 - 3*c*d^2*e^2*(2*B*e - A*f) + c^2*d*e*(8*C*e^2 -
 4*B*e*f + 3*A*f^2) + c^3*f*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) + a*b^
2*(d^3*e^2*(B*e - 18*A*f) - c^3*f^2*(4*C*e - B*f) - c*d^2*e*(4*C*
e^2 - 23*B*e*f + 12*A*f^2) - c^2*d*f*(40*C*e^2 - 23*B*e*f + 18*A*
f^2)) - 2*a^3*d*f*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*
(2*A*d*f - B*(d*e + c*f))) + a^2*b*(C*(d^3*e^3 + 23*c*d^2*e^2*f +
 23*c^2*d*e*f^2 + c^3*f^3) + 4*d*f*(6*A*d*f*(d*e + c*f) - B*(d^2*
e^2 + 10*c*d*e*f + c^2*f^2))))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c +
d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(8*(b*c - a*d)^(7/2)*(b*e
 - a*f)^(7/2))
```

Rubi [A] time = 8.03141, antiderivative size = 826, normalized size of antiderivative = 1., number of

steps used = 6, number of rules used = 5, integrand size = 36, $\frac{\text{number of rules}}{\text{integrand size}} = 0.139$

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{3b(bc-ad)(be-af)(a+bx)^3}$$

$$+\frac{\left(-2df\left(C\left(3d^2e^2+2cdfe+3c^2f^2\right)+4df(2Adf-B(de+cf))\right)a^3+b\left(C\left(d^3e^3+23cd^2fe^2+23c^2df^2e+c^3f^3\right)+4df\left(6A\right.\right.\right.}{}$$

$$+\frac{\left(4Cd^2f^2a^4+8bdf(Bdf-2C(de+cf))a^3-b^2\left(C\left(3d^2e^2-34cdfe+3c^2f^2\right)+2df(22Adf-5B(de+cf))\right)a^2-b^3\left(-3f\right.\right.}{2}$$

$$+\frac{\left(2Cdfa^3+b(4Bdf-7C(de+cf))a^2+b^2(12cCe+Bde+Bcf-10Adf)a-b^3(6Bce-5A(de+cf))\right)\sqrt{c+dx}\sqrt{e+fx}}{12b(bc-ad)^2(be-af)^2(a+bx)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/((a + b*x)^4*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] -((A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*(b*c
- a*d)*(b*e - a*f)*(a + b*x)^3) + ((2*a^3*C*d*f + a*b^2*(12*c*C*e
 + B*d*e + B*c*f - 10*A*d*f) - b^3*(6*B*c*e - 5*A*(d*e + c*f)) +
a^2*b*(4*B*d*f - 7*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x])/(
12*b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x)^2) + ((4*a^4*C*d^2*f^2
 + 8*a^3*b*d*f*(B*d*f - 2*C*(d*e + c*f)) - b^4*(15*A*d^2*e^2 - 2*
c*d*e*(9*B*e - 7*A*f) + 3*c^2*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) - a*
b^3*(d^2*e*(3*B*e - 44*A*f) - 3*c^2*f*(4*C*e - B*f) - 2*c*d*(6*C*
e^2 - 29*B*e*f + 22*A*f^2)) - a^2*b^2*(C*(3*d^2*e^2 - 34*c*d*e*f
+ 3*c^2*f^2) + 2*d*f*(22*A*d*f - 5*B*(d*e + c*f))))*Sqrt[c + d*x]
*Sqrt[e + f*x])/(24*b*(b*c - a*d)^3*(b*e - a*f)^3*(a + b*x)) + ((
b^3*(5*A*d^3*e^3 - 3*c*d^2*e^2*(2*B*e - A*f) + c^2*d*e*(8*C*e^2 -
 4*B*e*f + 3*A*f^2) + c^3*f*(8*C*e^2 - 6*B*e*f + 5*A*f^2)) + a*b^
2*(d^3*e^2*(B*e - 18*A*f) - c^3*f^2*(4*C*e - B*f) - c*d^2*e*(4*C*
e^2 - 23*B*e*f + 12*A*f^2) - c^2*d*f*(40*C*e^2 - 23*B*e*f + 18*A*
f^2)) - 2*a^3*d*f*(C*(3*d^2*e^2 + 2*c*d*e*f + 3*c^2*f^2) + 4*d*f*
(2*A*d*f - B*(d*e + c*f))) + a^2*b*(C*(d^3*e^3 + 23*c*d^2*e^2*f +
 23*c^2*d*e*f^2 + c^3*f^3) + 4*d*f*(6*A*d*f*(d*e + c*f) - B*(d^2*
e^2 + 10*c*d*e*f + c^2*f^2))))*ArcTanh[(Sqrt[b*e - a*f]*Sqrt[c +
d*x])/(Sqrt[b*c - a*d]*Sqrt[e + f*x])])/(8*(b*c - a*d)^(7/2)*(b*e
 - a*f)^(7/2))
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)**4/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 7.76228, size = 1586, normalized size = 1.92

$$\sqrt{c+dx}\sqrt{e+fx}\left(\frac{-Ca^2+bBa-Ab^2}{3b(bc-ad)(be-af)(a+bx)^3}\right.$$
$$+\frac{4Cd^2f^2a^4+8bBd^2f^2a^3-16bcCdf^2a^3-16bCd^2efa^3-3b^2Cd^2e^2a^2-44Ab^2d^2f^2a^2-3b^2c^2Cf^2a^2+10b^2Bcdf^2a^2+10b^2}{}$$
$$\left.+\frac{2Cdfa^3-7bCdea^2-7bcCfa^2+4bBdfa^2+12b^2cCea+b^2Bdea+b^2Bcfa-10Ab^2dfa-6b^3Bce+5Ab^3de+5Ab^3cf}{12b(bc-ad)^2(be-af)^2(a+bx)^2}\right)$$
$$-\frac{\left(-16Ad^3f^3a^3+8Bcd^2f^3a^3-6c^2Cdf^3a^3+8Bd^3ef^2a^3-4cCd^2ef^2a^3-6Cd^3e^2fa^3+bCd^3e^3a^2+24Abcd^2f^3a^2+bc^3Cf^3\right.}{}$$
$$+\frac{\left(-16Ad^3f^3a^3+8Bcd^2f^3a^3-6c^2Cdf^3a^3+8Bd^3ef^2a^3-4cCd^2ef^2a^3-6Cd^3e^2fa^3+bCd^3e^3a^2+24Abcd^2f^3a^2+bc^3Cf^3a\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2)/((a + b*x)^4*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] Sqrt[c + d*x]*Sqrt[e + f*x]*((-(A*b^2) + a*b*B - a^2*C)/(3*b*(b*c
 - a*d)*(b*e - a*f)*(a + b*x)^3) + (-6*b^3*B*c*e + 12*a*b^2*c*C*e
 + 5*A*b^3*d*e + a*b^2*B*d*e - 7*a^2*b*C*d*e + 5*A*b^3*c*f + a*b^
2*B*c*f - 7*a^2*b*c*C*f - 10*a*A*b^2*d*f + 4*a^2*b*B*d*f + 2*a^3*
C*d*f)/(12*b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x)^2) + (-24*b^4*
c^2*C*e^2 + 18*b^4*B*c*d*e^2 + 12*a*b^3*c*C*d*e^2 - 15*A*b^4*d^2*
e^2 - 3*a*b^3*B*d^2*e^2 - 3*a^2*b^2*C*d^2*e^2 + 18*b^4*B*c^2*e*f
+ 12*a*b^3*c^2*C*e*f - 14*A*b^4*c*d*e*f - 58*a*b^3*B*c*d*e*f + 34
*a^2*b^2*c*C*d*e*f + 44*a*A*b^3*d^2*e*f + 10*a^2*b^2*B*d^2*e*f -
16*a^3*b*C*d^2*e*f - 15*A*b^4*c^2*f^2 - 3*a*b^3*B*c^2*f^2 - 3*a^2
*b^2*c^2*C*f^2 + 44*a*A*b^3*c*d*f^2 + 10*a^2*b^2*B*c*d*f^2 - 16*a
^3*b*c*C*d*f^2 - 44*a^2*A*b^2*d^2*f^2 + 8*a^3*b*B*d^2*f^2 + 4*a^4
*C*d^2*f^2)/(24*b*(b*c - a*d)^3*(b*e - a*f)^3*(a + b*x))) - ((8*b
^3*c^2*C*d*e^3 - 6*b^3*B*c*d^2*e^3 - 4*a*b^2*c*C*d^2*e^3 + 5*A*b^
3*d^3*e^3 + a*b^2*B*d^3*e^3 + a^2*b*C*d^3*e^3 + 8*b^3*c^3*C*e^2*f
 - 4*b^3*B*c^2*d*e^2*f - 40*a*b^2*c^2*C*d*e^2*f + 3*A*b^3*c*d^2*e
^2*f + 23*a*b^2*B*c*d^2*e^2*f + 23*a^2*b*c*C*d^2*e^2*f - 18*a*A*b
^2*d^3*e^2*f - 4*a^2*b*B*d^3*e^2*f - 6*a^3*C*d^3*e^2*f - 6*b^3*B*
c^3*e*f^2 - 4*a*b^2*c^3*C*e*f^2 + 3*A*b^3*c^2*d*e*f^2 + 23*a*b^2*
B*c^2*d*e*f^2 + 23*a^2*b*c^2*C*d*e*f^2 - 12*a*A*b^2*c*d^2*e*f^2 -
 40*a^2*b*B*c*d^2*e*f^2 - 4*a^3*c*C*d^2*e*f^2 + 24*a^2*A*b*d^3*e*
f^2 + 8*a^3*B*d^3*e*f^2 + 5*A*b^3*c^3*f^3 + a*b^2*B*c^3*f^3 + a^2
*b*c^3*C*f^3 - 18*a*A*b^2*c^2*d*f^3 - 4*a^2*b*B*c^2*d*f^3 - 6*a^3
*c^2*C*d*f^3 + 24*a^2*A*b*c*d^2*f^3 + 8*a^3*B*c*d^2*f^3 - 16*a^3*
A*d^3*f^3)*Log[a + b*x])/(16*(b*c - a*d)^(7/2)*(b*e - a*f)^(7/2))
 + ((8*b^3*c^2*C*d*e^3 - 6*b^3*B*c*d^2*e^3 - 4*a*b^2*c*C*d^2*e^3
+ 5*A*b^3*d^3*e^3 + a*b^2*B*d^3*e^3 + a^2*b*C*d^3*e^3 + 8*b^3*c^3
*C*e^2*f - 4*b^3*B*c^2*d*e^2*f - 40*a*b^2*c^2*C*d*e^2*f + 3*A*b^3
*c*d^2*e^2*f + 23*a*b^2*B*c*d^2*e^2*f + 23*a^2*b*c*C*d^2*e^2*f -
18*a*A*b^2*d^3*e^2*f - 4*a^2*b*B*d^3*e^2*f - 6*a^3*C*d^3*e^2*f -
6*b^3*B*c^3*e*f^2 - 4*a*b^2*c^3*C*e*f^2 + 3*A*b^3*c^2*d*e*f^2 + 2
3*a*b^2*B*c^2*d*e*f^2 + 23*a^2*b*c^2*C*d*e*f^2 - 12*a*A*b^2*c*d^2
*e*f^2 - 40*a^2*b*B*c*d^2*e*f^2 - 4*a^3*c*C*d^2*e*f^2 + 24*a^2*A*
```

```
b*d^3*e*f^2 + 8*a^3*B*d^3*e*f^2 + 5*A*b^3*c^3*f^3 + a*b^2*B*c^3*f
^3 + a^2*b*c^3*C*f^3 - 18*a*A*b^2*c^2*d*f^3 - 4*a^2*b*B*c^2*d*f^3
 - 6*a^3*c^2*C*d*f^3 + 24*a^2*A*b*c*d^2*f^3 + 8*a^3*B*c*d^2*f^3 -
 16*a^3*A*d^3*f^3)*Log[2*b*c*e - a*d*e - a*c*f + b*d*e*x + b*c*f*
x - 2*a*d*f*x + 2*Sqrt[b*c - a*d]*Sqrt[b*e - a*f]*Sqrt[c + d*x]*S
qrt[e + f*x]])/(16*(b*c - a*d)^(7/2)*(b*e - a*f)^(7/2))
```

Maple [B] time = 0.441, size = 18802, normalized size = 22.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^4/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)

[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/((b*x + a)^4*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm

[Out] Exception raised: ValueError
```

Fricas [A] time = 148.303, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)/((b*x + a)^4*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm

[Out] [-1/96*(4*((4*(2*C*a^2*b^3 + B*a*b^4 + 2*A*b^5)*c^2 + 2*(5*C*a^3*
b^2 - 8*B*a^2*b^3 - 13*A*a*b^4)*c*d - 3*(C*a^4*b + B*a^3*b^2 - 11
*A*a^2*b^3)*d^2)*e^2 + 2*((5*C*a^3*b^2 - 8*B*a^2*b^3 - 13*A*a*b^4
)*c^2 - (29*C*a^4*b - 17*B*a^3*b^2 - 43*A*a^2*b^3)*c*d + 3*(3*C*a
^5 + 2*B*a^4*b - 15*A*a^3*b^2)*d^2)*e*f - 3*((C*a^4*b + B*a^3*b^2
 - 11*A*a^2*b^3)*c^2 - 2*(3*C*a^5 + 2*B*a^4*b - 15*A*a^3*b^2)*c*d
 + 8*(B*a^5 - 3*A*a^4*b)*d^2)*f^2 + (3*(8*C*b^5*c^2 - 2*(2*C*a*b^
```

4 + 3*B*b^5)*c*d + (C*a^2*b^3 + B*a*b^4 + 5*A*b^5)*d^2)*e^2 - 2*(
3*(2*C*a*b^4 + 3*B*b^5)*c^2 + (17*C*a^2*b^3 - 29*B*a*b^4 - 7*A*b^
5)*c*d - (8*C*a^3*b^2 - 5*B*a^2*b^3 - 22*A*a*b^4)*d^2)*e*f + (3*(
C*a^2*b^3 + B*a*b^4 + 5*A*b^5)*c^2 + 2*(8*C*a^3*b^2 - 5*B*a^2*b^3
 - 22*A*a*b^4)*c*d - 4*(C*a^4*b + 2*B*a^3*b^2 - 11*A*a^2*b^3)*d^2
)*f^2)*x^2 + 2*((6*(2*C*a*b^4 + B*b^5)*c^2 + (7*C*a^2*b^3 - 25*B*
a*b^4 - 5*A*b^5)*c*d - 4*(C*a^3*b^2 - B*a^2*b^3 - 5*A*a*b^4)*d^2)
*e^2 + ((7*C*a^2*b^3 - 25*B*a*b^4 - 5*A*b^5)*c^2 - 2*(31*C*a^3*b^
2 - 31*B*a^2*b^3 - 17*A*a*b^4)*c*d + (25*C*a^4*b - 7*B*a^3*b^2 -
59*A*a^2*b^3)*d^2)*e*f - (4*(C*a^3*b^2 - B*a^2*b^3 - 5*A*a*b^4)*c
^2 - (25*C*a^4*b - 7*B*a^3*b^2 - 59*A*a^2*b^3)*c*d + 6*(C*a^5 + 2
*B*a^4*b - 9*A*a^3*b^2)*d^2)*f^2)*x)*sqrt((b^2*c - a*b*d)*e - (a*
b*c - a^2*d)*f)*sqrt(d*x + c)*sqrt(f*x + e) + 3*((8*C*a^3*b^3*c^2
d - 2(2*C*a^4*b^2 + 3*B*a^3*b^3)*c*d^2 + (C*a^5*b + B*a^4*b^2 +
 5*A*a^3*b^3)*d^3)*e^3 + (8*C*a^3*b^3*c^3 - 4*(10*C*a^4*b^2 + B*a
^3*b^3)*c^2*d + (23*C*a^5*b + 23*B*a^4*b^2 + 3*A*a^3*b^3)*c*d^2 -
 2*(3*C*a^6 + 2*B*a^5*b + 9*A*a^4*b^2)*d^3)*e^2*f - (2*(2*C*a^4*b
^2 + 3*B*a^3*b^3)*c^3 - (23*C*a^5*b + 23*B*a^4*b^2 + 3*A*a^3*b^3)
*c^2*d + 4*(C*a^6 + 10*B*a^5*b + 3*A*a^4*b^2)*c*d^2 - 8*(B*a^6 +
3*A*a^5*b)*d^3)*e*f^2 - (16*A*a^6*d^3 - (C*a^5*b + B*a^4*b^2 + 5*
A*a^3*b^3)*c^3 + 2*(3*C*a^6 + 2*B*a^5*b + 9*A*a^4*b^2)*c^2*d - 8*
(B*a^6 + 3*A*a^5*b)*c*d^2)*f^3 + ((8*C*b^6*c^2*d - 2*(2*C*a*b^5 +
 3*B*b^6)*c*d^2 + (C*a^2*b^4 + B*a*b^5 + 5*A*b^6)*d^3)*e^3 + (8*C
*b^6*c^3 - 4*(10*C*a*b^5 + B*b^6)*c^2*d + (23*C*a^2*b^4 + 23*B*a*
b^5 + 3*A*b^6)*c*d^2 - 2*(3*C*a^3*b^3 + 2*B*a^2*b^4 + 9*A*a*b^5)*
d^3)*e^2*f - (2*(2*C*a*b^5 + 3*B*b^6)*c^3 - (23*C*a^2*b^4 + 23*B*
a*b^5 + 3*A*b^6)*c^2*d + 4*(C*a^3*b^3 + 10*B*a^2*b^4 + 3*A*a*b^5)
*c*d^2 - 8*(B*a^3*b^3 + 3*A*a^2*b^4)*d^3)*e*f^2 - (16*A*a^3*b^3*d
^3 - (C*a^2*b^4 + B*a*b^5 + 5*A*b^6)*c^3 + 2*(3*C*a^3*b^3 + 2*B*a
^2*b^4 + 9*A*a*b^5)*c^2*d - 8*(B*a^3*b^3 + 3*A*a^2*b^4)*c*d^2)*f^
3)*x^3 + 3*((8*C*a*b^5*c^2*d - 2*(2*C*a^2*b^4 + 3*B*a*b^5)*c*d^2
+ (C*a^3*b^3 + B*a^2*b^4 + 5*A*a*b^5)*d^3)*e^3 + (8*C*a*b^5*c^3 -
 4*(10*C*a^2*b^4 + B*a*b^5)*c^2*d + (23*C*a^3*b^3 + 23*B*a^2*b^4
+ 3*A*a*b^5)*c*d^2 - 2*(3*C*a^4*b^2 + 2*B*a^3*b^3 + 9*A*a^2*b^4)*
d^3)*e^2*f - (2*(2*C*a^2*b^4 + 3*B*a*b^5)*c^3 - (23*C*a^3*b^3 + 2
3*B*a^2*b^4 + 3*A*a*b^5)*c^2*d + 4*(C*a^4*b^2 + 10*B*a^3*b^3 + 3*
A*a^2*b^4)*c*d^2 - 8*(B*a^4*b^2 + 3*A*a^3*b^3)*d^3)*e*f^2 - (16*A
*a^4*b^2*d^3 - (C*a^3*b^3 + B*a^2*b^4 + 5*A*a*b^5)*c^3 + 2*(3*C*a
^4*b^2 + 2*B*a^3*b^3 + 9*A*a^2*b^4)*c^2*d - 8*(B*a^4*b^2 + 3*A*a^
3*b^3)*c*d^2)*f^3)*x^2 + 3*((8*C*a^2*b^4*c^2*d - 2*(2*C*a^3*b^3 +
 3*B*a^2*b^4)*c*d^2 + (C*a^4*b^2 + B*a^3*b^3 + 5*A*a^2*b^4)*d^3)*
e^3 + (8*C*a^2*b^4*c^3 - 4*(10*C*a^3*b^3 + B*a^2*b^4)*c^2*d + (23
*C*a^4*b^2 + 23*B*a^3*b^3 + 3*A*a^2*b^4)*c*d^2 - 2*(3*C*a^5*b + 2
*B*a^4*b^2 + 9*A*a^3*b^3)*d^3)*e^2*f - (2*(2*C*a^3*b^3 + 3*B*a^2*
b^4)*c^3 - (23*C*a^4*b^2 + 23*B*a^3*b^3 + 3*A*a^2*b^4)*c^2*d + 4*
(C*a^5*b + 10*B*a^4*b^2 + 3*A*a^3*b^3)*c*d^2 - 8*(B*a^5*b + 3*A*a
^4*b^2)*d^3)*e*f^2 - (16*A*a^5*b*d^3 - (C*a^4*b^2 + B*a^3*b^3 + 5
*A*a^2*b^4)*c^3 + 2*(3*C*a^5*b + 2*B*a^4*b^2 + 9*A*a^3*b^3)*c^2*d
 - 8*(B*a^5*b + 3*A*a^4*b^2)*c*d^2)*f^3)*x)*log(-(4*((2*b^3*c^2 -
 3*a*b^2*c*d + a^2*b*d^2)*e^2 - (3*a*b^2*c^2 - 4*a^2*b*c*d + a^3*
d^2)*e*f + (a^2*b*c^2 - a^3*c*d)*f^2 + ((b^3*c*d - a*b^2*d^2)*e^2
 + (b^3*c^2 - 4*a*b^2*c*d + 3*a^2*b*d^2)*e*f - (a*b^2*c^2 - 3*a^2
*b*c*d + 2*a^3*d^2)*f^2)*x)*sqrt(d*x + c)*sqrt(f*x + e) - (a^2*c^
2*f^2 + (8*b^2*c^2 - 8*a*b*c*d + a^2*d^2)*e^2 - 2*(4*a*b*c^2 - 3*
a^2*c*d)*e*f + (b^2*d^2*e^2 + 2*(3*b^2*c*d - 4*a*b*d^2)*e*f + (b^
2*c^2 - 8*a*b*c*d + 8*a^2*d^2)*f^2)*x^2 + 2*((4*b^2*c*d - 3*a*b*d

```
^2)*e^2 + 2*(2*b^2*c^2 - 5*a*b*c*d + 2*a^2*d^2)*e*f - (3*a*b*c^2
- 4*a^2*c*d)*f^2)*x)*sqrt((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f))
/(b^2*x^2 + 2*a*b*x + a^2)))/(((a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3
*a^5*b^4*c*d^2 - a^6*b^3*d^3)*e^3 - 3*(a^4*b^5*c^3 - 3*a^5*b^4*c^
2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*e^2*f + 3*(a^5*b^4*c^3 - 3*a
^6*b^3*c^2*d + 3*a^7*b^2*c*d^2 - a^8*b*d^3)*e*f^2 - (a^6*b^3*c^3
- 3*a^7*b^2*c^2*d + 3*a^8*b*c*d^2 - a^9*d^3)*f^3 + ((b^9*c^3 - 3*
a*b^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*e^3 - 3*(a*b^8*c^3 -
 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*e^2*f + 3*(a^2*
b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*e*f^2
- (a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)
*f^3)*x^3 + 3*((a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a
^4*b^5*d^3)*e^3 - 3*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*
d^2 - a^5*b^4*d^3)*e^2*f + 3*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a
^5*b^4*c*d^2 - a^6*b^3*d^3)*e*f^2 - (a^4*b^5*c^3 - 3*a^5*b^4*c^2*
d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*f^3)*x^2 + 3*((a^2*b^7*c^3 - 3
*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*e^3 - 3*(a^3*b^6*
c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*e^2*f + 3*
(a^4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*e
*f^2 - (a^5*b^4*c^3 - 3*a^6*b^3*c^2*d + 3*a^7*b^2*c*d^2 - a^8*b*d
^3)*f^3)*x)*sqrt((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f)), -1/48*(
2*((4*(2*C*a^2*b^3 + B*a*b^4 + 2*A*b^5)*c^2 + 2*(5*C*a^3*b^2 - 8*
B*a^2*b^3 - 13*A*a*b^4)*c*d - 3*(C*a^4*b + B*a^3*b^2 - 11*A*a^2*b
^3)*d^2)*e^2 + 2*((5*C*a^3*b^2 - 8*B*a^2*b^3 - 13*A*a*b^4)*c^2 -
(29*C*a^4*b - 17*B*a^3*b^2 - 43*A*a^2*b^3)*c*d + 3*(3*C*a^5 + 2*B
*a^4*b - 15*A*a^3*b^2)*d^2)*e*f - 3*((C*a^4*b + B*a^3*b^2 - 11*A*
a^2*b^3)*c^2 - 2*(3*C*a^5 + 2*B*a^4*b - 15*A*a^3*b^2)*c*d + 8*(B*
a^5 - 3*A*a^4*b)*d^2)*f^2 + (3*(8*C*b^5*c^2 - 2*(2*C*a*b^4 + 3*B*
b^5)*c*d + (C*a^2*b^3 + B*a*b^4 + 5*A*b^5)*d^2)*e^2 - 2*(3*(2*C*a
*b^4 + 3*B*b^5)*c^2 + (17*C*a^2*b^3 - 29*B*a*b^4 - 7*A*b^5)*c*d -
 (8*C*a^3*b^2 - 5*B*a^2*b^3 - 22*A*a*b^4)*d^2)*e*f + (3*(C*a^2*b^
3 + B*a*b^4 + 5*A*b^5)*c^2 + 2*(8*C*a^3*b^2 - 5*B*a^2*b^3 - 22*A*
a*b^4)*c*d - 4*(C*a^4*b + 2*B*a^3*b^2 - 11*A*a^2*b^3)*d^2)*f^2)*x
^2 + 2*((6*(2*C*a*b^4 + B*b^5)*c^2 + (7*C*a^2*b^3 - 25*B*a*b^4 -
5*A*b^5)*c*d - 4*(C*a^3*b^2 - B*a^2*b^3 - 5*A*a*b^4)*d^2)*e^2 + (
(7*C*a^2*b^3 - 25*B*a*b^4 - 5*A*b^5)*c^2 - 2*(31*C*a^3*b^2 - 31*B
*a^2*b^3 - 17*A*a*b^4)*c*d + (25*C*a^4*b - 7*B*a^3*b^2 - 59*A*a^2
*b^3)*d^2)*e*f - (4*(C*a^3*b^2 - B*a^2*b^3 - 5*A*a*b^4)*c^2 - (25
*C*a^4*b - 7*B*a^3*b^2 - 59*A*a^2*b^3)*c*d + 6*(C*a^5 + 2*B*a^4*b
 - 9*A*a^3*b^2)*d^2)*f^2)*x)*sqrt(-(b^2*c - a*b*d)*e + (a*b*c - a
^2*d)*f)*sqrt(d*x + c)*sqrt(f*x + e) + 3*((8*C*a^3*b^3*c^2*d - 2*
(2*C*a^4*b^2 + 3*B*a^3*b^3)*c*d^2 + (C*a^5*b + B*a^4*b^2 + 5*A*a^
3*b^3)*d^3)*e^3 + (8*C*a^3*b^3*c^3 - 4*(10*C*a^4*b^2 + B*a^3*b^3)
*c^2*d + (23*C*a^5*b + 23*B*a^4*b^2 + 3*A*a^3*b^3)*c*d^2 - 2*(3*C
*a^6 + 2*B*a^5*b + 9*A*a^4*b^2)*d^3)*e^2*f - (2*(2*C*a^4*b^2 + 3*
B*a^3*b^3)*c^3 - (23*C*a^5*b + 23*B*a^4*b^2 + 3*A*a^3*b^3)*c^2*d
+ 4*(C*a^6 + 10*B*a^5*b + 3*A*a^4*b^2)*c*d^2 - 8*(B*a^6 + 3*A*a^5
*b)*d^3)*e*f^2 - (16*A*a^6*d^3 - (C*a^5*b + B*a^4*b^2 + 5*A*a^3*b
^3)*c^3 + 2*(3*C*a^6 + 2*B*a^5*b + 9*A*a^4*b^2)*c^2*d - 8*(B*a^6
+ 3*A*a^5*b)*c*d^2)*f^3 + ((8*C*b^6*c^2*d - 2*(2*C*a*b^5 + 3*B*b^
6)*c*d^2 + (C*a^2*b^4 + B*a*b^5 + 5*A*b^6)*d^3)*e^3 + (8*C*b^6*c^
3 - 4*(10*C*a*b^5 + B*b^6)*c^2*d + (23*C*a^2*b^4 + 23*B*a*b^5 + 3
*A*b^6)*c*d^2 - 2*(3*C*a^3*b^3 + 2*B*a^2*b^4 + 9*A*a*b^5)*d^3)*e^
2*f - (2*(2*C*a*b^5 + 3*B*b^6)*c^3 - (23*C*a^2*b^4 + 23*B*a*b^5 +
 3*A*b^6)*c^2*d + 4*(C*a^3*b^3 + 10*B*a^2*b^4 + 3*A*a*b^5)*c*d^2
- 8*(B*a^3*b^3 + 3*A*a^2*b^4)*d^3)*e*f^2 - (16*A*a^3*b^3*d^3 - (C
```

```
*a^2*b^4 + B*a*b^5 + 5*A*b^6)*c^3 + 2*(3*C*a^3*b^3 + 2*B*a^2*b^4
+ 9*A*a*b^5)*c^2*d - 8*(B*a^3*b^3 + 3*A*a^2*b^4)*c*d^2)*f^3)*x^3
+ 3*((8*C*a*b^5*c^2*d - 2*(2*C*a^2*b^4 + 3*B*a*b^5)*c*d^2 + (C*a^
3*b^3 + B*a^2*b^4 + 5*A*a*b^5)*d^3)*e^3 + (8*C*a*b^5*c^3 - 4*(10*
C*a^2*b^4 + B*a*b^5)*c^2*d + (23*C*a^3*b^3 + 23*B*a^2*b^4 + 3*A*a
*b^5)*c*d^2 - 2*(3*C*a^4*b^2 + 2*B*a^3*b^3 + 9*A*a^2*b^4)*d^3)*e^
2*f - (2*(2*C*a^2*b^4 + 3*B*a*b^5)*c^3 - (23*C*a^3*b^3 + 23*B*a^2
*b^4 + 3*A*a*b^5)*c^2*d + 4*(C*a^4*b^2 + 10*B*a^3*b^3 + 3*A*a^2*b
^4)*c*d^2 - 8*(B*a^4*b^2 + 3*A*a^3*b^3)*d^3)*e*f^2 - (16*A*a^4*b^
2*d^3 - (C*a^3*b^3 + B*a^2*b^4 + 5*A*a*b^5)*c^3 + 2*(3*C*a^4*b^2
+ 2*B*a^3*b^3 + 9*A*a^2*b^4)*c^2*d - 8*(B*a^4*b^2 + 3*A*a^3*b^3)*
c*d^2)*f^3)*x^2 + 3*((8*C*a^2*b^4*c^2*d - 2*(2*C*a^3*b^3 + 3*B*a^
2*b^4)*c*d^2 + (C*a^4*b^2 + B*a^3*b^3 + 5*A*a^2*b^4)*d^3)*e^3 + (
8*C*a^2*b^4*c^3 - 4*(10*C*a^3*b^3 + B*a^2*b^4)*c^2*d + (23*C*a^4*
b^2 + 23*B*a^3*b^3 + 3*A*a^2*b^4)*c*d^2 - 2*(3*C*a^5*b + 2*B*a^4*
b^2 + 9*A*a^3*b^3)*d^3)*e^2*f - (2*(2*C*a^3*b^3 + 3*B*a^2*b^4)*c^
3 - (23*C*a^4*b^2 + 23*B*a^3*b^3 + 3*A*a^2*b^4)*c^2*d + 4*(C*a^5*
b + 10*B*a^4*b^2 + 3*A*a^3*b^3)*c*d^2 - 8*(B*a^5*b + 3*A*a^4*b^2)
*d^3)*e*f^2 - (16*A*a^5*b*d^3 - (C*a^4*b^2 + B*a^3*b^3 + 5*A*a^2*
b^4)*c^3 + 2*(3*C*a^5*b + 2*B*a^4*b^2 + 9*A*a^3*b^3)*c^2*d - 8*(B
*a^5*b + 3*A*a^4*b^2)*c*d^2)*f^3)*x)*arctan(1/2*(a*c*f - (2*b*c -
 a*d)*e - (b*d*e + (b*c - 2*a*d)*f)*x)*sqrt(-(b^2*c - a*b*d)*e +
(a*b*c - a^2*d)*f)/(((b^2*c - a*b*d)*e - (a*b*c - a^2*d)*f)*sqrt(
d*x + c)*sqrt(f*x + e))))/(((a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^
5*b^4*c*d^2 - a^6*b^3*d^3)*e^3 - 3*(a^4*b^5*c^3 - 3*a^5*b^4*c^2*d
 + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*e^2*f + 3*(a^5*b^4*c^3 - 3*a^6*
b^3*c^2*d + 3*a^7*b^2*c*d^2 - a^8*b*d^3)*e*f^2 - (a^6*b^3*c^3 - 3
*a^7*b^2*c^2*d + 3*a^8*b*c*d^2 - a^9*d^3)*f^3 + ((b^9*c^3 - 3*a*b
^8*c^2*d + 3*a^2*b^7*c*d^2 - a^3*b^6*d^3)*e^3 - 3*(a*b^8*c^3 - 3*
a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*b^5*d^3)*e^2*f + 3*(a^2*b^7
*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*e*f^2 - (
a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*f^
3)*x^3 + 3*((a*b^8*c^3 - 3*a^2*b^7*c^2*d + 3*a^3*b^6*c*d^2 - a^4*
b^5*d^3)*e^3 - 3*(a^2*b^7*c^3 - 3*a^3*b^6*c^2*d + 3*a^4*b^5*c*d^2
 - a^5*b^4*d^3)*e^2*f + 3*(a^3*b^6*c^3 - 3*a^4*b^5*c^2*d + 3*a^5*
b^4*c*d^2 - a^6*b^3*d^3)*e*f^2 - (a^4*b^5*c^3 - 3*a^5*b^4*c^2*d +
 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*f^3)*x^2 + 3*((a^2*b^7*c^3 - 3*a^
3*b^6*c^2*d + 3*a^4*b^5*c*d^2 - a^5*b^4*d^3)*e^3 - 3*(a^3*b^6*c^3
 - 3*a^4*b^5*c^2*d + 3*a^5*b^4*c*d^2 - a^6*b^3*d^3)*e^2*f + 3*(a^
4*b^5*c^3 - 3*a^5*b^4*c^2*d + 3*a^6*b^3*c*d^2 - a^7*b^2*d^3)*e*f^
2 - (a^5*b^4*c^3 - 3*a^6*b^3*c^2*d + 3*a^7*b^2*c*d^2 - a^8*b*d^3)
*f^3)*x)*sqrt(-(b^2*c - a*b*d)*e + (a*b*c - a^2*d)*f))]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(b*x+a)**4/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^4*sqrt(d*x + c)*sqrt(f*x + e)),x, algorithm
```

```
[Out] Timed out
```

3.95 $\int \sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)\,dx$

Optimal. Leaf size=1182

result too large to display

```
[Out] (2*(8*a^3*C*d^3*f^3 + 3*a^2*b*d^2*f^2*(C*d*e - c*C*f - 4*B*d*f) -
 3*a*b^2*d*f^2*((c^2*C - 7*A*d^2)*f + B*d*(d*e - 2*c*f)) - b^3*(C
*(16*d^3*e^3 - 3*c^2*d*e*f^2 - 8*c^3*f^3) + 3*d*f*(7*A*d*f*(2*d*e
 - c*f) - B*(8*d^2*e^2 - c*d*e*f - 4*c^2*f^2))))*Sqrt[a + b*x]*Sq
rt[c + d*x]*Sqrt[e + f*x])/(315*b^3*d^3*f^3) - (2*(7*b*d*f*(b*c*C
*e + a*C*d*e + a*c*C*f - 3*A*b*d*f) + (a*d*f - 4*b*(d*e + c*f))*(
2*a*C*d*f - b*(3*B*d*f - 2*C*(d*e + c*f))))*Sqrt[a + b*x]*Sqrt[c
+ d*x]*(e + f*x)^(3/2))/(105*b^2*d^2*f^3) - (2*(2*a*C*d*f - b*(3*
B*d*f - 2*C*(d*e + c*f)))*Sqrt[a + b*x]*(c + d*x)^(3/2)*(e + f*x)
^(3/2))/(21*b*d^2*f^2) + (2*C*(a + b*x)^(3/2)*(c + d*x)^(3/2)*(e
+ f*x)^(3/2))/(9*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(16*a^4*C*d^4*f^4
 - 8*a^3*b*d^3*f^3*(C*d*e + c*C*f + 3*B*d*f) + 3*a^2*b^2*d^2*f^2*
(d*f*(5*B*d*e + 5*B*c*f + 14*A*d*f) - 2*C*(d^2*e^2 - c*d*e*f + c^
2*f^2)) - a*b^3*d*f*(C*(8*d^3*e^3 - 6*c*d^2*e^2*f - 6*c^2*d*e*f^2
 + 8*c^3*f^3) + 3*d*f*(14*A*d*f*(d*e + c*f) - B*(5*d^2*e^2 - 6*c*
d*e*f + 5*c^2*f^2))) + b^4*(2*C*(8*d^4*e^4 - 4*c*d^3*e^3*f - 3*c^
2*d^2*e^2*f^2 - 4*c^3*d*e*f^3 + 8*c^4*f^4) + 3*d*f*(14*A*d*f*(d^2
*e^2 - c*d*e*f + c^2*f^2) - B*(8*d^3*e^3 - 5*c*d^2*e^2*f - 5*c^2*
d*e*f^2 + 8*c^3*f^3))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e +
f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]]
, ((b*c - a*d)*f)/(d*(b*e - a*f))])/(315*b^4*d^(7/2)*f^4*Sqrt[c +
 d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) - (2*Sqrt[-(b*c) + a*d]*(b
*e - a*f)*(d*e - c*f)*(8*a^3*C*d^3*f^3 + 3*a^2*b*d^2*f^2*(C*d*e -
 c*C*f - 4*B*d*f) - 3*a*b^2*d*f^2*((c^2*C - 7*A*d^2)*f + B*d*(d*e
 - 2*c*f)) - b^3*(C*(16*d^3*e^3 - 3*c^2*d*e*f^2 - 8*c^3*f^3) + 3*
d*f*(7*A*d*f*(2*d*e - c*f) - B*(8*d^2*e^2 - c*d*e*f - 4*c^2*f^2))
))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)
]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], (
(b*c - a*d)*f)/(d*(b*e - a*f))])/(315*b^4*d^(7/2)*f^4*Sqrt[c + d*
x]*Sqrt[e + f*x])
```

Rubi [A] time = 14.3087, antiderivative size = 1154, normalized size of antiderivative = 0.98, number

of steps used = 10, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.184

$$\frac{2C(a+bx)^{3/2}(c+dx)^{3/2}(e+fx)^{3/2}}{9bdf}+\frac{2(3bBdf-2aCdf-2bC(de+cf))\sqrt{a+bx}(c+dx)^{3/2}(e+fx)^{3/2}}{21bd^2f^2}$$

$$-\frac{2(7bdf(bcCe+aCde+acCf-3Abdf)-(adf-4b(de+cf))(3bBdf-2aCdf-2bC(de+cf)))\sqrt{a+bx}\sqrt{c+dx}(e+fx)}{105b^2d^2f^3}$$

$$-\frac{2\sqrt{ad-bc}\left(\left(2C\left(8d^4e^4-4cd^3fe^3-3c^2d^2f^2e^2-4c^3df^3e+8c^4f^4\right)+3df\left(14Adf\left(d^2e^2-cdfe+c^2f^2\right)-B\left(8d^3e^3-5c\right.\right.\right.\right.}{}$$

$$+\frac{2\left(\frac{8Cdfa^3}{b}+3(Cde-cCf-4Bdf)a^2-3b\left(\frac{Cfc^2}{d}-2Bfc+Bde-7Adf\right)a+b^2\left(\frac{8Cfc^3}{d^2}+\frac{3Cec^2}{d}+21Afc-42Ade-B\left(\frac{12f}{d}\right.\right.\right.}{315b^2df}$$

$$-\frac{2\sqrt{ad-bc}(be-af)(de-cf)\left(-\left(C\left(16d^3e^3-3c^2df^2e-8c^3f^3\right)+3df\left(7Adf(2de-cf)-B\left(8d^2e^2-cdfe-4c^2f^2\right)\right)\right)\right.}{315}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] (2*((8*a^3*C*d*f)/b - 3*a*b*(B*d*e - 2*B*c*f + (c^2*C*f)/d - 7*A*
d*f) + 3*a^2*(C*d*e - c*C*f - 4*B*d*f) + b^2*((3*c^2*C*e)/d - 42*
A*d*e - (16*C*d*e^3)/f^2 + 21*A*c*f + (8*c^3*C*f)/d^2 - B*(3*c*e
- (24*d*e^2)/f + (12*c^2*f)/d)))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt
[e + f*x])/(315*b^2*d*f) - (2*(7*b*d*f*(b*c*C*e + a*C*d*e + a*c*C
*f - 3*A*b*d*f) - (a*d*f - 4*b*(d*e + c*f))*(3*b*B*d*f - 2*a*C*d*
f - 2*b*C*(d*e + c*f)))*Sqrt[a + b*x]*Sqrt[c + d*x]*(e + f*x)^(3/
2))/(105*b^2*d^2*f^3) + (2*(3*b*B*d*f - 2*a*C*d*f - 2*b*C*(d*e +
c*f))*Sqrt[a + b*x]*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(21*b*d^2*f^
2) + (2*C*(a + b*x)^(3/2)*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(9*b*d
*f) - (2*Sqrt[-(b*c) + a*d]*(16*a^4*C*d^4*f^4 - 8*a^3*b*d^3*f^3*(
C*d*e + c*C*f + 3*B*d*f) + 3*a^2*b^2*d^2*f^2*(d*f*(5*B*d*e + 5*B*
c*f + 14*A*d*f) - 2*C*(d^2*e^2 - c*d*e*f + c^2*f^2)) - a*b^3*d*f*
(C*(8*d^3*e^3 - 6*c*d^2*e^2*f - 6*c^2*d*e*f^2 + 8*c^3*f^3) + 3*d*
f*(14*A*d*f*(d*e + c*f) - B*(5*d^2*e^2 - 6*c*d*e*f + 5*c^2*f^2)))
 + b^4*(2*C*(8*d^4*e^4 - 4*c*d^3*e^3*f - 3*c^2*d^2*e^2*f^2 - 4*c^
3*d*e*f^3 + 8*c^4*f^4) + 3*d*f*(14*A*d*f*(d^2*e^2 - c*d*e*f + c^2
*f^2) - B*(8*d^3*e^3 - 5*c*d^2*e^2*f - 5*c^2*d*e*f^2 + 8*c^3*f^3)
)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSi
n[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d
*(b*e - a*f))])/(315*b^4*d^(7/2)*f^4*Sqrt[c + d*x]*Sqrt[(b*(e + f
*x))/(b*e - a*f)]) - (2*Sqrt[-(b*c) + a*d]*(b*e - a*f)*(d*e - c*f
)*(8*a^3*C*d^3*f^3 + 3*a^2*b*d^2*f^2*(C*d*e - c*C*f - 4*B*d*f) -
3*a*b^2*d*f^2*((c^2*C - 7*A*d^2)*f + B*d*(d*e - 2*c*f)) - b^3*(C*
(16*d^3*e^3 - 3*c^2*d*e*f^2 - 8*c^3*f^3) + 3*d*f*(7*A*d*f*(2*d*e
- c*f) - B*(8*d^2*e^2 - c*d*e*f - 4*c^2*f^2))))*Sqrt[(b*(c + d*x)
)/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(
Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b
*e - a*f))])/(315*b^4*d^(7/2)*f^4*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(1/2)*(C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 22.3674, size = 11933, normalized size = 10.1

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.129, size = 14778, normalized size = 12.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(1/2)*(C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (Cx^2 + Bx + A)\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x
+ e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(Cx^2 + Bx + A\right)\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x +
 e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(1/2)*(C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Cx^2 + Bx + A\right)\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e),x, algorithm
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x
+ e), x)
```

3.96 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)}{\sqrt{a+bx}}\,dx$

Optimal. Leaf size=774

$$-\frac{2\sqrt{ad-bc}(be-af)(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(24a^2Cd^2f^2+abdf(-28Bdf-5cCf+13Cde)+b^2\left(-\left(7df(-5Adf-B\right.\right.\right.}{105b^4d^{5/2}f^3\sqrt{c+dx}\sqrt{e+fx}}$$

$$-\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(3bdf(5bcf(3aC(cf+de)+b(cCe-7Adf))-(3acf+ade+bce)(6aCdf-b(7Bdf-4C(c\right.}{}$$

$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}(5bdf(3aC(cf+de)+b(cCe-7Adf))-(4adf-bcf+2bde)(6aCdf-b(7Bdf-4C(cf+de)\right.}{105b^3d^2f^2}$$

$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}(e+fx)^{3/2}(6aCdf-b(7Bdf-4C(cf+de)))}{35b^2df^2}+\frac{2C\sqrt{a+bx}(c+dx)^{3/2}(e+fx)^{3/2}}{7bdf}$$

```
[Out] (-2*(5*b*d*f*(3*a*C*(d*e + c*f) + b*(c*C*e - 7*A*d*f)) - (2*b*d*e
 - b*c*f + 4*a*d*f)*(6*a*C*d*f - b*(7*B*d*f - 4*C*(d*e + c*f))))*
Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^3*d^2*f^2) - (2
*(6*a*C*d*f - b*(7*B*d*f - 4*C*(d*e + c*f)))*Sqrt[a + b*x]*Sqrt[c
 + d*x]*(e + f*x)^(3/2))/(35*b^2*d*f^2) + (2*C*Sqrt[a + b*x]*(c +
 d*x)^(3/2)*(e + f*x)^(3/2))/(7*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(3
*b*d*f*(5*b*c*f*(3*a*C*(d*e + c*f) + b*(c*C*e - 7*A*d*f)) - (b*c*
e + a*d*e + 3*a*c*f)*(6*a*C*d*f - b*(7*B*d*f - 4*C*(d*e + c*f))))
 + 2*((b*d*e)/2 - (b*c + a*d)*f)*(5*b*d*f*(3*a*C*(d*e + c*f) + b*
(c*C*e - 7*A*d*f)) - (2*b*d*e - b*c*f + 4*a*d*f)*(6*a*C*d*f - b*(
7*B*d*f - 4*C*(d*e + c*f)))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqr
t[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) +
 a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^4*d^(5/2)*f^3*Sq
rt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) - (2*Sqrt[-(b*c) + a
*d]*(b*e - a*f)*(d*e - c*f)*(24*a^2*C*d^2*f^2 + a*b*d*f*(13*C*d*e
 - 5*c*C*f - 28*B*d*f) - b^2*(7*d*f*(2*B*d*e - B*c*f - 5*A*d*f) -
 C*(8*d^2*e^2 - c*d*e*f - 4*c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c -
a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*S
qrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f)
)])/(105*b^4*d^(5/2)*f^3*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 6.89813, antiderivative size = 769, normalized size of antiderivative = 0.99, number

of steps used = 9, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.184

$$-\frac{2\sqrt{ad-bc}(be-af)(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(24a^2Cd^2f^2+abdf(-28Bdf-5cCf+13Cde)+b^2\left(-\left(7df(-5Adf-B\right.\right.\right.}{105b^4d^{5/2}f^3\sqrt{c+dx}\sqrt{e+fx}}$$

$$-\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(3bdf(5bcf(3aC(cf+de)+b(cCe-7Adf))+(3acf+ade+bce)(-6aCdf+7bBdf-4bC(\right.}{}$$

