Computer algebra independent integration tests

1_Algebraic_functions/1.1_Binomial_products/1.1.2Quadratic/1.1.2.6(gx)^m(a+bx^2)^p(c

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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.

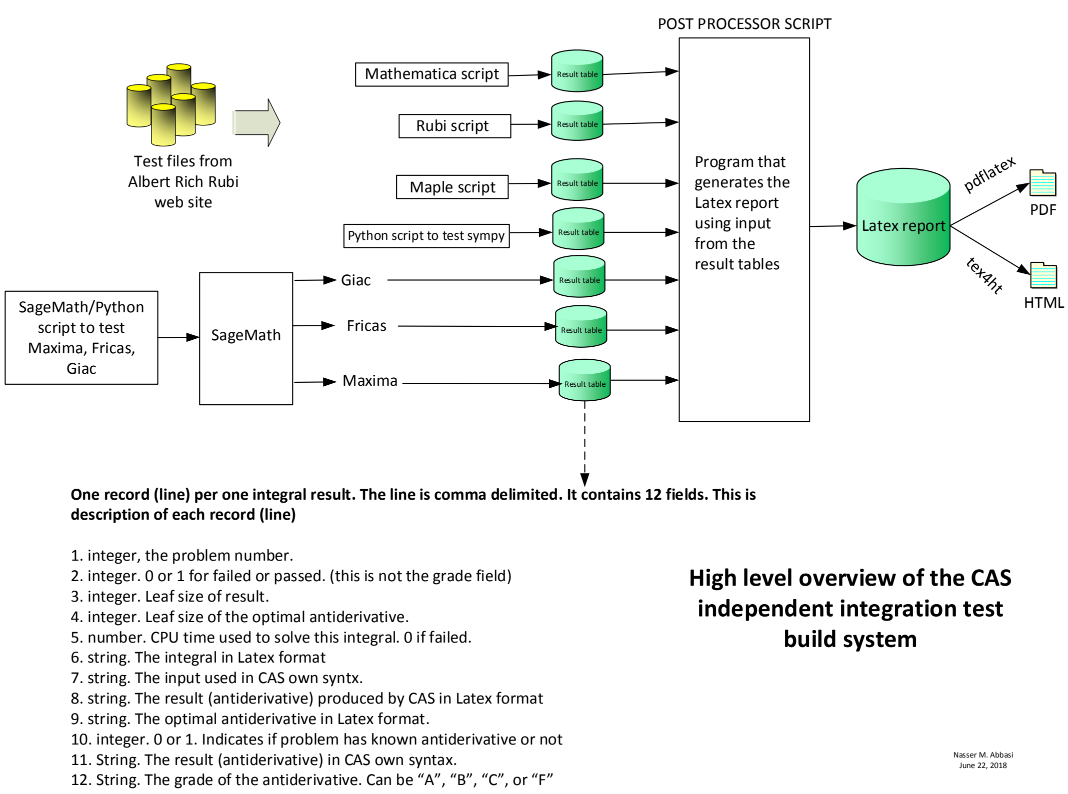
1. Mathematica 11.3 (64 bit).
2. Rubi 4.15.2 in Mathematica 11.3.
3. Rubi in Sympy (Version 1.3) under Python 3.7.0 using Anaconda distribution.
4. Maple 2018.1 (64 bit).
5. Maxima 5.41 Using Lisp ECL 16.1.2.
6. Fricas 1.3.4.
7. Sympy 1.3 under Python 3.7.0 using Anaconda distribution.
8. Giac/Xcas 1.4.9.

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. (51)	% 0. (0)
Rubi in Sympy	% 54.9 (28)	% 45.1 (23)
Mathematica	% 100. (51)	% 0. (0)
Maple	% 27.45 (14)	% 72.55 (37)
Maxima	% 0. (0)	% 100. (51)
Fricas	% 27.45 (14)	% 72.55 (37)
Sympy	% 47.06 (24)	% 52.94 (27)
Giac	% 27.45 (14)	% 72.55 (37)

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.

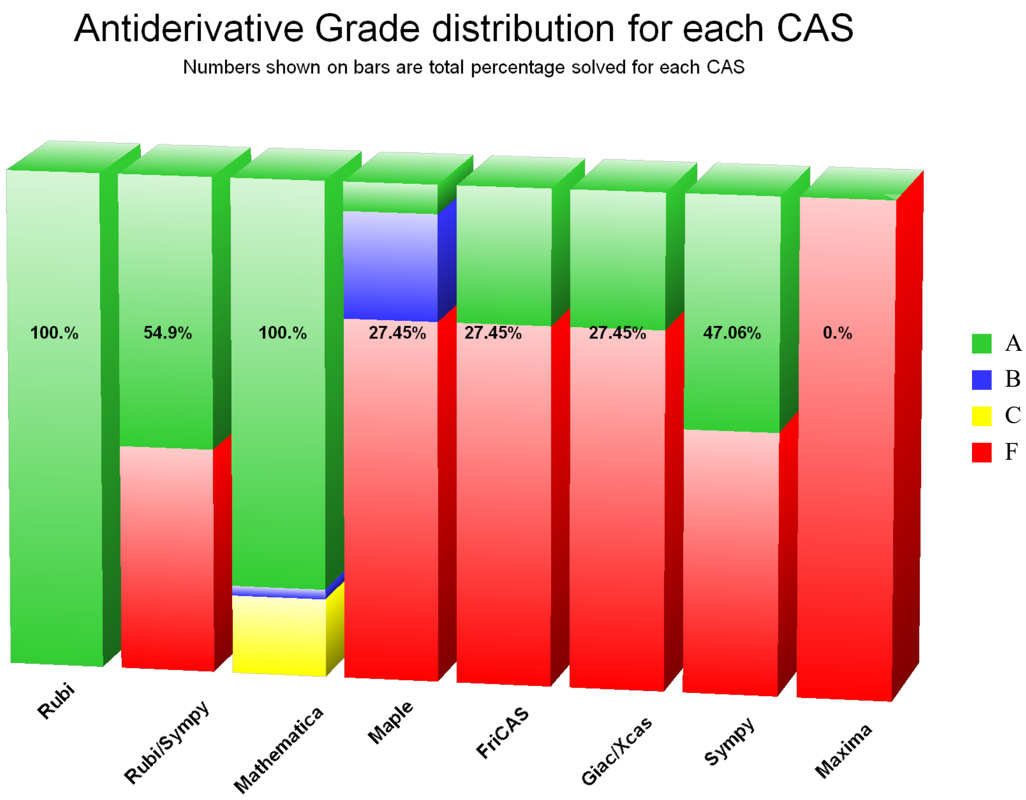
grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality.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

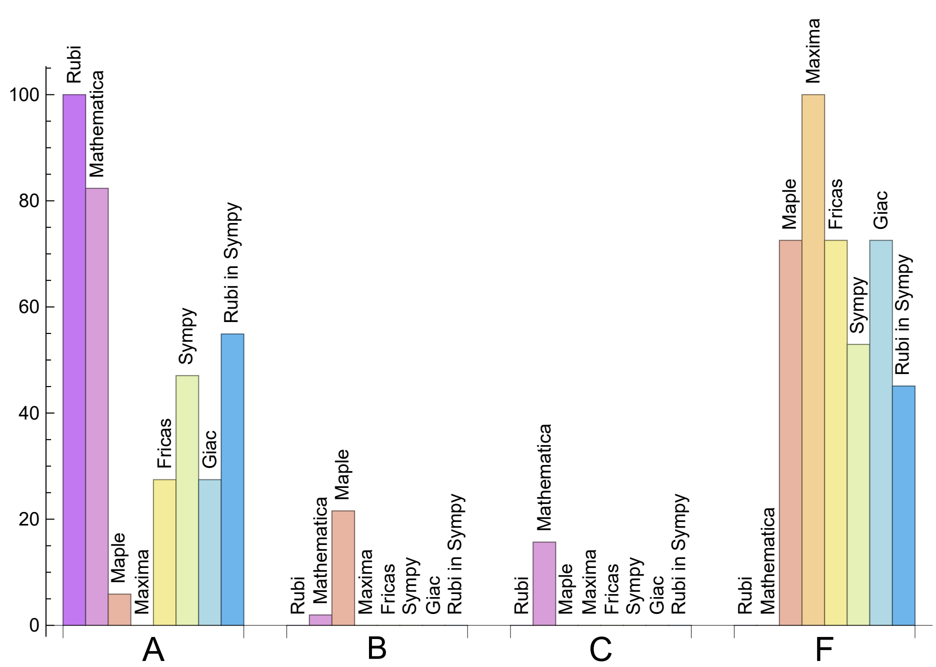
Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	100.	0.	0.	0.
Rubi in Sympy	54.9	0.	0.	45.1
Mathematica	82.35	1.96	15.69	0.
Maple	5.88	21.57	0.	72.55
Maxima	0.	0.	0.	100.
Fricas	27.45	0.	0.	72.55
Sympy	47.06	0.	0.	52.94
Giac	27.45	0.	0.	72.55

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	No
Rubi	1.24	262.39	1.	216.	
Rubi in Sympy	59.15	153.07	0.93	146.	
Mathematica	0.69	206.02	0.87	170.	
Maple	0.01	1113.14	5.12	711.	
Maxima	Round[Mean[], 0.01]	Round[Mean[], 0.01]	Round[Mean[], 0.01]	Round[Median[], 0.01]	Rou
Fricas	0.26	1041.86	4.78	693.	
Sympy	42.34	2774.08	14.5	1134.5	
Giac	0.23	207.07	2.16	1.	

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 {13, 15, 19, 20, 21, 22, 23, 28, 29, 30, 31, 34, 35, 36, 37, 41, 42, 43, 44, 45, 46, 48, 49}

Not solved by Mathematica {}

Not solved by Maple {5, 6, 7, 12, 13, 14, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49}

Not solved by Maxima {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51}

Not solved by Fricas {5, 6, 7, 12, 13, 14, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49}

Not solved by Sympy {7, 13, 14, 15, 20, 21, 27, 28, 29, 30, 31, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49}

Not solved by Giac {5, 6, 7, 12, 13, 14, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49}

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 {}

Mathematica {28, 29, 34, 35, 36, 41, 42, 43, 47, 48, 49}

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	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	151	1229	0	1230	6156	1	201
normalized size	1	1.	0.8	6.5	0.	6.51	32.57	0.01	1.06
time (sec)	N/A	0.514	0.532	0.012	0.	0.264	9.616	0.227	75.522

Problem 2	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	144	144	115	711	0	718	3373	1	146
normalized size	1	1.	0.8	4.94	0.	4.99	23.42	0.01	1.01
time (sec)	N/A	0.352	0.294	0.01	0.	0.267	5.566	0.218	53.538

Problem 3	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	97	97	73	321	0	317	1515	732	92
normalized size	1	1.	0.75	3.31	0.	3.27	15.62	7.55	0.95
time (sec)	N/A	0.184	0.108	0.006	0.	0.254	3.045	0.224	32.054

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	43	111	0	127	459	258	51
normalized size	1	1.	0.72	1.85	0.	2.12	7.65	4.3	0.85
time (sec)	N/A	0.093	0.064	0.005	0.	0.254	1.449	0.216	15.105

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	121	0	0	0	428	0	99
normalized size	1	1.	1.03	0.	0.	0.	3.63	0.	0.84
time (sec)	N/A	0.26	0.208	0.056	0.	0.	21.847	0.	39.714

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	121	0	0	0	2076	0	148
normalized size	1	1.	0.71	0.	0.	0.	12.14	0.	0.87
time (sec)	N/A	0.61	0.217	0.063	0.	0.	151.22	0.	46.006

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	121	0	0	0	0	0	194
normalized size	1	1.	0.58	0.	0.	0.	0.	0.	0.93
time (sec)	N/A	0.792	0.231	0.085	0.	0.	0.	0.	49.622

Problem 8	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	292	292	247	2443	0	2310	12199	1	323
normalized size	1	1.	0.85	8.37	0.	7.91	41.78	0.	1.11
time (sec)	N/A	0.716	1.058	0.014	0.	0.263	18.81	0.247	168.82

Problem 9	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	216	216	178	1471	0	1408	7019	1	235
normalized size	1	1.	0.82	6.81	0.	6.52	32.5	0.	1.09
time (sec)	N/A	0.56	0.779	0.012	0.	0.265	11.02	0.229	104.884

Problem 10	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	144	144	115	711	0	668	3373	1	146
normalized size	1	1.	0.8	4.94	0.	4.64	23.42	0.01	1.01
time (sec)	N/A	0.334	0.358	0.01	0.	0.261	5.626	0.22	53.628

Problem 11	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	91	91	67	263	0	293	1137	578	82
normalized size	1	1.	0.74	2.89	0.	3.22	12.49	6.35	0.9
time (sec)	N/A	0.159	0.068	0.008	0.	0.253	2.804	0.223	24.899

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	170	0	0	0	666	0	168
normalized size	1	1.	0.96	0.	0.	0.	3.74	0.	0.94
time (sec)	N/A	0.446	0.425	0.068	0.	0.	47.235	0.	84.392

Problem 13	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	247	247	170	0	0	0	0	0	0
normalized size	1	1.	0.69	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.114	0.497	0.079	0.	0.	0.	0.	0.

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	292	292	170	0	0	0	0	0	274
normalized size	1	1.	0.58	0.	0.	0.	0.	0.	0.94
time (sec)	N/A	1.127	0.48	0.1	0.	0.	0.	0.	106.696

Problem 15	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	379	379	327	3953	0	3587	0	1	0
normalized size	1	1.	0.86	10.43	0.	9.46	0.	0.	0.
time (sec)	N/A	1.125	2.122	0.015	0.	0.278	0.	0.254	0.

Problem 16	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	284	284	239	2443	0	2282	12199	1	323
normalized size	1	1.	0.84	8.6	0.	8.04	42.95	0.	1.14
time (sec)	N/A	0.745	1.304	0.014	0.	0.267	18.886	0.241	166.558

Problem 17	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	189	189	151	1229	0	1130	6156	1	201
normalized size	1	1.	0.8	6.5	0.	5.98	32.57	0.01	1.06
time (sec)	N/A	0.483	0.699	0.011	0.	0.267	9.693	0.225	73.487

Problem 18	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	121	121	90	475	0	514	2220	1017	110
normalized size	1	1.	0.74	3.93	0.	4.25	18.35	8.4	0.91
time (sec)	N/A	0.23	0.105	0.01	0.	0.261	4.834	0.244	31.192

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	258	258	218	0	0	0	911	0	0
normalized size	1	1.	0.84	0.	0.	0.	3.53	0.	0.
time (sec)	N/A	0.703	0.781	0.051	0.	0.	96.321	0.	0.

Problem 20	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	347	347	218	0	0	0	0	0	0
normalized size	1	1.	0.63	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.628	0.832	0.062	0.	0.	0.	0.	0.

Problem 21	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	480	480	218	0	0	0	0	0	0
normalized size	1	1.	0.45	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.911	0.856	0.075	0.	0.	0.	0.	0.

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	363	363	270	0	0	0	1132	0	0
normalized size	1	1.	0.74	0.	0.	0.	3.12	0.	0.
time (sec)	N/A	0.941	2.738	0.054	0.	0.	171.43	0.	0.

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	218	0	0	0	911	0	0
normalized size	1	1.	0.84	0.	0.	0.	3.5	0.	0.
time (sec)	N/A	0.644	0.8	0.052	0.	0.	97.454	0.	0.

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	170	0	0	0	666	0	168
normalized size	1	1.	0.94	0.	0.	0.	3.7	0.	0.93
time (sec)	N/A	0.441	0.482	0.068	0.	0.	47.976	0.	83.078

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	121	0	0	0	428	0	99
normalized size	1	1.	1.01	0.	0.	0.	3.57	0.	0.82
time (sec)	N/A	0.257	0.202	0.055	0.	0.	22.052	0.	40.529

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	58	0	0	0	204	0	56
normalized size	1	1.	0.75	0.	0.	0.	2.65	0.	0.73
time (sec)	N/A	0.116	0.069	0.066	0.	0.	7.962	0.	14.052

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	100	0	0	0	0	0	94
normalized size	1	1.	0.8	0.	0.	0.	0.	0.	0.75
time (sec)	N/A	0.34	0.163	0.074	0.	0.	0.	0.	43.501

Problem 28	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	206	206	377	0	0	0	0	0	0
normalized size	1	1.	1.83	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.025	0.991	0.1	0.	0.	0.	0.	0.

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	342	342	377	0	0	0	0	0	0
normalized size	1	1.	1.1	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.066	0.715	0.086	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	218	0	0	0	0	0	0
normalized size	1	1.	0.64	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.853	0.861	0.063	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	170	0	0	0	0	0	0
normalized size	1	1.	0.69	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.096	0.467	0.075	0.	0.	0.	0.	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	121	0	0	0	2076	0	148
normalized size	1	1.	0.71	0.	0.	0.	12.14	0.	0.87
time (sec)	N/A	0.607	0.213	0.063	0.	0.	152.577	0.	44.888

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	81	0	0	0	954	0	78
normalized size	1	1.	0.79	0.	0.	0.	9.26	0.	0.76
time (sec)	N/A	0.155	0.087	0.074	0.	0.	68.88	0.	16.303

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	205	205	377	0	0	0	0	0	0
normalized size	1	1.	1.84	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.048	0.976	0.102	0.	0.	0.	0.	0.

Problem 35	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	304	304	375	0	0	0	0	0	0
normalized size	1	1.	1.23	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.042	0.856	0.079	0.	0.	0.	0.	0.

Problem 36	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	491	491	379	0	0	0	0	0	0
normalized size	1	1.	0.77	0.	0.	0.	0.	0.	0.
time (sec)	N/A	4.053	1.481	0.109	0.	0.	0.	0.	0.

Problem 37	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	433	433	218	0	0	0	0	0	0
normalized size	1	1.	0.5	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.906	0.943	0.076	0.	0.	0.	0.	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	292	292	170	0	0	0	0	0	286
normalized size	1	1.	0.58	0.	0.	0.	0.	0.	0.98
time (sec)	N/A	1.12	0.48	0.1	0.	0.	0.	0.	114.425

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	121	0	0	0	0	0	194
normalized size	1	1.	0.58	0.	0.	0.	0.	0.	0.93
time (sec)	N/A	0.804	0.229	0.086	0.	0.	0.	0.	48.151

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	81	0	0	0	0	0	80
normalized size	1	1.	0.79	0.	0.	0.	0.	0.	0.78
time (sec)	N/A	0.153	0.091	0.079	0.	0.	0.	0.	16.626

Problem 41	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	333	333	377	0	0	0	0	0	0
normalized size	1	1.	1.13	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.086	1.007	0.089	0.	0.	0.	0.	0.

Problem 42	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	452	452	379	0	0	0	0	0	0
normalized size	1	1.	0.84	0.	0.	0.	0.	0.	0.
time (sec)	N/A	3.591	1.133	0.114	0.	0.	0.	0.	0.

Problem 43	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	665	665	375	0	0	0	0	0	0
normalized size	1	1.	0.56	0.	0.	0.	0.	0.	0.
time (sec)	N/A	6.368	1.945	0.11	0.	0.	0.	0.	0.

Problem 44	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1059	1047	248	0	0	0	0	0	0
normalized size	1	0.99	0.23	0.	0.	0.	0.	0.	0.
time (sec)	N/A	6.632	0.868	0.111	0.	0.	0.	0.	0.

Problem 45	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	495	464	198	0	0	0	0	0	0
normalized size	1	0.94	0.4	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.934	0.547	0.094	0.	0.	0.	0.	0.

Problem 46	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	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	253	238	147	0	0	0	0	0	0
normalized size	1	0.94	0.58	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.616	0.226	0.08	0.	0.	0.	0.	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	F	F	F	F(-1)	F	A
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	446	0	0	0	0	0	124
normalized size	1	1.	2.75	0.	0.	0.	0.	0.	0.77
time (sec)	N/A	0.446	0.757	0.09	0.	0.	0.	0.	66.484

Problem 48	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	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	295	295	403	0	0	0	0	0	0
normalized size	1	1.	1.37	0.	0.	0.	0.	0.	0.
time (sec)	N/A	1.222	1.4	0.096	0.	0.	0.	0.	0.

Problem 49	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	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	483	483	403	0	0	0	0	0	0
normalized size	1	1.	0.83	0.	0.	0.	0.	0.	0.
time (sec)	N/A	2.894	1.705	0.116	0.	0.	0.	0.	0.

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	103	112	0	1	160	153	83
normalized size	1	1.	1.23	1.33	0.	0.01	1.9	1.82	0.99
time (sec)	N/A	0.25	0.271	0.013	0.	0.269	19.467	0.221	21.38

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	103	112	0	1	160	153	83
normalized size	1	1.	1.23	1.33	0.	0.01	1.9	1.82	0.99
time (sec)	N/A	0.254	0.299	0.01	0.	0.277	20.331	0.22	20.668

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 [48] had the largest ratio of [0.1935]

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.	29	0.034
2	A	2	1	1.	29	0.034
3	A	2	1	1.	27	0.037
4	A	2	1	1.	20	0.05
5	A	3	2	1.	29	0.069
6	A	3	3	1.	29	0.103
7	A	3	3	1.	29	0.103
8	A	2	1	1.	31	0.032
9	A	2	1	1.	31	0.032
10	A	2	1	1.	29	0.034
11	A	2	1	1.	22	0.045
12	A	3	2	1.	31	0.065
13	A	4	3	1.	31	0.097
14	A	4	3	1.	31	0.097
15	A	2	1	1.	31	0.032
16	A	2	1	1.	31	0.032
17	A	2	1	1.	29	0.034
18	A	2	1	1.	22	0.045
19	A	3	2	1.	31	0.065

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	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
20	A	4	3	1.	31	0.097
21	A	5	3	1.	31	0.097
22	A	3	2	1.	31	0.065
23	A	3	2	1.	31	0.065
24	A	3	2	1.	31	0.065
25	A	3	2	1.	29	0.069
26	A	2	2	1.	22	0.091
27	A	4	2	1.	31	0.065
28	A	5	3	1.	31	0.097
29	A	6	3	1.	31	0.097
30	A	4	3	1.	31	0.097
31	A	4	3	1.	31	0.097
32	A	3	3	1.	29	0.103
33	A	2	2	1.	22	0.091
34	A	5	3	1.	31	0.097
35	A	6	3	1.	31	0.097
36	A	7	3	1.	31	0.097
37	A	5	3	1.	31	0.097
38	A	4	3	1.	31	0.097
39	A	3	3	1.	29	0.103
40	A	2	2	1.	22	0.091
41	A	6	3	1.	31	0.097
42	A	7	3	1.	31	0.097
43	A	8	3	1.	31	0.097
44	A	6	4	0.99	31	0.129
45	A	5	4	0.94	31	0.129
46	A	4	4	0.94	29	0.138
47	A	6	5	1.	31	0.161
48	A	7	6	1.	31	0.194
49	A	8	6	1.	31	0.194
50	A	5	5	1.	29	0.172
51	A	5	5	1.	29	0.172

3 Listing of integrals

3.1 $\int (ex)^m \left(a+bx^2\right)^3 \left(A+Bx^2\right) \left(c+dx^2\right) \, dx$

Optimal. Leaf size=189

$$\frac{a^3Ac(ex)^{m+1}}{e(m+1)}+\frac{a^2(ex)^{m+3}(aAd+aBc+3Abc)}{e^3(m+3)}+\frac{b^2(ex)^{m+9}(3aBd+Abd+bBc)}{e^9(m+9)}+\frac{b(ex)^{m+7}(Ab(3ad+bc)+3aB(ad+bc))}{e^7(m+7)}+\frac{a(ex)^{m+5}(3Ab(ad+bc)+aB(ad+3bc))}{e^5(m+5)}+\frac{b^3Bd(ex)^{m+11}}{e^{11}(m+11)}$$

```
[Out] (a^3*A*c*(e*x)^(1 + m))/(e*(1 + m)) + (a^2*(3*A*b*c + a*B*c + a*A
*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (a*(3*A*b*(b*c + a*d) + a*B*(3
*b*c + a*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (b*(3*a*B*(b*c + a*d)
 + A*b*(b*c + 3*a*d))*(e*x)^(7 + m))/(e^7*(7 + m)) + (b^2*(b*B*c
+ A*b*d + 3*a*B*d)*(e*x)^(9 + m))/(e^9*(9 + m)) + (b^3*B*d*(e*x)^
(11 + m))/(e^11*(11 + m))
```

Rubi [A] time = 0.514339, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.034

$$\frac{a^3Ac(ex)^{m+1}}{e(m+1)}+\frac{a^2(ex)^{m+3}(aAd+aBc+3Abc)}{e^3(m+3)}+\frac{b^2(ex)^{m+9}(3aBd+Abd+bBc)}{e^9(m+9)}+\frac{b(ex)^{m+7}(Ab(3ad+bc)+3aB(ad+bc))}{e^7(m+7)}+\frac{a(ex)^{m+5}(3Ab(ad+bc)+aB(ad+3bc))}{e^5(m+5)}+\frac{b^3Bd(ex)^{m+11}}{e^{11}(m+11)}$$

Antiderivative was successfully verified.

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



```
[Out] (a^3*A*c*(e*x)^(1 + m))/(e*(1 + m)) + (a^2*(3*A*b*c + a*B*c + a*A
*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (a*(3*A*b*(b*c + a*d) + a*B*(3
*b*c + a*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (b*(3*a*B*(b*c + a*d)
 + A*b*(b*c + 3*a*d))*(e*x)^(7 + m))/(e^7*(7 + m)) + (b^2*(b*B*c
+ A*b*d + 3*a*B*d)*(e*x)^(9 + m))/(e^9*(9 + m)) + (b^3*B*d*(e*x)^
(11 + m))/(e^11*(11 + m))
```

Rubi in Sympy [A] time = 75.5221, size = 201, normalized size = 1.06

$$\frac{Aa^3c\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bb^3d\,(ex)^{m+11}}{e^{11}\,(m+11)}+\frac{a^2\,(ex)^{m+3}\,(Aad+3Abc+Bac)}{e^3\,(m+3)}+\frac{a\,(ex)^{m+5}\left(3Aabd+3Ab^2c+Ba^2d+3Babc\right)}{e^5\,(m+5)}+\frac{b^2\,(ex)^{m+9}\,(Abd+3Bad+Bbc)}{e^9\,(m+9)}+\frac{b\,(ex)^{m+7}\left(3Aabd+Ab^2c+3Ba^2d+3Babc\right)}{e^7\,(m+7)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)**3*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] A*a**3*c*(e*x)**(m + 1)/(e*(m + 1)) + B*b**3*d*(e*x)**(m + 11)/(e
**11*(m + 11)) + a**2*(e*x)**(m + 3)*(A*a*d + 3*A*b*c + B*a*c)/(e
**3*(m + 3)) + a*(e*x)**(m + 5)*(3*A*a*b*d + 3*A*b**2*c + B*a**2*
d + 3*B*a*b*c)/(e**5*(m + 5)) + b**2*(e*x)**(m + 9)*(A*b*d + 3*B*
a*d + B*b*c)/(e**9*(m + 9)) + b*(e*x)**(m + 7)*(3*A*a*b*d + A*b**
2*c + 3*B*a**2*d + 3*B*a*b*c)/(e**7*(m + 7))
```

Mathematica [A] time = 0.532446, size = 151, normalized size = 0.8

$$(ex)^m\left(\frac{a^3Acx}{m+1}+\frac{a^2x^3(aAd+aBc+3Abc)}{m+3}+\frac{b^2x^9(3aBd+Abd+bBc)}{m+9}+\frac{bx^7(Ab(3ad+bc)+3aB(ad+bc))}{m+7}+\frac{ax^5(3Ab(ad+bc)+aB(ad+3bc))}{m+5}+\frac{b^3Bdx^{11}}{m+11}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a^3*A*c*x)/(1 + m) + (a^2*(3*A*b*c + a*B*c + a*A*d)*x^3
)/(3 + m) + (a*(3*A*b*(b*c + a*d) + a*B*(3*b*c + a*d))*x^5)/(5 +
m) + (b*(3*a*B*(b*c + a*d) + A*b*(b*c + 3*a*d))*x^7)/(7 + m) + (b
^2*(b*B*c + A*b*d + 3*a*B*d)*x^9)/(9 + m) + (b^3*B*d*x^11)/(11 +
m))
```

Maple [B] time = 0.012, size = 1229, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b^3*d*m^5*x^10+25*B*b^3*d*m^4*x^10+A*b^3*d*m^5*x^8+3*B*a*b^2
*d*m^5*x^8+B*b^3*c*m^5*x^8+230*B*b^3*d*m^3*x^10+27*A*b^3*d*m^4*x^
8+81*B*a*b^2*d*m^4*x^8+27*B*b^3*c*m^4*x^8+950*B*b^3*d*m^2*x^10+3*
A*a*b^2*d*m^5*x^6+A*b^3*c*m^5*x^6+262*A*b^3*d*m^3*x^8+3*B*a^2*b*d
*m^5*x^6+3*B*a*b^2*c*m^5*x^6+786*B*a*b^2*d*m^3*x^8+262*B*b^3*c*m^
3*x^8+1689*B*b^3*d*m*x^10+87*A*a*b^2*d*m^4*x^6+29*A*b^3*c*m^4*x^6
+1122*A*b^3*d*m^2*x^8+87*B*a^2*b*d*m^4*x^6+87*B*a*b^2*c*m^4*x^6+3
366*B*a*b^2*d*m^2*x^8+1122*B*b^3*c*m^2*x^8+945*B*b^3*d*x^10+3*A*a
^2*b*d*m^5*x^4+3*A*a*b^2*c*m^5*x^4+906*A*a*b^2*d*m^3*x^6+302*A*b^
3*c*m^3*x^6+2041*A*b^3*d*m*x^8+B*a^3*d*m^5*x^4+3*B*a^2*b*c*m^5*x^
4+906*B*a^2*b*d*m^3*x^6+906*B*a*b^2*c*m^3*x^6+6123*B*a*b^2*d*m*x^
8+2041*B*b^3*c*m*x^8+93*A*a^2*b*d*m^4*x^4+93*A*a*b^2*c*m^4*x^4+40
98*A*a*b^2*d*m^2*x^6+1366*A*b^3*c*m^2*x^6+1155*A*b^3*d*x^8+31*B*a
^3*d*m^4*x^4+93*B*a^2*b*c*m^4*x^4+4098*B*a^2*b*d*m^2*x^6+4098*B*a
*b^2*c*m^2*x^6+3465*B*a*b^2*d*x^8+1155*B*b^3*c*x^8+A*a^3*d*m^5*x^
2+3*A*a^2*b*c*m^5*x^2+1050*A*a^2*b*d*m^3*x^4+1050*A*a*b^2*c*m^3*x
^4+7731*A*a*b^2*d*m*x^6+2577*A*b^3*c*m*x^6+B*a^3*c*m^5*x^2+350*B*
a^3*d*m^3*x^4+1050*B*a^2*b*c*m^3*x^4+7731*B*a^2*b*d*m*x^6+7731*B*
a*b^2*c*m*x^6+33*A*a^3*d*m^4*x^2+99*A*a^2*b*c*m^4*x^2+5190*A*a^2*
b*d*m^2*x^4+5190*A*a*b^2*c*m^2*x^4+4455*A*a*b^2*d*x^6+1485*A*b^3*
c*x^6+33*B*a^3*c*m^4*x^2+1730*B*a^3*d*m^2*x^4+5190*B*a^2*b*c*m^2*
x^4+4455*B*a^2*b*d*x^6+4455*B*a*b^2*c*x^6+A*a^3*c*m^5+406*A*a^3*d
*m^3*x^2+1218*A*a^2*b*c*m^3*x^2+10467*A*a^2*b*d*m*x^4+10467*A*a*b
^2*c*m*x^4+406*B*a^3*c*m^3*x^2+3489*B*a^3*d*m*x^4+10467*B*a^2*b*c
*m*x^4+35*A*a^3*c*m^4+2262*A*a^3*d*m^2*x^2+6786*A*a^2*b*c*m^2*x^2
+6237*A*a^2*b*d*x^4+6237*A*a*b^2*c*x^4+2262*B*a^3*c*m^2*x^2+2079*
B*a^3*d*x^4+6237*B*a^2*b*c*x^4+470*A*a^3*c*m^3+5353*A*a^3*d*m*x^2
+16059*A*a^2*b*c*m*x^2+5353*B*a^3*c*m*x^2+3010*A*a^3*c*m^2+3465*A
*a^3*d*x^2+10395*A*a^2*b*c*x^2+3465*B*a^3*c*x^2+9129*A*a^3*c*m+10
395*A*a^3*c)*(e*x)^m/(11+m)/(9+m)/(7+m)/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.26357, size = 1230, normalized size = 6.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^3*d*m^5 + 25*B*b^3*d*m^4 + 230*B*b^3*d*m^3 + 950*B*b^3*d*m^
2 + 1689*B*b^3*d*m + 945*B*b^3*d)*x^11 + ((B*b^3*c + (3*B*a*b^2 +
 A*b^3)*d)*m^5 + 1155*B*b^3*c + 27*(B*b^3*c + (3*B*a*b^2 + A*b^3)
*d)*m^4 + 262*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m^3 + 1122*(B*b^3
*c + (3*B*a*b^2 + A*b^3)*d)*m^2 + 1155*(3*B*a*b^2 + A*b^3)*d + 20
41*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m)*x^9 + (((3*B*a*b^2 + A*b^
3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^5 + 29*((3*B*a*b^2 + A*b^3)*c +
 3*(B*a^2*b + A*a*b^2)*d)*m^4 + 302*((3*B*a*b^2 + A*b^3)*c + 3*(B
*a^2*b + A*a*b^2)*d)*m^3 + 1366*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2
*b + A*a*b^2)*d)*m^2 + 1485*(3*B*a*b^2 + A*b^3)*c + 4455*(B*a^2*b
 + A*a*b^2)*d + 2577*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^
2)*d)*m)*x^7 + ((3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)
*m^5 + 31*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m^4 +
 350*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m^3 + 1730
*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m^2 + 6237*(B*
a^2*b + A*a*b^2)*c + 2079*(B*a^3 + 3*A*a^2*b)*d + 3489*(3*(B*a^2*
b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m)*x^5 + ((A*a^3*d + (B*a
^3 + 3*A*a^2*b)*c)*m^5 + 3465*A*a^3*d + 33*(A*a^3*d + (B*a^3 + 3*
A*a^2*b)*c)*m^4 + 406*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m^3 + 226
2*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m^2 + 3465*(B*a^3 + 3*A*a^2*b
)*c + 5353*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m)*x^3 + (A*a^3*c*m^
5 + 35*A*a^3*c*m^4 + 470*A*a^3*c*m^3 + 3010*A*a^3*c*m^2 + 9129*A*
a^3*c*m + 10395*A*a^3*c)*x)*(e*x)^m/(m^6 + 36*m^5 + 505*m^4 + 348
0*m^3 + 12139*m^2 + 19524*m + 10395)
```

Sympy [A] time = 9.61594, size = 6156, normalized size = 32.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x)**m*(b*x**2+a)**3*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] Piecewise(((-A*a**3*c/(10*x**10) - A*a**3*d/(8*x**8) - 3*A*a**2*b
*c/(8*x**8) - A*a**2*b*d/(2*x**6) - A*a*b**2*c/(2*x**6) - 3*A*a*b
**2*d/(4*x**4) - A*b**3*c/(4*x**4) - A*b**3*d/(2*x**2) - B*a**3*c
/(8*x**8) - B*a**3*d/(6*x**6) - B*a**2*b*c/(2*x**6) - 3*B*a**2*b*
d/(4*x**4) - 3*B*a*b**2*c/(4*x**4) - 3*B*a*b**2*d/(2*x**2) - B*b*
*3*c/(2*x**2) + B*b**3*d*log(x))/e**11, Eq(m, -11)), ((-A*a**3*c/
(8*x**8) - A*a**3*d/(6*x**6) - A*a**2*b*c/(2*x**6) - 3*A*a**2*b*d
/(4*x**4) - 3*A*a*b**2*c/(4*x**4) - 3*A*a*b**2*d/(2*x**2) - A*b**
3*c/(2*x**2) + A*b**3*d*log(x) - B*a**3*c/(6*x**6) - B*a**3*d/(4*
x**4) - 3*B*a**2*b*c/(4*x**4) - 3*B*a**2*b*d/(2*x**2) - 3*B*a*b**
2*c/(2*x**2) + 3*B*a*b**2*d*log(x) + B*b**3*c*log(x) + B*b**3*d*x
**2/2)/e**9, Eq(m, -9)), ((-A*a**3*c/(6*x**6) - A*a**3*d/(4*x**4)
 - 3*A*a**2*b*c/(4*x**4) - 3*A*a**2*b*d/(2*x**2) - 3*A*a*b**2*c/(
2*x**2) + 3*A*a*b**2*d*log(x) + A*b**3*c*log(x) + A*b**3*d*x**2/2
 - B*a**3*c/(4*x**4) - B*a**3*d/(2*x**2) - 3*B*a**2*b*c/(2*x**2)
+ 3*B*a**2*b*d*log(x) + 3*B*a*b**2*c*log(x) + 3*B*a*b**2*d*x**2/2
 + B*b**3*c*x**2/2 + B*b**3*d*x**4/4)/e**7, Eq(m, -7)), ((-A*a**3
*c/(4*x**4) - A*a**3*d/(2*x**2) - 3*A*a**2*b*c/(2*x**2) + 3*A*a**
2*b*d*log(x) + 3*A*a*b**2*c*log(x) + 3*A*a*b**2*d*x**2/2 + A*b**3
*c*x**2/2 + A*b**3*d*x**4/4 - B*a**3*c/(2*x**2) + B*a**3*d*log(x)
 + 3*B*a**2*b*c*log(x) + 3*B*a**2*b*d*x**2/2 + 3*B*a*b**2*c*x**2/
2 + 3*B*a*b**2*d*x**4/4 + B*b**3*c*x**4/4 + B*b**3*d*x**6/6)/e**5
```

```
, Eq(m, -5)), ((-A*a**3*c/(2*x**2) + A*a**3*d*log(x) + 3*A*a**2*b
*c*log(x) + 3*A*a**2*b*d*x**2/2 + 3*A*a*b**2*c*x**2/2 + 3*A*a*b**
2*d*x**4/4 + A*b**3*c*x**4/4 + A*b**3*d*x**6/6 + B*a**3*c*log(x)
+ B*a**3*d*x**2/2 + 3*B*a**2*b*c*x**2/2 + 3*B*a**2*b*d*x**4/4 + 3
*B*a*b**2*c*x**4/4 + B*a*b**2*d*x**6/2 + B*b**3*c*x**6/6 + B*b**3
*d*x**8/8)/e**3, Eq(m, -3)), ((A*a**3*c*log(x) + A*a**3*d*x**2/2
+ 3*A*a**2*b*c*x**2/2 + 3*A*a**2*b*d*x**4/4 + 3*A*a*b**2*c*x**4/4
 + A*a*b**2*d*x**6/2 + A*b**3*c*x**6/6 + A*b**3*d*x**8/8 + B*a**3
*c*x**2/2 + B*a**3*d*x**4/4 + 3*B*a**2*b*c*x**4/4 + B*a**2*b*d*x*
*6/2 + B*a*b**2*c*x**6/2 + 3*B*a*b**2*d*x**8/8 + B*b**3*c*x**8/8
+ B*b**3*d*x**10/10)/e, Eq(m, -1)), (A*a**3*c*e**m*m**5*x*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 35*A*a**3*c*e**m*m**4*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3
480*m**3 + 12139*m**2 + 19524*m + 10395) + 470*A*a**3*c*e**m*m**3
*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 3010*A*a**3*c*e**m*m**2*x*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 9129*A*a**
3*c*e**m*m*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 10395*A*a**3*c*e**m*x*x**m/(m**6 + 36*m
**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + A*a*
*3*d*e**m*m**5*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
 12139*m**2 + 19524*m + 10395) + 33*A*a**3*d*e**m*m**4*x**3*x**m/
(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1
0395) + 406*A*a**3*d*e**m*m**3*x**3*x**m/(m**6 + 36*m**5 + 505*m*
*4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2262*A*a**3*d*e*
*m*m**2*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 5353*A*a**3*d*e**m*m*x**3*x**m/(m**6 +
36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) +
3465*A*a**3*d*e**m*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m*
*3 + 12139*m**2 + 19524*m + 10395) + 3*A*a**2*b*c*e**m*m**5*x**3*
x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*
m + 10395) + 99*A*a**2*b*c*e**m*m**4*x**3*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1218*A*a**
2*b*c*e**m*m**3*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 6786*A*a**2*b*c*e**m*m**2*x**3*
x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*
m + 10395) + 16059*A*a**2*b*c*e**m*m*x**3*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 10395*A*a*
*2*b*c*e**m*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 3*A*a**2*b*d*e**m*m**5*x**5*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 93*A*a**2*b*d*e**m*m**4*x**5*x**m/(m**6 + 36*m**5 + 505*m**
4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1050*A*a**2*b*d*e
**m*m**3*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139
*m**2 + 19524*m + 10395) + 5190*A*a**2*b*d*e**m*m**2*x**5*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 10467*A*a**2*b*d*e**m*m*x**5*x**m/(m**6 + 36*m**5 + 505*m**
4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 6237*A*a**2*b*d*e
**m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
 + 19524*m + 10395) + 3*A*a*b**2*c*e**m*m**5*x**5*x**m/(m**6 + 36
*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 93
*A*a*b**2*c*e**m*m**4*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480
*m**3 + 12139*m**2 + 19524*m + 10395) + 1050*A*a*b**2*c*e**m*m**3
*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
19524*m + 10395) + 5190*A*a*b**2*c*e**m*m**2*x**5*x**m/(m**6 + 36
*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 10
467*A*a*b**2*c*e**m*m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480
*m**3 + 12139*m**2 + 19524*m + 10395) + 6237*A*a*b**2*c*e**m*x**5
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 3*A*a*b**2*d*e**m*m**5*x**7*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 87*A*a*b**
2*d*e**m*m**4*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 906*A*a*b**2*d*e**m*m**3*x**7*x**
m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
 10395) + 4098*A*a*b**2*d*e**m*m**2*x**7*x**m/(m**6 + 36*m**5 + 5
05*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 7731*A*a*b*
*2*d*e**m*m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 4455*A*a*b**2*d*e**m*x**7*x**m/(m**
6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395
) + A*b**3*c*e**m*m**5*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 348
0*m**3 + 12139*m**2 + 19524*m + 10395) + 29*A*b**3*c*e**m*m**4*x*
*7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 302*A*b**3*c*e**m*m**3*x**7*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1366*A*b
```

3*c*em*m**2*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 2577*A*b**3*c*e**m*m*x**7*x**m/
(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1
0395) + 1485*A*b**3*c*e**m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 +
3480*m**3 + 12139*m**2 + 19524*m + 10395) + A*b**3*d*e**m*m**5*x
9*xm/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19
524*m + 10395) + 27*A*b**3*d*e**m*m**4*x**9*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 262*A*b*
*3*d*e**m*m**3*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 1122*A*b**3*d*e**m*m**2*x**9*x**
m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 2041*A*b**3*d*e**m*m*x**9*x**m/(m**6 + 36*m**5 + 505*m*
*4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1155*A*b**3*d*e*
*m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
+ 19524*m + 10395) + B*a**3*c*e**m*m**5*x**3*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 33*B*a*
*3*c*e**m*m**4*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 406*B*a**3*c*e**m*m**3*x**3*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 2262*B*a**3*c*e**m*m**2*x**3*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5353*B*a**3*c*
e**m*m*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m
2 + 19524*m + 10395) + 3465*B*a3*c*e**m*x**3*x**m/(m**6 + 36*
m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + B*a
3*d*em*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 31*B*a**3*d*e**m*m**4*x**5*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 350*B*a**3*d*e**m*m**3*x**5*x**m/(m**6 + 36*m**5 + 505*m
4 + 3480*m3 + 12139*m**2 + 19524*m + 10395) + 1730*B*a**3*d*e
m*m2*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139
*m**2 + 19524*m + 10395) + 3489*B*a**3*d*e**m*m*x**5*x**m/(m**6 +
36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) +
2079*B*a**3*d*e**m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m
3 + 12139*m2 + 19524*m + 10395) + 3*B*a**2*b*c*e**m*m**5*x**5
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 93*B*a**2*b*c*e**m*m**4*x**5*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1050*B*a*
*2*b*c*e**m*m**3*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 5190*B*a**2*b*c*e**m*m**2*x**5
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 10467*B*a**2*b*c*e**m*m*x**5*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 6237*B*a*
*2*b*c*e**m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 3*B*a**2*b*d*e**m*m**5*x**7*x**m/(m
6 + 36*m5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 87*B*a**2*b*d*e**m*m**4*x**7*x**m/(m**6 + 36*m**5 + 505*m**
4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 906*B*a**2*b*d*e*
*m*m**3*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 4098*B*a**2*b*d*e**m*m**2*x**7*x**m/(m*
*6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1039
5) + 7731*B*a**2*b*d*e**m*m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4
+ 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 4455*B*a**2*b*d*e**
m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
19524*m + 10395) + 3*B*a*b**2*c*e**m*m**5*x**7*x**m/(m**6 + 36*m
5 + 505*m4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 87*B
*a*b**2*c*e**m*m**4*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m
3 + 12139*m2 + 19524*m + 10395) + 906*B*a*b**2*c*e**m*m**3*x*
*7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 4098*B*a*b**2*c*e**m*m**2*x**7*x**m/(m**6 + 36*m*
*5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 7731*
B*a*b**2*c*e**m*m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**
3 + 12139*m**2 + 19524*m + 10395) + 4455*B*a*b**2*c*e**m*x**7*x**
m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 3*B*a*b**2*d*e**m*m**5*x**9*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 81*B*a*b**2*d*
e**m*m**4*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 1213
9*m**2 + 19524*m + 10395) + 786*B*a*b**2*d*e**m*m**3*x**9*x**m/(m
6 + 36*m5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 3366*B*a*b**2*d*e**m*m**2*x**9*x**m/(m**6 + 36*m**5 + 505*m
4 + 3480*m3 + 12139*m**2 + 19524*m + 10395) + 6123*B*a*b**2*d
*e**m*m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 3465*B*a*b**2*d*e**m*x**9*x**m/(m**6 +
36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) +
B*b**3*c*e**m*m**5*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m*

```
*3 + 12139*m**2 + 19524*m + 10395) + 27*B*b**3*c*e**m*m**4*x**9*x
**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
 + 10395) + 262*B*b**3*c*e**m*m**3*x**9*x**m/(m**6 + 36*m**5 + 50
5*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1122*B*b**3*
c*e**m*m**2*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 2041*B*b**3*c*e**m*m*x**9*x**m/(m**
6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395
) + 1155*B*b**3*c*e**m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 348
0*m**3 + 12139*m**2 + 19524*m + 10395) + B*b**3*d*e**m*m**5*x**11
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 25*B*b**3*d*e**m*m**4*x**11*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 230*B*b**3
*d*e**m*m**3*x**11*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 950*B*b**3*d*e**m*m**2*x**11*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 1689*B*b**3*d*e**m*m*x**11*x**m/(m**6 + 36*m**5 + 505*m*
*4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 945*B*b**3*d*e**
m*x**11*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
+ 19524*m + 10395), True))
```

GIAC/XCAS [A] time = 0.22698, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Done
```

3.2 $\int (ex)^m \left(a+bx^2\right)^2 \left(A+Bx^2\right) \left(c+dx^2\right) dx$

Optimal. Leaf size=144

$$\frac{a^2Ac(ex)^{m+1}}{e(m+1)}+\frac{b(ex)^{m+7}(2aBd+Abd+bBc)}{e^7(m+7)}+\frac{(ex)^{m+5}(Ab(2ad+bc)+aB(ad+2bc))}{e^5(m+5)}+\frac{a(ex)^{m+3}(aAd+aBc+2Abc)}{e^3(m+3)}+\frac{b^2Bd(ex)^{m+9}}{e^9(m+9)}$$

```
[Out] (a^2*A*c*(e*x)^(1 + m))/(e*(1 + m)) + (a*(2*A*b*c + a*B*c + a*A*d
)*(e*x)^(3 + m))/(e^3*(3 + m)) + ((a*B*(2*b*c + a*d) + A*b*(b*c +
 2*a*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (b*(b*B*c + A*b*d + 2*a*B
*d)*(e*x)^(7 + m))/(e^7*(7 + m)) + (b^2*B*d*(e*x)^(9 + m))/(e^9*(
9 + m))
```

Rubi [A] time = 0.352035, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.034$

$$\frac{a^2Ac(ex)^{m+1}}{e(m+1)}+\frac{b(ex)^{m+7}(2aBd+Abd+bBc)}{e^7(m+7)}+\frac{(ex)^{m+5}(Ab(2ad+bc)+aB(ad+2bc))}{e^5(m+5)}+\frac{a(ex)^{m+3}(aAd+aBc+2Abc)}{e^3(m+3)}+\frac{b^2Bd(ex)^{m+9}}{e^9(m+9)}$$

Antiderivative was successfully verified.

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

```
[Out] (a^2*A*c*(e*x)^(1 + m))/(e*(1 + m)) + (a*(2*A*b*c + a*B*c + a*A*d
)*(e*x)^(3 + m))/(e^3*(3 + m)) + ((a*B*(2*b*c + a*d) + A*b*(b*c +
 2*a*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (b*(b*B*c + A*b*d + 2*a*B
*d)*(e*x)^(7 + m))/(e^7*(7 + m)) + (b^2*B*d*(e*x)^(9 + m))/(e^9*(
9 + m))
```

Rubi in Sympy [A] time = 53.5382, size = 146, normalized size = 1.01

$$\frac{Aa^2c\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bb^2d\,(ex)^{m+9}}{e^9\,(m+9)}+\frac{a\,(ex)^{m+3}\,(Aad+2Abc+Bac)}{e^3\,(m+3)}+\frac{b\,(ex)^{m+7}\,(Abd+2Bad+Bbc)}{e^7\,(m+7)}+\frac{(ex)^{m+5}\,\left(2Aabd+Ab^2c+Ba^2d+2Babc\right)}{e^5\,(m+5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)**2*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] A*a**2*c*(e*x)**(m + 1)/(e*(m + 1)) + B*b**2*d*(e*x)**(m + 9)/(e*
*9*(m + 9)) + a*(e*x)**(m + 3)*(A*a*d + 2*A*b*c + B*a*c)/(e**3*(m
 + 3)) + b*(e*x)**(m + 7)*(A*b*d + 2*B*a*d + B*b*c)/(e**7*(m + 7)
) + (e*x)**(m + 5)*(2*A*a*b*d + A*b**2*c + B*a**2*d + 2*B*a*b*c)/
(e**5*(m + 5))
```