$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(5(3aC(cf+de)+b(cCe-7Adf))+\frac{(4adf-bcf+2bde)(-6aCdf+7bBdf-4bC(cf+de))}{bdf}\right)}{105b^2df}$$

$$+\frac{2\sqrt{a+bx}\sqrt{c+dx}(e+fx)^{3/2}(-6aCdf+7bBdf-4bC(cf+de))}{35b^2df^2}+\frac{2C\sqrt{a+bx}(c+dx)^{3/2}(e+fx)^{3/2}}{7bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/Sqrt[a + b*x],x]
```

```
[Out] (-2*(((2*b*d*e - b*c*f + 4*a*d*f)*(7*b*B*d*f - 6*a*C*d*f - 4*b*C*
(d*e + c*f)))/(b*d*f) + 5*(3*a*C*(d*e + c*f) + b*(c*C*e - 7*A*d*f
)))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^2*d*f) + (2
*(7*b*B*d*f - 6*a*C*d*f - 4*b*C*(d*e + c*f))*Sqrt[a + b*x]*Sqrt[c
 + d*x]*(e + f*x)^(3/2))/(35*b^2*d*f^2) + (2*C*Sqrt[a + b*x]*(c +
 d*x)^(3/2)*(e + f*x)^(3/2))/(7*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(3
*b*d*f*((b*c*e + a*d*e + 3*a*c*f)*(7*b*B*d*f - 6*a*C*d*f - 4*b*C*
(d*e + c*f)) + 5*b*c*f*(3*a*C*(d*e + c*f) + b*(c*C*e - 7*A*d*f)))
 + 2*((b*d*e)/2 - (b*c + a*d)*f)*((2*b*d*e - b*c*f + 4*a*d*f)*(7*
b*B*d*f - 6*a*C*d*f - 4*b*C*(d*e + c*f)) + 5*b*d*f*(3*a*C*(d*e +
c*f) + b*(c*C*e - 7*A*d*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqr
t[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) +
 a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^4*d^(5/2)*f^3*Sq
rt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) - (2*Sqrt[-(b*c) + a
*d]*(b*e - a*f)*(d*e - c*f)*(24*a^2*C*d^2*f^2 + a*b*d*f*(13*C*d*e
 - 5*c*C*f - 28*B*d*f) - b^2*(7*d*f*(2*B*d*e - B*c*f - 5*A*d*f) -
 C*(8*d^2*e^2 - c*d*e*f - 4*c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c -
a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*S
qrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f)
)])/(105*b^4*d^(5/2)*f^3*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 18.7491, size = 7297, normalized size = 9.43

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/Sqrt[a + b*x],x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.076, size = 10268, normalized size = 13.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{dx + c}\sqrt{fx + e}}{\sqrt{bx + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/sqrt(b*x + a),x, algorithm
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/sqrt(b*x
+ a), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{dx + c}\sqrt{fx + e}}{\sqrt{bx + a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/sqrt(b*x + a),x, algorithm
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/sqrt(b*x +
 a), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}\sqrt{fx + e}}{\sqrt{bx + a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/sqrt(b*x + a),x, algorithm
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/sqrt(b*x
+ a), x)
```

3.97 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)}{(a+bx)^{3/2}}\,dx$

Optimal. Leaf size=706

$$\frac{2\sqrt{a+bx}\sqrt{c+dx}(e+fx)^{3/2}\left(6a^2Cdf-ab(5Bdf+cCf+Cde)+b^2(5Adf+cCe)\right)}{5b^2f(bc-ad)(be-af)}$$
$$+\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(48a^2Cd^2f^2-8abdf(5Bdf+cCf+Cde)+b^2\left(5df(6Adf+Bcf+Bde)-2C\left(c^2f^2-cdef\right.\right.\right.}{15b^4d^{3/2}f^2\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}$$
$$-\frac{2\sqrt{ad-bc}(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(24a^2Cdf^2-abf(20Bdf+cCf+7Cde)+b^2(5df(3Af+Be)-Ce(2de-cf))\right)F\left(\right.}{15b^4d^{3/2}f^2\sqrt{c+dx}\sqrt{e+fx}}$$
$$+\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(24a^2Cdf^2-abf(20Bdf+cCf+7Cde)+b^2(5df(3Af+Be)-Ce(2de-cf))\right)}{15b^3df(be-af)}$$
$$-\frac{2(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{b\sqrt{a+bx}(bc-ad)(be-af)}$$

```
[Out] (2*(24*a^2*C*d*f^2 - a*b*f*(7*C*d*e + c*C*f + 20*B*d*f) + b^2*(5*
d*f*(B*e + 3*A*f) - C*e*(2*d*e - c*f)))*Sqrt[a + b*x]*Sqrt[c + d*
x]*Sqrt[e + f*x])/(15*b^3*d*f*(b*e - a*f)) + (2*(6*a^2*C*d*f + b^
2*(c*C*e + 5*A*d*f) - a*b*(C*d*e + c*C*f + 5*B*d*f))*Sqrt[a + b*x
]*Sqrt[c + d*x]*(e + f*x)^(3/2))/(5*b^2*(b*c - a*d)*f*(b*e - a*f)
) - (2*(A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(
b*(b*c - a*d)*(b*e - a*f)*Sqrt[a + b*x]) + (2*Sqrt[-(b*c) + a*d]*
(48*a^2*C*d^2*f^2 - 8*a*b*d*f*(C*d*e + c*C*f + 5*B*d*f) + b^2*(5*
d*f*(B*d*e + B*c*f + 6*A*d*f) - 2*C*(d^2*e^2 - c*d*e*f + c^2*f^2)
))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin
[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*
(b*e - a*f))])/(15*b^4*d^(3/2)*f^2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x
))/(b*e - a*f)]) - (2*Sqrt[-(b*c) + a*d]*(d*e - c*f)*(24*a^2*C*d*
f^2 - a*b*f*(7*C*d*e + c*C*f + 20*B*d*f) + b^2*(5*d*f*(B*e + 3*A*
f) - C*e*(2*d*e - c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*
(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/
Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^4*d^
(3/2)*f^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 5.12922, antiderivative size = 706, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.184

$$\frac{2\sqrt{a+bx}\sqrt{c+dx}(e+fx)^{3/2}\left(6a^2Cdf-ab(5Bdf+cCf+Cde)+b^2(5Adf+cCe)\right)}{5b^2f(bc-ad)(be-af)}$$

$$+\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(48a^2Cd^2f^2-8abdf(5Bdf+cCf+Cde)+b^2\left(5df(6Adf+Bcf+Bde)-2C\left(c^2f^2-cdef\right.\right.\right.}{15b^4d^{3/2}f^2\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}$$

$$-\frac{2\sqrt{ad-bc}(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(24a^2Cdf^2-abf(20Bdf+cCf+7Cde)+b^2(5df(3Af+Be)-Ce(2de-cf))\right)F(}{15b^4d^{3/2}f^2\sqrt{c+dx}\sqrt{e+fx}}$$

$$+\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(24a^2Cdf^2-abf(20Bdf+cCf+7Cde)+b^2(5df(3Af+Be)-Ce(2de-cf))\right)}{15b^3df(be-af)}$$

$$-\frac{2(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{b\sqrt{a+bx}(bc-ad)(be-af)}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(3/2),x]
```

```
[Out] (2*(24*a^2*C*d*f^2 - a*b*f*(7*C*d*e + c*C*f + 20*B*d*f) + b^2*(5*
d*f*(B*e + 3*A*f) - C*e*(2*d*e - c*f)))*Sqrt[a + b*x]*Sqrt[c + d*
x]*Sqrt[e + f*x])/(15*b^3*d*f*(b*e - a*f)) + (2*(6*a^2*C*d*f + b^
2*(c*C*e + 5*A*d*f) - a*b*(C*d*e + c*C*f + 5*B*d*f))*Sqrt[a + b*x
]*Sqrt[c + d*x]*(e + f*x)^(3/2))/(5*b^2*(b*c - a*d)*f*(b*e - a*f)
) - (2*(A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(
b*(b*c - a*d)*(b*e - a*f)*Sqrt[a + b*x]) + (2*Sqrt[-(b*c) + a*d]*
(48*a^2*C*d^2*f^2 - 8*a*b*d*f*(C*d*e + c*C*f + 5*B*d*f) + b^2*(5*
d*f*(B*d*e + B*c*f + 6*A*d*f) - 2*C*(d^2*e^2 - c*d*e*f + c^2*f^2)
))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin
[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*
(b*e - a*f))])/(15*b^4*d^(3/2)*f^2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x
))/(b*e - a*f)]) - (2*Sqrt[-(b*c) + a*d]*(d*e - c*f)*(24*a^2*C*d*
f^2 - a*b*f*(7*C*d*e + c*C*f + 20*B*d*f) + b^2*(5*d*f*(B*e + 3*A*
f) - C*e*(2*d*e - c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*
(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/
Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^4*d^
(3/2)*f^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(3/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 15.6284, size = 9487, normalized size = 13.44

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(3/2),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.095, size = 6257, normalized size = 8.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a)^(3/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(3/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(3/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{3}{2}}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(3/2),x, algorit
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^
(3/2), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(3/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(3/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(3/2), x)
```

3.98 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)}{(a+bx)^{5/2}}\,dx$

Optimal. Leaf size=687

$$\frac{2(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(8a^2Cdf-ab(4Bdf+7cCf+Cde)+b^2(Adf+3Bcf+cCe)\right)F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^4\sqrt{d}f\sqrt{c+dx}\sqrt{e+fx}\sqrt{ad-bc}}$$
$$+\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(8a^2Cdf-ab(4Bdf+7cCf+Cde)+b^2(Adf+3Bcf+cCe)\right)}{3b^3(bc-ad)(be-af)}$$
$$+\frac{2\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(16a^3Cd^2f^2-8a^2bdf(Bdf+2C(cf+de))+ab^2\left(df(2Adf+7Bcf+7Bde)+C\left(c^2f^2+16cdef+d^2e\right.\right.\right.}{3b^4\sqrt{d}f\sqrt{c+dx}\sqrt{ad-bc}(be-af)\sqrt{\frac{b(e}{be}}}$$
$$-\frac{2(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{3b(a+bx)^{3/2}(bc-ad)(be-af)}-\frac{2\sqrt{c+dx}(e+fx)^{3/2}(bB-2aC)}{b^2\sqrt{a+bx}(be-af)}$$

```
[Out] (2*(8*a^2*C*d*f + b^2*(c*C*e + 3*B*c*f + A*d*f) - a*b*(C*d*e + 7*
c*C*f + 4*B*d*f))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b
^3*(b*c - a*d)*(b*e - a*f)) - (2*(b*B - 2*a*C)*Sqrt[c + d*x]*(e +
 f*x)^(3/2))/(b^2*(b*e - a*f)*Sqrt[a + b*x]) - (2*(A*b^2 - a*(b*B
 - a*C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(3*b*(b*c - a*d)*(b*e -
 a*f)*(a + b*x)^(3/2)) + (2*(16*a^3*C*d^2*f^2 - 8*a^2*b*d*f*(B*d*
f + 2*C*(d*e + c*f)) - b^3*(c^2*C*e*f + A*d^2*e*f + c*d*(C*e^2 +
6*B*e*f + A*f^2)) + a*b^2*(d*f*(7*B*d*e + 7*B*c*f + 2*A*d*f) + C*
(d^2*e^2 + 16*c*d*e*f + c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c - a*d)
]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b
*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^4*Sqrt[d]*Sqr
t[-(b*c) + a*d]*f*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b
*e - a*f)]) + (2*(d*e - c*f)*(8*a^2*C*d*f + b^2*(c*C*e + 3*B*c*f
+ A*d*f) - a*b*(C*d*e + 7*c*C*f + 4*B*d*f))*Sqrt[(b*(c + d*x))/(b
*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt
[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e -
 a*f))])/(3*b^4*Sqrt[d]*Sqrt[-(b*c) + a*d]*f*Sqrt[c + d*x]*Sqrt[e
 + f*x])
```

Rubi [A] time = 5.17071, antiderivative size = 687, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 8, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.21$

$$\frac{2(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(8a^2Cdf-ab(4Bdf+7cCf+Cde)+b^2(Adf+3Bcf+cCe)\right)F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^4\sqrt{d}f\sqrt{c+dx}\sqrt{e+fx}\sqrt{ad-bc}}$$
$$+\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(8a^2Cdf-ab(4Bdf+7cCf+Cde)+b^2(Adf+3Bcf+cCe)\right)}{3b^3(bc-ad)(be-af)}$$
$$+\frac{2\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(16a^3Cd^2f^2-8a^2bdf(Bdf+2C(cf+de))+ab^2\left(df(2Adf+7Bcf+7Bde)+C\left(c^2f^2+16cdef+d^2e\right.\right.\right.}{3b^4\sqrt{d}f\sqrt{c+dx}\sqrt{ad-bc}(be-af)\sqrt{\frac{b(e}{be}}}$$
$$-\frac{2(c+dx)^{3/2}(e+fx)^{3/2}\left(Ab^2-a(bB-aC)\right)}{3b(a+bx)^{3/2}(bc-ad)(be-af)}-\frac{2\sqrt{c+dx}(e+fx)^{3/2}(bB-2aC)}{b^2\sqrt{a+bx}(be-af)}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(5/2),x]
```

```
[Out] (2*(8*a^2*C*d*f + b^2*(c*C*e + 3*B*c*f + A*d*f) - a*b*(C*d*e + 7*
c*C*f + 4*B*d*f))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b
^3*(b*c - a*d)*(b*e - a*f)) - (2*(b*B - 2*a*C)*Sqrt[c + d*x]*(e +
 f*x)^(3/2))/(b^2*(b*e - a*f)*Sqrt[a + b*x]) - (2*(A*b^2 - a*(b*B
 - a*C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(3*b*(b*c - a*d)*(b*e -
 a*f)*(a + b*x)^(3/2)) + (2*(16*a^3*C*d^2*f^2 - 8*a^2*b*d*f*(B*d*
f + 2*C*(d*e + c*f)) - b^3*(c^2*C*e*f + A*d^2*e*f + c*d*(C*e^2 +
6*B*e*f + A*f^2)) + a*b^2*(d*f*(7*B*d*e + 7*B*c*f + 2*A*d*f) + C*
(d^2*e^2 + 16*c*d*e*f + c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c - a*d)
]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b
*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^4*Sqrt[d]*Sqr
t[-(b*c) + a*d]*f*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b
*e - a*f)]) + (2*(d*e - c*f)*(8*a^2*C*d*f + b^2*(c*C*e + 3*B*c*f
+ A*d*f) - a*b*(C*d*e + 7*c*C*f + 4*B*d*f))*Sqrt[(b*(c + d*x))/(b
*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt
[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e -
 a*f))])/(3*b^4*Sqrt[d]*Sqrt[-(b*c) + a*d]*f*Sqrt[c + d*x]*Sqrt[e
 + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(5/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 17.5122, size = 5831, normalized size = 8.49

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(5/2),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.138, size = 16177, normalized size = 23.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a)^(5/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(5/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(5/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}\sqrt{fx + e}}{(b^2x^2 + 2\,abx + a^2)\sqrt{bx + a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(5/2),x, algorit
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/((b^2*x^2
+ 2*a*b*x + a^2)*sqrt(b*x + a)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(5/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(5/2), x)
```

3.99 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}(A+Bx+Cx^2)}{(a+bx)^{7/2}}\,dx$

Optimal. Leaf size=964

$$-\frac{2\left(Ab^2-a(bB-aC)\right)(c+dx)^{3/2}(e+fx)^{3/2}}{5b(bc-ad)(be-af)(a+bx)^{5/2}}$$
$$+\frac{2\left(6Cdfa^3-b(Bdf+8C(de+cf))a^2+b^2(10cCe+3Bde+3Bcf-4Adf)a-b^3(5Bce-2A(de+cf))\right)\sqrt{c+dx}(e+fx)^{3/2}}{15b^2(bc-ad)(be-af)^2(a+bx)^{3/2}}$$
$$+\frac{2\sqrt{d}\left(48Cd^2f^2a^4-8bdf(Bdf+11C(de+cf))a^3+b^2\left(2C\left(19d^2e^2+81cdfe+19c^2f^2\right)-df(2Adf-13B(de+cf))\right)a^2-\right.}{}$$
$$+\frac{2\left(24Cd^2fa^3-bd(23Cde+41cCf+4Bdf)a^2+b^2\left(15Cfc^2+(40Cde+6Bdf)c+d^2(3Be-Af)\right)a-b^3\left(15Cec^2+d(5Be+\right.\right.}{15b^3(bc-ad)^2(be-af)\sqrt{a+bx}}$$
$$+\frac{2(de-cf)\left(24Cd^2fa^3-bd(23Cde+41cCf+4Bdf)a^2+b^2\left(15Cfc^2+(40Cde+6Bdf)c+d^2(3Be-Af)\right)a-b^3\left(15Cec^2\right.\right.}{15b^4\sqrt{d}(ad-bc)^{3/2}(be-af)\sqrt{c+dx}\sqrt{e+fx}}$$

```
[Out] (2*(24*a^3*C*d^2*f - a^2*b*d*(23*C*d*e + 41*c*C*f + 4*B*d*f) - b^
3*(15*c^2*C*e - 2*A*d^2*e + c*d*(5*B*e + A*f)) + a*b^2*(15*c^2*C*
f + d^2*(3*B*e - A*f) + c*(40*C*d*e + 6*B*d*f)))*Sqrt[c + d*x]*Sq
rt[e + f*x])/(15*b^3*(b*c - a*d)^2*(b*e - a*f)*Sqrt[a + b*x]) + (
2*(6*a^3*C*d*f + a*b^2*(10*c*C*e + 3*B*d*e + 3*B*c*f - 4*A*d*f) -
 b^3*(5*B*c*e - 2*A*(d*e + c*f)) - a^2*b*(B*d*f + 8*C*(d*e + c*f)
))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(15*b^2*(b*c - a*d)*(b*e - a*f)
^2*(a + b*x)^(3/2)) - (2*(A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*
(e + f*x)^(3/2))/(5*b*(b*c - a*d)*(b*e - a*f)*(a + b*x)^(5/2)) +
(2*Sqrt[d]*(48*a^4*C*d^2*f^2 - 8*a^3*b*d*f*(B*d*f + 11*C*(d*e + c
*f)) - b^4*(2*A*d^2*e^2 - c*d*e*(5*B*e + 2*A*f) - c^2*(30*C*e^2 +
 5*B*e*f - 2*A*f^2)) - a*b^3*(d^2*e*(3*B*e - 2*A*f) + c^2*f*(70*C
*e + 3*B*f) + 2*c*d*(35*C*e^2 + 11*B*e*f - A*f^2)) + a^2*b^2*(2*C
*(19*d^2*e^2 + 81*c*d*e*f + 19*c^2*f^2) - d*f*(2*A*d*f - 13*B*(d*
e + c*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*Ellipti
cE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*
d)*f)/(d*(b*e - a*f))])/(15*b^4*(-(b*c) + a*d)^(3/2)*(b*e - a*f)^
2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) + (2*(d*e - c*f)
*(24*a^3*C*d^2*f - a^2*b*d*(23*C*d*e + 41*c*C*f + 4*B*d*f) - b^3*
(15*c^2*C*e - 2*A*d^2*e + c*d*(5*B*e + A*f)) + a*b^2*(15*c^2*C*f
+ d^2*(3*B*e - A*f) + c*(40*C*d*e + 6*B*d*f)))*Sqrt[(b*(c + d*x))
/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(S
qrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*
e - a*f))])/(15*b^4*Sqrt[d]*(-(b*c) + a*d)^(3/2)*(b*e - a*f)*Sqrt
[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 8.75883, antiderivative size = 964, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$-\frac{2\left(Ab^2-a(bB-aC)\right)(c+dx)^{3/2}(e+fx)^{3/2}}{5b(bc-ad)(be-af)(a+bx)^{5/2}}$$

$$+\frac{2\left(6Cdfa^3-b(Bdf+8C(de+cf))a^2+b^2(10cCe+3Bde+3Bcf-4Adf)a-b^3(5Bce-2A(de+cf))\right)\sqrt{c+dx}(e+fx)^{3/2}}{15b^2(bc-ad)(be-af)^2(a+bx)^{3/2}}$$

$$+\frac{2\sqrt{d}\left(48Cd^2f^2a^4-8bdf(Bdf+11C(de+cf))a^3+b^2\left(2C\left(19d^2e^2+81cdfe+19c^2f^2\right)-df(2Adf-13B(de+cf))\right)a^2-\right.}{}$$

$$+\frac{2\left(24Cd^2fa^3-bd(23Cde+41cCf+4Bdf)a^2+b^2\left(15Cfc^2+(40Cde+6Bdf)c+d^2(3Be-Af)\right)a-b^3\left(15Cec^2+d(5Be+\right.\right.}{15b^3(bc-ad)^2(be-af)\sqrt{a+bx}}$$

$$+\frac{2(de-cf)\left(24Cd^2fa^3-bd(23Cde+41cCf+4Bdf)a^2+b^2\left(15Cfc^2+(40Cde+6Bdf)c+d^2(3Be-Af)\right)a-b^3\left(15Cec^2\right.\right.}{15b^4\sqrt{d}(ad-bc)^{3/2}(be-af)\sqrt{c+dx}\sqrt{e+fx}}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(7/2),x]
```

```
[Out] (2*(24*a^3*C*d^2*f - a^2*b*d*(23*C*d*e + 41*c*C*f + 4*B*d*f) - b^
3*(15*c^2*C*e - 2*A*d^2*e + c*d*(5*B*e + A*f)) + a*b^2*(15*c^2*C*
f + d^2*(3*B*e - A*f) + c*(40*C*d*e + 6*B*d*f)))*Sqrt[c + d*x]*Sq
rt[e + f*x])/(15*b^3*(b*c - a*d)^2*(b*e - a*f)*Sqrt[a + b*x]) + (
2*(6*a^3*C*d*f + a*b^2*(10*c*C*e + 3*B*d*e + 3*B*c*f - 4*A*d*f) -
 b^3*(5*B*c*e - 2*A*(d*e + c*f)) - a^2*b*(B*d*f + 8*C*(d*e + c*f)
))*Sqrt[c + d*x]*(e + f*x)^(3/2))/(15*b^2*(b*c - a*d)*(b*e - a*f)
^2*(a + b*x)^(3/2)) - (2*(A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*
(e + f*x)^(3/2))/(5*b*(b*c - a*d)*(b*e - a*f)*(a + b*x)^(5/2)) +
(2*Sqrt[d]*(48*a^4*C*d^2*f^2 - 8*a^3*b*d*f*(B*d*f + 11*C*(d*e + c
*f)) - b^4*(2*A*d^2*e^2 - c*d*e*(5*B*e + 2*A*f) - c^2*(30*C*e^2 +
 5*B*e*f - 2*A*f^2)) - a*b^3*(d^2*e*(3*B*e - 2*A*f) + c^2*f*(70*C
*e + 3*B*f) + 2*c*d*(35*C*e^2 + 11*B*e*f - A*f^2)) + a^2*b^2*(2*C
*(19*d^2*e^2 + 81*c*d*e*f + 19*c^2*f^2) - d*f*(2*A*d*f - 13*B*(d*
e + c*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*Ellipti
cE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*
d)*f)/(d*(b*e - a*f))])/(15*b^4*(-(b*c) + a*d)^(3/2)*(b*e - a*f)^
2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) + (2*(d*e - c*f)
*(24*a^3*C*d^2*f - a^2*b*d*(23*C*d*e + 41*c*C*f + 4*B*d*f) - b^3*
(15*c^2*C*e - 2*A*d^2*e + c*d*(5*B*e + A*f)) + a*b^2*(15*c^2*C*f
+ d^2*(3*B*e - A*f) + c*(40*C*d*e + 6*B*d*f)))*Sqrt[(b*(c + d*x))
/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(S
qrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*
e - a*f))])/(15*b^4*Sqrt[d]*(-(b*c) + a*d)^(3/2)*(b*e - a*f)*Sqrt
[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(7/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 21.1193, size = 13960, normalized size = 14.48

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(7/2),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.254, size = 34389, normalized size = 35.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a)^(7/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(7/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(7/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{dx + c}\sqrt{fx + e}}{(b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3)\sqrt{bx + a}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(7/2),x, algorit
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/((b^3*x^3
+ 3*a*b^2*x^2 + 3*a^2*b*x + a^3)*sqrt(b*x + a)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(7/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(7/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(7/2), x)
```

3.100 $\int \frac{\sqrt{c+dx}\sqrt{e+fx}\left(A+Bx+Cx^2\right)}{(a+bx)^{9/2}}\,dx$

Optimal. Leaf size=1716

result too large to display

```
[Out] (-2*(24*a^4*C*d^2*f^2 - a^3*b*d*f*(61*C*d*e + 43*c*C*f - 4*B*d*f)
 - 3*a*b^3*(d^2*e*(B*e - 3*A*f) + 2*c^2*f*(7*C*e - B*f) + c*d*(28
*C*e^2 - 5*B*e*f + 5*A*f^2)) - b^4*(4*A*d^2*e^2 - c*d*e*(7*B*e -
A*f) - c^2*(35*C*e^2 - 14*B*e*f + 8*A*f^2)) - 3*a^2*b^2*(d*f*(3*B
*d*e + 2*B*c*f - A*d*f) - C*(15*d^2*e^2 + 37*c*d*e*f + 5*c^2*f^2)
))*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^3*(b*c - a*d)^2*(b*e - a*f
)^2*(a + b*x)^(3/2)) + (2*(48*a^5*C*d^3*f^3 + 8*a^4*b*d^2*f^2*(B*
d*f - 16*C*(d*e + c*f)) - b^5*(8*A*d^3*e^3 - c*d^2*e^2*(14*B*e +
5*A*f) + c^2*d*e*(35*C*e^2 + 14*B*e*f - 5*A*f^2) + c^3*f*(35*C*e^
2 - 14*B*e*f + 8*A*f^2)) - a*b^4*(d^3*e^2*(6*B*e - 19*A*f) - 6*c^
3*f^2*(7*C*e - B*f) - c^2*d*f*(238*C*e^2 - 19*f*(B*e - A*f)) - c*
d^2*e*(42*C*e^2 - f*(19*B*e + 20*A*f))) + a^3*b^2*d*f*(C*(103*d^2
*e^2 + 344*c*d*e*f + 103*c^2*f^2) + d*f*(6*A*d*f - 19*B*(d*e + c*
f))) - 3*a^2*b^3*(C*(5*d^3*e^3 + 94*c*d^2*e^2*f + 94*c^2*d*e*f^2
+ 5*c^3*f^3) + d*f*(3*A*d*f*(d*e + c*f) - B*(3*d^2*e^2 + 16*c*d*e
*f + 3*c^2*f^2))))*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^3*(b*c - a
*d)^3*(b*e - a*f)^3*Sqrt[a + b*x]) + (2*(6*a^3*C*d*f + a*b^2*(14*
c*C*e + 3*B*d*e + 3*B*c*f - 8*A*d*f) - b^3*(7*B*c*e - 4*A*(d*e +
c*f)) + a^2*b*(B*d*f - 10*C*(d*e + c*f)))*Sqrt[c + d*x]*(e + f*x)
^(3/2))/(35*b^2*(b*c - a*d)*(b*e - a*f)^2*(a + b*x)^(5/2)) - (2*(
A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(7*b*(b*c
 - a*d)*(b*e - a*f)*(a + b*x)^(7/2)) + (2*Sqrt[d]*(48*a^5*C*d^3*f
^3 + 8*a^4*b*d^2*f^2*(B*d*f - 16*C*(d*e + c*f)) - b^5*(8*A*d^3*e^
3 - c*d^2*e^2*(14*B*e + 5*A*f) + c^2*d*e*(35*C*e^2 + 14*B*e*f - 5
*A*f^2) + c^3*f*(35*C*e^2 - 14*B*e*f + 8*A*f^2)) - a*b^4*(d^3*e^2
*(6*B*e - 19*A*f) - 6*c^3*f^2*(7*C*e - B*f) - c^2*d*f*(238*C*e^2
- 19*f*(B*e - A*f)) - c*d^2*e*(42*C*e^2 - f*(19*B*e + 20*A*f))) +
 a^3*b^2*d*f*(C*(103*d^2*e^2 + 344*c*d*e*f + 103*c^2*f^2) + d*f*(
6*A*d*f - 19*B*(d*e + c*f))) - 3*a^2*b^3*(C*(5*d^3*e^3 + 94*c*d^2
*e^2*f + 94*c^2*d*e*f^2 + 5*c^3*f^3) + d*f*(3*A*d*f*(d*e + c*f) -
 B*(3*d^2*e^2 + 16*c*d*e*f + 3*c^2*f^2))))*Sqrt[(b*(c + d*x))/(b*
c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/
Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^4*(
-(b*c) + a*d)^(5/2)*(b*e - a*f)^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x)
)/(b*e - a*f)]) + (2*Sqrt[d]*(d*e - c*f)*(24*a^4*C*d^2*f^2 - a^3*
b*d*f*(43*C*d*e + 61*c*C*f - 4*B*d*f) + b^4*(8*A*d^2*e^2 - c*d*e*
(14*B*e + A*f) + c^2*(35*C*e^2 + 7*B*e*f - 4*A*f^2)) + 3*a*b^3*(d
^2*e*(2*B*e - 5*A*f) - c^2*f*(28*C*e + B*f) - c*d*(14*C*e^2 - 5*B
*e*f - 3*A*f^2)) - 3*a^2*b^2*(d*f*(2*B*d*e + 3*B*c*f - A*d*f) - C
*(5*d^2*e^2 + 37*c*d*e*f + 15*c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c
- a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]
*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*
f))])/(105*b^4*(-(b*c) + a*d)^(5/2)*(b*e - a*f)^2*Sqrt[c + d*x]*S
qrt[e + f*x])
```

Rubi [A] time = 22.1619, antiderivative size = 1716, normalized size of antiderivative = 1., number

of steps used = 10, number of rules used = 8, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.21$

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(9/2),x]
```

```
[Out] (-2*(24*a^4*C*d^2*f^2 - a^3*b*d*f*(61*C*d*e + 43*c*C*f - 4*B*d*f)
 - 3*a*b^3*(d^2*e*(B*e - 3*A*f) + 2*c^2*f*(7*C*e - B*f) + c*d*(28
*C*e^2 - 5*B*e*f + 5*A*f^2)) - b^4*(4*A*d^2*e^2 - c*d*e*(7*B*e -
A*f) - c^2*(35*C*e^2 - 14*B*e*f + 8*A*f^2)) - 3*a^2*b^2*(d*f*(3*B
*d*e + 2*B*c*f - A*d*f) - C*(15*d^2*e^2 + 37*c*d*e*f + 5*c^2*f^2)
))*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^3*(b*c - a*d)^2*(b*e - a*f
)^2*(a + b*x)^(3/2)) + (2*(48*a^5*C*d^3*f^3 + 8*a^4*b*d^2*f^2*(B*
d*f - 16*C*(d*e + c*f)) - b^5*(8*A*d^3*e^3 - c*d^2*e^2*(14*B*e +
5*A*f) + c^2*d*e*(35*C*e^2 + 14*B*e*f - 5*A*f^2) + c^3*f*(35*C*e^
2 - 14*B*e*f + 8*A*f^2)) - a*b^4*(d^3*e^2*(6*B*e - 19*A*f) - 6*c^
3*f^2*(7*C*e - B*f) - c^2*d*f*(238*C*e^2 - 19*f*(B*e - A*f)) - c*
d^2*e*(42*C*e^2 - f*(19*B*e + 20*A*f))) + a^3*b^2*d*f*(C*(103*d^2
*e^2 + 344*c*d*e*f + 103*c^2*f^2) + d*f*(6*A*d*f - 19*B*(d*e + c*
f))) - 3*a^2*b^3*(C*(5*d^3*e^3 + 94*c*d^2*e^2*f + 94*c^2*d*e*f^2
+ 5*c^3*f^3) + d*f*(3*A*d*f*(d*e + c*f) - B*(3*d^2*e^2 + 16*c*d*e
*f + 3*c^2*f^2))))*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^3*(b*c - a
*d)^3*(b*e - a*f)^3*Sqrt[a + b*x]) + (2*(6*a^3*C*d*f + a*b^2*(14*
c*C*e + 3*B*d*e + 3*B*c*f - 8*A*d*f) - b^3*(7*B*c*e - 4*A*(d*e +
c*f)) + a^2*b*(B*d*f - 10*C*(d*e + c*f)))*Sqrt[c + d*x]*(e + f*x)
^(3/2))/(35*b^2*(b*c - a*d)*(b*e - a*f)^2*(a + b*x)^(5/2)) - (2*(
A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*(e + f*x)^(3/2))/(7*b*(b*c
 - a*d)*(b*e - a*f)*(a + b*x)^(7/2)) + (2*Sqrt[d]*(48*a^5*C*d^3*f
^3 + 8*a^4*b*d^2*f^2*(B*d*f - 16*C*(d*e + c*f)) - b^5*(8*A*d^3*e^
3 - c*d^2*e^2*(14*B*e + 5*A*f) + c^2*d*e*(35*C*e^2 + 14*B*e*f - 5
*A*f^2) + c^3*f*(35*C*e^2 - 14*B*e*f + 8*A*f^2)) - a*b^4*(d^3*e^2
*(6*B*e - 19*A*f) - 6*c^3*f^2*(7*C*e - B*f) - c^2*d*f*(238*C*e^2
- 19*f*(B*e - A*f)) - c*d^2*e*(42*C*e^2 - f*(19*B*e + 20*A*f))) +
 a^3*b^2*d*f*(C*(103*d^2*e^2 + 344*c*d*e*f + 103*c^2*f^2) + d*f*(
6*A*d*f - 19*B*(d*e + c*f))) - 3*a^2*b^3*(C*(5*d^3*e^3 + 94*c*d^2
*e^2*f + 94*c^2*d*e*f^2 + 5*c^3*f^3) + d*f*(3*A*d*f*(d*e + c*f) -
 B*(3*d^2*e^2 + 16*c*d*e*f + 3*c^2*f^2))))*Sqrt[(b*(c + d*x))/(b*
c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/
Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^4*(
-(b*c) + a*d)^(5/2)*(b*e - a*f)^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x)
)/(b*e - a*f)]) + (2*Sqrt[d]*(d*e - c*f)*(24*a^4*C*d^2*f^2 - a^3*
b*d*f*(43*C*d*e + 61*c*C*f - 4*B*d*f) + b^4*(8*A*d^2*e^2 - c*d*e*
(14*B*e + A*f) + c^2*(35*C*e^2 + 7*B*e*f - 4*A*f^2)) + 3*a*b^3*(d
^2*e*(2*B*e - 5*A*f) - c^2*f*(28*C*e + B*f) - c*d*(14*C*e^2 - 5*B
*e*f - 3*A*f^2)) - 3*a^2*b^2*(d*f*(2*B*d*e + 3*B*c*f - A*d*f) - C
*(5*d^2*e^2 + 37*c*d*e*f + 15*c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c
- a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]
*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*
f))])/(105*b^4*(-(b*c) + a*d)^(5/2)*(b*e - a*f)^2*Sqrt[c + d*x]*S
qrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(9/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 25.7866, size = 22671, normalized size = 13.21

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + d*x]*Sqrt[e + f*x]*(A + B*x + C*x^2))/(a + b*x)^(9/2),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.432, size = 68351, normalized size = 39.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)*(d*x+c)^(1/2)*(f*x+e)^(1/2)/(b*x+a)^(9/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}\sqrt{fx + e}}{(bx + a)^{\frac{9}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(9/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(9/2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(Cx^2+Bx+A\right)\sqrt{dx+c}\sqrt{fx+e}}{(b^4x^4+4\,ab^3x^3+6\,a^2b^2x^2+4\,a^3bx+a^4)\sqrt{bx+a}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(9/2),x, algorit
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/((b^4*x^4
+ 4*a*b^3*x^3 + 6*a^2*b^2*x^2 + 4*a^3*b*x + a^4)*sqrt(b*x + a)),
x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)*(f*x+e)**(1/2)/(b*x+a)**(9/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(Cx^2+Bx+A\right)\sqrt{dx+c}\sqrt{fx+e}}{(bx+a)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)^(9/2),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)*sqrt(f*x + e)/(b*x + a)
^(9/2), x)
```

3.101 $\int \frac{(a+bx)^{3/2}\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{\sqrt{e+fx}}\,dx$

Optimal. Leaf size=1235

result too large to display

```
[Out] (-2*(5*b*d*f*(7*a*d*f*(5*b*c*C*e + 3*a*C*d*e + a*c*C*f - 9*A*b*d*
f) - (3*b*c*e + 3*a*d*e + a*c*f)*(4*a*C*d*f + b*(8*C*d*e + 6*c*C*
f - 9*B*d*f))) + 2*((a*d*f)/2 - b*(2*d*e + c*f))*(7*b*d*f*(5*b*c*
C*e + 3*a*C*d*e + a*c*C*f - 9*A*b*d*f) - (6*b*d*e + 4*b*c*f - 3*a
*d*f)*(4*a*C*d*f + b*(8*C*d*e + 6*c*C*f - 9*B*d*f))))*Sqrt[a + b*
x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(945*b^2*d^3*f^4) - (2*(7*b*d*f*(
5*b*c*C*e + 3*a*C*d*e + a*c*C*f - 9*A*b*d*f) - (6*b*d*e + 4*b*c*f
 - 3*a*d*f)*(4*a*C*d*f + b*(8*C*d*e + 6*c*C*f - 9*B*d*f)))*Sqrt[a
 + b*x]*(c + d*x)^(3/2)*Sqrt[e + f*x])/(315*b*d^3*f^3) - (2*(4*a*
C*d*f + b*(8*C*d*e + 6*c*C*f - 9*B*d*f))*(a + b*x)^(3/2)*(c + d*x
)^(3/2)*Sqrt[e + f*x])/(63*b*d^2*f^2) + (2*C*(a + b*x)^(5/2)*(c +
 d*x)^(3/2)*Sqrt[e + f*x])/(9*b*d*f) + (2*Sqrt[-(b*c) + a*d]*(8*a
^4*C*d^4*f^4 + a^3*b*d^3*f^3*(11*C*d*e - 7*c*C*f - 18*B*d*f) - 3*
a^2*b^2*d^2*f^2*(3*d*f*(4*B*d*e - 3*B*c*f - 7*A*d*f) - C*(9*d^2*e
^2 - 5*c*d*e*f - 3*c^2*f^2)) - a*b^3*d*f*(2*C*(92*d^3*e^3 - 33*c*
d^2*e^2*f - 18*c^2*d*e*f^2 - 16*c^3*f^3) + 3*d*f*(7*A*d*f*(13*d*e
 - 7*c*f) - B*(72*d^2*e^2 - 29*c*d*e*f - 19*c^2*f^2))) + b^4*(C*(
128*d^4*e^4 - 40*c*d^3*e^3*f - 21*c^2*d^2*e^2*f^2 - 16*c^3*d*e*f^
3 - 16*c^4*f^4) + 3*d*f*(7*A*d*f*(8*d^2*e^2 - 3*c*d*e*f - 2*c^2*f
^2) - B*(48*d^3*e^3 - 16*c*d^2*e^2*f - 9*c^2*d*e*f^2 - 8*c^3*f^3)
)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSi
n[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d
*(b*e - a*f))])/(315*b^3*d^(7/2)*f^5*Sqrt[c + d*x]*Sqrt[(b*(e + f
*x))/(b*e - a*f)]) + (2*Sqrt[-(b*c) + a*d]*(b*e - a*f)*(d*e - c*f
)*(4*a^3*C*d^3*f^3 + 3*a^2*b*d^2*f^2*(3*C*d*e - c*C*f - 3*B*d*f)
- 3*a*b^2*d*f*(3*d*f*(16*B*d*e + 3*B*c*f - 21*A*d*f) - 5*C*(8*d^2
*e^2 + 2*c*d*e*f + c^2*f^2)) - b^3*(C*(128*d^3*e^3 + 24*c*d^2*e^2
*f + 15*c^2*d*e*f^2 + 8*c^3*f^3) + 3*d*f*(7*A*d*f*(8*d*e + c*f) -
 4*B*(12*d^2*e^2 + 2*c*d*e*f + c^2*f^2))))*Sqrt[(b*(c + d*x))/(b*
c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[
d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e -
a*f))])/(315*b^3*d^(7/2)*f^5*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 14.8257, antiderivative size = 1235, normalized size of antiderivative = 1., number

of steps used = 10, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$\frac{2C(c+dx)^{3/2}\sqrt{e+fx}(a+bx)^{5/2}}{9bdf}-\frac{2(4aCdf+b(8Cde+6cCf-9Bdf))(c+dx)^{3/2}\sqrt{e+fx}(a+bx)^{3/2}}{63bd^2f^2}$$

$$-\frac{2(7bdf(5bcCe+3aCde+acCf-9Abdf)-(6bde+4bcf-3adf)(4aCdf+b(8Cde+6cCf-9Bdf)))(c+dx)^{3/2}\sqrt{e+fx}}{315bd^3f^3}$$

$$-\frac{2\left(5bdf(7adf(5bcCe+3aCde+acCf-9Abdf)-(3bce+3ade+acf)(4aCdf+b(8Cde+6cCf-9Bdf)))+2\left(\frac{adf}{2}-b\right.\right.}{}$$

$$+\frac{2\sqrt{ad-bc}\left(\left(C\left(128d^4e^4-40cd^3fe^3-21c^2d^2f^2e^2-16c^3df^3e-16c^4f^4\right)+3df\left(7Adf\left(8d^2e^2-3cdfe-2c^2f^2\right)-B\left(48\right.\right.\right.\right.}{}$$

$$+\frac{2\sqrt{ad-bc}(be-af)(de-cf)\left(-\left(C\left(128d^3e^3+24cd^2fe^2+15c^2df^2e+8c^3f^3\right)+3df\left(7Adf(8de+cf)-4B\left(12d^2e^2+2c\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^(3/2)*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] (-2*(5*b*d*f*(7*a*d*f*(5*b*c*C*e + 3*a*C*d*e + a*c*C*f - 9*A*b*d*
f) - (3*b*c*e + 3*a*d*e + a*c*f)*(4*a*C*d*f + b*(8*C*d*e + 6*c*C*
f - 9*B*d*f))) + 2*((a*d*f)/2 - b*(2*d*e + c*f))*(7*b*d*f*(5*b*c*
C*e + 3*a*C*d*e + a*c*C*f - 9*A*b*d*f) - (6*b*d*e + 4*b*c*f - 3*a
*d*f)*(4*a*C*d*f + b*(8*C*d*e + 6*c*C*f - 9*B*d*f))))*Sqrt[a + b*
x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(945*b^2*d^3*f^4) - (2*(7*b*d*f*(
5*b*c*C*e + 3*a*C*d*e + a*c*C*f - 9*A*b*d*f) - (6*b*d*e + 4*b*c*f
 - 3*a*d*f)*(4*a*C*d*f + b*(8*C*d*e + 6*c*C*f - 9*B*d*f)))*Sqrt[a
 + b*x]*(c + d*x)^(3/2)*Sqrt[e + f*x])/(315*b*d^3*f^3) - (2*(4*a*
C*d*f + b*(8*C*d*e + 6*c*C*f - 9*B*d*f))*(a + b*x)^(3/2)*(c + d*x
)^(3/2)*Sqrt[e + f*x])/(63*b*d^2*f^2) + (2*C*(a + b*x)^(5/2)*(c +
 d*x)^(3/2)*Sqrt[e + f*x])/(9*b*d*f) + (2*Sqrt[-(b*c) + a*d]*(8*a
^4*C*d^4*f^4 + a^3*b*d^3*f^3*(11*C*d*e - 7*c*C*f - 18*B*d*f) - 3*
a^2*b^2*d^2*f^2*(3*d*f*(4*B*d*e - 3*B*c*f - 7*A*d*f) - C*(9*d^2*e
^2 - 5*c*d*e*f - 3*c^2*f^2)) - a*b^3*d*f*(2*C*(92*d^3*e^3 - 33*c*
d^2*e^2*f - 18*c^2*d*e*f^2 - 16*c^3*f^3) + 3*d*f*(7*A*d*f*(13*d*e
 - 7*c*f) - B*(72*d^2*e^2 - 29*c*d*e*f - 19*c^2*f^2))) + b^4*(C*(
128*d^4*e^4 - 40*c*d^3*e^3*f - 21*c^2*d^2*e^2*f^2 - 16*c^3*d*e*f^
3 - 16*c^4*f^4) + 3*d*f*(7*A*d*f*(8*d^2*e^2 - 3*c*d*e*f - 2*c^2*f
^2) - B*(48*d^3*e^3 - 16*c*d^2*e^2*f - 9*c^2*d*e*f^2 - 8*c^3*f^3)
)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSi
n[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d
*(b*e - a*f))])/(315*b^3*d^(7/2)*f^5*Sqrt[c + d*x]*Sqrt[(b*(e + f
*x))/(b*e - a*f)]) + (2*Sqrt[-(b*c) + a*d]*(b*e - a*f)*(d*e - c*f
)*(4*a^3*C*d^3*f^3 + 3*a^2*b*d^2*f^2*(3*C*d*e - c*C*f - 3*B*d*f)
- 3*a*b^2*d*f*(3*d*f*(16*B*d*e + 3*B*c*f - 21*A*d*f) - 5*C*(8*d^2
*e^2 + 2*c*d*e*f + c^2*f^2)) - b^3*(C*(128*d^3*e^3 + 24*c*d^2*e^2
*f + 15*c^2*d*e*f^2 + 8*c^3*f^3) + 3*d*f*(7*A*d*f*(8*d*e + c*f) -
 4*B*(12*d^2*e^2 + 2*c*d*e*f + c^2*f^2))))*Sqrt[(b*(c + d*x))/(b*
c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[
d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e -
```

```
a*f))])/(315*b^3*d^(7/2)*f^5*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(3/2)*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)

[Out] Timed out
```

Mathematica [C] time = 23.916, size = 18421, normalized size = 14.92

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^(3/2)*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]

[Out] Result too large to show
```

Maple [B] time = 0.088, size = 15857, normalized size = 12.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(3/2)*(C*x^2+B*x+A)*(d*x+c)^(1/2)/(f*x+e)^(1/2),x)

[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)(bx + a)^{\frac{3}{2}}\sqrt{dx + c}}{\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)*sqrt(d*x + c)/sqrt(f*x + e),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)*sqrt(d*x + c)/sqrt(f*
x + e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(Cbx^3 + (Ca + Bb)x^2 + Aa + (Ba + Ab)x\right)\sqrt{bx + a}\sqrt{dx + c}}{\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)*sqrt(d*x + c)/sqrt(f*x + e),x, algorit
```

```
[Out] integral((C*b*x^3 + (C*a + B*b)*x^2 + A*a + (B*a + A*b)*x)*sqrt(b
*x + a)*sqrt(d*x + c)/sqrt(f*x + e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(3/2)*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)(bx + a)^{\frac{3}{2}}\sqrt{dx + c}}{\sqrt{fx + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)*sqrt(d*x + c)/sqrt(f*x + e),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)*sqrt(d*x + c)/sqrt(f*
x + e), x)
```

3.102 $\int \frac{\sqrt{a+bx}\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{\sqrt{e+fx}}\,dx$

Optimal. Leaf size=766

$$\frac{2\sqrt{ad-bc}(be-af)(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(4a^2Cd^2f^2+abdf(-7Bdf-2cCf+8Cde)+b^2\left(-\left(7df(-10Adf+Bcf+\right.\right.\right.}{105b^3d^{5/2}f^4\sqrt{c+dx}\sqrt{e+fx}}$$

$$-\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(3bdf(5adf(acCf+3aCde-7Abdf+3bcCe)-(acf+3ade+bce)(4aCdf+b(-7Bdf+4c\right.}{}$$

$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}(5bdf(acCf+3aCde-7Abdf+3bcCe)+(adf-2b(cf+2de))(4aCdf+b(-7Bdf+4cCf+6}{105b^2d^2f^3}$$

$$-\frac{2\sqrt{a+bx}(c+dx)^{3/2}\sqrt{e+fx}(4aCdf+b(-7Bdf+4cCf+6Cde))}{35bd^2f^2}+\frac{2C(a+bx)^{3/2}(c+dx)^{3/2}\sqrt{e+fx}}{7bdf}$$

```
[Out] (-2*(5*b*d*f*(3*b*c*C*e + 3*a*C*d*e + a*c*C*f - 7*A*b*d*f) + (a*d
*f - 2*b*(2*d*e + c*f))*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*f - 7*B*d
*f)))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^2*d^2*f^3
) - (2*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*f - 7*B*d*f))*Sqrt[a + b*x
]*(c + d*x)^(3/2)*Sqrt[e + f*x])/(35*b*d^2*f^2) + (2*C*(a + b*x)^
(3/2)*(c + d*x)^(3/2)*Sqrt[e + f*x])/(7*b*d*f) - (2*Sqrt[-(b*c) +
 a*d]*(3*b*d*f*(5*a*d*f*(3*b*c*C*e + 3*a*C*d*e + a*c*C*f - 7*A*b*
d*f) - (b*c*e + 3*a*d*e + a*c*f)*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*
f - 7*B*d*f))) + 2*((b*c*f)/2 - d*(b*e + a*f))*(5*b*d*f*(3*b*c*C*
e + 3*a*C*d*e + a*c*C*f - 7*A*b*d*f) + (a*d*f - 2*b*(2*d*e + c*f)
)*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*f - 7*B*d*f))))*Sqrt[(b*(c + d*
x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a +
 b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(10
5*b^3*d^(5/2)*f^4*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])
+ (2*Sqrt[-(b*c) + a*d]*(b*e - a*f)*(d*e - c*f)*(4*a^2*C*d^2*f^2
+ a*b*d*f*(8*C*d*e - 2*c*C*f - 7*B*d*f) - b^2*(7*d*f*(8*B*d*e + B
*c*f - 10*A*d*f) - 4*C*(12*d^2*e^2 + 2*c*d*e*f + c^2*f^2)))*Sqrt[
(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*Ellipt
icF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a
*d)*f)/(d*(b*e - a*f))])/(105*b^3*d^(5/2)*f^4*Sqrt[c + d*x]*Sqrt[
e + f*x])
```

Rubi [A] time = 6.73618, antiderivative size = 766, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$\frac{2\sqrt{ad-bc}(be-af)(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(4a^2Cd^2f^2+abdf(-7Bdf-2cCf+8Cde)+b^2\left(-\left(7df(-10Adf+Bcf+\cdots\right.\right.\right.}{105b^3d^{5/2}f^4\sqrt{c+dx}\sqrt{e+fx}\cdots}$$

$$-2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(3bdf(5adf(acCf+3aCde-7Abdf+3bcCe)-(acf+3ade+bce)(4aCdf+b(-7Bdf+4c\cdots\right.$$

$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}(5bdf(acCf+3aCde-7Abdf+3bcCe)+(adf-2b(cf+2de))(4aCdf+b(-7Bdf+4cCf+6\cdots}{105b^2d^2f^3}$$

$$-\frac{2\sqrt{a+bx}(c+dx)^{3/2}\sqrt{e+fx}(4aCdf+b(-7Bdf+4cCf+6Cde))}{35bd^2f^2}+\frac{2C(a+bx)^{3/2}(c+dx)^{3/2}\sqrt{e+fx}}{7bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[a + b*x]*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] (-2*(5*b*d*f*(3*b*c*C*e + 3*a*C*d*e + a*c*C*f - 7*A*b*d*f) + (a*d
*f - 2*b*(2*d*e + c*f))*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*f - 7*B*d
*f)))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b^2*d^2*f^3
) - (2*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*f - 7*B*d*f))*Sqrt[a + b*x
]*(c + d*x)^(3/2)*Sqrt[e + f*x])/(35*b*d^2*f^2) + (2*C*(a + b*x)^
(3/2)*(c + d*x)^(3/2)*Sqrt[e + f*x])/(7*b*d*f) - (2*Sqrt[-(b*c) +
 a*d]*(3*b*d*f*(5*a*d*f*(3*b*c*C*e + 3*a*C*d*e + a*c*C*f - 7*A*b*
d*f) - (b*c*e + 3*a*d*e + a*c*f)*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*
f - 7*B*d*f))) + 2*((b*c*f)/2 - d*(b*e + a*f))*(5*b*d*f*(3*b*c*C*
e + 3*a*C*d*e + a*c*C*f - 7*A*b*d*f) + (a*d*f - 2*b*(2*d*e + c*f)
)*(4*a*C*d*f + b*(6*C*d*e + 4*c*C*f - 7*B*d*f))))*Sqrt[(b*(c + d*
x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a +
 b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(10
5*b^3*d^(5/2)*f^4*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])
+ (2*Sqrt[-(b*c) + a*d]*(b*e - a*f)*(d*e - c*f)*(4*a^2*C*d^2*f^2
+ a*b*d*f*(8*C*d*e - 2*c*C*f - 7*B*d*f) - b^2*(7*d*f*(8*B*d*e + B
*c*f - 10*A*d*f) - 4*C*(12*d^2*e^2 + 2*c*d*e*f + c^2*f^2)))*Sqrt[
(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*Ellipt
icF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a
*d)*f)/(d*(b*e - a*f))])/(105*b^3*d^(5/2)*f^4*Sqrt[c + d*x]*Sqrt[
e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**(1/2)*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 19.5626, size = 10708, normalized size = 13.98

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[a + b*x]*Sqrt[c + d*x]*(A + B*x + C*x^2))/Sqrt[e + f*x],x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.05, size = 9543, normalized size = 12.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(1/2)*(C*x^2+B*x+A)*(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{bx + a}\sqrt{dx + c}}{\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)/sqrt(f*x
+ e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{bx + a}\sqrt{dx + c}}{\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)/sqrt(f*x +
 e), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(1/2)*(C*x**2+B*x+A)*(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{bx + a}\sqrt{dx + c}}{\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)/sqrt(f*x + e),x, algorithm
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)*sqrt(d*x + c)/sqrt(f*x
+ e), x)
```

3.103 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{\sqrt{a+bx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=527

$$-\frac{2\sqrt{ad-bc}(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(4a^2Cdf^2+abf(-5Bdf-cCf+3Cde)+b^2(-(5df(2Be-3Af)-Ce(cf+8de)))\right)}{15b^3d^{3/2}f^3\sqrt{c+dx}\sqrt{e+fx}}$$

$$-\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}(3bdf(acCf+3aCde-5Abdf+bcCe)-(2adf-bcf+2bde)(4aCdf+b(-5Bdf+2cCf+}{15b^3d^{3/2}f^3\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}$$

$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}(4aCdf+b(-5Bdf+2cCf+4Cde))}{15b^2df^2}+\frac{2C\sqrt{a+bx}(c+dx)^{3/2}\sqrt{e+fx}}{5bdf}$$

```
[Out] (-2*(4*a*C*d*f + b*(4*C*d*e + 2*c*C*f - 5*B*d*f))*Sqrt[a + b*x]*S
qrt[c + d*x]*Sqrt[e + f*x])/(15*b^2*d*f^2) + (2*C*Sqrt[a + b*x]*(
c + d*x)^(3/2)*Sqrt[e + f*x])/(5*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(
3*b*d*f*(b*c*C*e + 3*a*C*d*e + a*c*C*f - 5*A*b*d*f) - (2*b*d*e -
b*c*f + 2*a*d*f)*(4*a*C*d*f + b*(4*C*d*e + 2*c*C*f - 5*B*d*f)))*S
qrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sq
rt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e
 - a*f))])/(15*b^3*d^(3/2)*f^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(
b*e - a*f)]) - (2*Sqrt[-(b*c) + a*d]*(d*e - c*f)*(4*a^2*C*d*f^2 +
 a*b*f*(3*C*d*e - c*C*f - 5*B*d*f) - b^2*(5*d*f*(2*B*e - 3*A*f) -
 C*e*(8*d*e + c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e +
 f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt
[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^3*d^(3/2
)*f^3*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 2.72657, antiderivative size = 527, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$-\frac{2\sqrt{ad-bc}(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(4a^2Cdf^2+abf(-5Bdf-cCf+3Cde)+b^2(-(5df(2Be-3Af)-Ce(cf+8de)))\right)}{15b^3d^{3/2}f^3\sqrt{c+dx}\sqrt{e+fx}}$$

$$-\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}(3bdf(acCf+3aCde-5Abdf+bcCe)-(2adf-bcf+2bde)(4aCdf+b(-5Bdf+2cCf+}{15b^3d^{3/2}f^3\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}$$

$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}(4aCdf+b(-5Bdf+2cCf+4Cde))}{15b^2df^2}+\frac{2C\sqrt{a+bx}(c+dx)^{3/2}\sqrt{e+fx}}{5bdf}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[e + f*x]),x]
```

```
[Out] (-2*(4*a*C*d*f + b*(4*C*d*e + 2*c*C*f - 5*B*d*f))*Sqrt[a + b*x]*S
qrt[c + d*x]*Sqrt[e + f*x])/(15*b^2*d*f^2) + (2*C*Sqrt[a + b*x]*(
c + d*x)^(3/2)*Sqrt[e + f*x])/(5*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(
3*b*d*f*(b*c*C*e + 3*a*C*d*e + a*c*C*f - 5*A*b*d*f) - (2*b*d*e -
b*c*f + 2*a*d*f)*(4*a*C*d*f + b*(4*C*d*e + 2*c*C*f - 5*B*d*f)))*S
qrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sq
rt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e
 - a*f))])/(15*b^3*d^(3/2)*f^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(
b*e - a*f)]) - (2*Sqrt[-(b*c) + a*d]*(d*e - c*f)*(4*a^2*C*d*f^2 +
 a*b*f*(3*C*d*e - c*C*f - 5*B*d*f) - b^2*(5*d*f*(2*B*e - 3*A*f) -
 C*e*(8*d*e + c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e +
 f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt
[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^3*d^(3/2
)*f^3*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 15.6942, size = 5393, normalized size = 10.23

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/(Sqrt[a + b*x]*Sqrt[e + f*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.043, size = 6049, normalized size = 11.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{dx + c}}{\sqrt{bx + a}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/(sqrt(b*x + a)*sqrt(f*x + e)),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/(sqrt(b*x + a)*sqrt(f*x
 + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{dx + c}}{\sqrt{bx + a}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/(sqrt(b*x + a)*sqrt(f*x + e)),x, algorit
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)/(sqrt(b*x + a)*sqrt(f*x
+ e)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{c + dx}\,(A + Bx + Cx^2)}{\sqrt{a + bx}\sqrt{e + fx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Integral(sqrt(c + d*x)*(A + B*x + C*x**2)/(sqrt(a + b*x)*sqrt(e +
 f*x)), x)
```

<u>GIAC/XCAS</u> [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2+Bx+A\right)\sqrt{dx+c}}{\sqrt{bx+a}\sqrt{fx+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/(sqrt(b*x + a)*sqrt(f*x + e)),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/(sqrt(b*x + a)*sqrt(f*x
 + e)), x)
```

3.104 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{(a+bx)^{3/2}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=540

$$\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(4a^2Cdf-ab(3Bdf+cCf+Cde)+b^2(3Adf+cCe)\right)}{3b^2f(bc-ad)(be-af)}$$
$$+\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(8a^2Cdf^2-abf(6Bdf+cCf+3Cde)+b^2(3df(Af+Be)-Ce(2de-cf))\right)E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+b}}{\sqrt{ad-b}}\right.\right.}{3b^3\sqrt{d}f^2\sqrt{c+dx}(be-af)\sqrt{\frac{b(e+fx)}{be-af}}}$$
$$-\frac{2(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b\sqrt{a+bx}(bc-ad)(be-af)}$$
$$+\frac{2\sqrt{ad-bc}(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}(4aCf-3bBf+2bCe)F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^3\sqrt{d}f^2\sqrt{c+dx}\sqrt{e+fx}}$$

```
[Out] (2*(4*a^2*C*d*f + b^2*(c*C*e + 3*A*d*f) - a*b*(C*d*e + c*C*f + 3*
B*d*f))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b^2*(b*c -
a*d)*f*(b*e - a*f)) - (2*(A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*
Sqrt[e + f*x])/(b*(b*c - a*d)*(b*e - a*f)*Sqrt[a + b*x]) + (2*Sqr
t[-(b*c) + a*d]*(8*a^2*C*d*f^2 - a*b*f*(3*C*d*e + c*C*f + 6*B*d*f
) + b^2*(3*d*f*(B*e + A*f) - C*e*(2*d*e - c*f)))*Sqrt[(b*(c + d*x
))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a +
b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b
^3*Sqrt[d]*f^2*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e
- a*f)]) + (2*Sqrt[-(b*c) + a*d]*(d*e - c*f)*(2*b*C*e - 3*b*B*f +
 4*a*C*f)*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e
 - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a
*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^3*Sqrt[d]*f^2*Sqrt[c
 + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 3.08539, antiderivative size = 540, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\left(4a^2Cdf-ab(3Bdf+cCf+Cde)+b^2(3Adf+cCe)\right)}{3b^2f(bc-ad)(be-af)}$$
$$+\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(8a^2Cdf^2-abf(6Bdf+cCf+3Cde)+b^2(3df(Af+Be)-Ce(2de-cf))\right)E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+b}}{\sqrt{ad-b}}\right.\right.}{3b^3\sqrt{d}f^2\sqrt{c+dx}(be-af)\sqrt{\frac{b(e+fx)}{be-af}}}$$
$$-\frac{2(c+dx)^{3/2}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b\sqrt{a+bx}(bc-ad)(be-af)}$$
$$+\frac{2\sqrt{ad-bc}(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}(4aCf-3bBf+2bCe)F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^3\sqrt{d}f^2\sqrt{c+dx}\sqrt{e+fx}}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^(3/2)*Sqrt[e + f*x]),x]
```

```
[Out] (2*(4*a^2*C*d*f + b^2*(c*C*e + 3*A*d*f) - a*b*(C*d*e + c*C*f + 3*
B*d*f))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b^2*(b*c -
a*d)*f*(b*e - a*f)) - (2*(A*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*
Sqrt[e + f*x])/(b*(b*c - a*d)*(b*e - a*f)*Sqrt[a + b*x]) + (2*Sqr
t[-(b*c) + a*d]*(8*a^2*C*d*f^2 - a*b*f*(3*C*d*e + c*C*f + 6*B*d*f
) + b^2*(3*d*f*(B*e + A*f) - C*e*(2*d*e - c*f)))*Sqrt[(b*(c + d*x
))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a +
b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b
^3*Sqrt[d]*f^2*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e
- a*f)]) + (2*Sqrt[-(b*c) + a*d]*(d*e - c*f)*(2*b*C*e - 3*b*B*f +
 4*a*C*f)*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e
 - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a
*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^3*Sqrt[d]*f^2*Sqrt[c
 + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(3/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 12.2866, size = 551, normalized size = 1.02

$$-\frac{2\left(b^2(c+dx)(e+fx)\sqrt{\frac{bc}{d}-a}\left(-8a^2Cdf^2+abf(6Bdf+cCf+3Cde)+b^2(Ce(2de-cf)-3df(Af+Be))\right)-if(a+bx)^3\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^(3/2)*Sqrt[e + f*x]),x]
```

```
[Out] (-2*(b^2*Sqrt[-a + (b*c)/d]*(-8*a^2*C*d*f^2 + a*b*f*(3*C*d*e + c*
C*f + 6*B*d*f) + b^2*(-3*d*f*(B*e + A*f) + C*e*(2*d*e - c*f)))*(c
 + d*x)*(e + f*x) + b^2*Sqrt[-a + (b*c)/d]*d*f*(c + d*x)*(e + f*x
)*(3*(A*b^2 + a*(-(b*B) + a*C))*f - C*(b*e - a*f)*(a + b*x)) - I*
(b*c - a*d)*f*(8*a^2*C*d*f^2 - a*b*f*(3*C*d*e + c*C*f + 6*B*d*f)
+ b^2*(3*d*f*(B*e + A*f) + C*e*(-2*d*e + c*f)))*(a + b*x)^(3/2)*S
```

```
qrt[(b*(c + d*x))/(d*(a + b*x))]*Sqrt[(b*(e + f*x))/(f*(a + b*x))
]*EllipticE[I*ArcSinh[Sqrt[-a + (b*c)/d]/Sqrt[a + b*x]], (b*d*e -
 a*d*f)/(b*c*f - a*d*f)] - I*b*f*(d*e - c*f)*(4*a^2*C*d*f + b^2*(
c*C*e + 3*A*d*f) - a*b*(C*d*e + c*C*f + 3*B*d*f))*(a + b*x)^(3/2)
*Sqrt[(b*(c + d*x))/(d*(a + b*x))]*Sqrt[(b*(e + f*x))/(f*(a + b*x
))]*EllipticF[I*ArcSinh[Sqrt[-a + (b*c)/d]/Sqrt[a + b*x]], (b*d*e
 - a*d*f)/(b*c*f - a*d*f)]))/(3*b^4*Sqrt[-a + (b*c)/d]*d*f^2*(b*e
 - a*f)*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Maple [B] time = 0.059, size = 4732, normalized size = 8.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)^(3/2)/(f*x+e)^(1/2),x)
```

```
[Out] 2/3*(3*A*x*b^4*d^2*e*f^2-3*B*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2
),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*d^2*e*f^2*((b*x+a)*d/(
a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c
))^(1/2)+3*B*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d
/(a*f-b*e))^(1/2))*a*b^3*d^2*e^2*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-
(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-3*B*Ellip
ticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))
*b^4*c*d*e^2*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))
^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-9*C*EllipticE(((b*x+a)*d/(a*d
-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^3*b*c*d*f^3*((b*x
+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(
a*d-b*c))^(1/2)-11*C*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-
b*c)*f/d/(a*f-b*e))^(1/2))*a^3*b*d^2*e*f^2*((b*x+a)*d/(a*d-b*c))^
(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+C
*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^
(1/2))*a^2*b^2*d^2*e^2*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/
(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticE(((b*x
+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c^2
*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(
-(d*x+c)*b/(a*d-b*c))^(1/2)-4*C*EllipticF(((b*x+a)*d/(a*d-b*c))^(
1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^3*b*c*d*f^3*((b*x+a)*d/(a
*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c)
)^(1/2)+4*C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/
(a*f-b*e))^(1/2))*a^3*b*d^2*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(
f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*Ellipt
icF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*
a^2*b^2*d^2*e^2*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*
e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticF(((b*x+a)*d/(
a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c^2*e*f^2*
((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c
)*b/(a*d-b*c))^(1/2)-3*A*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((
a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c*d*f^3*((b*x+a)*d/(a*d-b*c)
)^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)
-3*A*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*
e))^(1/2))*a*b^3*d^2*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*
```

b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+3*A*EllipticE(((b
*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^4*c*d
*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(
-(d*x+c)*b/(a*d-b*c))^(1/2)+6*B*EllipticE(((b*x+a)*d/(a*d-b*c))^(
1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*c*d*f^3*((b*x+a)*d/
(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*
c))^(1/2)+9*B*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/
d/(a*f-b*e))^(1/2))*a^2*b^2*d^2*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)
*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-3*B*a*
b^3*c*d*e*f^2+4*C*a^2*b^2*c*d*e*f^2-C*a*b^3*c*d*e^2*f+3*A*x^2*b^4
*d^2*f^3-9*B*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d
/(a*f-b*e))^(1/2))*a*b^3*c*d*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-
(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+13*C*Elli
pticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2)
)*a^2*b^2*c*d*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-
b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticE(((b*x+a)*d
/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c*d*e^2*
f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x
+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),
((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*c*d*e*f^2*((b*x+a)*d/(a*
d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))
^(1/2)+4*C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(
a*f-b*e))^(1/2))*a*b^3*c*d*e^2*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f
*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+8*C*Ellipti
cE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a
^4*d^2*f^3*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/
2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-3*B*EllipticE(((b*x+a)*d/(a*d-b*c
))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*d^2*e^2*f*((b*x+a
)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*
d-b*c))^(1/2)+3*B*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c
)*f/d/(a*f-b*e))^(1/2))*b^4*c*d*e^2*f*((b*x+a)*d/(a*d-b*c))^(1/2)
*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+3*B*El
lipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/
2))*a^2*b^2*c*d*f^3*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-
b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticF(((b*x+a)*d
/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*d^2*e^3*
((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c
)*b/(a*d-b*c))^(1/2)-2*C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((
a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^4*c^2*e^2*f*((b*x+a)*d/(a*d-b*c)
)^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)
+2*C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*
e))^(1/2))*b^4*c*d*e^3*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a
*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+3*A*EllipticE(((b*x+a
)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*d^2
f^3((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(
d*x+c)*b/(a*d-b*c))^(1/2)+C*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2)
,((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*c^2*f^3*((b*x+a)*d/(a*d
-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^
(1/2)-3*B*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a
*f-b*e))^(1/2))*a*b^3*c^2*f^3*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+
e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+3*B*EllipticF(
((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^4*
c^2*e*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2
)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-6*B*EllipticE(((b*x+a)*d/(a*d-b*c)
)^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^3*b*d^2*f^3*((b*x+a)*d
/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b

```
*c))^(1/2)+2*C*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f
/d/(a*f-b*e))^(1/2))*a*b^3*d^2*e^3*((b*x+a)*d/(a*d-b*c))^(1/2)*(-
(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+C*Ellipti
cE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b
^4*c^2*e^2*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(
1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticE(((b*x+a)*d/(a*d-b
*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^4*c*d*e^3*((b*x+a)*
d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-
b*c))^(1/2)+4*C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*
f/d/(a*f-b*e))^(1/2))*a^2*b^2*c^2*f^3*((b*x+a)*d/(a*d-b*c))^(1/2)
*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-3*B*x^
2*a*b^3*d^2*f^3+4*C*x^2*a^2*b^2*d^2*f^3-C*x^2*b^4*d^2*e^2*f+3*A*x
*b^4*c*d*f^3+C*x^3*a*b^3*d^2*f^3-C*x^3*b^4*d^2*e*f^2+3*A*b^4*c*d*
e*f^2+C*x^2*a*b^3*c*d*f^3-C*x^2*b^4*c*d*e*f^2-3*B*x*a*b^3*c*d*f^3
-3*B*x*a*b^3*d^2*e*f^2+4*C*x*a^2*b^2*c*d*f^3+4*C*x*a^2*b^2*d^2*e*
f^2-C*x*a*b^3*d^2*e^2*f-C*x*b^4*c*d*e^2*f)*(f*x+e)^(1/2)*(b*x+a)^
(1/2)*(d*x+c)^(1/2)/d/b^4/f^2/(a*f-b*e)/(b*d*f*x^3+a*d*f*x^2+b*c*
f*x^2+b*d*e*x^2+a*c*f*x+a*d*e*x+b*c*e*x+a*c*e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{dx + c}}{(bx + a)^{\frac{3}{2}}\sqrt{fx + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f
*x + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{dx + c}}{(bx + a)^{\frac{3}{2}}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f*
x + e)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(3/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}}{(bx + a)^{\frac{3}{2}}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(3/2)*sqrt(f
*x + e)), x)
```

3.105 $\int \frac{\sqrt{c+dx}(A+Bx+Cx^2)}{(a+bx)^{5/2}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=597

$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\,(4a^2Cf-ab(Bf+6Ce)+b^2(3Be-2Af))}{3b^2\sqrt{a+bx}(be-af)^2}+\frac{2(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\,(4a^2Cdf-ab(Bdf+3C(cf+de))+b^2(Adf+3cCe))\,F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^3\sqrt{d}f\sqrt{c+dx}\sqrt{e+fx}\sqrt{ad-bc}(be-af)}+\frac{2\sqrt{d}\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\,(8a^3Cdf^2-a^2bf(2Bdf+7cCf+13Cde)+ab^2(f(-Adf+Bcf+4Bde)+3Ce(4cf+de))-b^3\,(c\,(\cdots}{3b^3f\sqrt{c+dx}\sqrt{ad-bc}(be-af)^2\sqrt{\frac{b(e+fx)}{be-af}}}-\frac{2(c+dx)^{3/2}\sqrt{e+fx}\,(Ab^2-a(bB-aC))}{3b(a+bx)^{3/2}(bc-ad)(be-af)}$$

```
[Out] (-2*(4*a^2*C*f + b^2*(3*B*e - 2*A*f) - a*b*(6*C*e + B*f))*Sqrt[c
+ d*x]*Sqrt[e + f*x])/(3*b^2*(b*e - a*f)^2*Sqrt[a + b*x]) - (2*(A
*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(3*b*(b*c -
a*d)*(b*e - a*f)*(a + b*x)^(3/2)) + (2*Sqrt[d]*(8*a^3*C*d*f^2 - a
^2*b*f*(13*C*d*e + 7*c*C*f + 2*B*d*f) + a*b^2*(3*C*e*(d*e + 4*c*f
) + f*(4*B*d*e + B*c*f - A*d*f)) - b^3*(A*d*e*f + c*(3*C*e^2 + 3*
B*e*f - 2*A*f^2)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*
EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b
*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^3*Sqrt[-(b*c) + a*d]*f*(b*e -
 a*f)^2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) + (2*(d*e
- c*f)*(4*a^2*C*d*f + b^2*(3*c*C*e + A*d*f) - a*b*(B*d*f + 3*C*(d
*e + c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b
*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) +
 a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^3*Sqrt[d]*Sqrt[-(b
*c) + a*d]*f*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 3.82747, antiderivative size = 596, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\,(4a^2Cf-ab(Bf+6Ce)+b^2(3Be-2Af))}{3b^2\sqrt{a+bx}(be-af)^2}+\frac{2(de-cf)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\,(4a^2Cdf-ab(Bdf+3C(cf+de))+b^2(Adf+3cCe))\,F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^3\sqrt{d}f\sqrt{c+dx}\sqrt{e+fx}\sqrt{ad-bc}(be-af)}+\frac{2\sqrt{d}\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\,(8a^3Cdf^2-a^2bf(2Bdf+7cCf+13Cde)+ab^2(f(-Adf+Bcf+4Bde)+3Ce(4cf+de))-b^3\,(cf(\cdots}{3b^3f\sqrt{c+dx}\sqrt{ad-bc}(be-af)^2\sqrt{\frac{b(e+fx)}{be-af}}}-\frac{2(c+dx)^{3/2}\sqrt{e+fx}\,(Ab^2-a(bB-aC))}{3b(a+bx)^{3/2}(bc-ad)(be-af)}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^(5/2)*Sqrt[e + f*x]),x]
```

```
[Out] (-2*(4*a^2*C*f + b^2*(3*B*e - 2*A*f) - a*b*(6*C*e + B*f))*Sqrt[c
+ d*x]*Sqrt[e + f*x])/(3*b^2*(b*e - a*f)^2*Sqrt[a + b*x]) - (2*(A
*b^2 - a*(b*B - a*C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(3*b*(b*c -
a*d)*(b*e - a*f)*(a + b*x)^(3/2)) + (2*Sqrt[d]*(8*a^3*C*d*f^2 - a
^2*b*f*(13*C*d*e + 7*c*C*f + 2*B*d*f) - b^3*(3*c*C*e^2 + A*d*e*f
+ c*f*(3*B*e - 2*A*f)) + a*b^2*(3*C*e*(d*e + 4*c*f) + f*(4*B*d*e
+ B*c*f - A*d*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*
EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b
*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^3*Sqrt[-(b*c) + a*d]*f*(b*e -
 a*f)^2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) + (2*(d*e
- c*f)*(4*a^2*C*d*f + b^2*(3*c*C*e + A*d*f) - a*b*(B*d*f + 3*C*(d
*e + c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b
*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) +
 a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^3*Sqrt[d]*Sqrt[-(b
*c) + a*d]*f*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(5/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 16.8165, size = 5074, normalized size = 8.5

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^(5/2)*Sqrt[e + f*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.115, size = 13614, normalized size = 22.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)^(5/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{dx + c}}{(bx + a)^{\frac{5}{2}}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(5/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(5/2)*sqrt(f
*x + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{dx + c}}{(b^2x^2 + 2\,abx + a^2)\sqrt{bx + a}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(5/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)/((b^2*x^2 + 2*a*b*x + a^
2)*sqrt(b*x + a)*sqrt(f*x + e)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(5/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{dx + c}}{(bx + a)^{\frac{5}{2}}\sqrt{fx + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(5/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(5/2)*sqrt(f
*x + e)), x)
```

3.106 $\int \frac{\sqrt{c+dx}\left(A+Bx+Cx^2\right)}{(a+bx)^{7/2}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=1034

$$-\frac{2\left(Ab^2-a(bB-aC)\right)\sqrt{e+fx}(c+dx)^{3/2}}{5b(bc-ad)(be-af)(a+bx)^{5/2}}$$

$$-\frac{2\left(8Cd^2f^2a^4-bdf(23Cde+13cCf-2Bdf)a^3-b^2\left(df(7Bde+2Bcf-3Adf)-C\left(23d^2e^2+37cdfe+3c^2f^2\right)\right)a^2-b^3\right.}{}$$

$$+\frac{2\left(4Cdfa^3-b(8Cde+6cCf-Bdf)a^2+b^2(10cCe+3Bde+Bcf-6Adf)a-b^3(5Bce-2Ade-4Acf)\right)\sqrt{e+fx}\sqrt{c+dx}}{15b^2(bc-ad)(be-af)^2(a+bx)^{3/2}}$$

$$+\frac{2\sqrt{d}\left(8Cd^2f^2a^4-bdf(23Cde+13cCf-2Bdf)a^3-b^2\left(df(7Bde+2Bcf-3Adf)-C\left(23d^2e^2+37cdfe+3c^2f^2\right)\right)a^2-\right.}{}$$

$$+\frac{2\sqrt{d}(de-cf)\left(4Cdfa^3-b(8Cde+6cCf-Bdf)a^2+b^2(10cCe+3Bde+Bcf-6Adf)a-b^3(5Bce-2Ade-4Acf)\right)\sqrt{\frac{b(c}{bc}}}{15b^3(ad-bc)^{3/2}(be-af)^2\sqrt{e+fx}\sqrt{c+dx}}$$

```
[Out] (2*(4*a^3*C*d*f - b^3*(5*B*c*e - 2*A*d*e - 4*A*c*f) + a*b^2*(10*c
*C*e + 3*B*d*e + B*c*f - 6*A*d*f) - a^2*b*(8*C*d*e + 6*c*C*f - B*
d*f))*Sqrt[c + d*x]*Sqrt[e + f*x])/(15*b^2*(b*c - a*d)*(b*e - a*f
)^2*(a + b*x)^(3/2)) - (2*(8*a^4*C*d^2*f^2 - a^3*b*d*f*(23*C*d*e
+ 13*c*C*f - 2*B*d*f) - b^4*(2*A*d^2*e^2 - c*d*e*(5*B*e - 3*A*f)
- c^2*(15*C*e^2 - 10*B*e*f + 8*A*f^2)) - a^2*b^2*(d*f*(7*B*d*e +
2*B*c*f - 3*A*d*f) - C*(23*d^2*e^2 + 37*c*d*e*f + 3*c^2*f^2)) - a
*b^3*(d^2*e*(3*B*e - 7*A*f) + 2*c^2*f*(5*C*e - B*f) + c*d*(40*C*e
^2 - 13*f*(B*e - A*f))))*Sqrt[c + d*x]*Sqrt[e + f*x])/(15*b^2*(b*
c - a*d)^2*(b*e - a*f)^3*Sqrt[a + b*x]) - (2*(A*b^2 - a*(b*B - a*
C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(5*b*(b*c - a*d)*(b*e - a*f)*(
a + b*x)^(5/2)) + (2*Sqrt[d]*(8*a^4*C*d^2*f^2 - a^3*b*d*f*(23*C*d
*e + 13*c*C*f - 2*B*d*f) - b^4*(2*A*d^2*e^2 - c*d*e*(5*B*e - 3*A*
f) - c^2*(15*C*e^2 - 10*B*e*f + 8*A*f^2)) - a^2*b^2*(d*f*(7*B*d*e
 + 2*B*c*f - 3*A*d*f) - C*(23*d^2*e^2 + 37*c*d*e*f + 3*c^2*f^2))
- a*b^3*(d^2*e*(3*B*e - 7*A*f) + 2*c^2*f*(5*C*e - B*f) + c*d*(40*
C*e^2 - 13*f*(B*e - A*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[
e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a
*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^3*(-(b*c) + a*d)^(3
/2)*(b*e - a*f)^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])
+ (2*Sqrt[d]*(d*e - c*f)*(4*a^3*C*d*f - b^3*(5*B*c*e - 2*A*d*e -
4*A*c*f) + a*b^2*(10*c*C*e + 3*B*d*e + B*c*f - 6*A*d*f) - a^2*b*(
8*C*d*e + 6*c*C*f - B*d*f))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[
(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x
])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^3
*(-(b*c) + a*d)^(3/2)*(b*e - a*f)^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 9.58534, antiderivative size = 1034, normalized size of antiderivative = 1., number

of steps used = 9, number of rules used = 8, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.21$

$$-\frac{2\left(Ab^2-a(bB-aC)\right)\sqrt{e+fx}(c+dx)^{3/2}}{5b(bc-ad)(be-af)(a+bx)^{5/2}}$$

$$-\frac{2\left(8Cd^2f^2a^4-bdf(23Cde+13cCf-2Bdf)a^3-b^2\left(df(7Bde+2Bcf-3Adf)-C\left(23d^2e^2+37cdfe+3c^2f^2\right)\right)a^2-b^3 \ldots}{\ldots}$$

$$+\frac{2\left(4Cdfa^3-b(8Cde+6cCf-Bdf)a^2+b^2(10cCe+3Bde+Bcf-6Adf)a-b^3(5Bce-2Ade-4Acf)\right)\sqrt{e+fx}\sqrt{c+dx}}{15b^2(bc-ad)(be-af)^2(a+bx)^{3/2}}$$

$$+\frac{2\sqrt{d}\left(8Cd^2f^2a^4-bdf(23Cde+13cCf-2Bdf)a^3-b^2\left(df(7Bde+2Bcf-3Adf)-C\left(23d^2e^2+37cdfe+3c^2f^2\right)\right)a^2- \ldots}{\ldots}$$

$$+\frac{2\sqrt{d}(de-cf)\left(4Cdfa^3-b(8Cde+6cCf-Bdf)a^2+b^2(10cCe+3Bde+Bcf-6Adf)a-b^3(5Bce-2Ade-4Acf)\right)\sqrt{\frac{b(c \ldots}{bc \ldots}}}{15b^3(ad-bc)^{3/2}(be-af)^2\sqrt{e+fx}\sqrt{c+dx}}$$

Antiderivative was successfully verified.

```
[In]  Int[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^(7/2)*Sqrt[e + f*x]),x]
```

```
[Out] (2*(4*a^3*C*d*f - b^3*(5*B*c*e - 2*A*d*e - 4*A*c*f) + a*b^2*(10*c
*C*e + 3*B*d*e + B*c*f - 6*A*d*f) - a^2*b*(8*C*d*e + 6*c*C*f - B*
d*f))*Sqrt[c + d*x]*Sqrt[e + f*x])/(15*b^2*(b*c - a*d)*(b*e - a*f
)^2*(a + b*x)^(3/2)) - (2*(8*a^4*C*d^2*f^2 - a^3*b*d*f*(23*C*d*e
+ 13*c*C*f - 2*B*d*f) - b^4*(2*A*d^2*e^2 - c*d*e*(5*B*e - 3*A*f)
- c^2*(15*C*e^2 - 10*B*e*f + 8*A*f^2)) - a^2*b^2*(d*f*(7*B*d*e +
2*B*c*f - 3*A*d*f) - C*(23*d^2*e^2 + 37*c*d*e*f + 3*c^2*f^2)) - a
*b^3*(d^2*e*(3*B*e - 7*A*f) + 2*c^2*f*(5*C*e - B*f) + c*d*(40*C*e
^2 - 13*f*(B*e - A*f))))*Sqrt[c + d*x]*Sqrt[e + f*x])/(15*b^2*(b*
c - a*d)^2*(b*e - a*f)^3*Sqrt[a + b*x]) - (2*(A*b^2 - a*(b*B - a*
C))*(c + d*x)^(3/2)*Sqrt[e + f*x])/(5*b*(b*c - a*d)*(b*e - a*f)*(
a + b*x)^(5/2)) + (2*Sqrt[d]*(8*a^4*C*d^2*f^2 - a^3*b*d*f*(23*C*d
*e + 13*c*C*f - 2*B*d*f) - b^4*(2*A*d^2*e^2 - c*d*e*(5*B*e - 3*A*
f) - c^2*(15*C*e^2 - 10*B*e*f + 8*A*f^2)) - a^2*b^2*(d*f*(7*B*d*e
 + 2*B*c*f - 3*A*d*f) - C*(23*d^2*e^2 + 37*c*d*e*f + 3*c^2*f^2))
- a*b^3*(d^2*e*(3*B*e - 7*A*f) + 2*c^2*f*(5*C*e - B*f) + c*d*(40*
C*e^2 - 13*f*(B*e - A*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[
e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a
*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^3*(-(b*c) + a*d)^(3
/2)*(b*e - a*f)^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)])
+ (2*Sqrt[d]*(d*e - c*f)*(4*a^3*C*d*f - b^3*(5*B*c*e - 2*A*d*e -
4*A*c*f) + a*b^2*(10*c*C*e + 3*B*d*e + B*c*f - 6*A*d*f) - a^2*b*(
8*C*d*e + 6*c*C*f - B*d*f))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[
(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x
])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^3
*(-(b*c) + a*d)^(3/2)*(b*e - a*f)^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(7/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 20.9661, size = 13302, normalized size = 12.86

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + d*x]*(A + B*x + C*x^2))/((a + b*x)^(7/2)*Sqrt[e + f*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.261, size = 33007, normalized size = 31.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+B*x+A)*(d*x+c)^(1/2)/(b*x+a)^(7/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{dx + c}}{(bx + a)^{\frac{7}{2}}\sqrt{fx + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(7/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(7/2)*sqrt(f
*x + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(Cx^2+Bx+A\right)\sqrt{dx+c}}{\left(b^3x^3+3\,ab^2x^2+3\,a^2bx+a^3\right)\sqrt{bx+a}\sqrt{fx+e}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(7/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(d*x + c)/((b^3*x^3 + 3*a*b^2*x^2
+ 3*a^2*b*x + a^3)*sqrt(b*x + a)*sqrt(f*x + e)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)*(d*x+c)**(1/2)/(b*x+a)**(7/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2+Bx+A\right)\sqrt{dx+c}}{(bx+a)^{\frac{7}{2}}\sqrt{fx+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(7/2)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(d*x + c)/((b*x + a)^(7/2)*sqrt(f
*x + e)), x)
```

3.107 $\int \frac{(a+bx)^{3/2}\left(A+Bx+Cx^2\right)}{\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=838

$$\frac{2C\sqrt{c+dx}\sqrt{e+fx}(a+bx)^{5/2}}{7bdf}-\frac{2(2aCdf-b(7Bdf-6C(de+cf)))\sqrt{c+dx}\sqrt{e+fx}(a+bx)^{3/2}}{35bd^2f^2}$$

$$-\frac{2(5bdf(5bcCe+aCde+acCf-7Abdf)+(3adf-4b(de+cf))(2aCdf-b(7Bdf-6C(de+cf))))\sqrt{c+dx}\sqrt{e+fx}\sqrt{a+}}{105bd^3f^3}$$

$$-\frac{2\sqrt{ad-bc}\left(3bdf(5adf(5bcCe+aCde+acCf-7Abdf)-(3bce+ade+acf)(2aCdf-b(7Bdf-6C(de+cf))))+2\left(\frac{aa}{2}\right.\right.}{}$$

$$-\frac{2\sqrt{ad-bc}(be-af)\left(-\left(C\left(48d^3e^3+16cd^2fe^2+17c^2df^2e+24c^3f^3\right)+7df\left(5Adf(2de+cf)-B\left(8d^2e^2+3cdfe+4c^2f\right.\right.\right.\right.}{}$$

```
[Out] (-2*(5*b*d*f*(5*b*c*C*e + a*C*d*e + a*c*C*f - 7*A*b*d*f) + (3*a*d
*f - 4*b*(d*e + c*f))*(2*a*C*d*f - b*(7*B*d*f - 6*C*(d*e + c*f)))
)*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b*d^3*f^3) - (2
*(2*a*C*d*f - b*(7*B*d*f - 6*C*(d*e + c*f)))*(a + b*x)^(3/2)*Sqrt
[c + d*x]*Sqrt[e + f*x])/(35*b*d^2*f^2) + (2*C*(a + b*x)^(5/2)*Sq
rt[c + d*x]*Sqrt[e + f*x])/(7*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(3*b
*d*f*(5*a*d*f*(5*b*c*C*e + a*C*d*e + a*c*C*f - 7*A*b*d*f) - (3*b*
c*e + a*d*e + a*c*f)*(2*a*C*d*f - b*(7*B*d*f - 6*C*(d*e + c*f))))
 + 2*((a*d*f)/2 - b*(d*e + c*f))*(5*b*d*f*(5*b*c*C*e + a*C*d*e +
a*c*C*f - 7*A*b*d*f) + (3*a*d*f - 4*b*(d*e + c*f))*(2*a*C*d*f - b
*(7*B*d*f - 6*C*(d*e + c*f)))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*S
qrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c)
 + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^2*d^(7/2)*f^4*
Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) - (2*Sqrt[-(b*c) +
 a*d]*(b*e - a*f)*(3*a^2*C*d^2*f^2*(d*e - c*f) - 3*a*b*d*f*(7*d*f
*(3*B*d*e + 2*B*c*f - 5*A*d*f) - C*(16*d^2*e^2 + 8*c*d*e*f + 11*c
^2*f^2)) - b^2*(C*(48*d^3*e^3 + 16*c*d^2*e^2*f + 17*c^2*d*e*f^2 +
 24*c^3*f^3) + 7*d*f*(5*A*d*f*(2*d*e + c*f) - B*(8*d^2*e^2 + 3*c*
d*e*f + 4*c^2*f^2))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e
+ f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqr
t[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^2*d^(7
/2)*f^4*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 7.85691, antiderivative size = 831, normalized size of antiderivative = 0.99, number

of steps used = 9, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$\frac{2C\sqrt{c+dx}\sqrt{e+fx}(a+bx)^{5/2}}{7bdf}+\frac{2(7bBdf-2aCdf-6bC(de+cf))\sqrt{c+dx}\sqrt{e+fx}(a+bx)^{3/2}}{35bd^2f^2}$$
$$-\frac{2(5bdf(5bcCe+aCde+acCf-7Abdf)-(3adf-4b(de+cf))(7bBdf-2aCdf-6bC(de+cf)))\sqrt{c+dx}\sqrt{e+fx}\sqrt{a+}}{105bd^3f^3}$$
$$-\frac{2\sqrt{ad-bc}\left(3bdf(5adf(5bcCe+aCde+acCf-7Abdf)+(3bce+ade+acf)(7bBdf-2aCdf-6bC(de+cf)))+2\left(\frac{ad}{2}\right.\right.}{}$$
$$-\frac{2\sqrt{ad-bc}(be-af)\left(-\left(C\left(48d^3e^3+16cd^2fe^2+17c^2df^2e+24c^3f^3\right)+7df\left(5Adf(2de+cf)-B\left(8d^2e^2+3cdfe+4c^2f\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)^(3/2)*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (-2*(5*b*d*f*(5*b*c*C*e + a*C*d*e + a*c*C*f - 7*A*b*d*f) - (3*a*d
*f - 4*b*(d*e + c*f))*(7*b*B*d*f - 2*a*C*d*f - 6*b*C*(d*e + c*f))
)*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(105*b*d^3*f^3) + (2
*(7*b*B*d*f - 2*a*C*d*f - 6*b*C*(d*e + c*f))*(a + b*x)^(3/2)*Sqrt
[c + d*x]*Sqrt[e + f*x])/(35*b*d^2*f^2) + (2*C*(a + b*x)^(5/2)*Sq
rt[c + d*x]*Sqrt[e + f*x])/(7*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(3*b
*d*f*(5*a*d*f*(5*b*c*C*e + a*C*d*e + a*c*C*f - 7*A*b*d*f) + (3*b*
c*e + a*d*e + a*c*f)*(7*b*B*d*f - 2*a*C*d*f - 6*b*C*(d*e + c*f)))
 + 2*((a*d*f)/2 - b*(d*e + c*f))*(5*b*d*f*(5*b*c*C*e + a*C*d*e +
a*c*C*f - 7*A*b*d*f) - (3*a*d*f - 4*b*(d*e + c*f))*(7*b*B*d*f - 2
*a*C*d*f - 6*b*C*(d*e + c*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*S
qrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c)
 + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^2*d^(7/2)*f^4*
Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) - (2*Sqrt[-(b*c) +
 a*d]*(b*e - a*f)*(3*a^2*C*d^2*f^2*(d*e - c*f) - 3*a*b*d*f*(7*d*f
*(3*B*d*e + 2*B*c*f - 5*A*d*f) - C*(16*d^2*e^2 + 8*c*d*e*f + 11*c
^2*f^2)) - b^2*(C*(48*d^3*e^3 + 16*c*d^2*e^2*f + 17*c^2*d*e*f^2 +
 24*c^3*f^3) + 7*d*f*(5*A*d*f*(2*d*e + c*f) - B*(8*d^2*e^2 + 3*c*
d*e*f + 4*c^2*f^2))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e
+ f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqr
t[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(105*b^2*d^(7
/2)*f^4*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(3/2)*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 19.9034, size = 7300, normalized size = 8.71

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)^(3/2)*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.082, size = 10546, normalized size = 12.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(3/2)*(C*x^2+B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)(bx + a)^{\frac{3}{2}}}{\sqrt{dx + c}\sqrt{fx + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(Cbx^3 + (Ca + Bb)x^2 + Aa + (Ba + Ab)x\right)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integral((C*b*x^3 + (C*a + B*b)*x^2 + A*a + (B*a + A*b)*x)*sqrt(b
*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(3/2)*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)(bx + a)^{\frac{3}{2}}}{\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

3.108 $\int \frac{\sqrt{a+bx}\left(A+Bx+Cx^2\right)}{\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=528

$$-\frac{2\sqrt{ad-bc}(be-af)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(aCdf(de-cf)-b\left(5df(-3Adf+Bcf+2Bde)-C\left(4c^2f^2+3cdef+8d^2e^2\right)\right)\right)F}{15b^2d^{5/2}f^3\sqrt{c+dx}\sqrt{e+fx}}$$
$$-\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}(3bdf(acCf+aCde-5Abdf+3bcCe)+(adf-2b(cf+de))(2aCdf-b(5Bdf-4C(cf+d}{15b^2d^{5/2}f^3\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}$$
$$-\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}(2aCdf-b(5Bdf-4C(cf+de)))}{15bd^2f^2}+\frac{2C(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}}{5bdf}$$