Mathematica [A] time = 0.293656, size = 115, normalized size = 0.8

$$(ex)^m\left(\frac{x^5\left(a^2Bd+2aAbd+2abBc+Ab^2c\right)}{m+5}+\frac{a^2Acx}{m+1}+\frac{bx^7(2aBd+Abd+bBc)}{m+7}+\frac{ax^3(aAd+aBc+2Abc)}{m+3}+\frac{b^2Bdx^9}{m+9}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a^2*A*c*x)/(1 + m) + (a*(2*A*b*c + a*B*c + a*A*d)*x^3)/
(3 + m) + ((A*b^2*c + 2*a*b*B*c + 2*a*A*b*d + a^2*B*d)*x^5)/(5 +
m) + (b*(b*B*c + A*b*d + 2*a*B*d)*x^7)/(7 + m) + (b^2*B*d*x^9)/(9
 + m))
```

Maple [B] time = 0.01, size = 711, normalized size = 4.9

$$\frac{(Bb^2dm^4x^8 + 16\,Bb^2dm^3x^8 + Ab^2dm^4x^6 + 2\,Babdm^4x^6 + Bb^2cm^4x^6 + 86\,Bb^2dm^2x^8 + 18\,Ab^2dm^3x^6 + 36\,Babdm^3x^6 + 18\,Bb\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b^2*d*m^4*x^8+16*B*b^2*d*m^3*x^8+A*b^2*d*m^4*x^6+2*B*a*b*d*m
^4*x^6+B*b^2*c*m^4*x^6+86*B*b^2*d*m^2*x^8+18*A*b^2*d*m^3*x^6+36*B
*a*b*d*m^3*x^6+18*B*b^2*c*m^3*x^6+176*B*b^2*d*m*x^8+2*A*a*b*d*m^4
*x^4+A*b^2*c*m^4*x^4+104*A*b^2*d*m^2*x^6+B*a^2*d*m^4*x^4+2*B*a*b*
c*m^4*x^4+208*B*a*b*d*m^2*x^6+104*B*b^2*c*m^2*x^6+105*B*b^2*d*x^8
+40*A*a*b*d*m^3*x^4+20*A*b^2*c*m^3*x^4+222*A*b^2*d*m*x^6+20*B*a^2
*d*m^3*x^4+40*B*a*b*c*m^3*x^4+444*B*a*b*d*m*x^6+222*B*b^2*c*m*x^6
+A*a^2*d*m^4*x^2+2*A*a*b*c*m^4*x^2+260*A*a*b*d*m^2*x^4+130*A*b^2*
c*m^2*x^4+135*A*b^2*d*x^6+B*a^2*c*m^4*x^2+130*B*a^2*d*m^2*x^4+260
*B*a*b*c*m^2*x^4+270*B*a*b*d*x^6+135*B*b^2*c*x^6+22*A*a^2*d*m^3*x
^2+44*A*a*b*c*m^3*x^2+600*A*a*b*d*m*x^4+300*A*b^2*c*m*x^4+22*B*a^
2*c*m^3*x^2+300*B*a^2*d*m*x^4+600*B*a*b*c*m*x^4+A*a^2*c*m^4+164*A
*a^2*d*m^2*x^2+328*A*a*b*c*m^2*x^2+378*A*a*b*d*x^4+189*A*b^2*c*x^
4+164*B*a^2*c*m^2*x^2+189*B*a^2*d*x^4+378*B*a*b*c*x^4+24*A*a^2*c*
m^3+458*A*a^2*d*m*x^2+916*A*a*b*c*m*x^2+458*B*a^2*c*m*x^2+206*A*a
^2*c*m^2+315*A*a^2*d*x^2+630*A*a*b*c*x^2+315*B*a^2*c*x^2+744*A*a^
2*c*m+945*A*a^2*c)*(e*x)^m/(9+m)/(7+m)/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.267449, size = 718, normalized size = 4.99

$$\frac{((Bb^2dm^4 + 16\,Bb^2dm^3 + 86\,Bb^2dm^2 + 176\,Bb^2dm + 105\,Bb^2d)\,x^9 + ((Bb^2c + (2\,Bab + Ab^2)\,d)\,m^4 + 135\,Bb^2c + 18\,(Bb^2c + (\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^2*d*m^4 + 16*B*b^2*d*m^3 + 86*B*b^2*d*m^2 + 176*B*b^2*d*m +
 105*B*b^2*d)*x^9 + ((B*b^2*c + (2*B*a*b + A*b^2)*d)*m^4 + 135*B*
b^2*c + 18*(B*b^2*c + (2*B*a*b + A*b^2)*d)*m^3 + 104*(B*b^2*c + (
2*B*a*b + A*b^2)*d)*m^2 + 135*(2*B*a*b + A*b^2)*d + 222*(B*b^2*c
```

```
+ (2*B*a*b + A*b^2)*d)*m)*x^7 + (((2*B*a*b + A*b^2)*c + (B*a^2 +
2*A*a*b)*d)*m^4 + 20*((2*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d)*
m^3 + 130*((2*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d)*m^2 + 189*(
2*B*a*b + A*b^2)*c + 189*(B*a^2 + 2*A*a*b)*d + 300*((2*B*a*b + A*
b^2)*c + (B*a^2 + 2*A*a*b)*d)*m)*x^5 + ((A*a^2*d + (B*a^2 + 2*A*a
*b)*c)*m^4 + 315*A*a^2*d + 22*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m^3
 + 164*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m^2 + 315*(B*a^2 + 2*A*a*b
)*c + 458*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m)*x^3 + (A*a^2*c*m^4 +
 24*A*a^2*c*m^3 + 206*A*a^2*c*m^2 + 744*A*a^2*c*m + 945*A*a^2*c)*
x)*(e*x)^m/(m^5 + 25*m^4 + 230*m^3 + 950*m^2 + 1689*m + 945)
```

Sympy [A] time = 5.56586, size = 3373, normalized size = 23.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise(((-A*a**2*c/(8*x**8) - A*a**2*d/(6*x**6) - A*a*b*c/(3*x
**6) - A*a*b*d/(2*x**4) - A*b**2*c/(4*x**4) - A*b**2*d/(2*x**2) -
 B*a**2*c/(6*x**6) - B*a**2*d/(4*x**4) - B*a*b*c/(2*x**4) - B*a*b
*d/x**2 - B*b**2*c/(2*x**2) + B*b**2*d*log(x))/e**9, Eq(m, -9)),
((-A*a**2*c/(6*x**6) - A*a**2*d/(4*x**4) - A*a*b*c/(2*x**4) - A*a
*b*d/x**2 - A*b**2*c/(2*x**2) + A*b**2*d*log(x) - B*a**2*c/(4*x**
4) - B*a**2*d/(2*x**2) - B*a*b*c/x**2 + 2*B*a*b*d*log(x) + B*b**2
*c*log(x) + B*b**2*d*x**2/2)/e**7, Eq(m, -7)), ((-A*a**2*c/(4*x**
4) - A*a**2*d/(2*x**2) - A*a*b*c/x**2 + 2*A*a*b*d*log(x) + A*b**2
*c*log(x) + A*b**2*d*x**2/2 - B*a**2*c/(2*x**2) + B*a**2*d*log(x)
 + 2*B*a*b*c*log(x) + B*a*b*d*x**2 + B*b**2*c*x**2/2 + B*b**2*d*x
**4/4)/e**5, Eq(m, -5)), ((-A*a**2*c/(2*x**2) + A*a**2*d*log(x) +
 2*A*a*b*c*log(x) + A*a*b*d*x**2 + A*b**2*c*x**2/2 + A*b**2*d*x**
4/4 + B*a**2*c*log(x) + B*a**2*d*x**2/2 + B*a*b*c*x**2 + B*a*b*d*
x**4/2 + B*b**2*c*x**4/4 + B*b**2*d*x**6/6)/e**3, Eq(m, -3)), ((A
*a**2*c*log(x) + A*a**2*d*x**2/2 + A*a*b*c*x**2 + A*a*b*d*x**4/2
+ A*b**2*c*x**4/4 + A*b**2*d*x**6/6 + B*a**2*c*x**2/2 + B*a**2*d*
x**4/4 + B*a*b*c*x**4/2 + B*a*b*d*x**6/3 + B*b**2*c*x**6/6 + B*b*
*2*d*x**8/8)/e, Eq(m, -1)), (A*a**2*c*e**m*m**4*x*x**m/(m**5 + 25
*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 24*A*a**2*c*e**m*m*
*3*x*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
 206*A*a**2*c*e**m*m**2*x*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m
**2 + 1689*m + 945) + 744*A*a**2*c*e**m*m*x*x**m/(m**5 + 25*m**4
+ 230*m**3 + 950*m**2 + 1689*m + 945) + 945*A*a**2*c*e**m*x*x**m/
(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + A*a**2*d*
e**m*m**4*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*
m + 945) + 22*A*a**2*d*e**m*m**3*x**3*x**m/(m**5 + 25*m**4 + 230*
m**3 + 950*m**2 + 1689*m + 945) + 164*A*a**2*d*e**m*m**2*x**3*x**
m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 458*A*a
**2*d*e**m*m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 16
89*m + 945) + 315*A*a**2*d*e**m*x**3*x**m/(m**5 + 25*m**4 + 230*m
**3 + 950*m**2 + 1689*m + 945) + 2*A*a*b*c*e**m*m**4*x**3*x**m/(m
**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 44*A*a*b*c*
e**m*m**3*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*
m + 945) + 328*A*a*b*c*e**m*m**2*x**3*x**m/(m**5 + 25*m**4 + 230*
m**3 + 950*m**2 + 1689*m + 945) + 916*A*a*b*c*e**m*m*x**3*x**m/(m
**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 630*A*a*b*c
*e**m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
945) + 2*A*a*b*d*e**m*m**4*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 +
 950*m**2 + 1689*m + 945) + 40*A*a*b*d*e**m*m**3*x**5*x**m/(m**5
+ 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 260*A*a*b*d*e**
m*m**2*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
 945) + 600*A*a*b*d*e**m*m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 +
 950*m**2 + 1689*m + 945) + 378*A*a*b*d*e**m*x**5*x**m/(m**5 + 25
*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + A*b**2*c*e**m*m**4*
x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
 20*A*b**2*c*e**m*m**3*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950
*m**2 + 1689*m + 945) + 130*A*b**2*c*e**m*m**2*x**5*x**m/(m**5 +
25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 300*A*b**2*c*e**m
*m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945
) + 189*A*b**2*c*e**m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*
```

```
m**2 + 1689*m + 945) + A*b**2*d*e**m*m**4*x**7*x**m/(m**5 + 25*m*
*4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 18*A*b**2*d*e**m*m**3*
x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
 104*A*b**2*d*e**m*m**2*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 95
0*m**2 + 1689*m + 945) + 222*A*b**2*d*e**m*m*x**7*x**m/(m**5 + 25
*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 135*A*b**2*d*e**m*x
**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
B*a**2*c*e**m*m**4*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**
2 + 1689*m + 945) + 22*B*a**2*c*e**m*m**3*x**3*x**m/(m**5 + 25*m*
*4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 164*B*a**2*c*e**m*m**2
*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945)
+ 458*B*a**2*c*e**m*m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*
m**2 + 1689*m + 945) + 315*B*a**2*c*e**m*x**3*x**m/(m**5 + 25*m**
4 + 230*m**3 + 950*m**2 + 1689*m + 945) + B*a**2*d*e**m*m**4*x**5
*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 20*
B*a**2*d*e**m*m**3*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**
2 + 1689*m + 945) + 130*B*a**2*d*e**m*m**2*x**5*x**m/(m**5 + 25*m
**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 300*B*a**2*d*e**m*m*x
**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
189*B*a**2*d*e**m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2
 + 1689*m + 945) + 2*B*a*b*c*e**m*m**4*x**5*x**m/(m**5 + 25*m**4
+ 230*m**3 + 950*m**2 + 1689*m + 945) + 40*B*a*b*c*e**m*m**3*x**5
*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 260
*B*a*b*c*e**m*m**2*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**
2 + 1689*m + 945) + 600*B*a*b*c*e**m*m*x**5*x**m/(m**5 + 25*m**4
+ 230*m**3 + 950*m**2 + 1689*m + 945) + 378*B*a*b*c*e**m*x**5*x**
m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 2*B*a*b
*d*e**m*m**4*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 16
89*m + 945) + 36*B*a*b*d*e**m*m**3*x**7*x**m/(m**5 + 25*m**4 + 23
0*m**3 + 950*m**2 + 1689*m + 945) + 208*B*a*b*d*e**m*m**2*x**7*x*
*m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 444*B*
a*b*d*e**m*m*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 16
89*m + 945) + 270*B*a*b*d*e**m*x**7*x**m/(m**5 + 25*m**4 + 230*m*
*3 + 950*m**2 + 1689*m + 945) + B*b**2*c*e**m*m**4*x**7*x**m/(m**
5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 18*B*b**2*c*e
**m*m**3*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
 + 945) + 104*B*b**2*c*e**m*m**2*x**7*x**m/(m**5 + 25*m**4 + 230*
m**3 + 950*m**2 + 1689*m + 945) + 222*B*b**2*c*e**m*m*x**7*x**m/(
m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 135*B*b**2
*c*e**m*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
+ 945) + B*b**2*d*e**m*m**4*x**9*x**m/(m**5 + 25*m**4 + 230*m**3
+ 950*m**2 + 1689*m + 945) + 16*B*b**2*d*e**m*m**3*x**9*x**m/(m**
5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 86*B*b**2*d*e
**m*m**2*x**9*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
 + 945) + 176*B*b**2*d*e**m*m*x**9*x**m/(m**5 + 25*m**4 + 230*m**
3 + 950*m**2 + 1689*m + 945) + 105*B*b**2*d*e**m*x**9*x**m/(m**5
+ 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945), True))
```

GIAC/XCAS [A] time = 0.21813, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Done
```

3.3 $\int (ex)^m \left(a+bx^2\right) \left(A+Bx^2\right) \left(c+dx^2\right) \, dx$

Optimal. Leaf size=97

$$\frac{(ex)^{m+5}(aBd+Abd+bBc)}{e^5(m+5)}+\frac{(ex)^{m+3}(aAd+aBc+Abc)}{e^3(m+3)}+\frac{aAc(ex)^{m+1}}{e(m+1)}+\frac{bBd(ex)^{m+7}}{e^7(m+7)}$$

```
[Out] (a*A*c*(e*x)^(1 + m))/(e*(1 + m)) + ((A*b*c + a*B*c + a*A*d)*(e*x
)^(3 + m))/(e^3*(3 + m)) + ((b*B*c + A*b*d + a*B*d)*(e*x)^(5 + m)
)/(e^5*(5 + m)) + (b*B*d*(e*x)^(7 + m))/(e^7*(7 + m))
```

Rubi [A] time = 0.183558, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.037$

$$\frac{(ex)^{m+5}(aBd+Abd+bBc)}{e^5(m+5)}+\frac{(ex)^{m+3}(aAd+aBc+Abc)}{e^3(m+3)}+\frac{aAc(ex)^{m+1}}{e(m+1)}+\frac{bBd(ex)^{m+7}}{e^7(m+7)}$$

Antiderivative was successfully verified.

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

```
[Out] (a*A*c*(e*x)^(1 + m))/(e*(1 + m)) + ((A*b*c + a*B*c + a*A*d)*(e*x
)^(3 + m))/(e^3*(3 + m)) + ((b*B*c + A*b*d + a*B*d)*(e*x)^(5 + m)
)/(e^5*(5 + m)) + (b*B*d*(e*x)^(7 + m))/(e^7*(7 + m))
```

Rubi in Sympy [A] time = 32.0537, size = 92, normalized size = 0.95

$$\frac{Aac\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bbd\,(ex)^{m+7}}{e^7\,(m+7)}+\frac{(ex)^{m+3}\,(Aad+Abc+Bac)}{e^3\,(m+3)}+\frac{(ex)^{m+5}\,(Abd+Bad+Bbc)}{e^5\,(m+5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] A*a*c*(e*x)**(m + 1)/(e*(m + 1)) + B*b*d*(e*x)**(m + 7)/(e**7*(m
+ 7)) + (e*x)**(m + 3)*(A*a*d + A*b*c + B*a*c)/(e**3*(m + 3)) + (
e*x)**(m + 5)*(A*b*d + B*a*d + B*b*c)/(e**5*(m + 5))
```

Mathematica [A] time = 0.107822, size = 73, normalized size = 0.75

$$(ex)^m\left(\frac{x^5(aBd+Abd+bBc)}{m+5}+\frac{x^3(aAd+aBc+Abc)}{m+3}+\frac{aAcx}{m+1}+\frac{bBdx^7}{m+7}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a*A*c*x)/(1 + m) + ((A*b*c + a*B*c + a*A*d)*x^3)/(3 + m
) + ((b*B*c + A*b*d + a*B*d)*x^5)/(5 + m) + (b*B*d*x^7)/(7 + m))
```

Maple [B] time = 0.006, size = 321, normalized size = 3.3

$$\left(Bbdm^3x^6+9\,Bbdm^2x^6+Abdm^3x^4+Badm^3x^4+Bbcm^3x^4+23\,Bbdmx^6+11\,Abdm^2x^4+11\,Badm^2x^4+11\,Bbcm^2x^4+15\,B$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b*d*m^3*x^6+9*B*b*d*m^2*x^6+A*b*d*m^3*x^4+B*a*d*m^3*x^4+B*b*
c*m^3*x^4+23*B*b*d*m*x^6+11*A*b*d*m^2*x^4+11*B*a*d*m^2*x^4+11*B*b
*c*m^2*x^4+15*B*b*d*x^6+A*a*d*m^3*x^2+A*b*c*m^3*x^2+31*A*b*d*m*x^
4+B*a*c*m^3*x^2+31*B*a*d*m*x^4+31*B*b*c*m*x^4+13*A*a*d*m^2*x^2+13
*A*b*c*m^2*x^2+21*A*b*d*x^4+13*B*a*c*m^2*x^2+21*B*a*d*x^4+21*B*b*
c*x^4+A*a*c*m^3+47*A*a*d*m*x^2+47*A*b*c*m*x^2+47*B*a*c*m*x^2+15*A
*a*c*m^2+35*A*a*d*x^2+35*A*b*c*x^2+35*B*a*c*x^2+71*A*a*c*m+105*A*
a*c)*(e*x)^m/(7+m)/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.25366, size = 317, normalized size = 3.27

$$\frac{\left(\left(Bbdm^3 + 9\,Bbdm^2 + 23\,Bbdm + 15\,Bbd\right)x^7 + \left((Bbc + (Ba + Ab)d)m^3 + 21\,Bbc + 11\,(Bbc + (Ba + Ab)d)m^2 + 21\,(Ba + Ab)d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b*d*m^3 + 9*B*b*d*m^2 + 23*B*b*d*m + 15*B*b*d)*x^7 + ((B*b*c
+ (B*a + A*b)*d)*m^3 + 21*B*b*c + 11*(B*b*c + (B*a + A*b)*d)*m^2
+ 21*(B*a + A*b)*d + 31*(B*b*c + (B*a + A*b)*d)*m)*x^5 + ((A*a*d
+ (B*a + A*b)*c)*m^3 + 35*A*a*d + 13*(A*a*d + (B*a + A*b)*c)*m^2
+ 35*(B*a + A*b)*c + 47*(A*a*d + (B*a + A*b)*c)*m)*x^3 + (A*a*c*m
^3 + 15*A*a*c*m^2 + 71*A*a*c*m + 105*A*a*c)*x)*(e*x)^m/(m^4 + 16*
m^3 + 86*m^2 + 176*m + 105)
```

Sympy [A] time = 3.045, size = 1515, normalized size = 15.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise(((-A*a*c/(6*x**6) - A*a*d/(4*x**4) - A*b*c/(4*x**4) - A
*b*d/(2*x**2) - B*a*c/(4*x**4) - B*a*d/(2*x**2) - B*b*c/(2*x**2)
+ B*b*d*log(x))/e**7, Eq(m, -7)), ((-A*a*c/(4*x**4) - A*a*d/(2*x*
*2) - A*b*c/(2*x**2) + A*b*d*log(x) - B*a*c/(2*x**2) + B*a*d*log(
x) + B*b*c*log(x) + B*b*d*x**2/2)/e**5, Eq(m, -5)), ((-A*a*c/(2*x
**2) + A*a*d*log(x) + A*b*c*log(x) + A*b*d*x**2/2 + B*a*c*log(x)
+ B*a*d*x**2/2 + B*b*c*x**2/2 + B*b*d*x**4/4)/e**3, Eq(m, -3)), (
(A*a*c*log(x) + A*a*d*x**2/2 + A*b*c*x**2/2 + A*b*d*x**4/4 + B*a*
c*x**2/2 + B*a*d*x**4/4 + B*b*c*x**4/4 + B*b*d*x**6/6)/e, Eq(m, -
1)), (A*a*c*e**m*m**3*x*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m +
105) + 15*A*a*c*e**m*m**2*x*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*
```

```
m + 105) + 71*A*a*c*e**m*m*x*x**m/(m**4 + 16*m**3 + 86*m**2 + 176
*m + 105) + 105*A*a*c*e**m*x*x**m/(m**4 + 16*m**3 + 86*m**2 + 176
*m + 105) + A*a*d*e**m*m**3*x**3*x**m/(m**4 + 16*m**3 + 86*m**2 +
 176*m + 105) + 13*A*a*d*e**m*m**2*x**3*x**m/(m**4 + 16*m**3 + 86
*m**2 + 176*m + 105) + 47*A*a*d*e**m*m*x**3*x**m/(m**4 + 16*m**3
+ 86*m**2 + 176*m + 105) + 35*A*a*d*e**m*x**3*x**m/(m**4 + 16*m**
3 + 86*m**2 + 176*m + 105) + A*b*c*e**m*m**3*x**3*x**m/(m**4 + 16
*m**3 + 86*m**2 + 176*m + 105) + 13*A*b*c*e**m*m**2*x**3*x**m/(m*
*4 + 16*m**3 + 86*m**2 + 176*m + 105) + 47*A*b*c*e**m*m*x**3*x**m
/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 35*A*b*c*e**m*x**3*x*
*m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + A*b*d*e**m*m**3*x**
5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 11*A*b*d*e**m*m
**2*x**5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 31*A*b*d
*e**m*m*x**5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 21*A
*b*d*e**m*x**5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + B*
a*c*e**m*m**3*x**3*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105)
+ 13*B*a*c*e**m*m**2*x**3*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m
+ 105) + 47*B*a*c*e**m*m*x**3*x**m/(m**4 + 16*m**3 + 86*m**2 + 17
6*m + 105) + 35*B*a*c*e**m*x**3*x**m/(m**4 + 16*m**3 + 86*m**2 +
176*m + 105) + B*a*d*e**m*m**3*x**5*x**m/(m**4 + 16*m**3 + 86*m**
2 + 176*m + 105) + 11*B*a*d*e**m*m**2*x**5*x**m/(m**4 + 16*m**3 +
 86*m**2 + 176*m + 105) + 31*B*a*d*e**m*m*x**5*x**m/(m**4 + 16*m*
*3 + 86*m**2 + 176*m + 105) + 21*B*a*d*e**m*x**5*x**m/(m**4 + 16*
m**3 + 86*m**2 + 176*m + 105) + B*b*c*e**m*m**3*x**5*x**m/(m**4 +
 16*m**3 + 86*m**2 + 176*m + 105) + 11*B*b*c*e**m*m**2*x**5*x**m/
(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 31*B*b*c*e**m*m*x**5*x
**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 21*B*b*c*e**m*x**5
*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + B*b*d*e**m*m**3*
x**7*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 9*B*b*d*e**m
*m**2*x**7*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 23*B*b
*d*e**m*m*x**7*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 15
*B*b*d*e**m*x**7*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105), T
rue))
```

GIAC/XCAS [A] time = 0.223712, size = 732, normalized size = 7.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b*d*m^3*x^7*e^(m*ln(x) + m) + 9*B*b*d*m^2*x^7*e^(m*ln(x) + m)
+ B*b*c*m^3*x^5*e^(m*ln(x) + m) + B*a*d*m^3*x^5*e^(m*ln(x) + m) +
 A*b*d*m^3*x^5*e^(m*ln(x) + m) + 23*B*b*d*m*x^7*e^(m*ln(x) + m) +
 11*B*b*c*m^2*x^5*e^(m*ln(x) + m) + 11*B*a*d*m^2*x^5*e^(m*ln(x) +
 m) + 11*A*b*d*m^2*x^5*e^(m*ln(x) + m) + 15*B*b*d*x^7*e^(m*ln(x)
+ m) + B*a*c*m^3*x^3*e^(m*ln(x) + m) + A*b*c*m^3*x^3*e^(m*ln(x) +
 m) + A*a*d*m^3*x^3*e^(m*ln(x) + m) + 31*B*b*c*m*x^5*e^(m*ln(x) +
 m) + 31*B*a*d*m*x^5*e^(m*ln(x) + m) + 31*A*b*d*m*x^5*e^(m*ln(x)
+ m) + 13*B*a*c*m^2*x^3*e^(m*ln(x) + m) + 13*A*b*c*m^2*x^3*e^(m*l
n(x) + m) + 13*A*a*d*m^2*x^3*e^(m*ln(x) + m) + 21*B*b*c*x^5*e^(m*
ln(x) + m) + 21*B*a*d*x^5*e^(m*ln(x) + m) + 21*A*b*d*x^5*e^(m*ln(
x) + m) + A*a*c*m^3*x*e^(m*ln(x) + m) + 47*B*a*c*m*x^3*e^(m*ln(x)
 + m) + 47*A*b*c*m*x^3*e^(m*ln(x) + m) + 47*A*a*d*m*x^3*e^(m*ln(x
) + m) + 15*A*a*c*m^2*x*e^(m*ln(x) + m) + 35*B*a*c*x^3*e^(m*ln(x)
 + m) + 35*A*b*c*x^3*e^(m*ln(x) + m) + 35*A*a*d*x^3*e^(m*ln(x) +
m) + 71*A*a*c*m*x*e^(m*ln(x) + m) + 105*A*a*c*x*e^(m*ln(x) + m))/
(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)
```

3.4 $\int (ex)^m \left(A+Bx^2\right) \left(c+dx^2\right) \, dx$

Optimal. Leaf size=60

$$\frac{(ex)^{m+3}(Ad+Bc)}{e^3(m+3)}+\frac{Ac(ex)^{m+1}}{e(m+1)}+\frac{Bd(ex)^{m+5}}{e^5(m+5)}$$

```
[Out] (A*c*(e*x)^(1 + m))/(e*(1 + m)) + ((B*c + A*d)*(e*x)^(3 + m))/(e^
3*(3 + m)) + (B*d*(e*x)^(5 + m))/(e^5*(5 + m))
```

Rubi [A] time = 0.0932165, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.05

$$\frac{(ex)^{m+3}(Ad+Bc)}{e^3(m+3)}+\frac{Ac(ex)^{m+1}}{e(m+1)}+\frac{Bd(ex)^{m+5}}{e^5(m+5)}$$

Antiderivative was successfully verified.

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

```
[Out] (A*c*(e*x)^(1 + m))/(e*(1 + m)) + ((B*c + A*d)*(e*x)^(3 + m))/(e^
3*(3 + m)) + (B*d*(e*x)^(5 + m))/(e^5*(5 + m))
```

Rubi in Sympy [A] time = 15.1046, size = 51, normalized size = 0.85

$$\frac{Ac\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bd\,(ex)^{m+5}}{e^5\,(m+5)}+\frac{(ex)^{m+3}\,(Ad+Bc)}{e^3\,(m+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] A*c*(e*x)**(m + 1)/(e*(m + 1)) + B*d*(e*x)**(m + 5)/(e**5*(m + 5)
) + (e*x)**(m + 3)*(A*d + B*c)/(e**3*(m + 3))
```

Mathematica [A] time = 0.0643915, size = 43, normalized size = 0.72

$$(ex)^m\left(\frac{x^3(Ad+Bc)}{m+3}+\frac{Acx}{m+1}+\frac{Bdx^5}{m+5}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((A*c*x)/(1 + m) + ((B*c + A*d)*x^3)/(3 + m) + (B*d*x^5)/
(5 + m))
```

Maple [A] time = 0.005, size = 111, normalized size = 1.9

$$\frac{\left(Bdm^2x^4+4\,Bdmx^4+Adm^2x^2+Bcm^2x^2+3\,Bdx^4+6\,Admx^2+6\,Bcmx^2+Acm^2+5\,Adx^2+5\,Bcx^2+8\,Acm+15\,Ac\right)x\,(ex}{(5+m)\,(3+m)\,(1+m)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(B*x^2+A)*(d*x^2+c),x)
```

```
[Out] x*(B*d*m^2*x^4+4*B*d*m*x^4+A*d*m^2*x^2+B*c*m^2*x^2+3*B*d*x^4+6*A*
d*m*x^2+6*B*c*m*x^2+A*c*m^2+5*A*d*x^2+5*B*c*x^2+8*A*c*m+15*A*c)*(
e*x)^m/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m,x, algorithm="maxima")
```

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

Fricas [A] time = 0.254182, size = 127, normalized size = 2.12

$$\frac{\left(\left(Bdm^{2} + 4\,Bdm + 3\,Bd\right)x^{5} + \left((Bc + Ad)m^{2} + 5\,Bc + 5\,Ad + 6\,(Bc + Ad)m\right)x^{3} + \left(Acm^{2} + 8\,Acm + 15\,Ac\right)x\right)\,(ex)^{m}}{m^{3} + 9\,m^{2} + 23\,m + 15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m,x, algorithm="fricas")
```

```
[Out] ((B*d*m^2 + 4*B*d*m + 3*B*d)*x^5 + ((B*c + A*d)*m^2 + 5*B*c + 5*A
*d + 6*(B*c + A*d)*m)*x^3 + (A*c*m^2 + 8*A*c*m + 15*A*c)*x)*(e*x)
^m/(m^3 + 9*m^2 + 23*m + 15)
```

Sympy [A] time = 1.44861, size = 459, normalized size = 7.65

$$\begin{cases} \frac{- \frac{Ac}{4x^{4}} - \frac{Ad}{2x^{2}} - \frac{Bc}{2x^{2}} + Bd\log{(x)}}{e^{5}} \\ \frac{- \frac{Ac}{2x^{2}} + Ad\log{(x)} + Bc\log{(x)} + \frac{Bdx^{2}}{2}}{e^{3}} \\ \frac{Ac\log{(x)} + \frac{Adx^{2}}{2} + \frac{Bcx^{2}}{2} + \frac{Bdx^{4}}{4}}{e} \\ \frac{Ace^{m}m^{2}xx^{m}}{m^{3}+9m^{2}+23m+15} + \frac{8Ace^{m}mxx^{m}}{m^{3}+9m^{2}+23m+15} + \frac{15Ace^{m}xx^{m}}{m^{3}+9m^{2}+23m+15} + \frac{Ade^{m}m^{2}x^{3}x^{m}}{m^{3}+9m^{2}+23m+15} + \frac{6Ade^{m}mx^{3}x^{m}}{m^{3}+9m^{2}+23m+15} + \frac{5Ade^{m}x^{3}x^{m}}{m^{3}+9m^{2}+23m+15} + \frac{Bce^{m}m^{2}x^{3}x^{m}}{m^{3}+9m^{2}+23m+15} + \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] Piecewise(((-A*c/(4*x**4) - A*d/(2*x**2) - B*c/(2*x**2) + B*d*log
(x))/e**5, Eq(m, -5)), ((-A*c/(2*x**2) + A*d*log(x) + B*c*log(x)
+ B*d*x**2/2)/e**3, Eq(m, -3)), ((A*c*log(x) + A*d*x**2/2 + B*c*x
**2/2 + B*d*x**4/4)/e, Eq(m, -1)), (A*c*e**m*m**2*x*x**m/(m**3 +
9*m**2 + 23*m + 15) + 8*A*c*e**m*m*x*x**m/(m**3 + 9*m**2 + 23*m +
 15) + 15*A*c*e**m*x*x**m/(m**3 + 9*m**2 + 23*m + 15) + A*d*e**m*
m**2*x**3*x**m/(m**3 + 9*m**2 + 23*m + 15) + 6*A*d*e**m*m*x**3*x*
*m/(m**3 + 9*m**2 + 23*m + 15) + 5*A*d*e**m*x**3*x**m/(m**3 + 9*m
**2 + 23*m + 15) + B*c*e**m*m**2*x**3*x**m/(m**3 + 9*m**2 + 23*m
+ 15) + 6*B*c*e**m*m*x**3*x**m/(m**3 + 9*m**2 + 23*m + 15) + 5*B*
c*e**m*x**3*x**m/(m**3 + 9*m**2 + 23*m + 15) + B*d*e**m*m**2*x**5
*x**m/(m**3 + 9*m**2 + 23*m + 15) + 4*B*d*e**m*m*x**5*x**m/(m**3
+ 9*m**2 + 23*m + 15) + 3*B*d*e**m*x**5*x**m/(m**3 + 9*m**2 + 23*
m + 15), True))
```

GIAC/XCAS [A] time = 0.215927, size = 258, normalized size = 4.3

$$\frac{Bdm^2x^5e^{(m\ln(x)+m)} + 4\,Bdmx^5e^{(m\ln(x)+m)} + Bcm^2x^3e^{(m\ln(x)+m)} + Adm^2x^3e^{(m\ln(x)+m)} + 3\,Bdx^5e^{(m\ln(x)+m)} + 6\,Bcmx^3e^{(m\ln(x)+m)}}{m^3 + 9\,m^2 +}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m,x, algorithm="giac")
```

```
[Out] (B*d*m^2*x^5*e^(m*ln(x) + m) + 4*B*d*m*x^5*e^(m*ln(x) + m) + B*c*
m^2*x^3*e^(m*ln(x) + m) + A*d*m^2*x^3*e^(m*ln(x) + m) + 3*B*d*x^5
*e^(m*ln(x) + m) + 6*B*c*m*x^3*e^(m*ln(x) + m) + 6*A*d*m*x^3*e^(m
*ln(x) + m) + A*c*m^2*x*e^(m*ln(x) + m) + 5*B*c*x^3*e^(m*ln(x) +
m) + 5*A*d*x^3*e^(m*ln(x) + m) + 8*A*c*m*x*e^(m*ln(x) + m) + 15*A
*c*x*e^(m*ln(x) + m))/(m^3 + 9*m^2 + 23*m + 15)
```

3.5 $\int \frac{(ex)^m (A+Bx^2)(c+dx^2)}{a+bx^2} dx$

Optimal. Leaf size=118

$$\frac{(ex)^{m+1}(Ab-aB)(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ab^2e(m+1)}+\frac{(ex)^{m+1}(-aBd+Abd+bBc)}{b^2e(m+1)}+\frac{Bd(ex)^{m+3}}{be^3(m+3)}$$

```
[Out] ((b*B*c + A*b*d - a*B*d)*(e*x)^(1 + m))/(b^2*e*(1 + m)) + (B*d*(e
*x)^(3 + m))/(b*e^3*(3 + m)) + ((A*b - a*B)*(b*c - a*d)*(e*x)^(1
+ m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(a
*b^2*e*(1 + m))
```

Rubi [A] time = 0.260416, antiderivative size = 118, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.069$

$$\frac{(ex)^{m+1}(Ab-aB)(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ab^2e(m+1)}+\frac{(ex)^{m+1}(-aBd+Abd+bBc)}{b^2e(m+1)}+\frac{Bd(ex)^{m+3}}{be^3(m+3)}$$

Antiderivative was successfully verified.

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

```
[Out] ((b*B*c + A*b*d - a*B*d)*(e*x)^(1 + m))/(b^2*e*(1 + m)) + (B*d*(e
*x)^(3 + m))/(b*e^3*(3 + m)) + ((A*b - a*B)*(b*c - a*d)*(e*x)^(1
+ m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(a
*b^2*e*(1 + m))
```

Rubi in Sympy [A] time = 39.7143, size = 99, normalized size = 0.84

$$\frac{Bd\,(ex)^{m+3}}{be^3\,(m+3)}+\frac{(ex)^{m+1}\,(Abd-Bad+Bbc)}{b^2e\,(m+1)}-\frac{(ex)^{m+1}\,(Ab-Ba)\,(ad-bc)\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{bx^2}{a}\right)}{ab^2e\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)/(b*x**2+a),x)
```

```
[Out] B*d*(e*x)**(m + 3)/(b*e**3*(m + 3)) + (e*x)**(m + 1)*(A*b*d - B*a
*d + B*b*c)/(b**2*e*(m + 1)) - (e*x)**(m + 1)*(A*b - B*a)*(a*d -
b*c)*hyper((1, m/2 + 1/2), (m/2 + 3/2,), -b*x**2/a)/(a*b**2*e*(m
+ 1))
```

Mathematica [A] time = 0.207669, size = 121, normalized size = 1.03

$$\frac{x(ex)^m\left(\frac{x^2(Ad+Bc)\,{}_2F_1\left(1,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+\frac{Ac\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{m+1}+\frac{Bdx^4\,{}_2F_1\left(1,\frac{m+5}{2};\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}\right)}{a}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*
x^2)/a)])/(1 + m) + ((B*c + A*d)*x^2*Hypergeometric2F1[1, (3 + m)
```

```
/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + (B*d*x^4*Hypergeometric2F
1[1, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/(5 + m)))/a
```

Maple [F] time = 0.056, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)/(b*x^2+a),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m/(b*x^2 + a), x)
```

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

$$\text{integral}\left(\frac{\left(Bdx^4 + (Bc + Ad)x^2 + Ac\right) (ex)^m}{bx^2 + a}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d*x^4 + (B*c + A*d)*x^2 + A*c)*(e*x)^m/(b*x^2 + a), x
)
```

Sympy [A] time = 21.8469, size = 428, normalized size = 3.63

$$\frac{Ace^m mxx^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{1}{2}\right) \left(\frac{m}{2} + \frac{1}{2}\right)}{4a\left(\frac{m}{2} + \frac{3}{2}\right)} + \frac{Ace^m xx^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{1}{2}\right) \left(\frac{m}{2} + \frac{1}{2}\right)}{4a\left(\frac{m}{2} + \frac{3}{2}\right)} + \frac{Ade^m mx^3 x^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{3}{2}\right) \left(\frac{m}{2} + \frac{3}{2}\right)}{4a\left(\frac{m}{2} + \frac{5}{2}\right)} + \frac{3Ade^m x^3 x^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{3}{2}\right) \left(\frac{m}{2} + \frac{3}{2}\right)}{4a\left(\frac{m}{2} + \frac{5}{2}\right)} + \frac{Bce^m mx^3 x^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{3}{2}\right) \left(\frac{m}{2} + \frac{3}{2}\right)}{4a\left(\frac{m}{2} + \frac{5}{2}\right)} + \frac{3Bce^m x^3 x^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{3}{2}\right) \left(\frac{m}{2} + \frac{3}{2}\right)}{4a\left(\frac{m}{2} + \frac{5}{2}\right)} + \frac{Bde^m mx^5 x^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{5}{2}\right) \left(\frac{m}{2} + \frac{5}{2}\right)}{4a\left(\frac{m}{2} + \frac{7}{2}\right)} + \frac{5Bde^m x^5 x^m \left(\frac{bx^2 e^{i\pi}}{a}, 1, \frac{m}{2} + \frac{5}{2}\right) \left(\frac{m}{2} + \frac{5}{2}\right)}{4a\left(\frac{m}{2} + \frac{7}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)/(b*x**2+a),x)
```

```
[Out] A*c*e**m*m*x*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 1/2
)*gamma(m/2 + 1/2)/(4*a*gamma(m/2 + 3/2)) + A*c*e**m*x*x**m*lerch
phi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/(4*a
*gamma(m/2 + 3/2)) + A*d*e**m*m*x**3*x**m*lerchphi(b*x**2*exp_pol
ar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma(m/2 + 5/2))
 + 3*A*d*e**m*x**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2
 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma(m/2 + 5/2)) + B*c*e**m*m*x**3
*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2
+ 3/2)/(4*a*gamma(m/2 + 5/2)) + 3*B*c*e**m*x**3*x**m*lerchphi(b*x
**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma(
m/2 + 5/2)) + B*d*e**m*m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi
)/a, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(4*a*gamma(m/2 + 7/2)) + 5*B*
d*e**m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)
*gamma(m/2 + 5/2)/(4*a*gamma(m/2 + 7/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(dx^2 + c)(ex)^m}{bx^2 + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m/(b*x^2 + a), x)
```

3.6 $\int \frac{(ex)^m (A+Bx^2)(c+dx^2)}{(a+bx^2)^2} dx$

Optimal. Leaf size=171

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(ad(m+1)+b(c-cm))+aB(bc(m+1)-ad(m+3)))}{2a^2b^2e(m+1)} - \frac{d(ex)^{m+1}(Ab(m+1)-aB(m+3))}{2ab^2e(m+1)} + \frac{(c+dx^2)(ex)^{m+1}(Ab-aB)}{2abe(a+bx^2)}$$

```
[Out] -(d*(A*b*(1 + m) - a*B*(3 + m))*(e*x)^(1 + m))/(2*a*b^2*e*(1 + m)
) + ((A*b - a*B)*(e*x)^(1 + m)*(c + d*x^2))/(2*a*b*e*(a + b*x^2))
 + ((a*B*(b*c*(1 + m) - a*d*(3 + m)) + A*b*(a*d*(1 + m) + b*(c -
c*m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -
((b*x^2)/a)])/(2*a^2*b^2*e*(1 + m))
```

Rubi [A] time = 0.609732, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(ad(m+1)+b(c-cm))+aB(bc(m+1)-ad(m+3)))}{2a^2b^2e(m+1)} - \frac{d(ex)^{m+1}(Ab(m+1)-aB(m+3))}{2ab^2e(m+1)} + \frac{(c+dx^2)(ex)^{m+1}(Ab-aB)}{2abe(a+bx^2)}$$

Antiderivative was successfully verified.

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

```
[Out] -(d*(A*b*(1 + m) - a*B*(3 + m))*(e*x)^(1 + m))/(2*a*b^2*e*(1 + m)
) + ((A*b - a*B)*(e*x)^(1 + m)*(c + d*x^2))/(2*a*b*e*(a + b*x^2))
 + ((a*B*(b*c*(1 + m) - a*d*(3 + m)) + A*b*(a*d*(1 + m) + b*(c -
c*m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -
((b*x^2)/a)])/(2*a^2*b^2*e*(1 + m))
```

Rubi in Sympy [A] time = 46.0064, size = 148, normalized size = 0.87

$$\frac{(ex)^{m+1}(c+dx^2)(Ab-Ba)}{2abe(a+bx^2)} + \frac{d(ex)^{m+1}(2Ab-(m+3)(Ab-Ba))}{2ab^2e(m+1)} - \frac{(ex)^{m+1}(ad(2Ab-(m+3)(Ab-Ba))-bc(-Abm+Ab+Bam+Ba))\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{bx^2}{a}\right)}{2a^2b^2e(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)/(b*x**2+a)**2,x)
```

```
[Out] (e*x)**(m + 1)*(c + d*x**2)*(A*b - B*a)/(2*a*b*e*(a + b*x**2)) +
d*(e*x)**(m + 1)*(2*A*b - (m + 3)*(A*b - B*a))/(2*a*b**2*e*(m + 1
)) - (e*x)**(m + 1)*(a*d*(2*A*b - (m + 3)*(A*b - B*a)) - b*c*(-A*
b*m + A*b + B*a*m + B*a))*hyper((1, m/2 + 1/2), (m/2 + 3/2,), -b*
x**2/a)/(2*a**2*b**2*e*(m + 1))
```

Mathematica [A] time = 0.216657, size = 121, normalized size = 0.71

$$\frac{x(ex)^m\left(\frac{x^2(Ad+Bc)\,{}_2F_1\left(2,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+\frac{Ac\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{m+1}+\frac{Bdx^4\,{}_2F_1\left(2,\frac{m+5}{2};\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}\right)}{a^2}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((b*
x^2)/a)])/(1 + m) + ((B*c + A*d)*x^2*Hypergeometric2F1[2, (3 + m)
/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + (B*d*x^4*Hypergeometric2F
1[2, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/(5 + m)))/a^2
```

Maple [F] time = 0.063, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)/(b*x^2+a)^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m/(b*x^2 + a)^2, x)
```

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

$$\text{integral}\left(\frac{\left(Bdx^4 + (Bc + Ad)x^2 + Ac\right) (ex)^m}{b^2x^4 + 2\,abx^2 + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d*x^4 + (B*c + A*d)*x^2 + A*c)*(e*x)^m/(b^2*x^4 + 2*a
*b*x^2 + a^2), x)
```

Sympy [A] time = 151.22, size = 2076, normalized size = 12.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)/(b*x**2+a)**2,x)
```

```
[Out] A*c*(-a*e**m*m**2*x*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/
2 + 1/2)*gamma(m/2 + 1/2)/(8*a**3*gamma(m/2 + 3/2) + 8*a**2*b*x**
```

```
2*gamma(m/2 + 3/2)) + 2*a*e**m*m*x*x**m*gamma(m/2 + 1/2)/(8*a**3*
gamma(m/2 + 3/2) + 8*a**2*b*x**2*gamma(m/2 + 3/2)) + a*e**m*x*x**
m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 1/2)*gamma(m/2 + 1/
2)/(8*a**3*gamma(m/2 + 3/2) + 8*a**2*b*x**2*gamma(m/2 + 3/2)) + 2
*a*e**m*x*x**m*gamma(m/2 + 1/2)/(8*a**3*gamma(m/2 + 3/2) + 8*a**2
*b*x**2*gamma(m/2 + 3/2)) - b*e**m*m**2*x**3*x**m*lerchphi(b*x**2
*exp_polar(I*pi)/a, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/(8*a**3*gamma(
m/2 + 3/2) + 8*a**2*b*x**2*gamma(m/2 + 3/2)) + b*e**m*x**3*x**m*l
erchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/
(8*a**3*gamma(m/2 + 3/2) + 8*a**2*b*x**2*gamma(m/2 + 3/2))) + A*d
*(-a*e**m*m**2*x**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/
2 + 3/2)*gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**
2*gamma(m/2 + 5/2)) - 4*a*e**m*m*x**3*x**m*lerchphi(b*x**2*exp_po
lar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5
/2) + 8*a**2*b*x**2*gamma(m/2 + 5/2)) + 2*a*e**m*m*x**3*x**m*gamm
a(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m/2 +
 5/2)) - 3*a*e**m*x**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1,
 m/2 + 3/2)*gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*
x**2*gamma(m/2 + 5/2)) + 6*a*e**m*x**3*x**m*gamma(m/2 + 3/2)/(8*a
**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m/2 + 5/2)) - b*e**m*m
**2*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*ga
mma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m/2
 + 5/2)) - 4*b*e**m*m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a
, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**
2*b*x**2*gamma(m/2 + 5/2)) - 3*b*e**m*x**5*x**m*lerchphi(b*x**2*e
xp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*a**3*gamma(m/
2 + 5/2) + 8*a**2*b*x**2*gamma(m/2 + 5/2))) + B*c*(-a*e**m*m**2*x
**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m
/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m/2 + 5/
2)) - 4*a*e**m*m*x**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1,
m/2 + 3/2)*gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x
**2*gamma(m/2 + 5/2)) + 2*a*e**m*m*x**3*x**m*gamma(m/2 + 3/2)/(8*
a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m/2 + 5/2)) - 3*a*e**
m*x**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamm
a(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m/2 +
 5/2)) + 6*a*e**m*x**3*x**m*gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 +
5/2) + 8*a**2*b*x**2*gamma(m/2 + 5/2)) - b*e**m*m**2*x**5*x**m*le
rchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(
8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m/2 + 5/2)) - 4*b*e
**m*m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*
gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**2*b*x**2*gamma(m
/2 + 5/2)) - 3*b*e**m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a
, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*a**3*gamma(m/2 + 5/2) + 8*a**
2*b*x**2*gamma(m/2 + 5/2))) + B*d*(-a*e**m*m**2*x**5*x**m*lerchph
i(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(8*a**
3*gamma(m/2 + 7/2) + 8*a**2*b*x**2*gamma(m/2 + 7/2)) - 8*a*e**m*m
*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma
(m/2 + 5/2)/(8*a**3*gamma(m/2 + 7/2) + 8*a**2*b*x**2*gamma(m/2 +
7/2)) + 2*a*e**m*m*x**5*x**m*gamma(m/2 + 5/2)/(8*a**3*gamma(m/2 +
 7/2) + 8*a**2*b*x**2*gamma(m/2 + 7/2)) - 15*a*e**m*x**5*x**m*ler
chphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(8
*a**3*gamma(m/2 + 7/2) + 8*a**2*b*x**2*gamma(m/2 + 7/2)) + 10*a*e
**m*x**5*x**m*gamma(m/2 + 5/2)/(8*a**3*gamma(m/2 + 7/2) + 8*a**2*
b*x**2*gamma(m/2 + 7/2)) - b*e**m*m**2*x**7*x**m*lerchphi(b*x**2*
exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(8*a**3*gamma(m
/2 + 7/2) + 8*a**2*b*x**2*gamma(m/2 + 7/2)) - 8*b*e**m*m*x**7*x**
m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma(m/2 + 5/
2)/(8*a**3*gamma(m/2 + 7/2) + 8*a**2*b*x**2*gamma(m/2 + 7/2)) - 1
5*b*e**m*x**7*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/
2)*gamma(m/2 + 5/2)/(8*a**3*gamma(m/2 + 7/2) + 8*a**2*b*x**2*gamm
a(m/2 + 7/2)))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(dx^2 + c)(ex)^m}{(bx^2 + a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m/(b*x^2 + a)^2, x)
```

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

Optimal. Leaf size=209

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(1-m)(ad(m+1)+bc(3-m))+aB(m+1)(ad(m+3)+b(c-cm)))}{8a^3b^2e(m+1)} - \frac{(ex)^{m+1}(Ab(ad(1-m)-bc(3-m))-aB(bc(m+1)-ad(m+3)))}{8a^2b^2e(a+bx^2)} + \frac{(c+dx^2)(ex)^{m+1}(Ab-aB)}{4abe(a+bx^2)^2}$$

```
[Out] -((A*b*(a*d*(1 - m) - b*c*(3 - m)) - a*B*(b*c*(1 + m) - a*d*(3 +
m)))*(e*x)^(1 + m))/(8*a^2*b^2*e*(a + b*x^2)) + ((A*b - a*B)*(e*x
)^(1 + m)*(c + d*x^2))/(4*a*b*e*(a + b*x^2)^2) + ((A*b*(1 - m)*(b
*c*(3 - m) + a*d*(1 + m)) + a*B*(1 + m)*(a*d*(3 + m) + b*(c - c*m
)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b
*x^2)/a)])/(8*a^3*b^2*e*(1 + m))
```

Rubi [A] time = 0.791808, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(1-m)(ad(m+1)+bc(3-m))+aB(m+1)(ad(m+3)+b(c-cm)))}{8a^3b^2e(m+1)} - \frac{(ex)^{m+1}(Ab(ad(1-m)-bc(3-m))-aB(bc(m+1)-ad(m+3)))}{8a^2b^2e(a+bx^2)} + \frac{(c+dx^2)(ex)^{m+1}(Ab-aB)}{4abe(a+bx^2)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -((A*b*(a*d*(1 - m) - b*c*(3 - m)) - a*B*(b*c*(1 + m) - a*d*(3 +
m)))*(e*x)^(1 + m))/(8*a^2*b^2*e*(a + b*x^2)) + ((A*b - a*B)*(e*x
)^(1 + m)*(c + d*x^2))/(4*a*b*e*(a + b*x^2)^2) + ((A*b*(1 - m)*(b
*c*(3 - m) + a*d*(1 + m)) + a*B*(1 + m)*(a*d*(3 + m) + b*(c - c*m
)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b
*x^2)/a)])/(8*a^3*b^2*e*(1 + m))
```

Rubi in Sympy [A] time = 49.6216, size = 194, normalized size = 0.93

$$\frac{(ex)^{m+1}(c+dx^2)(Ab-Ba)}{4abe(a+bx^2)^2} - \frac{(ex)^{m+1}(ad(-Abm+Ab+Bam+3Ba)-bc(-Abm+3Ab+Bam+Ba))}{8a^2b^2e(a+bx^2)} + \frac{(ex)^{m+1}(ad(m+1)(-Abm+Ab+Bam+3Ba)+bc(-m+1)(-Abm+3Ab+Bam+Ba))\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{bx^2}{a}\right)}{8a^3b^2e(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (e*x)**(m + 1)*(c + d*x**2)*(A*b - B*a)/(4*a*b*e*(a + b*x**2)**2)
 - (e*x)**(m + 1)*(a*d*(-A*b*m + A*b + B*a*m + 3*B*a) - b*c*(-A*b
*m + 3*A*b + B*a*m + B*a))/(8*a**2*b**2*e*(a + b*x**2)) + (e*x)**
(m + 1)*(a*d*(m + 1)*(-A*b*m + A*b + B*a*m + 3*B*a) + b*c*(-m + 1
)*(-A*b*m + 3*A*b + B*a*m + B*a))*hyper((1, m/2 + 1/2), (m/2 + 3/
2,), -b*x**2/a)/(8*a**3*b**2*e*(m + 1))
```

Mathematica [A] time = 0.231278, size = 121, normalized size = 0.58

$$\frac{x(ex)^m\left(\frac{x^2(Ad+Bc)\,{}_2F_1\left(3,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+\frac{Ac\,{}_2F_1\left(3,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{m+1}+\frac{Bdx^4\,{}_2F_1\left(3,\frac{m+5}{2};\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}\right)}{a^3}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c*Hypergeometric2F1[3, (1 + m)/2, (3 + m)/2, -((b*
x^2)/a)])/(1 + m) + ((B*c + A*d)*x^2*Hypergeometric2F1[3, (3 + m)
/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + (B*d*x^4*Hypergeometric2F
1[3, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/(5 + m)))/a^3
```