```
[Out] (-2*(2*a*C*d*f - b*(5*B*d*f - 4*C*(d*e + c*f)))*Sqrt[a + b*x]*Sqr
t[c + d*x]*Sqrt[e + f*x])/(15*b*d^2*f^2) + (2*C*(a + b*x)^(3/2)*S
qrt[c + d*x]*Sqrt[e + f*x])/(5*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(3*
b*d*f*(3*b*c*C*e + a*C*d*e + a*c*C*f - 5*A*b*d*f) + (a*d*f - 2*b*
(d*e + c*f))*(2*a*C*d*f - b*(5*B*d*f - 4*C*(d*e + c*f))))*Sqrt[(b
*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*
Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f
))])/(15*b^2*d^(5/2)*f^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e -
a*f)]) - (2*Sqrt[-(b*c) + a*d]*(b*e - a*f)*(a*C*d*f*(d*e - c*f) -
 b*(5*d*f*(2*B*d*e + B*c*f - 3*A*d*f) - C*(8*d^2*e^2 + 3*c*d*e*f
+ 4*c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))
/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c
) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^2*d^(5/2)*f^3*
Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 2.93789, antiderivative size = 524, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$-\frac{2\sqrt{ad-bc}(be-af)\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(aCdf(de-cf)+5bdf(3Adf-B(cf+2de))+bC\left(4c^2f^2+3cdef+8d^2e^2\right)\right)F\left(s\right.}{15b^2d^{5/2}f^3\sqrt{c+dx}\sqrt{e+fx}}$$
$$-\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}(3bdf(acCf+aCde-5Abdf+3bcCe)-(adf-2b(cf+de))(-2aCdf+5bBdf-4bC(cf+}{15b^2d^{5/2}f^3\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}$$
$$+\frac{2\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}(-2aCdf+5bBdf-4bC(cf+de))}{15bd^2f^2}+\frac{2C(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}}{5bdf}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[a + b*x]*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (2*(5*b*B*d*f - 2*a*C*d*f - 4*b*C*(d*e + c*f))*Sqrt[a + b*x]*Sqrt
[c + d*x]*Sqrt[e + f*x])/(15*b*d^2*f^2) + (2*C*(a + b*x)^(3/2)*Sq
rt[c + d*x]*Sqrt[e + f*x])/(5*b*d*f) - (2*Sqrt[-(b*c) + a*d]*(3*b
*d*f*(3*b*c*C*e + a*C*d*e + a*c*C*f - 5*A*b*d*f) - (a*d*f - 2*b*(
d*e + c*f))*(5*b*B*d*f - 2*a*C*d*f - 4*b*C*(d*e + c*f)))*Sqrt[(b*
(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*S
qrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f)
)])/(15*b^2*d^(5/2)*f^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a
*f)]) - (2*Sqrt[-(b*c) + a*d]*(b*e - a*f)*(a*C*d*f*(d*e - c*f) +
b*C*(8*d^2*e^2 + 3*c*d*e*f + 4*c^2*f^2) + 5*b*d*f*(3*A*d*f - B*(2
*d*e + c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/
(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c)
 + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^2*d^(5/2)*f^3*S
qrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(1/2)*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 15.704, size = 3657, normalized size = 6.93

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[a + b*x]*(A + B*x + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] Sqrt[a + b*x]*Sqrt[c + d*x]*((2*(-4*b*C*d*e - 4*b*c*C*f + 5*b*B*d
*f + a*C*d*f))/(15*b*d^2*f^2) + (2*C*x)/(5*d*f))*Sqrt[e + f*x] -
(2*(((-8*b^2*C*d^2*e^2 - 7*b^2*c*C*d*e*f + 10*b^2*B*d^2*e*f + 3*a
*b*C*d^2*e*f - 8*b^2*c^2*C*f^2 + 10*b^2*B*c*d*f^2 + 3*a*b*c*C*d*f
^2 - 15*A*b^2*d^2*f^2 - 5*a*b*B*d^2*f^2 + 2*a^2*C*d^2*f^2)*(a + b
*x)^(3/2)*(d + (b*c)/(a + b*x) - (a*d)/(a + b*x))*(f + (b*e)/(a +
 b*x) - (a*f)/(a + b*x)))/(d*f*Sqrt[c + ((a + b*x)*(d - (a*d)/(a
+ b*x)))/b]*Sqrt[e + ((a + b*x)*(f - (a*f)/(a + b*x)))/b]) + ((-(
b*c) + a*d)*(-(b*e) + a*f)*(a + b*x)*Sqrt[(d + (b*c)/(a + b*x) -
(a*d)/(a + b*x))*(f + (b*e)/(a + b*x) - (a*f)/(a + b*x))]*(((8*I)
*b^2*C*d^2*e^2*f*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 -
(-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c)
 + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)
] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]],
```

```
 (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/
d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a
*f)/(a + b*x))]) + ((7*I)*b^2*c*C*d*e*f^2*Sqrt[1 - (-(b*c) + a*d)
/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE
[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) +
 a*f))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) +
 a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)])
)/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)
/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) - ((10*I)*b^2*B*d^2*e*f
^2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)
/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sq
rt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[
I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) +
a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) +
a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))
]) - ((3*I)*a*b*C*d^2*e*f^2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))
]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqr
t[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c
) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt
[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b
*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f
 + (b*e - a*f)/(a + b*x))]) + ((8*I)*b^2*c^2*C*f^3*Sqrt[1 - (-(b*
c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(
EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*
(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-(
(-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) +
a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b
*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) - ((10*I)*b^2*
B*c*d*f^3*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e)
 + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)
/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - Ell
ipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(
b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(
b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a
+ b*x))]) - ((3*I)*a*b*c*C*d*f^3*Sqrt[1 - (-(b*c) + a*d)/(d*(a +
b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSin
h[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((
-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]
/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-
((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x
))*(f + (b*e - a*f)/(a + b*x))]) + ((15*I)*A*b^2*d^2*f^3*Sqrt[1 -
 (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*
x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]
], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[S
qrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b
*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(
d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) + ((5*I)
*a*b*B*d^2*f^3*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-
(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) +
 a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]
 - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (
d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)
]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f
)/(a + b*x))]) - ((2*I)*a^2*C*d^2*f^3*Sqrt[1 - (-(b*c) + a*d)/(d*
(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*A
rcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f
```

```
))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d
)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(S
qrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a
+ b*x))*(f + (b*e - a*f)/(a + b*x))]) - ((4*I)*b*C*d^2*e*f*Sqrt[1
 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a +
b*x))]*EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x
]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)])/(Sqrt[-((-(b*c) + a*d
)/d)]*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x)
)]) - ((4*I)*b*c*C*d*f^2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*S
qrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*EllipticF[I*ArcSinh[Sqrt[-(
(-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) +
a*d)*f)])/(Sqrt[-((-(b*c) + a*d)/d)]*Sqrt[(d + (b*c - a*d)/(a + b
*x))*(f + (b*e - a*f)/(a + b*x))]) + ((5*I)*b*B*d^2*f^2*Sqrt[1 -
(-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x
))]*EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]],
 (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)])/(Sqrt[-((-(b*c) + a*d)/d
)]*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))])
 - ((2*I)*a*C*d^2*f^2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt
[1 - (-(b*e) + a*f)/(f*(a + b*x))]*EllipticF[I*ArcSinh[Sqrt[-((-(
b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d
)*f)])/(Sqrt[-((-(b*c) + a*d)/d)]*Sqrt[(d + (b*c - a*d)/(a + b*x)
)*(f + (b*e - a*f)/(a + b*x))])))/(d*f*Sqrt[c + ((a + b*x)*(d - (
a*d)/(a + b*x)))/b]*Sqrt[e + ((a + b*x)*(f - (a*f)/(a + b*x)))/b]
)))/(15*b^3*d^2*f^2)
```

Maple [B] time = 0.045, size = 6174, normalized size = 11.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)^(1/2)*(C*x^2+B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + Bx + A\right)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x
 + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(Cx^2 + Bx + A)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorit
```

```
[Out] integral((C*x^2 + B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x
+ e)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + bx}\,(A + Bx + Cx^2)}{\sqrt{c + dx}\sqrt{e + fx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(1/2)*(C*x**2+B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*x)*(A + B*x + C*x**2)/(sqrt(c + d*x)*sqrt(e +
 f*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + Bx + A)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x
 + e)), x)
```

3.109 $\int \frac{A+Bx+Cx^2}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=384

$$\frac{2\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}(aCf(de-cf)-b(3df(Be-Af)-Ce(cf+2de)))F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^2d^{3/2}f^2\sqrt{c+dx}\sqrt{e+fx}}+\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}(3bBdf-2C(adf+bcf+bde))E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^2d^{3/2}f^2\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}+\frac{2C\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}}{3bdf}$$

```
[Out] (2*C*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*d*f) + (2*Sq
rt[-(b*c) + a*d]*(3*b*B*d*f - 2*C*(b*d*e + b*c*f + a*d*f))*Sqrt[(
b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]
*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*
f))])/(3*b^2*d^(3/2)*f^2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e -
a*f)]) + (2*Sqrt[-(b*c) + a*d]*(a*C*f*(d*e - c*f) - b*(3*d*f*(B*e
 - A*f) - C*e*(2*d*e + c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqr
t[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b
*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^
2*d^(3/2)*f^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 1.57633, antiderivative size = 383, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$

$$-\frac{2\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}(-aCf(de-cf)+3bdf(Be-Af)-bCe(cf+2de))F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^2d^{3/2}f^2\sqrt{c+dx}\sqrt{e+fx}}+\frac{2\sqrt{e+fx}\sqrt{ad-bc}\sqrt{\frac{b(c+dx)}{bc-ad}}(3bBdf-2C(adf+bcf+bde))E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{3b^2d^{3/2}f^2\sqrt{c+dx}\sqrt{\frac{b(e+fx)}{be-af}}}+\frac{2C\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}}{3bdf}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (2*C*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*d*f) + (2*Sq
rt[-(b*c) + a*d]*(3*b*B*d*f - 2*C*(b*d*e + b*c*f + a*d*f))*Sqrt[(
b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]
*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*
f))])/(3*b^2*d^(3/2)*f^2*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e -
```

```
a*f)]) - (2*Sqrt[-(b*c) + a*d]*(3*b*d*f*(B*e - A*f) - a*C*f*(d*e
- c*f) - b*C*e*(2*d*e + c*f))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqr
t[(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b
*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^
2*d^(3/2)*f^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 10.2635, size = 418, normalized size = 1.09

$$\frac{\sqrt{a+bx}\left(\frac{2ibf\sqrt{a+bx}\sqrt{\frac{b(c+dx)}{d(a+bx)}}\sqrt{\frac{b(e+fx)}{f(a+bx)}}\left(aCd(cf-de)+b\left(3Ad^2f+cd(Ce-3Bf)+2c^2Cf\right)\right)F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{bc}{d}-a}}{\sqrt{a+bx}}\right)|\frac{bde-adf}{bcf-adf}\right)}{\sqrt{\frac{bc}{d}-a}}-\frac{2b^2(c+dx)(e+fx)(2aCdf-3}{a+bx}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (Sqrt[a + b*x]*(2*b^2*C*d*f*(c + d*x)*(e + f*x) - (2*b^2*(-3*b*B*
d*f + 2*a*C*d*f + 2*b*C*(d*e + c*f))*(c + d*x)*(e + f*x))/(a + b*
x) + (2*I)*Sqrt[-a + (b*c)/d]*d*f*(3*b*B*d*f - 2*a*C*d*f - 2*b*C*
(d*e + c*f))*Sqrt[a + b*x]*Sqrt[(b*(c + d*x))/(d*(a + b*x))]*Sqrt
[(b*(e + f*x))/(f*(a + b*x))]*EllipticE[I*ArcSinh[Sqrt[-a + (b*c)
/d]/Sqrt[a + b*x]], (b*d*e - a*d*f)/(b*c*f - a*d*f)] + ((2*I)*b*f
*(a*C*d*(-(d*e) + c*f) + b*(2*c^2*C*f + 3*A*d^2*f + c*d*(C*e - 3*
B*f)))*Sqrt[a + b*x]*Sqrt[(b*(c + d*x))/(d*(a + b*x))]*Sqrt[(b*(e
 + f*x))/(f*(a + b*x))]*EllipticF[I*ArcSinh[Sqrt[-a + (b*c)/d]/Sq
rt[a + b*x]], (b*d*e - a*d*f)/(b*c*f - a*d*f)])/Sqrt[-a + (b*c)/d
]))/(3*b^3*d^2*f^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Maple [B] time = 0.042, size = 2497, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] 2/3*(C*x^2*a*b^2*d^2*f^2+C*x^3*b^3*d^2*f^2+C*a*b^2*c*d*e*f+2*C*((
b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*
b/(a*d-b*c))^(1/2)*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*
c)*f/d/(a*f-b*e))^(1/2))*a^3*d^2*f^2-C*((b*x+a)*d/(a*d-b*c))^(1/2
)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*Ellip
ticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))
*a^2*b*c*d*f^2+C*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e
))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*EllipticF(((b*x+a)*d/(a*d-b
*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b*d^2*e*f-3*B*((b
*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b
/(a*d-b*c))^(1/2)*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c
)*f/d/(a*f-b*e))^(1/2))*a*b^2*d^2*e*f+3*B*((b*x+a)*d/(a*d-b*c))^(
1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*El
lipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/
2))*b^3*c*d*e*f+3*B*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-
b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*EllipticE(((b*x+a)*d/(a*
d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^2*c*d*f^2+3*B*
((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c
)*b/(a*d-b*c))^(1/2)*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-
b*c)*f/d/(a*f-b*e))^(1/2))*a*b^2*d^2*e*f-3*B*((b*x+a)*d/(a*d-b*c)
)^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)
*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^
(1/2))*b^3*c*d*e*f+C*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f
-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*EllipticF(((b*x+a)*d/(a
*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^2*c^2*f^2+2*C
*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+
c)*b/(a*d-b*c))^(1/2)*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d
-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^2*d^2*e^2-C*((b*x+a)*d/(a*d-b*c))
^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*
EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(
1/2))*b^3*c^2*e*f-2*C*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*
f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*EllipticF(((b*x+a)*d/(
a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^3*c*d*e^2-2*C*
((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c
)*b/(a*d-b*c))^(1/2)*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-
b*c)*f/d/(a*f-b*e))^(1/2))*a*b^2*c^2*f^2-2*C*((b*x+a)*d/(a*d-b*c)
)^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)
*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^
(1/2))*a*b^2*d^2*e^2+2*C*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/
(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*EllipticE(((b*x+a)*
d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^3*c^2*e*f+2
*C*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*
x+c)*b/(a*d-b*c))^(1/2)*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a
*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^3*c*d*e^2+3*A*((b*x+a)*d/(a*d-b*c
))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2
)*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))
^(1/2))*a*b^2*d^2*f^2-3*A*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b
/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)*EllipticF(((b*x+a)
*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^3*c*d*f^2-
3*B*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d
*x+c)*b/(a*d-b*c))^(1/2)*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((
```

```
a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b*d^2*f^2-2*C*((b*x+a)*d/(a*d-
b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(
1/2)*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*
e))^(1/2))*a*b^2*c*d*e*f+C*x*a*b^2*c*d*f^2+C*x*a*b^2*d^2*e*f+C*x*
b^3*c*d*e*f+C*x^2*b^3*c*d*f^2+C*x^2*b^3*d^2*e*f)*(b*x+a)^(1/2)*(d
*x+c)^(1/2)*(f*x+e)^(1/2)/f^2/d^2/b^3/(b*d*f*x^3+a*d*f*x^2+b*c*f*
x^2+b*d*e*x^2+a*c*f*x+a*d*e*x+b*c*e*x+a*c*e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x
 + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cx^2 + Bx + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)),x, algorit
```

```
[Out] integral((C*x^2 + B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x
+ e)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Bx + Cx^2}{\sqrt{a + bx}\sqrt{c + dx}\sqrt{e + fx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Integral((A + B*x + C*x**2)/(sqrt(a + b*x)*sqrt(c + d*x)*sqrt(e +
 f*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)),x, algorit
```

```
[Out] integrate((C*x^2 + B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x
 + e)), x)
```

3.110 $\int \frac{A+Bx+Cx^2}{(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=422

$$-\frac{2\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(2a^2Cdf-ab(Bdf+cCf+Cde)+b^2(Adf+cCe)\right)E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{b^2\sqrt{d}f\sqrt{c+dx}\sqrt{ad-bc}(be-af)\sqrt{\frac{b(e+fx)}{be-af}}}-\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b\sqrt{a+bx}(bc-ad)(be-af)}-\frac{2\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}(aC(de-cf)-b(Adf-Bcf+cCe))F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{b^2\sqrt{d}f\sqrt{c+dx}\sqrt{e+fx}\sqrt{ad-bc}}$$

```
[Out] (-2*(A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(b*(b*c
- a*d)*(b*e - a*f)*Sqrt[a + b*x]) - (2*(2*a^2*C*d*f + b^2*(c*C*e
+ A*d*f) - a*b*(C*d*e + c*C*f + B*d*f))*Sqrt[(b*(c + d*x))/(b*c -
 a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqr
t[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(b^2*Sqrt[d]*
Sqrt[-(b*c) + a*d]*f*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))
/(b*e - a*f)]) - (2*(a*C*(d*e - c*f) - b*(c*C*e - B*c*f + A*d*f))
*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*
EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b
*c - a*d)*f)/(d*(b*e - a*f))])/(b^2*Sqrt[d]*Sqrt[-(b*c) + a*d]*f*
Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 2.04927, antiderivative size = 422, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$

$$-\frac{2\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(2a^2Cdf-ab(Bdf+cCf+Cde)+b^2(Adf+cCe)\right)E\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{b^2\sqrt{d}f\sqrt{c+dx}\sqrt{ad-bc}(be-af)\sqrt{\frac{b(e+fx)}{be-af}}}-\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{b\sqrt{a+bx}(bc-ad)(be-af)}-\frac{2\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}(aC(de-cf)-b(Adf-Bcf+cCe))F\left(\sin^{-1}\left(\frac{\sqrt{d}\sqrt{a+bx}}{\sqrt{ad-bc}}\right)|\frac{(bc-ad)f}{d(be-af)}\right)}{b^2\sqrt{d}f\sqrt{c+dx}\sqrt{e+fx}\sqrt{ad-bc}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x + C*x^2)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (-2*(A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(b*(b*c
- a*d)*(b*e - a*f)*Sqrt[a + b*x]) - (2*(2*a^2*C*d*f + b^2*(c*C*e
+ A*d*f) - a*b*(C*d*e + c*C*f + B*d*f))*Sqrt[(b*(c + d*x))/(b*c -
```

```
 a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqr
t[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))]])/(b^2*Sqrt[d]*
Sqrt[-(b*c) + a*d]*f*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))
/(b*e - a*f)]) - (2*(a*C*(d*e - c*f) - b*(c*C*e - B*c*f + A*d*f))
*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(b*(e + f*x))/(b*e - a*f)]*
EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b
*c - a*d)*f)/(d*(b*e - a*f))]])/(b^2*Sqrt[d]*Sqrt[-(b*c) + a*d]*f*
Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 9.64346, size = 477, normalized size = 1.13

$$\frac{2\left(\frac{b^2(c+dx)(e+fx)\left(2a^2Cdf-ab(Bdf+cCf+Cde)+b^2(Adf+cCe)\right)}{df}+\frac{i(a+bx)^{3/2}(bc-ad)\sqrt{\frac{b(c+dx)}{d(a+bx)}}\sqrt{\frac{b(e+fx)}{f(a+bx)}}\left(2a^2Cdf-ab(Bdf+cCf+Cde)+b^2(Adf+cCe)\right)}{d\sqrt{\frac{bc}{d}-a}}\right.}{b^3\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (2*(-(b^2*(A*b^2 + a*(-(b*B) + a*C))*(c + d*x)*(e + f*x)) + (b^2*
(2*a^2*C*d*f + b^2*(c*C*e + A*d*f) - a*b*(C*d*e + c*C*f + B*d*f))
*(c + d*x)*(e + f*x))/(d*f) + (I*(b*c - a*d)*(2*a^2*C*d*f + b^2*(
c*C*e + A*d*f) - a*b*(C*d*e + c*C*f + B*d*f))*(a + b*x)^(3/2)*Sqr
t[(b*(c + d*x))/(d*(a + b*x))]*Sqrt[(b*(e + f*x))/(f*(a + b*x))]*
EllipticE[I*ArcSinh[Sqrt[-a + (b*c)/d]/Sqrt[a + b*x]], (b*d*e - a
*d*f)/(b*c*f - a*d*f)])/(Sqrt[-a + (b*c)/d]*d) + (I*b*(-(b*c) + a
*d)*(a*C*(d*e - c*f) + b*(c*C*e - B*d*e + A*d*f))*(a + b*x)^(3/2)
*Sqrt[(b*(c + d*x))/(d*(a + b*x))]*Sqrt[(b*(e + f*x))/(f*(a + b*x
))]*EllipticF[I*ArcSinh[Sqrt[-a + (b*c)/d]/Sqrt[a + b*x]], (b*d*e
 - a*d*f)/(b*c*f - a*d*f)])/(Sqrt[-a + (b*c)/d]*d)))/(b^3*(b*c -
a*d)*(b*e - a*f)*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Maple [B] time = 0.059, size = 3979, normalized size = 9.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] -2*(-B*x^2*a*b^3*d^2*f^2-B*a*b^3*c*d*e*f+C*a^2*b^2*c*d*e*f+A*b^4*
c*d*e*f+A*x^2*b^4*d^2*f^2-A*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2)
,((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c*d*f^2*((b*x+a)*d/(a*d-b
*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1
/2)-A*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b
*e))^(1/2))*a*b^3*d^2*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b
/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+A*EllipticE(((b*x+
a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^4*c*d*e*
f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x
+c)*b/(a*d-b*c))^(1/2)+A*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((
a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c*d*f^2*((b*x+a)*d/(a*d-b*c)
)^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)
+A*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e)
)^(1/2))*a*b^3*d^2*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a
*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-A*EllipticF(((b*x+a)*
d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^4*c*d*e*f*(
(b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)
*b/(a*d-b*c))^(1/2)+B*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d
-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*c*d*f^2*((b*x+a)*d/(a*d-b*c))
^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+
B*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))
^(1/2))*a^2*b^2*d^2*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(
a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+B*EllipticF(((b*x+a)
*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*c*d*
f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d
*x+c)*b/(a*d-b*c))^(1/2)-3*C*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2
),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^3*b*c*d*f^2*((b*x+a)*d/(a*d-
b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(
1/2)-3*C*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*
f-b*e))^(1/2))*a^3*b*d^2*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e
)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticE((
(b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3
*c^2*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)
*(-(d*x+c)*b/(a*d-b*c))^(1/2)+2*C*EllipticE(((b*x+a)*d/(a*d-b*c))
^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^4*d^2*f^2*((b*x+a)*d/(a
*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c)
)^(1/2)+C*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a
*f-b*e))^(1/2))*b^4*c^2*e^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)
*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-2*C*EllipticE(((
b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*
c*d*e^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*
(-(d*x+c)*b/(a*d-b*c))^(1/2)-C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1
/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^3*b*c*d*f^2*((b*x+a)*d/(a*
d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))
^(1/2)+C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*
f-b*e))^(1/2))*a^3*b*d^2*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e
```

```
)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+2*C*EllipticF((
(b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3
*c*d*e^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)
*(-(d*x+c)*b/(a*d-b*c))^(1/2)-B*EllipticE(((b*x+a)*d/(a*d-b*c))^(
1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c*d*e*f*((b*x+a)*d/(a
*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c)
)^(1/2)-B*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a
*f-b*e))^(1/2))*a*b^3*c*d*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+
e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+5*C*EllipticE(
((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*
b^2*c*d*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1
/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-C*EllipticF(((b*x+a)*d/(a*d-b*c)
)^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*c*d*e*f*((b*x+a)
*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d
-b*c))^(1/2)-A*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f
/d/(a*f-b*e))^(1/2))*a^2*b^2*d^2*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*
(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-B*Ellip
ticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))
*a^3*b*d^2*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))
^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-B*EllipticF(((b*x+a)*d/(a*d-b
*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a*b^3*c^2*f^2*((b*x+a
)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*
d-b*c))^(1/2)+B*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*
f/d/(a*f-b*e))^(1/2))*b^4*c^2*e*f*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(
f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+C*Elliptic
E(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^
2*b^2*c^2*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^
(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+C*EllipticE(((b*x+a)*d/(a*d-b*
c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*a^2*b^2*d^2*e^2*((b*x+
a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a
*d-b*c))^(1/2)+C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)
*f/d/(a*f-b*e))^(1/2))*a^2*b^2*c^2*f^2*((b*x+a)*d/(a*d-b*c))^(1/2
)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-C*Ell
ipticF(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2
))*a^2*b^2*d^2*e^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e)*b/(a*f-b
*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)+C*x^2*a^2*b^2*d^2*f^2+A*x
*b^4*c*d*f^2+A*x*b^4*d^2*e*f-C*EllipticF(((b*x+a)*d/(a*d-b*c))^(1
/2),((a*d-b*c)*f/d/(a*f-b*e))^(1/2))*b^4*c^2*e^2*((b*x+a)*d/(a*d-
b*c))^(1/2)*(-(f*x+e)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(
1/2)+A*EllipticE(((b*x+a)*d/(a*d-b*c))^(1/2),((a*d-b*c)*f/d/(a*f-
b*e))^(1/2))*a^2*b^2*d^2*f^2*((b*x+a)*d/(a*d-b*c))^(1/2)*(-(f*x+e
)*b/(a*f-b*e))^(1/2)*(-(d*x+c)*b/(a*d-b*c))^(1/2)-B*x*a*b^3*c*d*f
^2-B*x*a*b^3*d^2*e*f+C*x*a^2*b^2*c*d*f^2+C*x*a^2*b^2*d^2*e*f)*(f*
x+e)^(1/2)*(d*x+c)^(1/2)*(b*x+a)^(1/2)/d/f/b^3/(a*f-b*e)/(a*d-b*c
)/(b*d*f*x^3+a*d*f*x^2+b*c*f*x^2+b*d*e*x^2+a*c*f*x+a*d*e*x+b*c*e*
x+a*c*e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{(bx+a)^{\frac{3}{2}}\sqrt{dx+c}\sqrt{fx+e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cx^2 + Bx + A}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integral((C*x^2 + B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*
x + e)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

3.111 $\int \frac{A+Bx+Cx^2}{(a+bx)^{5/2}\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=642

$$-\frac{2\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(a^2Cd(de-cf)+ab\left(3f\left(Ad^2+c^2C\right)-Bd(2cf+de)\right)-b^2\left(Acdf+2Ad^2e-3Bcde+3c^2Ce\right)\right)F\left(\sin\right.}{3b^2\sqrt{d}\sqrt{c+dx}\sqrt{e+fx}(ad-bc)^{3/2}(be-af)}$$
$$+\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(2a^3Cdf+a^2b(Bdf-4C(cf+de))+ab^2(-4Adf+Bcf+Bde+6cCe)-b^3(3Bce-2A(cf+de))\right)}{3b\sqrt{a+bx}(bc-ad)^2(be-af)^2}$$
$$-\frac{2\sqrt{d}\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(2a^3Cdf+a^2b(Bdf-4C(cf+de))+ab^2(-4Adf+Bcf+Bde+6cCe)-b^3(3Bce-2A(cf+de))\right)}{3b^2\sqrt{c+dx}(ad-bc)^{3/2}(be-af)^2\sqrt{\frac{b(e+fx)}{be-af}}}$$
$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{3b(a+bx)^{3/2}(bc-ad)(be-af)}$$

```
[Out] (-2*(A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*(b*
c - a*d)*(b*e - a*f)*(a + b*x)^(3/2)) + (2*(2*a^3*C*d*f + a*b^2*(
6*c*C*e + B*d*e + B*c*f - 4*A*d*f) - b^3*(3*B*c*e - 2*A*(d*e + c*
f)) + a^2*b*(B*d*f - 4*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x
])/(3*b*(b*c - a*d)^2*(b*e - a*f)^2*Sqrt[a + b*x]) - (2*Sqrt[d]*(
2*a^3*C*d*f + a*b^2*(6*c*C*e + B*d*e + B*c*f - 4*A*d*f) - b^3*(3*
B*c*e - 2*A*(d*e + c*f)) + a^2*b*(B*d*f - 4*C*(d*e + c*f)))*Sqrt[
(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d
]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a
*f))])/(3*b^2*(-(b*c) + a*d)^(3/2)*(b*e - a*f)^2*Sqrt[c + d*x]*Sq
rt[(b*(e + f*x))/(b*e - a*f)]) - (2*(a^2*C*d*(d*e - c*f) - b^2*(3
*c^2*C*e - 3*B*c*d*e + 2*A*d^2*e + A*c*d*f) + a*b*(3*(c^2*C + A*d
^2)*f - B*d*(d*e + 2*c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[
(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x
])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^2*
Sqrt[d]*(-(b*c) + a*d)^(3/2)*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[e + f
*x])
```

Rubi [A] time = 4.28106, antiderivative size = 642, normalized size of antiderivative = 1., number of

steps used = 8, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$-\frac{2\sqrt{\frac{b(c+dx)}{bc-ad}}\sqrt{\frac{b(e+fx)}{be-af}}\left(a^2Cd(de-cf)+ab\left(3f\left(Ad^2+c^2C\right)-Bd(2cf+de)\right)-b^2\left(Acdf+2Ad^2e-3Bcde+3c^2Ce\right)\right)F\left(\sin\right.}{3b^2\sqrt{d}\sqrt{c+dx}\sqrt{e+fx}(ad-bc)^{3/2}(be-af)}$$
$$+\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(2a^3Cdf+a^2b(Bdf-4C(cf+de))+ab^2(-4Adf+Bcf+Bde+6cCe)-b^3(3Bce-2A(cf+de))\right)}{3b\sqrt{a+bx}(bc-ad)^2(be-af)^2}$$
$$-\frac{2\sqrt{d}\sqrt{e+fx}\sqrt{\frac{b(c+dx)}{bc-ad}}\left(2a^3Cdf+a^2b(Bdf-4C(cf+de))+ab^2(-4Adf+Bcf+Bde+6cCe)-b^3(3Bce-2A(cf+de))\right)}{3b^2\sqrt{c+dx}(ad-bc)^{3/2}(be-af)^2\sqrt{\frac{b(e+fx)}{be-af}}}$$
$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{3b(a+bx)^{3/2}(bc-ad)(be-af)}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x + C*x^2)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (-2*(A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(3*b*(b*
c - a*d)*(b*e - a*f)*(a + b*x)^(3/2)) + (2*(2*a^3*C*d*f + a*b^2*(
6*c*C*e + B*d*e + B*c*f - 4*A*d*f) - b^3*(3*B*c*e - 2*A*(d*e + c*
f)) + a^2*b*(B*d*f - 4*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e + f*x
])/(3*b*(b*c - a*d)^2*(b*e - a*f)^2*Sqrt[a + b*x]) - (2*Sqrt[d]*(
2*a^3*C*d*f + a*b^2*(6*c*C*e + B*d*e + B*c*f - 4*A*d*f) - b^3*(3*
B*c*e - 2*A*(d*e + c*f)) + a^2*b*(B*d*f - 4*C*(d*e + c*f)))*Sqrt[
(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*EllipticE[ArcSin[(Sqrt[d
]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a
*f))])/(3*b^2*(-(b*c) + a*d)^(3/2)*(b*e - a*f)^2*Sqrt[c + d*x]*Sq
rt[(b*(e + f*x))/(b*e - a*f)]) - (2*(a^2*C*d*(d*e - c*f) - b^2*(3
*c^2*C*e - 3*B*c*d*e + 2*A*d^2*e + A*c*d*f) + a*b*(3*(c^2*C + A*d
^2)*f - B*d*(d*e + 2*c*f)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[
(b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x
])/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(3*b^2*
Sqrt[d]*(-(b*c) + a*d)^(3/2)*(b*e - a*f)*Sqrt[c + d*x]*Sqrt[e + f
*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*x**2+B*x+A)/(b*x+a)**(5/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 16.5525, size = 4349, normalized size = 6.77

Result too large to show

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x + C*x^2)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*((-2*(A*b^2 - a*b*B + a
^2*C))/(3*b*(b*c - a*d)*(b*e - a*f)*(a + b*x)^2) - (2*(3*b^3*B*c*
e - 6*a*b^2*c*C*e - 2*A*b^3*d*e - a*b^2*B*d*e + 4*a^2*b*C*d*e - 2
*A*b^3*c*f - a*b^2*B*c*f + 4*a^2*b*c*C*f + 4*a*A*b^2*d*f - a^2*b*
B*d*f - 2*a^3*C*d*f))/(3*b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x))
) + (2*(((3*b^3*B*c*e - 6*a*b^2*c*C*e - 2*A*b^3*d*e - a*b^2*B*d*e
 + 4*a^2*b*C*d*e - 2*A*b^3*c*f - a*b^2*B*c*f + 4*a^2*b*c*C*f + 4*
a*A*b^2*d*f - a^2*b*B*d*f - 2*a^3*C*d*f)*(a + b*x)^(3/2)*(d + (b*
c)/(a + b*x) - (a*d)/(a + b*x))*(f + (b*e)/(a + b*x) - (a*f)/(a +
 b*x)))/(Sqrt[c + ((a + b*x)*(d - (a*d)/(a + b*x)))/b]*Sqrt[e + (
(a + b*x)*(f - (a*f)/(a + b*x)))/b]) - ((b*c - a*d)*(b*e - a*f)*(
a + b*x)*Sqrt[(d + (b*c)/(a + b*x) - (a*d)/(a + b*x))*(f + (b*e)/
(a + b*x) - (a*f)/(a + b*x))]*(((3*I)*b^3*B*c*e*f*Sqrt[1 - (-(b*c
) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(E
llipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(
-(b*e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((
-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a
*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*
c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) - ((6*I)*a*b^2*
c*C*e*f*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) +
 a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d
)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - Ellip
ticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*
e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*
e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a +
b*x))]) - ((2*I)*A*b^3*d*e*f*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x)
)]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sq
rt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*
c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqr
t[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(
b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(
f + (b*e - a*f)/(a + b*x))]) - (I*a*b^2*B*d*e*f*Sqrt[1 - (-(b*c)
+ a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(Ell
ipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(
b*e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(
b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d
)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c
- a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) + ((4*I)*a^2*b*C*
d*e*f*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a
*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]
/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - Ellipti
cF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e)
 + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e)
 + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*
x))]) - ((2*I)*A*b^3*c*f^2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]
*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt
[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c)
```

```
 + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[
a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*
c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f
+ (b*e - a*f)/(a + b*x))]) - (I*a*b^2*B*c*f^2*Sqrt[1 - (-(b*c) +
a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(Ellip
ticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*
e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*
c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*
f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c -
a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) + ((4*I)*a^2*b*c*C*
f^2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f
)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/S
qrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF
[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) +
 a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) +
 a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x)
)]) + ((4*I)*a*A*b^2*d*f^2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]
*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt
[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c)
 + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[
a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*
c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f
+ (b*e - a*f)/(a + b*x))]) - (I*a^2*b*B*d*f^2*Sqrt[1 - (-(b*c) +
a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*(Ellip
ticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*
e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[I*ArcSinh[Sqrt[-((-(b*
c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*
f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a*f)*Sqrt[(d + (b*c -
a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) - ((2*I)*a^3*C*d*f^
2*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/
(f*(a + b*x))]*(EllipticE[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqr
t[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)] - EllipticF[I
*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a
*f))/((-(b*c) + a*d)*f)]))/(Sqrt[-((-(b*c) + a*d)/d)]*(-(b*e) + a
*f)*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]
) - ((3*I)*b^2*c*C*e*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[
1 - (-(b*e) + a*f)/(f*(a + b*x))]*EllipticF[I*ArcSinh[Sqrt[-((-(b
*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)
*f)])/(Sqrt[-((-(b*c) + a*d)/d)]*Sqrt[(d + (b*c - a*d)/(a + b*x))
*(f + (b*e - a*f)/(a + b*x))]) + ((3*I)*a*b*C*d*e*Sqrt[1 - (-(b*c
) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*El
lipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-
(b*e) + a*f))/((-(b*c) + a*d)*f)])/(Sqrt[-((-(b*c) + a*d)/d)]*Sqr
t[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) + ((3
*I)*a*b*c*C*f*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(
b*e) + a*f)/(f*(a + b*x))]*EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a
*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)])/(
Sqrt[-((-(b*c) + a*d)/d)]*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (
b*e - a*f)/(a + b*x))]) + (I*A*b^2*d*f*Sqrt[1 - (-(b*c) + a*d)/(d
*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*EllipticF[I*A
rcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f
))/((-(b*c) + a*d)*f)])/(Sqrt[-((-(b*c) + a*d)/d)]*Sqrt[(d + (b*c
 - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))]) - (I*a*b*B*d*f*S
qrt[1 - (-(b*c) + a*d)/(d*(a + b*x))]*Sqrt[1 - (-(b*e) + a*f)/(f*
(a + b*x))]*EllipticF[I*ArcSinh[Sqrt[-((-(b*c) + a*d)/d)]/Sqrt[a
+ b*x]], (d*(-(b*e) + a*f))/((-(b*c) + a*d)*f)])/(Sqrt[-((-(b*c)
```

```
+ a*d)/d)]*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a +
 b*x))]) - ((2*I)*a^2*C*d*f*Sqrt[1 - (-(b*c) + a*d)/(d*(a + b*x))
]*Sqrt[1 - (-(b*e) + a*f)/(f*(a + b*x))]*EllipticF[I*ArcSinh[Sqrt
[-((-(b*c) + a*d)/d)]/Sqrt[a + b*x]], (d*(-(b*e) + a*f))/((-(b*c)
 + a*d)*f)])/(Sqrt[-((-(b*c) + a*d)/d)]*Sqrt[(d + (b*c - a*d)/(a
+ b*x))*(f + (b*e - a*f)/(a + b*x))])))/(Sqrt[c + ((a + b*x)*(d -
 (a*d)/(a + b*x)))/b]*Sqrt[e + ((a + b*x)*(f - (a*f)/(a + b*x)))/
b])))/(3*b^3*(b*c - a*d)^2*(b*e - a*f)^2)
```

Maple [B] time = 0.157, size = 12988, normalized size = 20.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^(5/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{(bx + a)^{\frac{5}{2}}\sqrt{dx + c}\sqrt{fx + e}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cx^2 + Bx + A}{(b^2x^2 + 2\,abx + a^2)\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integral((C*x^2 + B*x + A)/((b^2*x^2 + 2*a*b*x + a^2)*sqrt(b*x +
a)*sqrt(d*x + c)*sqrt(f*x + e)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(b*x+a)**(5/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{(bx + a)^{\frac{5}{2}}\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

3.112 $\int \frac{A+Bx+Cx^2}{(a+bx)^{7/2}\sqrt{c+dx}\sqrt{e+fx}}\,dx$

Optimal. Leaf size=1116

$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{5b(bc-ad)(be-af)(a+bx)^{5/2}}$$

$$+\frac{2\sqrt{d}\left(2Cd^2f^2a^4+bdf(3Bdf-7C(de+cf))a^3-b^2\left(C\left(3d^2e^2-13cdfe+3c^2f^2\right)+df(23Adf-7B(de+cf))\right)a^2-b^3\left(-\cdots\right.\right.}{\cdots}$$

$$+\frac{2\sqrt{d}\left(Cdf(de-cf)a^3-3b\left(df(2Bde+3Bcf-5Adf)-C\left(d^2e^2+cdfe+3c^2f^2\right)\right)a^2+b^2\left(-f(20Ce-Bf)c^2-d\left(10Ce^2\cdots\right.\right.\right.}{15b\cdots}$$

$$+\frac{2\left(2Cd^2f^2a^4+bdf(3Bdf-7C(de+cf))a^3-b^2\left(C\left(3d^2e^2-13cdfe+3c^2f^2\right)+df(23Adf-7B(de+cf))\right)a^2-b^3\left(-2f\cdots\right.\right.}{1\cdots}$$

$$+\frac{2\left(2Cdfa^3+3b(Bdf-2C(de+cf))a^2+b^2(10cCe+Bde+Bcf-8Adf)a-b^3(5Bce-4A(de+cf))\right)\sqrt{c+dx}\sqrt{e+fx}}{15b(bc-ad)^2(be-af)^2(a+bx)^{3/2}}$$

```
[Out] (-2*(A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(5*b*(b*
c - a*d)*(b*e - a*f)*(a + b*x)^(5/2)) + (2*(2*a^3*C*d*f + a*b^2*(
10*c*C*e + B*d*e + B*c*f - 8*A*d*f) - b^3*(5*B*c*e - 4*A*(d*e + c
*f)) + 3*a^2*b*(B*d*f - 2*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e +
f*x])/(15*b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x)^(3/2)) + (2*(2*
a^4*C*d^2*f^2 + a^3*b*d*f*(3*B*d*f - 7*C*(d*e + c*f)) - b^4*(8*A*
d^2*e^2 - c*d*e*(10*B*e - 7*A*f) + c^2*(15*C*e^2 - 10*B*e*f + 8*A
*f^2)) - a*b^3*(d^2*e*(2*B*e - 23*A*f) - 2*c^2*f*(5*C*e - B*f) -
c*d*(10*C*e^2 - 33*B*e*f + 23*A*f^2)) - a^2*b^2*(C*(3*d^2*e^2 - 1
3*c*d*e*f + 3*c^2*f^2) + d*f*(23*A*d*f - 7*B*(d*e + c*f))))*Sqrt[
c + d*x]*Sqrt[e + f*x])/(15*b*(b*c - a*d)^3*(b*e - a*f)^3*Sqrt[a
+ b*x]) + (2*Sqrt[d]*(2*a^4*C*d^2*f^2 + a^3*b*d*f*(3*B*d*f - 7*C*
(d*e + c*f)) - b^4*(8*A*d^2*e^2 - c*d*e*(10*B*e - 7*A*f) + c^2*(1
5*C*e^2 - 10*B*e*f + 8*A*f^2)) - a*b^3*(d^2*e*(2*B*e - 23*A*f) -
2*c^2*f*(5*C*e - B*f) - c*d*(10*C*e^2 - 33*B*e*f + 23*A*f^2)) - a
^2*b^2*(C*(3*d^2*e^2 - 13*c*d*e*f + 3*c^2*f^2) + d*f*(23*A*d*f -
7*B*(d*e + c*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*
EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b
*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^2*(-(b*c) + a*d)^(5/2)*(b*e
- a*f)^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) + (2*Sqrt
[d]*(a^3*C*d*f*(d*e - c*f) + b^3*(8*A*d^2*e^2 - c*d*e*(10*B*e - 3
*A*f) + c^2*(15*C*e^2 - 5*B*e*f + 4*A*f^2)) + a*b^2*(d^2*e*(2*B*e
 - 19*A*f) - c^2*f*(20*C*e - B*f) - c*d*(10*C*e^2 - 27*B*e*f + 11
*A*f^2)) - 3*a^2*b*(d*f*(2*B*d*e + 3*B*c*f - 5*A*d*f) - C*(d^2*e^
2 + c*d*e*f + 3*c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(
b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x]
)/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^2*
(-(b*c) + a*d)^(5/2)*(b*e - a*f)^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 9.80673, antiderivative size = 1116, normalized size of antiderivative = 1., number

of steps used = 9, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\left(Ab^2-a(bB-aC)\right)}{5b(bc-ad)(be-af)(a+bx)^{5/2}}$$
$$+\frac{2\sqrt{d}\left(2Cd^2f^2a^4+bdf(3Bdf-7C(de+cf))a^3-b^2\left(C\left(3d^2e^2-13cdfe+3c^2f^2\right)+df(23Adf-7B(de+cf))\right)a^2-b^3\left(-\right.\right.}{}$$
$$+\frac{2\sqrt{d}\left(Cdf(de-cf)a^3-3b\left(df(2Bde+3Bcf-5Adf)-C\left(d^2e^2+cdfe+3c^2f^2\right)\right)a^2+b^2\left(-f(20Ce-Bf)c^2-d\left(10Ce^2\right.\right.\right.}{15b}$$
$$+\frac{2\left(2Cd^2f^2a^4+bdf(3Bdf-7C(de+cf))a^3-b^2\left(C\left(3d^2e^2-13cdfe+3c^2f^2\right)+df(23Adf-7B(de+cf))\right)a^2-b^3\left(-2f\right.\right.}{1}$$
$$+\frac{2\left(2Cdfa^3+3b(Bdf-2C(de+cf))a^2+b^2(10cCe+Bde+Bcf-8Adf)a-b^3(5Bce-4A(de+cf))\right)\sqrt{c+dx}\sqrt{e+fx}}{15b(bc-ad)^2(be-af)^2(a+bx)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x + C*x^2)/((a + b*x)^(7/2)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] (-2*(A*b^2 - a*(b*B - a*C))*Sqrt[c + d*x]*Sqrt[e + f*x])/(5*b*(b*
c - a*d)*(b*e - a*f)*(a + b*x)^(5/2)) + (2*(2*a^3*C*d*f + a*b^2*(
10*c*C*e + B*d*e + B*c*f - 8*A*d*f) - b^3*(5*B*c*e - 4*A*(d*e + c
*f)) + 3*a^2*b*(B*d*f - 2*C*(d*e + c*f)))*Sqrt[c + d*x]*Sqrt[e +
f*x])/(15*b*(b*c - a*d)^2*(b*e - a*f)^2*(a + b*x)^(3/2)) + (2*(2*
a^4*C*d^2*f^2 + a^3*b*d*f*(3*B*d*f - 7*C*(d*e + c*f)) - b^4*(8*A*
d^2*e^2 - c*d*e*(10*B*e - 7*A*f) + c^2*(15*C*e^2 - 10*B*e*f + 8*A
*f^2)) - a*b^3*(d^2*e*(2*B*e - 23*A*f) - 2*c^2*f*(5*C*e - B*f) -
c*d*(10*C*e^2 - 33*B*e*f + 23*A*f^2)) - a^2*b^2*(C*(3*d^2*e^2 - 1
3*c*d*e*f + 3*c^2*f^2) + d*f*(23*A*d*f - 7*B*(d*e + c*f))))*Sqrt[
c + d*x]*Sqrt[e + f*x])/(15*b*(b*c - a*d)^3*(b*e - a*f)^3*Sqrt[a
+ b*x]) + (2*Sqrt[d]*(2*a^4*C*d^2*f^2 + a^3*b*d*f*(3*B*d*f - 7*C*
(d*e + c*f)) - b^4*(8*A*d^2*e^2 - c*d*e*(10*B*e - 7*A*f) + c^2*(1
5*C*e^2 - 10*B*e*f + 8*A*f^2)) - a*b^3*(d^2*e*(2*B*e - 23*A*f) -
2*c^2*f*(5*C*e - B*f) - c*d*(10*C*e^2 - 33*B*e*f + 23*A*f^2)) - a
^2*b^2*(C*(3*d^2*e^2 - 13*c*d*e*f + 3*c^2*f^2) + d*f*(23*A*d*f -
7*B*(d*e + c*f))))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[e + f*x]*
EllipticE[ArcSin[(Sqrt[d]*Sqrt[a + b*x])/Sqrt[-(b*c) + a*d]], ((b
*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^2*(-(b*c) + a*d)^(5/2)*(b*e
- a*f)^3*Sqrt[c + d*x]*Sqrt[(b*(e + f*x))/(b*e - a*f)]) + (2*Sqrt
[d]*(a^3*C*d*f*(d*e - c*f) + b^3*(8*A*d^2*e^2 - c*d*e*(10*B*e - 3
*A*f) + c^2*(15*C*e^2 - 5*B*e*f + 4*A*f^2)) + a*b^2*(d^2*e*(2*B*e
 - 19*A*f) - c^2*f*(20*C*e - B*f) - c*d*(10*C*e^2 - 27*B*e*f + 11
*A*f^2)) - 3*a^2*b*(d*f*(2*B*d*e + 3*B*c*f - 5*A*d*f) - C*(d^2*e^
2 + c*d*e*f + 3*c^2*f^2)))*Sqrt[(b*(c + d*x))/(b*c - a*d)]*Sqrt[(
b*(e + f*x))/(b*e - a*f)]*EllipticF[ArcSin[(Sqrt[d]*Sqrt[a + b*x]
)/Sqrt[-(b*c) + a*d]], ((b*c - a*d)*f)/(d*(b*e - a*f))])/(15*b^2*
(-(b*c) + a*d)^(5/2)*(b*e - a*f)^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+B*x+A)/(b*x+a)**(7/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 20.192, size = 8844, normalized size = 7.92

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x + C*x^2)/((a + b*x)^(7/2)*Sqrt[c + d*x]*Sqrt[e + f*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.406, size = 34100, normalized size = 30.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+B*x+A)/(b*x+a)^(7/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{(bx + a)^{\frac{7}{2}}\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(7/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)/((b*x + a)^(7/2)*sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cx^2 + Bx + A}{(b^3x^3 + 3\,ab^2x^2 + 3\,a^2bx + a^3)\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(7/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integral((C*x^2 + B*x + A)/((b^3*x^3 + 3*a*b^2*x^2 + 3*a^2*b*x +
a^3)*sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+B*x+A)/(b*x+a)**(7/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + Bx + A}{(bx + a)^{\frac{7}{2}}\sqrt{dx + c}\sqrt{fx + e}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + B*x + A)/((b*x + a)^(7/2)*sqrt(d*x + c)*sqrt(f*x + e)),x, algor
```

```
[Out] integrate((C*x^2 + B*x + A)/((b*x + a)^(7/2)*sqrt(d*x + c)*sqrt(f
*x + e)), x)
```