Maple [F] time = 0.085, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)/(b*x^2+a)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m/(b*x^2 + a)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bdx^4+(Bc+Ad)x^2+Ac\right)(ex)^m}{b^3x^6+3\,ab^2x^4+3\,a^2bx^2+a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d*x^4 + (B*c + A*d)*x^2 + A*c)*(e*x)^m/(b^3*x^6 + 3*a
*b^2*x^4 + 3*a^2*b*x^2 + 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((e*x)**m*(B*x**2+A)*(d*x**2+c)/(b*x**2+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(dx^2 + c)(ex)^m}{(bx^2 + a)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(e*x)^m/(b*x^2 + a)^3, x)
```

3.8 $\int (ex)^m \left(a+bx^2\right)^3 \left(A+Bx^2\right) \left(c+dx^2\right)^2 \, dx$

Optimal. Leaf size=292

$$\frac{a^3Ac^2(ex)^{m+1}}{e(m+1)}+\frac{(ex)^{m+7}\left(Ab\left(3a^2d^2+6abcd+b^2c^2\right)+aB\left(a^2d^2+6abcd+3b^2c^2\right)\right)}{e^7(m+7)}+\frac{a(ex)^{m+5}\left(A\left(a^2d^2+6abcd+3b^2c^2\right)+aBc(2ad+3bc)\right)}{e^5(m+5)}+\frac{b(ex)^{m+9}\left(3a^2Bd^2+3abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{e^9(m+9)}+\frac{a^2c(ex)^{m+3}(2aAd+aBc+3Abc)}{e^3(m+3)}+\frac{b^2d(ex)^{m+11}(3aBd+Abd+2bBc)}{e^{11}(m+11)}+\frac{b^3Bd^2(ex)^{m+13}}{e^{13}(m+13)}$$

```
[Out] (a^3*A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (a^2*c*(3*A*b*c + a*B*c +
 2*a*A*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (a*(a*B*c*(3*b*c + 2*a*d
) + A*(3*b^2*c^2 + 6*a*b*c*d + a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 +
 m)) + ((a*B*(3*b^2*c^2 + 6*a*b*c*d + a^2*d^2) + A*b*(b^2*c^2 + 6
*a*b*c*d + 3*a^2*d^2))*(e*x)^(7 + m))/(e^7*(7 + m)) + (b*(3*a^2*B
*d^2 + 3*a*b*d*(2*B*c + A*d) + b^2*c*(B*c + 2*A*d))*(e*x)^(9 + m)
)/(e^9*(9 + m)) + (b^2*d*(2*b*B*c + A*b*d + 3*a*B*d)*(e*x)^(11 +
m))/(e^11*(11 + m)) + (b^3*B*d^2*(e*x)^(13 + m))/(e^13*(13 + m))
```

Rubi [A] time = 0.715805, antiderivative size = 292, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.032$

$$\frac{a^3Ac^2(ex)^{m+1}}{e(m+1)}+\frac{(ex)^{m+7}\left(Ab\left(3a^2d^2+6abcd+b^2c^2\right)+aB\left(a^2d^2+6abcd+3b^2c^2\right)\right)}{e^7(m+7)}+\frac{a(ex)^{m+5}\left(A\left(a^2d^2+6abcd+3b^2c^2\right)+aBc(2ad+3bc)\right)}{e^5(m+5)}+\frac{b(ex)^{m+9}\left(3a^2Bd^2+3abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{e^9(m+9)}+\frac{a^2c(ex)^{m+3}(2aAd+aBc+3Abc)}{e^3(m+3)}+\frac{b^2d(ex)^{m+11}(3aBd+Abd+2bBc)}{e^{11}(m+11)}+\frac{b^3Bd^2(ex)^{m+13}}{e^{13}(m+13)}$$

Antiderivative was successfully verified.

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

```
[Out] (a^3*A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (a^2*c*(3*A*b*c + a*B*c +
 2*a*A*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (a*(a*B*c*(3*b*c + 2*a*d
) + A*(3*b^2*c^2 + 6*a*b*c*d + a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 +
 m)) + ((a*B*(3*b^2*c^2 + 6*a*b*c*d + a^2*d^2) + A*b*(b^2*c^2 + 6
*a*b*c*d + 3*a^2*d^2))*(e*x)^(7 + m))/(e^7*(7 + m)) + (b*(3*a^2*B
*d^2 + 3*a*b*d*(2*B*c + A*d) + b^2*c*(B*c + 2*A*d))*(e*x)^(9 + m)
)/(e^9*(9 + m)) + (b^2*d*(2*b*B*c + A*b*d + 3*a*B*d)*(e*x)^(11 +
m))/(e^11*(11 + m)) + (b^3*B*d^2*(e*x)^(13 + m))/(e^13*(13 + m))
```

Rubi in Sympy [A] time = 168.82, size = 323, normalized size = 1.11

$$\frac{Aa^3c^2\left(ex\right)^{m+1}}{e\left(m+1\right)}+\frac{Bb^3d^2\left(ex\right)^{m+13}}{e^{13}\left(m+13\right)}+\frac{a^2c\left(ex\right)^{m+3}\left(2Aad+3Abc+Bac\right)}{e^3\left(m+3\right)}+\frac{a\left(ex\right)^{m+5}\left(Aa^2d^2+6Aabcd+3Ab^2c^2+2Ba^2cd+3Babc^2\right)}{e^5\left(m+5\right)}+\frac{b^2d\left(ex\right)^{m+11}\left(Abd+3Bad+2Bbc\right)}{e^{11}\left(m+11\right)}+\frac{b\left(ex\right)^{m+9}\left(3Aabd^2+2Ab^2cd+3Ba^2d^2+6Babcd+Bb^2c^2\right)}{e^9\left(m+9\right)}+\frac{\left(ex\right)^{m+7}\left(3Aa^2bd^2+6Aab^2cd+Ab^3c^2+Ba^3d^2+6Ba^2bcd+3Bab^2c^2\right)}{e^7\left(m+7\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)**3*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] A*a**3*c**2*(e*x)**(m + 1)/(e*(m + 1)) + B*b**3*d**2*(e*x)**(m +
13)/(e**13*(m + 13)) + a**2*c*(e*x)**(m + 3)*(2*A*a*d + 3*A*b*c +
 B*a*c)/(e**3*(m + 3)) + a*(e*x)**(m + 5)*(A*a**2*d**2 + 6*A*a*b*
c*d + 3*A*b**2*c**2 + 2*B*a**2*c*d + 3*B*a*b*c**2)/(e**5*(m + 5))
 + b**2*d*(e*x)**(m + 11)*(A*b*d + 3*B*a*d + 2*B*b*c)/(e**11*(m +
 11)) + b*(e*x)**(m + 9)*(3*A*a*b*d**2 + 2*A*b**2*c*d + 3*B*a**2*
d**2 + 6*B*a*b*c*d + B*b**2*c**2)/(e**9*(m + 9)) + (e*x)**(m + 7)
*(3*A*a**2*b*d**2 + 6*A*a*b**2*c*d + A*b**3*c**2 + B*a**3*d**2 +
6*B*a**2*b*c*d + 3*B*a*b**2*c**2)/(e**7*(m + 7))
```

Mathematica [A] time = 1.05827, size = 247, normalized size = 0.85

$$(ex)^m\left(\frac{a^3Ac^2x}{m+1}+\frac{x^7\left(Ab\left(3a^2d^2+6abcd+b^2c^2\right)+aB\left(a^2d^2+6abcd+3b^2c^2\right)\right)}{m+7}+\frac{ax^5\left(A\left(a^2d^2+6abcd+3b^2c^2\right)+aBc(2ad+3bc)\right)}{m+5}+\frac{bx^9\left(3a^2Bd^2+3abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{m+9}+\frac{a^2cx^3(2aAd+aBc+3Abc)}{m+3}+\frac{b^2dx^{11}(3aBd+Abd+2bBc)}{m+11}+\frac{b^3Bd^2x^{13}}{m+13}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a^3*A*c^2*x)/(1 + m) + (a^2*c*(3*A*b*c + a*B*c + 2*a*A*
d)*x^3)/(3 + m) + (a*(a*B*c*(3*b*c + 2*a*d) + A*(3*b^2*c^2 + 6*a*
b*c*d + a^2*d^2))*x^5)/(5 + m) + ((a*B*(3*b^2*c^2 + 6*a*b*c*d + a
^2*d^2) + A*b*(b^2*c^2 + 6*a*b*c*d + 3*a^2*d^2))*x^7)/(7 + m) + (
b*(3*a^2*B*d^2 + 3*a*b*d*(2*B*c + A*d) + b^2*c*(B*c + 2*A*d))*x^9
)/(9 + m) + (b^2*d*(2*b*B*c + A*b*d + 3*a*B*d)*x^11)/(11 + m) + (
b^3*B*d^2*x^13)/(13 + m))
```

Maple [B] time = 0.014, size = 2443, normalized size = 8.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b^3*d^2*m^6*x^12+36*B*b^3*d^2*m^5*x^12+A*b^3*d^2*m^6*x^10+3*
B*a*b^2*d^2*m^6*x^10+2*B*b^3*c*d*m^6*x^10+505*B*b^3*d^2*m^4*x^12+
38*A*b^3*d^2*m^5*x^10+114*B*a*b^2*d^2*m^5*x^10+76*B*b^3*c*d*m^5*x
^10+3480*B*b^3*d^2*m^3*x^12+3*A*a*b^2*d^2*m^6*x^8+2*A*b^3*c*d*m^6
*x^8+555*A*b^3*d^2*m^4*x^10+3*B*a^2*b*d^2*m^6*x^8+6*B*a*b^2*c*d*m
^6*x^8+1665*B*a*b^2*d^2*m^4*x^10+B*b^3*c^2*m^6*x^8+1110*B*b^3*c*d
*m^4*x^10+12139*B*b^3*d^2*m^2*x^12+120*A*a*b^2*d^2*m^5*x^8+80*A*b
^3*c*d*m^5*x^8+3940*A*b^3*d^2*m^3*x^10+120*B*a^2*b*d^2*m^5*x^8+24
0*B*a*b^2*c*d*m^5*x^8+11820*B*a*b^2*d^2*m^3*x^10+40*B*b^3*c^2*m^5
*x^8+7880*B*b^3*c*d*m^3*x^10+19524*B*b^3*d^2*m*x^12+3*A*a^2*b*d^2
*m^6*x^6+6*A*a*b^2*c*d*m^6*x^6+1839*A*a*b^2*d^2*m^4*x^8+A*b^3*c^2
*m^6*x^6+1226*A*b^3*c*d*m^4*x^8+14039*A*b^3*d^2*m^2*x^10+B*a^3*d^
2*m^6*x^6+6*B*a^2*b*c*d*m^6*x^6+1839*B*a^2*b*d^2*m^4*x^8+3*B*a*b^
2*c^2*m^6*x^6+3678*B*a*b^2*c*d*m^4*x^8+42117*B*a*b^2*d^2*m^2*x^10
+613*B*b^3*c^2*m^4*x^8+28078*B*b^3*c*d*m^2*x^10+10395*B*b^3*d^2*x
^12+126*A*a^2*b*d^2*m^5*x^6+252*A*a*b^2*c*d*m^5*x^6+13584*A*a*b^2
*d^2*m^3*x^8+42*A*b^3*c^2*m^5*x^6+9056*A*b^3*c*d*m^3*x^8+22902*A*
b^3*d^2*m*x^10+42*B*a^3*d^2*m^5*x^6+252*B*a^2*b*c*d*m^5*x^6+13584
*B*a^2*b*d^2*m^3*x^8+126*B*a*b^2*c^2*m^5*x^6+27168*B*a*b^2*c*d*m^
3*x^8+68706*B*a*b^2*d^2*m*x^10+4528*B*b^3*c^2*m^3*x^8+45804*B*b^3
```

```
*c*d*m*x^10+A*a^3*d^2*m^6*x^4+6*A*a^2*b*c*d*m^6*x^4+2037*A*a^2*b*
d^2*m^4*x^6+3*A*a*b^2*c^2*m^6*x^4+4074*A*a*b^2*c*d*m^4*x^6+49881*
A*a*b^2*d^2*m^2*x^8+679*A*b^3*c^2*m^4*x^6+33254*A*b^3*c*d*m^2*x^8
+12285*A*b^3*d^2*x^10+2*B*a^3*c*d*m^6*x^4+679*B*a^3*d^2*m^4*x^6+3
*B*a^2*b*c^2*m^6*x^4+4074*B*a^2*b*c*d*m^4*x^6+49881*B*a^2*b*d^2*m
^2*x^8+2037*B*a*b^2*c^2*m^4*x^6+99762*B*a*b^2*c*d*m^2*x^8+36855*B
*a*b^2*d^2*x^10+16627*B*b^3*c^2*m^2*x^8+24570*B*b^3*c*d*x^10+44*A
*a^3*d^2*m^5*x^4+264*A*a^2*b*c*d*m^5*x^4+15876*A*a^2*b*d^2*m^3*x^
6+132*A*a*b^2*c^2*m^5*x^4+31752*A*a*b^2*c*d*m^3*x^6+83064*A*a*b^2
*d^2*m*x^8+5292*A*b^3*c^2*m^3*x^6+55376*A*b^3*c*d*m*x^8+88*B*a^3*
c*d*m^5*x^4+5292*B*a^3*d^2*m^3*x^6+132*B*a^2*b*c^2*m^5*x^4+31752*
B*a^2*b*c*d*m^3*x^6+83064*B*a^2*b*d^2*m*x^8+15876*B*a*b^2*c^2*m^3
*x^6+166128*B*a*b^2*c*d*m*x^8+27688*B*b^3*c^2*m*x^8+2*A*a^3*c*d*m
^6*x^2+753*A*a^3*d^2*m^4*x^4+3*A*a^2*b*c^2*m^6*x^2+4518*A*a^2*b*c
*d*m^4*x^4+61005*A*a^2*b*d^2*m^2*x^6+2259*A*a*b^2*c^2*m^4*x^4+122
010*A*a*b^2*c*d*m^2*x^6+45045*A*a*b^2*d^2*x^8+20335*A*b^3*c^2*m^2
*x^6+30030*A*b^3*c*d*x^8+B*a^3*c^2*m^6*x^2+1506*B*a^3*c*d*m^4*x^4
+20335*B*a^3*d^2*m^2*x^6+2259*B*a^2*b*c^2*m^4*x^4+122010*B*a^2*b*
c*d*m^2*x^6+45045*B*a^2*b*d^2*x^8+61005*B*a*b^2*c^2*m^2*x^6+90090
*B*a*b^2*c*d*x^8+15015*B*b^3*c^2*x^8+92*A*a^3*c*d*m^5*x^2+6280*A*
a^3*d^2*m^3*x^4+138*A*a^2*b*c^2*m^5*x^2+37680*A*a^2*b*c*d*m^3*x^4
+104958*A*a^2*b*d^2*m*x^6+18840*A*a*b^2*c^2*m^3*x^4+209916*A*a*b^
2*c*d*m*x^6+34986*A*b^3*c^2*m*x^6+46*B*a^3*c^2*m^5*x^2+12560*B*a^
3*c*d*m^3*x^4+34986*B*a^3*d^2*m*x^6+18840*B*a^2*b*c^2*m^3*x^4+209
916*B*a^2*b*c*d*m*x^6+104958*B*a*b^2*c^2*m*x^6+A*a^3*c^2*m^6+1670
*A*a^3*c*d*m^4*x^2+25979*A*a^3*d^2*m^2*x^4+2505*A*a^2*b*c^2*m^4*x
^2+155874*A*a^2*b*c*d*m^2*x^4+57915*A*a^2*b*d^2*x^6+77937*A*a*b^2
*c^2*m^2*x^4+115830*A*a*b^2*c*d*x^6+19305*A*b^3*c^2*x^6+835*B*a^3
*c^2*m^4*x^2+51958*B*a^3*c*d*m^2*x^4+19305*B*a^3*d^2*x^6+77937*B*
a^2*b*c^2*m^2*x^4+115830*B*a^2*b*c*d*x^6+57915*B*a*b^2*c^2*x^6+48
*A*a^3*c^2*m^5+15080*A*a^3*c*d*m^3*x^2+47436*A*a^3*d^2*m*x^4+2262
0*A*a^2*b*c^2*m^3*x^2+284616*A*a^2*b*c*d*m*x^4+142308*A*a*b^2*c^2
*m*x^4+7540*B*a^3*c^2*m^3*x^2+94872*B*a^3*c*d*m*x^4+142308*B*a^2*
b*c^2*m*x^4+925*A*a^3*c^2*m^4+69518*A*a^3*c*d*m^2*x^2+27027*A*a^3
*d^2*x^4+104277*A*a^2*b*c^2*m^2*x^2+162162*A*a^2*b*c*d*x^4+81081*
A*a*b^2*c^2*x^4+34759*B*a^3*c^2*m^2*x^2+54054*B*a^3*c*d*x^4+81081
*B*a^2*b*c^2*x^4+9120*A*a^3*c^2*m^3+146108*A*a^3*c*d*m*x^2+219162
*A*a^2*b*c^2*m*x^2+73054*B*a^3*c^2*m*x^2+48259*A*a^3*c^2*m^2+9009
0*A*a^3*c*d*x^2+135135*A*a^2*b*c^2*x^2+45045*B*a^3*c^2*x^2+129072
*A*a^3*c^2*m+135135*A*a^3*c^2)*(e*x)^m/(13+m)/(11+m)/(9+m)/(7+m)/
(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.262641, size = 2310, normalized size = 7.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] ((B*b^3*d^2*m^6 + 36*B*b^3*d^2*m^5 + 505*B*b^3*d^2*m^4 + 3480*B*b
^3*d^2*m^3 + 12139*B*b^3*d^2*m^2 + 19524*B*b^3*d^2*m + 10395*B*b^
3*d^2)*x^13 + ((2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^6 + 2457
0*B*b^3*c*d + 38*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^5 + 55
5*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^4 + 3940*(2*B*b^3*c*d
```

```
 + (3*B*a*b^2 + A*b^3)*d^2)*m^3 + 12285*(3*B*a*b^2 + A*b^3)*d^2 +
 14039*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^2 + 22902*(2*B*b
^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m)*x^11 + ((B*b^3*c^2 + 2*(3*B*
a*b^2 + A*b^3)*c*d + 3*(B*a^2*b + A*a*b^2)*d^2)*m^6 + 15015*B*b^3
*c^2 + 40*(B*b^3*c^2 + 2*(3*B*a*b^2 + A*b^3)*c*d + 3*(B*a^2*b + A
*a*b^2)*d^2)*m^5 + 613*(B*b^3*c^2 + 2*(3*B*a*b^2 + A*b^3)*c*d + 3
*(B*a^2*b + A*a*b^2)*d^2)*m^4 + 4528*(B*b^3*c^2 + 2*(3*B*a*b^2 +
A*b^3)*c*d + 3*(B*a^2*b + A*a*b^2)*d^2)*m^3 + 30030*(3*B*a*b^2 +
A*b^3)*c*d + 45045*(B*a^2*b + A*a*b^2)*d^2 + 16627*(B*b^3*c^2 + 2
*(3*B*a*b^2 + A*b^3)*c*d + 3*(B*a^2*b + A*a*b^2)*d^2)*m^2 + 27688
*(B*b^3*c^2 + 2*(3*B*a*b^2 + A*b^3)*c*d + 3*(B*a^2*b + A*a*b^2)*d
^2)*m)*x^9 + (((3*B*a*b^2 + A*b^3)*c^2 + 6*(B*a^2*b + A*a*b^2)*c*
d + (B*a^3 + 3*A*a^2*b)*d^2)*m^6 + 42*((3*B*a*b^2 + A*b^3)*c^2 +
6*(B*a^2*b + A*a*b^2)*c*d + (B*a^3 + 3*A*a^2*b)*d^2)*m^5 + 679*((
3*B*a*b^2 + A*b^3)*c^2 + 6*(B*a^2*b + A*a*b^2)*c*d + (B*a^3 + 3*A
*a^2*b)*d^2)*m^4 + 5292*((3*B*a*b^2 + A*b^3)*c^2 + 6*(B*a^2*b + A
*a*b^2)*c*d + (B*a^3 + 3*A*a^2*b)*d^2)*m^3 + 19305*(3*B*a*b^2 + A
*b^3)*c^2 + 115830*(B*a^2*b + A*a*b^2)*c*d + 19305*(B*a^3 + 3*A*a
^2*b)*d^2 + 20335*((3*B*a*b^2 + A*b^3)*c^2 + 6*(B*a^2*b + A*a*b^2
)*c*d + (B*a^3 + 3*A*a^2*b)*d^2)*m^2 + 34986*((3*B*a*b^2 + A*b^3)
*c^2 + 6*(B*a^2*b + A*a*b^2)*c*d + (B*a^3 + 3*A*a^2*b)*d^2)*m)*x^
7 + ((A*a^3*d^2 + 3*(B*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*
b)*c*d)*m^6 + 27027*A*a^3*d^2 + 44*(A*a^3*d^2 + 3*(B*a^2*b + A*a*
b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*b)*c*d)*m^5 + 753*(A*a^3*d^2 + 3*(B
*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*b)*c*d)*m^4 + 6280*(A*
a^3*d^2 + 3*(B*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*b)*c*d)*
m^3 + 81081*(B*a^2*b + A*a*b^2)*c^2 + 54054*(B*a^3 + 3*A*a^2*b)*c
*d + 25979*(A*a^3*d^2 + 3*(B*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*
A*a^2*b)*c*d)*m^2 + 47436*(A*a^3*d^2 + 3*(B*a^2*b + A*a*b^2)*c^2
+ 2*(B*a^3 + 3*A*a^2*b)*c*d)*m)*x^5 + ((2*A*a^3*c*d + (B*a^3 + 3*
A*a^2*b)*c^2)*m^6 + 90090*A*a^3*c*d + 46*(2*A*a^3*c*d + (B*a^3 +
3*A*a^2*b)*c^2)*m^5 + 835*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)
*m^4 + 7540*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^3 + 45045*(
B*a^3 + 3*A*a^2*b)*c^2 + 34759*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)
*c^2)*m^2 + 73054*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m)*x^3
+ (A*a^3*c^2*m^6 + 48*A*a^3*c^2*m^5 + 925*A*a^3*c^2*m^4 + 9120*A*
a^3*c^2*m^3 + 48259*A*a^3*c^2*m^2 + 129072*A*a^3*c^2*m + 135135*A
*a^3*c^2)*x)*(e*x)^m/(m^7 + 49*m^6 + 973*m^5 + 10045*m^4 + 57379*
m^3 + 177331*m^2 + 264207*m + 135135)
```

Sympy [A] time = 18.8099, size = 12199, normalized size = 41.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(b*x**2+a)**3*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] Piecewise(((-A*a**3*c**2/(12*x**12) - A*a**3*c*d/(5*x**10) - A*a*
*3*d**2/(8*x**8) - 3*A*a**2*b*c**2/(10*x**10) - 3*A*a**2*b*c*d/(4
*x**8) - A*a**2*b*d**2/(2*x**6) - 3*A*a*b**2*c**2/(8*x**8) - A*a*
b**2*c*d/x**6 - 3*A*a*b**2*d**2/(4*x**4) - A*b**3*c**2/(6*x**6) -
 A*b**3*c*d/(2*x**4) - A*b**3*d**2/(2*x**2) - B*a**3*c**2/(10*x**
10) - B*a**3*c*d/(4*x**8) - B*a**3*d**2/(6*x**6) - 3*B*a**2*b*c**
2/(8*x**8) - B*a**2*b*c*d/x**6 - 3*B*a**2*b*d**2/(4*x**4) - B*a*b
**2*c**2/(2*x**6) - 3*B*a*b**2*c*d/(2*x**4) - 3*B*a*b**2*d**2/(2*
x**2) - B*b**3*c**2/(4*x**4) - B*b**3*c*d/x**2 + B*b**3*d**2*log(
x))/e**13, Eq(m, -13)), ((-A*a**3*c**2/(10*x**10) - A*a**3*c*d/(4
*x**8) - A*a**3*d**2/(6*x**6) - 3*A*a**2*b*c**2/(8*x**8) - A*a**2
*b*c*d/x**6 - 3*A*a**2*b*d**2/(4*x**4) - A*a*b**2*c**2/(2*x**6) -
 3*A*a*b**2*c*d/(2*x**4) - 3*A*a*b**2*d**2/(2*x**2) - A*b**3*c**2
/(4*x**4) - A*b**3*c*d/x**2 + A*b**3*d**2*log(x) - B*a**3*c**2/(8
*x**8) - B*a**3*c*d/(3*x**6) - B*a**3*d**2/(4*x**4) - B*a**2*b*c*
*2/(2*x**6) - 3*B*a**2*b*c*d/(2*x**4) - 3*B*a**2*b*d**2/(2*x**2)
- 3*B*a*b**2*c**2/(4*x**4) - 3*B*a*b**2*c*d/x**2 + 3*B*a*b**2*d**
2*log(x) - B*b**3*c**2/(2*x**2) + 2*B*b**3*c*d*log(x) + B*b**3*d*
*2*x**2/2)/e**11, Eq(m, -11)), ((-A*a**3*c**2/(8*x**8) - A*a**3*c
*d/(3*x**6) - A*a**3*d**2/(4*x**4) - A*a**2*b*c**2/(2*x**6) - 3*A
*a**2*b*c*d/(2*x**4) - 3*A*a**2*b*d**2/(2*x**2) - 3*A*a*b**2*c**2
/(4*x**4) - 3*A*a*b**2*c*d/x**2 + 3*A*a*b**2*d**2*log(x) - A*b**3
```

```
*c**2/(2*x**2) + 2*A*b**3*c*d*log(x) + A*b**3*d**2*x**2/2 - B*a**
3*c**2/(6*x**6) - B*a**3*c*d/(2*x**4) - B*a**3*d**2/(2*x**2) - 3*
B*a**2*b*c**2/(4*x**4) - 3*B*a**2*b*c*d/x**2 + 3*B*a**2*b*d**2*lo
g(x) - 3*B*a*b**2*c**2/(2*x**2) + 6*B*a*b**2*c*d*log(x) + 3*B*a*b
**2*d**2*x**2/2 + B*b**3*c**2*log(x) + B*b**3*c*d*x**2 + B*b**3*d
**2*x**4/4)/e**9, Eq(m, -9)), ((-A*a**3*c**2/(6*x**6) - A*a**3*c*
d/(2*x**4) - A*a**3*d**2/(2*x**2) - 3*A*a**2*b*c**2/(4*x**4) - 3*
A*a**2*b*c*d/x**2 + 3*A*a**2*b*d**2*log(x) - 3*A*a*b**2*c**2/(2*x
**2) + 6*A*a*b**2*c*d*log(x) + 3*A*a*b**2*d**2*x**2/2 + A*b**3*c*
*2*log(x) + A*b**3*c*d*x**2 + A*b**3*d**2*x**4/4 - B*a**3*c**2/(4
*x**4) - B*a**3*c*d/x**2 + B*a**3*d**2*log(x) - 3*B*a**2*b*c**2/(
2*x**2) + 6*B*a**2*b*c*d*log(x) + 3*B*a**2*b*d**2*x**2/2 + 3*B*a*
b**2*c**2*log(x) + 3*B*a*b**2*c*d*x**2 + 3*B*a*b**2*d**2*x**4/4 +
 B*b**3*c**2*x**2/2 + B*b**3*c*d*x**4/2 + B*b**3*d**2*x**6/6)/e**
7, Eq(m, -7)), ((-A*a**3*c**2/(4*x**4) - A*a**3*c*d/x**2 + A*a**3
*d**2*log(x) - 3*A*a**2*b*c**2/(2*x**2) + 6*A*a**2*b*c*d*log(x) +
 3*A*a**2*b*d**2*x**2/2 + 3*A*a*b**2*c**2*log(x) + 3*A*a*b**2*c*d
*x**2 + 3*A*a*b**2*d**2*x**4/4 + A*b**3*c**2*x**2/2 + A*b**3*c*d*
x**4/2 + A*b**3*d**2*x**6/6 - B*a**3*c**2/(2*x**2) + 2*B*a**3*c*d
*log(x) + B*a**3*d**2*x**2/2 + 3*B*a**2*b*c**2*log(x) + 3*B*a**2*
b*c*d*x**2 + 3*B*a**2*b*d**2*x**4/4 + 3*B*a*b**2*c**2*x**2/2 + 3*
B*a*b**2*c*d*x**4/2 + B*a*b**2*d**2*x**6/2 + B*b**3*c**2*x**4/4 +
 B*b**3*c*d*x**6/3 + B*b**3*d**2*x**8/8)/e**5, Eq(m, -5)), ((-A*a
**3*c**2/(2*x**2) + 2*A*a**3*c*d*log(x) + A*a**3*d**2*x**2/2 + 3*
A*a**2*b*c**2*log(x) + 3*A*a**2*b*c*d*x**2 + 3*A*a**2*b*d**2*x**4
/4 + 3*A*a*b**2*c**2*x**2/2 + 3*A*a*b**2*c*d*x**4/2 + A*a*b**2*d*
*2*x**6/2 + A*b**3*c**2*x**4/4 + A*b**3*c*d*x**6/3 + A*b**3*d**2*
x**8/8 + B*a**3*c**2*log(x) + B*a**3*c*d*x**2 + B*a**3*d**2*x**4/
4 + 3*B*a**2*b*c**2*x**2/2 + 3*B*a**2*b*c*d*x**4/2 + B*a**2*b*d**
2*x**6/2 + 3*B*a*b**2*c**2*x**4/4 + B*a*b**2*c*d*x**6 + 3*B*a*b**
2*d**2*x**8/8 + B*b**3*c**2*x**6/6 + B*b**3*c*d*x**8/4 + B*b**3*d
**2*x**10/10)/e**3, Eq(m, -3)), ((A*a**3*c**2*log(x) + A*a**3*c*d
*x**2 + A*a**3*d**2*x**4/4 + 3*A*a**2*b*c**2*x**2/2 + 3*A*a**2*b*
c*d*x**4/2 + A*a**2*b*d**2*x**6/2 + 3*A*a*b**2*c**2*x**4/4 + A*a*
b**2*c*d*x**6 + 3*A*a*b**2*d**2*x**8/8 + A*b**3*c**2*x**6/6 + A*b
**3*c*d*x**8/4 + A*b**3*d**2*x**10/10 + B*a**3*c**2*x**2/2 + B*a*
*3*c*d*x**4/2 + B*a**3*d**2*x**6/6 + 3*B*a**2*b*c**2*x**4/4 + B*a
**2*b*c*d*x**6 + 3*B*a**2*b*d**2*x**8/8 + B*a*b**2*c**2*x**6/2 +
3*B*a*b**2*c*d*x**8/4 + 3*B*a*b**2*d**2*x**10/10 + B*b**3*c**2*x*
*8/8 + B*b**3*c*d*x**10/5 + B*b**3*d**2*x**12/12)/e, Eq(m, -1)),
(A*a**3*c**2*e**m*m**6*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*
m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 48*A*a**3*
c**2*e**m*m**5*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5
7379*m**3 + 177331*m**2 + 264207*m + 135135) + 925*A*a**3*c**2*e*
*m*m**4*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m*
*3 + 177331*m**2 + 264207*m + 135135) + 9120*A*a**3*c**2*e**m*m**
3*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 1
77331*m**2 + 264207*m + 135135) + 48259*A*a**3*c**2*e**m*m**2*x*x
**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 129072*A*a**3*c**2*e**m*m*x*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 135135*A*a**3*c**2*e**m*x*x**m/(m**7 + 49*m
**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m
 + 135135) + 2*A*a**3*c*d*e**m*m**6*x**3*x**m/(m**7 + 49*m**6 + 9
73*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1351
35) + 92*A*a**3*c*d*e**m*m**5*x**3*x**m/(m**7 + 49*m**6 + 973*m**
5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
1670*A*a**3*c*d*e**m*m**4*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 1508
0*A*a**3*c*d*e**m*m**3*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 100
45*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 69518*A
*a**3*c*d*e**m*m**2*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*
m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 146108*A*a
**3*c*d*e**m*m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
+ 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 90090*A*a**3*c*
d*e**m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*
m**3 + 177331*m**2 + 264207*m + 135135) + A*a**3*d**2*e**m*m**6*x
**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 1
77331*m**2 + 264207*m + 135135) + 44*A*a**3*d**2*e**m*m**5*x**5*x
**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 753*A*a**3*d**2*e**m*m**4*x**5*x**m/
(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**
2 + 264207*m + 135135) + 6280*A*a**3*d**2*e**m*m**3*x**5*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
```

```
 264207*m + 135135) + 25979*A*a**3*d**2*e**m*m**2*x**5*x**m/(m**7
 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2
64207*m + 135135) + 47436*A*a**3*d**2*e**m*m*x**5*x**m/(m**7 + 49
*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207
*m + 135135) + 27027*A*a**3*d**2*e**m*x**5*x**m/(m**7 + 49*m**6 +
 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 13
5135) + 3*A*a**2*b*c**2*e**m*m**6*x**3*x**m/(m**7 + 49*m**6 + 973
*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135
) + 138*A*a**2*b*c**2*e**m*m**5*x**3*x**m/(m**7 + 49*m**6 + 973*m
**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
+ 2505*A*a**2*b*c**2*e**m*m**4*x**3*x**m/(m**7 + 49*m**6 + 973*m*
*5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
 22620*A*a**2*b*c**2*e**m*m**3*x**3*x**m/(m**7 + 49*m**6 + 973*m*
*5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
 104277*A*a**2*b*c**2*e**m*m**2*x**3*x**m/(m**7 + 49*m**6 + 973*m
**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
+ 219162*A*a**2*b*c**2*e**m*m*x**3*x**m/(m**7 + 49*m**6 + 973*m**
5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
135135*A*a**2*b*c**2*e**m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 6*A*
a**2*b*c*d*e**m*m**6*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045
*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 264*A*a**
2*b*c*d*e**m*m**5*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 4518*A*a**2*
b*c*d*e**m*m**4*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 37680*A*a**2*b
*c*d*e**m*m**3*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
+ 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 155874*A*a**2*b
*c*d*e**m*m**2*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
+ 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 284616*A*a**2*b
*c*d*e**m*m*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5
7379*m**3 + 177331*m**2 + 264207*m + 135135) + 162162*A*a**2*b*c*
d*e**m*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*
m**3 + 177331*m**2 + 264207*m + 135135) + 3*A*a**2*b*d**2*e**m*m*
*6*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3
 + 177331*m**2 + 264207*m + 135135) + 126*A*a**2*b*d**2*e**m*m**5
*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
 177331*m**2 + 264207*m + 135135) + 2037*A*a**2*b*d**2*e**m*m**4*
x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 15876*A*a**2*b*d**2*e**m*m**3*
x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 61005*A*a**2*b*d**2*e**m*m**2*
x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 104958*A*a**2*b*d**2*e**m*m*x*
*7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17
7331*m**2 + 264207*m + 135135) + 57915*A*a**2*b*d**2*e**m*x**7*x*
*m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*
m**2 + 264207*m + 135135) + 3*A*a*b**2*c**2*e**m*m**6*x**5*x**m/(
m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
 + 264207*m + 135135) + 132*A*a*b**2*c**2*e**m*m**5*x**5*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 2259*A*a*b**2*c**2*e**m*m**4*x**5*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 18840*A*a*b**2*c**2*e**m*m**3*x**5*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 77937*A*a*b**2*c**2*e**m*m**2*x**5*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 142308*A*a*b**2*c**2*e**m*m*x**5*x**m/(m**7
+ 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26
4207*m + 135135) + 81081*A*a*b**2*c**2*e**m*x**5*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 6*A*a*b**2*c*d*e**m*m**6*x**7*x**m/(m**7 + 49*m**6
+ 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1
35135) + 252*A*a*b**2*c*d*e**m*m**5*x**7*x**m/(m**7 + 49*m**6 + 9
73*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1351
35) + 4074*A*a*b**2*c*d*e**m*m**4*x**7*x**m/(m**7 + 49*m**6 + 973
*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135
) + 31752*A*a*b**2*c*d*e**m*m**3*x**7*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 122010*A*a*b**2*c*d*e**m*m**2*x**7*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 209916*A*a*b**2*c*d*e**m*m*x**7*x**m/(m**7 + 49*m**6 + 973*m**
5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
115830*A*a*b**2*c*d*e**m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 1
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0045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 3*A*a
*b**2*d**2*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045
*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 120*A*a*b
**2*d**2*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m
**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 1839*A*a*b*
*2*d**2*e**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 13584*A*a*b*
*2*d**2*e**m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 49881*A*a*b*
*2*d**2*e**m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 83064*A*a*b*
*2*d**2*e**m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
+ 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 45045*A*a*b**2*
d**2*e**m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 573
79*m**3 + 177331*m**2 + 264207*m + 135135) + A*b**3*c**2*e**m*m**
6*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3
+ 177331*m**2 + 264207*m + 135135) + 42*A*b**3*c**2*e**m*m**5*x**
7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177
331*m**2 + 264207*m + 135135) + 679*A*b**3*c**2*e**m*m**4*x**7*x*
*m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*
m**2 + 264207*m + 135135) + 5292*A*b**3*c**2*e**m*m**3*x**7*x**m/
(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**
2 + 264207*m + 135135) + 20335*A*b**3*c**2*e**m*m**2*x**7*x**m/(m
**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
+ 264207*m + 135135) + 34986*A*b**3*c**2*e**m*m*x**7*x**m/(m**7 +
 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264
207*m + 135135) + 19305*A*b**3*c**2*e**m*x**7*x**m/(m**7 + 49*m**
6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
 135135) + 2*A*b**3*c*d*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 973
*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135
) + 80*A*b**3*c*d*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m**5
+ 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 12
26*A*b**3*c*d*e**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 9056*A
*b**3*c*d*e**m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*
m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 33254*A*b*
*3*c*d*e**m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**
4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 55376*A*b**3*
c*d*e**m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 30030*A*b**3*c*d*e*
*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3
 + 177331*m**2 + 264207*m + 135135) + A*b**3*d**2*e**m*m**6*x**11
*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 1773
31*m**2 + 264207*m + 135135) + 38*A*b**3*d**2*e**m*m**5*x**11*x**
m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m
**2 + 264207*m + 135135) + 555*A*b**3*d**2*e**m*m**4*x**11*x**m/(
m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
 + 264207*m + 135135) + 3940*A*b**3*d**2*e**m*m**3*x**11*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 14039*A*b**3*d**2*e**m*m**2*x**11*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 22902*A*b**3*d**2*e**m*m*x**11*x**m/(m**7 +
49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2642
07*m + 135135) + 12285*A*b**3*d**2*e**m*x**11*x**m/(m**7 + 49*m**
6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
 135135) + B*a**3*c**2*e**m*m**6*x**3*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 46*B*a**3*c**2*e**m*m**5*x**3*x**m/(m**7 + 49*m**6 + 973*m**5
+ 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 83
5*B*a**3*c**2*e**m*m**4*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 7540*B
*a**3*c**2*e**m*m**3*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045
*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 34759*B*a
**3*c**2*e**m*m**2*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m
**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 73054*B*a**
3*c**2*e**m*m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 45045*B*a**3*c**
2*e**m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*
m**3 + 177331*m**2 + 264207*m + 135135) + 2*B*a**3*c*d*e**m*m**6*
x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 88*B*a**3*c*d*e**m*m**5*x**5*x
**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 1506*B*a**3*c*d*e**m*m**4*x**5*x**m/
(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**
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2 + 264207*m + 135135) + 12560*B*a**3*c*d*e**m*m**3*x**5*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 51958*B*a**3*c*d*e**m*m**2*x**5*x**m/(m**7
+ 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26
4207*m + 135135) + 94872*B*a**3*c*d*e**m*m*x**5*x**m/(m**7 + 49*m
6 + 973*m5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m
 + 135135) + 54054*B*a**3*c*d*e**m*x**5*x**m/(m**7 + 49*m**6 + 97
3*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 13513
5) + B*a**3*d**2*e**m*m**6*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 +
 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 42*
B*a**3*d**2*e**m*m**5*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 1004
5*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 679*B*a*
*3*d**2*e**m*m**4*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 5292*B*a**3*
d**2*e**m*m**3*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
+ 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 20335*B*a**3*d*
*2*e**m*m**2*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
57379*m**3 + 177331*m**2 + 264207*m + 135135) + 34986*B*a**3*d**2
*e**m*m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379
*m**3 + 177331*m**2 + 264207*m + 135135) + 19305*B*a**3*d**2*e**m
*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
 177331*m**2 + 264207*m + 135135) + 3*B*a**2*b*c**2*e**m*m**6*x**
5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177
331*m**2 + 264207*m + 135135) + 132*B*a**2*b*c**2*e**m*m**5*x**5*
x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17733
1*m**2 + 264207*m + 135135) + 2259*B*a**2*b*c**2*e**m*m**4*x**5*x
m/(m7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 18840*B*a**2*b*c**2*e**m*m**3*x**5*x
m/(m7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 77937*B*a**2*b*c**2*e**m*m**2*x**5*x
m/(m7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 142308*B*a**2*b*c**2*e**m*m*x**5*x**
m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m
2 + 264207*m + 135135) + 81081*B*a2*b*c**2*e**m*x**5*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 6*B*a**2*b*c*d*e**m*m**6*x**7*x**m/(m**7 +
49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2642
07*m + 135135) + 252*B*a**2*b*c*d*e**m*m**5*x**7*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 4074*B*a**2*b*c*d*e**m*m**4*x**7*x**m/(m**7 + 49*m*
*6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m
+ 135135) + 31752*B*a**2*b*c*d*e**m*m**3*x**7*x**m/(m**7 + 49*m**
6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
 135135) + 122010*B*a**2*b*c*d*e**m*m**2*x**7*x**m/(m**7 + 49*m**
6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
 135135) + 209916*B*a**2*b*c*d*e**m*m*x**7*x**m/(m**7 + 49*m**6 +
 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 13
5135) + 115830*B*a**2*b*c*d*e**m*x**7*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 3*B*a**2*b*d**2*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 973*m**5
 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 1
20*B*a**2*b*d**2*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 +
 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 183
9*B*a**2*b*d**2*e**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 1358
4*B*a**2*b*d**2*e**m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 4988
1*B*a**2*b*d**2*e**m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 8306
4*B*a**2*b*d**2*e**m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 100
45*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 45045*B
*a**2*b*d**2*e**m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 3*B*a*b**2*c
2*em*m**6*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 126*B*a*b**2*c**
2*e**m*m**5*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5
7379*m**3 + 177331*m**2 + 264207*m + 135135) + 2037*B*a*b**2*c**2
*e**m*m**4*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 15876*B*a*b**2*c**2
*e**m*m**3*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 61005*B*a*b**2*c**2
*e**m*m**2*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 104958*B*a*b**2*c**
2*e**m*m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5737

```
9*m**3 + 177331*m**2 + 264207*m + 135135) + 57915*B*a*b**2*c**2*e
**m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**
3 + 177331*m**2 + 264207*m + 135135) + 6*B*a*b**2*c*d*e**m*m**6*x
**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 1
77331*m**2 + 264207*m + 135135) + 240*B*a*b**2*c*d*e**m*m**5*x**9
*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 1773
31*m**2 + 264207*m + 135135) + 3678*B*a*b**2*c*d*e**m*m**4*x**9*x
**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 27168*B*a*b**2*c*d*e**m*m**3*x**9*x*
*m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*
m**2 + 264207*m + 135135) + 99762*B*a*b**2*c*d*e**m*m**2*x**9*x**
m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m
**2 + 264207*m + 135135) + 166128*B*a*b**2*c*d*e**m*m*x**9*x**m/(
m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
 + 264207*m + 135135) + 90090*B*a*b**2*c*d*e**m*x**9*x**m/(m**7 +
 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264
207*m + 135135) + 3*B*a*b**2*d**2*e**m*m**6*x**11*x**m/(m**7 + 49
*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207
*m + 135135) + 114*B*a*b**2*d**2*e**m*m**5*x**11*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 1665*B*a*b**2*d**2*e**m*m**4*x**11*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 11820*B*a*b**2*d**2*e**m*m**3*x**11*x**m/(m**7 + 49
*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207
*m + 135135) + 42117*B*a*b**2*d**2*e**m*m**2*x**11*x**m/(m**7 + 4
9*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26420
7*m + 135135) + 68706*B*a*b**2*d**2*e**m*m*x**11*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 36855*B*a*b**2*d**2*e**m*x**11*x**m/(m**7 + 49*m**6
 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
135135) + B*b**3*c**2*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 973*m
**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
+ 40*B*b**3*c**2*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 +
 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 613
*B*b**3*c**2*e**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 100
45*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 4528*B*
b**3*c**2*e**m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*
m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 16627*B*b*
*3*c**2*e**m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 27688*B*b**3
*c**2*e**m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
57379*m**3 + 177331*m**2 + 264207*m + 135135) + 15015*B*b**3*c**2
*e**m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m
**3 + 177331*m**2 + 264207*m + 135135) + 2*B*b**3*c*d*e**m*m**6*x
**11*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 76*B*b**3*c*d*e**m*m**5*x**11*
x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17733
1*m**2 + 264207*m + 135135) + 1110*B*b**3*c*d*e**m*m**4*x**11*x**
m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m
**2 + 264207*m + 135135) + 7880*B*b**3*c*d*e**m*m**3*x**11*x**m/(
m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
 + 264207*m + 135135) + 28078*B*b**3*c*d*e**m*m**2*x**11*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 45804*B*b**3*c*d*e**m*m*x**11*x**m/(m**7 +
49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2642
07*m + 135135) + 24570*B*b**3*c*d*e**m*x**11*x**m/(m**7 + 49*m**6
 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
135135) + B*b**3*d**2*e**m*m**6*x**13*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 36*B*b**3*d**2*e**m*m**5*x**13*x**m/(m**7 + 49*m**6 + 973*m**5
 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 5
05*B*b**3*d**2*e**m*m**4*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 3480
*B*b**3*d**2*e**m*m**3*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 12139*
B*b**3*d**2*e**m*m**2*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 100
45*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 19524*B
*b**3*d**2*e**m*m*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m
**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 10395*B*b**
3*d**2*e**m*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
57379*m**3 + 177331*m**2 + 264207*m + 135135), True))
```

GIAC/XCAS [A] time = 0.247482, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Done
```

3.9 $\int (ex)^m \left(a+bx^2\right)^2 \left(A+Bx^2\right) \left(c+dx^2\right)^2 \, dx$

Optimal. Leaf size=216

$$\frac{(ex)^{m+5}\left(A\left(a^2d^2+4abcd+b^2c^2\right)+2aBc(ad+bc)\right)}{e^5(m+5)}+\frac{(ex)^{m+7}\left(a^2Bd^2+2abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{e^7(m+7)}+\frac{a^2Ac^2(ex)^{m+1}}{e(m+1)}+\frac{bd(ex)^{m+9}(2aBd+Abd+2bBc)}{e^9(m+9)}+\frac{ac(ex)^{m+3}(2A(ad+bc)+aBc)}{e^3(m+3)}+\frac{b^2Bd^2(ex)^{m+11}}{e^{11}(m+11)}$$

```
[Out] (a^2*A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (a*c*(a*B*c + 2*A*(b*c +
a*d))*(e*x)^(3 + m))/(e^3*(3 + m)) + ((2*a*B*c*(b*c + a*d) + A*(b
^2*c^2 + 4*a*b*c*d + a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 + m)) + ((a
^2*B*d^2 + 2*a*b*d*(2*B*c + A*d) + b^2*c*(B*c + 2*A*d))*(e*x)^(7
+ m))/(e^7*(7 + m)) + (b*d*(2*b*B*c + A*b*d + 2*a*B*d)*(e*x)^(9 +
 m))/(e^9*(9 + m)) + (b^2*B*d^2*(e*x)^(11 + m))/(e^11*(11 + m))
```

Rubi [A] time = 0.559959, antiderivative size = 216, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.032

$$\frac{(ex)^{m+5}\left(A\left(a^2d^2+4abcd+b^2c^2\right)+2aBc(ad+bc)\right)}{e^5(m+5)}+\frac{(ex)^{m+7}\left(a^2Bd^2+2abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{e^7(m+7)}+\frac{a^2Ac^2(ex)^{m+1}}{e(m+1)}+\frac{bd(ex)^{m+9}(2aBd+Abd+2bBc)}{e^9(m+9)}+\frac{ac(ex)^{m+3}(2A(ad+bc)+aBc)}{e^3(m+3)}+\frac{b^2Bd^2(ex)^{m+11}}{e^{11}(m+11)}$$

Antiderivative was successfully verified.

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


```
[Out] (a^2*A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (a*c*(a*B*c + 2*A*(b*c +
a*d))*(e*x)^(3 + m))/(e^3*(3 + m)) + ((2*a*B*c*(b*c + a*d) + A*(b
^2*c^2 + 4*a*b*c*d + a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 + m)) + ((a
^2*B*d^2 + 2*a*b*d*(2*B*c + A*d) + b^2*c*(B*c + 2*A*d))*(e*x)^(7
+ m))/(e^7*(7 + m)) + (b*d*(2*b*B*c + A*b*d + 2*a*B*d)*(e*x)^(9 +
 m))/(e^9*(9 + m)) + (b^2*B*d^2*(e*x)^(11 + m))/(e^11*(11 + m))
```

Rubi in Sympy [A] time = 104.884, size = 235, normalized size = 1.09

$$\frac{Aa^2c^2\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bb^2d^2\,(ex)^{m+11}}{e^{11}\,(m+11)}+\frac{ac\,(ex)^{m+3}\,(2Aad+2Abc+Bac)}{e^3\,(m+3)}+\frac{bd\,(ex)^{m+9}\,(Abd+2Bad+2Bbc)}{e^9\,(m+9)}+\frac{(ex)^{m+5}\left(Aa^2d^2+4Aabcd+Ab^2c^2+2Ba^2cd+2Babc^2\right)}{e^5\,(m+5)}+\frac{(ex)^{m+7}\left(2Aabd^2+2Ab^2cd+Ba^2d^2+4Babcd+Bb^2c^2\right)}{e^7\,(m+7)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)**2*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] A*a**2*c**2*(e*x)**(m + 1)/(e*(m + 1)) + B*b**2*d**2*(e*x)**(m +
11)/(e**11*(m + 11)) + a*c*(e*x)**(m + 3)*(2*A*a*d + 2*A*b*c + B*
a*c)/(e**3*(m + 3)) + b*d*(e*x)**(m + 9)*(A*b*d + 2*B*a*d + 2*B*b
*c)/(e**9*(m + 9)) + (e*x)**(m + 5)*(A*a**2*d**2 + 4*A*a*b*c*d +
A*b**2*c**2 + 2*B*a**2*c*d + 2*B*a*b*c**2)/(e**5*(m + 5)) + (e*x)
**(m + 7)*(2*A*a*b*d**2 + 2*A*b**2*c*d + B*a**2*d**2 + 4*B*a*b*c*
```

```
d + B*b**2*c**2)/(e**7*(m + 7))
```

Mathematica [A] time = 0.779022, size = 178, normalized size = 0.82

$$(ex)^m\left(\frac{x^5\left(A\left(a^2d^2+4abcd+b^2c^2\right)+2aBc(ad+bc)\right)}{m+5}+\frac{x^7\left(a^2Bd^2+2abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{m+7}+\frac{a^2Ac^2x}{m+1}+\frac{bdx^9(2aBd+Abd+2bBc)}{m+9}+\frac{acx^3(2A(ad+bc)+aBc)}{m+3}+\frac{b^2Bd^2x^{11}}{m+11}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a^2*A*c^2*x)/(1 + m) + (a*c*(a*B*c + 2*A*(b*c + a*d))*x
^3)/(3 + m) + ((2*a*B*c*(b*c + a*d) + A*(b^2*c^2 + 4*a*b*c*d + a^
2*d^2))*x^5)/(5 + m) + ((a^2*B*d^2 + 2*a*b*d*(2*B*c + A*d) + b^2*
c*(B*c + 2*A*d))*x^7)/(7 + m) + (b*d*(2*b*B*c + A*b*d + 2*a*B*d)*
x^9)/(9 + m) + (b^2*B*d^2*x^11)/(11 + m))
```

Maple [B] time = 0.012, size = 1471, normalized size = 6.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b^2*d^2*m^5*x^10+25*B*b^2*d^2*m^4*x^10+A*b^2*d^2*m^5*x^8+2*B
*a*b*d^2*m^5*x^8+2*B*b^2*c*d*m^5*x^8+230*B*b^2*d^2*m^3*x^10+27*A*
b^2*d^2*m^4*x^8+54*B*a*b*d^2*m^4*x^8+54*B*b^2*c*d*m^4*x^8+950*B*b
^2*d^2*m^2*x^10+2*A*a*b*d^2*m^5*x^6+2*A*b^2*c*d*m^5*x^6+262*A*b^2
*d^2*m^3*x^8+B*a^2*d^2*m^5*x^6+4*B*a*b*c*d*m^5*x^6+524*B*a*b*d^2*
m^3*x^8+B*b^2*c^2*m^5*x^6+524*B*b^2*c*d*m^3*x^8+1689*B*b^2*d^2*m*
x^10+58*A*a*b*d^2*m^4*x^6+58*A*b^2*c*d*m^4*x^6+1122*A*b^2*d^2*m^2
*x^8+29*B*a^2*d^2*m^4*x^6+116*B*a*b*c*d*m^4*x^6+2244*B*a*b*d^2*m^
2*x^8+29*B*b^2*c^2*m^4*x^6+2244*B*b^2*c*d*m^2*x^8+945*B*b^2*d^2*x
^10+A*a^2*d^2*m^5*x^4+4*A*a*b*c*d*m^5*x^4+604*A*a*b*d^2*m^3*x^6+A
*b^2*c^2*m^5*x^4+604*A*b^2*c*d*m^3*x^6+2041*A*b^2*d^2*m*x^8+2*B*a
^2*c*d*m^5*x^4+302*B*a^2*d^2*m^3*x^6+2*B*a*b*c^2*m^5*x^4+1208*B*a
*b*c*d*m^3*x^6+4082*B*a*b*d^2*m*x^8+302*B*b^2*c^2*m^3*x^6+4082*B*
b^2*c*d*m*x^8+31*A*a^2*d^2*m^4*x^4+124*A*a*b*c*d*m^4*x^4+2732*A*a
*b*d^2*m^2*x^6+31*A*b^2*c^2*m^4*x^4+2732*A*b^2*c*d*m^2*x^6+1155*A
*b^2*d^2*x^8+62*B*a^2*c*d*m^4*x^4+1366*B*a^2*d^2*m^2*x^6+62*B*a*b
*c^2*m^4*x^4+5464*B*a*b*c*d*m^2*x^6+2310*B*a*b*d^2*x^8+1366*B*b^2
*c^2*m^2*x^6+2310*B*b^2*c*d*x^8+2*A*a^2*c*d*m^5*x^2+350*A*a^2*d^2
*m^3*x^4+2*A*a*b*c^2*m^5*x^2+1400*A*a*b*c*d*m^3*x^4+5154*A*a*b*d^
2*m*x^6+350*A*b^2*c^2*m^3*x^4+5154*A*b^2*c*d*m*x^6+B*a^2*c^2*m^5*
x^2+700*B*a^2*c*d*m^3*x^4+2577*B*a^2*d^2*m*x^6+700*B*a*b*c^2*m^3*
x^4+10308*B*a*b*c*d*m*x^6+2577*B*b^2*c^2*m*x^6+66*A*a^2*c*d*m^4*x
^2+1730*A*a^2*d^2*m^2*x^4+66*A*a*b*c^2*m^4*x^2+6920*A*a*b*c*d*m^2
*x^4+2970*A*a*b*d^2*x^6+1730*A*b^2*c^2*m^2*x^4+2970*A*b^2*c*d*x^6
+33*B*a^2*c^2*m^4*x^2+3460*B*a^2*c*d*m^2*x^4+1485*B*a^2*d^2*x^6+3
460*B*a*b*c^2*m^2*x^4+5940*B*a*b*c*d*x^6+1485*B*b^2*c^2*x^6+A*a^2
*c^2*m^5+812*A*a^2*c*d*m^3*x^2+3489*A*a^2*d^2*m*x^4+812*A*a*b*c^2
*m^3*x^2+13956*A*a*b*c*d*m*x^4+3489*A*b^2*c^2*m*x^4+406*B*a^2*c^2
*m^3*x^2+6978*B*a^2*c*d*m*x^4+6978*B*a*b*c^2*m*x^4+35*A*a^2*c^2*m
^4+4524*A*a^2*c*d*m^2*x^2+2079*A*a^2*d^2*x^4+4524*A*a*b*c^2*m^2*x
^2+8316*A*a*b*c*d*x^4+2079*A*b^2*c^2*x^4+2262*B*a^2*c^2*m^2*x^2+4
158*B*a^2*c*d*x^4+4158*B*a*b*c^2*x^4+470*A*a^2*c^2*m^3+10706*A*a^
2*c*d*m*x^2+10706*A*a*b*c^2*m*x^2+5353*B*a^2*c^2*m*x^2+3010*A*a^2
*c^2*m^2+6930*A*a^2*c*d*x^2+6930*A*a*b*c^2*x^2+3465*B*a^2*c^2*x^2
+9129*A*a^2*c^2*m+10395*A*a^2*c^2)*(e*x)^m/(11+m)/(9+m)/(7+m)/(5+
```

```
m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.264621, size = 1408, normalized size = 6.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^2*d^2*m^5 + 25*B*b^2*d^2*m^4 + 230*B*b^2*d^2*m^3 + 950*B*b^
2*d^2*m^2 + 1689*B*b^2*d^2*m + 945*B*b^2*d^2)*x^11 + ((2*B*b^2*c*
d + (2*B*a*b + A*b^2)*d^2)*m^5 + 2310*B*b^2*c*d + 27*(2*B*b^2*c*d
 + (2*B*a*b + A*b^2)*d^2)*m^4 + 262*(2*B*b^2*c*d + (2*B*a*b + A*b
^2)*d^2)*m^3 + 1155*(2*B*a*b + A*b^2)*d^2 + 1122*(2*B*b^2*c*d + (
2*B*a*b + A*b^2)*d^2)*m^2 + 2041*(2*B*b^2*c*d + (2*B*a*b + A*b^2)
*d^2)*m)*x^9 + ((B*b^2*c^2 + 2*(2*B*a*b + A*b^2)*c*d + (B*a^2 + 2
*A*a*b)*d^2)*m^5 + 1485*B*b^2*c^2 + 29*(B*b^2*c^2 + 2*(2*B*a*b +
A*b^2)*c*d + (B*a^2 + 2*A*a*b)*d^2)*m^4 + 302*(B*b^2*c^2 + 2*(2*B
*a*b + A*b^2)*c*d + (B*a^2 + 2*A*a*b)*d^2)*m^3 + 2970*(2*B*a*b +
A*b^2)*c*d + 1485*(B*a^2 + 2*A*a*b)*d^2 + 1366*(B*b^2*c^2 + 2*(2*
B*a*b + A*b^2)*c*d + (B*a^2 + 2*A*a*b)*d^2)*m^2 + 2577*(B*b^2*c^2
 + 2*(2*B*a*b + A*b^2)*c*d + (B*a^2 + 2*A*a*b)*d^2)*m)*x^7 + ((A*
a^2*d^2 + (2*B*a*b + A*b^2)*c^2 + 2*(B*a^2 + 2*A*a*b)*c*d)*m^5 +
2079*A*a^2*d^2 + 31*(A*a^2*d^2 + (2*B*a*b + A*b^2)*c^2 + 2*(B*a^2
 + 2*A*a*b)*c*d)*m^4 + 350*(A*a^2*d^2 + (2*B*a*b + A*b^2)*c^2 + 2
*(B*a^2 + 2*A*a*b)*c*d)*m^3 + 2079*(2*B*a*b + A*b^2)*c^2 + 4158*(
B*a^2 + 2*A*a*b)*c*d + 1730*(A*a^2*d^2 + (2*B*a*b + A*b^2)*c^2 +
2*(B*a^2 + 2*A*a*b)*c*d)*m^2 + 3489*(A*a^2*d^2 + (2*B*a*b + A*b^2
)*c^2 + 2*(B*a^2 + 2*A*a*b)*c*d)*m)*x^5 + ((2*A*a^2*c*d + (B*a^2
+ 2*A*a*b)*c^2)*m^5 + 6930*A*a^2*c*d + 33*(2*A*a^2*c*d + (B*a^2 +
 2*A*a*b)*c^2)*m^4 + 406*(2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^
3 + 3465*(B*a^2 + 2*A*a*b)*c^2 + 2262*(2*A*a^2*c*d + (B*a^2 + 2*A
*a*b)*c^2)*m^2 + 5353*(2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m)*x^
3 + (A*a^2*c^2*m^5 + 35*A*a^2*c^2*m^4 + 470*A*a^2*c^2*m^3 + 3010*
A*a^2*c^2*m^2 + 9129*A*a^2*c^2*m + 10395*A*a^2*c^2)*x)*(e*x)^m/(m
^6 + 36*m^5 + 505*m^4 + 3480*m^3 + 12139*m^2 + 19524*m + 10395)
```

Sympy [A] time = 11.0196, size = 7019, normalized size = 32.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise(((-A*a**2*c**2/(10*x**10) - A*a**2*c*d/(4*x**8) - A*a**
2*d**2/(6*x**6) - A*a*b*c**2/(4*x**8) - 2*A*a*b*c*d/(3*x**6) - A*
a*b*d**2/(2*x**4) - A*b**2*c**2/(6*x**6) - A*b**2*c*d/(2*x**4) -
A*b**2*d**2/(2*x**2) - B*a**2*c**2/(8*x**8) - B*a**2*c*d/(3*x**6)
```

```
 - B*a**2*d**2/(4*x**4) - B*a*b*c**2/(3*x**6) - B*a*b*c*d/x**4 -
B*a*b*d**2/x**2 - B*b**2*c**2/(4*x**4) - B*b**2*c*d/x**2 + B*b**2
*d**2*log(x))/e**11, Eq(m, -11)), ((-A*a**2*c**2/(8*x**8) - A*a**
2*c*d/(3*x**6) - A*a**2*d**2/(4*x**4) - A*a*b*c**2/(3*x**6) - A*a
*b*c*d/x**4 - A*a*b*d**2/x**2 - A*b**2*c**2/(4*x**4) - A*b**2*c*d
/x**2 + A*b**2*d**2*log(x) - B*a**2*c**2/(6*x**6) - B*a**2*c*d/(2
*x**4) - B*a**2*d**2/(2*x**2) - B*a*b*c**2/(2*x**4) - 2*B*a*b*c*d
/x**2 + 2*B*a*b*d**2*log(x) - B*b**2*c**2/(2*x**2) + 2*B*b**2*c*d
*log(x) + B*b**2*d**2*x**2/2)/e**9, Eq(m, -9)), ((-A*a**2*c**2/(6
*x**6) - A*a**2*c*d/(2*x**4) - A*a**2*d**2/(2*x**2) - A*a*b*c**2/
(2*x**4) - 2*A*a*b*c*d/x**2 + 2*A*a*b*d**2*log(x) - A*b**2*c**2/(
2*x**2) + 2*A*b**2*c*d*log(x) + A*b**2*d**2*x**2/2 - B*a**2*c**2/
(4*x**4) - B*a**2*c*d/x**2 + B*a**2*d**2*log(x) - B*a*b*c**2/x**2
 + 4*B*a*b*c*d*log(x) + B*a*b*d**2*x**2 + B*b**2*c**2*log(x) + B*
b**2*c*d*x**2 + B*b**2*d**2*x**4/4)/e**7, Eq(m, -7)), ((-A*a**2*c
**2/(4*x**4) - A*a**2*c*d/x**2 + A*a**2*d**2*log(x) - A*a*b*c**2/
x**2 + 4*A*a*b*c*d*log(x) + A*a*b*d**2*x**2 + A*b**2*c**2*log(x)
+ A*b**2*c*d*x**2 + A*b**2*d**2*x**4/4 - B*a**2*c**2/(2*x**2) + 2
*B*a**2*c*d*log(x) + B*a**2*d**2*x**2/2 + 2*B*a*b*c**2*log(x) + 2
*B*a*b*c*d*x**2 + B*a*b*d**2*x**4/2 + B*b**2*c**2*x**2/2 + B*b**2
*c*d*x**4/2 + B*b**2*d**2*x**6/6)/e**5, Eq(m, -5)), ((-A*a**2*c**
2/(2*x**2) + 2*A*a**2*c*d*log(x) + A*a**2*d**2*x**2/2 + 2*A*a*b*c
**2*log(x) + 2*A*a*b*c*d*x**2 + A*a*b*d**2*x**4/2 + A*b**2*c**2*x
**2/2 + A*b**2*c*d*x**4/2 + A*b**2*d**2*x**6/6 + B*a**2*c**2*log(
x) + B*a**2*c*d*x**2 + B*a**2*d**2*x**4/4 + B*a*b*c**2*x**2 + B*a
*b*c*d*x**4 + B*a*b*d**2*x**6/3 + B*b**2*c**2*x**4/4 + B*b**2*c*d
*x**6/3 + B*b**2*d**2*x**8/8)/e**3, Eq(m, -3)), ((A*a**2*c**2*log
(x) + A*a**2*c*d*x**2 + A*a**2*d**2*x**4/4 + A*a*b*c**2*x**2 + A*
a*b*c*d*x**4 + A*a*b*d**2*x**6/3 + A*b**2*c**2*x**4/4 + A*b**2*c*
d*x**6/3 + A*b**2*d**2*x**8/8 + B*a**2*c**2*x**2/2 + B*a**2*c*d*x
**4/2 + B*a**2*d**2*x**6/6 + B*a*b*c**2*x**4/2 + 2*B*a*b*c*d*x**6
/3 + B*a*b*d**2*x**8/4 + B*b**2*c**2*x**6/6 + B*b**2*c*d*x**8/4 +
 B*b**2*d**2*x**10/10)/e, Eq(m, -1)), (A*a**2*c**2*e**m*m**5*x*x*
*m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
+ 10395) + 35*A*a**2*c**2*e**m*m**4*x*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 470*A*a**2*c**
2*e**m*m**3*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139
*m**2 + 19524*m + 10395) + 3010*A*a**2*c**2*e**m*m**2*x*x**m/(m**
6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395
) + 9129*A*a**2*c**2*e**m*m*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3
480*m**3 + 12139*m**2 + 19524*m + 10395) + 10395*A*a**2*c**2*e**m
*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 2*A*a**2*c*d*e**m*m**5*x**3*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 66*A*a**
2*c*d*e**m*m**4*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 812*A*a**2*c*d*e**m*m**3*x**3*x
**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
 + 10395) + 4524*A*a**2*c*d*e**m*m**2*x**3*x**m/(m**6 + 36*m**5 +
 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 10706*A*a
**2*c*d*e**m*m*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
 12139*m**2 + 19524*m + 10395) + 6930*A*a**2*c*d*e**m*x**3*x**m/(
m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10
395) + A*a**2*d**2*e**m*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4
 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 31*A*a**2*d**2*e**
m*m**4*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m
**2 + 19524*m + 10395) + 350*A*a**2*d**2*e**m*m**3*x**5*x**m/(m**
6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395
) + 1730*A*a**2*d**2*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m*
*4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3489*A*a**2*d**2
*e**m*m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 2079*A*a**2*d**2*e**m*x**5*x**m/(m**6 +
 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) +
 2*A*a*b*c**2*e**m*m**5*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 34
80*m**3 + 12139*m**2 + 19524*m + 10395) + 66*A*a*b*c**2*e**m*m**4
*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
19524*m + 10395) + 812*A*a*b*c**2*e**m*m**3*x**3*x**m/(m**6 + 36*
m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 452
4*A*a*b*c**2*e**m*m**2*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 348
0*m**3 + 12139*m**2 + 19524*m + 10395) + 10706*A*a*b*c**2*e**m*m*
x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1
9524*m + 10395) + 6930*A*a*b*c**2*e**m*x**3*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 4*A*a*b*
c*d*e**m*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 124*A*a*b*c*d*e**m*m**4*x**5*x**m
```

```
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 1400*A*a*b*c*d*e**m*m**3*x**5*x**m/(m**6 + 36*m**5 + 505
*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 6920*A*a*b*c*
d*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 13956*A*a*b*c*d*e**m*m*x**5*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 8316*A*a*b*c*d*e**m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 +
3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2*A*a*b*d**2*e**m*m**
5*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
 19524*m + 10395) + 58*A*a*b*d**2*e**m*m**4*x**7*x**m/(m**6 + 36*
m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 604
*A*a*b*d**2*e**m*m**3*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480
*m**3 + 12139*m**2 + 19524*m + 10395) + 2732*A*a*b*d**2*e**m*m**2
*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
19524*m + 10395) + 5154*A*a*b*d**2*e**m*m*x**7*x**m/(m**6 + 36*m*
*5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2970*
A*a*b*d**2*e**m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + A*b**2*c**2*e**m*m**5*x**5*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 31*A*b**2*c**2*e**m*m**4*x**5*x**m/(m**6 + 36*m**5 + 505
*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 350*A*b**2*c*
*2*e**m*m**3*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 1
2139*m**2 + 19524*m + 10395) + 1730*A*b**2*c**2*e**m*m**2*x**5*x*
*m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
+ 10395) + 3489*A*b**2*c**2*e**m*m*x**5*x**m/(m**6 + 36*m**5 + 50
5*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2079*A*b**2*
c**2*e**m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 1213
9*m**2 + 19524*m + 10395) + 2*A*b**2*c*d*e**m*m**5*x**7*x**m/(m**
6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395
) + 58*A*b**2*c*d*e**m*m**4*x**7*x**m/(m**6 + 36*m**5 + 505*m**4
+ 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 604*A*b**2*c*d*e**m
*m**3*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m*
*2 + 19524*m + 10395) + 2732*A*b**2*c*d*e**m*m**2*x**7*x**m/(m**6
 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395)
 + 5154*A*b**2*c*d*e**m*m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 +
3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2970*A*b**2*c*d*e**m*
x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1
9524*m + 10395) + A*b**2*d**2*e**m*m**5*x**9*x**m/(m**6 + 36*m**5
 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 27*A*b*
*2*d**2*e**m*m**4*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**
3 + 12139*m**2 + 19524*m + 10395) + 262*A*b**2*d**2*e**m*m**3*x**
9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1952
4*m + 10395) + 1122*A*b**2*d**2*e**m*m**2*x**9*x**m/(m**6 + 36*m*
*5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2041*
A*b**2*d**2*e**m*m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m*
*3 + 12139*m**2 + 19524*m + 10395) + 1155*A*b**2*d**2*e**m*x**9*x
**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
 + 10395) + B*a**2*c**2*e**m*m**5*x**3*x**m/(m**6 + 36*m**5 + 505
*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 33*B*a**2*c**
2*e**m*m**4*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 406*B*a**2*c**2*e**m*m**3*x**3*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 2262*B*a**2*c**2*e**m*m**2*x**3*x**m/(m**6 + 36*m**5 + 5
05*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5353*B*a**2
*c**2*e**m*m*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 1
2139*m**2 + 19524*m + 10395) + 3465*B*a**2*c**2*e**m*x**3*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 2*B*a**2*c*d*e**m*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4
 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 62*B*a**2*c*d*e**m
*m**4*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m*
*2 + 19524*m + 10395) + 700*B*a**2*c*d*e**m*m**3*x**5*x**m/(m**6
+ 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395)
+ 3460*B*a**2*c*d*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m**4
+ 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 6978*B*a**2*c*d*e**
m*m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
 + 19524*m + 10395) + 4158*B*a**2*c*d*e**m*x**5*x**m/(m**6 + 36*m
**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + B*a*
*2*d**2*e**m*m**5*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**
3 + 12139*m**2 + 19524*m + 10395) + 29*B*a**2*d**2*e**m*m**4*x**7
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 302*B*a**2*d**2*e**m*m**3*x**7*x**m/(m**6 + 36*m**5
 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1366*B*
a**2*d**2*e**m*m**2*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m
**3 + 12139*m**2 + 19524*m + 10395) + 2577*B*a**2*d**2*e**m*m*x**
```

```
7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1952
4*m + 10395) + 1485*B*a**2*d**2*e**m*x**7*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2*B*a*b*c*
*2*e**m*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 1
2139*m**2 + 19524*m + 10395) + 62*B*a*b*c**2*e**m*m**4*x**5*x**m/
(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1
0395) + 700*B*a*b*c**2*e**m*m**3*x**5*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3460*B*a*b*c**
2*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 6978*B*a*b*c**2*e**m*m*x**5*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 4158*B*a*b*c**2*e**m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 +
 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 4*B*a*b*c*d*e**m*m**
5*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
 19524*m + 10395) + 116*B*a*b*c*d*e**m*m**4*x**7*x**m/(m**6 + 36*
m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 120
8*B*a*b*c*d*e**m*m**3*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480
*m**3 + 12139*m**2 + 19524*m + 10395) + 5464*B*a*b*c*d*e**m*m**2*
x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1
9524*m + 10395) + 10308*B*a*b*c*d*e**m*m*x**7*x**m/(m**6 + 36*m**
5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5940*B
*a*b*c*d*e**m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 2*B*a*b*d**2*e**m*m**5*x**9*x**m/
(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1
0395) + 54*B*a*b*d**2*e**m*m**4*x**9*x**m/(m**6 + 36*m**5 + 505*m
**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 524*B*a*b*d**2*
e**m*m**3*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 1213
9*m**2 + 19524*m + 10395) + 2244*B*a*b*d**2*e**m*m**2*x**9*x**m/(
m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10
395) + 4082*B*a*b*d**2*e**m*m*x**9*x**m/(m**6 + 36*m**5 + 505*m**
4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2310*B*a*b*d**2*e
**m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
 + 19524*m + 10395) + B*b**2*c**2*e**m*m**5*x**7*x**m/(m**6 + 36*
m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 29*
B*b**2*c**2*e**m*m**4*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480
*m**3 + 12139*m**2 + 19524*m + 10395) + 302*B*b**2*c**2*e**m*m**3
*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
19524*m + 10395) + 1366*B*b**2*c**2*e**m*m**2*x**7*x**m/(m**6 + 3
6*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 2
577*B*b**2*c**2*e**m*m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 348
0*m**3 + 12139*m**2 + 19524*m + 10395) + 1485*B*b**2*c**2*e**m*x*
*7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 2*B*b**2*c*d*e**m*m**5*x**9*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 54*B*b**
2*c*d*e**m*m**4*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 524*B*b**2*c*d*e**m*m**3*x**9*x
**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
 + 10395) + 2244*B*b**2*c*d*e**m*m**2*x**9*x**m/(m**6 + 36*m**5 +
 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 4082*B*b*
*2*c*d*e**m*m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 2310*B*b**2*c*d*e**m*x**9*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + B*b**2*d**2*e**m*m**5*x**11*x**m/(m**6 + 36*m**5 + 505*m**4
 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 25*B*b**2*d**2*e**
m*m**4*x**11*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 230*B*b**2*d**2*e**m*m**3*x**11*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 950*B*b**2*d**2*e**m*m**2*x**11*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1689*B*b**2*d*
*2*e**m*m*x**11*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 121
39*m**2 + 19524*m + 10395) + 945*B*b**2*d**2*e**m*x**11*x**m/(m**
6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395
), True))
```

GIAC/XCAS [A] time = 0.228532, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Done
```

3.10 $\int (ex)^m \left(a+bx^2\right) \left(A+Bx^2\right) \left(c+dx^2\right)^2 \, dx$

Optimal. Leaf size=144

$$\frac{d(ex)^{m+7}(aBd+Abd+2bBc)}{e^7(m+7)}+\frac{(ex)^{m+5}(ad(Ad+2Bc)+bc(2Ad+Bc))}{e^5(m+5)}+\frac{c(ex)^{m+3}(2aAd+aBc+Abc)}{e^3(m+3)}+\frac{aAc^2(ex)^{m+1}}{e(m+1)}+\frac{bBd^2(ex)^{m+9}}{e^9(m+9)}$$

```
[Out] (a*A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (c*(A*b*c + a*B*c + 2*a*A*d
)*(e*x)^(3 + m))/(e^3*(3 + m)) + ((a*d*(2*B*c + A*d) + b*c*(B*c +
 2*A*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (d*(2*b*B*c + A*b*d + a*B
*d)*(e*x)^(7 + m))/(e^7*(7 + m)) + (b*B*d^2*(e*x)^(9 + m))/(e^9*(
9 + m))
```

Rubi [A] time = 0.333618, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.034

$$\frac{d(ex)^{m+7}(aBd+Abd+2bBc)}{e^7(m+7)}+\frac{(ex)^{m+5}(ad(Ad+2Bc)+bc(2Ad+Bc))}{e^5(m+5)}+\frac{c(ex)^{m+3}(2aAd+aBc+Abc)}{e^3(m+3)}+\frac{aAc^2(ex)^{m+1}}{e(m+1)}+\frac{bBd^2(ex)^{m+9}}{e^9(m+9)}$$

Antiderivative was successfully verified.

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

```
[Out] (a*A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (c*(A*b*c + a*B*c + 2*a*A*d
)*(e*x)^(3 + m))/(e^3*(3 + m)) + ((a*d*(2*B*c + A*d) + b*c*(B*c +
 2*A*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (d*(2*b*B*c + A*b*d + a*B
*d)*(e*x)^(7 + m))/(e^7*(7 + m)) + (b*B*d^2*(e*x)^(9 + m))/(e^9*(
9 + m))
```

Rubi in Sympy [A] time = 53.6277, size = 146, normalized size = 1.01

$$\frac{Aac^2\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bbd^2\,(ex)^{m+9}}{e^9\,(m+9)}+\frac{c\,(ex)^{m+3}\,(2Aad+Abc+Bac)}{e^3\,(m+3)}+\frac{d\,(ex)^{m+7}\,(Abd+Bad+2Bbc)}{e^7\,(m+7)}+\frac{(ex)^{m+5}\left(Aad^2+2Abcd+2Bacd+Bbc^2\right)}{e^5\,(m+5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] A*a*c**2*(e*x)**(m + 1)/(e*(m + 1)) + B*b*d**2*(e*x)**(m + 9)/(e*
*9*(m + 9)) + c*(e*x)**(m + 3)*(2*A*a*d + A*b*c + B*a*c)/(e**3*(m
 + 3)) + d*(e*x)**(m + 7)*(A*b*d + B*a*d + 2*B*b*c)/(e**7*(m + 7)
) + (e*x)**(m + 5)*(A*a*d**2 + 2*A*b*c*d + 2*B*a*c*d + B*b*c**2)/
(e**5*(m + 5))
```

Mathematica [A] time = 0.357779, size = 115, normalized size = 0.8

$$(ex)^m\left(\frac{x^5\left(aAd^2+2aBcd+2Abcd+bBc^2\right)}{m+5}+\frac{dx^7(aBd+Abd+2bBc)}{m+7}+\frac{cx^3(2aAd+aBc+Abc)}{m+3}+\frac{aAc^2x}{m+1}+\frac{bBd^2x^9}{m+9}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a*A*c^2*x)/(1 + m) + (c*(A*b*c + a*B*c + 2*a*A*d)*x^3)/
(3 + m) + ((b*B*c^2 + 2*A*b*c*d + 2*a*B*c*d + a*A*d^2)*x^5)/(5 +
m) + (d*(2*b*B*c + A*b*d + a*B*d)*x^7)/(7 + m) + (b*B*d^2*x^9)/(9
 + m))
```

Maple [B] time = 0.01, size = 711, normalized size = 4.9

$$\frac{\left(Bbd^2m^4x^8 + 16\,Bbd^2m^3x^8 + Abd^2m^4x^6 + Bad^2m^4x^6 + 2\,Bbcdm^4x^6 + 86\,Bbd^2m^2x^8 + 18\,Abd^2m^3x^6 + 18\,Bad^2m^3x^6 + 36\,Bbc\ldots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b*d^2*m^4*x^8+16*B*b*d^2*m^3*x^8+A*b*d^2*m^4*x^6+B*a*d^2*m^4
*x^6+2*B*b*c*d*m^4*x^6+86*B*b*d^2*m^2*x^8+18*A*b*d^2*m^3*x^6+18*B
*a*d^2*m^3*x^6+36*B*b*c*d*m^3*x^6+176*B*b*d^2*m*x^8+A*a*d^2*m^4*x
^4+2*A*b*c*d*m^4*x^4+104*A*b*d^2*m^2*x^6+2*B*a*c*d*m^4*x^4+104*B*
a*d^2*m^2*x^6+B*b*c^2*m^4*x^4+208*B*b*c*d*m^2*x^6+105*B*b*d^2*x^8
+20*A*a*d^2*m^3*x^4+40*A*b*c*d*m^3*x^4+222*A*b*d^2*m*x^6+40*B*a*c
*d*m^3*x^4+222*B*a*d^2*m*x^6+20*B*b*c^2*m^3*x^4+444*B*b*c*d*m*x^6
+2*A*a*c*d*m^4*x^2+130*A*a*d^2*m^2*x^4+A*b*c^2*m^4*x^2+260*A*b*c*
d*m^2*x^4+135*A*b*d^2*x^6+B*a*c^2*m^4*x^2+260*B*a*c*d*m^2*x^4+135
*B*a*d^2*x^6+130*B*b*c^2*m^2*x^4+270*B*b*c*d*x^6+44*A*a*c*d*m^3*x
^2+300*A*a*d^2*m*x^4+22*A*b*c^2*m^3*x^2+600*A*b*c*d*m*x^4+22*B*a*
c^2*m^3*x^2+600*B*a*c*d*m*x^4+300*B*b*c^2*m*x^4+A*a*c^2*m^4+328*A
*a*c*d*m^2*x^2+189*A*a*d^2*x^4+164*A*b*c^2*m^2*x^2+378*A*b*c*d*x^
4+164*B*a*c^2*m^2*x^2+378*B*a*c*d*x^4+189*B*b*c^2*x^4+24*A*a*c^2*
m^3+916*A*a*c*d*m*x^2+458*A*b*c^2*m*x^2+458*B*a*c^2*m*x^2+206*A*a
*c^2*m^2+630*A*a*c*d*x^2+315*A*b*c^2*x^2+315*B*a*c^2*x^2+744*A*a*
c^2*m+945*A*a*c^2)*(e*x)^m/(9+m)/(7+m)/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.260677, size = 668, normalized size = 4.64

$$\frac{\left(\left(Bbd^2m^4 + 16\,Bbd^2m^3 + 86\,Bbd^2m^2 + 176\,Bbd^2m + 105\,Bbd^2\right)x^9 + \left(\left(2\,Bbcd + (Ba + Ab)d^2\right)m^4 + 270\,Bbcd + 18\,\left(2\,Bbcd + \ldots\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b*d^2*m^4 + 16*B*b*d^2*m^3 + 86*B*b*d^2*m^2 + 176*B*b*d^2*m +
 105*B*b*d^2)*x^9 + ((2*B*b*c*d + (B*a + A*b)*d^2)*m^4 + 270*B*b*
c*d + 18*(2*B*b*c*d + (B*a + A*b)*d^2)*m^3 + 135*(B*a + A*b)*d^2
+ 104*(2*B*b*c*d + (B*a + A*b)*d^2)*m^2 + 222*(2*B*b*c*d + (B*a +
```

```
 A*b)*d^2)*m)*x^7 + ((B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d)*m^4
+ 189*B*b*c^2 + 189*A*a*d^2 + 20*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*
b)*c*d)*m^3 + 378*(B*a + A*b)*c*d + 130*(B*b*c^2 + A*a*d^2 + 2*(B
*a + A*b)*c*d)*m^2 + 300*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d)*
m)*x^5 + ((2*A*a*c*d + (B*a + A*b)*c^2)*m^4 + 630*A*a*c*d + 22*(2
*A*a*c*d + (B*a + A*b)*c^2)*m^3 + 315*(B*a + A*b)*c^2 + 164*(2*A*
a*c*d + (B*a + A*b)*c^2)*m^2 + 458*(2*A*a*c*d + (B*a + A*b)*c^2)*
m)*x^3 + (A*a*c^2*m^4 + 24*A*a*c^2*m^3 + 206*A*a*c^2*m^2 + 744*A*
a*c^2*m + 945*A*a*c^2)*x)*(e*x)^m/(m^5 + 25*m^4 + 230*m^3 + 950*m
^2 + 1689*m + 945)
```

Sympy [A] time = 5.62566, size = 3373, normalized size = 23.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise(((-A*a*c**2/(8*x**8) - A*a*c*d/(3*x**6) - A*a*d**2/(4*x
**4) - A*b*c**2/(6*x**6) - A*b*c*d/(2*x**4) - A*b*d**2/(2*x**2) -
 B*a*c**2/(6*x**6) - B*a*c*d/(2*x**4) - B*a*d**2/(2*x**2) - B*b*c
**2/(4*x**4) - B*b*c*d/x**2 + B*b*d**2*log(x))/e**9, Eq(m, -9)),
((-A*a*c**2/(6*x**6) - A*a*c*d/(2*x**4) - A*a*d**2/(2*x**2) - A*b
*c**2/(4*x**4) - A*b*c*d/x**2 + A*b*d**2*log(x) - B*a*c**2/(4*x**
4) - B*a*c*d/x**2 + B*a*d**2*log(x) - B*b*c**2/(2*x**2) + 2*B*b*c
*d*log(x) + B*b*d**2*x**2/2)/e**7, Eq(m, -7)), ((-A*a*c**2/(4*x**
4) - A*a*c*d/x**2 + A*a*d**2*log(x) - A*b*c**2/(2*x**2) + 2*A*b*c
*d*log(x) + A*b*d**2*x**2/2 - B*a*c**2/(2*x**2) + 2*B*a*c*d*log(x
) + B*a*d**2*x**2/2 + B*b*c**2*log(x) + B*b*c*d*x**2 + B*b*d**2*x
**4/4)/e**5, Eq(m, -5)), ((-A*a*c**2/(2*x**2) + 2*A*a*c*d*log(x)
+ A*a*d**2*x**2/2 + A*b*c**2*log(x) + A*b*c*d*x**2 + A*b*d**2*x**
4/4 + B*a*c**2*log(x) + B*a*c*d*x**2 + B*a*d**2*x**4/4 + B*b*c**2
*x**2/2 + B*b*c*d*x**4/2 + B*b*d**2*x**6/6)/e**3, Eq(m, -3)), ((A
*a*c**2*log(x) + A*a*c*d*x**2 + A*a*d**2*x**4/4 + A*b*c**2*x**2/2
 + A*b*c*d*x**4/2 + A*b*d**2*x**6/6 + B*a*c**2*x**2/2 + B*a*c*d*x
**4/2 + B*a*d**2*x**6/6 + B*b*c**2*x**4/4 + B*b*c*d*x**6/3 + B*b*
d**2*x**8/8)/e, Eq(m, -1)), (A*a*c**2*e**m*m**4*x*x**m/(m**5 + 25
*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 24*A*a*c**2*e**m*m*
*3*x*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
 206*A*a*c**2*e**m*m**2*x*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m
**2 + 1689*m + 945) + 744*A*a*c**2*e**m*m*x*x**m/(m**5 + 25*m**4
+ 230*m**3 + 950*m**2 + 1689*m + 945) + 945*A*a*c**2*e**m*x*x**m/
(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 2*A*a*c*d
*e**m*m**4*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689
*m + 945) + 44*A*a*c*d*e**m*m**3*x**3*x**m/(m**5 + 25*m**4 + 230*
m**3 + 950*m**2 + 1689*m + 945) + 328*A*a*c*d*e**m*m**2*x**3*x**m
/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 916*A*a*
c*d*e**m*m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689
*m + 945) + 630*A*a*c*d*e**m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3
 + 950*m**2 + 1689*m + 945) + A*a*d**2*e**m*m**4*x**5*x**m/(m**5
+ 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 20*A*a*d**2*e**
m*m**3*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
 945) + 130*A*a*d**2*e**m*m**2*x**5*x**m/(m**5 + 25*m**4 + 230*m*
*3 + 950*m**2 + 1689*m + 945) + 300*A*a*d**2*e**m*m*x**5*x**m/(m*
*5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 189*A*a*d**2
*e**m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
945) + A*b*c**2*e**m*m**4*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 +
950*m**2 + 1689*m + 945) + 22*A*b*c**2*e**m*m**3*x**3*x**m/(m**5
+ 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 164*A*b*c**2*e*
*m*m**2*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
+ 945) + 458*A*b*c**2*e**m*m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3
 + 950*m**2 + 1689*m + 945) + 315*A*b*c**2*e**m*x**3*x**m/(m**5 +
 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 2*A*b*c*d*e**m*m
**4*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 94
5) + 40*A*b*c*d*e**m*m**3*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 +
950*m**2 + 1689*m + 945) + 260*A*b*c*d*e**m*m**2*x**5*x**m/(m**5
+ 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 600*A*b*c*d*e**
m*m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 94
5) + 378*A*b*c*d*e**m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*
```

```
m**2 + 1689*m + 945) + A*b*d**2*e**m*m**4*x**7*x**m/(m**5 + 25*m*
*4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 18*A*b*d**2*e**m*m**3*
x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
 104*A*b*d**2*e**m*m**2*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 95
0*m**2 + 1689*m + 945) + 222*A*b*d**2*e**m*m*x**7*x**m/(m**5 + 25
*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 135*A*b*d**2*e**m*x
**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
B*a*c**2*e**m*m**4*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**
2 + 1689*m + 945) + 22*B*a*c**2*e**m*m**3*x**3*x**m/(m**5 + 25*m*
*4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 164*B*a*c**2*e**m*m**2
*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945)
+ 458*B*a*c**2*e**m*m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*
m**2 + 1689*m + 945) + 315*B*a*c**2*e**m*x**3*x**m/(m**5 + 25*m**
4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 2*B*a*c*d*e**m*m**4*x**
5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 40
*B*a*c*d*e**m*m**3*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**
2 + 1689*m + 945) + 260*B*a*c*d*e**m*m**2*x**5*x**m/(m**5 + 25*m*
*4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 600*B*a*c*d*e**m*m*x**
5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 37
8*B*a*c*d*e**m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 +
1689*m + 945) + B*a*d**2*e**m*m**4*x**7*x**m/(m**5 + 25*m**4 + 23
0*m**3 + 950*m**2 + 1689*m + 945) + 18*B*a*d**2*e**m*m**3*x**7*x*
*m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 104*B*
a*d**2*e**m*m**2*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2
+ 1689*m + 945) + 222*B*a*d**2*e**m*m*x**7*x**m/(m**5 + 25*m**4 +
 230*m**3 + 950*m**2 + 1689*m + 945) + 135*B*a*d**2*e**m*x**7*x**
m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + B*b*c**
2*e**m*m**4*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 168
9*m + 945) + 20*B*b*c**2*e**m*m**3*x**5*x**m/(m**5 + 25*m**4 + 23
0*m**3 + 950*m**2 + 1689*m + 945) + 130*B*b*c**2*e**m*m**2*x**5*x
**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 300*B
*b*c**2*e**m*m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 +
1689*m + 945) + 189*B*b*c**2*e**m*x**5*x**m/(m**5 + 25*m**4 + 230
*m**3 + 950*m**2 + 1689*m + 945) + 2*B*b*c*d*e**m*m**4*x**7*x**m/
(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 36*B*b*c*
d*e**m*m**3*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 168
9*m + 945) + 208*B*b*c*d*e**m*m**2*x**7*x**m/(m**5 + 25*m**4 + 23
0*m**3 + 950*m**2 + 1689*m + 945) + 444*B*b*c*d*e**m*m*x**7*x**m/
(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 270*B*b*c
*d*e**m*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
+ 945) + B*b*d**2*e**m*m**4*x**9*x**m/(m**5 + 25*m**4 + 230*m**3
+ 950*m**2 + 1689*m + 945) + 16*B*b*d**2*e**m*m**3*x**9*x**m/(m**
5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 86*B*b*d**2*e
**m*m**2*x**9*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
 + 945) + 176*B*b*d**2*e**m*m*x**9*x**m/(m**5 + 25*m**4 + 230*m**
3 + 950*m**2 + 1689*m + 945) + 105*B*b*d**2*e**m*x**9*x**m/(m**5
+ 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945), True))
```

GIAC/XCAS [A] time = 0.220257, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Done
```

3.11 $\int (ex)^m \left(A+Bx^2\right) \left(c+dx^2\right)^2 \, dx$

Optimal. Leaf size=91

$$\frac{d(ex)^{m+5}(Ad+2Bc)}{e^5(m+5)}+\frac{c(ex)^{m+3}(2Ad+Bc)}{e^3(m+3)}+\frac{Ac^2(ex)^{m+1}}{e(m+1)}+\frac{Bd^2(ex)^{m+7}}{e^7(m+7)}$$

```
[Out] (A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (c*(B*c + 2*A*d)*(e*x)^(3 + m
))/(e^3*(3 + m)) + (d*(2*B*c + A*d)*(e*x)^(5 + m))/(e^5*(5 + m))
+ (B*d^2*(e*x)^(7 + m))/(e^7*(7 + m))
```

Rubi [A] time = 0.159328, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.045

$$\frac{d(ex)^{m+5}(Ad+2Bc)}{e^5(m+5)}+\frac{c(ex)^{m+3}(2Ad+Bc)}{e^3(m+3)}+\frac{Ac^2(ex)^{m+1}}{e(m+1)}+\frac{Bd^2(ex)^{m+7}}{e^7(m+7)}$$

Antiderivative was successfully verified.

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

```
[Out] (A*c^2*(e*x)^(1 + m))/(e*(1 + m)) + (c*(B*c + 2*A*d)*(e*x)^(3 + m
))/(e^3*(3 + m)) + (d*(2*B*c + A*d)*(e*x)^(5 + m))/(e^5*(5 + m))
+ (B*d^2*(e*x)^(7 + m))/(e^7*(7 + m))
```

Rubi in Sympy [A] time = 24.8986, size = 82, normalized size = 0.9

$$\frac{Ac^2\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bd^2\,(ex)^{m+7}}{e^7\,(m+7)}+\frac{c\,(ex)^{m+3}\,(2Ad+Bc)}{e^3\,(m+3)}+\frac{d\,(ex)^{m+5}\,(Ad+2Bc)}{e^5\,(m+5)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] A*c**2*(e*x)**(m + 1)/(e*(m + 1)) + B*d**2*(e*x)**(m + 7)/(e**7*(
m + 7)) + c*(e*x)**(m + 3)*(2*A*d + B*c)/(e**3*(m + 3)) + d*(e*x)
**(m + 5)*(A*d + 2*B*c)/(e**5*(m + 5))
```

Mathematica [A] time = 0.0675241, size = 67, normalized size = 0.74

$$(ex)^m\left(\frac{dx^5(Ad+2Bc)}{m+5}+\frac{cx^3(2Ad+Bc)}{m+3}+\frac{Ac^2x}{m+1}+\frac{Bd^2x^7}{m+7}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((A*c^2*x)/(1 + m) + (c*(B*c + 2*A*d)*x^3)/(3 + m) + (d*(
2*B*c + A*d)*x^5)/(5 + m) + (B*d^2*x^7)/(7 + m))
```

Maple [B] time = 0.008, size = 263, normalized size = 2.9

$$\left(Bd^2m^3x^6+9\,Bd^2m^2x^6+Ad^2m^3x^4+2\,Bcdm^3x^4+23\,Bd^2mx^6+11\,Ad^2m^2x^4+22\,Bcdm^2x^4+15\,Bd^2x^6+2\,Acdm^3x^2+31\,A\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(B*x^2+A)*(d*x^2+c)^2,x)
```

```
[Out] x*(B*d^2*m^3*x^6+9*B*d^2*m^2*x^6+A*d^2*m^3*x^4+2*B*c*d*m^3*x^4+23
*B*d^2*m*x^6+11*A*d^2*m^2*x^4+22*B*c*d*m^2*x^4+15*B*d^2*x^6+2*A*c
*d*m^3*x^2+31*A*d^2*m*x^4+B*c^2*m^3*x^2+62*B*c*d*m*x^4+26*A*c*d*m
^2*x^2+21*A*d^2*x^4+13*B*c^2*m^2*x^2+42*B*c*d*x^4+A*c^2*m^3+94*A*
c*d*m*x^2+47*B*c^2*m*x^2+15*A*c^2*m^2+70*A*c*d*x^2+35*B*c^2*x^2+7
1*A*c^2*m+105*A*c^2)*(e*x)^m/(7+m)/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m,x, algorithm="maxima")
```

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

Fricas [A] time = 0.252593, size = 293, normalized size = 3.22

$$\frac{\left(\left(Bd^2m^3 + 9\,Bd^2m^2 + 23\,Bd^2m + 15\,Bd^2\right)x^7 + \left(\left(2\,Bcd + Ad^2\right)m^3 + 42\,Bcd + 21\,Ad^2 + 11\left(2\,Bcd + Ad^2\right)m^2 + 31\left(2\,Bcd + Ad^2 \ldots\right.\right.\right.}{m^4 + \ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m,x, algorithm="fricas")
```

```
[Out] ((B*d^2*m^3 + 9*B*d^2*m^2 + 23*B*d^2*m + 15*B*d^2)*x^7 + ((2*B*c*
d + A*d^2)*m^3 + 42*B*c*d + 21*A*d^2 + 11*(2*B*c*d + A*d^2)*m^2 +
 31*(2*B*c*d + A*d^2)*m)*x^5 + ((B*c^2 + 2*A*c*d)*m^3 + 35*B*c^2
+ 70*A*c*d + 13*(B*c^2 + 2*A*c*d)*m^2 + 47*(B*c^2 + 2*A*c*d)*m)*x
^3 + (A*c^2*m^3 + 15*A*c^2*m^2 + 71*A*c^2*m + 105*A*c^2)*x)*(e*x)
^m/(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)
```

Sympy [A] time = 2.80396, size = 1137, normalized size = 12.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] Piecewise(((-A*c**2/(6*x**6) - A*c*d/(2*x**4) - A*d**2/(2*x**2) -
 B*c**2/(4*x**4) - B*c*d/x**2 + B*d**2*log(x))/e**7, Eq(m, -7)),
((-A*c**2/(4*x**4) - A*c*d/x**2 + A*d**2*log(x) - B*c**2/(2*x**2)
 + 2*B*c*d*log(x) + B*d**2*x**2/2)/e**5, Eq(m, -5)), ((-A*c**2/(2
*x**2) + 2*A*c*d*log(x) + A*d**2*x**2/2 + B*c**2*log(x) + B*c*d*x
**2 + B*d**2*x**4/4)/e**3, Eq(m, -3)), ((A*c**2*log(x) + A*c*d*x*
*2 + A*d**2*x**4/4 + B*c**2*x**2/2 + B*c*d*x**4/2 + B*d**2*x**6/6
)/e, Eq(m, -1)), (A*c**2*e**m*m**3*x*x**m/(m**4 + 16*m**3 + 86*m*
*2 + 176*m + 105) + 15*A*c**2*e**m*m**2*x*x**m/(m**4 + 16*m**3 +
86*m**2 + 176*m + 105) + 71*A*c**2*e**m*m*x*x**m/(m**4 + 16*m**3
+ 86*m**2 + 176*m + 105) + 105*A*c**2*e**m*x*x**m/(m**4 + 16*m**3
 + 86*m**2 + 176*m + 105) + 2*A*c*d*e**m*m**3*x**3*x**m/(m**4 + 1
6*m**3 + 86*m**2 + 176*m + 105) + 26*A*c*d*e**m*m**2*x**3*x**m/(m
**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 94*A*c*d*e**m*m*x**3*x**
```

```
m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 70*A*c*d*e**m*x**3*x
**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + A*d**2*e**m*m**3*x
**5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 11*A*d**2*e**
m*m**2*x**5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 31*A*
d**2*e**m*m*x**5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) +
21*A*d**2*e**m*x**5*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105)
 + B*c**2*e**m*m**3*x**3*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m +
 105) + 13*B*c**2*e**m*m**2*x**3*x**m/(m**4 + 16*m**3 + 86*m**2 +
 176*m + 105) + 47*B*c**2*e**m*m*x**3*x**m/(m**4 + 16*m**3 + 86*m
**2 + 176*m + 105) + 35*B*c**2*e**m*x**3*x**m/(m**4 + 16*m**3 + 8
6*m**2 + 176*m + 105) + 2*B*c*d*e**m*m**3*x**5*x**m/(m**4 + 16*m*
*3 + 86*m**2 + 176*m + 105) + 22*B*c*d*e**m*m**2*x**5*x**m/(m**4
+ 16*m**3 + 86*m**2 + 176*m + 105) + 62*B*c*d*e**m*m*x**5*x**m/(m
**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 42*B*c*d*e**m*x**5*x**m/
(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + B*d**2*e**m*m**3*x**7*
x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 9*B*d**2*e**m*m**
2*x**7*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 23*B*d**2*
e**m*m*x**7*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105) + 15*B*
d**2*e**m*x**7*x**m/(m**4 + 16*m**3 + 86*m**2 + 176*m + 105), Tru
e))
```

GIAC/XCAS [A] time = 0.222697, size = 578, normalized size = 6.35

$$\frac{Bd^2m^3x^7e^{(m\ln(x)+m)} + 9\,Bd^2m^2x^7e^{(m\ln(x)+m)} + 2\,Bcdm^3x^5e^{(m\ln(x)+m)} + Ad^2m^3x^5e^{(m\ln(x)+m)} + 23\,Bd^2mx^7e^{(m\ln(x)+m)} + 22\,Bcd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m,x, algorithm="giac")
```

```
[Out] (B*d^2*m^3*x^7*e^(m*ln(x) + m) + 9*B*d^2*m^2*x^7*e^(m*ln(x) + m)
+ 2*B*c*d*m^3*x^5*e^(m*ln(x) + m) + A*d^2*m^3*x^5*e^(m*ln(x) + m)
 + 23*B*d^2*m*x^7*e^(m*ln(x) + m) + 22*B*c*d*m^2*x^5*e^(m*ln(x) +
 m) + 11*A*d^2*m^2*x^5*e^(m*ln(x) + m) + 15*B*d^2*x^7*e^(m*ln(x)
+ m) + B*c^2*m^3*x^3*e^(m*ln(x) + m) + 2*A*c*d*m^3*x^3*e^(m*ln(x)
 + m) + 62*B*c*d*m*x^5*e^(m*ln(x) + m) + 31*A*d^2*m*x^5*e^(m*ln(x
) + m) + 13*B*c^2*m^2*x^3*e^(m*ln(x) + m) + 26*A*c*d*m^2*x^3*e^(m
*ln(x) + m) + 42*B*c*d*x^5*e^(m*ln(x) + m) + 21*A*d^2*x^5*e^(m*ln
(x) + m) + A*c^2*m^3*x*e^(m*ln(x) + m) + 47*B*c^2*m*x^3*e^(m*ln(x
) + m) + 94*A*c*d*m*x^3*e^(m*ln(x) + m) + 15*A*c^2*m^2*x*e^(m*ln(
x) + m) + 35*B*c^2*x^3*e^(m*ln(x) + m) + 70*A*c*d*x^3*e^(m*ln(x)
+ m) + 71*A*c^2*m*x*e^(m*ln(x) + m) + 105*A*c^2*x*e^(m*ln(x) + m)
)/(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)
```

3.12 $\int \frac{(ex)^m (A+Bx^2) (c+dx^2)^2}{a+bx^2} dx$

Optimal. Leaf size=178

$$\frac{(ex)^{m+1} \left(a^2Bd^2 - abd(Ad + 2Bc) + b^2c(2Ad + Bc)\right)}{b^3e(m + 1)} + \frac{(ex)^{m+1}(Ab - aB)(bc - ad)^2 \, {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{bx^2}{a}\right)}{ab^3e(m + 1)} + \frac{d(ex)^{m+3}(-aBd + Abd + 2bBc)}{b^2e^3(m + 3)} + \frac{Bd^2(ex)^{m+5}}{be^5(m + 5)}$$