3.113 $\int \frac{(a+bx)\left(abB-a^2C+b^2Bx+b^2Cx^2\right)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=704

$$-\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(15a^3Cd^2f^2h^3-15a^2bd^2f^2h^2(Bh+Cg)+5ab^2dfh(6Bdfgh\right.}{}$$
$$+\frac{2b^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(2C(adfh-2b(cfh+deh+dfg))+5bBdfh)}{15d^2f^2h^2}$$
$$+\frac{2b^2C(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{5dfh}$$
$$+\frac{2b\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(3dfh(5adfh(2bB-aC)-bC(2a(cfh+deh+dfg)+3b(ceh}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

```
[Out] (2*b^2*(5*b*B*d*f*h + 2*C*(a*d*f*h - 2*b*(d*f*g + d*e*h + c*f*h))
)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(15*d^2*f^2*h^2) + (
2*b^2*C*(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(5*d
*f*h) + (2*b*Sqrt[-(d*e) + c*f]*(3*d*f*h*(5*a*(2*b*B - a*C)*d*f*h
 - b*C*(3*b*(d*e*g + c*f*g + c*e*h) + 2*a*(d*f*g + d*e*h + c*f*h)
)) - 2*b*(d*f*g + d*e*h + c*f*h)*(5*b*B*d*f*h + 2*C*(a*d*f*h - 2*
b*(d*f*g + d*e*h + c*f*h))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*Sqrt
[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f
]*(15*a^3*C*d^2*f^2*h^3 - 15*a^2*b*d^2*f^2*h^2*(C*g + B*h) + 5*a*
b^2*d*f*h*(6*B*d*f*g*h - C*(c*h*(f*g - e*h) + d*g*(2*f*g + e*h)))
 - b^3*(5*B*d*f*h*(c*h*(f*g - e*h) + d*g*(2*f*g + e*h)) - C*(4*c^
2*f*h^2*(f*g - e*h) + c*d*h*(3*f^2*g^2 + e*f*g*h - 4*e^2*h^2) + d
^2*g*(8*f^2*g^2 + 3*e*f*g*h + 4*e^2*h^2))))*Sqrt[(d*(e + f*x))/(d
*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt
[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g -
 c*h))])/(15*d^3*f^(5/2)*h^3*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 5.15379, antiderivative size = 702, normalized size of antiderivative = 1., number of

steps used = 8, number of rules used = 7, integrand size = 58, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121

$$-\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(15a^3Cd^2f^2h^3-15a^2bd^2f^2h^2(Bh+Cg)+5ab^2dfh(6Bdfgh\right.}{}$$

$$+\frac{2b^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(2aCdfh+5bBdfh-4bC(cfh+deh+dfg))}{15d^2f^2h^2}$$
$$+\frac{2b^2C(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{5dfh}$$
$$-\frac{2b\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(2b(cfh+deh+dfg)(2aCdfh+5bBdfh-4bC(cfh+deh}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)*(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]
```

```
[Out] (2*b^2*(5*b*B*d*f*h + 2*a*C*d*f*h - 4*b*C*(d*f*g + d*e*h + c*f*h)
)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(15*d^2*f^2*h^2) + (
2*b^2*C*(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(5*d
*f*h) - (2*b*Sqrt[-(d*e) + c*f]*(2*b*(d*f*g + d*e*h + c*f*h)*(5*b
*B*d*f*h + 2*a*C*d*f*h - 4*b*C*(d*f*g + d*e*h + c*f*h)) - 3*d*f*h
*(5*a*(2*b*B - a*C)*d*f*h - b*C*(3*b*(d*e*g + c*f*g + c*e*h) + 2*
a*(d*f*g + d*e*h + c*f*h))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*Sqrt
[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f
]*(15*a^3*C*d^2*f^2*h^3 - 15*a^2*b*d^2*f^2*h^2*(C*g + B*h) + 5*a*
b^2*d*f*h*(6*B*d*f*g*h - c*C*h*(f*g - e*h) - C*d*g*(2*f*g + e*h))
 - b^3*(5*B*d*f*h*(c*h*(f*g - e*h) + d*g*(2*f*g + e*h)) - C*(4*c^
2*f*h^2*(f*g - e*h) + c*d*h*(3*f^2*g^2 + e*f*g*h - 4*e^2*h^2) + d
^2*g*(8*f^2*g^2 + 3*e*f*g*h + 4*e^2*h^2))))*Sqrt[(d*(e + f*x))/(d
*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt
[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g -
 c*h))])/(15*d^3*f^(5/2)*h^3*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)*(C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(d*x+c)**(1/2)/(f*x
```

```
[Out] Timed out
```

Mathematica [C] time = 18.9488, size = 12665, normalized size = 17.99

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)*(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2))/(Sqrt[c + d*x]*Sqrt[e
```

```
[Out] Result too large to show
```

Maple [B] time = 0.091, size = 8421, normalized size = 12.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)*(C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cb^2x^2 + Bb^2x - Ca^2 + Bab\right)(bx + a)}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*(b*x + a)/(sqrt(d
*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cb^3x^3 - Ca^3 + Ba^2b + \left(Cab^2 + Bb^3\right)x^2 - \left(Ca^2b - 2\,Bab^2\right)x}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x
```

```
[Out] integral((C*b^3*x^3 - C*a^3 + B*a^2*b + (C*a*b^2 + B*b^3)*x^2 - (
C*a^2*b - 2*B*a*b^2)*x)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g
)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(d*x+c)**(1/2)/(f*x+e)**
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cb^2x^2 + Bb^2x - Ca^2 + Bab\right)(bx + a)}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*(b*x + a)/(sqrt(d
*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.114 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=410

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(-3a^2Cdfh^2+3abBdfh^2+b^2(-(3Bdfgh-C(ch(fg-eh)+c\right.}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{g+hx}}$$
$$+\frac{2b^2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}(3Bdfh-2C(cfh+deh+dfg))E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$
$$+\frac{2b^2C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3dfh}$$

```
[Out] (2*b^2*C*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*d*f*h) + (
2*b^2*Sqrt[-(d*e) + c*f]*(3*B*d*f*h - 2*C*(d*f*g + d*e*h + c*f*h)
)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[
(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(
d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))
/(d*g - c*h)]) + (2*Sqrt[-(d*e) + c*f]*(3*a*b*B*d*f*h^2 - 3*a^2*C
*d*f*h^2 - b^2*(3*B*d*f*g*h - C*(c*h*(f*g - e*h) + d*g*(2*f*g + e
*h))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g -
c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]
], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e +
f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 1.71677, antiderivative size = 410, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 53, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.113

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(-3a^2Cdfh^2+3abBdfh^2+b^2(-(3Bdfgh-cCh(fg-eh)-C\right.}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{g+hx}}$$
$$+\frac{2b^2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}(3Bdfh-2C(cfh+deh+dfg))E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$
$$+\frac{2b^2C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3dfh}$$

Antiderivative was successfully verified.

```
[In] Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*
```

```
[Out] (2*b^2*C*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*d*f*h) + (
2*b^2*Sqrt[-(d*e) + c*f]*(3*B*d*f*h - 2*C*(d*f*g + d*e*h + c*f*h)
```

```
)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[
(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(
d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))
/(d*g - c*h)]) + (2*Sqrt[-(d*e) + c*f]*(3*a*b*B*d*f*h^2 - 3*a^2*C
*d*f*h^2 - b^2*(3*B*d*f*g*h - c*C*h*(f*g - e*h) - C*d*g*(2*f*g +
e*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g -
c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]
], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e +
f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(d*x+c)**(1/2)/(f*x+e)**(1/
```

```
[Out] Timed out
```

Mathematica [C] time = 11.8062, size = 442, normalized size = 1.08

$$\sqrt{c+dx}\left(\frac{2idh\sqrt{c+dx}\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}}F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-cfh}{deh-cfh}\right)\left(-3a^2Cdf^2h+3abBdf^2h+b^2(-3Bdefh+cCf(eh-fg)+Cde(2eh+fg))\right)}{\sqrt{\frac{de}{f}-c}}+\frac{2b^2d^2(\cdots\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt
```

```
[Out] (Sqrt[c + d*x]*(2*b^2*C*d^2*f*h*(e + f*x)*(g + h*x) + (2*b^2*d^2*
(3*B*d*f*h - 2*C*(d*f*g + d*e*h + c*f*h))*(e + f*x)*(g + h*x))/(c
 + d*x) + (2*I)*b^2*Sqrt[-c + (d*e)/f]*f*h*(3*B*d*f*h - 2*C*(d*f*
g + d*e*h + c*f*h))*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x)
)]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticE[I*ArcSinh[Sqrt[-c
+ (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)] + ((2
*I)*d*h*(3*a*b*B*d*f^2*h - 3*a^2*C*d*f^2*h + b^2*(-3*B*d*e*f*h +
c*C*f*(-(f*g) + e*h) + C*d*e*(f*g + 2*e*h)))*Sqrt[c + d*x]*Sqrt[(
d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*Ell
ipticF[I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*
h)/(d*e*h - c*f*h)])/Sqrt[-c + (d*e)/f]))/(3*d^3*f^2*h^2*Sqrt[e +
 f*x]*Sqrt[g + h*x])
```

Maple [B] time = 0.045, size = 2825, normalized size = 6.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),
```

```
[Out] -2/3*(-C*x*b^2*d^3*e*f*g*h+C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g
)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x
+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c^2*d
*e*f*h^2-C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/
2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(
1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c^2*d*f^2*g*h-C*x*b^2*c
*d^2*e*f*h^2+3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g
))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d
*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c^2*d*f^2*h^2+3*C
*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+
e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f
-d*e)*h/f/(c*h-d*g))^(1/2))*a^2*c*d^2*f^2*h^2-3*C*((d*x+c)*f/(c*f
-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^
(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d
*g))^(1/2))*a^2*d^3*e*f*h^2-C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+
g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*
x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^
2*e^2*h^2-2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^
(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e)
)^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^2*f^2*g^2+C*((d*
x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/
(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)
*h/f/(c*h-d*g))^(1/2))*b^2*d^3*e^2*g*h+2*C*((d*x+c)*f/(c*f-d*e))^
(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*E
llipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1
/2))*b^2*d^3*e*f*g^2+2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/
(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*
f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^2*e^2
*h^2+2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)
*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/
2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^2*f^2*g^2-2*C*((d*x+c
)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*
f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/
f/(c*h-d*g))^(1/2))*b^2*d^3*e^2*g*h-2*C*((d*x+c)*f/(c*f-d*e))^(1/
2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*Elli
pticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2)
)*b^2*d^3*e*f*g^2-3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*
h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(
c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*b*c*d^2*f^2*h^
2+3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-
(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),
((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*b*d^3*e*f*h^2+3*B*((d*x+c)*f/(
c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e
))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*
h-d*g))^(1/2))*b^2*c*d^2*f^2*g*h-3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*
```

```
(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*Ellipti
cF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b
^2*d^3*e*f*g*h-3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d
*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f
-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^2*e*f*h^2-3
*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*
x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c
*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^2*f^2*g*h+3*B*((d*x+c)*f/(c
*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e)
)^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h
-d*g))^(1/2))*b^2*d^3*e*f*g*h-C*x*b^2*c*d^2*f^2*g*h-C*b^2*c*d^2*e
*f*g*h-2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/
2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(
1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c^3*f^2*h^2+2*C*((d*x+c
)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*
f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/
f/(c*h-d*g))^(1/2))*b^2*c*d^2*e*f*g*h-C*x^2*b^2*d^3*e*f*h^2-C*x^2
*b^2*d^3*f^2*g*h-C*x^2*b^2*c*d^2*f^2*h^2-C*x^3*b^2*d^3*f^2*h^2)*(
d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/h^2/f^2/d^3/(d*f*h*x^3+c
*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(d*x + c)*sq
rt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt
```

```
[Out] integral((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(d*x + c)*sqr
t(f*x + e)*sqrt(h*x + g)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+bx)(Bb-Ca+Cbx)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h
```

```
[Out] Integral((a + b*x)*(B*b - C*a + C*b*x)/(sqrt(c + d*x)*sqrt(e + f*
x)*sqrt(g + h*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2+Bb^2x-Ca^2+Bab}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(d*x + c)*sq
rt(f*x + e)*sqrt(h*x + g)), x)
```

3.115 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=291

$$\frac{2bC\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} - \frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}(aCh-bBh+bCg)F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{g+hx}}$$

```
[Out] (2*b*C*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g
+ h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f
]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e + f*x]*
Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(b*C*g -
 b*B*h + a*C*h)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x)
)/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*
e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e
 + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 1.14374, antiderivative size = 291, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 60, $\frac{\text{number of rules}}{\text{integrand size}} = 0.1$

$$\frac{2bC\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}} - \frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}(aCh-bBh+bCg)F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

```
[In] Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*S
```


```
[Out] (2*b*C*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g
+ h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f
]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e + f*x]*
Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(b*C*g -
 b*B*h + a*C*h)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x)
)/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*
e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e
 + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [A] time = 150.009, size = 248, normalized size = 0.85

$$\frac{2Cb\sqrt{\frac{f(c+dx)}{cf-de}}\sqrt{g+hx}\sqrt{-cf+de}E\left(\operatorname{asin}\left(\frac{\sqrt{d}\sqrt{e+fx}}{\sqrt{-cf+de}}\right)\middle|\frac{h(cf-de)}{d(-eh+fg)}\right)}{\sqrt{d}fh\sqrt{\frac{f(-g-hx)}{eh-fg}}\sqrt{c+dx}} + \frac{2\sqrt{\frac{d(-e-fx)}{cf-de}}\sqrt{\frac{d(-g-hx)}{ch-dg}}\sqrt{ch-dg}\,(Bbh-Cah-Cbg)\,F\left(\operatorname{asin}\left(\frac{\sqrt{h}\sqrt{c+dx}}{\sqrt{ch-dg}}\right)\middle|\frac{f(ch-dg)}{h(cf-de)}\right)}{dh^{\frac{3}{2}}\sqrt{e+fx}\sqrt{g+hx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)/(d*x+c)**(1/2)/(f*x
```

```
[Out] 2*C*b*sqrt(f*(c + d*x)/(c*f - d*e))*sqrt(g + h*x)*sqrt(-c*f + d*e
)*elliptic_e(asin(sqrt(d)*sqrt(e + f*x)/sqrt(-c*f + d*e)), h*(c*f
 - d*e)/(d*(-e*h + f*g)))/(sqrt(d)*f*h*sqrt(f*(-g - h*x)/(e*h - f
*g))*sqrt(c + d*x)) + 2*sqrt(d*(-e - f*x)/(c*f - d*e))*sqrt(d*(-g
 - h*x)/(c*h - d*g))*sqrt(c*h - d*g)*(B*b*h - C*a*h - C*b*g)*elli
ptic_f(asin(sqrt(h)*sqrt(c + d*x)/sqrt(c*h - d*g)), f*(c*h - d*g)
/(h*(c*f - d*e)))/(d*h**(3/2)*sqrt(e + f*x)*sqrt(g + h*x))
```

Mathematica [C] time = 3.69264, size = 326, normalized size = 1.12

$$\frac{2\left(-idh(c+dx)^{3/2}\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}}(aCf-bBf+bCe)F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)\middle|\frac{dfg-cfh}{deh-cfh}\right)+bCd^2(e+fx)(g+hx)\sqrt{\frac{de}{f}-c}+\right.}{d^2fh\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\sqrt{\frac{de}{f}-c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e +
```

```
[Out] (2*(b*C*d^2*Sqrt[-c + (d*e)/f]*(e + f*x)*(g + h*x) + I*b*C*(d*e -
 c*f)*h*(c + d*x)^(3/2)*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d
*(g + h*x))/(h*(c + d*x))]*EllipticE[I*ArcSinh[Sqrt[-c + (d*e)/f]
/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)] - I*d*(b*C*e -
b*B*f + a*C*f)*h*(c + d*x)^(3/2)*Sqrt[(d*(e + f*x))/(f*(c + d*x))
]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticF[I*ArcSinh[Sqrt[-c +
 (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)]))/(d^2
*Sqrt[-c + (d*e)/f]*f*h*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]
)
```

Maple [B] time = 0.039, size = 673, normalized size = 2.3

$$2\frac{\sqrt{hx+g}\sqrt{fx+e}\sqrt{dx+c}}{hfd^2\left(dfhx^3+cfhx^2+dehx^2+dfgx^2+cehx+cfgx+degx+ceg\right)}\left(BEllipticF\left(\sqrt{\frac{(dx+c)f}{cf-de}},\sqrt{\frac{(cf-de)h}{f(ch-dg)}}\right)bcdfh-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g
```

```
[Out] 2*(B*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*
g))^(1/2))*b*c*d*f*h-B*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*
f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^2*e*h-C*EllipticF(((d*x+c)*f/(c*
f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d*f*h+C*Ellipt
icF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*
a*d^2*e*h-C*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/
(c*h-d*g))^(1/2))*b*c*d*f*g+C*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/
2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^2*e*g-C*EllipticE(((d*x+c
)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c^2*f*h+C
*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^
(1/2))*b*c*d*e*h+C*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*
e)*h/f/(c*h-d*g))^(1/2))*b*c*d*f*g-C*EllipticE(((d*x+c)*f/(c*f-d*
e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^2*e*g)*(-(f*x+e)*d
/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*((d*x+c)*f/(c*f-d*
e))^(1/2)/h/f/d^2*(h*x+g)^(1/2)*(f*x+e)^(1/2)*(d*x+c)^(1/2)/(d*f*
h*x^3+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g
)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2+Bb^2x-Ca^2+Bab}{(bx+a)\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)*sqrt(d
*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cbx-Ca+Bb}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x
```

```
[Out] integral((C*b*x - C*a + B*b)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*
x + g)), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bb - Ca + Cbx}{\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**
```

```
[Out] Integral((B*b - C*a + C*b*x)/(sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g
+ h*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx + a)\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)*sqrt(d
*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.116 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=309

$$\frac{2C\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2(bB-2aC)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}$$

```
[Out] (2*C*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(
g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/S
qrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*
Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(b*B - 2*a*C)*Sqrt[-(d*e) + c*f
]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]
*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*S
qrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)
)])/((b*c - a*d)*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 2.65897, antiderivative size = 309, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 60, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133

$$\frac{2C\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2(bB-2aC)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]
```


```
[Out] (2*C*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(
g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/S
qrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*
Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(b*B - 2*a*C)*Sqrt[-(d*e) + c*f
]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]
*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*S
qrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)
)])/((b*c - a*d)*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**2/(d*x+c)**(1/2)/(
```

```
[Out] Timed out
```

Mathematica [C] time = 2.70617, size = 248, normalized size = 0.8

$$\frac{2i\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{h(c+dx)}}\left(d(2aC-bB)\left(\frac{(bc-ad)f}{b(cf-de)};i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-cfh}{deh-cfh}\right)-(aCd-bBd+bcC)F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-c}{deh-c}\right.\right.}{f\sqrt{g+hx}(ad-bc)\sqrt{\frac{de}{f}-c}\sqrt{\frac{d(e+fx)}{f(c+dx)}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e
```

```
[Out] ((2*I)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*(-((b*c*C
- b*B*d + a*C*d)*EllipticF[I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt[c +
d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)]) + (-(b*B) + 2*a*C)*d*Ell
ipticPi[((b*c - a*d)*f)/(b*(-(d*e) + c*f)), I*ArcSinh[Sqrt[-c + (
d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)]))/((-(b*
c) + a*d)*Sqrt[-c + (d*e)/f]*f*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*
Sqrt[g + h*x])
```

Maple [B] time = 0.052, size = 663, normalized size = 2.2

$$2\frac{\sqrt{hx+g}\sqrt{fx+e}\sqrt{dx+c}}{(ad-bc)fd\left(dfhx^{3}+cfhx^{2}+dehx^{2}+dfgx^{2}+cehx+cfgx+degx+ceg\right)}\sqrt{\frac{(dx+c)f}{cf-de}}\sqrt{-\frac{(hx+g)d}{ch-dg}}\sqrt{-\frac{(fx+e)d}{cf-de}}\left(B\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(b*x+a)^2/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x
```

```
[Out] 2*(h*x+g)^(1/2)*(f*x+e)^(1/2)*(d*x+c)^(1/2)/f/d*((d*x+c)*f/(c*f-d
*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1
/2)*(B*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d
-b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d*f-B*EllipticPi(((d*x
+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c
```

```
*h-d*g))^(1/2))*b*d^2*e+C*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),(
(c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d*f-C*EllipticF(((d*x+c)*f/(c
*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*d^2*e-C*Ellipti
cF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b
*c^2*f+C*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*
h-d*g))^(1/2))*b*c*d*e-2*C*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2)
,-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d*
f+2*C*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-
b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*d^2*e)/(a*d-b*c)/(d*f*h*x
^3+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx+a)^2\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^2*sqrt
(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f
```

```
[Out] Timed out
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**2/(d*x+c)**(1/2)/(f*x+e
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx+a)^2\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^2*sqrt
(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.117 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{(a+bx)^3\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=680

$$-\frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(4a^3Cdfh-a^2b(3Bdfh+2C(cfh+deh+dfg))+2ab^2B(cfh+deh+dfg)-b^3(Bdeg-c(-\right.}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)^2(be-af)(bg-ah)}$$
$$-\frac{b^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(bB-2aC)}{(a+bx)(bc-ad)(be-af)(bg-ah)}$$
$$-\frac{\sqrt{f}(bB-2aC)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}\sqrt{g+hx}(bc-ad)(be-af)}$$
$$+\frac{b\sqrt{f}\sqrt{g+hx}(bB-2aC)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

```
[Out] -((b^2*(b*B - 2*a*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(
(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x))) + (b*(b*B - 2*a*C
)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)
*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - ((b
*B - 2*a*C)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e -
c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*S
qrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)
)])/((b*c - a*d)*(b*e - a*f)*Sqrt[e + f*x]*Sqrt[g + h*x]) - (Sqrt
[-(d*e) + c*f]*(4*a^3*C*d*f*h + 2*a*b^2*B*(d*f*g + d*e*h + c*f*h)
 - b^3*(B*d*e*g - c*(2*C*e*g - B*f*g - B*e*h)) - a^2*b*(3*B*d*f*h
 + 2*C*(d*f*g + d*e*h + c*f*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*
Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*
c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]],
 ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)^2*Sqrt[f]*(b*e -
a*f)*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 4.86865, antiderivative size = 680, normalized size of antiderivative = 1., number of

steps used = 13, number of rules used = 11, integrand size = 60, $\frac{\text{number of rules}}{\text{integrand size}} = 0.183$

$$-\frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(4a^3Cdfh-a^2b(3Bdfh+2C(cfh+deh+dfg))+2ab^2B(cfh+deh+dfg)-b^3(Bdeg-c(-\right.}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)^2(be-af)(bg-ah)}$$
$$-\frac{b^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(bB-2aC)}{(a+bx)(bc-ad)(be-af)(bg-ah)}$$
$$-\frac{\sqrt{f}(bB-2aC)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}\sqrt{g+hx}(bc-ad)(be-af)}$$
$$+\frac{b\sqrt{f}\sqrt{g+hx}(bB-2aC)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

Antiderivative was successfully verified.

```
[In] Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^3*Sqrt[c + d*x]*Sqrt[e + f*x]
```

```
[Out] -((b^2*(b*B - 2*a*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(
(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x))) + (b*(b*B - 2*a*C
)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)
*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - ((b
*B - 2*a*C)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e -
c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*S
qrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h)
)])/((b*c - a*d)*(b*e - a*f)*Sqrt[e + f*x]*Sqrt[g + h*x]) - (Sqrt
[-(d*e) + c*f]*(4*a^3*C*d*f*h + 2*a*b^2*B*(d*f*g + d*e*h + c*f*h)
 - b^3*(B*d*e*g - c*(2*C*e*g - B*f*g - B*e*h)) - a^2*b*(3*B*d*f*h
 + 2*C*(d*f*g + d*e*h + c*f*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*
Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*
c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]],
 ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)^2*Sqrt[f]*(b*e -
a*f)*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**3/(d*x+c)**(1/2)/(
```

```
[Out] Timed out
```

Mathematica [C] time = 20.3224, size = 16821, normalized size = 24.74

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^3*Sqrt[c + d*x]*Sqrt[e
```

```
[Out] Result too large to show
```

Maple [B] time = 0.143, size = 13405, normalized size = 19.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(b*x+a)^3/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx + a)^3\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^3*sqrt(d*x + c)*sqrt(f
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^3*sqrt
(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^3*sqrt(d*x + c)*sqrt(f
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**3/(d*x+c)**(1/2)/(f*x+e
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx+a)^3\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^3*sqrt(d*x + c)*sqrt(f
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^3*sqrt
(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.118 $\int \frac{\sqrt{a+bx}(abB-a^2C+b^2Bx+b^2Cx^2)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=990

$$\frac{C\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}b^2}{2dfh}$$
$$-\frac{\sqrt{dg-ch}\sqrt{fg-eh}(4bBdfh+C(adfh-3b(dfg+deh+cfh)))\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(}{(be-af)(}\right.}{4d^2f^2h^2\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}}$$
$$+\frac{(4bBdfh+C(adfh-3b(dfg+deh+cfh)))\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}b}{4df^2h^2\sqrt{c+dx}}$$
$$+\frac{(be-af)\sqrt{bg-ah}(aCdfh-b(4Bdfh-C(3dfg+3deh+cfh)))\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad}{(de-cf}\right.}{4df^2h^2\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}$$
$$-\frac{\sqrt{ch-dg}\left(\left(4Bdfh(dfg+deh+cfh)-C\left(\left(3f^2g^2+2efhg+3e^2h^2\right)d^2+2cfh(fg+eh)d+3c^2f^2h^2\right)\right)b^2-2adfh(6Bdf\right.}{4d^2\sqrt{bc-ad}}$$

```
[Out] (b*(4*b*B*d*f*h + C*(a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h)))*Sqrt
[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(4*d*f^2*h^2*Sqrt[c + d*x]
) + (b^2*C*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x
])/(2*d*f*h) - (b*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(4*b*B*d*f*h +
C*(a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h)))*Sqrt[a + b*x]*Sqrt[-((
(d*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin
[(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])]
, ((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(4*d^2*f^
2*h^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[
g + h*x]) + ((b*e - a*f)*Sqrt[b*g - a*h]*(a*C*d*f*h - b*(4*B*d*f*
h - C*(3*d*f*g + 3*d*e*h + c*f*h)))*Sqrt[((b*e - a*f)*(c + d*x))/
((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g
 - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c
- a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(4*d*f^2*h^2*Sqr
t[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g -
 e*h)*(a + b*x)))]) - (Sqrt[-(d*g) + c*h]*(9*a^2*C*d^2*f^2*h^2 -
2*a*b*d*f*h*(6*B*d*f*h - C*(d*f*g + d*e*h + c*f*h)) + b^2*(4*B*d*
f*h*(d*f*g + d*e*h + c*f*h) - C*(3*c^2*f^2*h^2 + 2*c*d*f*h*(f*g +
 e*h) + d^2*(3*f^2*g^2 + 2*e*f*g*h + 3*e^2*h^2))))*(a + b*x)*Sqrt
[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*
h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h
))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt
[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c -
 a*d)*(f*g - e*h))])/(4*d^2*Sqrt[b*c - a*d]*f^2*h^3*Sqrt[c + d*x]
*Sqrt[e + f*x])
```

Rubi [A] time = 8.6528, antiderivative size = 987, normalized size of antiderivative = 1., number of

steps used = 10, number of rules used = 10, integrand size = 62, $\frac{\text{number of rules}}{\text{integrand size}} = 0.161$

$$\frac{C\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}b^2}{2dfh} - \frac{\sqrt{dg-ch}\sqrt{fg-eh}(4bBdfh+aCdfh-3bC(dfg+deh+cfh))\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(}{(be-af)(}\right.}{4d^2f^2h^2\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}} + \frac{(4bBdfh+aCdfh-3bC(dfg+deh+cfh))\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}b}{4df^2h^2\sqrt{c+dx}} - \frac{(be-af)\sqrt{bg-ah}(4bBdfh-aCdfh-bC(cfh+3d(fg+eh)))\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)}{(de-cf)}\right.}{4df^2h^2\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}} - \frac{\sqrt{ch-dg}\left(\left(4Bdfh(dfg+deh+cfh)-C\left(\left(3f^2g^2+2efhg+3e^2h^2\right)d^2+2cfh(fg+eh)d+3c^2f^2h^2\right)\right)b^2-2adfh(6Bdf\right.}{4d^2\sqrt{bc-ad}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(Sqrt[a + b*x]*(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2))/(Sqrt[c + d*x]*Sqrt[e +
```

```
[Out] (b*(4*b*B*d*f*h + a*C*d*f*h - 3*b*C*(d*f*g + d*e*h + c*f*h))*Sqrt
[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(4*d*f^2*h^2*Sqrt[c + d*x]
) + (b^2*C*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x
])/(2*d*f*h) - (b*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(4*b*B*d*f*h +
a*C*d*f*h - 3*b*C*(d*f*g + d*e*h + c*f*h))*Sqrt[a + b*x]*Sqrt[-((
(d*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin
[(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])]
, ((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(4*d^2*f^
2*h^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[
g + h*x]) - ((b*e - a*f)*Sqrt[b*g - a*h]*(4*b*B*d*f*h - a*C*d*f*h
 - b*C*(c*f*h + 3*d*(f*g + e*h)))*Sqrt[((b*e - a*f)*(c + d*x))/((
d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g -
 a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c -
a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(4*d*f^2*h^2*Sqrt[
f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e
*h)*(a + b*x)))]) - (Sqrt[-(d*g) + c*h]*(9*a^2*C*d^2*f^2*h^2 - 2*
a*b*d*f*h*(6*B*d*f*h - C*(d*f*g + d*e*h + c*f*h)) + b^2*(4*B*d*f*
h*(d*f*g + d*e*h + c*f*h) - C*(3*c^2*f^2*h^2 + 2*c*d*f*h*(f*g + e
*h) + d^2*(3*f^2*g^2 + 2*e*f*g*h + 3*e^2*h^2))))*(a + b*x)*Sqrt[(
(b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)
*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))
/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-
(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a
*d)*(f*g - e*h))])/(4*d^2*Sqrt[b*c - a*d]*f^2*h^3*Sqrt[c + d*x]*S
qrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(1/2)*(C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(d*x+c)**(1/
```

```
[Out] Timed out
```

Mathematica [B] time = 23.993, size = 21555, normalized size = 21.77

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[a + b*x]*(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2))/(Sqrt[c + d*x]*Sq
```

```
[Out] Result too large to show
```

Maple [B] time = 0.165, size = 55327, normalized size = 55.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(1/2)*(C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cb^2x^2 + Bb^2x - Ca^2 + Bab\right)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*sqrt(b*x + a)/(sq
rt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(1/2)*(C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(d*x+c)**(1/2)/(f
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cb^2x^2 + Bb^2x - Ca^2 + Bab\right)\sqrt{bx+a}}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)*sqrt(b*x + a)/(sq
rt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.119 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=734

$$-\frac{(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}(aCdfh-b(2Bdfh-C(cfh+deh+dfg)))\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+h}}{\sqrt{ch-dg}\sqrt{a+b}}\right.\right.}{dfh^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

$$+\frac{bC\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{fh\sqrt{c+dx}}$$

$$-\frac{C\sqrt{g+hx}(be-af)\sqrt{bg-ah}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{fh\sqrt{c+dx}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$

$$-\frac{bC\sqrt{a+bx}\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{dfh\sqrt{g+hx}\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

```
[Out] (b*C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(f*h*Sqrt[c + d*x
]) - (b*C*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((
d*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[
(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])],
 ((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(d*f*h*Sqr
t[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x])
 - (C*(b*e - a*f)*Sqrt[b*g - a*h]*Sqrt[((b*e - a*f)*(c + d*x))/((
d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g -
 a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c -
a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(f*h*Sqrt[f*g - e*
h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a +
 b*x)))]) - (Sqrt[-(d*g) + c*h]*(a*C*d*f*h - b*(2*B*d*f*h - C*(d*
f*g + d*e*h + c*f*h)))*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d
*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(
a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[
(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x]
)], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])/(d*Sqrt
[b*c - a*d]*f*h^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 3.39842, antiderivative size = 732, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 9, integrand size = 62, $\frac{\text{number of rules}}{\text{integrand size}} = 0.145$

$$\frac{(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}(-aCdfh+2bBdfh-bC(cfh+deh+dfg))\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+h}}{\sqrt{ch-dg}\sqrt{a+b}}\right.\right.}{dfh^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

$$+\frac{bC\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{fh\sqrt{c+dx}}$$

$$-\frac{C\sqrt{g+hx}(be-af)\sqrt{bg-ah}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{fh\sqrt{c+dx}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$

$$-\frac{bC\sqrt{a+bx}\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{dfh\sqrt{g+hx}\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*
```

```
[Out] (b*C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(f*h*Sqrt[c + d*x
]) - (b*C*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((
d*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[
(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])],
 ((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(d*f*h*Sqr
t[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x])
 - (C*(b*e - a*f)*Sqrt[b*g - a*h]*Sqrt[((b*e - a*f)*(c + d*x))/((
d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g -
 a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c -
a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(f*h*Sqrt[f*g - e*
h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a +
 b*x)))]) + (Sqrt[-(d*g) + c*h]*(2*b*B*d*f*h - a*C*d*f*h - b*C*(d
*f*g + d*e*h + c*f*h))*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d
*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(
a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[
(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x]
)], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])/(d*Sqrt
[b*c - a*d]*f*h^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(1/2)/(d*x+c)**(1/
```

```
[Out] Timed out
```

Mathematica [B] time = 17.7352, size = 6667, normalized size = 9.08

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt
```

```
[Out] Result too large to show
```

Maple [B] time = 0.092, size = 20235, normalized size = 27.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{\sqrt{bx+a}\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(b*x + a)*sq
rt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/(sqrt(b*x + a)*sq
rt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.120 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=436

$$\frac{2\sqrt{g+hx}(bB-2aC)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}+\frac{2C(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}\Pi\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)}{h\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

```
[Out] (2*(b*B - 2*a*C)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b
*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*
x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))
/((d*e - c*f)*(b*g - a*h)))])/(Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sq
rt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)
))]) + (2*C*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d
*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g
- e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)),
 ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[
a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])
/(Sqrt[b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 2.0255, antiderivative size = 436, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 62, $\frac{\text{number of rules}}{\text{integrand size}} = 0.113$

$$\frac{2\sqrt{g+hx}(bB-2aC)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}+\frac{2C(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}\Pi\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)}{h\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

Antiderivative was successfully verified.

```
[In] Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e +
```


```
[Out] (2*(b*B - 2*a*C)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b
*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*
x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))
/((d*e - c*f)*(b*g - a*h)))])/(Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sq
rt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)
))]) + (2*C*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d
*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g
- e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)),
```

```
 ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[
a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])
/(Sqrt[b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(3/2)/(d*x+c)**(1/
```

```
[Out] Timed out
```

Mathematica [A] time = 10.3425, size = 583, normalized size = 1.34

$$\frac{2(a+bx)^{3/2}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\left(-\frac{bB(g+hx)\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}F\left(\sin^{-1}\left(\sqrt{\frac{(af-be)(g+hx)}{(fg-eh)(a+bx)}}\right)|\frac{(ad-bc)(eh-fg)}{(be-af)(dg-ch)}\right)}{(a+bx)(bg-ah)\sqrt{\frac{(g+hx)(af-be)}{(a+bx)(fg-eh)}}}-\frac{2aC(g+hx)\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}F\left(\sin^{-1}\left(\sqrt{\frac{(af-be)(}{(fg-eh)(}}\right.\right.}{(a+bx)(ah-bg)\sqrt{\frac{(g+hx)(af}{(a+bx)(fg}}}\right.}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sq
```

```
[Out] (2*(a + b*x)^(3/2)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a +
 b*x))]*(-((b*B*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*
x))]*(g + h*x)*EllipticF[ArcSin[Sqrt[((-(b*e) + a*f)*(g + h*x))/(
(f*g - e*h)*(a + b*x))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((b*e -
 a*f)*(d*g - c*h))])/((b*g - a*h)*(a + b*x)*Sqrt[((-(b*e) + a*f)*
(g + h*x))/((f*g - e*h)*(a + b*x))])) - (2*a*C*Sqrt[((b*g - a*h)*
(e + f*x))/((f*g - e*h)*(a + b*x))]*(g + h*x)*EllipticF[ArcSin[Sq
rt[((-(b*e) + a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]], ((-(b*c)
 + a*d)*(-(f*g) + e*h))/((b*e - a*f)*(d*g - c*h))])/((-(b*g) + a*
h)*(a + b*x)*Sqrt[((-(b*e) + a*f)*(g + h*x))/((f*g - e*h)*(a + b*
x))]) + (C*(-(f*g) + e*h)*Sqrt[-(((b*e - a*f)*(b*g - a*h)*(e + f*
x)*(g + h*x))/((f*g - e*h)^2*(a + b*x)^2))]*EllipticPi[(b*(-(f*g)
 + e*h))/((b*e - a*f)*h), ArcSin[Sqrt[((-(b*e) + a*f)*(g + h*x))/
((f*g - e*h)*(a + b*x))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((b*e
- a*f)*(d*g - c*h))])/((b*e - a*f)*h)))/(Sqrt[c + d*x]*Sqrt[e + f
*x]*Sqrt[g + h*x])
```

Maple [B] time = 0.116, size = 3003, normalized size = 6.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/
```

```
[Out] 2/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2)/h/f*((a
*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2)*((e*h-f*g)*(d*x+c)/(c*h-
d*g)/(f*x+e))^(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^(1/2)*(
C*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e
)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*a*b*f^3*g*h+C*Ellipti
cF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*
g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*b^2*e*f^2*g*h+C*EllipticPi(((a
*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),
((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*a*b*e*f^2*h^
2-C*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b
*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2)
)*x^2*a*b*f^3*g*h-C*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+
e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/
(a*f-b*e))^(1/2))*x^2*b^2*e*f^2*g*h+2*B*EllipticF(((a*f-b*e)*(h*x
+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-
b*e))^(1/2))*x*a*b*e*f^2*h^2-2*B*EllipticF(((a*f-b*e)*(h*x+g)/(a*
h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(
1/2))*x*b^2*e*f^2*g*h-2*C*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/
(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x
*a*b*e^2*f*h^2+2*C*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e)
)^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*b^2*e^
2*f*g*h+2*C*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2
),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e
))^(1/2))*x*a*b*e^2*f*h^2-2*C*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-
b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/
(c*h-d*g)/(a*f-b*e))^(1/2))*x*b^2*e^2*f*g*h+C*EllipticF(((a*f-b*e
)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)
/(a*f-b*e))^(1/2))*a*b*e^2*f*g*h-C*EllipticPi(((a*f-b*e)*(h*x+g)/
(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-
b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*a*b*e^2*f*g*h-C*EllipticF(((a*f-
b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d
*g)/(a*f-b*e))^(1/2))*x^2*a*b*e*f^2*h^2+C*EllipticPi(((a*f-b*e)*(
h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e
)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*b^2*f^3*g^2-C*Ellipti
cF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*
g)/(c*h-d*g)/(a*f-b*e))^(1/2))*a^2*e^2*f*h^2-C*EllipticF(((a*f-b*
e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g
)/(a*f-b*e))^(1/2))*a*b*e^3*h^2+C*EllipticF(((a*f-b*e)*(h*x+g)/(a
*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^
(1/2))*b^2*e^3*g*h+C*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x
+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)
/(a*f-b*e))^(1/2))*a*b*e^3*h^2-C*EllipticPi(((a*f-b*e)*(h*x+g)/(a
*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*
g)/(c*h-d*g)/(a*f-b*e))^(1/2))*b^2*e^3*g*h+C*EllipticPi(((a*f-b*e
)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-
d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*b^2*e^2*f*g^2-B*Ellipt
icF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b
*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*b^2*f^3*g*h-2*C*EllipticF(((a
*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*
h-d*g)/(a*f-b*e))^(1/2))*x*a^2*e*f^2*h^2+2*C*EllipticPi(((a*f-b*e
)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-
```

```
d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*b^2*e*f^2*g^2+B*Elli
pticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h
-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*a*b*e^2*f*h^2-B*EllipticF(((a*f
-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-
d*g)/(a*f-b*e))^(1/2))*b^2*e^2*f*g*h+B*EllipticF(((a*f-b*e)*(h*x+
g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b
*e))^(1/2))*x^2*a*b*f^3*h^2+2*C*EllipticF(((a*f-b*e)*(h*x+g)/(a*h
-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1
/2))*x*a*b*e*f^2*g*h-2*C*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/
(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-
d*g)/(a*f-b*e))^(1/2))*x*a*b*e*f^2*g*h-C*EllipticF(((a*f-b*e)*(h*
x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f
-b*e))^(1/2))*x^2*a^2*f^3*h^2)/(a*f-b*e)/(e*h-f*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(3/2)*sqrt(d*x + c)*sq
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(3/2)*
sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(3/2)*sqrt(d*x + c)*sq
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(3/2)*sqrt(d*x + c)*sq
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(3/2)*
sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.121 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{(a+bx)^{5/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=616

$$-\frac{2b^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(bB-2aC)}{\sqrt{a+bx}(bc-ad)(be-af)(bg-ah)}+\frac{2bd\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}(bB-2aC)}{\sqrt{c+dx}(bc-ad)(be-af)(bg-ah)}+\frac{2\sqrt{g+hx}(aCd-bBd+bcC)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}-\frac{2b\sqrt{a+bx}(bB-2aC)\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{\sqrt{g+hx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

```
[Out] (2*b*(b*B - 2*a*C)*d*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(
(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[c + d*x]) - (2*b^2*(b*B
- 2*a*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*
(b*e - a*f)*(b*g - a*h)*Sqrt[a + b*x]) - (2*b*(b*B - 2*a*C)*Sqrt[
d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g +
 h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h
]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(
f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)*
(b*g - a*h)*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]
*Sqrt[g + h*x]) + (2*(b*c*C - b*B*d + a*C*d)*Sqrt[((b*e - a*f)*(c
 + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[
(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])],
 -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/((b*c -
 a*d)*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e
- a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])
```

Rubi [A] time = 2.744, antiderivative size = 616, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 62, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$

$$-\frac{2b^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(bB-2aC)}{\sqrt{a+bx}(bc-ad)(be-af)(bg-ah)}+\frac{2bd\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}(bB-2aC)}{\sqrt{c+dx}(bc-ad)(be-af)(bg-ah)}+\frac{2\sqrt{g+hx}(aCd-bBd+bcC)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}-\frac{2b\sqrt{a+bx}(bB-2aC)\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{\sqrt{g+hx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sqrt[e +
```

```
[Out] (2*b*(b*B - 2*a*C)*d*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(
(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[c + d*x]) - (2*b^2*(b*B
- 2*a*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*
(b*e - a*f)*(b*g - a*h)*Sqrt[a + b*x]) - (2*b*(b*B - 2*a*C)*Sqrt[
d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g +
 h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h
]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(
f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)*
(b*g - a*h)*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]
*Sqrt[g + h*x]) + (2*(b*c*C - b*B*d + a*C*d)*Sqrt[((b*e - a*f)*(c
 + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[
(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])],
 -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/((b*c -
 a*d)*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e
- a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(5/2)/(d*x+c)**(1/
```