```
[Out] ((a^2*B*d^2 - a*b*d*(2*B*c + A*d) + b^2*c*(B*c + 2*A*d))*(e*x)^(1
 + m))/(b^3*e*(1 + m)) + (d*(2*b*B*c + A*b*d - a*B*d)*(e*x)^(3 +
m))/(b^2*e^3*(3 + m)) + (B*d^2*(e*x)^(5 + m))/(b*e^5*(5 + m)) + (
(A*b - a*B)*(b*c - a*d)^2*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 +
 m)/2, (3 + m)/2, -((b*x^2)/a)])/(a*b^3*e*(1 + m))
```

Rubi [A] time = 0.445623, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065

$$\frac{(ex)^{m+1} \left(a^2Bd^2 - abd(Ad + 2Bc) + b^2c(2Ad + Bc)\right)}{b^3e(m + 1)} + \frac{(ex)^{m+1}(Ab - aB)(bc - ad)^2 \, {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{bx^2}{a}\right)}{ab^3e(m + 1)} + \frac{d(ex)^{m+3}(-aBd + Abd + 2bBc)}{b^2e^3(m + 3)} + \frac{Bd^2(ex)^{m+5}}{be^5(m + 5)}$$

Antiderivative was successfully verified.

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

```
[Out] ((a^2*B*d^2 - a*b*d*(2*B*c + A*d) + b^2*c*(B*c + 2*A*d))*(e*x)^(1
 + m))/(b^3*e*(1 + m)) + (d*(2*b*B*c + A*b*d - a*B*d)*(e*x)^(3 +
m))/(b^2*e^3*(3 + m)) + (B*d^2*(e*x)^(5 + m))/(b*e^5*(5 + m)) + (
(A*b - a*B)*(b*c - a*d)^2*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 +
 m)/2, (3 + m)/2, -((b*x^2)/a)])/(a*b^3*e*(1 + m))
```

Rubi in Sympy [A] time = 84.3918, size = 168, normalized size = 0.94

$$\frac{Bd^2 (ex)^{m+5}}{be^5 (m + 5)} + \frac{d (ex)^{m+3} (Abd - Bad + 2Bbc)}{b^2e^3 (m + 3)} + \frac{(ex)^{m+1} \left(-Aabd^2 + 2Ab^2cd + Ba^2d^2 - 2Babcd + Bb^2c^2\right)}{b^3e (m + 1)} + \frac{(ex)^{m+1} (Ab - Ba) (ad - bc)^2 \, {}_2F_1\left(\begin{matrix} 1, \frac{m}{2} + \frac{1}{2} \\ \frac{m}{2} + \frac{3}{2} \end{matrix}\middle| -\frac{bx^2}{a}\right)}{ab^3e (m + 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)**2/(b*x**2+a),x)
```

```
[Out] B*d**2*(e*x)**(m + 5)/(b*e**5*(m + 5)) + d*(e*x)**(m + 3)*(A*b*d
- B*a*d + 2*B*b*c)/(b**2*e**3*(m + 3)) + (e*x)**(m + 1)*(-A*a*b*d
**2 + 2*A*b**2*c*d + B*a**2*d**2 - 2*B*a*b*c*d + B*b**2*c**2)/(b*
*3*e*(m + 1)) + (e*x)**(m + 1)*(A*b - B*a)*(a*d - b*c)**2*hyper((
1, m/2 + 1/2), (m/2 + 3/2,), -b*x**2/a)/(a*b**3*e*(m + 1))
```

Mathematica [A] time = 0.425395, size = 170, normalized size = 0.96

$$\frac{x(ex)^m\left(\frac{cx^2(2Ad+Bc)\,{}_2F_1\left(1,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+dx^4\left(\frac{(Ad+2Bc)\,{}_2F_1\left(1,\frac{m+5}{2};\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}+\frac{Bdx^2\,{}_2F_1\left(1,\frac{m+7}{2};\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}\right)+\frac{Ac^2\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{b}{}\right.}{m+1}}{a}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c^2*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((
b*x^2)/a)])/(1 + m) + (c*(B*c + 2*A*d)*x^2*Hypergeometric2F1[1, (
3 + m)/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d*x^4*(((2*B*c + A*
d)*Hypergeometric2F1[1, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/(5 +
 m) + (B*d*x^2*Hypergeometric2F1[1, (7 + m)/2, (9 + m)/2, -((b*x^
2)/a)])/(7 + m))))/a
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)^2/(b*x^2+a),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m/(b*x^2 + a), x)
```

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

$$\operatorname{integral}\left(\frac{\left(Bd^2x^6+\left(2\,Bcd+Ad^2\right)x^4+Ac^2+\left(Bc^2+2\,Acd\right)x^2\right)(ex)^m}{bx^2+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d^2*x^6 + (2*B*c*d + A*d^2)*x^4 + A*c^2 + (B*c^2 + 2*
A*c*d)*x^2)*(e*x)^m/(b*x^2 + a), x)
```

Sympy [A] time = 47.2352, size = 666, normalized size = 3.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)**2/(b*x**2+a),x)
```

```
[Out] A*c**2*e**m*m*x*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 +
1/2)*gamma(m/2 + 1/2)/(4*a*gamma(m/2 + 3/2)) + A*c**2*e**m*x*x**m
*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 1/2)*gamma(m/2 + 1/2
)/(4*a*gamma(m/2 + 3/2)) + A*c*d*e**m*m*x**3*x**m*lerchphi(b*x**2
*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(2*a*gamma(m/2
 + 5/2)) + 3*A*c*d*e**m*x**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)
/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(2*a*gamma(m/2 + 5/2)) + A*d**
2*e**m*m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/
2)*gamma(m/2 + 5/2)/(4*a*gamma(m/2 + 7/2)) + 5*A*d**2*e**m*x**5*x
**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma(m/2 +
5/2)/(4*a*gamma(m/2 + 7/2)) + B*c**2*e**m*m*x**3*x**m*lerchphi(b*
x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma
(m/2 + 5/2)) + 3*B*c**2*e**m*x**3*x**m*lerchphi(b*x**2*exp_polar(
I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma(m/2 + 5/2)) +
B*c*d*e**m*m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2
+ 5/2)*gamma(m/2 + 5/2)/(2*a*gamma(m/2 + 7/2)) + 5*B*c*d*e**m*x**
5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma(m/2
 + 5/2)/(2*a*gamma(m/2 + 7/2)) + B*d**2*e**m*m*x**7*x**m*lerchphi
(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*a*ga
mma(m/2 + 9/2)) + 7*B*d**2*e**m*x**7*x**m*lerchphi(b*x**2*exp_pol
ar(I*pi)/a, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*a*gamma(m/2 + 9/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)\,(dx^2 + c)^2\,(ex)^m}{bx^2 + a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m/(b*x^2 + a), x)
```

3.13 $\int \frac{(ex)^m (A+Bx^2) (c+dx^2)^2}{(a+bx^2)^2} \, dx$

Optimal. Leaf size=247

$$\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(ad(m+3)+b(c-cm))+aB(bc(m+1)-ad(m+5)))}{2a^2b^3e(m+1)} - \frac{d(ex)^{m+1}(Ab(2bc(m+1)-ad(m+3))-aB(2bc(m+3)-ad(m+5)))}{2ab^3e(m+1)} - \frac{d^2(ex)^{m+3}(Ab(m+3)-aB(m+5))}{2ab^2e^3(m+3)} + \frac{(c+dx^2)^2(ex)^{m+1}(Ab-aB)}{2abe\,(a+bx^2)}$$

```
[Out] -(d*(A*b*(2*b*c*(1 + m) - a*d*(3 + m)) - a*B*(2*b*c*(3 + m) - a*d
*(5 + m)))*(e*x)^(1 + m))/(2*a*b^3*e*(1 + m)) - (d^2*(A*b*(3 + m)
 - a*B*(5 + m))*(e*x)^(3 + m))/(2*a*b^2*e^3*(3 + m)) + ((A*b - a*
B)*(e*x)^(1 + m)*(c + d*x^2)^2)/(2*a*b*e*(a + b*x^2)) + ((b*c - a
*d)*(a*B*(b*c*(1 + m) - a*d*(5 + m)) + A*b*(a*d*(3 + m) + b*(c -
c*m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -
((b*x^2)/a)])/(2*a^2*b^3*e*(1 + m))
```

Rubi [A] time = 1.11389, antiderivative size = 247, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(ad(m+3)+b(c-cm))+aB(bc(m+1)-ad(m+5)))}{2a^2b^3e(m+1)} - \frac{d(ex)^{m+1}(Ab(2bc(m+1)-ad(m+3))-aB(2bc(m+3)-ad(m+5)))}{2ab^3e(m+1)} - \frac{d^2(ex)^{m+3}(Ab(m+3)-aB(m+5))}{2ab^2e^3(m+3)} + \frac{(c+dx^2)^2(ex)^{m+1}(Ab-aB)}{2abe\,(a+bx^2)}$$

Antiderivative was successfully verified.

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

```
[Out] -(d*(A*b*(2*b*c*(1 + m) - a*d*(3 + m)) - a*B*(2*b*c*(3 + m) - a*d
*(5 + m)))*(e*x)^(1 + m))/(2*a*b^3*e*(1 + m)) - (d^2*(A*b*(3 + m)
 - a*B*(5 + m))*(e*x)^(3 + m))/(2*a*b^2*e^3*(3 + m)) + ((A*b - a*
B)*(e*x)^(1 + m)*(c + d*x^2)^2)/(2*a*b*e*(a + b*x^2)) + ((b*c - a
*d)*(a*B*(b*c*(1 + m) - a*d*(5 + m)) + A*b*(a*d*(3 + m) + b*(c -
c*m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -
((b*x^2)/a)])/(2*a^2*b^3*e*(1 + m))
```

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((e*x)**m*(B*x**2+A)*(d*x**2+c)**2/(b*x**2+a)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.496609, size = 170, normalized size = 0.69

$$\frac{x(ex)^m\left(\frac{cx^2(2Ad+Bc)\,{}_2F_1\left(2,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+dx^4\left(\frac{(Ad+2Bc)\,{}_2F_1\left(2,\frac{m+5}{2};\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}+\frac{Bdx^2\,{}_2F_1\left(2,\frac{m+7}{2};\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}\right)+\frac{Ac^2\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{m+1}\right)}{a^2}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c^2*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((
b*x^2)/a)])/(1 + m) + (c*(B*c + 2*A*d)*x^2*Hypergeometric2F1[2, (
3 + m)/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d*x^4*(((2*B*c + A*
d)*Hypergeometric2F1[2, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/(5 +
 m) + (B*d*x^2*Hypergeometric2F1[2, (7 + m)/2, (9 + m)/2, -((b*x^
2)/a)])/(7 + m))))/a^2
```

Maple [F] time = 0.079, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (Bx^2 + A) (dx^2 + c)^2}{(bx^2 + a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)^2/(b*x^2+a)^2,x)
```

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

$$\int \frac{(Bx^2 + A) (dx^2 + c)^2 (ex)^m}{(bx^2 + a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m/(b*x^2 + a)^2, x)
```

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

$$\text{integral}\left(\frac{\left(Bd^2x^6 + \left(2\,Bcd + Ad^2\right)x^4 + Ac^2 + \left(Bc^2 + 2\,Acd\right)x^2\right)(ex)^m}{b^2x^4 + 2\,abx^2 + a^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d^2*x^6 + (2*B*c*d + A*d^2)*x^4 + A*c^2 + (B*c^2 + 2*
A*c*d)*x^2)*(e*x)^m/(b^2*x^4 + 2*a*b*x^2 + 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((e*x)**m*(B*x**2+A)*(d*x**2+c)**2/(b*x**2+a)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(dx^2 + c)^2 (ex)^m}{(bx^2 + a)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m/(b*x^2 + a)^2, x)
```

3.14 $\int \frac{(ex)^m (A+Bx^2)(c+dx^2)^2}{(a+bx^2)^3} dx$

Optimal. Leaf size=292

$$-\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(ad(Ab(m+1)-aB(m+5))(bc(m+1)-ad(m+3))-bc(aB(m+1)+Ab(3-m))(ad(m+}{8a^3b^3e(m+1)}$$
$$+\frac{d(ex)^{m+1}(Ab(m+1)-aB(m+5))(bc(m+1)-ad(m+3))}{8a^2b^3e(m+1)}$$
$$+\frac{(ex)^{m+1}(bc-ad)\left(c(aB(m+1)+Ab(3-m))-dx^2(Ab(m+1)-aB(m+5))\right)}{8a^2b^2e\,(a+bx^2)}$$
$$+\frac{\left(c+dx^2\right)^2(ex)^{m+1}(Ab-aB)}{4abe\,(a+bx^2)^2}$$

```
[Out] (d*(b*c*(1 + m) - a*d*(3 + m))*(A*b*(1 + m) - a*B*(5 + m))*(e*x)^
(1 + m))/(8*a^2*b^3*e*(1 + m)) + ((A*b - a*B)*(e*x)^(1 + m)*(c +
d*x^2)^2)/(4*a*b*e*(a + b*x^2)^2) + ((b*c - a*d)*(e*x)^(1 + m)*(c
*(A*b*(3 - m) + a*B*(1 + m)) - d*(A*b*(1 + m) - a*B*(5 + m))*x^2)
)/(8*a^2*b^2*e*(a + b*x^2)) - ((a*d*(b*c*(1 + m) - a*d*(3 + m))*(
A*b*(1 + m) - a*B*(5 + m)) - b*c*(A*b*(3 - m) + a*B*(1 + m))*(a*d
*(1 + m) + b*(c - c*m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 +
m)/2, (3 + m)/2, -((b*x^2)/a)])/(8*a^3*b^3*e*(1 + m))
```

Rubi [A] time = 1.12674, antiderivative size = 292, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$-\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(ad(Ab(m+1)-aB(m+5))(bc(m+1)-ad(m+3))-bc(aB(m+1)+Ab(3-m))(ad(m+}{8a^3b^3e(m+1)}$$
$$+\frac{d(ex)^{m+1}(Ab(m+1)-aB(m+5))(bc(m+1)-ad(m+3))}{8a^2b^3e(m+1)}$$
$$+\frac{(ex)^{m+1}(bc-ad)\left(c(aB(m+1)+Ab(3-m))-dx^2(Ab(m+1)-aB(m+5))\right)}{8a^2b^2e\,(a+bx^2)}$$
$$+\frac{\left(c+dx^2\right)^2(ex)^{m+1}(Ab-aB)}{4abe\,(a+bx^2)^2}$$

Antiderivative was successfully verified.

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


```
[Out] (d*(b*c*(1 + m) - a*d*(3 + m))*(A*b*(1 + m) - a*B*(5 + m))*(e*x)^
(1 + m))/(8*a^2*b^3*e*(1 + m)) + ((A*b - a*B)*(e*x)^(1 + m)*(c +
d*x^2)^2)/(4*a*b*e*(a + b*x^2)^2) + ((b*c - a*d)*(e*x)^(1 + m)*(c
*(A*b*(3 - m) + a*B*(1 + m)) - d*(A*b*(1 + m) - a*B*(5 + m))*x^2)
)/(8*a^2*b^2*e*(a + b*x^2)) - ((a*d*(b*c*(1 + m) - a*d*(3 + m))*(
A*b*(1 + m) - a*B*(5 + m)) - b*c*(A*b*(3 - m) + a*B*(1 + m))*(a*d
*(1 + m) + b*(c - c*m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 +
m)/2, (3 + m)/2, -((b*x^2)/a)])/(8*a^3*b^3*e*(1 + m))
```

Rubi in Sympy [A] time = 106.696, size = 274, normalized size = 0.94

$$\frac{(ex)^{m+1}\left(c+dx^2\right)^2(Ab-Ba)}{4abe\,(a+bx^2)^2}$$
$$-\frac{(ex)^{m+1}(ad-bc)\left(c(-Abm+3Ab+Bam+Ba)+dx^2(4Ab-(m+5)(Ab-Ba))\right)}{8a^2b^2e\,(a+bx^2)}$$
$$+\frac{d\,(ex)^{m+1}(4Ab-(m+5)(Ab-Ba))(2bc+(m+3)(ad-bc))}{8a^2b^3e\,(m+1)}$$
$$-\frac{(ex)^{m+1}(ad(4Ab-(m+5)(Ab-Ba))(2bc+(m+3)(ad-bc))-bc(-Abm+3Ab+Bam+Ba)(adm+ad-bcm+bc))\,{}_2F}{8a^3b^3e\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (e*x)**(m + 1)*(c + d*x**2)**2*(A*b - B*a)/(4*a*b*e*(a + b*x**2)*
*2) - (e*x)**(m + 1)*(a*d - b*c)*(c*(-A*b*m + 3*A*b + B*a*m + B*a
) + d*x**2*(4*A*b - (m + 5)*(A*b - B*a)))/(8*a**2*b**2*e*(a + b*x
**2)) + d*(e*x)**(m + 1)*(4*A*b - (m + 5)*(A*b - B*a))*(2*b*c + (
m + 3)*(a*d - b*c))/(8*a**2*b**3*e*(m + 1)) - (e*x)**(m + 1)*(a*d
*(4*A*b - (m + 5)*(A*b - B*a))*(2*b*c + (m + 3)*(a*d - b*c)) - b*
c*(-A*b*m + 3*A*b + B*a*m + B*a)*(a*d*m + a*d - b*c*m + b*c))*hyp
er((1, m/2 + 1/2), (m/2 + 3/2,), -b*x**2/a)/(8*a**3*b**3*e*(m + 1
))
```

Mathematica [A] time = 0.479671, size = 170, normalized size = 0.58

$$\frac{x(ex)^m\left(\frac{cx^2(2Ad+Bc)\,{}_2F_1\left(3,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+dx^4\left(\frac{(Ad+2Bc)\,{}_2F_1\left(3,\frac{m+5}{2};\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}+\frac{Bdx^2\,{}_2F_1\left(3,\frac{m+7}{2};\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}\right)+\frac{Ac^2\,{}_2F_1\left(3,\frac{m+1}{2};\frac{m+3}{2};-\frac{b\ldots}{\ldots}\right.}{m+1}\ldots}{a^3}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c^2*Hypergeometric2F1[3, (1 + m)/2, (3 + m)/2, -((
b*x^2)/a)])/(1 + m) + (c*(B*c + 2*A*d)*x^2*Hypergeometric2F1[3, (
3 + m)/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d*x^4*(((2*B*c + A*
d)*Hypergeometric2F1[3, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/(5 +
 m) + (B*d*x^2*Hypergeometric2F1[3, (7 + m)/2, (9 + m)/2, -((b*x^
2)/a)])/(7 + m))))/a^3
```

Maple [F] time = 0.1, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)^2/(b*x^2+a)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m/(b*x^2 + a)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bd^2x^6+\left(2\,Bcd+Ad^2\right)x^4+Ac^2+\left(Bc^2+2\,Acd\right)x^2\right)(ex)^m}{b^3x^6+3\,ab^2x^4+3\,a^2bx^2+a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d^2*x^6 + (2*B*c*d + A*d^2)*x^4 + A*c^2 + (B*c^2 + 2*
A*c*d)*x^2)*(e*x)^m/(b^3*x^6 + 3*a*b^2*x^4 + 3*a^2*b*x^2 + 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((e*x)**m*(B*x**2+A)*(d*x**2+c)**2/(b*x**2+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(e*x)^m/(b*x^2 + a)^3, x)
```

3.15 $\int (ex)^m \left(a+bx^2\right)^3 \left(A+Bx^2\right) \left(c+dx^2\right)^3 \, dx$

Optimal. Leaf size=379

$$\frac{a^3Ac^3(ex)^{m+1}}{e(m+1)}+\frac{3ac(ex)^{m+5}\left(A\left(a^2d^2+3abcd+b^2c^2\right)+aBc(ad+bc)\right)}{e^5(m+5)}+\frac{3bd(ex)^{m+11}\left(a^2Bd^2+abd(Ad+3Bc)+b^2c(Ad+Bc)\right)}{e^{11}(m+11)}+\frac{a^2c^2(ex)^{m+3}(3A(ad+bc)+aBc)}{e^3(m+3)}+\frac{(ex)^{m+9}\left(a^3Bd^3+3a^2bd^2(Ad+3Bc)+9ab^2cd(Ad+Bc)+b^3c^2(3Ad+Bc)\right)}{e^9(m+9)}+\frac{(ex)^{m+7}\left(3aBc\left(a^2d^2+3abcd+b^2c^2\right)+A\left(a^3d^3+9a^2bcd^2+9ab^2c^2d+b^3c^3\right)\right)}{e^7(m+7)}+\frac{b^2d^2(ex)^{m+13}(3aBd+Abd+3bBc)}{e^{13}(m+13)}+\frac{b^3Bd^3(ex)^{m+15}}{e^{15}(m+15)}$$

```
[Out] (a^3*A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (a^2*c^2*(a*B*c + 3*A*(b*
c + a*d))*(e*x)^(3 + m))/(e^3*(3 + m)) + (3*a*c*(a*B*c*(b*c + a*d
) + A*(b^2*c^2 + 3*a*b*c*d + a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 + m
)) + ((3*a*B*c*(b^2*c^2 + 3*a*b*c*d + a^2*d^2) + A*(b^3*c^3 + 9*a
*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3))*(e*x)^(7 + m))/(e^7*(7 + m
)) + ((a^3*B*d^3 + 9*a*b^2*c*d*(B*c + A*d) + 3*a^2*b*d^2*(3*B*c +
 A*d) + b^3*c^2*(B*c + 3*A*d))*(e*x)^(9 + m))/(e^9*(9 + m)) + (3*
b*d*(a^2*B*d^2 + b^2*c*(B*c + A*d) + a*b*d*(3*B*c + A*d))*(e*x)^(
11 + m))/(e^11*(11 + m)) + (b^2*d^2*(3*b*B*c + A*b*d + 3*a*B*d)*(
e*x)^(13 + m))/(e^13*(13 + m)) + (b^3*B*d^3*(e*x)^(15 + m))/(e^15
*(15 + m))
```

Rubi [A] time = 1.12521, antiderivative size = 379, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.032$

$$\frac{a^3Ac^3(ex)^{m+1}}{e(m+1)}+\frac{3ac(ex)^{m+5}\left(A\left(a^2d^2+3abcd+b^2c^2\right)+aBc(ad+bc)\right)}{e^5(m+5)}+\frac{3bd(ex)^{m+11}\left(a^2Bd^2+abd(Ad+3Bc)+b^2c(Ad+Bc)\right)}{e^{11}(m+11)}+\frac{a^2c^2(ex)^{m+3}(3A(ad+bc)+aBc)}{e^3(m+3)}+\frac{(ex)^{m+9}\left(a^3Bd^3+3a^2bd^2(Ad+3Bc)+9ab^2cd(Ad+Bc)+b^3c^2(3Ad+Bc)\right)}{e^9(m+9)}+\frac{(ex)^{m+7}\left(3aBc\left(a^2d^2+3abcd+b^2c^2\right)+A\left(a^3d^3+9a^2bcd^2+9ab^2c^2d+b^3c^3\right)\right)}{e^7(m+7)}+\frac{b^2d^2(ex)^{m+13}(3aBd+Abd+3bBc)}{e^{13}(m+13)}+\frac{b^3Bd^3(ex)^{m+15}}{e^{15}(m+15)}$$

Antiderivative was successfully verified.

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

```
[Out] (a^3*A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (a^2*c^2*(a*B*c + 3*A*(b*
c + a*d))*(e*x)^(3 + m))/(e^3*(3 + m)) + (3*a*c*(a*B*c*(b*c + a*d
) + A*(b^2*c^2 + 3*a*b*c*d + a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 + m
)) + ((3*a*B*c*(b^2*c^2 + 3*a*b*c*d + a^2*d^2) + A*(b^3*c^3 + 9*a
*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3))*(e*x)^(7 + m))/(e^7*(7 + m
)) + ((a^3*B*d^3 + 9*a*b^2*c*d*(B*c + A*d) + 3*a^2*b*d^2*(3*B*c +
 A*d) + b^3*c^2*(B*c + 3*A*d))*(e*x)^(9 + m))/(e^9*(9 + m)) + (3*
b*d*(a^2*B*d^2 + b^2*c*(B*c + A*d) + a*b*d*(3*B*c + A*d))*(e*x)^(
11 + m))/(e^11*(11 + m)) + (b^2*d^2*(3*b*B*c + A*b*d + 3*a*B*d)*(
e*x)^(13 + m))/(e^13*(13 + m)) + (b^3*B*d^3*(e*x)^(15 + m))/(e^15
*(15 + m))
```

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((e*x)**m*(b*x**2+a)**3*(B*x**2+A)*(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

Mathematica [A]   time = 2.12169, size = 327, normalized size = 0.86

$$(ex)^m\left(\frac{a^3Ac^3x}{m+1}+\frac{3acx^5\left(A\left(a^2d^2+3abcd+b^2c^2\right)+aBc(ad+bc)\right)}{m+5}+\frac{3bdx^{11}\left(a^2Bd^2+abd(Ad+3Bc)+b^2c(Ad+Bc)\right)}{m+11}+\frac{a^2c^2x^3(3A(ad+bc)+aBc)}{m+3}+\frac{x^9\left(a^3Bd^3+3a^2bd^2(Ad+3Bc)+9ab^2cd(Ad+Bc)+b^3c^2(3Ad+Bc)\right)}{m+9}+\frac{x^7\left(3aBc\left(a^2d^2+3abcd+b^2c^2\right)+A\left(a^3d^3+9a^2bcd^2+9ab^2c^2d+b^3c^3\right)\right)}{m+7}+\frac{b^2d^2x^{13}(3aBd+Abd+3bBc)}{m+13}+\frac{b^3Bd^3x^{15}}{m+15}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a^3*A*c^3*x)/(1 + m) + (a^2*c^2*(a*B*c + 3*A*(b*c + a*d
))*x^3)/(3 + m) + (3*a*c*(a*B*c*(b*c + a*d) + A*(b^2*c^2 + 3*a*b*
c*d + a^2*d^2))*x^5)/(5 + m) + ((3*a*B*c*(b^2*c^2 + 3*a*b*c*d + a
^2*d^2) + A*(b^3*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3))*
x^7)/(7 + m) + ((a^3*B*d^3 + 9*a*b^2*c*d*(B*c + A*d) + 3*a^2*b*d^
2*(3*B*c + A*d) + b^3*c^2*(B*c + 3*A*d))*x^9)/(9 + m) + (3*b*d*(a
^2*B*d^2 + b^2*c*(B*c + A*d) + a*b*d*(3*B*c + A*d))*x^11)/(11 + m
) + (b^2*d^2*(3*b*B*c + A*b*d + 3*a*B*d)*x^13)/(13 + m) + (b^3*B*
d^3*x^15)/(15 + m))
```

Maple [B]   time = 0.015, size = 3953, normalized size = 10.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b^3*d^3*m^7*x^14+49*B*b^3*d^3*m^6*x^14+A*b^3*d^3*m^7*x^12+3*
B*a*b^2*d^3*m^7*x^12+3*B*b^3*c*d^2*m^7*x^12+973*B*b^3*d^3*m^5*x^1
4+51*A*b^3*d^3*m^6*x^12+153*B*a*b^2*d^3*m^6*x^12+153*B*b^3*c*d^2*
m^6*x^12+10045*B*b^3*d^3*m^4*x^14+3*A*a*b^2*d^3*m^7*x^10+3*A*b^3*
c*d^2*m^7*x^10+1045*A*b^3*d^3*m^5*x^12+3*B*a^2*b*d^3*m^7*x^10+9*B
*a*b^2*c*d^2*m^7*x^10+3135*B*a*b^2*d^3*m^5*x^12+3*B*b^3*c^2*d*m^7
*x^10+3135*B*b^3*c*d^2*m^5*x^12+57379*B*b^3*d^3*m^3*x^14+159*A*a*
b^2*d^3*m^6*x^10+159*A*b^3*c*d^2*m^6*x^10+11055*A*b^3*d^3*m^4*x^1
2+159*B*a^2*b*d^3*m^6*x^10+477*B*a*b^2*c*d^2*m^6*x^10+33165*B*a*b
^2*d^3*m^4*x^12+159*B*b^3*c^2*d*m^6*x^10+33165*B*b^3*c*d^2*m^4*x^
12+177331*B*b^3*d^3*m^2*x^14+3*A*a^2*b*d^3*m^7*x^8+9*A*a*b^2*c*d^
2*m^7*x^8+3375*A*a*b^2*d^3*m^5*x^10+3*A*b^3*c^2*d*m^7*x^8+3375*A*
b^3*c*d^2*m^5*x^10+64339*A*b^3*d^3*m^3*x^12+B*a^3*d^3*m^7*x^8+9*B
*a^2*b*c*d^2*m^7*x^8+3375*B*a^2*b*d^3*m^5*x^10+9*B*a*b^2*c^2*d*m^
7*x^8+10125*B*a*b^2*c*d^2*m^5*x^10+193017*B*a*b^2*d^3*m^3*x^12+B*
b^3*c^3*m^7*x^8+3375*B*b^3*c^2*d*m^5*x^10+193017*B*b^3*c*d^2*m^3*
x^12+264207*B*b^3*d^3*m*x^14+165*A*a^2*b*d^3*m^6*x^8+495*A*a*b^2*
c*d^2*m^6*x^8+36795*A*a*b^2*d^3*m^4*x^10+165*A*b^3*c^2*d*m^6*x^8+
36795*A*b^3*c*d^2*m^4*x^10+201609*A*b^3*d^3*m^2*x^12+55*B*a^3*d^3
*m^6*x^8+495*B*a^2*b*c*d^2*m^6*x^8+36795*B*a^2*b*d^3*m^4*x^10+495
*B*a*b^2*c^2*d*m^6*x^8+110385*B*a*b^2*c*d^2*m^4*x^10+604827*B*a*b
```

```
^2*d^3*m^2*x^12+55*B*b^3*c^3*m^6*x^8+36795*B*b^3*c^2*d*m^4*x^10+6
04827*B*b^3*c*d^2*m^2*x^12+135135*B*b^3*d^3*x^14+A*a^3*d^3*m^7*x^
6+9*A*a^2*b*c*d^2*m^7*x^6+3639*A*a^2*b*d^3*m^5*x^8+9*A*a*b^2*c^2*
d*m^7*x^6+10917*A*a*b^2*c*d^2*m^5*x^8+219417*A*a*b^2*d^3*m^3*x^10
+A*b^3*c^3*m^7*x^6+3639*A*b^3*c^2*d*m^5*x^8+219417*A*b^3*c*d^2*m^
3*x^10+303255*A*b^3*d^3*m*x^12+3*B*a^3*c*d^2*m^7*x^6+1213*B*a^3*d
^3*m^5*x^8+9*B*a^2*b*c^2*d*m^7*x^6+10917*B*a^2*b*c*d^2*m^5*x^8+21
9417*B*a^2*b*d^3*m^3*x^10+3*B*a*b^2*c^3*m^7*x^6+10917*B*a*b^2*c^2
*d*m^5*x^8+658251*B*a*b^2*c*d^2*m^3*x^10+909765*B*a*b^2*d^3*m*x^1
2+1213*B*b^3*c^3*m^5*x^8+219417*B*b^3*c^2*d*m^3*x^10+909765*B*b^3
*c*d^2*m*x^12+57*A*a^3*d^3*m^6*x^6+513*A*a^2*b*c*d^2*m^6*x^6+4116
9*A*a^2*b*d^3*m^4*x^8+513*A*a*b^2*c^2*d*m^6*x^6+123507*A*a*b^2*c*
d^2*m^4*x^8+700461*A*a*b^2*d^3*m^2*x^10+57*A*b^3*c^3*m^6*x^6+4116
9*A*b^3*c^2*d*m^4*x^8+700461*A*b^3*c*d^2*m^2*x^10+155925*A*b^3*d^
3*x^12+171*B*a^3*c*d^2*m^6*x^6+13723*B*a^3*d^3*m^4*x^8+513*B*a^2*
b*c^2*d*m^6*x^6+123507*B*a^2*b*c*d^2*m^4*x^8+700461*B*a^2*b*d^3*m
^2*x^10+171*B*a*b^2*c^3*m^6*x^6+123507*B*a*b^2*c^2*d*m^4*x^8+2101
383*B*a*b^2*c*d^2*m^2*x^10+467775*B*a*b^2*d^3*x^12+13723*B*b^3*c^
3*m^4*x^8+700461*B*b^3*c^2*d*m^2*x^10+467775*B*b^3*c*d^2*x^12+3*A
*a^3*c*d^2*m^7*x^4+1309*A*a^3*d^3*m^5*x^6+9*A*a^2*b*c^2*d*m^7*x^4
+11781*A*a^2*b*c*d^2*m^5*x^6+253641*A*a^2*b*d^3*m^3*x^8+3*A*a*b^2
*c^3*m^7*x^4+11781*A*a*b^2*c^2*d*m^5*x^6+760923*A*a*b^2*c*d^2*m^3
*x^8+1067445*A*a*b^2*d^3*m*x^10+1309*A*b^3*c^3*m^5*x^6+253641*A*b
^3*c^2*d*m^3*x^8+1067445*A*b^3*c*d^2*m*x^10+3*B*a^3*c^2*d*m^7*x^4
+3927*B*a^3*c*d^2*m^5*x^6+84547*B*a^3*d^3*m^3*x^8+3*B*a^2*b*c^3*m
^7*x^4+11781*B*a^2*b*c^2*d*m^5*x^6+760923*B*a^2*b*c*d^2*m^3*x^8+1
067445*B*a^2*b*d^3*m*x^10+3927*B*a*b^2*c^3*m^5*x^6+760923*B*a*b^2
*c^2*d*m^3*x^8+3202335*B*a*b^2*c*d^2*m*x^10+84547*B*b^3*c^3*m^3*x
^8+1067445*B*b^3*c^2*d*m*x^10+177*A*a^3*c*d^2*m^6*x^4+15477*A*a^3
*d^3*m^4*x^6+531*A*a^2*b*c^2*d*m^6*x^4+139293*A*a^2*b*c*d^2*m^4*x
^6+831279*A*a^2*b*d^3*m^2*x^8+177*A*a*b^2*c^3*m^6*x^4+139293*A*a*
b^2*c^2*d*m^4*x^6+2493837*A*a*b^2*c*d^2*m^2*x^8+552825*A*a*b^2*d^
3*x^10+15477*A*b^3*c^3*m^4*x^6+831279*A*b^3*c^2*d*m^2*x^8+552825*
A*b^3*c*d^2*x^10+177*B*a^3*c^2*d*m^6*x^4+46431*B*a^3*c*d^2*m^4*x^
6+277093*B*a^3*d^3*m^2*x^8+177*B*a^2*b*c^3*m^6*x^4+139293*B*a^2*b
*c^2*d*m^4*x^6+2493837*B*a^2*b*c*d^2*m^2*x^8+552825*B*a^2*b*d^3*x
^10+46431*B*a*b^2*c^3*m^4*x^6+2493837*B*a*b^2*c^2*d*m^2*x^8+16584
75*B*a*b^2*c*d^2*x^10+277093*B*b^3*c^3*m^2*x^8+552825*B*b^3*c^2*d
*x^10+3*A*a^3*c^2*d*m^7*x^2+4239*A*a^3*c*d^2*m^5*x^4+99715*A*a^3*
d^3*m^3*x^6+3*A*a^2*b*c^3*m^7*x^2+12717*A*a^2*b*c^2*d*m^5*x^4+897
435*A*a^2*b*c*d^2*m^3*x^6+1291005*A*a^2*b*d^3*m*x^8+4239*A*a*b^2*
c^3*m^5*x^4+897435*A*a*b^2*c^2*d*m^3*x^6+3873015*A*a*b^2*c*d^2*m*
x^8+99715*A*b^3*c^3*m^3*x^6+1291005*A*b^3*c^2*d*m*x^8+B*a^3*c^3*m
^7*x^2+4239*B*a^3*c^2*d*m^5*x^4+299145*B*a^3*c*d^2*m^3*x^6+430335
*B*a^3*d^3*m*x^8+4239*B*a^2*b*c^3*m^5*x^4+897435*B*a^2*b*c^2*d*m^
3*x^6+3873015*B*a^2*b*c*d^2*m*x^8+299145*B*a*b^2*c^3*m^3*x^6+3873
015*B*a*b^2*c^2*d*m*x^8+430335*B*b^3*c^3*m*x^8+183*A*a^3*c^2*d*m^
6*x^2+52725*A*a^3*c*d^2*m^4*x^4+340011*A*a^3*d^3*m^2*x^6+183*A*a^
2*b*c^3*m^6*x^2+158175*A*a^2*b*c^2*d*m^4*x^4+3060099*A*a^2*b*c*d^
2*m^2*x^6+675675*A*a^2*b*d^3*x^8+52725*A*a*b^2*c^3*m^4*x^4+306009
9*A*a*b^2*c^2*d*m^2*x^6+2027025*A*a*b^2*c*d^2*x^8+340011*A*b^3*c^
3*m^2*x^6+675675*A*b^3*c^2*d*x^8+61*B*a^3*c^3*m^6*x^2+52725*B*a^3
*c^2*d*m^4*x^4+1020033*B*a^3*c*d^2*m^2*x^6+225225*B*a^3*d^3*x^8+5
2725*B*a^2*b*c^3*m^4*x^4+3060099*B*a^2*b*c^2*d*m^2*x^6+2027025*B*
a^2*b*c*d^2*x^8+1020033*B*a*b^2*c^3*m^2*x^6+2027025*B*a*b^2*c^2*d
*x^8+225225*B*b^3*c^3*x^8+A*a^3*c^3*m^7+4575*A*a^3*c^2*d*m^5*x^2+
360537*A*a^3*c*d^2*m^3*x^4+544095*A*a^3*d^3*m*x^6+4575*A*a^2*b*c^
3*m^5*x^2+1081611*A*a^2*b*c^2*d*m^3*x^4+4896855*A*a^2*b*c*d^2*m*x
^6+360537*A*a*b^2*c^3*m^3*x^4+4896855*A*a*b^2*c^2*d*m*x^6+544095*
A*b^3*c^3*m*x^6+1525*B*a^3*c^3*m^5*x^2+360537*B*a^3*c^2*d*m^3*x^4
+1632285*B*a^3*c*d^2*m*x^6+360537*B*a^2*b*c^3*m^3*x^4+4896855*B*a
^2*b*c^2*d*m*x^6+1632285*B*a*b^2*c^3*m*x^6+63*A*a^3*c^3*m^6+60195
*A*a^3*c^2*d*m^4*x^2+1311363*A*a^3*c*d^2*m^2*x^4+289575*A*a^3*d^3
*x^6+60195*A*a^2*b*c^3*m^4*x^2+3934089*A*a^2*b*c^2*d*m^2*x^4+2606
175*A*a^2*b*c*d^2*x^6+1311363*A*a*b^2*c^3*m^2*x^4+2606175*A*a*b^2
*c^2*d*x^6+289575*A*b^3*c^3*x^6+20065*B*a^3*c^3*m^4*x^2+1311363*B
*a^3*c^2*d*m^2*x^4+868725*B*a^3*c*d^2*x^6+1311363*B*a^2*b*c^3*m^2
*x^4+2606175*B*a^2*b*c^2*d*x^6+868725*B*a*b^2*c^3*x^6+1645*A*a^3*
c^3*m^5+443577*A*a^3*c^2*d*m^3*x^2+2215701*A*a^3*c*d^2*m*x^4+4435
77*A*a^2*b*c^3*m^3*x^2+6647103*A*a^2*b*c^2*d*m*x^4+2215701*A*a*b^
2*c^3*m*x^4+147859*B*a^3*c^3*m^3*x^2+2215701*B*a^3*c^2*d*m*x^4+22
15701*B*a^2*b*c^3*m*x^4+22995*A*a^3*c^3*m^4+1783317*A*a^3*c^2*d*m
^2*x^2+1216215*A*a^3*c*d^2*x^4+1783317*A*a^2*b*c^3*m^2*x^2+364864
5*A*a^2*b*c^2*d*x^4+1216215*A*a*b^2*c^3*x^4+594439*B*a^3*c^3*m^2*
```

```
x^2+1216215*B*a^3*c^2*d*x^4+1216215*B*a^2*b*c^3*x^4+185059*A*a^3*
c^3*m^3+3422565*A*a^3*c^2*d*m*x^2+3422565*A*a^2*b*c^3*m*x^2+11408
55*B*a^3*c^3*m*x^2+852957*A*a^3*c^3*m^2+2027025*A*a^3*c^2*d*x^2+2
027025*A*a^2*b*c^3*x^2+675675*B*a^3*c^3*x^2+2071215*A*a^3*c^3*m+2
027025*A*a^3*c^3)*(e*x)^m/(1+m)/(3+m)/(5+m)/(7+m)/(9+m)/(11+m)/(1
3+m)/(15+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.277518, size = 3587, normalized size = 9.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^3*d^3*m^7 + 49*B*b^3*d^3*m^6 + 973*B*b^3*d^3*m^5 + 10045*B*
b^3*d^3*m^4 + 57379*B*b^3*d^3*m^3 + 177331*B*b^3*d^3*m^2 + 264207
*B*b^3*d^3*m + 135135*B*b^3*d^3)*x^15 + ((3*B*b^3*c*d^2 + (3*B*a*
b^2 + A*b^3)*d^3)*m^7 + 467775*B*b^3*c*d^2 + 51*(3*B*b^3*c*d^2 +
(3*B*a*b^2 + A*b^3)*d^3)*m^6 + 1045*(3*B*b^3*c*d^2 + (3*B*a*b^2 +
 A*b^3)*d^3)*m^5 + 11055*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3
)*m^4 + 155925*(3*B*a*b^2 + A*b^3)*d^3 + 64339*(3*B*b^3*c*d^2 + (
3*B*a*b^2 + A*b^3)*d^3)*m^3 + 201609*(3*B*b^3*c*d^2 + (3*B*a*b^2
+ A*b^3)*d^3)*m^2 + 303255*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d
^3)*m)*x^13 + 3*((B*b^3*c^2*d + (3*B*a*b^2 + A*b^3)*c*d^2 + (B*a^
2*b + A*a*b^2)*d^3)*m^7 + 184275*B*b^3*c^2*d + 53*(B*b^3*c^2*d +
(3*B*a*b^2 + A*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3)*m^6 + 1125*(
B*b^3*c^2*d + (3*B*a*b^2 + A*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3
)*m^5 + 12265*(B*b^3*c^2*d + (3*B*a*b^2 + A*b^3)*c*d^2 + (B*a^2*b
 + A*a*b^2)*d^3)*m^4 + 184275*(3*B*a*b^2 + A*b^3)*c*d^2 + 184275*
(B*a^2*b + A*a*b^2)*d^3 + 73139*(B*b^3*c^2*d + (3*B*a*b^2 + A*b^3
)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3)*m^3 + 233487*(B*b^3*c^2*d + (3
*B*a*b^2 + A*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3)*m^2 + 355815*(
B*b^3*c^2*d + (3*B*a*b^2 + A*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3
)*m)*x^11 + ((B*b^3*c^3 + 3*(3*B*a*b^2 + A*b^3)*c^2*d + 9*(B*a^2*
b + A*a*b^2)*c*d^2 + (B*a^3 + 3*A*a^2*b)*d^3)*m^7 + 225225*B*b^3*
c^3 + 55*(B*b^3*c^3 + 3*(3*B*a*b^2 + A*b^3)*c^2*d + 9*(B*a^2*b +
A*a*b^2)*c*d^2 + (B*a^3 + 3*A*a^2*b)*d^3)*m^6 + 1213*(B*b^3*c^3 +
 3*(3*B*a*b^2 + A*b^3)*c^2*d + 9*(B*a^2*b + A*a*b^2)*c*d^2 + (B*a
^3 + 3*A*a^2*b)*d^3)*m^5 + 13723*(B*b^3*c^3 + 3*(3*B*a*b^2 + A*b^
3)*c^2*d + 9*(B*a^2*b + A*a*b^2)*c*d^2 + (B*a^3 + 3*A*a^2*b)*d^3)
*m^4 + 675675*(3*B*a*b^2 + A*b^3)*c^2*d + 2027025*(B*a^2*b + A*a*
b^2)*c*d^2 + 225225*(B*a^3 + 3*A*a^2*b)*d^3 + 84547*(B*b^3*c^3 +
3*(3*B*a*b^2 + A*b^3)*c^2*d + 9*(B*a^2*b + A*a*b^2)*c*d^2 + (B*a^
3 + 3*A*a^2*b)*d^3)*m^3 + 277093*(B*b^3*c^3 + 3*(3*B*a*b^2 + A*b^
3)*c^2*d + 9*(B*a^2*b + A*a*b^2)*c*d^2 + (B*a^3 + 3*A*a^2*b)*d^3)
*m^2 + 430335*(B*b^3*c^3 + 3*(3*B*a*b^2 + A*b^3)*c^2*d + 9*(B*a^2
*b + A*a*b^2)*c*d^2 + (B*a^3 + 3*A*a^2*b)*d^3)*m)*x^9 + ((A*a^3*d
^3 + (3*B*a*b^2 + A*b^3)*c^3 + 9*(B*a^2*b + A*a*b^2)*c^2*d + 3*(B
*a^3 + 3*A*a^2*b)*c*d^2)*m^7 + 289575*A*a^3*d^3 + 57*(A*a^3*d^3 +
 (3*B*a*b^2 + A*b^3)*c^3 + 9*(B*a^2*b + A*a*b^2)*c^2*d + 3*(B*a^3
 + 3*A*a^2*b)*c*d^2)*m^6 + 1309*(A*a^3*d^3 + (3*B*a*b^2 + A*b^3)*
c^3 + 9*(B*a^2*b + A*a*b^2)*c^2*d + 3*(B*a^3 + 3*A*a^2*b)*c*d^2)*
m^5 + 15477*(A*a^3*d^3 + (3*B*a*b^2 + A*b^3)*c^3 + 9*(B*a^2*b + A
*a*b^2)*c^2*d + 3*(B*a^3 + 3*A*a^2*b)*c*d^2)*m^4 + 289575*(3*B*a*
```

```
b^2 + A*b^3)*c^3 + 2606175*(B*a^2*b + A*a*b^2)*c^2*d + 868725*(B*
a^3 + 3*A*a^2*b)*c*d^2 + 99715*(A*a^3*d^3 + (3*B*a*b^2 + A*b^3)*c
^3 + 9*(B*a^2*b + A*a*b^2)*c^2*d + 3*(B*a^3 + 3*A*a^2*b)*c*d^2)*m
^3 + 340011*(A*a^3*d^3 + (3*B*a*b^2 + A*b^3)*c^3 + 9*(B*a^2*b + A
*a*b^2)*c^2*d + 3*(B*a^3 + 3*A*a^2*b)*c*d^2)*m^2 + 544095*(A*a^3*
d^3 + (3*B*a*b^2 + A*b^3)*c^3 + 9*(B*a^2*b + A*a*b^2)*c^2*d + 3*(
B*a^3 + 3*A*a^2*b)*c*d^2)*m)*x^7 + 3*((A*a^3*c*d^2 + (B*a^2*b + A
*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b)*c^2*d)*m^7 + 405405*A*a^3*c*d^2
 + 59*(A*a^3*c*d^2 + (B*a^2*b + A*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b
)*c^2*d)*m^6 + 1413*(A*a^3*c*d^2 + (B*a^2*b + A*a*b^2)*c^3 + (B*a
^3 + 3*A*a^2*b)*c^2*d)*m^5 + 17575*(A*a^3*c*d^2 + (B*a^2*b + A*a*
b^2)*c^3 + (B*a^3 + 3*A*a^2*b)*c^2*d)*m^4 + 405405*(B*a^2*b + A*a
*b^2)*c^3 + 405405*(B*a^3 + 3*A*a^2*b)*c^2*d + 120179*(A*a^3*c*d^
2 + (B*a^2*b + A*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b)*c^2*d)*m^3 + 43
7121*(A*a^3*c*d^2 + (B*a^2*b + A*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b)
*c^2*d)*m^2 + 738567*(A*a^3*c*d^2 + (B*a^2*b + A*a*b^2)*c^3 + (B*
a^3 + 3*A*a^2*b)*c^2*d)*m)*x^5 + ((3*A*a^3*c^2*d + (B*a^3 + 3*A*a
^2*b)*c^3)*m^7 + 2027025*A*a^3*c^2*d + 61*(3*A*a^3*c^2*d + (B*a^3
 + 3*A*a^2*b)*c^3)*m^6 + 1525*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b
)*c^3)*m^5 + 20065*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^4
+ 675675*(B*a^3 + 3*A*a^2*b)*c^3 + 147859*(3*A*a^3*c^2*d + (B*a^3
 + 3*A*a^2*b)*c^3)*m^3 + 594439*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2
*b)*c^3)*m^2 + 1140855*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*
m)*x^3 + (A*a^3*c^3*m^7 + 63*A*a^3*c^3*m^6 + 1645*A*a^3*c^3*m^5 +
 22995*A*a^3*c^3*m^4 + 185059*A*a^3*c^3*m^3 + 852957*A*a^3*c^3*m^
2 + 2071215*A*a^3*c^3*m + 2027025*A*a^3*c^3)*x)*(e*x)^m/(m^8 + 64
*m^7 + 1708*m^6 + 24640*m^5 + 208054*m^4 + 1038016*m^3 + 2924172*
m^2 + 4098240*m + 2027025)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(b*x**2+a)**3*(B*x**2+A)*(d*x**2+c)**3,x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.253886, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Done
```

3.16 $\int (ex)^m \left(a+bx^2\right)^2 \left(A+Bx^2\right) \left(c+dx^2\right)^3 \, dx$

Optimal. Leaf size=284

$$\frac{(ex)^{m+7}\left(a^2d^2(Ad+3Bc)+6abcd(Ad+Bc)+b^2c^2(3Ad+Bc)\right)}{e^7(m+7)}+\frac{c(ex)^{m+5}\left(A\left(3a^2d^2+6abcd+b^2c^2\right)+aBc(3ad+2bc)\right)}{e^5(m+5)}+\frac{d(ex)^{m+9}\left(a^2Bd^2+2abd(Ad+3Bc)+3b^2c(Ad+Bc)\right)}{e^9(m+9)}+\frac{a^2Ac^3(ex)^{m+1}}{e(m+1)}+\frac{ac^2(ex)^{m+3}(3aAd+aBc+2Abc)}{e^3(m+3)}+\frac{bd^2(ex)^{m+11}(2aBd+Abd+3bBc)}{e^{11}(m+11)}+\frac{b^2Bd^3(ex)^{m+13}}{e^{13}(m+13)}$$

```
[Out] (a^2*A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (a*c^2*(2*A*b*c + a*B*c +
 3*a*A*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (c*(a*B*c*(2*b*c + 3*a*d
) + A*(b^2*c^2 + 6*a*b*c*d + 3*a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 +
 m)) + ((6*a*b*c*d*(B*c + A*d) + a^2*d^2*(3*B*c + A*d) + b^2*c^2*
(B*c + 3*A*d))*(e*x)^(7 + m))/(e^7*(7 + m)) + (d*(a^2*B*d^2 + 3*b
^2*c*(B*c + A*d) + 2*a*b*d*(3*B*c + A*d))*(e*x)^(9 + m))/(e^9*(9
+ m)) + (b*d^2*(3*b*B*c + A*b*d + 2*a*B*d)*(e*x)^(11 + m))/(e^11*
(11 + m)) + (b^2*B*d^3*(e*x)^(13 + m))/(e^13*(13 + m))
```

Rubi [A] time = 0.745135, antiderivative size = 284, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.032$

$$\frac{(ex)^{m+7}\left(a^2d^2(Ad+3Bc)+6abcd(Ad+Bc)+b^2c^2(3Ad+Bc)\right)}{e^7(m+7)}+\frac{c(ex)^{m+5}\left(A\left(3a^2d^2+6abcd+b^2c^2\right)+aBc(3ad+2bc)\right)}{e^5(m+5)}+\frac{d(ex)^{m+9}\left(a^2Bd^2+2abd(Ad+3Bc)+3b^2c(Ad+Bc)\right)}{e^9(m+9)}+\frac{a^2Ac^3(ex)^{m+1}}{e(m+1)}+\frac{ac^2(ex)^{m+3}(3aAd+aBc+2Abc)}{e^3(m+3)}+\frac{bd^2(ex)^{m+11}(2aBd+Abd+3bBc)}{e^{11}(m+11)}+\frac{b^2Bd^3(ex)^{m+13}}{e^{13}(m+13)}$$

Antiderivative was successfully verified.

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

```
[Out] (a^2*A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (a*c^2*(2*A*b*c + a*B*c +
 3*a*A*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (c*(a*B*c*(2*b*c + 3*a*d
) + A*(b^2*c^2 + 6*a*b*c*d + 3*a^2*d^2))*(e*x)^(5 + m))/(e^5*(5 +
 m)) + ((6*a*b*c*d*(B*c + A*d) + a^2*d^2*(3*B*c + A*d) + b^2*c^2*
(B*c + 3*A*d))*(e*x)^(7 + m))/(e^7*(7 + m)) + (d*(a^2*B*d^2 + 3*b
^2*c*(B*c + A*d) + 2*a*b*d*(3*B*c + A*d))*(e*x)^(9 + m))/(e^9*(9
+ m)) + (b*d^2*(3*b*B*c + A*b*d + 2*a*B*d)*(e*x)^(11 + m))/(e^11*
(11 + m)) + (b^2*B*d^3*(e*x)^(13 + m))/(e^13*(13 + m))
```

Rubi in Sympy [A] time = 166.558, size = 323, normalized size = 1.14

$$\frac{Aa^2c^3\left(ex\right)^{m+1}}{e\left(m+1\right)}+\frac{Bb^2d^3\left(ex\right)^{m+13}}{e^{13}\left(m+13\right)}+\frac{ac^2\left(ex\right)^{m+3}\left(3Aad+2Abc+Bac\right)}{e^3\left(m+3\right)}+\frac{bd^2\left(ex\right)^{m+11}\left(Abd+2Bad+3Bbc\right)}{e^{11}\left(m+11\right)}+\frac{c\left(ex\right)^{m+5}\left(3Aa^2d^2+6Aabcd+Ab^2c^2+3Ba^2cd+2Babc^2\right)}{e^5\left(m+5\right)}+\frac{d\left(ex\right)^{m+9}\left(2Aabd^2+3Ab^2cd+Ba^2d^2+6Babcd+3Bb^2c^2\right)}{e^9\left(m+9\right)}+\frac{\left(ex\right)^{m+7}\left(Aa^2d^3+6Aabcd^2+3Ab^2c^2d+3Ba^2cd^2+6Babc^2d+Bb^2c^3\right)}{e^7\left(m+7\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)**2*(B*x**2+A)*(d*x**2+c)**3,x)
```

```
[Out] A*a**2*c**3*(e*x)**(m + 1)/(e*(m + 1)) + B*b**2*d**3*(e*x)**(m +
13)/(e**13*(m + 13)) + a*c**2*(e*x)**(m + 3)*(3*A*a*d + 2*A*b*c +
 B*a*c)/(e**3*(m + 3)) + b*d**2*(e*x)**(m + 11)*(A*b*d + 2*B*a*d
+ 3*B*b*c)/(e**11*(m + 11)) + c*(e*x)**(m + 5)*(3*A*a**2*d**2 + 6
*A*a*b*c*d + A*b**2*c**2 + 3*B*a**2*c*d + 2*B*a*b*c**2)/(e**5*(m
+ 5)) + d*(e*x)**(m + 9)*(2*A*a*b*d**2 + 3*A*b**2*c*d + B*a**2*d*
*2 + 6*B*a*b*c*d + 3*B*b**2*c**2)/(e**9*(m + 9)) + (e*x)**(m + 7)
*(A*a**2*d**3 + 6*A*a*b*c*d**2 + 3*A*b**2*c**2*d + 3*B*a**2*c*d**
2 + 6*B*a*b*c**2*d + B*b**2*c**3)/(e**7*(m + 7))
```

Mathematica [A] time = 1.30429, size = 239, normalized size = 0.84

$$(ex)^m \left(\frac{x^7 \left(a^2 d^2 (Ad+3Bc)+6abcd(Ad+Bc)+b^2c^2(3Ad+Bc)\right)}{m+7} + \frac{cx^5 \left(A\left(3a^2d^2+6abcd+b^2c^2\right)+aBc(3ad+2bc)\right)}{m+5} + \frac{dx^9 \left(a^2Bd^2+2abd(Ad+3Bc)+3b^2c(Ad+Bc)\right)}{m+9} + \frac{a^2Ac^3x}{m+1} + \frac{ac^2x^3(3aAd+aBc+2Abc)}{m+3} + \frac{bd^2x^{11}(2aBd+Abd+3bBc)}{m+11} + \frac{b^2Bd^3x^{13}}{m+13}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a^2*A*c^3*x)/(1 + m) + (a*c^2*(2*A*b*c + a*B*c + 3*a*A*
d)*x^3)/(3 + m) + (c*(a*B*c*(2*b*c + 3*a*d) + A*(b^2*c^2 + 6*a*b*
c*d + 3*a^2*d^2))*x^5)/(5 + m) + ((6*a*b*c*d*(B*c + A*d) + a^2*d^
2*(3*B*c + A*d) + b^2*c^2*(B*c + 3*A*d))*x^7)/(7 + m) + (d*(a^2*B
*d^2 + 3*b^2*c*(B*c + A*d) + 2*a*b*d*(3*B*c + A*d))*x^9)/(9 + m)
+ (b*d^2*(3*b*B*c + A*b*d + 2*a*B*d)*x^11)/(11 + m) + (b^2*B*d^3*
x^13)/(13 + m))
```

Maple [B] time = 0.014, size = 2443, normalized size = 8.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b^2*d^3*m^6*x^12+36*B*b^2*d^3*m^5*x^12+A*b^2*d^3*m^6*x^10+2*
B*a*b*d^3*m^6*x^10+3*B*b^2*c*d^2*m^6*x^10+505*B*b^2*d^3*m^4*x^12+
38*A*b^2*d^3*m^5*x^10+76*B*a*b*d^3*m^5*x^10+114*B*b^2*c*d^2*m^5*x
^10+3480*B*b^2*d^3*m^3*x^12+2*A*a*b*d^3*m^6*x^8+3*A*b^2*c*d^2*m^6
*x^8+555*A*b^2*d^3*m^4*x^10+B*a^2*d^3*m^6*x^8+6*B*a*b*c*d^2*m^6*x
^8+1110*B*a*b*d^3*m^4*x^10+3*B*b^2*c^2*d*m^6*x^8+1665*B*b^2*c*d^2
*m^4*x^10+12139*B*b^2*d^3*m^2*x^12+80*A*a*b*d^3*m^5*x^8+120*A*b^2
*c*d^2*m^5*x^8+3940*A*b^2*d^3*m^3*x^10+40*B*a^2*d^3*m^5*x^8+240*B
*a*b*c*d^2*m^5*x^8+7880*B*a*b*d^3*m^3*x^10+120*B*b^2*c^2*d*m^5*x^
8+11820*B*b^2*c*d^2*m^3*x^10+19524*B*b^2*d^3*m*x^12+A*a^2*d^3*m^6
*x^6+6*A*a*b*c*d^2*m^6*x^6+1226*A*a*b*d^3*m^4*x^8+3*A*b^2*c^2*d*m
^6*x^6+1839*A*b^2*c*d^2*m^4*x^8+14039*A*b^2*d^3*m^2*x^10+3*B*a^2*
c*d^2*m^6*x^6+613*B*a^2*d^3*m^4*x^8+6*B*a*b*c^2*d*m^6*x^6+3678*B*
a*b*c*d^2*m^4*x^8+28078*B*a*b*d^3*m^2*x^10+B*b^2*c^3*m^6*x^6+1839
*B*b^2*c^2*d*m^4*x^8+42117*B*b^2*c*d^2*m^2*x^10+10395*B*b^2*d^3*x
^12+42*A*a^2*d^3*m^5*x^6+252*A*a*b*c*d^2*m^5*x^6+9056*A*a*b*d^3*m
^3*x^8+126*A*b^2*c^2*d*m^5*x^6+13584*A*b^2*c*d^2*m^3*x^8+22902*A*
b^2*d^3*m*x^10+126*B*a^2*c*d^2*m^5*x^6+4528*B*a^2*d^3*m^3*x^8+252
*B*a*b*c^2*d*m^5*x^6+27168*B*a*b*c*d^2*m^3*x^8+45804*B*a*b*d^3*m*
x^10+42*B*b^2*c^3*m^5*x^6+13584*B*b^2*c^2*d*m^3*x^8+68706*B*b^2*c
```

```
*d^2*m*x^10+3*A*a^2*c*d^2*m^6*x^4+679*A*a^2*d^3*m^4*x^6+6*A*a*b*c
^2*d*m^6*x^4+4074*A*a*b*c*d^2*m^4*x^6+33254*A*a*b*d^3*m^2*x^8+A*b
^2*c^3*m^6*x^4+2037*A*b^2*c^2*d*m^4*x^6+49881*A*b^2*c*d^2*m^2*x^8
+12285*A*b^2*d^3*x^10+3*B*a^2*c^2*d*m^6*x^4+2037*B*a^2*c*d^2*m^4*
x^6+16627*B*a^2*d^3*m^2*x^8+2*B*a*b*c^3*m^6*x^4+4074*B*a*b*c^2*d*
m^4*x^6+99762*B*a*b*c*d^2*m^2*x^8+24570*B*a*b*d^3*x^10+679*B*b^2*
c^3*m^4*x^6+49881*B*b^2*c^2*d*m^2*x^8+36855*B*b^2*c*d^2*x^10+132*
A*a^2*c*d^2*m^5*x^4+5292*A*a^2*d^3*m^3*x^6+264*A*a*b*c^2*d*m^5*x^
4+31752*A*a*b*c*d^2*m^3*x^6+55376*A*a*b*d^3*m*x^8+44*A*b^2*c^3*m^
5*x^4+15876*A*b^2*c^2*d*m^3*x^6+83064*A*b^2*c*d^2*m*x^8+132*B*a^2
*c^2*d*m^5*x^4+15876*B*a^2*c*d^2*m^3*x^6+27688*B*a^2*d^3*m*x^8+88
*B*a*b*c^3*m^5*x^4+31752*B*a*b*c^2*d*m^3*x^6+166128*B*a*b*c*d^2*m
*x^8+5292*B*b^2*c^3*m^3*x^6+83064*B*b^2*c^2*d*m*x^8+3*A*a^2*c^2*d
*m^6*x^2+2259*A*a^2*c*d^2*m^4*x^4+20335*A*a^2*d^3*m^2*x^6+2*A*a*b
*c^3*m^6*x^2+4518*A*a*b*c^2*d*m^4*x^4+122010*A*a*b*c*d^2*m^2*x^6+
30030*A*a*b*d^3*x^8+753*A*b^2*c^3*m^4*x^4+61005*A*b^2*c^2*d*m^2*x
^6+45045*A*b^2*c*d^2*x^8+B*a^2*c^3*m^6*x^2+2259*B*a^2*c^2*d*m^4*x
^4+61005*B*a^2*c*d^2*m^2*x^6+15015*B*a^2*d^3*x^8+1506*B*a*b*c^3*m
^4*x^4+122010*B*a*b*c^2*d*m^2*x^6+90090*B*a*b*c*d^2*x^8+20335*B*b
^2*c^3*m^2*x^6+45045*B*b^2*c^2*d*x^8+138*A*a^2*c^2*d*m^5*x^2+1884
0*A*a^2*c*d^2*m^3*x^4+34986*A*a^2*d^3*m*x^6+92*A*a*b*c^3*m^5*x^2+
37680*A*a*b*c^2*d*m^3*x^4+209916*A*a*b*c*d^2*m*x^6+6280*A*b^2*c^3
*m^3*x^4+104958*A*b^2*c^2*d*m*x^6+46*B*a^2*c^3*m^5*x^2+18840*B*a^
2*c^2*d*m^3*x^4+104958*B*a^2*c*d^2*m*x^6+12560*B*a*b*c^3*m^3*x^4+
209916*B*a*b*c^2*d*m*x^6+34986*B*b^2*c^3*m*x^6+A*a^2*c^3*m^6+2505
*A*a^2*c^2*d*m^4*x^2+77937*A*a^2*c*d^2*m^2*x^4+19305*A*a^2*d^3*x^
6+1670*A*a*b*c^3*m^4*x^2+155874*A*a*b*c^2*d*m^2*x^4+115830*A*a*b*
c*d^2*x^6+25979*A*b^2*c^3*m^2*x^4+57915*A*b^2*c^2*d*x^6+835*B*a^2
*c^3*m^4*x^2+77937*B*a^2*c^2*d*m^2*x^4+57915*B*a^2*c*d^2*x^6+5195
8*B*a*b*c^3*m^2*x^4+115830*B*a*b*c^2*d*x^6+19305*B*b^2*c^3*x^6+48
*A*a^2*c^3*m^5+22620*A*a^2*c^2*d*m^3*x^2+142308*A*a^2*c*d^2*m*x^4
+15080*A*a*b*c^3*m^3*x^2+284616*A*a*b*c^2*d*m*x^4+47436*A*b^2*c^3
*m*x^4+7540*B*a^2*c^3*m^3*x^2+142308*B*a^2*c^2*d*m*x^4+94872*B*a*
b*c^3*m*x^4+925*A*a^2*c^3*m^4+104277*A*a^2*c^2*d*m^2*x^2+81081*A*
a^2*c*d^2*x^4+69518*A*a*b*c^3*m^2*x^2+162162*A*a*b*c^2*d*x^4+2702
7*A*b^2*c^3*x^4+34759*B*a^2*c^3*m^2*x^2+81081*B*a^2*c^2*d*x^4+540
54*B*a*b*c^3*x^4+9120*A*a^2*c^3*m^3+219162*A*a^2*c^2*d*m*x^2+1461
08*A*a*b*c^3*m*x^2+73054*B*a^2*c^3*m*x^2+48259*A*a^2*c^3*m^2+1351
35*A*a^2*c^2*d*x^2+90090*A*a*b*c^3*x^2+45045*B*a^2*c^3*x^2+129072
*A*a^2*c^3*m+135135*A*a^2*c^3)*(e*x)^m/(13+m)/(11+m)/(9+m)/(7+m)/
(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.26696, size = 2282, normalized size = 8.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^2*d^3*m^6 + 36*B*b^2*d^3*m^5 + 505*B*b^2*d^3*m^4 + 3480*B*b
^2*d^3*m^3 + 12139*B*b^2*d^3*m^2 + 19524*B*b^2*d^3*m + 10395*B*b^
2*d^3)*x^13 + ((3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^6 + 3685
5*B*b^2*c*d^2 + 38*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^5 +
555*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^4 + 12285*(2*B*a*b
```

```
+ A*b^2)*d^3 + 3940*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^3 +
 14039*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^2 + 22902*(3*B*b
^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m)*x^11 + ((3*B*b^2*c^2*d + 3*(
2*B*a*b + A*b^2)*c*d^2 + (B*a^2 + 2*A*a*b)*d^3)*m^6 + 45045*B*b^2
*c^2*d + 40*(3*B*b^2*c^2*d + 3*(2*B*a*b + A*b^2)*c*d^2 + (B*a^2 +
 2*A*a*b)*d^3)*m^5 + 613*(3*B*b^2*c^2*d + 3*(2*B*a*b + A*b^2)*c*d
^2 + (B*a^2 + 2*A*a*b)*d^3)*m^4 + 45045*(2*B*a*b + A*b^2)*c*d^2 +
 15015*(B*a^2 + 2*A*a*b)*d^3 + 4528*(3*B*b^2*c^2*d + 3*(2*B*a*b +
 A*b^2)*c*d^2 + (B*a^2 + 2*A*a*b)*d^3)*m^3 + 16627*(3*B*b^2*c^2*d
 + 3*(2*B*a*b + A*b^2)*c*d^2 + (B*a^2 + 2*A*a*b)*d^3)*m^2 + 27688
*(3*B*b^2*c^2*d + 3*(2*B*a*b + A*b^2)*c*d^2 + (B*a^2 + 2*A*a*b)*d
^3)*m)*x^9 + ((B*b^2*c^3 + A*a^2*d^3 + 3*(2*B*a*b + A*b^2)*c^2*d
+ 3*(B*a^2 + 2*A*a*b)*c*d^2)*m^6 + 19305*B*b^2*c^3 + 19305*A*a^2*
d^3 + 42*(B*b^2*c^3 + A*a^2*d^3 + 3*(2*B*a*b + A*b^2)*c^2*d + 3*(
B*a^2 + 2*A*a*b)*c*d^2)*m^5 + 679*(B*b^2*c^3 + A*a^2*d^3 + 3*(2*B
*a*b + A*b^2)*c^2*d + 3*(B*a^2 + 2*A*a*b)*c*d^2)*m^4 + 57915*(2*B
*a*b + A*b^2)*c^2*d + 57915*(B*a^2 + 2*A*a*b)*c*d^2 + 5292*(B*b^2
*c^3 + A*a^2*d^3 + 3*(2*B*a*b + A*b^2)*c^2*d + 3*(B*a^2 + 2*A*a*b
)*c*d^2)*m^3 + 20335*(B*b^2*c^3 + A*a^2*d^3 + 3*(2*B*a*b + A*b^2)
*c^2*d + 3*(B*a^2 + 2*A*a*b)*c*d^2)*m^2 + 34986*(B*b^2*c^3 + A*a^
2*d^3 + 3*(2*B*a*b + A*b^2)*c^2*d + 3*(B*a^2 + 2*A*a*b)*c*d^2)*m)
*x^7 + ((3*A*a^2*c*d^2 + (2*B*a*b + A*b^2)*c^3 + 3*(B*a^2 + 2*A*a
*b)*c^2*d)*m^6 + 81081*A*a^2*c*d^2 + 44*(3*A*a^2*c*d^2 + (2*B*a*b
 + A*b^2)*c^3 + 3*(B*a^2 + 2*A*a*b)*c^2*d)*m^5 + 753*(3*A*a^2*c*d
^2 + (2*B*a*b + A*b^2)*c^3 + 3*(B*a^2 + 2*A*a*b)*c^2*d)*m^4 + 270
27*(2*B*a*b + A*b^2)*c^3 + 81081*(B*a^2 + 2*A*a*b)*c^2*d + 6280*(
3*A*a^2*c*d^2 + (2*B*a*b + A*b^2)*c^3 + 3*(B*a^2 + 2*A*a*b)*c^2*d
)*m^3 + 25979*(3*A*a^2*c*d^2 + (2*B*a*b + A*b^2)*c^3 + 3*(B*a^2 +
 2*A*a*b)*c^2*d)*m^2 + 47436*(3*A*a^2*c*d^2 + (2*B*a*b + A*b^2)*c
^3 + 3*(B*a^2 + 2*A*a*b)*c^2*d)*m)*x^5 + ((3*A*a^2*c^2*d + (B*a^2
 + 2*A*a*b)*c^3)*m^6 + 135135*A*a^2*c^2*d + 46*(3*A*a^2*c^2*d + (
B*a^2 + 2*A*a*b)*c^3)*m^5 + 835*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b
)*c^3)*m^4 + 45045*(B*a^2 + 2*A*a*b)*c^3 + 7540*(3*A*a^2*c^2*d +
(B*a^2 + 2*A*a*b)*c^3)*m^3 + 34759*(3*A*a^2*c^2*d + (B*a^2 + 2*A*
a*b)*c^3)*m^2 + 73054*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m)*
x^3 + (A*a^2*c^3*m^6 + 48*A*a^2*c^3*m^5 + 925*A*a^2*c^3*m^4 + 912
0*A*a^2*c^3*m^3 + 48259*A*a^2*c^3*m^2 + 129072*A*a^2*c^3*m + 1351
35*A*a^2*c^3)*x)*(e*x)^m/(m^7 + 49*m^6 + 973*m^5 + 10045*m^4 + 57
379*m^3 + 177331*m^2 + 264207*m + 135135)
```

Sympy [A] time = 18.8863, size = 12199, normalized size = 42.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(b*x**2+a)**2*(B*x**2+A)*(d*x**2+c)**3,x)
```

```
[Out] Piecewise(((-A*a**2*c**3/(12*x**12) - 3*A*a**2*c**2*d/(10*x**10)
- 3*A*a**2*c*d**2/(8*x**8) - A*a**2*d**3/(6*x**6) - A*a*b*c**3/(5
*x**10) - 3*A*a*b*c**2*d/(4*x**8) - A*a*b*c*d**2/x**6 - A*a*b*d**
3/(2*x**4) - A*b**2*c**3/(8*x**8) - A*b**2*c**2*d/(2*x**6) - 3*A*
b**2*c*d**2/(4*x**4) - A*b**2*d**3/(2*x**2) - B*a**2*c**3/(10*x**
10) - 3*B*a**2*c**2*d/(8*x**8) - B*a**2*c*d**2/(2*x**6) - B*a**2*
d**3/(4*x**4) - B*a*b*c**3/(4*x**8) - B*a*b*c**2*d/x**6 - 3*B*a*b
*c*d**2/(2*x**4) - B*a*b*d**3/x**2 - B*b**2*c**3/(6*x**6) - 3*B*b
**2*c**2*d/(4*x**4) - 3*B*b**2*c*d**2/(2*x**2) + B*b**2*d**3*log(
x))/e**13, Eq(m, -13)), ((-A*a**2*c**3/(10*x**10) - 3*A*a**2*c**2
*d/(8*x**8) - A*a**2*c*d**2/(2*x**6) - A*a**2*d**3/(4*x**4) - A*a
*b*c**3/(4*x**8) - A*a*b*c**2*d/x**6 - 3*A*a*b*c*d**2/(2*x**4) -
A*a*b*d**3/x**2 - A*b**2*c**3/(6*x**6) - 3*A*b**2*c**2*d/(4*x**4)
 - 3*A*b**2*c*d**2/(2*x**2) + A*b**2*d**3*log(x) - B*a**2*c**3/(8
*x**8) - B*a**2*c**2*d/(2*x**6) - 3*B*a**2*c*d**2/(4*x**4) - B*a*
*2*d**3/(2*x**2) - B*a*b*c**3/(3*x**6) - 3*B*a*b*c**2*d/(2*x**4)
- 3*B*a*b*c*d**2/x**2 + 2*B*a*b*d**3*log(x) - B*b**2*c**3/(4*x**4
) - 3*B*b**2*c**2*d/(2*x**2) + 3*B*b**2*c*d**2*log(x) + B*b**2*d*
*3*x**2/2)/e**11, Eq(m, -11)), ((-A*a**2*c**3/(8*x**8) - A*a**2*c
**2*d/(2*x**6) - 3*A*a**2*c*d**2/(4*x**4) - A*a**2*d**3/(2*x**2)
- A*a*b*c**3/(3*x**6) - 3*A*a*b*c**2*d/(2*x**4) - 3*A*a*b*c*d**2/
x**2 + 2*A*a*b*d**3*log(x) - A*b**2*c**3/(4*x**4) - 3*A*b**2*c**2
```

```
*d/(2*x**2) + 3*A*b**2*c*d**2*log(x) + A*b**2*d**3*x**2/2 - B*a**
2*c**3/(6*x**6) - 3*B*a**2*c**2*d/(4*x**4) - 3*B*a**2*c*d**2/(2*x
**2) + B*a**2*d**3*log(x) - B*a*b*c**3/(2*x**4) - 3*B*a*b*c**2*d/
x**2 + 6*B*a*b*c*d**2*log(x) + B*a*b*d**3*x**2 - B*b**2*c**3/(2*x
**2) + 3*B*b**2*c**2*d*log(x) + 3*B*b**2*c*d**2*x**2/2 + B*b**2*d
**3*x**4/4)/e**9, Eq(m, -9)), ((-A*a**2*c**3/(6*x**6) - 3*A*a**2*
c**2*d/(4*x**4) - 3*A*a**2*c*d**2/(2*x**2) + A*a**2*d**3*log(x) -
 A*a*b*c**3/(2*x**4) - 3*A*a*b*c**2*d/x**2 + 6*A*a*b*c*d**2*log(x
) + A*a*b*d**3*x**2 - A*b**2*c**3/(2*x**2) + 3*A*b**2*c**2*d*log(
x) + 3*A*b**2*c*d**2*x**2/2 + A*b**2*d**3*x**4/4 - B*a**2*c**3/(4
*x**4) - 3*B*a**2*c**2*d/(2*x**2) + 3*B*a**2*c*d**2*log(x) + B*a*
*2*d**3*x**2/2 - B*a*b*c**3/x**2 + 6*B*a*b*c**2*d*log(x) + 3*B*a*
b*c*d**2*x**2 + B*a*b*d**3*x**4/2 + B*b**2*c**3*log(x) + 3*B*b**2
*c**2*d*x**2/2 + 3*B*b**2*c*d**2*x**4/4 + B*b**2*d**3*x**6/6)/e**
7, Eq(m, -7)), ((-A*a**2*c**3/(4*x**4) - 3*A*a**2*c**2*d/(2*x**2)
 + 3*A*a**2*c*d**2*log(x) + A*a**2*d**3*x**2/2 - A*a*b*c**3/x**2
+ 6*A*a*b*c**2*d*log(x) + 3*A*a*b*c*d**2*x**2 + A*a*b*d**3*x**4/2
 + A*b**2*c**3*log(x) + 3*A*b**2*c**2*d*x**2/2 + 3*A*b**2*c*d**2*
x**4/4 + A*b**2*d**3*x**6/6 - B*a**2*c**3/(2*x**2) + 3*B*a**2*c**
2*d*log(x) + 3*B*a**2*c*d**2*x**2/2 + B*a**2*d**3*x**4/4 + 2*B*a*
b*c**3*log(x) + 3*B*a*b*c**2*d*x**2 + 3*B*a*b*c*d**2*x**4/2 + B*a
*b*d**3*x**6/3 + B*b**2*c**3*x**2/2 + 3*B*b**2*c**2*d*x**4/4 + B*
b**2*c*d**2*x**6/2 + B*b**2*d**3*x**8/8)/e**5, Eq(m, -5)), ((-A*a
**2*c**3/(2*x**2) + 3*A*a**2*c**2*d*log(x) + 3*A*a**2*c*d**2*x**2
/2 + A*a**2*d**3*x**4/4 + 2*A*a*b*c**3*log(x) + 3*A*a*b*c**2*d*x*
*2 + 3*A*a*b*c*d**2*x**4/2 + A*a*b*d**3*x**6/3 + A*b**2*c**3*x**2
/2 + 3*A*b**2*c**2*d*x**4/4 + A*b**2*c*d**2*x**6/2 + A*b**2*d**3*
x**8/8 + B*a**2*c**3*log(x) + 3*B*a**2*c**2*d*x**2/2 + 3*B*a**2*c
*d**2*x**4/4 + B*a**2*d**3*x**6/6 + B*a*b*c**3*x**2 + 3*B*a*b*c**
2*d*x**4/2 + B*a*b*c*d**2*x**6 + B*a*b*d**3*x**8/4 + B*b**2*c**3*
x**4/4 + B*b**2*c**2*d*x**6/2 + 3*B*b**2*c*d**2*x**8/8 + B*b**2*d
**3*x**10/10)/e**3, Eq(m, -3)), ((A*a**2*c**3*log(x) + 3*A*a**2*c
**2*d*x**2/2 + 3*A*a**2*c*d**2*x**4/4 + A*a**2*d**3*x**6/6 + A*a*
b*c**3*x**2 + 3*A*a*b*c**2*d*x**4/2 + A*a*b*c*d**2*x**6 + A*a*b*d
**3*x**8/4 + A*b**2*c**3*x**4/4 + A*b**2*c**2*d*x**6/2 + 3*A*b**2
*c*d**2*x**8/8 + A*b**2*d**3*x**10/10 + B*a**2*c**3*x**2/2 + 3*B*
a**2*c**2*d*x**4/4 + B*a**2*c*d**2*x**6/2 + B*a**2*d**3*x**8/8 +
B*a*b*c**3*x**4/2 + B*a*b*c**2*d*x**6 + 3*B*a*b*c*d**2*x**8/4 + B
*a*b*d**3*x**10/5 + B*b**2*c**3*x**6/6 + 3*B*b**2*c**2*d*x**8/8 +
 3*B*b**2*c*d**2*x**10/10 + B*b**2*d**3*x**12/12)/e, Eq(m, -1)),
(A*a**2*c**3*e**m*m**6*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*
m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 48*A*a**2*
c**3*e**m*m**5*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5
7379*m**3 + 177331*m**2 + 264207*m + 135135) + 925*A*a**2*c**3*e*
*m*m**4*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m*
*3 + 177331*m**2 + 264207*m + 135135) + 9120*A*a**2*c**3*e**m*m**
3*x*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 1
77331*m**2 + 264207*m + 135135) + 48259*A*a**2*c**3*e**m*m**2*x*x
**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 129072*A*a**2*c**3*e**m*m*x*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 135135*A*a**2*c**3*e**m*x*x**m/(m**7 + 49*m
**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m
 + 135135) + 3*A*a**2*c**2*d*e**m*m**6*x**3*x**m/(m**7 + 49*m**6
+ 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1
35135) + 138*A*a**2*c**2*d*e**m*m**5*x**3*x**m/(m**7 + 49*m**6 +
973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135
135) + 2505*A*a**2*c**2*d*e**m*m**4*x**3*x**m/(m**7 + 49*m**6 + 9
73*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1351
35) + 22620*A*a**2*c**2*d*e**m*m**3*x**3*x**m/(m**7 + 49*m**6 + 9
73*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1351
35) + 104277*A*a**2*c**2*d*e**m*m**2*x**3*x**m/(m**7 + 49*m**6 +
973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135
135) + 219162*A*a**2*c**2*d*e**m*m*x**3*x**m/(m**7 + 49*m**6 + 97
3*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 13513
5) + 135135*A*a**2*c**2*d*e**m*x**3*x**m/(m**7 + 49*m**6 + 973*m*
*5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
 3*A*a**2*c*d**2*e**m*m**6*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 +
 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 132
*A*a**2*c*d**2*e**m*m**5*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 1
0045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 2259*
A*a**2*c*d**2*e**m*m**4*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 18840*
A*a**2*c*d**2*e**m*m**3*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
```

```
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 77937*
A*a**2*c*d**2*e**m*m**2*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 142308
*A*a**2*c*d**2*e**m*m*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 1004
5*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 81081*A*
a**2*c*d**2*e**m*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**
4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + A*a**2*d**3*e
**m*m**6*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5737
9*m**3 + 177331*m**2 + 264207*m + 135135) + 42*A*a**2*d**3*e**m*m
**5*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**
3 + 177331*m**2 + 264207*m + 135135) + 679*A*a**2*d**3*e**m*m**4*
x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 5292*A*a**2*d**3*e**m*m**3*x**
7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177
331*m**2 + 264207*m + 135135) + 20335*A*a**2*d**3*e**m*m**2*x**7*
x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17733
1*m**2 + 264207*m + 135135) + 34986*A*a**2*d**3*e**m*m*x**7*x**m/
(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**
2 + 264207*m + 135135) + 19305*A*a**2*d**3*e**m*x**7*x**m/(m**7 +
 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264
207*m + 135135) + 2*A*a*b*c**3*e**m*m**6*x**3*x**m/(m**7 + 49*m**
6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
 135135) + 92*A*a*b*c**3*e**m*m**5*x**3*x**m/(m**7 + 49*m**6 + 97
3*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 13513
5) + 1670*A*a*b*c**3*e**m*m**4*x**3*x**m/(m**7 + 49*m**6 + 973*m*
*5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
 15080*A*a*b*c**3*e**m*m**3*x**3*x**m/(m**7 + 49*m**6 + 973*m**5
+ 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 69
518*A*a*b*c**3*e**m*m**2*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 1
0045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 14610
8*A*a*b*c**3*e**m*m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*
m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 90090*A*a*
b*c**3*e**m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5
7379*m**3 + 177331*m**2 + 264207*m + 135135) + 6*A*a*b*c**2*d*e**
m*m**6*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*
m**3 + 177331*m**2 + 264207*m + 135135) + 264*A*a*b*c**2*d*e**m*m
**5*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**
3 + 177331*m**2 + 264207*m + 135135) + 4518*A*a*b*c**2*d*e**m*m**
4*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3
+ 177331*m**2 + 264207*m + 135135) + 37680*A*a*b*c**2*d*e**m*m**3
*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
 177331*m**2 + 264207*m + 135135) + 155874*A*a*b*c**2*d*e**m*m**2
*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
 177331*m**2 + 264207*m + 135135) + 284616*A*a*b*c**2*d*e**m*m*x*
*5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17
7331*m**2 + 264207*m + 135135) + 162162*A*a*b*c**2*d*e**m*x**5*x*
*m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*
m**2 + 264207*m + 135135) + 6*A*a*b*c*d**2*e**m*m**6*x**7*x**m/(m
**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
+ 264207*m + 135135) + 252*A*a*b*c*d**2*e**m*m**5*x**7*x**m/(m**7
 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2
64207*m + 135135) + 4074*A*a*b*c*d**2*e**m*m**4*x**7*x**m/(m**7 +
 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264
207*m + 135135) + 31752*A*a*b*c*d**2*e**m*m**3*x**7*x**m/(m**7 +
49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2642
07*m + 135135) + 122010*A*a*b*c*d**2*e**m*m**2*x**7*x**m/(m**7 +
49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2642
07*m + 135135) + 209916*A*a*b*c*d**2*e**m*m*x**7*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 115830*A*a*b*c*d**2*e**m*x**7*x**m/(m**7 + 49*m**6
+ 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1
35135) + 2*A*a*b*d**3*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 973*m
**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
+ 80*A*a*b*d**3*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 1226
*A*a*b*d**3*e**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 1004
5*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 9056*A*a
*b*d**3*e**m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 33254*A*a*b*
d**3*e**m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
+ 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 55376*A*a*b*d**
3*e**m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5737
9*m**3 + 177331*m**2 + 264207*m + 135135) + 30030*A*a*b*d**3*e**m
*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
```

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 177331*m**2 + 264207*m + 135135) + A*b**2*c**3*e**m*m**6*x**5*x*
*m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*
m**2 + 264207*m + 135135) + 44*A*b**2*c**3*e**m*m**5*x**5*x**m/(m
**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
+ 264207*m + 135135) + 753*A*b**2*c**3*e**m*m**4*x**5*x**m/(m**7
+ 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26
4207*m + 135135) + 6280*A*b**2*c**3*e**m*m**3*x**5*x**m/(m**7 + 4
9*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26420
7*m + 135135) + 25979*A*b**2*c**3*e**m*m**2*x**5*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 47436*A*b**2*c**3*e**m*m*x**5*x**m/(m**7 + 49*m**6
+ 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1
35135) + 27027*A*b**2*c**3*e**m*x**5*x**m/(m**7 + 49*m**6 + 973*m
**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
+ 3*A*b**2*c**2*d*e**m*m**6*x**7*x**m/(m**7 + 49*m**6 + 973*m**5
+ 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 12
6*A*b**2*c**2*d*e**m*m**5*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 2037
*A*b**2*c**2*d*e**m*m**4*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 1
0045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 15876
*A*b**2*c**2*d*e**m*m**3*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 1
0045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 61005
*A*b**2*c**2*d*e**m*m**2*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 1
0045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 10495
8*A*b**2*c**2*d*e**m*m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 100
45*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 57915*A
*b**2*c**2*d*e**m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m*
*4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 3*A*b**2*c*d
**2*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 120*A*b**2*c*d**
2*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5
7379*m**3 + 177331*m**2 + 264207*m + 135135) + 1839*A*b**2*c*d**2
*e**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 13584*A*b**2*c*d**2
*e**m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 49881*A*b**2*c*d**2
*e**m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 83064*A*b**2*c*d**2
*e**m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379
*m**3 + 177331*m**2 + 264207*m + 135135) + 45045*A*b**2*c*d**2*e*
*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3
 + 177331*m**2 + 264207*m + 135135) + A*b**2*d**3*e**m*m**6*x**11
*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 1773
31*m**2 + 264207*m + 135135) + 38*A*b**2*d**3*e**m*m**5*x**11*x**
m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m
**2 + 264207*m + 135135) + 555*A*b**2*d**3*e**m*m**4*x**11*x**m/(
m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
 + 264207*m + 135135) + 3940*A*b**2*d**3*e**m*m**3*x**11*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 14039*A*b**2*d**3*e**m*m**2*x**11*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 22902*A*b**2*d**3*e**m*m*x**11*x**m/(m**7 +
49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 2642
07*m + 135135) + 12285*A*b**2*d**3*e**m*x**11*x**m/(m**7 + 49*m**
6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
 135135) + B*a**2*c**3*e**m*m**6*x**3*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 46*B*a**2*c**3*e**m*m**5*x**3*x**m/(m**7 + 49*m**6 + 973*m**5
+ 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 83
5*B*a**2*c**3*e**m*m**4*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 7540*B
*a**2*c**3*e**m*m**3*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045
*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 34759*B*a
**2*c**3*e**m*m**2*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m
**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 73054*B*a**
2*c**3*e**m*m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 45045*B*a**2*c**
3*e**m*x**3*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*
m**3 + 177331*m**2 + 264207*m + 135135) + 3*B*a**2*c**2*d*e**m*m*
*6*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3
 + 177331*m**2 + 264207*m + 135135) + 132*B*a**2*c**2*d*e**m*m**5
*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
 177331*m**2 + 264207*m + 135135) + 2259*B*a**2*c**2*d*e**m*m**4*
x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
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177331*m**2 + 264207*m + 135135) + 18840*B*a**2*c**2*d*e**m*m**3*
x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 77937*B*a**2*c**2*d*e**m*m**2*
x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 +
177331*m**2 + 264207*m + 135135) + 142308*B*a**2*c**2*d*e**m*m*x*
*5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17
7331*m**2 + 264207*m + 135135) + 81081*B*a**2*c**2*d*e**m*x**5*x*
*m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*
m**2 + 264207*m + 135135) + 3*B*a**2*c*d**2*e**m*m**6*x**7*x**m/(
m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
 + 264207*m + 135135) + 126*B*a**2*c*d**2*e**m*m**5*x**7*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 2037*B*a**2*c*d**2*e**m*m**4*x**7*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 15876*B*a**2*c*d**2*e**m*m**3*x**7*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 61005*B*a**2*c*d**2*e**m*m**2*x**7*x**m/(m**
7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
264207*m + 135135) + 104958*B*a**2*c*d**2*e**m*m*x**7*x**m/(m**7
+ 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26
4207*m + 135135) + 57915*B*a**2*c*d**2*e**m*x**7*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + B*a**2*d**3*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 9
73*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1351
35) + 40*B*a**2*d**3*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m*
*5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
 613*B*a**2*d**3*e**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 +
 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 452
8*B*a**2*d**3*e**m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 16627*
B*a**2*d**3*e**m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 1004
5*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 27688*B*
a**2*d**3*e**m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**
4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 15015*B*a**2*
d**3*e**m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 573
79*m**3 + 177331*m**2 + 264207*m + 135135) + 2*B*a*b*c**3*e**m*m*
*6*x**5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3
 + 177331*m**2 + 264207*m + 135135) + 88*B*a*b*c**3*e**m*m**5*x**
5*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177
331*m**2 + 264207*m + 135135) + 1506*B*a*b*c**3*e**m*m**4*x**5*x*
*m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*
m**2 + 264207*m + 135135) + 12560*B*a*b*c**3*e**m*m**3*x**5*x**m/
(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**
2 + 264207*m + 135135) + 51958*B*a*b*c**3*e**m*m**2*x**5*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 94872*B*a*b*c**3*e**m*m*x**5*x**m/(m**7 + 4
9*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26420
7*m + 135135) + 54054*B*a*b*c**3*e**m*x**5*x**m/(m**7 + 49*m**6 +
 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 13
5135) + 6*B*a*b*c**2*d*e**m*m**6*x**7*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 252*B*a*b*c**2*d*e**m*m**5*x**7*x**m/(m**7 + 49*m**6 + 973*m**
5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) +
4074*B*a*b*c**2*d*e**m*m**4*x**7*x**m/(m**7 + 49*m**6 + 973*m**5
+ 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 31
752*B*a*b*c**2*d*e**m*m**3*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 +
 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 122
010*B*a*b*c**2*d*e**m*m**2*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 +
 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 209
916*B*a*b*c**2*d*e**m*m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 115830
*B*a*b*c**2*d*e**m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m
**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 6*B*a*b*c*d
**2*e**m*m**6*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 240*B*a*b*c*d**2
*e**m*m**5*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57
379*m**3 + 177331*m**2 + 264207*m + 135135) + 3678*B*a*b*c*d**2*e
**m*m**4*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5737
9*m**3 + 177331*m**2 + 264207*m + 135135) + 27168*B*a*b*c*d**2*e*
*m*m**3*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379
*m**3 + 177331*m**2 + 264207*m + 135135) + 99762*B*a*b*c*d**2*e**
m*m**2*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*
m**3 + 177331*m**2 + 264207*m + 135135) + 166128*B*a*b*c*d**2*e**
m*m*x**9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**
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3 + 177331*m**2 + 264207*m + 135135) + 90090*B*a*b*c*d**2*e**m*x*
*9*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17
7331*m**2 + 264207*m + 135135) + 2*B*a*b*d**3*e**m*m**6*x**11*x**
m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m
**2 + 264207*m + 135135) + 76*B*a*b*d**3*e**m*m**5*x**11*x**m/(m*
*7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 +
 264207*m + 135135) + 1110*B*a*b*d**3*e**m*m**4*x**11*x**m/(m**7
+ 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26
4207*m + 135135) + 7880*B*a*b*d**3*e**m*m**3*x**11*x**m/(m**7 + 4
9*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26420
7*m + 135135) + 28078*B*a*b*d**3*e**m*m**2*x**11*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 45804*B*a*b*d**3*e**m*m*x**11*x**m/(m**7 + 49*m**6
+ 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 1
35135) + 24570*B*a*b*d**3*e**m*x**11*x**m/(m**7 + 49*m**6 + 973*m
**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
+ B*b**2*c**3*e**m*m**6*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 42*B*b
**2*c**3*e**m*m**5*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m
**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 679*B*b**2*
c**3*e**m*m**4*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4
+ 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 5292*B*b**2*c**
3*e**m*m**3*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 5
7379*m**3 + 177331*m**2 + 264207*m + 135135) + 20335*B*b**2*c**3*
e**m*m**2*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 573
79*m**3 + 177331*m**2 + 264207*m + 135135) + 34986*B*b**2*c**3*e*
*m*m*x**7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m*
*3 + 177331*m**2 + 264207*m + 135135) + 19305*B*b**2*c**3*e**m*x*
*7*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 17
7331*m**2 + 264207*m + 135135) + 3*B*b**2*c**2*d*e**m*m**6*x**9*x
**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331
*m**2 + 264207*m + 135135) + 120*B*b**2*c**2*d*e**m*m**5*x**9*x**
m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m
**2 + 264207*m + 135135) + 1839*B*b**2*c**2*d*e**m*m**4*x**9*x**m
/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m*
*2 + 264207*m + 135135) + 13584*B*b**2*c**2*d*e**m*m**3*x**9*x**m
/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m*
*2 + 264207*m + 135135) + 49881*B*b**2*c**2*d*e**m*m**2*x**9*x**m
/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m*
*2 + 264207*m + 135135) + 83064*B*b**2*c**2*d*e**m*m*x**9*x**m/(m
**7 + 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2
+ 264207*m + 135135) + 45045*B*b**2*c**2*d*e**m*x**9*x**m/(m**7 +
 49*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264
207*m + 135135) + 3*B*b**2*c*d**2*e**m*m**6*x**11*x**m/(m**7 + 49
*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207
*m + 135135) + 114*B*b**2*c*d**2*e**m*m**5*x**11*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 1665*B*b**2*c*d**2*e**m*m**4*x**11*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 11820*B*b**2*c*d**2*e**m*m**3*x**11*x**m/(m**7 + 49
*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207
*m + 135135) + 42117*B*b**2*c*d**2*e**m*m**2*x**11*x**m/(m**7 + 4
9*m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 26420
7*m + 135135) + 68706*B*b**2*c*d**2*e**m*m*x**11*x**m/(m**7 + 49*
m**6 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*
m + 135135) + 36855*B*b**2*c*d**2*e**m*x**11*x**m/(m**7 + 49*m**6
 + 973*m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m +
135135) + B*b**2*d**3*e**m*m**6*x**13*x**m/(m**7 + 49*m**6 + 973*
m**5 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135)
 + 36*B*b**2*d**3*e**m*m**5*x**13*x**m/(m**7 + 49*m**6 + 973*m**5
 + 10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 5
05*B*b**2*d**3*e**m*m**4*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 +
10045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 3480
*B*b**2*d**3*e**m*m**3*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 10
045*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 12139*
B*b**2*d**3*e**m*m**2*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 100
45*m**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 19524*B
*b**2*d**3*e**m*m*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m
**4 + 57379*m**3 + 177331*m**2 + 264207*m + 135135) + 10395*B*b**
2*d**3*e**m*x**13*x**m/(m**7 + 49*m**6 + 973*m**5 + 10045*m**4 +
57379*m**3 + 177331*m**2 + 264207*m + 135135), True))
```

GIAC/XCAS [A] time = 0.241444, size = 1, normalized size = 0.

$$Done$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Done
```

3.17 $\int (ex)^m \left(a+bx^2\right) \left(A+Bx^2\right) \left(c+dx^2\right)^3 \, dx$

Optimal. Leaf size=189

$$\frac{c^2(ex)^{m+3}(3aAd+aBc+Abc)}{e^3(m+3)}+\frac{d^2(ex)^{m+9}(aBd+Abd+3bBc)}{e^9(m+9)}+\frac{d(ex)^{m+7}(ad(Ad+3Bc)+3bc(Ad+Bc))}{e^7(m+7)}+\frac{c(ex)^{m+5}(3ad(Ad+Bc)+bc(3Ad+Bc))}{e^5(m+5)}+\frac{aAc^3(ex)^{m+1}}{e(m+1)}+\frac{bBd^3(ex)^{m+11}}{e^{11}(m+11)}$$

```
[Out] (a*A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (c^2*(A*b*c + a*B*c + 3*a*A
*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (c*(3*a*d*(B*c + A*d) + b*c*(B
*c + 3*A*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (d*(3*b*c*(B*c + A*d)
 + a*d*(3*B*c + A*d))*(e*x)^(7 + m))/(e^7*(7 + m)) + (d^2*(3*b*B*
c + A*b*d + a*B*d)*(e*x)^(9 + m))/(e^9*(9 + m)) + (b*B*d^3*(e*x)^
(11 + m))/(e^11*(11 + m))
```

Rubi [A] time = 0.483125, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.034

$$\frac{c^2(ex)^{m+3}(3aAd+aBc+Abc)}{e^3(m+3)}+\frac{d^2(ex)^{m+9}(aBd+Abd+3bBc)}{e^9(m+9)}+\frac{d(ex)^{m+7}(ad(Ad+3Bc)+3bc(Ad+Bc))}{e^7(m+7)}+\frac{c(ex)^{m+5}(3ad(Ad+Bc)+bc(3Ad+Bc))}{e^5(m+5)}+\frac{aAc^3(ex)^{m+1}}{e(m+1)}+\frac{bBd^3(ex)^{m+11}}{e^{11}(m+11)}$$

Antiderivative was successfully verified.