```
[Out] Timed out
```

Mathematica [B] time = 18.1709, size = 1753, normalized size = 2.85

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sq
```

```
[Out] (-2*b^2*(b*B - 2*a*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/
((b*c - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[a + b*x]) + (2*(((-(b*B
) + 2*a*C)*(a + b*x)^(5/2)*(d + (b*c)/(a + b*x) - (a*d)/(a + b*x)
)*(f + (b*e)/(a + b*x) - (a*f)/(a + b*x))*(h + (b*g)/(a + b*x) -
(a*h)/(a + b*x)))/(Sqrt[c + ((a + b*x)*(d - (a*d)/(a + b*x)))/b]*
Sqrt[e + ((a + b*x)*(f - (a*f)/(a + b*x)))/b]*Sqrt[g + ((a + b*x)
*(h - (a*h)/(a + b*x)))/b]) - ((b*c - a*d)*(b*e - a*f)*(b*g - a*h
)*(a + b*x)^(3/2)*Sqrt[(d + (b*c)/(a + b*x) - (a*d)/(a + b*x))*(f
 + (b*e)/(a + b*x) - (a*f)/(a + b*x))*(h + (b*g)/(a + b*x) - (a*h
)/(a + b*x))]*(-((b*B*Sqrt[((b*c - a*d)*(b*g - a*h)*(-(d/(-(b*c)
```

```
+ a*d)) + (a + b*x)^(-1)))/(b*d*g - b*c*h)]*(-(f/(-(b*e) + a*f))
+ (a + b*x)^(-1))*Sqrt[(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1))/(f/
(-(b*e) + a*f) - h/(-(b*g) + a*h))]*(-(((b*d*g - b*c*h)*EllipticE
[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a + b*x))
)/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(b*e)
+ a*f)*(-(d*g) + c*h))])/((b*c - a*d)*(b*g - a*h))) - (d*Elliptic
F[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a + b*x)
))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(b*e)
 + a*f)*(-(d*g) + c*h))])/(-(b*c) + a*d)))/(Sqrt[(-(f/(-(b*e) + a
*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*f)) + h/(-(b*g) + a*h))]*
Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))*(h +
 (b*g - a*h)/(a + b*x))])) + (2*a*C*Sqrt[((b*c - a*d)*(b*g - a*h)
*(-(d/(-(b*c) + a*d)) + (a + b*x)^(-1)))/(b*d*g - b*c*h)]*(-(f/(-
(b*e) + a*f)) + (a + b*x)^(-1))*Sqrt[(-(h/(-(b*g) + a*h)) + (a +
b*x)^(-1))/(f/(-(b*e) + a*f) - h/(-(b*g) + a*h))]*(-(((b*d*g - b*
c*h)*EllipticE[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a
*h)/(a + b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e
*h))/((-(b*e) + a*f)*(-(d*g) + c*h))])/((b*c - a*d)*(b*g - a*h)))
 - (d*EllipticF[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (
a*h)/(a + b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) +
e*h))/((-(b*e) + a*f)*(-(d*g) + c*h))])/(-(b*c) + a*d)))/(Sqrt[(-
(f/(-(b*e) + a*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*f)) + h/(-(
b*g) + a*h))]*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(
a + b*x))*(h + (b*g - a*h)/(a + b*x))]) - (C*Sqrt[(-(d/(-(b*c) +
a*d)) + (a + b*x)^(-1))/(-(d/(-(b*c) + a*d)) + h/(-(b*g) + a*h))]
*Sqrt[(-(f/(-(b*e) + a*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*f))
 + h/(-(b*g) + a*h))]*(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1))*Elli
pticF[ArcSin[Sqrt[((-(b*e) + a*f)*(-h - (b*g)/(a + b*x) + (a*h)/(
a + b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/
((-(b*e) + a*f)*(-(d*g) + c*h))])/(Sqrt[(-(h/(-(b*g) + a*h)) + (a
 + b*x)^(-1))/(f/(-(b*e) + a*f) - h/(-(b*g) + a*h))]*Sqrt[(d + (b
*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))*(h + (b*g - a*h)
/(a + b*x))])))/(Sqrt[c + ((a + b*x)*(d - (a*d)/(a + b*x)))/b]*Sq
rt[e + ((a + b*x)*(f - (a*f)/(a + b*x)))/b]*Sqrt[g + ((a + b*x)*(
h - (a*h)/(a + b*x)))/b])))/(b*(-(b*c) + a*d)*(-(b*e) + a*f)*(-(b
*g) + a*h))
```

Maple [B] time = 0.21, size = 9443, normalized size = 15.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(b*x+a)^(5/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx + a)^{\frac{5}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(5/2)*sqrt(d*x + c)*sq
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(5/2)*
sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{Cbx - Ca + Bb}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(5/2)*sqrt(d*x + c)*sq
```

```
[Out] integral((C*b*x - C*a + B*b)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(
f*x + e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(5/2)/(d*x+c)**(1/2)/(f
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx + a)^{\frac{5}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(5/2)*sqrt(d*x + c)*sq
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(5/2)*
sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.122 $\int \frac{abB-a^2C+b^2Bx+b^2Cx^2}{(a+bx)^{7/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=1128

$$-\frac{2\left(9Cdfha^3-b(6Bdfh+5C(dfg+deh+cfh))a^2+b^2(C(deg+cfg+ceh)+4B(dfg+deh+cfh))a-b^3(2Bdeg-c(3Ce\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{a+bx}}$$

$$-\frac{2(bB-2aC)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}b^2}{3(bc-ad)(be-af)(bg-ah)(a+bx)^{3/2}}$$

$$-\frac{2\sqrt{dg-ch}\sqrt{fg-eh}\left(9Cdfha^3-b(6Bdfh+5C(dfg+deh+cfh))a^2+b^2(C(deg+cfg+ceh)+4B(dfg+deh+cfh))a\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{}}$$

$$+\frac{2d\left(9Cdfha^3-b(6Bdfh+5C(dfg+deh+cfh))a^2+b^2(C(deg+cfg+ceh)+4B(dfg+deh+cfh))a-b^3(2Bdeg-c(3C\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{c+dx}}$$

$$-\frac{2\left(3Cd^2fha^3-3bd(Bdfh+C(dfg+deh-cfh))a^2+b^2\left(3B(fg+eh)d^2+C\left(-2fhc^2-dfgc-dehc+d^2eg\right)\right)a-b^3\left(-\right.\right.}{3(bc-ad)^2(be-af)(bg-ah)^{3/2}\sqrt{fg-}}$$

```
[Out] (2*b*d*(9*a^3*C*d*f*h - b^3*(2*B*d*e*g - c*(3*C*e*g - 2*B*f*g - 2
*B*e*h)) + a*b^2*(C*(d*e*g + c*f*g + c*e*h) + 4*B*(d*f*g + d*e*h
+ c*f*h)) - a^2*b*(6*B*d*f*h + 5*C*(d*f*g + d*e*h + c*f*h)))*Sqrt
[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*
f)^2*(b*g - a*h)^2*Sqrt[c + d*x]) - (2*b^2*(b*B - 2*a*C)*Sqrt[c +
 d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)*(b*e - a*f)*(b*
g - a*h)*(a + b*x)^(3/2)) - (2*b^2*(9*a^3*C*d*f*h - b^3*(2*B*d*e*
g - c*(3*C*e*g - 2*B*f*g - 2*B*e*h)) + a*b^2*(C*(d*e*g + c*f*g +
c*e*h) + 4*B*(d*f*g + d*e*h + c*f*h)) - a^2*b*(6*B*d*f*h + 5*C*(d
*f*g + d*e*h + c*f*h)))*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]
)/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a*h)^2*Sqrt[a + b*x]) - (
2*b*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(9*a^3*C*d*f*h - b^3*(2*B*d*e
*g - c*(3*C*e*g - 2*B*f*g - 2*B*e*h)) + a*b^2*(C*(d*e*g + c*f*g +
 c*e*h) + 4*B*(d*f*g + d*e*h + c*f*h)) - a^2*b*(6*B*d*f*h + 5*C*(
d*f*g + d*e*h + c*f*h)))*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h
*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*
Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*
g - e*h))/((b*e - a*f)*(d*g - c*h))])/(3*(b*c - a*d)^2*(b*e - a*f
)^2*(b*g - a*h)^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c +
d*x))]*Sqrt[g + h*x]) - (2*(3*a^3*C*d^2*f*h - b^3*(2*B*d^2*e*g -
B*c^2*f*h - c*d*(3*C*e*g - B*f*g - B*e*h)) - 3*a^2*b*d*(B*d*f*h +
 C*(d*f*g + d*e*h - c*f*h)) + a*b^2*(3*B*d^2*(f*g + e*h) + C*(d^2
*e*g - c*d*f*g - c*d*e*h - 2*c^2*f*h)))*Sqrt[((b*e - a*f)*(c + d*
x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt
[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((
b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(3*(b*c - a*
d)^2*(b*e - a*f)*(b*g - a*h)^(3/2)*Sqrt[f*g - e*h]*Sqrt[c + d*x]*
Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])
```

Rubi [A] time = 9.95317, antiderivative size = 1119, normalized size of antiderivative = 0.99, number of steps used = 9, number of rules used = 8, integrand size = 62, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$

$$-\frac{2\left(9Cdfha^3 - b(6Bdfh + 5C(dfg + deh + cfh))a^2 + b^2(C(deg + cfg + ceh) + 4B(dfg + deh + cfh))a + b^3(3cCeg - 2Bdeg\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{a+bx}}$$

$$-\frac{2(bB-2aC)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}b^2}{3(bc-ad)(be-af)(bg-ah)(a+bx)^{3/2}}$$

$$-\frac{2\sqrt{dg-ch}\sqrt{fg-eh}\left(9Cdfha^3 - b(6Bdfh + 5C(dfg + deh + cfh))a^2 + b^2(C(deg + cfg + ceh) + 4B(dfg + deh + cfh))a\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{\frac{(}{(b}}}$$

$$+\frac{2d\left(9Cdfha^3 - b(6Bdfh + 5C(dfg + deh + cfh))a^2 + b^2(C(deg + cfg + ceh) + 4B(dfg + deh + cfh))a + b^3(3cCeg - 2Bde\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{c+dx}}$$

$$-\frac{2\left(3Cd^2fha^3 - 3bd(Bdfh + C(dfg + deh - cfh))a^2 + b^2\left(3B(fg+eh)d^2 + C\left(-2fhc^2 - dfgc - dehc + d^2eg\right)\right)a - b^3\left(-\right.\right.}{3(bc-ad)^2(be-af)(bg-ah)^{3/2}\sqrt{fg-}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^(7/2)*Sqrt[c + d*x]*Sqrt[e +
```

```
[Out] (2*b*d*(9*a^3*C*d*f*h + b^3*(3*c*C*e*g - 2*B*d*e*g - 2*B*c*(f*g +
 e*h)) + a*b^2*(C*(d*e*g + c*f*g + c*e*h) + 4*B*(d*f*g + d*e*h +
c*f*h)) - a^2*b*(6*B*d*f*h + 5*C*(d*f*g + d*e*h + c*f*h)))*Sqrt[a
 + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*f)
^2*(b*g - a*h)^2*Sqrt[c + d*x]) - (2*b^2*(b*B - 2*a*C)*Sqrt[c + d
*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)*(b*e - a*f)*(b*g
- a*h)*(a + b*x)^(3/2)) - (2*b^2*(9*a^3*C*d*f*h + b^3*(3*c*C*e*g
- 2*B*d*e*g - 2*B*c*(f*g + e*h)) + a*b^2*(C*(d*e*g + c*f*g + c*e*
h) + 4*B*(d*f*g + d*e*h + c*f*h)) - a^2*b*(6*B*d*f*h + 5*C*(d*f*g
 + d*e*h + c*f*h)))*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3
*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a*h)^2*Sqrt[a + b*x]) - (2*b*
Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(9*a^3*C*d*f*h + b^3*(3*c*C*e*g -
 2*B*d*e*g - 2*B*c*(f*g + e*h)) + a*b^2*(C*(d*e*g + c*f*g + c*e*h
) + 4*B*(d*f*g + d*e*h + c*f*h)) - a^2*b*(6*B*d*f*h + 5*C*(d*f*g
+ d*e*h + c*f*h)))*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/(
(f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e
 + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*
h))/((b*e - a*f)*(d*g - c*h))])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b
*g - a*h)^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]
*Sqrt[g + h*x]) - (2*(3*a^3*C*d^2*f*h - b^3*(2*B*d^2*e*g - B*c^2*
f*h - c*d*(3*C*e*g - B*f*g - B*e*h)) - 3*a^2*b*d*(B*d*f*h + C*(d*
f*g + d*e*h - c*f*h)) + a*b^2*(3*B*d^2*(f*g + e*h) + C*(d^2*e*g -
 c*d*f*g - c*d*e*h - 2*c^2*f*h)))*Sqrt[((b*e - a*f)*(c + d*x))/((
d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g -
 a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c -
a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(3*(b*c - a*d)^2*(
b*e - a*f)*(b*g - a*h)^(3/2)*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-
(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(7/2)/(d*x+c)**(1/
```

```
[Out] Timed out
```

Mathematica [B] time = 37.5099, size = 10645, normalized size = 9.44

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a*b*B - a^2*C + b^2*B*x + b^2*C*x^2)/((a + b*x)^(7/2)*Sqrt[c + d*x]*Sq
```

```
[Out] Result too large to show
```

Maple [B] time = 1.96, size = 75992, normalized size = 67.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*b^2*x^2+B*b^2*x+B*a*b-C*a^2)/(b*x+a)^(7/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx+a)^{\frac{7}{2}}\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(7/2)*sqrt(d*x + c)*sq
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(7/2)*
sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cbx - Ca + Bb}{(b^2x^2 + 2\,abx + a^2)\sqrt{bx+a}\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(7/2)*sqrt(d*x + c)*sq
```

```
[Out] integral((C*b*x - C*a + B*b)/((b^2*x^2 + 2*a*b*x + a^2)*sqrt(b*x
+ a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b**2*x**2+B*b**2*x+B*a*b-C*a**2)/(b*x+a)**(7/2)/(d*x+c)**(1/2)/(f
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cb^2x^2 + Bb^2x - Ca^2 + Bab}{(bx+a)^{\frac{7}{2}}\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(7/2)*sqrt(d*x + c)*sq
```

```
[Out] integrate((C*b^2*x^2 + B*b^2*x - C*a^2 + B*a*b)/((b*x + a)^(7/2)*
sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

3.123 $\int \frac{(a+bx)^2(A+Bx)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=681

$$-\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(15a^2d^2f^2h^2(Bg-Ah)+10abdfh(3Adfgh-B(ch(fg-eh)\right.}{}$$

$$+\frac{2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(3dfh(5adfh(aB+2Ab)-bB(2a(cfh+deh+dfg)+3b(ceh+}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

$$+\frac{2b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(7aBdfh+b(5Adfh-4B(cfh+deh+dfg)))}{15d^2f^2h^2}$$

$$+\frac{2bB(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{5dfh}$$

```
[Out] (2*b*(7*a*B*d*f*h + b*(5*A*d*f*h - 4*B*(d*f*g + d*e*h + c*f*h)))*
Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(15*d^2*f^2*h^2) + (2*
b*B*(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(5*d*f*h
) + (2*Sqrt[-(d*e) + c*f]*(3*d*f*h*(5*a*(2*A*b + a*B)*d*f*h - b*B
*(3*b*(d*e*g + c*f*g + c*e*h) + 2*a*(d*f*g + d*e*h + c*f*h))) - 2
*b*(d*f*g + d*e*h + c*f*h)*(7*a*B*d*f*h + b*(5*A*d*f*h - 4*B*(d*f
*g + d*e*h + c*f*h))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h
*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]],
 ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*Sqrt[e + f
*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(15*
a^2*d^2*f^2*h^2*(B*g - A*h) + 10*a*b*d*f*h*(3*A*d*f*g*h - B*(c*h*
(f*g - e*h) + d*g*(2*f*g + e*h))) - b^2*(5*A*d*f*h*(c*h*(f*g - e*
h) + d*g*(2*f*g + e*h)) - B*(4*c^2*f*h^2*(f*g - e*h) + c*d*h*(3*f
^2*g^2 + e*f*g*h - 4*e^2*h^2) + d^2*g*(8*f^2*g^2 + 3*e*f*g*h + 4*
e^2*h^2))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d
*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
 c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*Sqr
t[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 5.75584, antiderivative size = 679, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$

$$-\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(15a^2d^2f^2h^2(Bg-Ah)+10abdfh(3Adfgh-Bch(fg-eh)\cdot\right.}{}$$

$$-\frac{2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(2b(cfh+deh+dfg)(7aBdfh+5Abdfh-4bB(cfh+deh+}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

$$+\frac{2b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(7aBdfh+5Abdfh-4bB(cfh+deh+dfg))}{15d^2f^2h^2}$$

$$+\frac{2bB(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{5dfh}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)^2*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*b*(5*A*b*d*f*h + 7*a*B*d*f*h - 4*b*B*(d*f*g + d*e*h + c*f*h))*
Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(15*d^2*f^2*h^2) + (2*
b*B*(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(5*d*f*h
) - (2*Sqrt[-(d*e) + c*f]*(2*b*(d*f*g + d*e*h + c*f*h)*(5*A*b*d*f
*h + 7*a*B*d*f*h - 4*b*B*(d*f*g + d*e*h + c*f*h)) - 3*d*f*h*(5*a*
(2*A*b + a*B)*d*f*h - b*B*(3*b*(d*e*g + c*f*g + c*e*h) + 2*a*(d*f
*g + d*e*h + c*f*h))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h
*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]],
 ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*Sqrt[e + f
*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(15*
a^2*d^2*f^2*h^2*(B*g - A*h) + 10*a*b*d*f*h*(3*A*d*f*g*h - B*c*h*(
f*g - e*h) - B*d*g*(2*f*g + e*h)) - b^2*(5*A*d*f*h*(c*h*(f*g - e*
h) + d*g*(2*f*g + e*h)) - B*(4*c^2*f*h^2*(f*g - e*h) + c*d*h*(3*f
^2*g^2 + e*f*g*h - 4*e^2*h^2) + d^2*g*(8*f^2*g^2 + 3*e*f*g*h + 4*
e^2*h^2))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d
*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
 c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*Sqr
t[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**2*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2)
```

```
[Out] Timed out
```

Mathematica [C] time = 18.259, size = 12443, normalized size = 18.27

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)^2*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.061, size = 8125, normalized size = 11.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx+A)(bx+a)^2}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Bb^2x^3 + Aa^2 + \left(2\,Bab + Ab^2\right)x^2 + \left(Ba^2 + 2\,Aab\right)x}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integral((B*b^2*x^3 + A*a^2 + (2*B*a*b + A*b^2)*x^2 + (B*a^2 + 2*
A*a*b)*x)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx+A)(bx+a)^2}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((B*x + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

3.124 $\int \frac{(a+bx)(A+Bx)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=402

$$-\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(3adfh(Bg-Ah)+b(3Adfgh-B(ch(fg-eh)+dg(eh+2f}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{g+hx}}$$
$$+\frac{2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(3dfh(aB+Ab)-2bB(cfh+deh+dfg))}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$
$$+\frac{2bB\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3dfh}$$

```
[Out] (2*b*B*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*d*f*h) + (2*
Sqrt[-(d*e) + c*f]*(3*(A*b + a*B)*d*f*h - 2*b*B*(d*f*g + d*e*h +
c*f*h))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x]*EllipticE[A
rcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h
)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f*x]*Sqrt[(d*(g +
 h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(3*a*d*f*h*(B*g - A*
h) + b*(3*A*d*f*g*h - B*(c*h*(f*g - e*h) + d*g*(2*f*g + e*h))))*S
qrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*El
lipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e
 - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f*x]*Sqr
t[g + h*x])
```

Rubi [A] time = 2.27807, antiderivative size = 402, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}} = 0.184$

$$-\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(3adfh(Bg-Ah)+b(3Adfgh-Bch(fg-eh)-Bdg(eh+2}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{g+hx}}$$
$$+\frac{2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(3dfh(aB+Ab)-2bB(cfh+deh+dfg))}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$
$$+\frac{2bB\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3dfh}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*b*B*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*d*f*h) + (2*
Sqrt[-(d*e) + c*f]*(3*(A*b + a*B)*d*f*h - 2*b*B*(d*f*g + d*e*h +
```

```
c*f*h))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x]*EllipticE[A
rcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h
)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f*x]*Sqrt[(d*(g +
 h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(3*a*d*f*h*(B*g - A*
h) + b*(3*A*d*f*g*h - B*c*h*(f*g - e*h) - B*d*g*(2*f*g + e*h)))*S
qrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*El
lipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e
 - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f*x]*Sqr
t[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)

[Out] Timed out
```

Mathematica [C] time = 9.62189, size = 450, normalized size = 1.12

$$\frac{\sqrt{c+dx}\left(-\frac{2d^2(e+fx)(g+hx)(-3aBdfh-3Abdfh+2bB(cfh+deh+dfg))}{c+dx}+\frac{2idh\sqrt{c+dx}\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}}F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-cfh}{deh-cfh}\right)(3adfh(Af-B}{\sqrt{\frac{de}{f}-c}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]

[Out] (Sqrt[c + d*x]*(2*b*B*d^2*f*h*(e + f*x)*(g + h*x) - (2*d^2*(-3*A*
b*d*f*h - 3*a*B*d*f*h + 2*b*B*(d*f*g + d*e*h + c*f*h))*(e + f*x)*
(g + h*x))/(c + d*x) + ((2*I)*(d*e - c*f)*h*(3*A*b*d*f*h + 3*a*B*
d*f*h - 2*b*B*(d*f*g + d*e*h + c*f*h))*Sqrt[c + d*x]*Sqrt[(d*(e +
 f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticE
[I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*
e*h - c*f*h)])/Sqrt[-c + (d*e)/f] + ((2*I)*d*h*(3*a*d*f*(-(B*e) +
 A*f)*h + b*(-3*A*d*e*f*h + B*c*f*(-(f*g) + e*h) + B*d*e*(f*g + 2
*e*h)))*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(
g + h*x))/(h*(c + d*x))]*EllipticF[I*ArcSinh[Sqrt[-c + (d*e)/f]/S
qrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)])/Sqrt[-c + (d*e)/
f]))/(3*d^3*f^2*h^2*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Maple [B] time = 0.045, size = 3224, normalized size = 8.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2/3*(3*A*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)
*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/
2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d^2*f^2*h^2-3*A*((d*x+c)*
f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-
d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/
(c*h-d*g))^(1/2))*a*d^3*e*f*h^2-3*A*((d*x+c)*f/(c*f-d*e))^(1/2)*(
-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*Elliptic
E(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*
c^2*d*f^2*h^2+B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g)
)^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*
e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d^2*e^2*h^2+2*B*((
d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*
d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*
e)*h/f/(c*h-d*g))^(1/2))*b*c*d^2*f^2*g^2-B*((d*x+c)*f/(c*f-d*e))^
(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*E
llipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1
/2))*b*d^3*e^2*g*h-2*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c
*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/
(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^3*e*f*g^2-3
*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*
x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c
*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c^2*d*f^2*h^2-2*B*((d*x+c)*f/(c*f
-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^
(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d
*g))^(1/2))*b*c*d^2*e^2*h^2-2*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*
x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((
d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d^
2*f^2*g^2+2*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^
(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e)
)^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^3*e^2*g*h+2*B*((d*x+
c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c
*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h
/f/(c*h-d*g))^(1/2))*b*d^3*e*f*g^2-3*A*((d*x+c)*f/(c*f-d*e))^(1/2
)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*Ellip
ticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))
*b*c*d^2*f^2*g*h+3*A*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h
-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c
*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^3*e*f*g*h+3*A
*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+
e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f
-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d^2*e*f*h^2+3*A*((d*x+c)*f/(c*f-d
*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1
/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g
))^(1/2))*b*c*d^2*f^2*g*h-3*A*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+
g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*
```

```
x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*d^3*e*
f*g*h-3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2
)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1
/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d^2*f^2*g*h+3*B*((d*x+c)
*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f
-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f
/(c*h-d*g))^(1/2))*a*d^3*e*f*g*h-B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-
(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF
(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c
^2*d*e*f*h^2+B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))
^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e
))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c^2*d*f^2*g*h-2*B*((d
*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d
/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e
)*h/f/(c*h-d*g))^(1/2))*b*c*d^2*e*f*g*h+B*b*c*d^2*e*f*g*h+B*x*b*c
*d^2*f^2*g*h+2*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g
))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d
*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c^3*f^2*h^2+B*x*b*d
^3*e*f*g*h+B*x*b*c*d^2*e*f*h^2+3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-
(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE
(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c
*d^2*e*f*h^2+3*B*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g
))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d
*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d^2*f^2*g*h-3*B*(
(d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)
*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d
*e)*h/f/(c*h-d*g))^(1/2))*a*d^3*e*f*g*h+B*x^2*b*c*d^2*f^2*h^2+B*x
^2*b*d^3*e*f*h^2+B*x^2*b*d^3*f^2*g*h+B*x^3*b*d^3*f^2*h^2)*(d*x+c)
^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/h^2/f^2/d^3/(d*f*h*x^3+c*f*h*x
^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx+A)(bx+a)}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algor
```

```
[Out] integrate((B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h
*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Bbx^2+Aa+(Ba+Ab)x}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algor
```

```
[Out] integral((B*b*x^2 + A*a + (B*a + A*b)*x)/(sqrt(d*x + c)*sqrt(f*x
+ e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(bx + a)}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algor
```

```
[Out] integrate((B*x + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h
*x + g)), x)
```

3.125 $\int \frac{A+Bx}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=284

$$\frac{2B\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}-\frac{2(Bg-Ah)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{g+hx}}$$

```
[Out] (2*B*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g +
h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sq
rt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(B*g - A*h
)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]
*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((
d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[g
 + h*x])
```

Rubi [A] time = 1.02494, antiderivative size = 284, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.152

$$\frac{2B\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}-\frac{2(Bg-Ah)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + B*x)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*B*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g +
h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sq
rt[(d*(g + h*x))/(d*g - c*h)]) - (2*Sqrt[-(d*e) + c*f]*(B*g - A*h
)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]
*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((
d*e - c*f)*h)/(f*(d*g - c*h))])/(d*Sqrt[f]*h*Sqrt[e + f*x]*Sqrt[g
 + h*x])
```

Rubi in Sympy [A] time = 117.404, size = 241, normalized size = 0.85

$$\frac{2B\sqrt{\frac{d(-e-fx)}{cf-de}}\sqrt{g+hx}\sqrt{cf-de}E\left(\operatorname{asin}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{h(cf-de)}{f(ch-dg)}\right)}{d\sqrt{f}h\sqrt{\frac{d(-g-hx)}{ch-dg}}\sqrt{e+fx}} + \frac{2\sqrt{\frac{d(-e-fx)}{cf-de}}\sqrt{\frac{d(-g-hx)}{ch-dg}}\,(Ah-Bg)\,\sqrt{cf-de}F\left(\operatorname{asin}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\middle|\frac{h(cf-de)}{f(ch-dg)}\right)}{d\sqrt{f}h\sqrt{e+fx}\sqrt{g+hx}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] 2*B*sqrt(d*(-e - f*x)/(c*f - d*e))*sqrt(g + h*x)*sqrt(c*f - d*e)*
elliptic_e(asin(sqrt(f)*sqrt(c + d*x)/sqrt(c*f - d*e)), h*(c*f -
d*e)/(f*(c*h - d*g)))/(d*sqrt(f)*h*sqrt(d*(-g - h*x)/(c*h - d*g))
*sqrt(e + f*x)) + 2*sqrt(d*(-e - f*x)/(c*f - d*e))*sqrt(d*(-g - h
*x)/(c*h - d*g))*(A*h - B*g)*sqrt(c*f - d*e)*elliptic_f(asin(sqrt
(f)*sqrt(c + d*x)/sqrt(c*f - d*e)), h*(c*f - d*e)/(f*(c*h - d*g))
)/(d*sqrt(f)*h*sqrt(e + f*x)*sqrt(g + h*x))
```

Mathematica [C] time = 3.1133, size = 319, normalized size = 1.12

$$-\frac{2\left(idh(c+dx)^{3/2}(Be-Af)\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}}F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-cfh}{deh-cfh}\right)-Bd^2(e+fx)(g+hx)\sqrt{\frac{de}{f}-c}-iBh(c+dx\ldots\right.}{d^2fh\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\sqrt{\frac{de}{f}-c}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(A + B*x)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (-2*(-(B*d^2*Sqrt[-c + (d*e)/f]*(e + f*x)*(g + h*x)) - I*B*(d*e -
 c*f)*h*(c + d*x)^(3/2)*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d
*(g + h*x))/(h*(c + d*x))]*EllipticE[I*ArcSinh[Sqrt[-c + (d*e)/f]
/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)] + I*d*(B*e - A*
f)*h*(c + d*x)^(3/2)*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[(d*(g
 + h*x))/(h*(c + d*x))]*EllipticF[I*ArcSinh[Sqrt[-c + (d*e)/f]/Sq
rt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)]))/(d^2*Sqrt[-c + (
d*e)/f]*f*h*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Maple [B] time = 0.033, size = 559, normalized size = 2.

$$2\frac{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{d^2fh\left(dfhx^3+cfhx^2+dehx^2+dfgx^2+cehx+cfgx+degx+ceg\right)}\left(AEllipticF\left(\sqrt{\frac{(dx+c)f}{cf-de}},\sqrt{\frac{(cf-de)h}{f(ch-dg)}}\right)cdfh-A\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2*(A*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*
g))^(1/2))*c*d*f*h-A*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-
d*e)*h/f/(c*h-d*g))^(1/2))*d^2*e*h-B*EllipticF(((d*x+c)*f/(c*f-d*
e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d*f*g+B*EllipticF(((
d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d^2*e*
g-B*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g
))^(1/2))*c^2*f*h+B*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d
*e)*h/f/(c*h-d*g))^(1/2))*c*d*e*h+B*EllipticE(((d*x+c)*f/(c*f-d*e
))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d*f*g-B*EllipticE(((d
*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d^2*e*g
)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*((d*x
+c)*f/(c*f-d*e))^(1/2)/h/f/d^2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g
)^(1/2)/(d*f*h*x^3+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+
d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx+A}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algorithm="max
```

```
[Out] integrate((B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Bx+A}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algorithm="fri
```

```
[Out] integral((B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x
)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A+Bx}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Integral((A + B*x)/(sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g + h*x)), x
)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx+A}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algorithm="gia
```

```
[Out] integrate((B*x + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),
x)
```

3.126 $\int \frac{A+Bx}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=313

$$\frac{2B\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{bd\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2\left(A-\frac{aB}{b}\right)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}$$

```
[Out] (2*B*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(
g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/S
qrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b*d*Sqrt[f
]*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(A - (a*B)/b)*Sqrt[-(d*e) + c
*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h
)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]
*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*
h))])/((b*c - a*d)*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 2.65882, antiderivative size = 313, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$

$$\frac{2B\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{bd\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}} - \frac{2\left(A-\frac{aB}{b}\right)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\Pi\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```


```
[Out] (2*B*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(
g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/S
qrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b*d*Sqrt[f
]*Sqrt[e + f*x]*Sqrt[g + h*x]) - (2*(A - (a*B)/b)*Sqrt[-(d*e) + c
*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h
)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]
*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*
h))])/((b*c - a*d)*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((B*x+A)/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 2.26074, size = 244, normalized size = 0.78

$$\frac{2i\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{h(c+dx)}}\left(d(aB-Ab)\left(\frac{(bc-ad)f}{b(cf-de)};i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-cfh}{deh-cfh}\right)+b(Ad-Bc)F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-cfh}{deh-cfh}\right)\right)}{bf\sqrt{g+hx}(ad-bc)\sqrt{\frac{de}{f}-c}\sqrt{\frac{d(e+fx)}{f(c+dx)}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] ((2*I)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*(b*(-(B*c)
 + A*d)*EllipticF[I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt[c + d*x]], (d
*f*g - c*f*h)/(d*e*h - c*f*h)] + (-(A*b) + a*B)*d*EllipticPi[((b*
c - a*d)*f)/(b*(-(d*e) + c*f)), I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt
[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)]))/(b*(-(b*c) + a*d)*
Sqrt[-c + (d*e)/f]*f*Sqrt[(d*(e + f*x))/(f*(c + d*x))]*Sqrt[g + h
*x])
```

Maple [B] time = 0.046, size = 665, normalized size = 2.1

$$2\,\frac{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}{(ad-bc)\,bfd\,(dfhx^3+cfhx^2+dehx^2+dfgx^2+cehx+cfgx+degx+ceg)}\sqrt{\frac{(dx+c)\,f}{cf-de}}\sqrt{-\frac{(hx+g)\,d}{ch-dg}}\sqrt{-\frac{(fx+e)\,d}{cf-de}}\,($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*x+A)/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/d/f/b*((d*x+c)*f/(c*f
-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^
(1/2)*(A*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a
*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b*c*d*f-A*EllipticPi(((d
*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/
```

```
(c*h-d*g))^(1/2))*b*d^2*e+B*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2)
,((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d*f-B*EllipticF(((d*x+c)*f/
(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*d^2*e-B*Ellip
ticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))
*b*c^2*f+B*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(
c*h-d*g))^(1/2))*b*c*d*e-B*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2)
,-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*c*d*
f+B*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*
c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*d^2*e)/(a*d-b*c)/(d*f*h*x^3
+c*f*h*x^2+d*e*h*x^2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algor
```

```
[Out] integrate((B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h
*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algor
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Bx}{(a + bx)\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x+A)/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Integral((A + B*x)/((a + b*x)*sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g
+ h*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algor
```

```
[Out] integrate((B*x + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h
*x + g)), x)
```

3.127 $\int \frac{A+Bx}{(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=678

$$\frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(a^3(-B)dfh+3a^2Abdfh+ab^2(B(ceh+cfg+deg)-2A(cfh+deh+dfg))-b^3(2Bceg-A(c\right.}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)^2(be-af)(bg-ah)}$$

$$-\frac{b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{(a+bx)(bc-ad)(be-af)(bg-ah)}$$

$$-\frac{\sqrt{f}(Ab-aB)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{b\sqrt{e+fx}\sqrt{g+hx}(bc-ad)(be-af)}$$

$$+\frac{\sqrt{f}\sqrt{g+hx}(Ab-aB)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

```
[Out] -((b*(A*b - a*B)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c
 - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x))) + ((A*b - a*B)*Sqrt[f
]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x
]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], (
(d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)*(b*g -
a*h)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - ((A*b - a*B
)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*
x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b*(b*
c - a*d)*(b*e - a*f)*Sqrt[e + f*x]*Sqrt[g + h*x]) + (Sqrt[-(d*e)
+ c*f]*(3*a^2*A*b*d*f*h - a^3*B*d*f*h - b^3*(2*B*c*e*g - A*(d*e*g
 + c*f*g + c*e*h)) + a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 2*A*(d*f*
g + d*e*h + c*f*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g +
 h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f))
, ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f
)*h)/(f*(d*g - c*h))])/(b*(b*c - a*d)^2*Sqrt[f]*(b*e - a*f)*(b*g
- a*h)*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 4.59057, antiderivative size = 678, normalized size of antiderivative = 1., number of

steps used = 12, number of rules used = 10, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.25$

$$\frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(a^3(-B)dfh+3a^2Abdfh+ab^2(B(ceh+cfg+deg)-2A(cfh+deh+dfg))-b^3(2Bceg-A(ce\right.}{b\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)^2(be-af)(bg-ah)}$$

$$-\frac{b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{(a+bx)(bc-ad)(be-af)(bg-ah)}$$

$$-\frac{\sqrt{f}(Ab-aB)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{b\sqrt{e+fx}\sqrt{g+hx}(bc-ad)(be-af)}$$

$$+\frac{\sqrt{f}\sqrt{g+hx}(Ab-aB)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] -((b*(A*b - a*B)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c
 - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x))) + ((A*b - a*B)*Sqrt[f
]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x
]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], (
(d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)*(b*g -
a*h)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) - ((A*b - a*B
)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*
x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b*(b*
c - a*d)*(b*e - a*f)*Sqrt[e + f*x]*Sqrt[g + h*x]) + (Sqrt[-(d*e)
+ c*f]*(3*a^2*A*b*d*f*h - a^3*B*d*f*h - b^3*(2*B*c*e*g - A*(d*e*g
 + c*f*g + c*e*h)) + a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 2*A*(d*f*
g + d*e*h + c*f*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g +
 h*x))/(d*g - c*h)]*EllipticPi[-((b*(d*e - c*f))/((b*c - a*d)*f))
, ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f
)*h)/(f*(d*g - c*h))])/(b*(b*c - a*d)^2*Sqrt[f]*(b*e - a*f)*(b*g
- a*h)*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((B*x+A)/(b*x+a)**2/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2)
```

```
[Out] Timed out
```

Mathematica [C] time = 19.3543, size = 14516, normalized size = 21.41

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(A + B*x)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.107, size = 13380, normalized size = 19.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*x+A)/(b*x+a)^2/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)^2 \sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] Timed out
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x+A)/(b*x+a)**2/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)^2 \sqrt{dx + c} \sqrt{fx + e} \sqrt{hx + g}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((B*x + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

3.128 $\int \frac{(a+bx)^{3/2}(A+Bx)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=995

$$\frac{b\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}B}{2dfh}$$

$$-\frac{\sqrt{dg-ch}\sqrt{fg-eh}(5aBdfh+b(4Adfh-3B(dfg+deh+cfh)))\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-a\cdots}{(be-a\cdots}\right.}{4d^2f^2h^2\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}}$$

$$-\frac{(be-af)\sqrt{bg-ah}(3aBdfh+b(4Adfh-B(cfh+3d(fg+eh))))\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-a\cdots}{(de-c\cdots}\right.}{4bdf^2h^2\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}$$

$$+\frac{\sqrt{ch-dg}\left(-\left(4Adfh(dfg+deh+cfh)-B\left(\left(3f^2g^2+2efhg+3e^2h^2\right)d^2+2cfh(fg+eh)d+3c^2f^2h^2\right)\right)b^2+6adfh(2Ad\cdots\right.}{4bd^2\sqrt{bc-a\cdots}}$$

$$+\frac{(5aBdfh+b(4Adfh-3B(dfg+deh+cfh)))\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{4df^2h^2\sqrt{c+dx}}$$

```
[Out] ((5*a*B*d*f*h + b*(4*A*d*f*h - 3*B*(d*f*g + d*e*h + c*f*h)))*Sqrt
[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(4*d*f^2*h^2*Sqrt[c + d*x]
) + (b*B*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
/(2*d*f*h) - (Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(5*a*B*d*f*h + b*(4
*A*d*f*h - 3*B*(d*f*g + d*e*h + c*f*h)))*Sqrt[a + b*x]*Sqrt[-(((d
*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(
Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])],
((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(4*d^2*f^2*
h^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g
+ h*x]) - ((b*e - a*f)*Sqrt[b*g - a*h]*(3*a*B*d*f*h + b*(4*A*d*f*
h - B*(c*f*h + 3*d*(f*g + e*h))))*Sqrt[((b*e - a*f)*(c + d*x))/((
d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g -
 a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c -
a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(4*b*d*f^2*h^2*Sqr
t[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g -
 e*h)*(a + b*x)))]) + (Sqrt[-(d*g) + c*h]*(3*a^2*B*d^2*f^2*h^2 +
6*a*b*d*f*h*(2*A*d*f*h - B*(d*f*g + d*e*h + c*f*h)) - b^2*(4*A*d*
f*h*(d*f*g + d*e*h + c*f*h) - B*(3*c^2*f^2*h^2 + 2*c*d*f*h*(f*g +
 e*h) + d^2*(3*f^2*g^2 + 2*e*f*g*h + 3*e^2*h^2))))*(a + b*x)*Sqrt
[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*
h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h
))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt
[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c -
 a*d)*(f*g - e*h))])/(4*b*d^2*Sqrt[b*c - a*d]*f^2*h^3*Sqrt[c + d*
x]*Sqrt[e + f*x])
```

Rubi [A] time = 9.67383, antiderivative size = 992, normalized size of antiderivative = 1., number of

steps used = 11, number of rules used = 10, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238

$$\frac{b\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}B}{2dfh} - \frac{\sqrt{dg-ch}\sqrt{fg-eh}(4Abdfh+5aBdfh-3bB(dfg+deh+cfh))\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad}{(be-af}\right.}{4d^2f^2h^2\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}} - \frac{(be-af)\sqrt{bg-ah}(4Abdfh+3aBdfh-bB(cfh+3d(fg+eh)))\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ac}{(de-cf}\right.}{4bdf^2h^2\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}} + \frac{\sqrt{ch-dg}\left(-\left(4Adfh(dfg+deh+cfh)-B\left(\left(3f^2g^2+2efhg+3e^2h^2\right)d^2+2cfh(fg+eh)d+3c^2f^2h^2\right)\right)b^2+6adfh(2Ad\right.}{4bd^2\sqrt{bc-ac}} + \frac{(4Abdfh+5aBdfh-3bB(dfg+deh+cfh))\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{4df^2h^2\sqrt{c+dx}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[((a + b*x)^(3/2)*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] ((4*A*b*d*f*h + 5*a*B*d*f*h - 3*b*B*(d*f*g + d*e*h + c*f*h))*Sqrt
[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(4*d*f^2*h^2*Sqrt[c + d*x]
) + (b*B*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
/(2*d*f*h) - (Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(4*A*b*d*f*h + 5*a*
B*d*f*h - 3*b*B*(d*f*g + d*e*h + c*f*h))*Sqrt[a + b*x]*Sqrt[-(((d
*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(
Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])],
((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(4*d^2*f^2*
h^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g
+ h*x]) - ((b*e - a*f)*Sqrt[b*g - a*h]*(4*A*b*d*f*h + 3*a*B*d*f*h
 - b*B*(c*f*h + 3*d*(f*g + e*h)))*Sqrt[((b*e - a*f)*(c + d*x))/((
d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g -
 a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c -
a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(4*b*d*f^2*h^2*Sqr
t[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g -
 e*h)*(a + b*x)))]) + (Sqrt[-(d*g) + c*h]*(3*a^2*B*d^2*f^2*h^2 +
6*a*b*d*f*h*(2*A*d*f*h - B*(d*f*g + d*e*h + c*f*h)) - b^2*(4*A*d*
f*h*(d*f*g + d*e*h + c*f*h) - B*(3*c^2*f^2*h^2 + 2*c*d*f*h*(f*g +
 e*h) + d^2*(3*f^2*g^2 + 2*e*f*g*h + 3*e^2*h^2))))*(a + b*x)*Sqrt
[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*
h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h
))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt
[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c -
 a*d)*(f*g - e*h))])/(4*b*d^2*Sqrt[b*c - a*d]*f^2*h^3*Sqrt[c + d*
x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(3/2)*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(
```

```
[Out] Timed out
```

Mathematica [B] time = 23.9575, size = 21555, normalized size = 21.66

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^(3/2)*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

```
[Out] Result too large to show
```

Maple [B] time = 0.156, size = 54623, normalized size = 54.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(3/2)*(B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(bx + a)^{\frac{3}{2}}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(3/2)*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)(bx + a)^{\frac{3}{2}}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((B*x + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

3.129 $\int \frac{\sqrt{a+bx}(A+Bx)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=736

$$\frac{(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}(aBdfh+b(2Adfh-B(cfh+deh+dfg)))\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right.\right.}{bdfh^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$
$$+\frac{B\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{fh\sqrt{c+dx}}$$
$$-\frac{B\sqrt{g+hx}(be-af)\sqrt{bg-ah}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{bfh\sqrt{c+dx}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$
$$-\frac{B\sqrt{a+bx}\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{dfh\sqrt{g+hx}\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

```
[Out] (B*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(f*h*Sqrt[c + d*x])
 - (B*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e
- c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqr
t[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b
*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(d*f*h*Sqrt[((
d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x]) - (
B*(b*e - a*f)*Sqrt[b*g - a*h]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e
- c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h
]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)
*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(b*f*h*Sqrt[f*g - e*h]
*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b
*x)))]) + (Sqrt[-(d*g) + c*h]*(a*B*d*f*h + b*(2*A*d*f*h - B*(d*f*
g + d*e*h + c*f*h)))*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g
 - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a
+ b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(S
qrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])]
, ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])/(b*d*Sqrt
[b*c - a*d]*f*h^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 4.42482, antiderivative size = 735, normalized size of antiderivative = 1., number of

steps used = 10, number of rules used = 10, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$

$$\frac{(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}(aBdfh+2Abdfh-bB(cfh+deh+dfg))\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right.\right.}{bdfh^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

$$+\frac{B\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{fh\sqrt{c+dx}}$$

$$-\frac{B\sqrt{g+hx}(be-af)\sqrt{bg-ah}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{bfh\sqrt{c+dx}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$

$$-\frac{B\sqrt{a+bx}\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{dfh\sqrt{g+hx}\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(Sqrt[a + b*x]*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (B*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(f*h*Sqrt[c + d*x])
 - (B*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e
- c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqr
t[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b
*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(d*f*h*Sqrt[((
d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x]) - (
B*(b*e - a*f)*Sqrt[b*g - a*h]*Sqrt[((b*e - a*f)*(c + d*x))/((d*e
- c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h
]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)
*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(b*f*h*Sqrt[f*g - e*h]
*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b
*x)))]) + (Sqrt[-(d*g) + c*h]*(2*A*b*d*f*h + a*B*d*f*h - b*B*(d*f
*g + d*e*h + c*f*h))*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g
 - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a
+ b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(S
qrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])]
, ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])/(b*d*Sqrt
[b*c - a*d]*f*h^2*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((b*x+a)**(1/2)*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(
```

```
[Out] Timed out
```

Mathematica [B] time = 17.5658, size = 6648, normalized size = 9.03

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[a + b*x]*(A + B*x))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x
```

```
[Out] Result too large to show
```

Maple [B] time = 0.089, size = 20733, normalized size = 28.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(1/2)*(B*x+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx + A)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(A+Bx)\sqrt{a+bx}}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(1/2)*(B*x+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),
```

```
[Out] Integral((A + B*x)*sqrt(a + b*x)/(sqrt(c + d*x)*sqrt(e + f*x)*sqr
t(g + h*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx+A)\sqrt{bx+a}}{\sqrt{dx+c}\sqrt{fx+e}\sqrt{hx+g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((B*x + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

3.130 $\int \frac{A+Bx}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=440

$$\frac{2\sqrt{g+hx}\left(A-\frac{aB}{b}\right)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}+\frac{2B(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}\Pi\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)}{bh\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

```
[Out] (2*(A - (a*B)/b)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b
*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*
x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))
/((d*e - c*f)*(b*g - a*h)))])/(Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sq
rt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)
))]) + (2*B*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d
*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g
- e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)),
 ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[
a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])
/(b*Sqrt[b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 2.04063, antiderivative size = 440, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$

$$\frac{2\sqrt{g+hx}\left(A-\frac{aB}{b}\right)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}+\frac{2B(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}\Pi\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)}{bh\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + B*x)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```



```
[Out] (2*(A - (a*B)/b)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b
*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*
x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))
/((d*e - c*f)*(b*g - a*h)))])/(Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sq
rt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)
))]) + (2*B*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d
*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g
- e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)),
```

```
 ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[
a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])
/(b*Sqrt[b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((B*x+A)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(
```

```
[Out] Timed out
```