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

```
[Out] (a*A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (c^2*(A*b*c + a*B*c + 3*a*A
*d)*(e*x)^(3 + m))/(e^3*(3 + m)) + (c*(3*a*d*(B*c + A*d) + b*c*(B
*c + 3*A*d))*(e*x)^(5 + m))/(e^5*(5 + m)) + (d*(3*b*c*(B*c + A*d)
 + a*d*(3*B*c + A*d))*(e*x)^(7 + m))/(e^7*(7 + m)) + (d^2*(3*b*B*
c + A*b*d + a*B*d)*(e*x)^(9 + m))/(e^9*(9 + m)) + (b*B*d^3*(e*x)^
(11 + m))/(e^11*(11 + m))
```

Rubi in Sympy [A] time = 73.4873, size = 201, normalized size = 1.06

$$\frac{Aac^3\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bbd^3\,(ex)^{m+11}}{e^{11}\,(m+11)}+\frac{c^2\,(ex)^{m+3}\,(3Aad+Abc+Bac)}{e^3\,(m+3)}+\frac{c\,(ex)^{m+5}\left(3Aad^2+3Abcd+3Bacd+Bbc^2\right)}{e^5\,(m+5)}+\frac{d^2\,(ex)^{m+9}\,(Abd+Bad+3Bbc)}{e^9\,(m+9)}+\frac{d\,(ex)^{m+7}\left(Aad^2+3Abcd+3Bacd+3Bbc^2\right)}{e^7\,(m+7)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)*(d*x**2+c)**3,x)
```

```
[Out] A*a*c**3*(e*x)**(m + 1)/(e*(m + 1)) + B*b*d**3*(e*x)**(m + 11)/(e
**11*(m + 11)) + c**2*(e*x)**(m + 3)*(3*A*a*d + A*b*c + B*a*c)/(e
**3*(m + 3)) + c*(e*x)**(m + 5)*(3*A*a*d**2 + 3*A*b*c*d + 3*B*a*c
*d + B*b*c**2)/(e**5*(m + 5)) + d**2*(e*x)**(m + 9)*(A*b*d + B*a*
d + 3*B*b*c)/(e**9*(m + 9)) + d*(e*x)**(m + 7)*(A*a*d**2 + 3*A*b*
c*d + 3*B*a*c*d + 3*B*b*c**2)/(e**7*(m + 7))
```

Mathematica [A] time = 0.699487, size = 151, normalized size = 0.8

$$(ex)^m\left(\frac{c^2x^3(3aAd+aBc+Abc)}{m+3}+\frac{d^2x^9(aBd+Abd+3bBc)}{m+9}+\frac{dx^7(ad(Ad+3Bc)+3bc(Ad+Bc))}{m+7}+\frac{cx^5(3ad(Ad+Bc)+bc(3Ad+Bc))}{m+5}+\frac{aAc^3x}{m+1}+\frac{bBd^3x^{11}}{m+11}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((a*A*c^3*x)/(1 + m) + (c^2*(A*b*c + a*B*c + 3*a*A*d)*x^3
)/(3 + m) + (c*(3*a*d*(B*c + A*d) + b*c*(B*c + 3*A*d))*x^5)/(5 +
m) + (d*(3*b*c*(B*c + A*d) + a*d*(3*B*c + A*d))*x^7)/(7 + m) + (d
^2*(3*b*B*c + A*b*d + a*B*d)*x^9)/(9 + m) + (b*B*d^3*x^11)/(11 +
m))
```

Maple [B] time = 0.011, size = 1229, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*b*d^3*m^5*x^10+25*B*b*d^3*m^4*x^10+A*b*d^3*m^5*x^8+B*a*d^3*m
^5*x^8+3*B*b*c*d^2*m^5*x^8+230*B*b*d^3*m^3*x^10+27*A*b*d^3*m^4*x^
8+27*B*a*d^3*m^4*x^8+81*B*b*c*d^2*m^4*x^8+950*B*b*d^3*m^2*x^10+A*
a*d^3*m^5*x^6+3*A*b*c*d^2*m^5*x^6+262*A*b*d^3*m^3*x^8+3*B*a*c*d^2
*m^5*x^6+262*B*a*d^3*m^3*x^8+3*B*b*c^2*d*m^5*x^6+786*B*b*c*d^2*m^
3*x^8+1689*B*b*d^3*m*x^10+29*A*a*d^3*m^4*x^6+87*A*b*c*d^2*m^4*x^6
+1122*A*b*d^3*m^2*x^8+87*B*a*c*d^2*m^4*x^6+1122*B*a*d^3*m^2*x^8+8
7*B*b*c^2*d*m^4*x^6+3366*B*b*c*d^2*m^2*x^8+945*B*b*d^3*x^10+3*A*a
*c*d^2*m^5*x^4+302*A*a*d^3*m^3*x^6+3*A*b*c^2*d*m^5*x^4+906*A*b*c*
d^2*m^3*x^6+2041*A*b*d^3*m*x^8+3*B*a*c^2*d*m^5*x^4+906*B*a*c*d^2*
m^3*x^6+2041*B*a*d^3*m*x^8+B*b*c^3*m^5*x^4+906*B*b*c^2*d*m^3*x^6+
6123*B*b*c*d^2*m*x^8+93*A*a*c*d^2*m^4*x^4+1366*A*a*d^3*m^2*x^6+93
*A*b*c^2*d*m^4*x^4+4098*A*b*c*d^2*m^2*x^6+1155*A*b*d^3*x^8+93*B*a
*c^2*d*m^4*x^4+4098*B*a*c*d^2*m^2*x^6+1155*B*a*d^3*x^8+31*B*b*c^3
*m^4*x^4+4098*B*b*c^2*d*m^2*x^6+3465*B*b*c*d^2*x^8+3*A*a*c^2*d*m^
5*x^2+1050*A*a*c*d^2*m^3*x^4+2577*A*a*d^3*m*x^6+A*b*c^3*m^5*x^2+1
050*A*b*c^2*d*m^3*x^4+7731*A*b*c*d^2*m*x^6+B*a*c^3*m^5*x^2+1050*B
*a*c^2*d*m^3*x^4+7731*B*a*c*d^2*m*x^6+350*B*b*c^3*m^3*x^4+7731*B*
b*c^2*d*m*x^6+99*A*a*c^2*d*m^4*x^2+5190*A*a*c*d^2*m^2*x^4+1485*A*
a*d^3*x^6+33*A*b*c^3*m^4*x^2+5190*A*b*c^2*d*m^2*x^4+4455*A*b*c*d^
2*x^6+33*B*a*c^3*m^4*x^2+5190*B*a*c^2*d*m^2*x^4+4455*B*a*c*d^2*x^
6+1730*B*b*c^3*m^2*x^4+4455*B*b*c^2*d*x^6+A*a*c^3*m^5+1218*A*a*c^
2*d*m^3*x^2+10467*A*a*c*d^2*m*x^4+406*A*b*c^3*m^3*x^2+10467*A*b*c
^2*d*m*x^4+406*B*a*c^3*m^3*x^2+10467*B*a*c^2*d*m*x^4+3489*B*b*c^3
*m*x^4+35*A*a*c^3*m^4+6786*A*a*c^2*d*m^2*x^2+6237*A*a*c*d^2*x^4+2
262*A*b*c^3*m^2*x^2+6237*A*b*c^2*d*x^4+2262*B*a*c^3*m^2*x^2+6237*
B*a*c^2*d*x^4+2079*B*b*c^3*x^4+470*A*a*c^3*m^3+16059*A*a*c^2*d*m*
x^2+5353*A*b*c^3*m*x^2+5353*B*a*c^3*m*x^2+3010*A*a*c^3*m^2+10395*
A*a*c^2*d*x^2+3465*A*b*c^3*x^2+3465*B*a*c^3*x^2+9129*A*a*c^3*m+10
395*A*a*c^3)*(e*x)^m/(11+m)/(9+m)/(7+m)/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.267, size = 1130, normalized size = 5.98

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b*d^3*m^5 + 25*B*b*d^3*m^4 + 230*B*b*d^3*m^3 + 950*B*b*d^3*m^
2 + 1689*B*b*d^3*m + 945*B*b*d^3)*x^11 + ((3*B*b*c*d^2 + (B*a + A
*b)*d^3)*m^5 + 3465*B*b*c*d^2 + 27*(3*B*b*c*d^2 + (B*a + A*b)*d^3
)*m^4 + 1155*(B*a + A*b)*d^3 + 262*(3*B*b*c*d^2 + (B*a + A*b)*d^3
)*m^3 + 1122*(3*B*b*c*d^2 + (B*a + A*b)*d^3)*m^2 + 2041*(3*B*b*c*
d^2 + (B*a + A*b)*d^3)*m)*x^9 + ((3*B*b*c^2*d + A*a*d^3 + 3*(B*a
+ A*b)*c*d^2)*m^5 + 4455*B*b*c^2*d + 1485*A*a*d^3 + 29*(3*B*b*c^2
*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^4 + 4455*(B*a + A*b)*c*d^2
+ 302*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^3 + 1366*(3
*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^2 + 2577*(3*B*b*c^2
*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m)*x^7 + ((B*b*c^3 + 3*A*a*c*
d^2 + 3*(B*a + A*b)*c^2*d)*m^5 + 2079*B*b*c^3 + 6237*A*a*c*d^2 +
31*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^4 + 6237*(B*a
+ A*b)*c^2*d + 350*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*
m^3 + 1730*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^2 + 34
89*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m)*x^5 + ((3*A*a
*c^2*d + (B*a + A*b)*c^3)*m^5 + 10395*A*a*c^2*d + 33*(3*A*a*c^2*d
 + (B*a + A*b)*c^3)*m^4 + 3465*(B*a + A*b)*c^3 + 406*(3*A*a*c^2*d
 + (B*a + A*b)*c^3)*m^3 + 2262*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m^
2 + 5353*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m)*x^3 + (A*a*c^3*m^5 +
35*A*a*c^3*m^4 + 470*A*a*c^3*m^3 + 3010*A*a*c^3*m^2 + 9129*A*a*c^
3*m + 10395*A*a*c^3)*x)*(e*x)^m/(m^6 + 36*m^5 + 505*m^4 + 3480*m^
3 + 12139*m^2 + 19524*m + 10395)
```

Sympy [A] time = 9.69277, size = 6156, normalized size = 32.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)*(d*x**2+c)**3,x)
```

```
[Out] Piecewise(((-A*a*c**3/(10*x**10) - 3*A*a*c**2*d/(8*x**8) - A*a*c*
d**2/(2*x**6) - A*a*d**3/(4*x**4) - A*b*c**3/(8*x**8) - A*b*c**2*
d/(2*x**6) - 3*A*b*c*d**2/(4*x**4) - A*b*d**3/(2*x**2) - B*a*c**3
/(8*x**8) - B*a*c**2*d/(2*x**6) - 3*B*a*c*d**2/(4*x**4) - B*a*d**
3/(2*x**2) - B*b*c**3/(6*x**6) - 3*B*b*c**2*d/(4*x**4) - 3*B*b*c*
d**2/(2*x**2) + B*b*d**3*log(x))/e**11, Eq(m, -11)), ((-A*a*c**3/
(8*x**8) - A*a*c**2*d/(2*x**6) - 3*A*a*c*d**2/(4*x**4) - A*a*d**3
/(2*x**2) - A*b*c**3/(6*x**6) - 3*A*b*c**2*d/(4*x**4) - 3*A*b*c*d
**2/(2*x**2) + A*b*d**3*log(x) - B*a*c**3/(6*x**6) - 3*B*a*c**2*d
/(4*x**4) - 3*B*a*c*d**2/(2*x**2) + B*a*d**3*log(x) - B*b*c**3/(4
*x**4) - 3*B*b*c**2*d/(2*x**2) + 3*B*b*c*d**2*log(x) + B*b*d**3*x
**2/2)/e**9, Eq(m, -9)), ((-A*a*c**3/(6*x**6) - 3*A*a*c**2*d/(4*x
**4) - 3*A*a*c*d**2/(2*x**2) + A*a*d**3*log(x) - A*b*c**3/(4*x**4
) - 3*A*b*c**2*d/(2*x**2) + 3*A*b*c*d**2*log(x) + A*b*d**3*x**2/2
 - B*a*c**3/(4*x**4) - 3*B*a*c**2*d/(2*x**2) + 3*B*a*c*d**2*log(x
) + B*a*d**3*x**2/2 - B*b*c**3/(2*x**2) + 3*B*b*c**2*d*log(x) + 3
*B*b*c*d**2*x**2/2 + B*b*d**3*x**4/4)/e**7, Eq(m, -7)), ((-A*a*c*
*3/(4*x**4) - 3*A*a*c**2*d/(2*x**2) + 3*A*a*c*d**2*log(x) + A*a*d
**3*x**2/2 - A*b*c**3/(2*x**2) + 3*A*b*c**2*d*log(x) + 3*A*b*c*d*
*2*x**2/2 + A*b*d**3*x**4/4 - B*a*c**3/(2*x**2) + 3*B*a*c**2*d*lo
```

```
g(x) + 3*B*a*c*d**2*x**2/2 + B*a*d**3*x**4/4 + B*b*c**3*log(x) +
3*B*b*c**2*d*x**2/2 + 3*B*b*c*d**2*x**4/4 + B*b*d**3*x**6/6)/e**5
, Eq(m, -5)), ((-A*a*c**3/(2*x**2) + 3*A*a*c**2*d*log(x) + 3*A*a*
c*d**2*x**2/2 + A*a*d**3*x**4/4 + A*b*c**3*log(x) + 3*A*b*c**2*d*
x**2/2 + 3*A*b*c*d**2*x**4/4 + A*b*d**3*x**6/6 + B*a*c**3*log(x)
+ 3*B*a*c**2*d*x**2/2 + 3*B*a*c*d**2*x**4/4 + B*a*d**3*x**6/6 + B
*b*c**3*x**2/2 + 3*B*b*c**2*d*x**4/4 + B*b*c*d**2*x**6/2 + B*b*d*
*3*x**8/8)/e**3, Eq(m, -3)), ((A*a*c**3*log(x) + 3*A*a*c**2*d*x**
2/2 + 3*A*a*c*d**2*x**4/4 + A*a*d**3*x**6/6 + A*b*c**3*x**2/2 + 3
*A*b*c**2*d*x**4/4 + A*b*c*d**2*x**6/2 + A*b*d**3*x**8/8 + B*a*c*
*3*x**2/2 + 3*B*a*c**2*d*x**4/4 + B*a*c*d**2*x**6/2 + B*a*d**3*x*
*8/8 + B*b*c**3*x**4/4 + B*b*c**2*d*x**6/2 + 3*B*b*c*d**2*x**8/8
+ B*b*d**3*x**10/10)/e, Eq(m, -1)), (A*a*c**3*e**m*m**5*x*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 35*A*a*c**3*e**m*m**4*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3
480*m**3 + 12139*m**2 + 19524*m + 10395) + 470*A*a*c**3*e**m*m**3
*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 3010*A*a*c**3*e**m*m**2*x*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 9129*A*a*c
**3*e**m*m*x*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 10395*A*a*c**3*e**m*x*x**m/(m**6 + 36*m
**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*A*
a*c**2*d*e**m*m**5*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m*
*3 + 12139*m**2 + 19524*m + 10395) + 99*A*a*c**2*d*e**m*m**4*x**3
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 1218*A*a*c**2*d*e**m*m**3*x**3*x**m/(m**6 + 36*m**5
 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 6786*A*
a*c**2*d*e**m*m**2*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m*
*3 + 12139*m**2 + 19524*m + 10395) + 16059*A*a*c**2*d*e**m*m*x**3
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 10395*A*a*c**2*d*e**m*x**3*x**m/(m**6 + 36*m**5 + 5
05*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*A*a*c*d**
2*e**m*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 93*A*a*c*d**2*e**m*m**4*x**5*x**m/(
m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10
395) + 1050*A*a*c*d**2*e**m*m**3*x**5*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5190*A*a*c*d**
2*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 10467*A*a*c*d**2*e**m*m*x**5*x**m/(
m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10
395) + 6237*A*a*c*d**2*e**m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4
+ 3480*m**3 + 12139*m**2 + 19524*m + 10395) + A*a*d**3*e**m*m**5*
x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1
9524*m + 10395) + 29*A*a*d**3*e**m*m**4*x**7*x**m/(m**6 + 36*m**5
 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 302*A*a
*d**3*e**m*m**3*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 1366*A*a*d**3*e**m*m**2*x**7*x*
*m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
+ 10395) + 2577*A*a*d**3*e**m*m*x**7*x**m/(m**6 + 36*m**5 + 505*m
**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1485*A*a*d**3*e
**m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
 + 19524*m + 10395) + A*b*c**3*e**m*m**5*x**3*x**m/(m**6 + 36*m**
5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 33*A*b
*c**3*e**m*m**4*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3
+ 12139*m**2 + 19524*m + 10395) + 406*A*b*c**3*e**m*m**3*x**3*x**
m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
 10395) + 2262*A*b*c**3*e**m*m**2*x**3*x**m/(m**6 + 36*m**5 + 505
*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5353*A*b*c**3
*e**m*m*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 3465*A*b*c**3*e**m*x**3*x**m/(m**6 + 36
*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*
A*b*c**2*d*e**m*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*
m**3 + 12139*m**2 + 19524*m + 10395) + 93*A*b*c**2*d*e**m*m**4*x*
*5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 1050*A*b*c**2*d*e**m*m**3*x**5*x**m/(m**6 + 36*m*
*5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5190*
A*b*c**2*d*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*
m**3 + 12139*m**2 + 19524*m + 10395) + 10467*A*b*c**2*d*e**m*m*x*
*5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 6237*A*b*c**2*d*e**m*x**5*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*A*b*c*d*
*2*e**m*m**5*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 1
2139*m**2 + 19524*m + 10395) + 87*A*b*c*d**2*e**m*m**4*x**7*x**m/
(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1
```

```
0395) + 906*A*b*c*d**2*e**m*m**3*x**7*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 4098*A*b*c*d**
2*e**m*m**2*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 7731*A*b*c*d**2*e**m*m*x**7*x**m/(m
**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 103
95) + 4455*A*b*c*d**2*e**m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 +
 3480*m**3 + 12139*m**2 + 19524*m + 10395) + A*b*d**3*e**m*m**5*x
**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19
524*m + 10395) + 27*A*b*d**3*e**m*m**4*x**9*x**m/(m**6 + 36*m**5
 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 262*A*b*
d**3*e**m*m**3*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
 12139*m**2 + 19524*m + 10395) + 1122*A*b*d**3*e**m*m**2*x**9*x**
m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
 10395) + 2041*A*b*d**3*e**m*m*x**9*x**m/(m**6 + 36*m**5 + 505*m*
*4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1155*A*b*d**3*e*
*m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
+ 19524*m + 10395) + B*a*c**3*e**m*m**5*x**3*x**m/(m**6 + 36*m**5
 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 33*B*a*
c**3*e**m*m**4*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
 12139*m**2 + 19524*m + 10395) + 406*B*a*c**3*e**m*m**3*x**3*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 2262*B*a*c**3*e**m*m**2*x**3*x**m/(m**6 + 36*m**5 + 505*
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5353*B*a*c**3*
e**m*m*x**3*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m
**2 + 19524*m + 10395) + 3465*B*a*c**3*e**m*x**3*x**m/(m**6 + 36*
m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*B
*a*c**2*d*e**m*m**5*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m
**3 + 12139*m**2 + 19524*m + 10395) + 93*B*a*c**2*d*e**m*m**4*x**
5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1952
4*m + 10395) + 1050*B*a*c**2*d*e**m*m**3*x**5*x**m/(m**6 + 36*m**
5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 5190*B
*a*c**2*d*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m
**3 + 12139*m**2 + 19524*m + 10395) + 10467*B*a*c**2*d*e**m*m*x**
5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 1952
4*m + 10395) + 6237*B*a*c**2*d*e**m*x**5*x**m/(m**6 + 36*m**5 + 5
05*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*B*a*c*d**
2*e**m*m**5*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12
139*m**2 + 19524*m + 10395) + 87*B*a*c*d**2*e**m*m**4*x**7*x**m/(
m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10
395) + 906*B*a*c*d**2*e**m*m**3*x**7*x**m/(m**6 + 36*m**5 + 505*m
**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 4098*B*a*c*d**2
*e**m*m**2*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 121
39*m**2 + 19524*m + 10395) + 7731*B*a*c*d**2*e**m*m*x**7*x**m/(m*
*6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1039
5) + 4455*B*a*c*d**2*e**m*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 +
3480*m**3 + 12139*m**2 + 19524*m + 10395) + B*a*d**3*e**m*m**5*x*
*9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 195
24*m + 10395) + 27*B*a*d**3*e**m*m**4*x**9*x**m/(m**6 + 36*m**5 +
 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 262*B*a*d
**3*e**m*m**3*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 1122*B*a*d**3*e**m*m**2*x**9*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 2041*B*a*d**3*e**m*m*x**9*x**m/(m**6 + 36*m**5 + 505*m**
4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 1155*B*a*d**3*e**
m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 +
 19524*m + 10395) + B*b*c**3*e**m*m**5*x**5*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 31*B*b*c
**3*e**m*m**4*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 350*B*b*c**3*e**m*m**3*x**5*x**m/
(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 1
0395) + 1730*B*b*c**3*e**m*m**2*x**5*x**m/(m**6 + 36*m**5 + 505*m
**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3489*B*b*c**3*e
**m*m*x**5*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m*
*2 + 19524*m + 10395) + 2079*B*b*c**3*e**m*x**5*x**m/(m**6 + 36*m
**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*B*
b*c**2*d*e**m*m**5*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m*
*3 + 12139*m**2 + 19524*m + 10395) + 87*B*b*c**2*d*e**m*m**4*x**7
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 906*B*b*c**2*d*e**m*m**3*x**7*x**m/(m**6 + 36*m**5
+ 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 4098*B*b
*c**2*d*e**m*m**2*x**7*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**
3 + 12139*m**2 + 19524*m + 10395) + 7731*B*b*c**2*d*e**m*m*x**7*x
**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m
 + 10395) + 4455*B*b*c**2*d*e**m*x**7*x**m/(m**6 + 36*m**5 + 505*
```

```
m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3*B*b*c*d**2*e
**m*m**5*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139
*m**2 + 19524*m + 10395) + 81*B*b*c*d**2*e**m*m**4*x**9*x**m/(m**
6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395
) + 786*B*b*c*d**2*e**m*m**3*x**9*x**m/(m**6 + 36*m**5 + 505*m**4
 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 3366*B*b*c*d**2*e*
*m*m**2*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*
m**2 + 19524*m + 10395) + 6123*B*b*c*d**2*e**m*m*x**9*x**m/(m**6
+ 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395)
+ 3465*B*b*c*d**2*e**m*x**9*x**m/(m**6 + 36*m**5 + 505*m**4 + 348
0*m**3 + 12139*m**2 + 19524*m + 10395) + B*b*d**3*e**m*m**5*x**11
*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524
*m + 10395) + 25*B*b*d**3*e**m*m**4*x**11*x**m/(m**6 + 36*m**5 +
505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 230*B*b*d*
*3*e**m*m**3*x**11*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 +
12139*m**2 + 19524*m + 10395) + 950*B*b*d**3*e**m*m**2*x**11*x**m
/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2 + 19524*m +
10395) + 1689*B*b*d**3*e**m*m*x**11*x**m/(m**6 + 36*m**5 + 505*m*
*4 + 3480*m**3 + 12139*m**2 + 19524*m + 10395) + 945*B*b*d**3*e**
m*x**11*x**m/(m**6 + 36*m**5 + 505*m**4 + 3480*m**3 + 12139*m**2
+ 19524*m + 10395), True))
```

GIAC/XCAS [A] time = 0.22476, size = 1, normalized size = 0.01

Done

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Done
```

3.18 $\int (ex)^m \left(A+Bx^2\right) \left(c+dx^2\right)^3 \, dx$

Optimal. Leaf size=121

$$\frac{c^2(ex)^{m+3}(3Ad+Bc)}{e^3(m+3)}+\frac{d^2(ex)^{m+7}(Ad+3Bc)}{e^7(m+7)}+\frac{3cd(ex)^{m+5}(Ad+Bc)}{e^5(m+5)}+\frac{Ac^3(ex)^{m+1}}{e(m+1)}+\frac{Bd^3(ex)^{m+9}}{e^9(m+9)}$$

```
[Out] (A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (c^2*(B*c + 3*A*d)*(e*x)^(3 +
 m))/(e^3*(3 + m)) + (3*c*d*(B*c + A*d)*(e*x)^(5 + m))/(e^5*(5 +
m)) + (d^2*(3*B*c + A*d)*(e*x)^(7 + m))/(e^7*(7 + m)) + (B*d^3*(e
*x)^(9 + m))/(e^9*(9 + m))
```

Rubi [A] time = 0.230133, antiderivative size = 121, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.045

$$\frac{c^2(ex)^{m+3}(3Ad+Bc)}{e^3(m+3)}+\frac{d^2(ex)^{m+7}(Ad+3Bc)}{e^7(m+7)}+\frac{3cd(ex)^{m+5}(Ad+Bc)}{e^5(m+5)}+\frac{Ac^3(ex)^{m+1}}{e(m+1)}+\frac{Bd^3(ex)^{m+9}}{e^9(m+9)}$$

Antiderivative was successfully verified.

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

```
[Out] (A*c^3*(e*x)^(1 + m))/(e*(1 + m)) + (c^2*(B*c + 3*A*d)*(e*x)^(3 +
 m))/(e^3*(3 + m)) + (3*c*d*(B*c + A*d)*(e*x)^(5 + m))/(e^5*(5 +
m)) + (d^2*(3*B*c + A*d)*(e*x)^(7 + m))/(e^7*(7 + m)) + (B*d^3*(e
*x)^(9 + m))/(e^9*(9 + m))
```

Rubi in Sympy [A] time = 31.1922, size = 110, normalized size = 0.91

$$\frac{Ac^3\,(ex)^{m+1}}{e\,(m+1)}+\frac{Bd^3\,(ex)^{m+9}}{e^9\,(m+9)}+\frac{c^2\,(ex)^{m+3}\,(3Ad+Bc)}{e^3\,(m+3)}+\frac{3cd\,(ex)^{m+5}\,(Ad+Bc)}{e^5\,(m+5)}+\frac{d^2\,(ex)^{m+7}\,(Ad+3Bc)}{e^7\,(m+7)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)**3,x)
```

```
[Out] A*c**3*(e*x)**(m + 1)/(e*(m + 1)) + B*d**3*(e*x)**(m + 9)/(e**9*(
m + 9)) + c**2*(e*x)**(m + 3)*(3*A*d + B*c)/(e**3*(m + 3)) + 3*c*
d*(e*x)**(m + 5)*(A*d + B*c)/(e**5*(m + 5)) + d**2*(e*x)**(m + 7)
*(A*d + 3*B*c)/(e**7*(m + 7))
```

Mathematica [A] time = 0.10516, size = 90, normalized size = 0.74

$$(ex)^m\left(\frac{c^2x^3(3Ad+Bc)}{m+3}+\frac{d^2x^7(Ad+3Bc)}{m+7}+\frac{3cdx^5(Ad+Bc)}{m+5}+\frac{Ac^3x}{m+1}+\frac{Bd^3x^9}{m+9}\right)$$

Antiderivative was successfully verified.

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

```
[Out] (e*x)^m*((A*c^3*x)/(1 + m) + (c^2*(B*c + 3*A*d)*x^3)/(3 + m) + (3
*c*d*(B*c + A*d)*x^5)/(5 + m) + (d^2*(3*B*c + A*d)*x^7)/(7 + m) +
 (B*d^3*x^9)/(9 + m))
```

Maple [B] time = 0.01, size = 475, normalized size = 3.9

$$\frac{\left(Bd^3m^4x^8 + 16\,Bd^3m^3x^8 + Ad^3m^4x^6 + 3\,Bcd^2m^4x^6 + 86\,Bd^3m^2x^8 + 18\,Ad^3m^3x^6 + 54\,Bcd^2m^3x^6 + 176\,Bd^3mx^8 + 3\,Acd^2m^4x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(B*x^2+A)*(d*x^2+c)^3,x)
```

```
[Out] x*(B*d^3*m^4*x^8+16*B*d^3*m^3*x^8+A*d^3*m^4*x^6+3*B*c*d^2*m^4*x^6
+86*B*d^3*m^2*x^8+18*A*d^3*m^3*x^6+54*B*c*d^2*m^3*x^6+176*B*d^3*m
*x^8+3*A*c*d^2*m^4*x^4+104*A*d^3*m^2*x^6+3*B*c^2*d*m^4*x^4+312*B*
c*d^2*m^2*x^6+105*B*d^3*x^8+60*A*c*d^2*m^3*x^4+222*A*d^3*m*x^6+60
*B*c^2*d*m^3*x^4+666*B*c*d^2*m*x^6+3*A*c^2*d*m^4*x^2+390*A*c*d^2*
m^2*x^4+135*A*d^3*x^6+B*c^3*m^4*x^2+390*B*c^2*d*m^2*x^4+405*B*c*d
^2*x^6+66*A*c^2*d*m^3*x^2+900*A*c*d^2*m*x^4+22*B*c^3*m^3*x^2+900*
B*c^2*d*m*x^4+A*c^3*m^4+492*A*c^2*d*m^2*x^2+567*A*c*d^2*x^4+164*B
*c^3*m^2*x^2+567*B*c^2*d*x^4+24*A*c^3*m^3+1374*A*c^2*d*m*x^2+458*
B*c^3*m*x^2+206*A*c^3*m^2+945*A*c^2*d*x^2+315*B*c^3*x^2+744*A*c^3
*m+945*A*c^3)*(e*x)^m/(9+m)/(7+m)/(5+m)/(3+m)/(1+m)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.260655, size = 514, normalized size = 4.25

$$\frac{\left(\left(Bd^3m^4 + 16\,Bd^3m^3 + 86\,Bd^3m^2 + 176\,Bd^3m + 105\,Bd^3\right)x^9 + \left(\left(3\,Bcd^2 + Ad^3\right)m^4 + 405\,Bcd^2 + 135\,Ad^3 + 18\,\left(3\,Bcd^2 + Ad^3\right)\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*d^3*m^4 + 16*B*d^3*m^3 + 86*B*d^3*m^2 + 176*B*d^3*m + 105*B*d
^3)*x^9 + ((3*B*c*d^2 + A*d^3)*m^4 + 405*B*c*d^2 + 135*A*d^3 + 18
*(3*B*c*d^2 + A*d^3)*m^3 + 104*(3*B*c*d^2 + A*d^3)*m^2 + 222*(3*B
*c*d^2 + A*d^3)*m)*x^7 + 3*((B*c^2*d + A*c*d^2)*m^4 + 189*B*c^2*d
 + 189*A*c*d^2 + 20*(B*c^2*d + A*c*d^2)*m^3 + 130*(B*c^2*d + A*c*
d^2)*m^2 + 300*(B*c^2*d + A*c*d^2)*m)*x^5 + ((B*c^3 + 3*A*c^2*d)*
m^4 + 315*B*c^3 + 945*A*c^2*d + 22*(B*c^3 + 3*A*c^2*d)*m^3 + 164*
(B*c^3 + 3*A*c^2*d)*m^2 + 458*(B*c^3 + 3*A*c^2*d)*m)*x^3 + (A*c^3
*m^4 + 24*A*c^3*m^3 + 206*A*c^3*m^2 + 744*A*c^3*m + 945*A*c^3)*x)
*(e*x)^m/(m^5 + 25*m^4 + 230*m^3 + 950*m^2 + 1689*m + 945)
```

Sympy [A] time = 4.83388, size = 2220, normalized size = 18.35

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)*(d*x**2+c)**3,x)
```

```
[Out] Piecewise(((-A*c**3/(8*x**8) - A*c**2*d/(2*x**6) - 3*A*c*d**2/(4*
x**4) - A*d**3/(2*x**2) - B*c**3/(6*x**6) - 3*B*c**2*d/(4*x**4) -
 3*B*c*d**2/(2*x**2) + B*d**3*log(x))/e**9, Eq(m, -9)), ((-A*c**3
/(6*x**6) - 3*A*c**2*d/(4*x**4) - 3*A*c*d**2/(2*x**2) + A*d**3*lo
g(x) - B*c**3/(4*x**4) - 3*B*c**2*d/(2*x**2) + 3*B*c*d**2*log(x)
+ B*d**3*x**2/2)/e**7, Eq(m, -7)), ((-A*c**3/(4*x**4) - 3*A*c**2*
d/(2*x**2) + 3*A*c*d**2*log(x) + A*d**3*x**2/2 - B*c**3/(2*x**2)
+ 3*B*c**2*d*log(x) + 3*B*c*d**2*x**2/2 + B*d**3*x**4/4)/e**5, Eq
(m, -5)), ((-A*c**3/(2*x**2) + 3*A*c**2*d*log(x) + 3*A*c*d**2*x**
2/2 + A*d**3*x**4/4 + B*c**3*log(x) + 3*B*c**2*d*x**2/2 + 3*B*c*d
**2*x**4/4 + B*d**3*x**6/6)/e**3, Eq(m, -3)), ((A*c**3*log(x) + 3
*A*c**2*d*x**2/2 + 3*A*c*d**2*x**4/4 + A*d**3*x**6/6 + B*c**3*x**
2/2 + 3*B*c**2*d*x**4/4 + B*c*d**2*x**6/2 + B*d**3*x**8/8)/e, Eq(
m, -1)), (A*c**3*e**m*m**4*x*x**m/(m**5 + 25*m**4 + 230*m**3 + 95
0*m**2 + 1689*m + 945) + 24*A*c**3*e**m*m**3*x*x**m/(m**5 + 25*m*
*4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 206*A*c**3*e**m*m**2*x
*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 744
*A*c**3*e**m*m*x*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 168
9*m + 945) + 945*A*c**3*e**m*x*x**m/(m**5 + 25*m**4 + 230*m**3 +
950*m**2 + 1689*m + 945) + 3*A*c**2*d*e**m*m**4*x**3*x**m/(m**5 +
 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 66*A*c**2*d*e**m
*m**3*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
945) + 492*A*c**2*d*e**m*m**2*x**3*x**m/(m**5 + 25*m**4 + 230*m**
3 + 950*m**2 + 1689*m + 945) + 1374*A*c**2*d*e**m*m*x**3*x**m/(m*
*5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 945*A*c**2*d
*e**m*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
945) + 3*A*c*d**2*e**m*m**4*x**5*x**m/(m**5 + 25*m**4 + 230*m**3
+ 950*m**2 + 1689*m + 945) + 60*A*c*d**2*e**m*m**3*x**5*x**m/(m**
5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 390*A*c*d**2*
e**m*m**2*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*
m + 945) + 900*A*c*d**2*e**m*m*x**5*x**m/(m**5 + 25*m**4 + 230*m*
*3 + 950*m**2 + 1689*m + 945) + 567*A*c*d**2*e**m*x**5*x**m/(m**5
 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + A*d**3*e**m*m*
*4*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945
) + 18*A*d**3*e**m*m**3*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 95
0*m**2 + 1689*m + 945) + 104*A*d**3*e**m*m**2*x**7*x**m/(m**5 + 2
5*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 222*A*d**3*e**m*m*
x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) +
 135*A*d**3*e**m*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2
+ 1689*m + 945) + B*c**3*e**m*m**4*x**3*x**m/(m**5 + 25*m**4 + 23
0*m**3 + 950*m**2 + 1689*m + 945) + 22*B*c**3*e**m*m**3*x**3*x**m
/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 164*B*c*
*3*e**m*m**2*x**3*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 16
89*m + 945) + 458*B*c**3*e**m*m*x**3*x**m/(m**5 + 25*m**4 + 230*m
**3 + 950*m**2 + 1689*m + 945) + 315*B*c**3*e**m*x**3*x**m/(m**5
+ 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 3*B*c**2*d*e**m
*m**4*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
945) + 60*B*c**2*d*e**m*m**3*x**5*x**m/(m**5 + 25*m**4 + 230*m**3
 + 950*m**2 + 1689*m + 945) + 390*B*c**2*d*e**m*m**2*x**5*x**m/(m
**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 900*B*c**2*
d*e**m*m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
 + 945) + 567*B*c**2*d*e**m*x**5*x**m/(m**5 + 25*m**4 + 230*m**3
+ 950*m**2 + 1689*m + 945) + 3*B*c*d**2*e**m*m**4*x**7*x**m/(m**5
 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 54*B*c*d**2*e*
*m*m**3*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m
+ 945) + 312*B*c*d**2*e**m*m**2*x**7*x**m/(m**5 + 25*m**4 + 230*m
**3 + 950*m**2 + 1689*m + 945) + 666*B*c*d**2*e**m*m*x**7*x**m/(m
**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 405*B*c*d**
2*e**m*x**7*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m +
 945) + B*d**3*e**m*m**4*x**9*x**m/(m**5 + 25*m**4 + 230*m**3 + 9
50*m**2 + 1689*m + 945) + 16*B*d**3*e**m*m**3*x**9*x**m/(m**5 + 2
5*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945) + 86*B*d**3*e**m*m**
2*x**9*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m**2 + 1689*m + 945)
 + 176*B*d**3*e**m*m*x**9*x**m/(m**5 + 25*m**4 + 230*m**3 + 950*m
**2 + 1689*m + 945) + 105*B*d**3*e**m*x**9*x**m/(m**5 + 25*m**4 +
 230*m**3 + 950*m**2 + 1689*m + 945), True))
```

GIAC/XCAS [A] time = 0.24371, size = 1017, normalized size = 8.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*d^3*m^4*x^9*e^(m*ln(x) + m) + 16*B*d^3*m^3*x^9*e^(m*ln(x) + m)
 + 3*B*c*d^2*m^4*x^7*e^(m*ln(x) + m) + A*d^3*m^4*x^7*e^(m*ln(x) +
 m) + 86*B*d^3*m^2*x^9*e^(m*ln(x) + m) + 54*B*c*d^2*m^3*x^7*e^(m*
ln(x) + m) + 18*A*d^3*m^3*x^7*e^(m*ln(x) + m) + 176*B*d^3*m*x^9*e
^(m*ln(x) + m) + 3*B*c^2*d*m^4*x^5*e^(m*ln(x) + m) + 3*A*c*d^2*m^
4*x^5*e^(m*ln(x) + m) + 312*B*c*d^2*m^2*x^7*e^(m*ln(x) + m) + 104
*A*d^3*m^2*x^7*e^(m*ln(x) + m) + 105*B*d^3*x^9*e^(m*ln(x) + m) +
60*B*c^2*d*m^3*x^5*e^(m*ln(x) + m) + 60*A*c*d^2*m^3*x^5*e^(m*ln(x
) + m) + 666*B*c*d^2*m*x^7*e^(m*ln(x) + m) + 222*A*d^3*m*x^7*e^(m
*ln(x) + m) + B*c^3*m^4*x^3*e^(m*ln(x) + m) + 3*A*c^2*d*m^4*x^3*e
^(m*ln(x) + m) + 390*B*c^2*d*m^2*x^5*e^(m*ln(x) + m) + 390*A*c*d^
2*m^2*x^5*e^(m*ln(x) + m) + 405*B*c*d^2*x^7*e^(m*ln(x) + m) + 135
*A*d^3*x^7*e^(m*ln(x) + m) + 22*B*c^3*m^3*x^3*e^(m*ln(x) + m) + 6
6*A*c^2*d*m^3*x^3*e^(m*ln(x) + m) + 900*B*c^2*d*m*x^5*e^(m*ln(x)
+ m) + 900*A*c*d^2*m*x^5*e^(m*ln(x) + m) + A*c^3*m^4*x*e^(m*ln(x)
 + m) + 164*B*c^3*m^2*x^3*e^(m*ln(x) + m) + 492*A*c^2*d*m^2*x^3*e
^(m*ln(x) + m) + 567*B*c^2*d*x^5*e^(m*ln(x) + m) + 567*A*c*d^2*x^
5*e^(m*ln(x) + m) + 24*A*c^3*m^3*x*e^(m*ln(x) + m) + 458*B*c^3*m*
x^3*e^(m*ln(x) + m) + 1374*A*c^2*d*m*x^3*e^(m*ln(x) + m) + 206*A*
c^3*m^2*x*e^(m*ln(x) + m) + 315*B*c^3*x^3*e^(m*ln(x) + m) + 945*A
*c^2*d*x^3*e^(m*ln(x) + m) + 744*A*c^3*m*x*e^(m*ln(x) + m) + 945*
A*c^3*x*e^(m*ln(x) + m))/(m^5 + 25*m^4 + 230*m^3 + 950*m^2 + 1689
*m + 945)
```

3.19 $\int \frac{(ex)^m (A+Bx^2)(c+dx^2)^3}{a+bx^2} dx$

Optimal. Leaf size=258

$$\frac{d(ex)^{m+3}\left(a^2Bd^2-abd(Ad+3Bc)+3b^2c(Ad+Bc)\right)}{b^3e^3(m+3)} - \frac{(ex)^{m+1}\left(a^3Bd^3-a^2bd^2(Ad+3Bc)+3ab^2cd(Ad+Bc)+b^3\left(-c^2\right)(3Ad+Bc)\right)}{b^4e(m+1)} + \frac{(ex)^{m+1}(Ab-aB)(bc-ad)^3\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ab^4e(m+1)} + \frac{d^2(ex)^{m+5}(-aBd+Abd+3bBc)}{b^2e^5(m+5)} + \frac{Bd^3(ex)^{m+7}}{be^7(m+7)}$$

```
[Out] -(((a^3*B*d^3 + 3*a*b^2*c*d*(B*c + A*d) - a^2*b*d^2*(3*B*c + A*d)
 - b^3*c^2*(B*c + 3*A*d))*(e*x)^(1 + m))/(b^4*e*(1 + m))) + (d*(a
^2*B*d^2 + 3*b^2*c*(B*c + A*d) - a*b*d*(3*B*c + A*d))*(e*x)^(3 +
m))/(b^3*e^3*(3 + m)) + (d^2*(3*b*B*c + A*b*d - a*B*d)*(e*x)^(5 +
 m))/(b^2*e^5*(5 + m)) + (B*d^3*(e*x)^(7 + m))/(b*e^7*(7 + m)) +
((A*b - a*B)*(b*c - a*d)^3*(e*x)^(1 + m)*Hypergeometric2F1[1, (1
+ m)/2, (3 + m)/2, -((b*x^2)/a)])/(a*b^4*e*(1 + m))
```

Rubi [A] time = 0.702518, antiderivative size = 258, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$

$$\frac{d(ex)^{m+3}\left(a^2Bd^2-abd(Ad+3Bc)+3b^2c(Ad+Bc)\right)}{b^3e^3(m+3)} - \frac{(ex)^{m+1}\left(a^3Bd^3-a^2bd^2(Ad+3Bc)+3ab^2cd(Ad+Bc)+b^3\left(-c^2\right)(3Ad+Bc)\right)}{b^4e(m+1)} + \frac{(ex)^{m+1}(Ab-aB)(bc-ad)^3\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ab^4e(m+1)} + \frac{d^2(ex)^{m+5}(-aBd+Abd+3bBc)}{b^2e^5(m+5)} + \frac{Bd^3(ex)^{m+7}}{be^7(m+7)}$$

Antiderivative was successfully verified.

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


```
[Out] -(((a^3*B*d^3 + 3*a*b^2*c*d*(B*c + A*d) - a^2*b*d^2*(3*B*c + A*d)
 - b^3*c^2*(B*c + 3*A*d))*(e*x)^(1 + m))/(b^4*e*(1 + m))) + (d*(a
^2*B*d^2 + 3*b^2*c*(B*c + A*d) - a*b*d*(3*B*c + A*d))*(e*x)^(3 +
m))/(b^3*e^3*(3 + m)) + (d^2*(3*b*B*c + A*b*d - a*B*d)*(e*x)^(5 +
 m))/(b^2*e^5*(5 + m)) + (B*d^3*(e*x)^(7 + m))/(b*e^7*(7 + m)) +
((A*b - a*B)*(b*c - a*d)^3*(e*x)^(1 + m)*Hypergeometric2F1[1, (1
+ m)/2, (3 + m)/2, -((b*x^2)/a)])/(a*b^4*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [A] time = 0.781351, size = 218, normalized size = 0.84

$$\frac{x(ex)^m\left(\frac{c^2x^2(3Ad+Bc)\,{}_2F_1\left(1,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+dx^4\left(dx^2\left(\frac{(Ad+3Bc)\,{}_2F_1\left(1,\frac{m+7}{2};\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}+\frac{Bdx^2\,{}_2F_1\left(1,\frac{m+9}{2};\frac{m+11}{2};-\frac{bx^2}{a}\right)}{m+9}\right)+\frac{3c(Ad+Bc)\,{}_2F_1\left(\right.}{}\right.\right.}{a}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c^3*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((
b*x^2)/a)])/(1 + m) + (c^2*(B*c + 3*A*d)*x^2*Hypergeometric2F1[1,
 (3 + m)/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d*x^4*((3*c*(B*c
+ A*d)*Hypergeometric2F1[1, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/
(5 + m) + d*x^2*(((3*B*c + A*d)*Hypergeometric2F1[1, (7 + m)/2, (
9 + m)/2, -((b*x^2)/a)])/(7 + m) + (B*d*x^2*Hypergeometric2F1[1,
(9 + m)/2, (11 + m)/2, -((b*x^2)/a)])/(9 + m)))))/a
```

Maple [F] time = 0.051, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)^3/(b*x^2+a),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(e*x)^m/(b*x^2 + a), x)
```

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

$$\text{integral}\left(\frac{\left(Bd^3x^8+\left(3\,Bcd^2+Ad^3\right)x^6+3\left(Bc^2d+Acd^2\right)x^4+Ac^3+\left(Bc^3+3\,Ac^2d\right)x^2\right)(ex)^m}{bx^2+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d^3*x^8 + (3*B*c*d^2 + A*d^3)*x^6 + 3*(B*c^2*d + A*c*
d^2)*x^4 + A*c^3 + (B*c^3 + 3*A*c^2*d)*x^2)*(e*x)^m/(b*x^2 + a),
x)
```

Sympy [A] time = 96.321, size = 911, normalized size = 3.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*c**3*e**m*m*x*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 +
1/2)*gamma(m/2 + 1/2)/(4*a*gamma(m/2 + 3/2)) + A*c**3*e**m*x*x**m
*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 1/2)*gamma(m/2 + 1/2
)/(4*a*gamma(m/2 + 3/2)) + 3*A*c**2*d*e**m*m*x**3*x**m*lerchphi(b
*x**2*exp_polar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamm
a(m/2 + 5/2)) + 9*A*c**2*d*e**m*x**3*x**m*lerchphi(b*x**2*exp_pol
ar(I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma(m/2 + 5/2))
 + 3*A*c*d**2*e**m*m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a,
 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(4*a*gamma(m/2 + 7/2)) + 15*A*c*d
**2*e**m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/
2)*gamma(m/2 + 5/2)/(4*a*gamma(m/2 + 7/2)) + A*d**3*e**m*m*x**7*x
**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 7/2)*gamma(m/2 +
7/2)/(4*a*gamma(m/2 + 9/2)) + 7*A*d**3*e**m*x**7*x**m*lerchphi(b*
x**2*exp_polar(I*pi)/a, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*a*gamma
(m/2 + 9/2)) + B*c**3*e**m*m*x**3*x**m*lerchphi(b*x**2*exp_polar(
I*pi)/a, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma(m/2 + 5/2)) +
3*B*c**3*e**m*x**3*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2
 + 3/2)*gamma(m/2 + 3/2)/(4*a*gamma(m/2 + 5/2)) + 3*B*c**2*d*e**m
*m*x**5*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gam
ma(m/2 + 5/2)/(4*a*gamma(m/2 + 7/2)) + 15*B*c**2*d*e**m*x**5*x**m
*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 5/2)*gamma(m/2 + 5/2
)/(4*a*gamma(m/2 + 7/2)) + 3*B*c*d**2*e**m*m*x**7*x**m*lerchphi(b
*x**2*exp_polar(I*pi)/a, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*a*gamm
a(m/2 + 9/2)) + 21*B*c*d**2*e**m*x**7*x**m*lerchphi(b*x**2*exp_po
lar(I*pi)/a, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*a*gamma(m/2 + 9/2)
) + B*d**3*e**m*m*x**9*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1,
 m/2 + 9/2)*gamma(m/2 + 9/2)/(4*a*gamma(m/2 + 11/2)) + 9*B*d**3*e
**m*x**9*x**m*lerchphi(b*x**2*exp_polar(I*pi)/a, 1, m/2 + 9/2)*ga
mma(m/2 + 9/2)/(4*a*gamma(m/2 + 11/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(e*x)^m/(b*x^2 + a), x)
```

3.20 $\int \frac{(ex)^m\left(A+Bx^2\right)\left(c+dx^2\right)^3}{\left(a+bx^2\right)^2}\,dx$

Optimal. Leaf size=347

$$\frac{(ex)^{m+1}(bc-ad)^2\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(ad(m+5)+b(c-cm))+aB(bc(m+1)-ad(m+7)))}{2a^2b^4e(m+1)}-\frac{d(ex)^{m+1}\left(Ab\left(a^2d^2(m+5)-3abcd(m+3)+3b^2c^2(m+1)\right)-aB\left(a^2d^2(m+7)-3abcd(m+5)+3b^2c^2(m+3)\right)\right)}{2ab^4e(m+1)}-\frac{d^2(ex)^{m+3}(Ab(3bc(m+3)-ad(m+5))-aB(3bc(m+5)-ad(m+7)))}{2ab^3e^3(m+3)}-\frac{d^3(ex)^{m+5}(Ab(m+5)-aB(m+7))}{2ab^2e^5(m+5)}+\frac{\left(c+dx^2\right)^3(ex)^{m+1}(Ab-aB)}{2abe\left(a+bx^2\right)}$$

```
[Out] -(d*(A*b*(3*b^2*c^2*(1 + m) - 3*a*b*c*d*(3 + m) + a^2*d^2*(5 + m)
) - a*B*(3*b^2*c^2*(3 + m) - 3*a*b*c*d*(5 + m) + a^2*d^2*(7 + m))
)*(e*x)^(1 + m))/(2*a*b^4*e*(1 + m)) - (d^2*(A*b*(3*b*c*(3 + m) -
 a*d*(5 + m)) - a*B*(3*b*c*(5 + m) - a*d*(7 + m)))*(e*x)^(3 + m))
/(2*a*b^3*e^3*(3 + m)) - (d^3*(A*b*(5 + m) - a*B*(7 + m))*(e*x)^(
5 + m))/(2*a*b^2*e^5*(5 + m)) + ((A*b - a*B)*(e*x)^(1 + m)*(c + d
*x^2)^3)/(2*a*b*e*(a + b*x^2)) + ((b*c - a*d)^2*(a*B*(b*c*(1 + m)
 - a*d*(7 + m)) + A*b*(a*d*(5 + m) + b*(c - c*m)))*(e*x)^(1 + m)*
Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(2*a^2*
b^4*e*(1 + m))
```

Rubi [A] time = 1.62804, antiderivative size = 347, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097

$$\frac{(ex)^{m+1}(bc-ad)^2\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(ad(m+5)+b(c-cm))+aB(bc(m+1)-ad(m+7)))}{2a^2b^4e(m+1)}-\frac{d(ex)^{m+1}\left(Ab\left(a^2d^2(m+5)-3abcd(m+3)+3b^2c^2(m+1)\right)-aB\left(a^2d^2(m+7)-3abcd(m+5)+3b^2c^2(m+3)\right)\right)}{2ab^4e(m+1)}-\frac{d^2(ex)^{m+3}(Ab(3bc(m+3)-ad(m+5))-aB(3bc(m+5)-ad(m+7)))}{2ab^3e^3(m+3)}-\frac{d^3(ex)^{m+5}(Ab(m+5)-aB(m+7))}{2ab^2e^5(m+5)}+\frac{\left(c+dx^2\right)^3(ex)^{m+1}(Ab-aB)}{2abe\left(a+bx^2\right)}$$

Antiderivative was successfully verified.