Mathematica [A] time = 10.1962, size = 586, normalized size = 1.33

$$\frac{2(a+bx)^{3/2}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\left(-\frac{Ab(g+hx)\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}F\left(\sin^{-1}\left(\sqrt{\frac{(af-be)(g+hx)}{(fg-eh)(a+bx)}}\right)|\frac{(ad-bc)(eh-fg)}{(be-af)(dg-ch)}\right)}{(a+bx)(bg-ah)\sqrt{\frac{(g+hx)(af-be)}{(a+bx)(fg-eh)}}}-\frac{aB(g+hx)\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}F\left(\sin^{-1}\left(\sqrt{\frac{(af-be)(g}{(fg-eh)(a}}\right.\right.}{(a+bx)(ah-bg)\sqrt{\frac{(g+hx)(af-}{(a+bx)(fg-}}}\right.}{b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + B*x)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*(a + b*x)^(3/2)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a +
 b*x))]*(-((A*b*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*
x))]*(g + h*x)*EllipticF[ArcSin[Sqrt[((-(b*e) + a*f)*(g + h*x))/(
(f*g - e*h)*(a + b*x))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((b*e -
 a*f)*(d*g - c*h))])/((b*g - a*h)*(a + b*x)*Sqrt[((-(b*e) + a*f)*
(g + h*x))/((f*g - e*h)*(a + b*x))])) - (a*B*Sqrt[((b*g - a*h)*(e
 + f*x))/((f*g - e*h)*(a + b*x))]*(g + h*x)*EllipticF[ArcSin[Sqrt
[((-(b*e) + a*f)*(g + h*x))/((f*g - e*h)*(a + b*x))]], ((-(b*c) +
 a*d)*(-(f*g) + e*h))/((b*e - a*f)*(d*g - c*h))])/((-(b*g) + a*h)
*(a + b*x)*Sqrt[((-(b*e) + a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)
)]) + (B*(-(f*g) + e*h)*Sqrt[-(((b*e - a*f)*(b*g - a*h)*(e + f*x)
*(g + h*x))/((f*g - e*h)^2*(a + b*x)^2))]*EllipticPi[(b*(-(f*g) +
 e*h))/((b*e - a*f)*h), ArcSin[Sqrt[((-(b*e) + a*f)*(g + h*x))/((
f*g - e*h)*(a + b*x))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((b*e -
a*f)*(d*g - c*h))])/((b*e - a*f)*h)))/(b*Sqrt[c + d*x]*Sqrt[e + f
*x]*Sqrt[g + h*x])
```

Maple [B] time = 0.107, size = 2453, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*x+A)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2/(h*x+g)^(1/2)/(f*x+e)^(1/2)/(d*x+c)^(1/2)/(b*x+a)^(1/2)/f/h*((a
*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2)*((e*h-f*g)*(d*x+c)/(c*h-
d*g)/(f*x+e))^(1/2)*((e*h-f*g)*(b*x+a)/(a*h-b*g)/(f*x+e))^(1/2)*(
A*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e
)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*a*f^3*h^2-A*EllipticF
(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)
/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*b*f^3*g*h-B*EllipticF(((a*f-b*e)
*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/
(a*f-b*e))^(1/2))*x^2*a*e*f^2*h^2+B*EllipticF(((a*f-b*e)*(h*x+g)/
(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e)
)^(1/2))*x^2*b*e*f^2*g*h+B*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g
)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*
h-d*g)/(a*f-b*e))^(1/2))*x^2*a*e*f^2*h^2-B*EllipticPi(((a*f-b*e)*
(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*
e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*a*f^3*g*h-B*Elliptic
Pi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f
-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x^2*b*e*f^
2*g*h+B*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a
*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(
1/2))*x^2*b*f^3*g^2+2*A*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f
*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*a
*e*f^2*h^2-2*A*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1
/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*b*e*f^2*g*
h-2*B*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f
-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*a*e^2*f*h^2+2*B*Ell
ipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*
h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*b*e^2*f*g*h+2*B*EllipticPi((
(a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e
),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*a*e^2*f*h^2-
2*B*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b
*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2)
)*x*a*e*f^2*g*h-2*B*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+
e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/
(a*f-b*e))^(1/2))*x*b*e^2*f*g*h+2*B*EllipticPi(((a*f-b*e)*(h*x+g)
/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h
-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*x*b*e*f^2*g^2+A*EllipticF(((a*f
-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-
d*g)/(a*f-b*e))^(1/2))*a*e^2*f*h^2-A*EllipticF(((a*f-b*e)*(h*x+g)
/(a*h-b*g)/(f*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e
))^(1/2))*b*e^2*f*g*h-B*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f
*x+e))^(1/2),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*a*e
^3*h^2+B*EllipticF(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),((
c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*b*e^3*g*h+B*Ellipt
icPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a
*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2))*a*e^3*h^
2-B*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^(1/2),(a*h-b
*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f-b*e))^(1/2)
)*a*e^2*f*g*h-B*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)/(f*x+e))^
(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h-d*g)/(a*f
-b*e))^(1/2))*b*e^3*g*h+B*EllipticPi(((a*f-b*e)*(h*x+g)/(a*h-b*g)
/(f*x+e))^(1/2),(a*h-b*g)*f/h/(a*f-b*e),((c*f-d*e)*(a*h-b*g)/(c*h
```

```
-d*g)/(a*f-b*e))^(1/2))*b*e^2*f*g^2)/(e*h-f*g)/(a*f-b*e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x+A)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((B*x + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

3.131 $\int \frac{A+Bx}{(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=606

$$-\frac{2b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{\sqrt{a+bx}(bc-ad)(be-af)(bg-ah)}+\frac{2d\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{\sqrt{c+dx}(bc-ad)(be-af)(bg-ah)}+\frac{2\sqrt{g+hx}(Bc-Ad)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}-\frac{2\sqrt{a+bx}(Ab-aB)\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{\sqrt{g+hx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

```
[Out] (2*(A*b - a*B)*d*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c
 - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[c + d*x]) - (2*b*(A*b - a*B)
*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*(b*e - a
*f)*(b*g - a*h)*Sqrt[a + b*x]) - (2*(A*b - a*B)*Sqrt[d*g - c*h]*S
qrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/((f*g
 - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e + f
*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*h))/
((b*e - a*f)*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)*(b*g - a*h)*
Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*
x]) + (2*(B*c - A*d)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a
 + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e
+ f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e
*h))/((d*e - c*f)*(b*g - a*h)))])/((b*c - a*d)*Sqrt[b*g - a*h]*Sq
rt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g
- e*h)*(a + b*x)))])
```

Rubi [A] time = 2.44749, antiderivative size = 606, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$-\frac{2b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{\sqrt{a+bx}(bc-ad)(be-af)(bg-ah)}+\frac{2d\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{\sqrt{c+dx}(bc-ad)(be-af)(bg-ah)}+\frac{2\sqrt{g+hx}(Bc-Ad)\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{\sqrt{c+dx}(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}-\frac{2\sqrt{a+bx}(Ab-aB)\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{\sqrt{g+hx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(A + B*x)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*(A*b - a*B)*d*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c
 - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[c + d*x]) - (2*b*(A*b - a*B)
*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*(b*e - a
*f)*(b*g - a*h)*Sqrt[a + b*x]) - (2*(A*b - a*B)*Sqrt[d*g - c*h]*S
qrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/((f*g
 - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e + f
*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*h))/
((b*e - a*f)*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)*(b*g - a*h)*
Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*
x]) + (2*(B*c - A*d)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a
 + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e
+ f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e
*h))/((d*e - c*f)*(b*g - a*h)))])/((b*c - a*d)*Sqrt[b*g - a*h]*Sq
rt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g
- e*h)*(a + b*x)))])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((B*x+A)/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(
```

```
[Out] Timed out
```

Mathematica [B] time = 17.5008, size = 1749, normalized size = 2.89

result too large to display

Warning: Unable to verify antiderivative.

```
[In]  Integrate[(A + B*x)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x
```

```
[Out] (-2*b*(A*b - a*B)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*
c - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[a + b*x]) + ((-2*(A*b - a*B
)*(a + b*x)^(5/2)*(d + (b*c)/(a + b*x) - (a*d)/(a + b*x))*(f + (b
*e)/(a + b*x) - (a*f)/(a + b*x))*(h + (b*g)/(a + b*x) - (a*h)/(a
+ b*x)))/(Sqrt[c + ((a + b*x)*(d - (a*d)/(a + b*x)))/b]*Sqrt[e +
((a + b*x)*(f - (a*f)/(a + b*x)))/b]*Sqrt[g + ((a + b*x)*(h - (a*
h)/(a + b*x)))/b]) - (2*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a +
b*x)^(3/2)*Sqrt[(d + (b*c)/(a + b*x) - (a*d)/(a + b*x))*(f + (b*e
)/(a + b*x) - (a*f)/(a + b*x))*(h + (b*g)/(a + b*x) - (a*h)/(a +
b*x))]*(-((A*b*Sqrt[((b*c - a*d)*(b*g - a*h)*(-(d/(-(b*c) + a*d))
```

```
 + (a + b*x)^(-1)))/(b*d*g - b*c*h)]*(-(f/(-(b*e) + a*f)) + (a +
b*x)^(-1))*Sqrt[(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1))/(f/(-(b*e)
 + a*f) - h/(-(b*g) + a*h))]*(-(((b*d*g - b*c*h)*EllipticE[ArcSin
[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a + b*x)))/(b*(-
(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(b*e) + a*f)*
(-(d*g) + c*h))])/((b*c - a*d)*(b*g - a*h))) - (d*EllipticF[ArcSi
n[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a + b*x)))/(b*(
-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(b*e) + a*f)
*(-(d*g) + c*h))])/(-(b*c) + a*d)))/(Sqrt[(-(f/(-(b*e) + a*f)) +
(a + b*x)^(-1))/(-(f/(-(b*e) + a*f)) + h/(-(b*g) + a*h))]*Sqrt[(d
 + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))*(h + (b*g -
 a*h)/(a + b*x))])) + (a*B*Sqrt[((b*c - a*d)*(b*g - a*h)*(-(d/(-(
b*c) + a*d)) + (a + b*x)^(-1)))/(b*d*g - b*c*h)]*(-(f/(-(b*e) + a
*f)) + (a + b*x)^(-1))*Sqrt[(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1)
)/(f/(-(b*e) + a*f) - h/(-(b*g) + a*h))]*(-(((b*d*g - b*c*h)*Elli
pticE[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a +
b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(
b*e) + a*f)*(-(d*g) + c*h))])/((b*c - a*d)*(b*g - a*h))) - (d*Ell
ipticF[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a +
 b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-
(b*e) + a*f)*(-(d*g) + c*h))])/(-(b*c) + a*d)))/(Sqrt[(-(f/(-(b*e
) + a*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*f)) + h/(-(b*g) + a*
h))]*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))
*(h + (b*g - a*h)/(a + b*x))]) - (B*Sqrt[(-(d/(-(b*c) + a*d)) + (
a + b*x)^(-1))/(-(d/(-(b*c) + a*d)) + h/(-(b*g) + a*h))]*Sqrt[(-(
f/(-(b*e) + a*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*f)) + h/(-(b
*g) + a*h))]*(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1))*EllipticF[Arc
Sin[Sqrt[((-(b*e) + a*f)*(-h - (b*g)/(a + b*x) + (a*h)/(a + b*x))
)/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(b*e)
+ a*f)*(-(d*g) + c*h))])/(Sqrt[(-(h/(-(b*g) + a*h)) + (a + b*x)^(
-1))/(f/(-(b*e) + a*f) - h/(-(b*g) + a*h))]*Sqrt[(d + (b*c - a*d)
/(a + b*x))*(f + (b*e - a*f)/(a + b*x))*(h + (b*g - a*h)/(a + b*x
))])))/(Sqrt[c + ((a + b*x)*(d - (a*d)/(a + b*x)))/b]*Sqrt[e + ((
a + b*x)*(f - (a*f)/(a + b*x)))/b]*Sqrt[g + ((a + b*x)*(h - (a*h)
/(a + b*x)))/b]))/(b^2*(-(b*c) + a*d)*(-(b*e) + a*f)*(-(b*g) + a*
h))
```

Maple [B] time = 0.2, size = 9328, normalized size = 15.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*x+A)/(b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)

[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Bx + A}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integral((B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*s
qrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x+A)/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)^{\frac{3}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x

[Out] integrate((B*x + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

3.132 $\int \frac{A+Bx}{(a+bx)^{5/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=1081

$$-\frac{2b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{3(bc-ad)(be-af)(bg-ah)(a+bx)^{3/2}}$$

$$-\frac{2\sqrt{dg-ch}\sqrt{fg-eh}\left(3Bdfha^3-b(6Adfh+B(dfg+deh+cfh))a^2-b^2(B(deg+cfg+ceh)-4A(dfg+deh+cfh))a+\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{\frac{(de-}{(be-}}}$$

$$-\frac{2\left(3d(Bc-Ad)fha^2+b\left(3Ad^2(fg+eh)-B\left(fhc^2+2d(fg+eh)c+d^2eg\right)\right)a+b^2\left(3Bcdeg-A\left(-fhc^2+d(fg+eh)c+2\right.\right.\right.}{3(bc-ad)^2(be-af)(bg-ah)^{3/2}\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be}{(fg}}}$$

$$-\frac{2b\left(3Bdfha^3-b(6Adfh+B(dfg+deh+cfh))a^2-b^2(B(deg+cfg+ceh)-4A(dfg+deh+cfh))a+b^3(3Bceg-2A(de\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{a+bx}}$$

$$+\frac{2d\left(3Bdfha^3-b(6Adfh+B(dfg+deh+cfh))a^2-b^2(B(deg+cfg+ceh)-4A(dfg+deh+cfh))a+b^3(3Bceg-2A(deg\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{c+dx}}$$

```
[Out] (2*d*(3*a^3*B*d*f*h + b^3*(3*B*c*e*g - 2*A*(d*e*g + c*f*g + c*e*h
)) - a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 4*A*(d*f*g + d*e*h + c*f*
h)) - a^2*b*(6*A*d*f*h + B*(d*f*g + d*e*h + c*f*h)))*Sqrt[a + b*x
]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*
g - a*h)^2*Sqrt[c + d*x]) - (2*b*(A*b - a*B)*Sqrt[c + d*x]*Sqrt[e
 + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a
+ b*x)^(3/2)) - (2*b*(3*a^3*B*d*f*h + b^3*(3*B*c*e*g - 2*A*(d*e*g
 + c*f*g + c*e*h)) - a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 4*A*(d*f*
g + d*e*h + c*f*h)) - a^2*b*(6*A*d*f*h + B*(d*f*g + d*e*h + c*f*h
)))*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(
b*e - a*f)^2*(b*g - a*h)^2*Sqrt[a + b*x]) - (2*Sqrt[d*g - c*h]*Sq
rt[f*g - e*h]*(3*a^3*B*d*f*h + b^3*(3*B*c*e*g - 2*A*(d*e*g + c*f*
g + c*e*h)) - a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 4*A*(d*f*g + d*e
*h + c*f*h)) - a^2*b*(6*A*d*f*h + B*(d*f*g + d*e*h + c*f*h)))*Sqr
t[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x))
)]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e
*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g
- c*h))])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a*h)^2*Sqrt[((d*e
 - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x]) - (2*(
3*a^2*d*(B*c - A*d)*f*h + b^2*(3*B*c*d*e*g - A*(2*d^2*e*g - c^2*f
*h + c*d*(f*g + e*h))) + a*b*(3*A*d^2*(f*g + e*h) - B*(d^2*e*g +
c^2*f*h + 2*c*d*(f*g + e*h))))*Sqrt[((b*e - a*f)*(c + d*x))/((d*e
 - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*
h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d
)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(3*(b*c - a*d)^2*(b*e
 - a*f)*(b*g - a*h)^(3/2)*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((
b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])
```

Rubi [A] time = 8.31665, antiderivative size = 1080, normalized size of antiderivative = 1., number

of steps used = 8, number of rules used = 7, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$-\frac{2b\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(Ab-aB)}{3(bc-ad)(be-af)(bg-ah)(a+bx)^{3/2}}$$
$$-\frac{2\sqrt{dg-ch}\sqrt{fg-eh}\left(3Bdfha^3-b(6Adfh+B(dfg+deh+cfh))a^2-b^2(B(deg+cfg+ceh)-4A(dfg+deh+cfh))a+\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{\frac{(de-}{(be-}}}$$
$$-\frac{2\left(3d(Bc-Ad)fha^2+b\left(3Ad^2(fg+eh)-B\left(fhc^2+2d(fg+eh)c+d^2eg\right)\right)a+b^2\left(Afhc^2+3Bdegc-Ad(fg+eh)c-2A\right.\right.}{3(bc-ad)^2(be-af)(bg-ah)^{3/2}\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be}{(fg}}}$$
$$-\frac{2b\left(3Bdfha^3-b(6Adfh+B(dfg+deh+cfh))a^2-b^2(B(deg+cfg+ceh)-4A(dfg+deh+cfh))a+b^3(3Bceg-2A(de\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{a+bx}}$$
$$+\frac{2d\left(3Bdfha^3-b(6Adfh+B(dfg+deh+cfh))a^2-b^2(B(deg+cfg+ceh)-4A(dfg+deh+cfh))a+b^3(3Bceg-2A(de\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{c+dx}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(A + B*x)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*d*(3*a^3*B*d*f*h + b^3*(3*B*c*e*g - 2*A*(d*e*g + c*f*g + c*e*h
)) - a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 4*A*(d*f*g + d*e*h + c*f*
h)) - a^2*b*(6*A*d*f*h + B*(d*f*g + d*e*h + c*f*h)))*Sqrt[a + b*x
]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*
g - a*h)^2*Sqrt[c + d*x]) - (2*b*(A*b - a*B)*Sqrt[c + d*x]*Sqrt[e
 + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a
+ b*x)^(3/2)) - (2*b*(3*a^3*B*d*f*h + b^3*(3*B*c*e*g - 2*A*(d*e*g
 + c*f*g + c*e*h)) - a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 4*A*(d*f*
g + d*e*h + c*f*h)) - a^2*b*(6*A*d*f*h + B*(d*f*g + d*e*h + c*f*h
)))*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(
b*e - a*f)^2*(b*g - a*h)^2*Sqrt[a + b*x]) - (2*Sqrt[d*g - c*h]*Sq
rt[f*g - e*h]*(3*a^3*B*d*f*h + b^3*(3*B*c*e*g - 2*A*(d*e*g + c*f*
g + c*e*h)) - a*b^2*(B*(d*e*g + c*f*g + c*e*h) - 4*A*(d*f*g + d*e
*h + c*f*h)) - a^2*b*(6*A*d*f*h + B*(d*f*g + d*e*h + c*f*h)))*Sqr
t[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x))
)]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e
*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g
- c*h))])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a*h)^2*Sqrt[((d*e
 - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x]) - (2*(
3*a^2*d*(B*c - A*d)*f*h + b^2*(3*B*c*d*e*g - 2*A*d^2*e*g + A*c^2*
f*h - A*c*d*(f*g + e*h)) + a*b*(3*A*d^2*(f*g + e*h) - B*(d^2*e*g
+ c^2*f*h + 2*c*d*(f*g + e*h))))*Sqrt[((b*e - a*f)*(c + d*x))/((d
*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g -
a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a
*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(3*(b*c - a*d)^2*(b
*e - a*f)*(b*g - a*h)^(3/2)*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(
((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((B*x+A)/(b*x+a)**(5/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(
```

```
[Out] Timed out
```

Mathematica [B] time = 35.716, size = 10637, normalized size = 9.84

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(A + B*x)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x
```

```
[Out] Result too large to show
```

Maple [B] time = 1.606, size = 71656, normalized size = 66.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((B*x+A)/(b*x+a)^(5/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)^{\frac{5}{2}} \sqrt{dx + c} \sqrt{fx + e} \sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Bx + A}{(b^2x^2 + 2\,abx + a^2)\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integral((B*x + A)/((b^2*x^2 + 2*a*b*x + a^2)*sqrt(b*x + a)*sqrt(
d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x+A)/(b*x+a)**(5/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Bx + A}{(bx + a)^{\frac{5}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((B*x + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

3.133 $\int \frac{(a+bx)^2(A+Cx^2)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=1096

$$\frac{2C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(a+bx)^2}{7dfh}$$

$$+\frac{4C(2adfh-3b(dfg+deh+cfh))\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(a+bx)}{35d^2f^2h^2}$$

$$-\frac{4\sqrt{cf-de}\left(3dfh\left(C(3b(deg+cfg+ceh)+2a(dfg+deh+cfh))(2adfh-3b(dfg+deh+cfh))+5dfh\left(C(dfg+deh+\right.\right.\right.}{}$$

$$+\frac{2\sqrt{cf-de}\left(\left(35Ad^2f^2(ch(fg-eh)+dg(2fg+eh))h^2+C\left(g\left(48f^3g^3+16ef^2hg^2+17e^2fh^2g+24e^3h^3\right)d^3+2ch\left(8f^3g^3+\right.\right.\right.\right.}{}$$

$$+\frac{2(4C(2adfh-3b(dfg+deh+cfh))(adfh-2b(dfg+deh+cfh))+5bdfh(7Abdfh-C(5b(deg+cfg+ceh)+2a(dfg+}{105d^3f^3h^3}$$

```
[Out] (2*(4*C*(2*a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h))*(a*d*f*h - 2*b*
(d*f*g + d*e*h + c*f*h)) + 5*b*d*f*h*(7*A*b*d*f*h - C*(5*b*(d*e*g
 + c*f*g + c*e*h) + 2*a*(d*f*g + d*e*h + c*f*h))))*Sqrt[c + d*x]*
Sqrt[e + f*x]*Sqrt[g + h*x])/(105*d^3*f^3*h^3) + (4*C*(2*a*d*f*h
- 3*b*(d*f*g + d*e*h + c*f*h))*(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f
*x]*Sqrt[g + h*x])/(35*d^2*f^2*h^2) + (2*C*(a + b*x)^2*Sqrt[c + d
*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(7*d*f*h) - (4*Sqrt[-(d*e) + c*f
]*(3*d*f*h*(C*(3*b*(d*e*g + c*f*g + c*e*h) + 2*a*(d*f*g + d*e*h +
 c*f*h))*(2*a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h)) + 5*d*f*h*(2*b
^2*c*C*e*g + a^2*C*(d*f*g + d*e*h + c*f*h) - a*b*(7*A*d*f*h - 3*C
*(d*e*g + c*f*g + c*e*h)))) + (d*f*g + d*e*h + c*f*h)*(4*C*(2*a*d
*f*h - 3*b*(d*f*g + d*e*h + c*f*h))*(a*d*f*h - 2*b*(d*f*g + d*e*h
 + c*f*h)) + 5*b*d*f*h*(7*A*b*d*f*h - C*(5*b*(d*e*g + c*f*g + c*e
*h) + 2*a*(d*f*g + d*e*h + c*f*h)))))*Sqrt[(d*(e + f*x))/(d*e - c
*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[
-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(105*d^4*f^(7/2
)*h^4*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (2*Sqrt[-(
d*e) + c*f]*(35*a^2*d^2*f^2*h^2*(3*A*d*f*h^2 + C*(c*h*(f*g - e*h)
 + d*g*(2*f*g + e*h))) - 14*a*b*d*f*h*(15*A*d^2*f^2*g*h^2 + C*(4*
c^2*f*h^2*(f*g - e*h) + c*d*h*(3*f^2*g^2 + e*f*g*h - 4*e^2*h^2) +
 d^2*g*(8*f^2*g^2 + 3*e*f*g*h + 4*e^2*h^2))) + b^2*(35*A*d^2*f^2*
h^2*(c*h*(f*g - e*h) + d*g*(2*f*g + e*h)) + C*(24*c^3*f^2*h^3*(f*
g - e*h) + c^2*d*f*h^2*(17*f^2*g^2 + 6*e*f*g*h - 23*e^2*h^2) + 2*
c*d^2*h*(8*f^3*g^3 + e*f^2*g^2*h + 3*e^2*f*g*h^2 - 12*e^3*h^3) +
d^3*g*(48*f^3*g^3 + 16*e*f^2*g^2*h + 17*e^2*f*g*h^2 + 24*e^3*h^3)
)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h
)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]],
((d*e - c*f)*h)/(f*(d*g - c*h))])/(105*d^4*f^(7/2)*h^4*Sqrt[e + f
*x]*Sqrt[g + h*x])
```

Rubi [A] time = 13.6873, antiderivative size = 1080, normalized size of antiderivative = 0.99, number of steps used = 9, number of rules used = 7, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$

$$\frac{2C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(a+bx)^2}{7dfh} + \frac{4C(2adfh-3b(dfg+deh+cfh))\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(a+bx)}{35d^2f^2h^2} - \frac{4\sqrt{cf-de}\left((dfg+deh+cfh)(4C(2adfh-3b(dfg+deh+cfh))(adfh-2b(dfg+deh+cfh))+5bdfh(7Abdfh-5bC\right.}{}$$

$$+\frac{2\sqrt{cf-de}\left(\left(35Ad^2f^2(ch(fg-eh)+dg(2fg+eh))h^2+C\left(g\left(48f^3g^3+16ef^2hg^2+17e^2fh^2g+24e^3h^3\right)d^3+2ch\left(8f^3g^3+\right.\right.\right.}{}$$

$$+\frac{2\left(8Cdfha^2-38bC(dfg+deh+cfh)a+\frac{24b^2C(dfg+deh+cfh)^2}{dfh}+35Ab^2dfh-25b^2C(deg+cfg+ceh)\right)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g}}{105d^2f^2h^2}$$

Antiderivative was successfully verified.

```
[In]  Int[((a + b*x)^2*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*(35*A*b^2*d*f*h + 8*a^2*C*d*f*h - 25*b^2*C*(d*e*g + c*f*g + c*
e*h) - 38*a*b*C*(d*f*g + d*e*h + c*f*h) + (24*b^2*C*(d*f*g + d*e*
h + c*f*h)^2)/(d*f*h))*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
/(105*d^2*f^2*h^2) + (4*C*(2*a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h
))*(a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(35*d^2*f
^2*h^2) + (2*C*(a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h
*x])/(7*d*f*h) - (4*Sqrt[-(d*e) + c*f]*((d*f*g + d*e*h + c*f*h)*(
4*C*(2*a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h))*(a*d*f*h - 2*b*(d*f
*g + d*e*h + c*f*h)) + 5*b*d*f*h*(7*A*b*d*f*h - 5*b*C*(d*e*g + c*
f*g + c*e*h) - 2*a*C*(d*f*g + d*e*h + c*f*h))) + 3*d*f*h*(C*(3*b*
(d*e*g + c*f*g + c*e*h) + 2*a*(d*f*g + d*e*h + c*f*h))*(2*a*d*f*h
 - 3*b*(d*f*g + d*e*h + c*f*h)) + 5*d*f*h*(2*b^2*c*C*e*g + a^2*C*
(d*f*g + d*e*h + c*f*h) - a*b*(7*A*d*f*h - 3*C*(d*e*g + c*f*g + c
*e*h)))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g + h*x]*EllipticE
[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)
*h)/(f*(d*g - c*h))])/(105*d^4*f^(7/2)*h^4*Sqrt[e + f*x]*Sqrt[(d*
(g + h*x))/(d*g - c*h)]) + (2*Sqrt[-(d*e) + c*f]*(35*a^2*d^2*f^2*
h^2*(3*A*d*f*h^2 + c*C*h*(f*g - e*h) + C*d*g*(2*f*g + e*h)) - 14*
a*b*d*f*h*(15*A*d^2*f^2*g*h^2 + C*(4*c^2*f*h^2*(f*g - e*h) + c*d*
h*(3*f^2*g^2 + e*f*g*h - 4*e^2*h^2) + d^2*g*(8*f^2*g^2 + 3*e*f*g*
h + 4*e^2*h^2))) + b^2*(35*A*d^2*f^2*h^2*(c*h*(f*g - e*h) + d*g*(
2*f*g + e*h)) + C*(24*c^3*f^2*h^3*(f*g - e*h) + c^2*d*f*h^2*(17*f
^2*g^2 + 6*e*f*g*h - 23*e^2*h^2) + 2*c*d^2*h*(8*f^3*g^3 + e*f^2*g
^2*h + 3*e^2*f*g*h^2 - 12*e^3*h^3) + d^3*g*(48*f^3*g^3 + 16*e*f^2
*g^2*h + 17*e^2*f*g*h^2 + 24*e^3*h^3))))*Sqrt[(d*(e + f*x))/(d*e
- c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]
*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*
h))])/(105*d^4*f^(7/2)*h^4*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**2*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1
```

```
[Out] Timed out
```

Mathematica [C] time = 23.9218, size = 18383, normalized size = 16.77

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)^2*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x
```

```
[Out] Result too large to show
```

Maple [B] time = 0.1, size = 12279, normalized size = 11.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^2*(C*x^2+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + A\right)(bx + a)^2}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((C*x^2 + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cb^2x^4 + 2\,Cabx^3 + 2\,Aabx + Aa^2 + \left(Ca^2 + Ab^2\right)x^2}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integral((C*b^2*x^4 + 2*C*a*b*x^3 + 2*A*a*b*x + A*a^2 + (C*a^2 +
A*b^2)*x^2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**2*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + A\right)\left(bx + a\right)^2}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((C*x^2 + A)*(b*x + a)^2/(sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

3.134 $\int \frac{(a+bx)(A+Cx^2)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=608

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(5adfh\left(3Adfh^2+C(ch(fg-eh)+dg(eh+2fg))\right)-b\left(15Ad\right.\right.}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{g+h}}$$
$$-\frac{2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(4C(cfh+deh+dfg)(adfh-2b(cfh+deh+dfg))-3dfh(}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$
$$+\frac{4C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(adfh-2b(cfh+deh+dfg))}{15d^2f^2h^2}+\frac{2C(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{5dfh}$$

```
[Out] (4*C*(a*d*f*h - 2*b*(d*f*g + d*e*h + c*f*h))*Sqrt[c + d*x]*Sqrt[e
 + f*x]*Sqrt[g + h*x])/(15*d^2*f^2*h^2) + (2*C*(a + b*x)*Sqrt[c +
 d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(5*d*f*h) - (2*Sqrt[-(d*e) + c
*f]*(4*C*(d*f*g + d*e*h + c*f*h)*(a*d*f*h - 2*b*(d*f*g + d*e*h +
c*f*h)) - 3*d*f*h*(5*A*b*d*f*h - C*(3*b*(d*e*g + c*f*g + c*e*h) +
 2*a*(d*f*g + d*e*h + c*f*h))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*S
qrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e)
 + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*S
qrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (2*Sqrt[-(d*e) +
c*f]*(5*a*d*f*h*(3*A*d*f*h^2 + C*(c*h*(f*g - e*h) + d*g*(2*f*g +
e*h))) - b*(15*A*d^2*f^2*g*h^2 + C*(4*c^2*f*h^2*(f*g - e*h) + c*d
*h*(3*f^2*g^2 + e*f*g*h - 4*e^2*h^2) + d^2*g*(8*f^2*g^2 + 3*e*f*g
*h + 4*e^2*h^2))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h
*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-
(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*
h^3*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 3.71776, antiderivative size = 605, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 40, $\frac{\text{number of rules}}{\text{integrand size}} = 0.175$

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)\left(5adfh\left(3Adfh^2+cCh(fg-eh)+Cdg(eh+2fg)\right)-b\left(15Ad\right.\right.}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{g+h}}$$
$$-\frac{2\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)(4C(cfh+deh+dfg)(adfh-2b(cfh+deh+dfg))-3dfh(}{15d^3f^{5/2}h^3\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$
$$+\frac{4C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(adfh-2b(cfh+deh+dfg))}{15d^2f^2h^2}+\frac{2C(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{5dfh}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*x)*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (4*C*(a*d*f*h - 2*b*(d*f*g + d*e*h + c*f*h))*Sqrt[c + d*x]*Sqrt[e
 + f*x]*Sqrt[g + h*x])/(15*d^2*f^2*h^2) + (2*C*(a + b*x)*Sqrt[c +
 d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(5*d*f*h) - (2*Sqrt[-(d*e) + c
*f]*(4*C*(d*f*g + d*e*h + c*f*h)*(a*d*f*h - 2*b*(d*f*g + d*e*h +
c*f*h)) - 3*d*f*h*(5*A*b*d*f*h - 3*b*C*(d*e*g + c*f*g + c*e*h) -
2*a*C*(d*f*g + d*e*h + c*f*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*S
qrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e)
 + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*h^3*S
qrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (2*Sqrt[-(d*e) +
c*f]*(5*a*d*f*h*(3*A*d*f*h^2 + c*C*h*(f*g - e*h) + C*d*g*(2*f*g +
 e*h)) - b*(15*A*d^2*f^2*g*h^2 + C*(4*c^2*f*h^2*(f*g - e*h) + c*d
*h*(3*f^2*g^2 + e*f*g*h - 4*e^2*h^2) + d^2*g*(8*f^2*g^2 + 3*e*f*g
*h + 4*e^2*h^2))))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h
*x))/(d*g - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-
(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(15*d^3*f^(5/2)*
h^3*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2)
```

```
[Out] Timed out
```

Mathematica [C] time = 17.0088, size = 8828, normalized size = 14.52

Result too large to show

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*x)*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.052, size = 5679, normalized size = 9.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((b*x+a)*(C*x^2+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + A)(bx + a)}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((C*x^2 + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cbx^3 + Cax^2 + Abx + Aa}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integral((C*b*x^3 + C*a*x^2 + A*b*x + A*a)/(sqrt(d*x + c)*sqrt(f*
x + e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + A)(bx + a)}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((C*x^2 + A)*(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

3.135 $\int \frac{A+Cx^2}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=368

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(3Adfh^2+C(ch(fg-eh)+dg(eh+2fg))\right)F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\mid\frac{(de-cf)h}{f(dg-ch)}\right)}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{g+hx}}-\frac{4C\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}(cfh+deh+dfg)E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\mid\frac{(de-cf)h}{f(dg-ch)}\right)}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}+\frac{2C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3dfh}$$

```
[Out] (2*C*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*d*f*h) - (4*C*
Sqrt[-(d*e) + c*f]*(d*f*g + d*e*h + c*f*h)*Sqrt[(d*(e + f*x))/(d*
e - c*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/
Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(
3/2)*h^2*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (2*Sqrt
[-(d*e) + c*f]*(3*A*d*f*h^2 + C*(c*h*(f*g - e*h) + d*g*(2*f*g + e
*h)))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c
*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f
*x]*Sqrt[g + h*x])
```

Rubi [A] time = 1.56166, antiderivative size = 367, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 35, $\frac{\text{number of rules}}{\text{integrand size}} = 0.171$

$$\frac{2\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\left(3Adfh^2+cCh(fg-eh)+Cdg(eh+2fg)\right)F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\mid\frac{(de-cf)h}{f(dg-ch)}\right)}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{g+hx}}-\frac{4C\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}(cfh+deh+dfg)E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\mid\frac{(de-cf)h}{f(dg-ch)}\right)}{3d^2f^{3/2}h^2\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}+\frac{2C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}{3dfh}$$

Antiderivative was successfully verified.

```
[In]  Int[(A + C*x^2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*C*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*d*f*h) - (4*C*
Sqrt[-(d*e) + c*f]*(d*f*g + d*e*h + c*f*h)*Sqrt[(d*(e + f*x))/(d*
e - c*f)]*Sqrt[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/
```

```
Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(
3/2)*h^2*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (2*Sqrt
[-(d*e) + c*f]*(3*A*d*f*h^2 + c*C*h*(f*g - e*h) + C*d*g*(2*f*g +
e*h))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c
*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(3*d^2*f^(3/2)*h^2*Sqrt[e + f
*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 7.77586, size = 390, normalized size = 1.06

$$\frac{\sqrt{c+dx}\left(\frac{2idh\sqrt{c+dx}\sqrt{\frac{d(e+fx)}{f(c+dx)}}\sqrt{\frac{d(g+hx)}{h(c+dx)}}\left(3Adf^2h+cCf(eh-fg)+Cde(2eh+fg)\right)F\left(i\sinh^{-1}\left(\frac{\sqrt{\frac{de}{f}-c}}{\sqrt{c+dx}}\right)|\frac{dfg-cfh}{deh-cfh}\right)}{\sqrt{\frac{de}{f}-c}}-\frac{4Cd^2(e+fx)(g+hx)(cfh+deh+dfg)}{c+dx}-\cdots\right)}{3d^3f^2h^2\sqrt{e+\cdots}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(A + C*x^2)/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (Sqrt[c + d*x]*(2*C*d^2*f*h*(e + f*x)*(g + h*x) - (4*C*d^2*(d*f*g
 + d*e*h + c*f*h)*(e + f*x)*(g + h*x))/(c + d*x) - (4*I)*C*Sqrt[-
c + (d*e)/f]*f*h*(d*f*g + d*e*h + c*f*h)*Sqrt[c + d*x]*Sqrt[(d*(e
 + f*x))/(f*(c + d*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*Ellipti
cE[I*ArcSinh[Sqrt[-c + (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(
d*e*h - c*f*h)] + ((2*I)*d*h*(3*A*d*f^2*h + c*C*f*(-(f*g) + e*h)
+ C*d*e*(f*g + 2*e*h))*Sqrt[c + d*x]*Sqrt[(d*(e + f*x))/(f*(c + d
*x))]*Sqrt[(d*(g + h*x))/(h*(c + d*x))]*EllipticF[I*ArcSinh[Sqrt[
-c + (d*e)/f]/Sqrt[c + d*x]], (d*f*g - c*f*h)/(d*e*h - c*f*h)])/S
qrt[-c + (d*e)/f]))/(3*d^3*f^2*h^2*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Maple [B] time = 0.036, size = 1804, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((C*x^2+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2/3*(3*A*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)
*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/
2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d^2*f^2*h^2-3*A*((d*x+c)*f/
(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*
e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c
*h-d*g))^(1/2))*d^3*e*f*h^2-C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+
g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*
x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c^2*d*e*
f*h^2+C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*
(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2
),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c^2*d*f^2*g*h+C*((d*x+c)*f/(c*
f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))
^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-
d*g))^(1/2))*c*d^2*e^2*h^2+2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x
+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d
*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d^2*f
^2*g^2-C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)
*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/
2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d^3*e^2*g*h-2*C*((d*x+c)*f/(c
*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e)
)^(1/2)*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h
-d*g))^(1/2))*d^3*e*f*g^2+2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+
g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*
x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c^3*f^2*
h^2-2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*
(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2
),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d^2*e^2*h^2-2*C*((d*x+c)*f/(
c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e
))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*
h-d*g))^(1/2))*c*d^2*e*f*g*h-2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h
*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE((
(d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*c*d^2
*f^2*g^2+2*C*((d*x+c)*f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(
1/2)*(-(f*x+e)*d/(c*f-d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))
^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*d^3*e^2*g*h+2*C*((d*x+c)*
f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-
d*e))^(1/2)*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/
(c*h-d*g))^(1/2))*d^3*e*f*g^2+C*x^3*d^3*f^2*h^2+C*x^2*c*d^2*f^2*h
^2+C*x^2*d^3*e*f*h^2+C*x^2*d^3*f^2*g*h+C*x*c*d^2*e*f*h^2+C*x*c*d^
2*f^2*g*h+C*x*d^3*e*f*g*h+C*c*d^2*e*f*g*h)*(d*x+c)^(1/2)*(f*x+e)^
(1/2)*(h*x+g)^(1/2)/h^2/f^2/d^3/(d*f*h*x^3+c*f*h*x^2+d*e*h*x^2+d*
f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algorithm="m
```

```
[Out] integrate((C*x^2 + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cx^2 + A}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algorithm="f
```

```
[Out] integral((C*x^2 + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),
 x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Cx^2}{\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Integral((A + C*x**2)/(sqrt(c + d*x)*sqrt(e + f*x)*sqrt(g + h*x))
, x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, algorithm="g
```

```
[Out] integrate((C*x^2 + A)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
, x)
```

3.136 $\int \frac{A+Cx^2}{(a+bx)\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=465

$$-\frac{2\left(\frac{a^2C}{b^2}+A\right)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\,\Pi\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\Big|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}-\frac{2C(ah+bg)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\Big|\frac{(de-cf)h}{f(dg-ch)}\right)}{b^2d\sqrt{f}h\sqrt{e+fx}\sqrt{g+hx}}+\frac{2C\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\Big|\frac{(de-cf)h}{f(dg-ch)}\right)}{bd\sqrt{f}h\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

```
[Out] (2*C*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g +
h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b*d*Sqrt[f]*h*Sqrt[e + f*x]*
Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*C*Sqrt[-(d*e) + c*f]*(b*g +
 a*h)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c
*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b^2*d*Sqrt[f]*h*Sqrt[e + f*x
]*Sqrt[g + h*x]) - (2*(A + (a^2*C)/b^2)*Sqrt[-(d*e) + c*f]*Sqrt[(
d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*Ellipti
cPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c +
d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*
c - a*d)*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi [A] time = 3.02211, antiderivative size = 465, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.214$

$$-\frac{2\left(\frac{a^2C}{b^2}+A\right)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\,\Pi\left(-\frac{b(de-cf)}{(bc-ad)f};\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\Big|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)}-\frac{2C(ah+bg)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\Big|\frac{(de-cf)h}{f(dg-ch)}\right)}{b^2d\sqrt{f}h\sqrt{e+fx}\sqrt{g+hx}}+\frac{2C\sqrt{g+hx}\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)\Big|\frac{(de-cf)h}{f(dg-ch)}\right)}{bd\sqrt{f}h\sqrt{e+fx}\sqrt{\frac{d(g+hx)}{dg-ch}}}$$

Antiderivative was successfully verified.

```
[In] Int[(A + C*x^2)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*C*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[g +
h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b*d*Sqrt[f]*h*Sqrt[e + f*x]*
Sqrt[(d*(g + h*x))/(d*g - c*h)]) - (2*C*Sqrt[-(d*e) + c*f]*(b*g +
 a*h)*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c
*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c*f]]
, ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b^2*d*Sqrt[f]*h*Sqrt[e + f*x
]*Sqrt[g + h*x]) - (2*(A + (a^2*C)/b^2)*Sqrt[-(d*e) + c*f]*Sqrt[(
d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*Ellipti
cPi[-((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c +
d*x])/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*
c - a*d)*Sqrt[f]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+A)/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2)
```

```
[Out] Timed out
```

Mathematica [C] time = 16.3669, size = 13075, normalized size = 28.12

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(A + C*x^2)/((a + b*x)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.049, size = 1368, normalized size = 2.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+A)/(b*x+a)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] 2*(d*x+c)^(1/2)*(f*x+e)^(1/2)*(h*x+g)^(1/2)/h/f/d^2/b^2*((d*x+c)*
f/(c*f-d*e))^(1/2)*(-(h*x+g)*d/(c*h-d*g))^(1/2)*(-(f*x+e)*d/(c*f-
```

```
d*e))^(1/2)*(A*EllipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*
b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^2*f*h-A*El
lipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c
*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*d^3*e*h-C*EllipticF(((d*x+c)*f/
(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a^2*c*d^2*f*h+C
*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^
(1/2))*a^2*d^3*e*h+C*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-
d*e)*h/f/(c*h-d*g))^(1/2))*a*b*c^2*d*f*h-C*EllipticF(((d*x+c)*f/(
c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*b*c*d^2*e*h-C*
EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(
1/2))*a*b*c*d^2*f*g+C*EllipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f
-d*e)*h/f/(c*h-d*g))^(1/2))*a*b*d^3*e*g+C*EllipticF(((d*x+c)*f/(c
*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c^2*d*f*g-C*E
llipticF(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1
/2))*b^2*c*d^2*e*g-C*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-
d*e)*h/f/(c*h-d*g))^(1/2))*a*b*c^2*d*f*h+C*EllipticE(((d*x+c)*f/(
c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*a*b*c*d^2*e*h+C*
EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(
1/2))*a*b*c*d^2*f*g-C*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f
-d*e)*h/f/(c*h-d*g))^(1/2))*a*b*d^3*e*g+C*EllipticE(((d*x+c)*f/(c
*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c^3*f*h-C*Ell
ipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2
))*b^2*c^2*d*e*h-C*EllipticE(((d*x+c)*f/(c*f-d*e))^(1/2),((c*f-d*
e)*h/f/(c*h-d*g))^(1/2))*b^2*c^2*d*f*g+C*EllipticE(((d*x+c)*f/(c*
f-d*e))^(1/2),((c*f-d*e)*h/f/(c*h-d*g))^(1/2))*b^2*c*d^2*e*g+C*El
lipticPi(((d*x+c)*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c
*f-d*e)*h/f/(c*h-d*g))^(1/2))*a^2*c*d^2*f*h-C*EllipticPi(((d*x+c)
*f/(c*f-d*e))^(1/2),-(c*f-d*e)*b/f/(a*d-b*c),((c*f-d*e)*h/f/(c*h-
d*g))^(1/2))*a^2*d^3*e*h)/(a*d-b*c)/(d*f*h*x^3+c*f*h*x^2+d*e*h*x^
2+d*f*g*x^2+c*e*h*x+c*f*g*x+d*e*g*x+c*e*g)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] Timed out
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{A + Cx^2}{(a + bx)\sqrt{c + dx}\sqrt{e + fx}\sqrt{g + hx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+A)/(b*x+a)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x)
```

```
[Out] Integral((A + C*x**2)/((a + b*x)*sqrt(c + d*x)*sqrt(e + f*x)*sqrt
(g + h*x)), x)
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, alg
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt
(h*x + g)), x)
```

3.137 $\int \frac{A+Cx^2}{(a+bx)^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=738

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\,(a^2C+Ab^2)}{(a+bx)(bc-ad)(be-af)(bg-ah)}$$
$$+\frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\,(a^2Cdf-2abC(cf+de)+b^2(2cCe-Adf))\,F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{b^2d\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)(be-af)}$$
$$+\frac{\sqrt{f}\sqrt{g+hx}\left(\frac{a^2C}{b}+Ab\right)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{d(g+hx)}{dg-ch}}}$$
$$-\frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\,(a^4Cdfh-2a^3bC(cfh+deh+dfg)-3a^2b^2(Adfh-C(ceh+cfg+deg))-2ab^3(-Acfh-\ldots}{b^2\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)^2(be-af\ldots}$$

```
[Out] -(((A*b^2 + a^2*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b
*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x))) + ((A*b + (a^2*C)/b
)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)
*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (Sq
rt[-(d*e) + c*f]*(a^2*C*d*f - 2*a*b*C*(d*e + c*f) + b^2*(2*c*C*e
- A*d*f))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g
 - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c
*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b^2*d*(b*c - a*d)*Sqrt[f
]*(b*e - a*f)*Sqrt[e + f*x]*Sqrt[g + h*x]) - (Sqrt[-(d*e) + c*f]*
(a^4*C*d*f*h - A*b^4*(d*e*g + c*f*g + c*e*h) - 2*a^3*b*C*(d*f*g +
 d*e*h + c*f*h) - 2*a*b^3*(2*c*C*e*g - A*d*f*g - A*d*e*h - A*c*f*
h) - 3*a^2*b^2*(A*d*f*h - C*(d*e*g + c*f*g + c*e*h)))*Sqrt[(d*(e
+ f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-
((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])
/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b^2*(b*c
 - a*d)^2*Sqrt[f]*(b*e - a*f)*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[g +
h*x])
```

Rubi [A] time = 5.53412, antiderivative size = 738, normalized size of antiderivative = 1., number of

steps used = 12, number of rules used = 10, integrand size = 42, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$

$$-\frac{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\,(a^2C+Ab^2)}{(a+bx)(bc-ad)(be-af)(bg-ah)} + \frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\,\left(a^2Cdf-2abC(cf+de)+b^2(2cCe-Adf)\right)F\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{b^2d\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)(be-af)} + \frac{\sqrt{f}\sqrt{g+hx}\left(\frac{a^2C}{b}+Ab\right)\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}E\left(\sin^{-1}\left(\frac{\sqrt{f}\sqrt{c+dx}}{\sqrt{cf-de}}\right)|\frac{(de-cf)h}{f(dg-ch)}\right)}{\sqrt{e+fx}(bc-ad)(be-af)(bg-ah)\sqrt{\frac{d(g+hx)}{dg-ch}}} - \frac{\sqrt{cf-de}\sqrt{\frac{d(e+fx)}{de-cf}}\sqrt{\frac{d(g+hx)}{dg-ch}}\,\left(a^4Cdfh-2a^3bC(cfh+deh+dfg)-3a^2b^2(Adfh-C(ceh+cfg+deg))-2ab^3(-Acfh-\right.}{b^2\sqrt{f}\sqrt{e+fx}\sqrt{g+hx}(bc-ad)^2(be-af}$$

Antiderivative was successfully verified.

```
[In] Int[(A + C*x^2)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] -(((A*b^2 + a^2*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b
*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x))) + ((A*b + (a^2*C)/b
)*Sqrt[f]*Sqrt[-(d*e) + c*f]*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt
[g + h*x]*EllipticE[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) +
c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/((b*c - a*d)*(b*e - a*f)
*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[(d*(g + h*x))/(d*g - c*h)]) + (Sq
rt[-(d*e) + c*f]*(a^2*C*d*f - 2*a*b*C*(d*e + c*f) + b^2*(2*c*C*e
- A*d*f))*Sqrt[(d*(e + f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g
 - c*h)]*EllipticF[ArcSin[(Sqrt[f]*Sqrt[c + d*x])/Sqrt[-(d*e) + c
*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b^2*d*(b*c - a*d)*Sqrt[f
]*(b*e - a*f)*Sqrt[e + f*x]*Sqrt[g + h*x]) - (Sqrt[-(d*e) + c*f]*
(a^4*C*d*f*h - A*b^4*(d*e*g + c*f*g + c*e*h) - 2*a^3*b*C*(d*f*g +
 d*e*h + c*f*h) - 2*a*b^3*(2*c*C*e*g - A*d*f*g - A*d*e*h - A*c*f*
h) - 3*a^2*b^2*(A*d*f*h - C*(d*e*g + c*f*g + c*e*h)))*Sqrt[(d*(e
+ f*x))/(d*e - c*f)]*Sqrt[(d*(g + h*x))/(d*g - c*h)]*EllipticPi[-
((b*(d*e - c*f))/((b*c - a*d)*f)), ArcSin[(Sqrt[f]*Sqrt[c + d*x])
/Sqrt[-(d*e) + c*f]], ((d*e - c*f)*h)/(f*(d*g - c*h))])/(b^2*(b*c
 - a*d)^2*Sqrt[f]*(b*e - a*f)*(b*g - a*h)*Sqrt[e + f*x]*Sqrt[g +
h*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+A)/(b*x+a)**2/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1
```

```
[Out] Timed out
```

Mathematica [C] time = 21.1554, size = 17743, normalized size = 24.04

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(A + C*x^2)/((a + b*x)^2*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] Result too large to show
```

Maple [B] time = 0.131, size = 17460, normalized size = 23.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+A)/(b*x+a)^2/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)^2 \sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] Timed out
```

Sympy [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+A)/(b*x+a)**2/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/2),x
```

```
[Out] Exception raised: ValueError
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)^2\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x, a
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)^2*sqrt(d*x + c)*sqrt(f*x + e)*sq
rt(h*x + g)), x)
```

3.138 $\int \frac{(a+bx)^{3/2}\left(A+Cx^2\right)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=1405

result too large to display

```
[Out] ((C*(3*a*d*f*h - 5*b*(d*f*g + d*e*h + c*f*h))*(a*d*f*h - 3*b*(d*f
*g + d*e*h + c*f*h)) + 8*b*d*f*h*(3*A*b*d*f*h - C*(2*b*(d*e*g + c
*f*g + c*e*h) + a*(d*f*g + d*e*h + c*f*h))))*Sqrt[a + b*x]*Sqrt[e
 + f*x]*Sqrt[g + h*x])/(24*b*d^2*f^3*h^3*Sqrt[c + d*x]) + (C*(3*a
*d*f*h - 5*b*(d*f*g + d*e*h + c*f*h))*Sqrt[a + b*x]*Sqrt[c + d*x]
*Sqrt[e + f*x]*Sqrt[g + h*x])/(12*d^2*f^2*h^2) + (C*(a + b*x)^(3/
2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(3*d*f*h) - (Sqrt[d
*g - c*h]*Sqrt[f*g - e*h]*(C*(3*a*d*f*h - 5*b*(d*f*g + d*e*h + c*
f*h))*(a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h)) + 8*b*d*f*h*(3*A*b*
d*f*h - C*(2*b*(d*e*g + c*f*g + c*e*h) + a*(d*f*g + d*e*h + c*f*h
))))*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/((f*g - e*h)*(c
 + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt
[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*h))/((b*e - a*
f)*(d*g - c*h))])/(24*b*d^3*f^3*h^3*Sqrt[((d*e - c*f)*(a + b*x))/
((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x]) + ((b*e - a*f)*Sqrt[b*g -
 a*h]*(3*a^2*C*d^2*f^2*h^2 + 6*a*b*C*d*f*h*(c*f*h + 2*d*(f*g + e*
h)) - b^2*(24*A*d^2*f^2*h^2 + C*(5*c^2*f^2*h^2 + 4*c*d*f*h*(f*g +
 e*h) + d^2*(15*f^2*g^2 + 14*e*f*g*h + 15*e^2*h^2))))*Sqrt[((b*e
- a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*Elliptic
F[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a
+ b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))]
)/(24*b^2*d^2*f^3*h^3*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e
- a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]) - (Sqrt[-(d*g) + c*h
]*(a^3*C*d^3*f^3*h^3 + 3*a^2*b*C*d^2*f^2*h^2*(d*f*g + d*e*h + c*f
*h) - 3*a*b^2*d*f*h*(8*A*d^2*f^2*h^2 + C*(3*c^2*f^2*h^2 + 2*c*d*f
*h*(f*g + e*h) + d^2*(3*f^2*g^2 + 2*e*f*g*h + 3*e^2*h^2))) + b^3*
(8*A*d^2*f^2*h^2*(d*f*g + d*e*h + c*f*h) + C*(5*c^3*f^3*h^3 + 3*c
^2*d*f^2*h^2*(f*g + e*h) + c*d^2*f*h*(3*f^2*g^2 + 2*e*f*g*h + 3*e
^2*h^2) + d^3*(5*f^3*g^3 + 3*e*f^2*g^2*h + 3*e^2*f*g*h^2 + 5*e^3*
h^3))))*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a +
b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*Elli
pticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d
]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f
)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])/(8*b^2*d^3*Sqrt[b*c -
a*d]*f^3*h^4*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 24.5378, antiderivative size = 1388, normalized size of antiderivative = 0.99, number

of steps used = 11, number of rules used = 10, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}} = 0.227$

$$\frac{C\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}(a+bx)^{3/2}}{3dfh}$$

$$-\frac{\sqrt{ch-dg}\left(\left(8Ad^2f^2(dfg+deh+cfh)h^2+C\left(\left(5f^3g^3+3ef^2hg^2+3e^2fh^2g+5e^3h^3\right)d^3+cfh\left(3f^2g^2+2efhg+3e^2h^2\right)d\right.\right.\right.}{}$$

$$-\frac{\sqrt{dg-ch}\sqrt{fg-eh}\left(24Ad^2f^2h^2b^2+15C(dfg+deh+cfh)^2b^2-16Cdfh(deg+cfg+ceh)b^2-22aCdfh(dfg+deh+cf\right.}{24bd^3f^3h^3\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}}$$

$$+\frac{C(3adfh-5b(dfg+deh+cfh))\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\sqrt{a+bx}}{12d^2f^2h^2}$$

$$+\frac{\left(24Abfhd^2+\frac{3a^2Cfhd^2}{b}-16bC(deg+cfg+ceh)d-22aC(dfg+deh+cfh)d+\frac{15bC(dfg+deh+cfh)^2}{fh}\right)\sqrt{e+fx}\sqrt{g+hx}\sqrt{a+}}{24d^2f^2h^2\sqrt{c+dx}}$$

$$+\frac{(be-af)\sqrt{bg-ah}\left(-\left(24Ad^2f^2h^2+C\left(\left(15f^2g^2+14efhg+15e^2h^2\right)d^2+4cfh(fg+eh)d+5c^2f^2h^2\right)\right)b^2+6aCdfh(cfh\right.}{24b^2d^2f^3h^3\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(b}{(f}}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[((a + b*x)^(3/2)*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] ((24*A*b*d^2*f*h + (3*a^2*C*d^2*f*h)/b - 16*b*C*d*(d*e*g + c*f*g
+ c*e*h) - 22*a*C*d*(d*f*g + d*e*h + c*f*h) + (15*b*C*(d*f*g + d*
e*h + c*f*h)^2)/(f*h))*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
/(24*d^2*f^2*h^2*Sqrt[c + d*x]) + (C*(3*a*d*f*h - 5*b*(d*f*g + d*
e*h + c*f*h))*Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g +
h*x])/(12*d^2*f^2*h^2) + (C*(a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e
+ f*x]*Sqrt[g + h*x])/(3*d*f*h) - (Sqrt[d*g - c*h]*Sqrt[f*g - e*h
]*(24*A*b^2*d^2*f^2*h^2 + 3*a^2*C*d^2*f^2*h^2 - 16*b^2*C*d*f*h*(d
*e*g + c*f*g + c*e*h) - 22*a*b*C*d*f*h*(d*f*g + d*e*h + c*f*h) +
15*b^2*C*(d*f*g + d*e*h + c*f*h)^2)*Sqrt[a + b*x]*Sqrt[-(((d*e -
c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[
d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c
 - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(24*b*d^3*f^3*h^
3*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g +
h*x]) + ((b*e - a*f)*Sqrt[b*g - a*h]*(3*a^2*C*d^2*f^2*h^2 + 6*a*b
*C*d*f*h*(c*f*h + 2*d*(f*g + e*h)) - b^2*(24*A*d^2*f^2*h^2 + C*(5
*c^2*f^2*h^2 + 4*c*d*f*h*(f*g + e*h) + d^2*(15*f^2*g^2 + 14*e*f*g
*h + 15*e^2*h^2))))*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a
+ b*x))]*Sqrt[g + h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e +
 f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*
h))/((d*e - c*f)*(b*g - a*h)))])/(24*b^2*d^2*f^3*h^3*Sqrt[f*g - e
*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a
+ b*x)))]) - (Sqrt[-(d*g) + c*h]*(a^3*C*d^3*f^3*h^3 + 3*a^2*b*C*d
^2*f^2*h^2*(d*f*g + d*e*h + c*f*h) - 3*a*b^2*d*f*h*(8*A*d^2*f^2*h
^2 + C*(3*c^2*f^2*h^2 + 2*c*d*f*h*(f*g + e*h) + d^2*(3*f^2*g^2 +
2*e*f*g*h + 3*e^2*h^2))) + b^3*(8*A*d^2*f^2*h^2*(d*f*g + d*e*h +
```

```
c*f*h) + C*(5*c^3*f^3*h^3 + 3*c^2*d*f^2*h^2*(f*g + e*h) + c*d^2*f
*h*(3*f^2*g^2 + 2*e*f*g*h + 3*e^2*h^2) + d^3*(5*f^3*g^3 + 3*e*f^2
*g^2*h + 3*e^2*f*g*h^2 + 5*e^3*h^3))))*(a + b*x)*Sqrt[((b*g - a*h
)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x)
)/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a
*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*
h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g -
 e*h))])/(8*b^2*d^3*Sqrt[b*c - a*d]*f^3*h^4*Sqrt[c + d*x]*Sqrt[e
+ f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(3/2)*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)
```

```
[Out] Timed out
```

Mathematica [B] time = 35.8123, size = 38310, normalized size = 27.27

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^(3/2)*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x
```

```
[Out] Result too large to show
```

Maple [B] time = 0.276, size = 89498, normalized size = 63.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(3/2)*(C*x^2+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + A)(bx + a)^{\frac{3}{2}}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] integrate((C*x^2 + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e
)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(3/2)*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Cx^2 + A)(bx + a)^{\frac{3}{2}}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] integrate((C*x^2 + A)*(b*x + a)^(3/2)/(sqrt(d*x + c)*sqrt(f*x + e
)*sqrt(h*x + g)), x)
```

3.139 $\int \frac{\sqrt{a+bx}(A+Cx^2)}{\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=951

$$-\frac{\sqrt{dg-ch}\sqrt{fg-eh}(adfh-3b(dfg+deh+cfh))\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)C}{4bd^2f^2h^2\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}}$$
$$+\frac{(be-af)\sqrt{bg-ah}(adfh+b(cfh+3d(fg+eh)))\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)C}{4b^2df^2h^2\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}$$
$$+\frac{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}C}{2dfh}+\frac{(adfh-3b(dfg+deh+cfh))\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}C}{4bdf^2h^2\sqrt{c+dx}}$$
$$-\frac{\sqrt{ch-dg}\left(-\left(8Ad^2f^2h^2+C\left(\left(3f^2g^2+2efhg+3e^2h^2\right)d^2+2cfh(fg+eh)d+3c^2f^2h^2\right)\right)b^2+2aCdfh(dfg+deh+cfh)\ldots\right.}{4b^2d^2\sqrt{bc-ad}f^2h^3\sqrt{c+d\ldots}}$$

```
[Out] (C*(a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h))*Sqrt[a + b*x]*Sqrt[e +
 f*x]*Sqrt[g + h*x])/(4*b*d*f^2*h^2*Sqrt[c + d*x]) + (C*Sqrt[a +
b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(2*d*f*h) - (C*Sq
rt[d*g - c*h]*Sqrt[f*g - e*h]*(a*d*f*h - 3*b*(d*f*g + d*e*h + c*f
*h))*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/((f*g - e*h)*(c
 + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt
[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*h))/((b*e - a*
f)*(d*g - c*h))])/(4*b*d^2*f^2*h^2*Sqrt[((d*e - c*f)*(a + b*x))/(
(b*e - a*f)*(c + d*x))]*Sqrt[g + h*x]) + (C*(b*e - a*f)*Sqrt[b*g
- a*h]*(a*d*f*h + b*(c*f*h + 3*d*(f*g + e*h)))*Sqrt[((b*e - a*f)*
(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSi
n[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])
], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(4*b^
2*d*f^2*h^2*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g
+ h*x))/((f*g - e*h)*(a + b*x)))]) - (Sqrt[-(d*g) + c*h]*(a^2*C*d
^2*f^2*h^2 + 2*a*b*C*d*f*h*(d*f*g + d*e*h + c*f*h) - b^2*(8*A*d^2
*f^2*h^2 + C*(3*c^2*f^2*h^2 + 2*c*d*f*h*(f*g + e*h) + d^2*(3*f^2*
g^2 + 2*e*f*g*h + 3*e^2*h^2))))*(a + b*x)*Sqrt[((b*g - a*h)*(c +
d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g
 - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h))
, ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt
[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))]
)/(4*b^2*d^2*Sqrt[b*c - a*d]*f^2*h^3*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 6.86803, antiderivative size = 950, normalized size of antiderivative = 1., number of

steps used = 10, number of rules used = 10, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227

$$-\frac{\sqrt{dg-ch}\sqrt{fg-eh}(adfh-3b(dfg+deh+cfh))\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)C}{4bd^2f^2h^2\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}}$$
$$+\frac{(be-af)\sqrt{bg-ah}(bcfh+adfh+3bd(fg+eh))\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)C}{4b^2df^2h^2\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}$$
$$+\frac{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}C}{2dfh}+\frac{(adfh-3b(dfg+deh+cfh))\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}C}{4bdf^2h^2\sqrt{c+dx}}$$
$$-\frac{\sqrt{ch-dg}\left(-\left(8Ad^2f^2h^2+C\left(\left(3f^2g^2+2efhg+3e^2h^2\right)d^2+2cfh(fg+eh)d+3c^2f^2h^2\right)\right)b^2+2aCdfh(dfg+deh+cfh)\ldots\right.}{4b^2d^2\sqrt{bc-ad}f^2h^3\sqrt{c+d\ldots}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(Sqrt[a + b*x]*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (C*(a*d*f*h - 3*b*(d*f*g + d*e*h + c*f*h))*Sqrt[a + b*x]*Sqrt[e +
 f*x]*Sqrt[g + h*x])/(4*b*d*f^2*h^2*Sqrt[c + d*x]) + (C*Sqrt[a +
b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(2*d*f*h) - (C*Sq
rt[d*g - c*h]*Sqrt[f*g - e*h]*(a*d*f*h - 3*b*(d*f*g + d*e*h + c*f
*h))*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g + h*x))/((f*g - e*h)*(c
 + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt
[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(f*g - e*h))/((b*e - a*
f)*(d*g - c*h))])/(4*b*d^2*f^2*h^2*Sqrt[((d*e - c*f)*(a + b*x))/(
(b*e - a*f)*(c + d*x))]*Sqrt[g + h*x]) + (C*(b*e - a*f)*Sqrt[b*g
- a*h]*(b*c*f*h + a*d*f*h + 3*b*d*(f*g + e*h))*Sqrt[((b*e - a*f)*
(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*EllipticF[ArcSi
n[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a + b*x])
], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))])/(4*b^
2*d*f^2*h^2*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g
+ h*x))/((f*g - e*h)*(a + b*x)))]) - (Sqrt[-(d*g) + c*h]*(a^2*C*d
^2*f^2*h^2 + 2*a*b*C*d*f*h*(d*f*g + d*e*h + c*f*h) - b^2*(8*A*d^2
*f^2*h^2 + C*(3*c^2*f^2*h^2 + 2*c*d*f*h*(f*g + e*h) + d^2*(3*f^2*
g^2 + 2*e*f*g*h + 3*e^2*h^2))))*(a + b*x)*Sqrt[((b*g - a*h)*(c +
d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g
 - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h))
, ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt
[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))]
)/(4*b^2*d^2*Sqrt[b*c - a*d]*f^2*h^3*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((b*x+a)**(1/2)*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)
```

```
[Out] Timed out
```

Mathematica [B] time = 21.5105, size = 16659, normalized size = 17.52

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[a + b*x]*(A + C*x^2))/(Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

```
[Out] Result too large to show
```

Maple [B] time = 0.128, size = 42545, normalized size = 44.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^(1/2)*(C*x^2+A)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + A\right)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((C*x^2 + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**(1/2)*(C*x**2+A)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Cx^2 + A\right)\sqrt{bx + a}}{\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((C*x^2 + A)*sqrt(b*x + a)/(sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

3.140 $\int \frac{A+Cx^2}{\sqrt{a+bx}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=757

$$\frac{\sqrt{g+hx}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}\left(a^2Cfh+abC(eh+fg)-b^2(Ceg-2Afh)\right)F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{b^2fh\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$

$$-\frac{C(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}(adfh+b(cfh+deh+dfg))\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(d}{(bc-ad)(f}\right.}{b^2dfh^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$

$$+\frac{C\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{bfh\sqrt{c+dx}}$$

$$-\frac{C\sqrt{a+bx}\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{bdfh\sqrt{g+hx}\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

```
[Out] (C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*x
]) - (C*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*
e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(S
qrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], (
(b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(b*d*f*h*Sqr
t[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x])
 + ((a^2*C*f*h + a*b*C*(f*g + e*h) - b^2*(C*e*g - 2*A*f*h))*Sqrt[
((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*El
lipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*S
qrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a
*h)))])/(b^2*f*h*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sq
rt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]) - (C*Sqrt
[-(d*g) + c*h]*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h))*(a + b*x)*Sq
rt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g -
a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c
*h))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sq
rt[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c
 - a*d)*(f*g - e*h))])/(b^2*d*Sqrt[b*c - a*d]*f*h^2*Sqrt[c + d*x]
*Sqrt[e + f*x])
```

Rubi [A] time = 4.04754, antiderivative size = 757, normalized size of antiderivative = 1., number of

steps used = 9, number of rules used = 9, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}} = 0.204$

$$\frac{\sqrt{g+hx}\sqrt{\frac{(c+dx)(be-af)}{(a+bx)(de-cf)}}\left(a^2Cfh+abC(eh+fg)-b^2(Ceg-2Afh)\right)F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{b^2fh\sqrt{c+dx}\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(be-af)}{(a+bx)(fg-eh)}}}$$
$$-\frac{C(a+bx)\sqrt{ch-dg}\sqrt{\frac{(c+dx)(bg-ah)}{(a+bx)(dg-ch)}}\sqrt{\frac{(e+fx)(bg-ah)}{(a+bx)(fg-eh)}}(adfh+b(cfh+deh+dfg))\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(d}{(bc-ad)(f}\right.}{b^2dfh^2\sqrt{c+dx}\sqrt{e+fx}\sqrt{bc-ad}}$$
$$+\frac{C\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}}{bfh\sqrt{c+dx}}$$
$$-\frac{C\sqrt{a+bx}\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{-\frac{(g+hx)(de-cf)}{(c+dx)(fg-eh)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)}{bdfh\sqrt{g+hx}\sqrt{\frac{(a+bx)(de-cf)}{(c+dx)(be-af)}}}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(A + C*x^2)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (C*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(b*f*h*Sqrt[c + d*x
]) - (C*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*
e - c*f)*(g + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(S
qrt[d*g - c*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], (
(b*c - a*d)*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(b*d*f*h*Sqr
t[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x))]*Sqrt[g + h*x])
 + ((a^2*C*f*h + a*b*C*(f*g + e*h) - b^2*(C*e*g - 2*A*f*h))*Sqrt[
((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*El
lipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*S
qrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a
*h)))])/(b^2*f*h*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]*Sq
rt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]) - (C*Sqrt
[-(d*g) + c*h]*(a*d*f*h + b*(d*f*g + d*e*h + c*f*h))*(a + b*x)*Sq
rt[((b*g - a*h)*(c + d*x))/((d*g - c*h)*(a + b*x))]*Sqrt[((b*g -
a*h)*(e + f*x))/((f*g - e*h)*(a + b*x))]*EllipticPi[-((b*(d*g - c
*h))/((b*c - a*d)*h)), ArcSin[(Sqrt[b*c - a*d]*Sqrt[g + h*x])/(Sq
rt[-(d*g) + c*h]*Sqrt[a + b*x])], ((b*e - a*f)*(d*g - c*h))/((b*c
 - a*d)*(f*g - e*h))])/(b^2*d*Sqrt[b*c - a*d]*f*h^2*Sqrt[c + d*x]
*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+A)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)
```

```
[Out] Timed out
```

Mathematica [B] time = 16.5267, size = 6207, normalized size = 8.2

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(A + C*x^2)/(Sqrt[a + b*x]*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x
```

```
[Out] Result too large to show
```

Maple [B] time = 0.12, size = 15875, normalized size = 21.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+A)/(b*x+a)^(1/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((C*x^2 + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+A)/(b*x+a)**(1/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)),x
```

```
[Out] integrate((C*x^2 + A)/(sqrt(b*x + a)*sqrt(d*x + c)*sqrt(f*x + e)*
sqrt(h*x + g)), x)
```

3.141 $\int \frac{A+Cx^2}{(a+bx)^{3/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=867

$$-\frac{2\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)(Ca^2+Ab^2)}{b(bc-ad)(be-af)(bg-ah)\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}}-\frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\,(Ca^2+Ab^2)}{(bc-ad)(be-af)(bg-ah)\sqrt{a+bx}}+\frac{2d\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}\,(Ca^2+Ab^2)}{b(bc-ad)(be-af)(bg-ah)\sqrt{c+dx}}-\frac{2\left(-Cda^2+2bcCa+Ab^2d\right)\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{b^2(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}+\frac{2C\sqrt{ch-dg}(a+bx)\sqrt{\frac{(bg-ah)(c+dx)}{(dg-ch)(a+bx)}}\sqrt{\frac{(bg-ah)(e+fx)}{(fg-eh)(a+bx)}}\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)}{b^2\sqrt{bc-ad}h\sqrt{c+dx}\sqrt{e+fx}}$$

```
[Out] (2*(A*b^2 + a^2*C)*d*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(
b*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[c + d*x]) - (2*(A*b^2
+ a^2*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*
(b*e - a*f)*(b*g - a*h)*Sqrt[a + b*x]) - (2*(A*b^2 + a^2*C)*Sqrt[
d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g +
 h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h
]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(
f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(b*(b*c - a*d)*(b*e - a*f
)*(b*g - a*h)*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x)
)]*Sqrt[g + h*x]) - (2*(2*a*b*c*C + A*b^2*d - a^2*C*d)*Sqrt[((b*e
 - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*Ellipti
cF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a
 + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))
])/(b^2*(b*c - a*d)*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]) + (2*C
*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g
- c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a +
 b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(Sq
rt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])],
 ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])/(b^2*Sqrt[
b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi [A] time = 7.15553, antiderivative size = 867, normalized size of antiderivative = 1., number of

steps used = 10, number of rules used = 10, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}} = 0.227$

$$-\frac{2\sqrt{dg-ch}\sqrt{fg-eh}\sqrt{a+bx}\sqrt{-\frac{(de-cf)(g+hx)}{(fg-eh)(c+dx)}}E\left(\sin^{-1}\left(\frac{\sqrt{dg-ch}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{c+dx}}\right)|\frac{(bc-ad)(fg-eh)}{(be-af)(dg-ch)}\right)(Ca^2+Ab^2)}{b(bc-ad)(be-af)(bg-ah)\sqrt{\frac{(de-cf)(a+bx)}{(be-af)(c+dx)}}\sqrt{g+hx}}$$
$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\,(Ca^2+Ab^2)}{(bc-ad)(be-af)(bg-ah)\sqrt{a+bx}}+\frac{2d\sqrt{a+bx}\sqrt{e+fx}\sqrt{g+hx}\,(Ca^2+Ab^2)}{b(bc-ad)(be-af)(bg-ah)\sqrt{c+dx}}$$
$$-\frac{2\left(-Cda^2+2bcCa+Ab^2d\right)\sqrt{\frac{(be-af)(c+dx)}{(de-cf)(a+bx)}}\sqrt{g+hx}F\left(\sin^{-1}\left(\frac{\sqrt{bg-ah}\sqrt{e+fx}}{\sqrt{fg-eh}\sqrt{a+bx}}\right)|-\frac{(bc-ad)(fg-eh)}{(de-cf)(bg-ah)}\right)}{b^2(bc-ad)\sqrt{bg-ah}\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-\frac{(be-af)(g+hx)}{(fg-eh)(a+bx)}}}$$
$$+\frac{2C\sqrt{ch-dg}(a+bx)\sqrt{\frac{(bg-ah)(c+dx)}{(dg-ch)(a+bx)}}\sqrt{\frac{(bg-ah)(e+fx)}{(fg-eh)(a+bx)}}\left(-\frac{b(dg-ch)}{(bc-ad)h};\sin^{-1}\left(\frac{\sqrt{bc-ad}\sqrt{g+hx}}{\sqrt{ch-dg}\sqrt{a+bx}}\right)|\frac{(be-af)(dg-ch)}{(bc-ad)(fg-eh)}\right)}{b^2\sqrt{bc-ad}h\sqrt{c+dx}\sqrt{e+fx}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(A + C*x^2)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (2*(A*b^2 + a^2*C)*d*Sqrt[a + b*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/(
b*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[c + d*x]) - (2*(A*b^2
+ a^2*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((b*c - a*d)*
(b*e - a*f)*(b*g - a*h)*Sqrt[a + b*x]) - (2*(A*b^2 + a^2*C)*Sqrt[
d*g - c*h]*Sqrt[f*g - e*h]*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g +
 h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c*h
]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)*(
f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(b*(b*c - a*d)*(b*e - a*f
)*(b*g - a*h)*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(c + d*x)
)]*Sqrt[g + h*x]) - (2*(2*a*b*c*C + A*b^2*d - a^2*C*d)*Sqrt[((b*e
 - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g + h*x]*Ellipti
cF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[a
 + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(b*g - a*h)))
])/(b^2*(b*c - a*d)*Sqrt[b*g - a*h]*Sqrt[f*g - e*h]*Sqrt[c + d*x]
*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g - e*h)*(a + b*x)))]) + (2*C
*Sqrt[-(d*g) + c*h]*(a + b*x)*Sqrt[((b*g - a*h)*(c + d*x))/((d*g
- c*h)*(a + b*x))]*Sqrt[((b*g - a*h)*(e + f*x))/((f*g - e*h)*(a +
 b*x))]*EllipticPi[-((b*(d*g - c*h))/((b*c - a*d)*h)), ArcSin[(Sq
rt[b*c - a*d]*Sqrt[g + h*x])/(Sqrt[-(d*g) + c*h]*Sqrt[a + b*x])],
 ((b*e - a*f)*(d*g - c*h))/((b*c - a*d)*(f*g - e*h))])/(b^2*Sqrt[
b*c - a*d]*h*Sqrt[c + d*x]*Sqrt[e + f*x])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+A)/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)
```

```
[Out] Timed out
```

Mathematica [B] time = 18.5395, size = 2103, normalized size = 2.43

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(A + C*x^2)/((a + b*x)^(3/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

```
[Out] (-2*(A*b^2 + a^2*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])/((
b*c - a*d)*(b*e - a*f)*(b*g - a*h)*Sqrt[a + b*x]) + (2*(((-(A*b^2
) - a^2*C)*(a + b*x)^(5/2)*(d + (b*c)/(a + b*x) - (a*d)/(a + b*x)
)*(f + (b*e)/(a + b*x) - (a*f)/(a + b*x))*(h + (b*g)/(a + b*x) -
(a*h)/(a + b*x)))/(Sqrt[c + ((a + b*x)*(d - (a*d)/(a + b*x)))/b]*
Sqrt[e + ((a + b*x)*(f - (a*f)/(a + b*x)))/b]*Sqrt[g + ((a + b*x)
*(h - (a*h)/(a + b*x)))/b]) + ((b*c - a*d)*(b*e - a*f)*(b*g - a*h
)*(a + b*x)^(3/2)*Sqrt[(d + (b*c)/(a + b*x) - (a*d)/(a + b*x))*(f
 + (b*e)/(a + b*x) - (a*f)/(a + b*x))*(h + (b*g)/(a + b*x) - (a*h
)/(a + b*x))]*((A*b^2*Sqrt[((b*c - a*d)*(b*g - a*h)*(-(d/(-(b*c)
+ a*d)) + (a + b*x)^(-1)))/(b*d*g - b*c*h)]*(-(f/(-(b*e) + a*f))
+ (a + b*x)^(-1))*Sqrt[(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1))/(f/
(-(b*e) + a*f) - h/(-(b*g) + a*h))]*(-(((b*d*g - b*c*h)*EllipticE
[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a + b*x))
)/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(b*e)
+ a*f)*(-(d*g) + c*h))])/((b*c - a*d)*(b*g - a*h))) - (d*Elliptic
F[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*h)/(a + b*x)
))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h))/((-(b*e)
 + a*f)*(-(d*g) + c*h))])/(-(b*c) + a*d)))/(Sqrt[(-(f/(-(b*e) + a
*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*f)) + h/(-(b*g) + a*h))]*
Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))*(h +
 (b*g - a*h)/(a + b*x))]) + (a^2*C*Sqrt[((b*c - a*d)*(b*g - a*h)*
(-(d/(-(b*c) + a*d)) + (a + b*x)^(-1)))/(b*d*g - b*c*h)]*(-(f/(-(
b*e) + a*f)) + (a + b*x)^(-1))*Sqrt[(-(h/(-(b*g) + a*h)) + (a + b
*x)^(-1))/(f/(-(b*e) + a*f) - h/(-(b*g) + a*h))]*(-(((b*d*g - b*c
*h)*EllipticE[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a*
h)/(a + b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*
h))/((-(b*e) + a*f)*(-(d*g) + c*h))])/((b*c - a*d)*(b*g - a*h)))
- (d*EllipticF[ArcSin[Sqrt[((b*e - a*f)*(h + (b*g)/(a + b*x) - (a
*h)/(a + b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e
*h))/((-(b*e) + a*f)*(-(d*g) + c*h))])/(-(b*c) + a*d)))/(Sqrt[(-(
f/(-(b*e) + a*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*f)) + h/(-(b
*g) + a*h))]*Sqrt[(d + (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a
 + b*x))*(h + (b*g - a*h)/(a + b*x))]) - (2*a*C*Sqrt[(-(d/(-(b*c)
 + a*d)) + (a + b*x)^(-1))/(-(d/(-(b*c) + a*d)) + h/(-(b*g) + a*h
))]*Sqrt[(-(f/(-(b*e) + a*f)) + (a + b*x)^(-1))/(-(f/(-(b*e) + a*
f)) + h/(-(b*g) + a*h))]*(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1))*E
llipticF[ArcSin[Sqrt[((-(b*e) + a*f)*(-h - (b*g)/(a + b*x) + (a*h
)/(a + b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d)*(-(f*g) + e*h
```

```
))/((-(b*e) + a*f)*(-(d*g) + c*h))])/(Sqrt[(-(h/(-(b*g) + a*h)) +
 (a + b*x)^(-1))/(f/(-(b*e) + a*f) - h/(-(b*g) + a*h))]*Sqrt[(d +
 (b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))*(h + (b*g - a
*h)/(a + b*x))]) - (C*(-(b*g) + a*h)*(-(f/(-(b*e) + a*f)) + h/(-(
b*g) + a*h))*Sqrt[(-(d/(-(b*c) + a*d)) + (a + b*x)^(-1))/(-(d/(-(
b*c) + a*d)) + h/(-(b*g) + a*h))]*Sqrt[-(((-(f/(-(b*e) + a*f)) +
(a + b*x)^(-1))*(-(h/(-(b*g) + a*h)) + (a + b*x)^(-1)))/(-(f/(-(b
*e) + a*f)) + h/(-(b*g) + a*h))^2)]*EllipticPi[-((-(b*f*g) + b*e*
h)/((-(b*e) + a*f)*h)), ArcSin[Sqrt[((-(b*e) + a*f)*(-h - (b*g)/(
a + b*x) + (a*h)/(a + b*x)))/(b*(-(f*g) + e*h))]], ((-(b*c) + a*d
)*(-(f*g) + e*h))/((-(b*e) + a*f)*(-(d*g) + c*h))])/(h*Sqrt[(d +
(b*c - a*d)/(a + b*x))*(f + (b*e - a*f)/(a + b*x))*(h + (b*g - a*
h)/(a + b*x))])))/(Sqrt[c + ((a + b*x)*(d - (a*d)/(a + b*x)))/b]*
Sqrt[e + ((a + b*x)*(f - (a*f)/(a + b*x)))/b]*Sqrt[g + ((a + b*x)
*(h - (a*h)/(a + b*x)))/b])))/(b^3*(-(b*c) + a*d)*(-(b*e) + a*f)*
(-(b*g) + a*h))
```

Maple [B] time = 0.222, size = 20597, normalized size = 23.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+A)/(b*x+a)^(3/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)^{\frac{3}{2}} \sqrt{dx + c} \sqrt{fx + e} \sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e
)*sqrt(h*x + g)), x)
```

Fricas [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] Timed out
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+A)/(b*x+a)**(3/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)^{\frac{3}{2}} \sqrt{dx + c} \sqrt{fx + e} \sqrt{hx + g}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)^(3/2)*sqrt(d*x + c)*sqrt(f*x + e
)*sqrt(h*x + g)), x)
```

3.142 $\int \frac{A+Cx^2}{(a+bx)^{5/2}\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}}\,dx$

Optimal. Leaf size=1070

$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\left(Ca^2+Ab^2\right)}{3(bc-ad)(be-af)(bg-ah)(a+bx)^{3/2}}$$

$$+\frac{4\sqrt{dg-ch}\sqrt{fg-eh}\left(C(dfg+deh+cfh)a^3+b(3Adfh-2C(deg+cfg+ceh))a^2-b^2(2Ad(fg+eh)-c(3Ceg-2Afh))a\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{\frac{(de-cf)(a}{(be-af)(c}}}$$

$$-\frac{2\left(-\left(3Ad^2fh-C\left(-2fhc^2-dfgc-dehc+d^2eg\right)\right)a^2+3b\left(Cc^2+Ad^2\right)(fg+eh)a-b^2\left((3Ceg-Afh)c^2+Ad(fg+eh)\right.\right.}{3(bc-ad)^2(be-af)(bg-ah)^{3/2}\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-}}$$

$$+\frac{4b\left(C(dfg+deh+cfh)a^3+b(3Adfh-2C(deg+cfg+ceh))a^2-b^2(2Ad(fg+eh)-c(3Ceg-2Afh))a+Ab^3(deg+cfg\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{a+bx}}$$

$$-\frac{4d\left(C(dfg+deh+cfh)a^3+b(3Adfh-2C(deg+cfg+ceh))a^2-b^2(2Ad(fg+eh)-c(3Ceg-2Afh))a+Ab^3(deg+cfg\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{c+dx}}$$

```
[Out] (-4*d*(A*b^3*(d*e*g + c*f*g + c*e*h) + a^3*C*(d*f*g + d*e*h + c*f
*h) + a^2*b*(3*A*d*f*h - 2*C*(d*e*g + c*f*g + c*e*h)) - a*b^2*(2*
A*d*(f*g + e*h) - c*(3*C*e*g - 2*A*f*h)))*Sqrt[a + b*x]*Sqrt[e +
f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a*h)^2*
Sqrt[c + d*x]) - (2*(A*b^2 + a^2*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*S
qrt[g + h*x])/(3*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x)^(3
/2)) + (4*b*(A*b^3*(d*e*g + c*f*g + c*e*h) + a^3*C*(d*f*g + d*e*h
 + c*f*h) + a^2*b*(3*A*d*f*h - 2*C*(d*e*g + c*f*g + c*e*h)) - a*b
^2*(2*A*d*(f*g + e*h) - c*(3*C*e*g - 2*A*f*h)))*Sqrt[c + d*x]*Sqr
t[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a
*h)^2*Sqrt[a + b*x]) + (4*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(A*b^3*
(d*e*g + c*f*g + c*e*h) + a^3*C*(d*f*g + d*e*h + c*f*h) + a^2*b*(
3*A*d*f*h - 2*C*(d*e*g + c*f*g + c*e*h)) - a*b^2*(2*A*d*(f*g + e*
h) - c*(3*C*e*g - 2*A*f*h)))*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g
 + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c
*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)
*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(3*(b*c - a*d)^2*(b*e -
 a*f)^2*(b*g - a*h)^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(
c + d*x))]*Sqrt[g + h*x]) - (2*(3*a*b*(c^2*C + A*d^2)*(f*g + e*h)
 - b^2*(2*A*d^2*e*g + A*c*d*(f*g + e*h) + c^2*(3*C*e*g - A*f*h))
- a^2*(3*A*d^2*f*h - C*(d^2*e*g - c*d*f*g - c*d*e*h - 2*c^2*f*h))
)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g +
h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g -
 e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(
b*g - a*h)))])/(3*(b*c - a*d)^2*(b*e - a*f)*(b*g - a*h)^(3/2)*Sqr
t[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g -
 e*h)*(a + b*x)))])
```

Rubi [A] time = 8.21987, antiderivative size = 1070, normalized size of antiderivative = 1., number

of steps used = 8, number of rules used = 7, integrand size = 44, $\frac{\text{number of rules}}{\text{integrand size}} = 0.159$

$$-\frac{2\sqrt{c+dx}\sqrt{e+fx}\sqrt{g+hx}\left(Ca^2+Ab^2\right)}{3(bc-ad)(be-af)(bg-ah)(a+bx)^{3/2}}$$
$$+\frac{4\sqrt{dg-ch}\sqrt{fg-eh}\left(C(dfg+deh+cfh)a^3+b(3Adfh-2C(deg+cfg+ceh))a^2-b^2(2Ad(fg+eh)-c(3Ceg-2Afh))a\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{\frac{(de-cf)(a}{(be-af)(c}}}$$
$$-\frac{2\left(-\left(3Ad^2fh-C\left(-2fhc^2-dfgc-dehc+d^2eg\right)\right)a^2+3b\left(Cc^2+Ad^2\right)(fg+eh)a-b^2\left((3Ceg-Afh)c^2+Ad(fg+eh)\right.\right.}{3(bc-ad)^2(be-af)(bg-ah)^{3/2}\sqrt{fg-eh}\sqrt{c+dx}\sqrt{-}}$$
$$+\frac{4b\left(C(dfg+deh+cfh)a^3+b(3Adfh-2C(deg+cfg+ceh))a^2-b^2(2Ad(fg+eh)-c(3Ceg-2Afh))a+Ab^3(deg+cfg\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{a+bx}}$$
$$-\frac{4d\left(C(dfg+deh+cfh)a^3+b(3Adfh-2C(deg+cfg+ceh))a^2-b^2(2Ad(fg+eh)-c(3Ceg-2Afh))a+Ab^3(deg+cfg\right.}{3(bc-ad)^2(be-af)^2(bg-ah)^2\sqrt{c+dx}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[(A + C*x^2)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x]),x]
```

```
[Out] (-4*d*(A*b^3*(d*e*g + c*f*g + c*e*h) + a^3*C*(d*f*g + d*e*h + c*f
*h) + a^2*b*(3*A*d*f*h - 2*C*(d*e*g + c*f*g + c*e*h)) - a*b^2*(2*
A*d*(f*g + e*h) - c*(3*C*e*g - 2*A*f*h)))*Sqrt[a + b*x]*Sqrt[e +
f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a*h)^2*
Sqrt[c + d*x]) - (2*(A*b^2 + a^2*C)*Sqrt[c + d*x]*Sqrt[e + f*x]*S
qrt[g + h*x])/(3*(b*c - a*d)*(b*e - a*f)*(b*g - a*h)*(a + b*x)^(3
/2)) + (4*b*(A*b^3*(d*e*g + c*f*g + c*e*h) + a^3*C*(d*f*g + d*e*h
 + c*f*h) + a^2*b*(3*A*d*f*h - 2*C*(d*e*g + c*f*g + c*e*h)) - a*b
^2*(2*A*d*(f*g + e*h) - c*(3*C*e*g - 2*A*f*h)))*Sqrt[c + d*x]*Sqr
t[e + f*x]*Sqrt[g + h*x])/(3*(b*c - a*d)^2*(b*e - a*f)^2*(b*g - a
*h)^2*Sqrt[a + b*x]) + (4*Sqrt[d*g - c*h]*Sqrt[f*g - e*h]*(A*b^3*
(d*e*g + c*f*g + c*e*h) + a^3*C*(d*f*g + d*e*h + c*f*h) + a^2*b*(
3*A*d*f*h - 2*C*(d*e*g + c*f*g + c*e*h)) - a*b^2*(2*A*d*(f*g + e*
h) - c*(3*C*e*g - 2*A*f*h)))*Sqrt[a + b*x]*Sqrt[-(((d*e - c*f)*(g
 + h*x))/((f*g - e*h)*(c + d*x)))]*EllipticE[ArcSin[(Sqrt[d*g - c
*h]*Sqrt[e + f*x])/(Sqrt[f*g - e*h]*Sqrt[c + d*x])], ((b*c - a*d)
*(f*g - e*h))/((b*e - a*f)*(d*g - c*h))])/(3*(b*c - a*d)^2*(b*e -
 a*f)^2*(b*g - a*h)^2*Sqrt[((d*e - c*f)*(a + b*x))/((b*e - a*f)*(
c + d*x))]*Sqrt[g + h*x]) - (2*(3*a*b*(c^2*C + A*d^2)*(f*g + e*h)
 - b^2*(2*A*d^2*e*g + A*c*d*(f*g + e*h) + c^2*(3*C*e*g - A*f*h))
- a^2*(3*A*d^2*f*h - C*(d^2*e*g - c*d*f*g - c*d*e*h - 2*c^2*f*h))
)*Sqrt[((b*e - a*f)*(c + d*x))/((d*e - c*f)*(a + b*x))]*Sqrt[g +
h*x]*EllipticF[ArcSin[(Sqrt[b*g - a*h]*Sqrt[e + f*x])/(Sqrt[f*g -
 e*h]*Sqrt[a + b*x])], -(((b*c - a*d)*(f*g - e*h))/((d*e - c*f)*(
b*g - a*h)))])/(3*(b*c - a*d)^2*(b*e - a*f)*(b*g - a*h)^(3/2)*Sqr
t[f*g - e*h]*Sqrt[c + d*x]*Sqrt[-(((b*e - a*f)*(g + h*x))/((f*g -
 e*h)*(a + b*x)))])
```

Rubi in Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((C*x**2+A)/(b*x+a)**(5/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)
```

```
[Out] Timed out
```

Mathematica [B] time = 35.4361, size = 19544, normalized size = 18.27

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(A + C*x^2)/((a + b*x)^(5/2)*Sqrt[c + d*x]*Sqrt[e + f*x]*Sqrt[g + h*x])
```

```
[Out] Result too large to show
```

Maple [B] time = 1.787, size = 72702, normalized size = 68.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((C*x^2+A)/(b*x+a)^(5/2)/(d*x+c)^(1/2)/(f*x+e)^(1/2)/(h*x+g)^(1/2),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)^{\frac{5}{2}} \sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e
)*sqrt(h*x + g)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{Cx^2 + A}{(b^2x^2 + 2\,abx + a^2)\sqrt{bx + a}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] integral((C*x^2 + A)/((b^2*x^2 + 2*a*b*x + a^2)*sqrt(b*x + a)*sqr
t(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g)), x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x**2+A)/(b*x+a)**(5/2)/(d*x+c)**(1/2)/(f*x+e)**(1/2)/(h*x+g)**(1/
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{Cx^2 + A}{(bx + a)^{\frac{5}{2}}\sqrt{dx + c}\sqrt{fx + e}\sqrt{hx + g}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((C*x^2 + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e)*sqrt(h*x + g))
```

```
[Out] integrate((C*x^2 + A)/((b*x + a)^(5/2)*sqrt(d*x + c)*sqrt(f*x + e
)*sqrt(h*x + g)), x)
```

4 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 Mathematica/Rubi followed by one for Maple. The following are links to the source code.

The following are the listing of the above functions.

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)
(* ::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_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]

(* ::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]
```

```
# 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
GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal;

      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";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(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.

  if not type(result,freeof('int')) then
     return "F";
  end if;

  if ExpnType_result<=ExpnType_optimal then
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
         if leaf_count_result<=2*leaf_count_optimal then
            return "A";
         else
            return "B";
         end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      return "C";
  end if
end proc:
```

```
# is_contains_complex(result) takes expressions and returns true if it contains "I"
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

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' or op(0,expn)='integrate' 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,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:
```