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

```
[Out] -(d*(A*b*(3*b^2*c^2*(1 + m) - 3*a*b*c*d*(3 + m) + a^2*d^2*(5 + m)
) - a*B*(3*b^2*c^2*(3 + m) - 3*a*b*c*d*(5 + m) + a^2*d^2*(7 + m))
)*(e*x)^(1 + m))/(2*a*b^4*e*(1 + m)) - (d^2*(A*b*(3*b*c*(3 + m) -
 a*d*(5 + m)) - a*B*(3*b*c*(5 + m) - a*d*(7 + m)))*(e*x)^(3 + m))
/(2*a*b^3*e^3*(3 + m)) - (d^3*(A*b*(5 + m) - a*B*(7 + m))*(e*x)^(
5 + m))/(2*a*b^2*e^5*(5 + m)) + ((A*b - a*B)*(e*x)^(1 + m)*(c + d
*x^2)^3)/(2*a*b*e*(a + b*x^2)) + ((b*c - a*d)^2*(a*B*(b*c*(1 + m)
 - a*d*(7 + m)) + A*b*(a*d*(5 + m) + b*(c - c*m)))*(e*x)^(1 + m)*
Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(2*a^2*
b^4*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [A] time = 0.831509, size = 218, normalized size = 0.63

$$\frac{x(ex)^m\left(\frac{c^2x^2(3Ad+Bc)\,{}_2F_1\left(2,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+dx^4\left(dx^2\left(\frac{(Ad+3Bc)\,{}_2F_1\left(2,\frac{m+7}{2};\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}+\frac{Bdx^2\,{}_2F_1\left(2,\frac{m+9}{2};\frac{m+11}{2};-\frac{bx^2}{a}\right)}{m+9}\right)+\frac{3c(Ad+Bc)\,{}_2F_1(}{}\right.\right.}{a^2}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c^3*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((
b*x^2)/a)])/(1 + m) + (c^2*(B*c + 3*A*d)*x^2*Hypergeometric2F1[2,
 (3 + m)/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d*x^4*((3*c*(B*c
+ A*d)*Hypergeometric2F1[2, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/
(5 + m) + d*x^2*(((3*B*c + A*d)*Hypergeometric2F1[2, (7 + m)/2, (
9 + m)/2, -((b*x^2)/a)])/(7 + m) + (B*d*x^2*Hypergeometric2F1[2,
(9 + m)/2, (11 + m)/2, -((b*x^2)/a)])/(9 + m)))))/a^2
```

Maple [F] time = 0.062, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)^3/(b*x^2+a)^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(e*x)^m/(b*x^2 + a)^2, x)
```

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

$$\mathrm{integral}\left(\frac{\left(Bd^3x^8+\left(3\,Bcd^2+Ad^3\right)x^6+3\left(Bc^2d+Acd^2\right)x^4+Ac^3+\left(Bc^3+3\,Ac^2d\right)x^2\right)(ex)^m}{b^2x^4+2\,abx^2+a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d^3*x^8 + (3*B*c*d^2 + A*d^3)*x^6 + 3*(B*c^2*d + A*c*
d^2)*x^4 + A*c^3 + (B*c^3 + 3*A*c^2*d)*x^2)*(e*x)^m/(b^2*x^4 + 2*
```

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

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(e*x)^m/(b*x^2 + a)^2, x)
```

3.21 $\int \frac{(ex)^m (A+Bx^2) (c+dx^2)^3}{(a+bx^2)^3} \, dx$

Optimal. Leaf size=480

$$-\frac{d^2(ex)^{m+3} \left(Ab(m+3)(ad(m+5)+bc(3-m))+aB \left(bc \left(m^2+4m+3\right)-ad \left(m^2+12m+35\right)\right)\right)}{8a^2b^3e^3(m+3)}+\frac{\left(c+dx^2\right)^2 (ex)^{m+1}(Ab(ad(m+3)+bc(3-m))+aB(bc(m+1)-ad(m+7)))}{8a^2b^2e\left(a+bx^2\right)}-\frac{d(ex)^{m+1} \left(Ab \left(-a^2d^2 \left(m^2+8m+15\right)+3abcd \left(m^2+4m+3\right)+2b^2c^2 \left(-m^2+2m+3\right)\right)+aB \left(a^2d^2 \left(m^2+12m+35\right)-3ab \cdots\right)\right)}{8a^2b^4e(m+1)}+\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right) \left(Ab \left(a^2d^2 \left(m^2+8m+15\right)+2abcd \left(-m^2-2m+3\right)+b^2c^2 \left(m^2-4m+3\right)\right)+aB \cdots\right)}{8a^3b^4e(m+1)}+\frac{\left(c+dx^2\right)^3 (ex)^{m+1}(Ab-aB)}{4abe\left(a+bx^2\right)^2}$$

```
[Out] -(d*(A*b*(2*b^2*c^2*(3 + 2*m - m^2) + 3*a*b*c*d*(3 + 4*m + m^2) -
 a^2*d^2*(15 + 8*m + m^2)) + a*B*(2*b^2*c^2*(1 + m)^2 - 3*a*b*c*d
*(15 + 8*m + m^2) + a^2*d^2*(35 + 12*m + m^2)))*(e*x)^(1 + m))/(8
*a^2*b^4*e*(1 + m)) - (d^2*(A*b*(3 + m)*(b*c*(3 - m) + a*d*(5 + m
)) + a*B*(b*c*(3 + 4*m + m^2) - a*d*(35 + 12*m + m^2)))*(e*x)^(3
+ m))/(8*a^2*b^3*e^3*(3 + m)) + ((A*b*(b*c*(3 - m) + a*d*(3 + m))
 + a*B*(b*c*(1 + m) - a*d*(7 + m)))*(e*x)^(1 + m)*(c + d*x^2)^2)/
(8*a^2*b^2*e*(a + b*x^2)) + ((A*b - a*B)*(e*x)^(1 + m)*(c + d*x^2
)^3)/(4*a*b*e*(a + b*x^2)^2) + ((b*c - a*d)*(A*b*(2*a*b*c*d*(3 -
2*m - m^2) + b^2*c^2*(3 - 4*m + m^2) + a^2*d^2*(15 + 8*m + m^2))
+ a*B*(b^2*c^2*(1 - m^2) + 2*a*b*c*d*(5 + 6*m + m^2) - a^2*d^2*(3
5 + 12*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (
3 + m)/2, -((b*x^2)/a)])/(8*a^3*b^4*e*(1 + m))
```

Rubi [A] time = 2.91074, antiderivative size = 480, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$-\frac{d^2(ex)^{m+3} \left(Ab(m+3)(ad(m+5)+bc(3-m))+aB \left(bc \left(m^2+4m+3\right)-ad \left(m^2+12m+35\right)\right)\right)}{8a^2b^3e^3(m+3)}+\frac{\left(c+dx^2\right)^2 (ex)^{m+1}(Ab(ad(m+3)+bc(3-m))+aB(bc(m+1)-ad(m+7)))}{8a^2b^2e\left(a+bx^2\right)}-\frac{d(ex)^{m+1} \left(Ab \left(-a^2d^2 \left(m^2+8m+15\right)+3abcd \left(m^2+4m+3\right)+2b^2c^2 \left(-m^2+2m+3\right)\right)+aB \left(a^2d^2 \left(m^2+12m+35\right)-3ab \cdots\right)\right)}{8a^2b^4e(m+1)}+\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right) \left(Ab \left(a^2d^2 \left(m^2+8m+15\right)+2abcd \left(-m^2-2m+3\right)+b^2c^2 \left(m^2-4m+3\right)\right)+aB \cdots\right)}{8a^3b^4e(m+1)}+\frac{\left(c+dx^2\right)^3 (ex)^{m+1}(Ab-aB)}{4abe\left(a+bx^2\right)^2}$$

Antiderivative was successfully verified.

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


```
[Out] -(d*(A*b*(2*b^2*c^2*(3 + 2*m - m^2) + 3*a*b*c*d*(3 + 4*m + m^2) -
 a^2*d^2*(15 + 8*m + m^2)) + a*B*(2*b^2*c^2*(1 + m)^2 - 3*a*b*c*d
*(15 + 8*m + m^2) + a^2*d^2*(35 + 12*m + m^2)))*(e*x)^(1 + m))/(8
*a^2*b^4*e*(1 + m)) - (d^2*(A*b*(3 + m)*(b*c*(3 - m) + a*d*(5 + m
)) + a*B*(b*c*(3 + 4*m + m^2) - a*d*(35 + 12*m + m^2)))*(e*x)^(3
+ m))/(8*a^2*b^3*e^3*(3 + m)) + ((A*b*(b*c*(3 - m) + a*d*(3 + m))
 + a*B*(b*c*(1 + m) - a*d*(7 + m)))*(e*x)^(1 + m)*(c + d*x^2)^2)/
(8*a^2*b^2*e*(a + b*x^2)) + ((A*b - a*B)*(e*x)^(1 + m)*(c + d*x^2
)^3)/(4*a*b*e*(a + b*x^2)^2) + ((b*c - a*d)*(A*b*(2*a*b*c*d*(3 -
2*m - m^2) + b^2*c^2*(3 - 4*m + m^2) + a^2*d^2*(15 + 8*m + m^2))
+ a*B*(b^2*c^2*(1 - m^2) + 2*a*b*c*d*(5 + 6*m + m^2) - a^2*d^2*(3
5 + 12*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (
3 + m)/2, -((b*x^2)/a)])/(8*a^3*b^4*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [A] time = 0.855526, size = 218, normalized size = 0.45

$$\frac{x(ex)^m\left(\frac{c^2x^2(3Ad+Bc)\,{}_2F_1\left(3,\frac{m+3}{2};\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+dx^4\left(dx^2\left(\frac{(Ad+3Bc)\,{}_2F_1\left(3,\frac{m+7}{2};\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}+\frac{Bdx^2\,{}_2F_1\left(3,\frac{m+9}{2};\frac{m+11}{2};-\frac{bx^2}{a}\right)}{m+9}\right)+3c(Ad+Bc)\,{}_2F_1(\right.\right.}{a^3}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((A*c^3*Hypergeometric2F1[3, (1 + m)/2, (3 + m)/2, -((
b*x^2)/a)])/(1 + m) + (c^2*(B*c + 3*A*d)*x^2*Hypergeometric2F1[3,
 (3 + m)/2, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d*x^4*((3*c*(B*c
+ A*d)*Hypergeometric2F1[3, (5 + m)/2, (7 + m)/2, -((b*x^2)/a)])/
(5 + m) + d*x^2*(((3*B*c + A*d)*Hypergeometric2F1[3, (7 + m)/2, (
9 + m)/2, -((b*x^2)/a)])/(7 + m) + (B*d*x^2*Hypergeometric2F1[3,
(9 + m)/2, (11 + m)/2, -((b*x^2)/a)])/(9 + m)))))/a^3
```

Maple [F] time = 0.075, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)*(d*x^2+c)^3/(b*x^2+a)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(e*x)^m/(b*x^2 + a)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bd^3x^8+\left(3\,Bcd^2+Ad^3\right)x^6+3\left(Bc^2d+Acd^2\right)x^4+Ac^3+\left(Bc^3+3\,Ac^2d\right)x^2\right)(ex)^m}{b^3x^6+3\,ab^2x^4+3\,a^2bx^2+a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d^3*x^8 + (3*B*c*d^2 + A*d^3)*x^6 + 3*(B*c^2*d + A*c*
d^2)*x^4 + A*c^3 + (B*c^3 + 3*A*c^2*d)*x^2)*(e*x)^m/(b^3*x^6 + 3*
a*b^2*x^4 + 3*a^2*b*x^2 + 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((e*x)**m*(B*x**2+A)*(d*x**2+c)**3/(b*x**2+a)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(e*x)^m/(b*x^2 + a)^3, x)
```

3.22 $\int \frac{(ex)^m \left(a+bx^2\right)^4 \left(A+Bx^2\right)}{c+dx^2} \, dx$

Optimal. Leaf size=363

$$\frac{b^2(ex)^{m+5}\left(6a^2Bd^2-4abd(Bc-Ad)+b^2c(Bc-Ad)\right)}{d^3e^5(m+5)}+\frac{b(ex)^{m+3}\left(4a^3Bd^3-6a^2bd^2(Bc-Ad)+4ab^2cd(Bc-Ad)+b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4e^3(m+3)}+\frac{(ex)^{m+1}\left(a^4Bd^4-4a^3bd^3(Bc-Ad)+6a^2b^2cd^2(Bc-Ad)-4ab^3c^2d(Bc-Ad)+b^4c^3(Bc-Ad)\right)}{d^5e(m+1)}-\frac{b^3(ex)^{m+7}(-4aBd-Abd+bBc)}{d^2e^7(m+7)}-\frac{(ex)^{m+1}(bc-ad)^4(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cd^5e(m+1)}+\frac{b^4B(ex)^{m+9}}{de^9(m+9)}$$

```
[Out] ((a^4*B*d^4 + b^4*c^3*(B*c - A*d) - 4*a*b^3*c^2*d*(B*c - A*d) + 6
*a^2*b^2*c*d^2*(B*c - A*d) - 4*a^3*b*d^3*(B*c - A*d))*(e*x)^(1 +
m))/(d^5*e*(1 + m)) + (b*(4*a^3*B*d^3 - b^3*c^2*(B*c - A*d) + 4*a
*b^2*c*d*(B*c - A*d) - 6*a^2*b*d^2*(B*c - A*d))*(e*x)^(3 + m))/(d
^4*e^3*(3 + m)) + (b^2*(6*a^2*B*d^2 + b^2*c*(B*c - A*d) - 4*a*b*d
*(B*c - A*d))*(e*x)^(5 + m))/(d^3*e^5*(5 + m)) - (b^3*(b*B*c - A*
b*d - 4*a*B*d)*(e*x)^(7 + m))/(d^2*e^7*(7 + m)) + (b^4*B*(e*x)^(9
 + m))/(d*e^9*(9 + m)) - ((b*c - a*d)^4*(B*c - A*d)*(e*x)^(1 + m)
*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(c*d^5
*e*(1 + m))
```

Rubi [A] time = 0.940892, antiderivative size = 363, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$

$$\frac{b^2(ex)^{m+5}\left(6a^2Bd^2-4abd(Bc-Ad)+b^2c(Bc-Ad)\right)}{d^3e^5(m+5)}+\frac{b(ex)^{m+3}\left(4a^3Bd^3-6a^2bd^2(Bc-Ad)+4ab^2cd(Bc-Ad)+b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4e^3(m+3)}+\frac{(ex)^{m+1}\left(a^4Bd^4-4a^3bd^3(Bc-Ad)+6a^2b^2cd^2(Bc-Ad)-4ab^3c^2d(Bc-Ad)+b^4c^3(Bc-Ad)\right)}{d^5e(m+1)}-\frac{b^3(ex)^{m+7}(-4aBd-Abd+bBc)}{d^2e^7(m+7)}-\frac{(ex)^{m+1}(bc-ad)^4(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cd^5e(m+1)}+\frac{b^4B(ex)^{m+9}}{de^9(m+9)}$$

Antiderivative was successfully verified.

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

```
[Out] ((a^4*B*d^4 + b^4*c^3*(B*c - A*d) - 4*a*b^3*c^2*d*(B*c - A*d) + 6
*a^2*b^2*c*d^2*(B*c - A*d) - 4*a^3*b*d^3*(B*c - A*d))*(e*x)^(1 +
m))/(d^5*e*(1 + m)) + (b*(4*a^3*B*d^3 - b^3*c^2*(B*c - A*d) + 4*a
*b^2*c*d*(B*c - A*d) - 6*a^2*b*d^2*(B*c - A*d))*(e*x)^(3 + m))/(d
^4*e^3*(3 + m)) + (b^2*(6*a^2*B*d^2 + b^2*c*(B*c - A*d) - 4*a*b*d
*(B*c - A*d))*(e*x)^(5 + m))/(d^3*e^5*(5 + m)) - (b^3*(b*B*c - A*
b*d - 4*a*B*d)*(e*x)^(7 + m))/(d^2*e^7*(7 + m)) + (b^4*B*(e*x)^(9
 + m))/(d*e^9*(9 + m)) - ((b*c - a*d)^4*(B*c - A*d)*(e*x)^(1 + m)
*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(c*d^5
*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [A] time = 2.73804, size = 270, normalized size = 0.74

$$\frac{x(ex)^m\left(\frac{a^4A\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{a^3x^2(aB+4Ab)\,{}_2F_1\left(1,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+bx^4\left(\frac{2a^2(2aB+3Ab)\,{}_2F_1\left(1,\frac{m+5}{2};\frac{m+7}{2};-\frac{dx^2}{c}\right)}{m+5}+bx^2\left(bx^2\left(\frac{(4aB+A}{}\right.\right.\right.\right.}{c}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a^4*A*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(1 + m) + (a^3*(4*A*b + a*B)*x^2*Hypergeometric2F1[1,
 (3 + m)/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + b*x^4*((2*a^2*(3*
A*b + 2*a*B)*Hypergeometric2F1[1, (5 + m)/2, (7 + m)/2, -((d*x^2)
/c)])/(5 + m) + b*x^2*((2*a*(2*A*b + 3*a*B)*Hypergeometric2F1[1,
(7 + m)/2, (9 + m)/2, -((d*x^2)/c)])/(7 + m) + b*x^2*(((A*b + 4*a
*B)*Hypergeometric2F1[1, (9 + m)/2, (11 + m)/2, -((d*x^2)/c)])/(9
 + m) + (b*B*x^2*Hypergeometric2F1[1, (11 + m)/2, (13 + m)/2, -((
d*x^2)/c)])/(11 + m))))))/c
```

Maple [F] time = 0.054, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^4*(B*x^2+A)/(d*x^2+c),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((B*x^2 + A)*(b*x^2 + a)^4*(e*x)^m/(d*x^2 + c),x, algorithm="maxima")
```

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^4*(e*x)^m/(d*x^2 + c), x)
```

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

$$\text{integral}\left(\frac{\left(Bb^4x^{10}+\left(4\,Bab^3+Ab^4\right)x^8+2\left(3\,Ba^2b^2+2\,Aab^3\right)x^6+Aa^4+2\left(2\,Ba^3b+3\,Aa^2b^2\right)x^4+\left(Ba^4+4\,Aa^3b\right)x^2\right)(ex)^m}{dx^2+c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((B*x^2 + A)*(b*x^2 + a)^4*(e*x)^m/(d*x^2 + c),x, algorithm="fricas")
```

```
[Out] integral((B*b^4*x^10 + (4*B*a*b^3 + A*b^4)*x^8 + 2*(3*B*a^2*b^2 +
 2*A*a*b^3)*x^6 + A*a^4 + 2*(2*B*a^3*b + 3*A*a^2*b^2)*x^4 + (B*a^
4 + 4*A*a^3*b)*x^2)*(e*x)^m/(d*x^2 + c), x)
```

Sympy [A] time = 171.43, size = 1132, normalized size = 3.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*a**4*e**m*m*x*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 +
1/2)*gamma(m/2 + 1/2)/(4*c*gamma(m/2 + 3/2)) + A*a**4*e**m*x*x**m
*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2
)/(4*c*gamma(m/2 + 3/2)) + A*a**3*b*e**m*m*x**3*x**m*lerchphi(d*x
**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(c*gamma(m/
2 + 5/2)) + 3*A*a**3*b*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(I
*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(c*gamma(m/2 + 5/2)) + 3*A
*a**2*b**2*e**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1,
 m/2 + 5/2)*gamma(m/2 + 5/2)/(2*c*gamma(m/2 + 7/2)) + 15*A*a**2*b
**2*e**m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/
2)*gamma(m/2 + 5/2)/(2*c*gamma(m/2 + 7/2)) + A*a*b**3*e**m*m*x**7
*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2
+ 7/2)/(c*gamma(m/2 + 9/2)) + 7*A*a*b**3*e**m*x**7*x**m*lerchphi(
d*x**2*exp_polar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(c*gamma
(m/2 + 9/2)) + A*b**4*e**m*m*x**9*x**m*lerchphi(d*x**2*exp_polar(
I*pi)/c, 1, m/2 + 9/2)*gamma(m/2 + 9/2)/(4*c*gamma(m/2 + 11/2)) +
 9*A*b**4*e**m*x**9*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/
2 + 9/2)*gamma(m/2 + 9/2)/(4*c*gamma(m/2 + 11/2)) + B*a**4*e**m*m
*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma
(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2)) + 3*B*a**4*e**m*x**3*x**m*lerc
hphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*
c*gamma(m/2 + 5/2)) + B*a**3*b*e**m*m*x**5*x**m*lerchphi(d*x**2*e
xp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(c*gamma(m/2 + 7
/2)) + 5*B*a**3*b*e**m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/
c, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(c*gamma(m/2 + 7/2)) + 3*B*a**2
*b**2*e**m*m*x**7*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2
+ 7/2)*gamma(m/2 + 7/2)/(2*c*gamma(m/2 + 9/2)) + 21*B*a**2*b**2*e
**m*x**7*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 7/2)*ga
mma(m/2 + 7/2)/(2*c*gamma(m/2 + 9/2)) + B*a*b**3*e**m*m*x**9*x**m
*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 9/2)*gamma(m/2 + 9/2
)/(c*gamma(m/2 + 11/2)) + 9*B*a*b**3*e**m*x**9*x**m*lerchphi(d*x*
*2*exp_polar(I*pi)/c, 1, m/2 + 9/2)*gamma(m/2 + 9/2)/(c*gamma(m/2
 + 11/2)) + B*b**4*e**m*m*x**11*x**m*lerchphi(d*x**2*exp_polar(I*
pi)/c, 1, m/2 + 11/2)*gamma(m/2 + 11/2)/(4*c*gamma(m/2 + 13/2)) +
 11*B*b**4*e**m*x**11*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1,
m/2 + 11/2)*gamma(m/2 + 11/2)/(4*c*gamma(m/2 + 13/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(bx^2 + a)^4 (ex)^m}{dx^2 + c} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^4*(e*x)^m/(d*x^2 + c), x)
```

3.23 $\int \frac{(ex)^m (a+bx^2)^3 (A+Bx^2)}{c+dx^2} \, dx$

Optimal. Leaf size=260

$$\frac{b(ex)^{m+3} \left(3a^2Bd^2 - 3abd(Bc-Ad) + b^2c(Bc-Ad)\right)}{d^3e^3(m+3)} + \frac{(ex)^{m+1} \left(a^3Bd^3 - 3a^2bd^2(Bc-Ad) + 3ab^2cd(Bc-Ad) + b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4e(m+1)} - \frac{b^2(ex)^{m+5}(-3aBd - Abd + bBc)}{d^2e^5(m+5)} + \frac{(ex)^{m+1}(bc-ad)^3(Bc-Ad)\,{}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right)}{cd^4e(m+1)} + \frac{b^3B(ex)^{m+7}}{de^7(m+7)}$$

```
[Out] ((a^3*B*d^3 - b^3*c^2*(B*c - A*d) + 3*a*b^2*c*d*(B*c - A*d) - 3*a
^2*b*d^2*(B*c - A*d))*(e*x)^(1 + m))/(d^4*e*(1 + m)) + (b*(3*a^2*
B*d^2 + b^2*c*(B*c - A*d) - 3*a*b*d*(B*c - A*d))*(e*x)^(3 + m))/(
d^3*e^3*(3 + m)) - (b^2*(b*B*c - A*b*d - 3*a*B*d)*(e*x)^(5 + m))/
(d^2*e^5*(5 + m)) + (b^3*B*(e*x)^(7 + m))/(d*e^7*(7 + m)) + ((b*c
 - a*d)^3*(B*c - A*d)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/
2, (3 + m)/2, -((d*x^2)/c)])/(c*d^4*e*(1 + m))
```

Rubi [A] time = 0.644206, antiderivative size = 260, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$

$$\frac{b(ex)^{m+3} \left(3a^2Bd^2 - 3abd(Bc-Ad) + b^2c(Bc-Ad)\right)}{d^3e^3(m+3)} + \frac{(ex)^{m+1} \left(a^3Bd^3 - 3a^2bd^2(Bc-Ad) + 3ab^2cd(Bc-Ad) + b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4e(m+1)} - \frac{b^2(ex)^{m+5}(-3aBd - Abd + bBc)}{d^2e^5(m+5)} + \frac{(ex)^{m+1}(bc-ad)^3(Bc-Ad)\,{}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right)}{cd^4e(m+1)} + \frac{b^3B(ex)^{m+7}}{de^7(m+7)}$$

Antiderivative was successfully verified.

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



```
[Out] ((a^3*B*d^3 - b^3*c^2*(B*c - A*d) + 3*a*b^2*c*d*(B*c - A*d) - 3*a
^2*b*d^2*(B*c - A*d))*(e*x)^(1 + m))/(d^4*e*(1 + m)) + (b*(3*a^2*
B*d^2 + b^2*c*(B*c - A*d) - 3*a*b*d*(B*c - A*d))*(e*x)^(3 + m))/(
d^3*e^3*(3 + m)) - (b^2*(b*B*c - A*b*d - 3*a*B*d)*(e*x)^(5 + m))/
(d^2*e^5*(5 + m)) + (b^3*B*(e*x)^(7 + m))/(d*e^7*(7 + m)) + ((b*c
 - a*d)^3*(B*c - A*d)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/
2, (3 + m)/2, -((d*x^2)/c)])/(c*d^4*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [A] time = 0.7998, size = 218, normalized size = 0.84

$$\frac{x(ex)^m\left(\frac{a^3A\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{a^2x^2(aB+3Ab)\,{}_2F_1\left(1,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+bx^4\left(bx^2\left(\frac{(3aB+Ab)\,{}_2F_1\left(1,\frac{m+7}{2};\frac{m+9}{2};-\frac{dx^2}{c}\right)}{m+7}+\frac{bBx^2\,{}_2F_1\left(1,\frac{m+9}{2};m\cdots\right.}{m+9}\right.\right.\right.}{c}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a^3*A*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(1 + m) + (a^2*(3*A*b + a*B)*x^2*Hypergeometric2F1[1,
 (3 + m)/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + b*x^4*((3*a*(A*b
+ a*B)*Hypergeometric2F1[1, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/
(5 + m) + b*x^2*(((A*b + 3*a*B)*Hypergeometric2F1[1, (7 + m)/2, (
9 + m)/2, -((d*x^2)/c)])/(7 + m) + (b*B*x^2*Hypergeometric2F1[1,
(9 + m)/2, (11 + m)/2, -((d*x^2)/c)])/(9 + m)))))/c
```

Maple [F] time = 0.052, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^3*(B*x^2+A)/(d*x^2+c),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^3*(e*x)^m/(d*x^2 + c), x)
```

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

$$\mathrm{integral}\left(\frac{\left(Bb^3x^8+\left(3\,Bab^2+Ab^3\right)x^6+3\left(Ba^2b+Aab^2\right)x^4+Aa^3+\left(Ba^3+3\,Aa^2b\right)x^2\right)(ex)^m}{dx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b^3*x^8 + (3*B*a*b^2 + A*b^3)*x^6 + 3*(B*a^2*b + A*a*
b^2)*x^4 + A*a^3 + (B*a^3 + 3*A*a^2*b)*x^2)*(e*x)^m/(d*x^2 + c),
x)
```

Sympy [A] time = 97.4542, size = 911, normalized size = 3.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*a**3*e**m*m*x*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 +
1/2)*gamma(m/2 + 1/2)/(4*c*gamma(m/2 + 3/2)) + A*a**3*e**m*x*x**m
*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2
)/(4*c*gamma(m/2 + 3/2)) + 3*A*a**2*b*e**m*m*x**3*x**m*lerchphi(d
*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamm
a(m/2 + 5/2)) + 9*A*a**2*b*e**m*x**3*x**m*lerchphi(d*x**2*exp_pol
ar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2))
 + 3*A*a*b**2*e**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c,
 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(4*c*gamma(m/2 + 7/2)) + 15*A*a*b
**2*e**m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/
2)*gamma(m/2 + 5/2)/(4*c*gamma(m/2 + 7/2)) + A*b**3*e**m*m*x**7*x
**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2 +
7/2)/(4*c*gamma(m/2 + 9/2)) + 7*A*b**3*e**m*x**7*x**m*lerchphi(d*
x**2*exp_polar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*c*gamma
(m/2 + 9/2)) + B*a**3*e**m*m*x**3*x**m*lerchphi(d*x**2*exp_polar(
I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2)) +
3*B*a**3*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2
 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2)) + 3*B*a**2*b*e**m
*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gam
ma(m/2 + 5/2)/(4*c*gamma(m/2 + 7/2)) + 15*B*a**2*b*e**m*x**5*x**m
*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2 + 5/2
)/(4*c*gamma(m/2 + 7/2)) + 3*B*a*b**2*e**m*m*x**7*x**m*lerchphi(d
*x**2*exp_polar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*c*gamm
a(m/2 + 9/2)) + 21*B*a*b**2*e**m*x**7*x**m*lerchphi(d*x**2*exp_po
lar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*c*gamma(m/2 + 9/2)
) + B*b**3*e**m*m*x**9*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1,
 m/2 + 9/2)*gamma(m/2 + 9/2)/(4*c*gamma(m/2 + 11/2)) + 9*B*b**3*e
**m*x**9*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 9/2)*ga
mma(m/2 + 9/2)/(4*c*gamma(m/2 + 11/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^3*(e*x)^m/(d*x^2 + c), x)
```

3.24 $\int \frac{(ex)^m(a+bx^2)^2(A+Bx^2)}{c+dx^2}\,dx$

Optimal. Leaf size=180

$$\frac{(ex)^{m+1}\left(a^2Bd^2-2abd(Bc-Ad)+b^2c(Bc-Ad)\right)}{d^3e(m+1)}-\frac{(ex)^{m+1}(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cd^3e(m+1)}-\frac{b(ex)^{m+3}(-2aBd-Abd+bBc)}{d^2e^3(m+3)}+\frac{b^2B(ex)^{m+5}}{de^5(m+5)}$$

```
[Out] ((a^2*B*d^2 + b^2*c*(B*c - A*d) - 2*a*b*d*(B*c - A*d))*(e*x)^(1 +
 m))/(d^3*e*(1 + m)) - (b*(b*B*c - A*b*d - 2*a*B*d)*(e*x)^(3 + m)
)/(d^2*e^3*(3 + m)) + (b^2*B*(e*x)^(5 + m))/(d*e^5*(5 + m)) - ((b
*c - a*d)^2*(B*c - A*d)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m
)/2, (3 + m)/2, -((d*x^2)/c)])/(c*d^3*e*(1 + m))
```

Rubi [A] time = 0.441483, antiderivative size = 180, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065

$$\frac{(ex)^{m+1}\left(a^2Bd^2-2abd(Bc-Ad)+b^2c(Bc-Ad)\right)}{d^3e(m+1)}-\frac{(ex)^{m+1}(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cd^3e(m+1)}-\frac{b(ex)^{m+3}(-2aBd-Abd+bBc)}{d^2e^3(m+3)}+\frac{b^2B(ex)^{m+5}}{de^5(m+5)}$$

Antiderivative was successfully verified.

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

```
[Out] ((a^2*B*d^2 + b^2*c*(B*c - A*d) - 2*a*b*d*(B*c - A*d))*(e*x)^(1 +
 m))/(d^3*e*(1 + m)) - (b*(b*B*c - A*b*d - 2*a*B*d)*(e*x)^(3 + m)
)/(d^2*e^3*(3 + m)) + (b^2*B*(e*x)^(5 + m))/(d*e^5*(5 + m)) - ((b
*c - a*d)^2*(B*c - A*d)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m
)/2, (3 + m)/2, -((d*x^2)/c)])/(c*d^3*e*(1 + m))
```

Rubi in Sympy [A] time = 83.0784, size = 168, normalized size = 0.93

$$\frac{Bb^2\,(ex)^{m+5}}{de^5\,(m+5)}+\frac{b\,(ex)^{m+3}\,(Abd+2Bad-Bbc)}{d^2e^3\,(m+3)}+\frac{(ex)^{m+1}\left(2Aabd^2-Ab^2cd+Ba^2d^2-2Babcd+Bb^2c^2\right)}{d^3e\,(m+1)}+\frac{(ex)^{m+1}\,(Ad-Bc)\,(ad-bc)^2\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{dx^2}{c}\right)}{cd^3e\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)**2*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] B*b**2*(e*x)**(m + 5)/(d*e**5*(m + 5)) + b*(e*x)**(m + 3)*(A*b*d
+ 2*B*a*d - B*b*c)/(d**2*e**3*(m + 3)) + (e*x)**(m + 1)*(2*A*a*b*
d**2 - A*b**2*c*d + B*a**2*d**2 - 2*B*a*b*c*d + B*b**2*c**2)/(d**
3*e*(m + 1)) + (e*x)**(m + 1)*(A*d - B*c)*(a*d - b*c)**2*hyper((1
, m/2 + 1/2), (m/2 + 3/2,), -d*x**2/c)/(c*d**3*e*(m + 1))
```

Mathematica [A] time = 0.481526, size = 170, normalized size = 0.94

$$\frac{x(ex)^m\left(\frac{a^2A\,_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{ax^2(aB+2Ab)\,_2F_1\left(1,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+bx^4\left(\frac{(2aB+Ab)\,_2F_1\left(1,\frac{m+5}{2};\frac{m+7}{2};-\frac{dx^2}{c}\right)}{m+5}+\frac{bBx^2\,_2F_1\left(1,\frac{m+7}{2};\frac{m+9}{2};-\frac{dx^2}{c}\right)}{m+7}\right)\right)}{c}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a^2*A*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(1 + m) + (a*(2*A*b + a*B)*x^2*Hypergeometric2F1[1, (
3 + m)/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + b*x^4*(((A*b + 2*a*
B)*Hypergeometric2F1[1, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/(5 +
 m) + (b*B*x^2*Hypergeometric2F1[1, (7 + m)/2, (9 + m)/2, -((d*x^
2)/c)])/(7 + m))))/c
```

Maple [F] time = 0.068, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^2*(B*x^2+A)/(d*x^2+c),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^2*(e*x)^m/(d*x^2 + c), x)
```

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

$$\mathrm{integral}\left(\frac{\left(Bb^2x^6+\left(2\,Bab+Ab^2\right)x^4+Aa^2+\left(Ba^2+2\,Aab\right)x^2\right)(ex)^m}{dx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b^2*x^6 + (2*B*a*b + A*b^2)*x^4 + A*a^2 + (B*a^2 + 2*
A*a*b)*x^2)*(e*x)^m/(d*x^2 + c), x)
```

Sympy [A] time = 47.9764, size = 666, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(b*x**2+a)**2*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] A*a**2*e**m*m*x*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 +
1/2)*gamma(m/2 + 1/2)/(4*c*gamma(m/2 + 3/2)) + A*a**2*e**m*x*x**m
*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2
)/(4*c*gamma(m/2 + 3/2)) + A*a*b*e**m*m*x**3*x**m*lerchphi(d*x**2
*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(2*c*gamma(m/2
 + 5/2)) + 3*A*a*b*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)
/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(2*c*gamma(m/2 + 5/2)) + A*b**
2*e**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/
2)*gamma(m/2 + 5/2)/(4*c*gamma(m/2 + 7/2)) + 5*A*b**2*e**m*x**5*x
**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2 +
5/2)/(4*c*gamma(m/2 + 7/2)) + B*a**2*e**m*m*x**3*x**m*lerchphi(d*
x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma
(m/2 + 5/2)) + 3*B*a**2*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(
I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2)) +
B*a*b*e**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2
+ 5/2)*gamma(m/2 + 5/2)/(2*c*gamma(m/2 + 7/2)) + 5*B*a*b*e**m*x**
5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2
 + 5/2)/(2*c*gamma(m/2 + 7/2)) + B*b**2*e**m*m*x**7*x**m*lerchphi
(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*c*ga
mma(m/2 + 9/2)) + 7*B*b**2*e**m*x**7*x**m*lerchphi(d*x**2*exp_pol
ar(I*pi)/c, 1, m/2 + 7/2)*gamma(m/2 + 7/2)/(4*c*gamma(m/2 + 9/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(bx^2 + a)^2 (ex)^m}{dx^2 + c} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^2*(e*x)^m/(d*x^2 + c), x)
```

3.25 $\int \frac{(ex)^m (a+bx^2)(A+Bx^2)}{c+dx^2}\,dx$

Optimal. Leaf size=120

$$\frac{(ex)^{m+1}(bc-ad)(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cd^2e(m+1)}-\frac{(ex)^{m+1}(-aBd-Abd+bBc)}{d^2e(m+1)}+\frac{bB(ex)^{m+3}}{de^3(m+3)}$$

```
[Out] -(((b*B*c - A*b*d - a*B*d)*(e*x)^(1 + m))/(d^2*e*(1 + m))) + (b*B
*(e*x)^(3 + m))/(d*e^3*(3 + m)) + ((b*c - a*d)*(B*c - A*d)*(e*x)^
(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])
/(c*d^2*e*(1 + m))
```

Rubi [A] time = 0.257458, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.069$

$$\frac{(ex)^{m+1}(bc-ad)(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cd^2e(m+1)}-\frac{(ex)^{m+1}(-aBd-Abd+bBc)}{d^2e(m+1)}+\frac{bB(ex)^{m+3}}{de^3(m+3)}$$

Antiderivative was successfully verified.

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

```
[Out] -(((b*B*c - A*b*d - a*B*d)*(e*x)^(1 + m))/(d^2*e*(1 + m))) + (b*B
*(e*x)^(3 + m))/(d*e^3*(3 + m)) + ((b*c - a*d)*(B*c - A*d)*(e*x)^
(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])
/(c*d^2*e*(1 + m))
```

Rubi in Sympy [A] time = 40.5286, size = 99, normalized size = 0.82

$$\frac{Bb\,(ex)^{m+3}}{de^3\,(m+3)}+\frac{(ex)^{m+1}\,(Abd+Bad-Bbc)}{d^2e\,(m+1)}+\frac{(ex)^{m+1}\,(Ad-Bc)\,(ad-bc)\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{dx^2}{c}\right)}{cd^2e\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] B*b*(e*x)**(m + 3)/(d*e**3*(m + 3)) + (e*x)**(m + 1)*(A*b*d + B*a
*d - B*b*c)/(d**2*e*(m + 1)) + (e*x)**(m + 1)*(A*d - B*c)*(a*d -
b*c)*hyper((1, m/2 + 1/2), (m/2 + 3/2,), -d*x**2/c)/(c*d**2*e*(m
+ 1))
```

Mathematica [A] time = 0.202129, size = 121, normalized size = 1.01

$$\frac{x(ex)^m\left(\frac{x^2(aB+Ab)\,{}_2F_1\left(1,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+\frac{aA\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{bBx^4\,{}_2F_1\left(1,\frac{m+5}{2};\frac{m+7}{2};-\frac{dx^2}{c}\right)}{m+5}\right)}{c}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a*A*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*
x^2)/c)])/(1 + m) + ((A*b + a*B)*x^2*Hypergeometric2F1[1, (3 + m)
```

```
/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + (b*B*x^4*Hypergeometric2F
1[1, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/(5 + m)))/c
```

Maple [F] time = 0.055, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] int((e*x)^m*(b*x^2+a)*(B*x^2+A)/(d*x^2+c),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate((B*x^2 + A)*(b*x^2 + a)*(e*x)^m/(d*x^2 + c), x)
```

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

$$\text{integral}\left(\frac{\left(Bbx^4+(Ba+Ab)x^2+Aa\right)(ex)^m}{dx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integral((B*b*x^4 + (B*a + A*b)*x^2 + A*a)*(e*x)^m/(d*x^2 + c), x
)
```

Sympy [A] time = 22.0524, size = 428, normalized size = 3.57

$$\frac{Aae^m mxx^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{1}{2}\right)\left(\frac{m}{2}+\frac{1}{2}\right)}{4c\left(\frac{m}{2}+\frac{3}{2}\right)}+\frac{Aae^m xx^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{1}{2}\right)\left(\frac{m}{2}+\frac{1}{2}\right)}{4c\left(\frac{m}{2}+\frac{3}{2}\right)}$$
$$+\frac{Abe^m mx^3x^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{3}{2}\right)\left(\frac{m}{2}+\frac{3}{2}\right)}{4c\left(\frac{m}{2}+\frac{5}{2}\right)}+\frac{3Abe^m x^3x^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{3}{2}\right)\left(\frac{m}{2}+\frac{3}{2}\right)}{4c\left(\frac{m}{2}+\frac{5}{2}\right)}$$
$$+\frac{Bae^m mx^3x^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{3}{2}\right)\left(\frac{m}{2}+\frac{3}{2}\right)}{4c\left(\frac{m}{2}+\frac{5}{2}\right)}+\frac{3Bae^m x^3x^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{3}{2}\right)\left(\frac{m}{2}+\frac{3}{2}\right)}{4c\left(\frac{m}{2}+\frac{5}{2}\right)}$$
$$+\frac{Bbe^m mx^5x^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{5}{2}\right)\left(\frac{m}{2}+\frac{5}{2}\right)}{4c\left(\frac{m}{2}+\frac{7}{2}\right)}+\frac{5Bbe^m x^5x^m \left(\frac{dx^2e^{i\pi}}{c}, 1, \frac{m}{2}+\frac{5}{2}\right)\left(\frac{m}{2}+\frac{5}{2}\right)}{4c\left(\frac{m}{2}+\frac{7}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] A*a*e**m*m*x*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2
)*gamma(m/2 + 1/2)/(4*c*gamma(m/2 + 3/2)) + A*a*e**m*x*x**m*lerch
phi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/(4*c
*gamma(m/2 + 3/2)) + A*b*e**m*m*x**3*x**m*lerchphi(d*x**2*exp_pol
ar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2))
 + 3*A*b*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2
 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2)) + B*a*e**m*m*x**3
*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2
+ 3/2)/(4*c*gamma(m/2 + 5/2)) + 3*B*a*e**m*x**3*x**m*lerchphi(d*x
**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(
m/2 + 5/2)) + B*b*e**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi
)/c, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(4*c*gamma(m/2 + 7/2)) + 5*B*
b*e**m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)
*gamma(m/2 + 5/2)/(4*c*gamma(m/2 + 7/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(bx^2 + a)(ex)^m}{dx^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)*(e*x)^m/(d*x^2 + c), x)
```

3.26 $\int \frac{(ex)^m(A+Bx^2)}{c+dx^2}\,dx$

Optimal. Leaf size=77

$$\frac{B(ex)^{m+1}}{de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cde(m+1)}$$

```
[Out] (B*(e*x)^(1 + m))/(d*e*(1 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*Hype
rgeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(c*d*e*(1 +
 m))
```

Rubi [A] time = 0.11575, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{B(ex)^{m+1}}{de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{cde(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (B*(e*x)^(1 + m))/(d*e*(1 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*Hype
rgeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(c*d*e*(1 +
 m))
```

Rubi in Sympy [A] time = 14.052, size = 56, normalized size = 0.73

$$\frac{B\,(ex)^{m+1}}{de\,(m+1)}+\frac{(ex)^{m+1}\,(Ad-Bc)\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{dx^2}{c}\right)}{cde\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] B*(e*x)**(m + 1)/(d*e*(m + 1)) + (e*x)**(m + 1)*(A*d - B*c)*hyper
((1, m/2 + 1/2), (m/2 + 3/2,), -d*x**2/c)/(c*d*e*(m + 1))
```

Mathematica [A] time = 0.0690555, size = 58, normalized size = 0.75

$$-\frac{x(ex)^m\left((Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)-Bc\right)}{cd(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] -((x*(e*x)^m*(-(B*c) + (B*c - A*d)*Hypergeometric2F1[1, (1 + m)/2
, (3 + m)/2, -((d*x^2)/c)]))/(c*d*(1 + m)))
```

Maple [F] time = 0.066, size = 0, normalized size = 0.

$$\int \frac{(ex)^m\,(Bx^2+A)}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(B*x^2+A)/(d*x^2+c),x)
```

```
[Out] int((e*x)^m*(B*x^2+A)/(d*x^2+c),x)
```

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

$$\int \frac{(Bx^2 + A)(ex)^m}{dx^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/(d*x^2 + c), x)
```

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

$$\text{integral}\left(\frac{(Bx^2 + A)(ex)^m}{dx^2 + c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(d*x^2 + c), x)
```

Sympy [A] time = 7.96214, size = 204, normalized size = 2.65

$$\frac{Ae^m mxx^m \Phi\left(\frac{dx^2 e^{i\pi}}{c}, 1, \frac{m}{2} + \frac{1}{2}\right)\Gamma\left(\frac{m}{2} + \frac{1}{2}\right)}{4c\,\Gamma\left(\frac{m}{2} + \frac{3}{2}\right)} + \frac{Ae^m xx^m \Phi\left(\frac{dx^2 e^{i\pi}}{c}, 1, \frac{m}{2} + \frac{1}{2}\right)\Gamma\left(\frac{m}{2} + \frac{1}{2}\right)}{4c\,\Gamma\left(\frac{m}{2} + \frac{3}{2}\right)} + \frac{Be^m mx^3 x^m \Phi\left(\frac{dx^2 e^{i\pi}}{c}, 1, \frac{m}{2} + \frac{3}{2}\right)\Gamma\left(\frac{m}{2} + \frac{3}{2}\right)}{4c\,\Gamma\left(\frac{m}{2} + \frac{5}{2}\right)} + \frac{3Be^m x^3 x^m \Phi\left(\frac{dx^2 e^{i\pi}}{c}, 1, \frac{m}{2} + \frac{3}{2}\right)\Gamma\left(\frac{m}{2} + \frac{3}{2}\right)}{4c\,\Gamma\left(\frac{m}{2} + \frac{5}{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] A*e**m*m*x*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*
gamma(m/2 + 1/2)/(4*c*gamma(m/2 + 3/2)) + A*e**m*x*x**m*lerchphi(
d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/(4*c*gam
ma(m/2 + 3/2)) + B*e**m*m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*p
i)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2)) + 3*B
*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*
gamma(m/2 + 3/2)/(4*c*gamma(m/2 + 5/2))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(ex)^m}{dx^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate((B*x^2 + A)*(e*x)^m/(d*x^2 + c), x)
```

3.27 $\int \frac{(ex)^m (A+Bx^2)}{(a+bx^2)(c+dx^2)} \, dx$

Optimal. Leaf size=125

$$\frac{(ex)^{m+1}(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ae(m+1)(bc-ad)}+\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{ce(m+1)(bc-ad)}$$

```
[Out] ((A*b - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m
)/2, -((b*x^2)/a)])/(a*(b*c - a*d)*e*(1 + m)) + ((B*c - A*d)*(e*x
)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)
])/(c*(b*c - a*d)*e*(1 + m))
```

Rubi [A] time = 0.339741, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.065

$$\frac{(ex)^{m+1}(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ae(m+1)(bc-ad)}+\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{ce(m+1)(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] ((A*b - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m
)/2, -((b*x^2)/a)])/(a*(b*c - a*d)*e*(1 + m)) + ((B*c - A*d)*(e*x
)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)
])/(c*(b*c - a*d)*e*(1 + m))
```

Rubi in Sympy [A] time = 43.5012, size = 94, normalized size = 0.75

$$\frac{(ex)^{m+1}\,(Ad-Bc)\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{dx^2}{c}\right)}{ce\,(m+1)\,(ad-bc)}-\frac{(ex)^{m+1}\,(Ab-Ba)\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{bx^2}{a}\right)}{ae\,(m+1)\,(ad-bc)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)/(b*x**2+a)/(d*x**2+c),x)
```

```
[Out] (e*x)**(m + 1)*(A*d - B*c)*hyper((1, m/2 + 1/2), (m/2 + 3/2,), -d
*x**2/c)/(c*e*(m + 1)*(a*d - b*c)) - (e*x)**(m + 1)*(A*b - B*a)*h
yper((1, m/2 + 1/2), (m/2 + 3/2,), -b*x**2/a)/(a*e*(m + 1)*(a*d -
 b*c))
```

Mathematica [A] time = 0.162532, size = 100, normalized size = 0.8

$$\frac{x(ex)^m\left((aBc-Abc)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)+a(Ad-Bc)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\right)}{ac(m+1)(ad-bc)}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((-(A*b*c) + a*B*c)*Hypergeometric2F1[1, (1 + m)/2, (3
 + m)/2, -((b*x^2)/a)] + a*(-(B*c) + A*d)*Hypergeometric2F1[1, (1
 + m)/2, (3 + m)/2, -((d*x^2)/c)]))/(a*c*(-(b*c) + a*d)*(1 + m))
```

Maple [F] time = 0.074, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (Bx^2 + A)}{(bx^2 + a)(dx^2 + c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)/(d*x^2+c),x)
```

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

$$\int \frac{(Bx^2 + A)(ex)^m}{(bx^2 + a)(dx^2 + c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)*(d*x^2 + c)), x)
```

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

$$\text{integral}\left(\frac{(Bx^2 + A)(ex)^m}{bdx^4 + (bc + ad)x^2 + ac}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b*d*x^4 + (b*c + a*d)*x^2 + a*c), 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((e*x)**m*(B*x**2+A)/(b*x**2+a)/(d*x**2+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(ex)^m}{(bx^2 + a)(dx^2 + c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)*(d*x^2 + c)), x)
```

3.28 $\int \frac{(ex)^m \left(A+Bx^2\right)}{\left(a+bx^2\right)^2 \left(c+dx^2\right)} \, dx$

Optimal. Leaf size=206

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(bc(1-m)-ad(3-m))+aB(ad(1-m)+bc(m+1)))}{2a^2e(m+1)(bc-ad)^2} - \frac{d(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{ce(m+1)(bc-ad)^2} + \frac{(ex)^{m+1}(Ab-aB)}{2ae\left(a+bx^2\right)(bc-ad)}$$

```
[Out] ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)*e*(a + b*x^2)) + ((A
*b*(b*c*(1 - m) - a*d*(3 - m)) + a*B*(a*d*(1 - m) + b*c*(1 + m)))
*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^
2)/a)])/(2*a^2*(b*c - a*d)^2*e*(1 + m)) - (d*(B*c - A*d)*(e*x)^(1
 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(
c*(b*c - a*d)^2*e*(1 + m))
```

Rubi [A] time = 1.02509, antiderivative size = 206, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(bc(1-m)-ad(3-m))+aB(ad(1-m)+bc(m+1)))}{2a^2e(m+1)(bc-ad)^2} - \frac{d(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{ce(m+1)(bc-ad)^2} + \frac{(ex)^{m+1}(Ab-aB)}{2ae\left(a+bx^2\right)(bc-ad)}$$

Antiderivative was successfully verified.

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


```
[Out] ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)*e*(a + b*x^2)) + ((A
*b*(b*c*(1 - m) - a*d*(3 - m)) + a*B*(a*d*(1 - m) + b*c*(1 + m)))
*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^
2)/a)])/(2*a^2*(b*c - a*d)^2*e*(1 + m)) - (d*(B*c - A*d)*(e*x)^(1
 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(
c*(b*c - a*d)^2*e*(1 + m))
```

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((e*x)**m*(B*x**2+A)/(b*x**2+a)**2/(d*x**2+c),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 0.990988, size = 377, normalized size = 1.83

$$\frac{acx(ex)^m\left(\frac{A(m+3)^2F_1\left(\frac{m+1}{2};2,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};2,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-2x^2\left(adF_1\left(\frac{m+3}{2};2,2;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)+2bcF_1\left(\frac{m+3}{2};3,1;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)\right)} + \frac{\cdots}{ac(m+5)F_1\left(\frac{m}{\cdots}\right.}\right.}{(m+3)\left(a+bx^2\right)^2\left(c+dx^2\right)}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 2, 1, (3 + m)/2,
 -((b*x^2)/a), -((d*x^2)/c)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 2, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(a*d*
AppellF1[(3 + m)/2, 2, 2, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]
+ 2*b*c*AppellF1[(3 + m)/2, 3, 1, (5 + m)/2, -((b*x^2)/a), -((d*x
^2)/c)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 2, 1, (5 + m)/2,
-((b*x^2)/a), -((d*x^2)/c)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 2,
1, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(a*d*AppellF1[(
5 + m)/2, 2, 2, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] + 2*b*c*Ap
pellF1[(5 + m)/2, 3, 1, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])))
)/((3 + m)*(a + b*x^2)^2*(c + d*x^2))
```

Maple [F] time = 0.1, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (Bx^2 + A)}{(bx^2 + a)^2 (dx^2 + c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)^2/(d*x^2+c),x)
```

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

$$\int \frac{(Bx^2 + A)(ex)^m}{(bx^2 + a)^2 (dx^2 + c)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^2*(d*x^2 + c)), x)
```

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

$$\text{integral}\left(\frac{(Bx^2 + A)(ex)^m}{b^2dx^6 + (b^2c + 2\,abd)x^4 + a^2c + (2\,abc + a^2d)x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b^2*d*x^6 + (b^2*c + 2*a*b*d)*x^4 +
 a^2*c + (2*a*b*c + a^2*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)**2/(d*x**2+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(ex)^m}{(bx^2 + a)^2(dx^2 + c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^2*(d*x^2 + c)), x)
```

3.29 $\int \frac{(ex)^m (A+Bx^2)}{(a+bx^2)^3 (c+dx^2)} \, dx$

Optimal. Leaf size=342

$$\frac{(ex)^{m+1}(Ab(bc(3-m)-ad(7-m))+aB(ad(3-m)+bc(m+1)))}{8a^2e\,(a+bx^2)\,(bc-ad)^2} + \frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(Ab\left(a^2d^2\left(m^2-8m+15\right)-2abcd\left(m^2-6m+5\right)+b^2c^2\left(m^2-4m+3\right)\right)+aB\left(-a^2d^2\left(m\right.\right.\right.}{8a^3e(m+1)(bc-ad)^3} + \frac{d^2(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{ce(m+1)(bc-ad)^3} + \frac{(ex)^{m+1}(Ab-aB)}{4ae\,(a+bx^2)^2\,(bc-ad)}$$

```
[Out] ((A*b - a*B)*(e*x)^(1 + m))/(4*a*(b*c - a*d)*e*(a + b*x^2)^2) + (
(A*b*(b*c*(3 - m) - a*d*(7 - m)) + a*B*(a*d*(3 - m) + b*c*(1 + m)
))*(e*x)^(1 + m))/(8*a^2*(b*c - a*d)^2*e*(a + b*x^2)) + ((A*b*(a^
2*d^2*(15 - 8*m + m^2) - 2*a*b*c*d*(5 - 6*m + m^2) + b^2*c^2*(3 -
 4*m + m^2)) + a*B*(b^2*c^2*(1 - m^2) - 2*a*b*c*d*(3 + 2*m - m^2)
 - a^2*d^2*(3 - 4*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (
1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(8*a^3*(b*c - a*d)^3*e*(1 + m
)) + (d^2*(B*c - A*d)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/
2, (3 + m)/2, -((d*x^2)/c)])/(c*(b*c - a*d)^3*e*(1 + m))
```

Rubi [A] time = 2.06616, antiderivative size = 342, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097

$$\frac{(ex)^{m+1}(Ab(bc(3-m)-ad(7-m))+aB(ad(3-m)+bc(m+1)))}{8a^2e\,(a+bx^2)\,(bc-ad)^2} + \frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(Ab\left(a^2d^2\left(m^2-8m+15\right)-2abcd\left(m^2-6m+5\right)+b^2c^2\left(m^2-4m+3\right)\right)+aB\left(-a^2d^2\left(m\right.\right.\right.}{8a^3e(m+1)(bc-ad)^3} + \frac{d^2(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{ce(m+1)(bc-ad)^3} + \frac{(ex)^{m+1}(Ab-aB)}{4ae\,(a+bx^2)^2\,(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] ((A*b - a*B)*(e*x)^(1 + m))/(4*a*(b*c - a*d)*e*(a + b*x^2)^2) + (
(A*b*(b*c*(3 - m) - a*d*(7 - m)) + a*B*(a*d*(3 - m) + b*c*(1 + m)
))*(e*x)^(1 + m))/(8*a^2*(b*c - a*d)^2*e*(a + b*x^2)) + ((A*b*(a^
2*d^2*(15 - 8*m + m^2) - 2*a*b*c*d*(5 - 6*m + m^2) + b^2*c^2*(3 -
 4*m + m^2)) + a*B*(b^2*c^2*(1 - m^2) - 2*a*b*c*d*(3 + 2*m - m^2)
 - a^2*d^2*(3 - 4*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (
1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(8*a^3*(b*c - a*d)^3*e*(1 + m
)) + (d^2*(B*c - A*d)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/
2, (3 + m)/2, -((d*x^2)/c)])/(c*(b*c - a*d)^3*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [C] time = 0.715223, size = 377, normalized size = 1.1

$$\frac{acx(ex)^m\left(\frac{A(m+3)^2F_1\left(\frac{m+1}{2};3,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};3,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-2x^2\left(adF_1\left(\frac{m+3}{2};3,2;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)+3bcF_1\left(\frac{m+3}{2};4,1;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)\right)}+\frac{\ldots}{ac(m+5)F_1\left(\frac{m}{}\ldots\right.}\right.}{(m+3)\left(a+bx^2\right)^3\left(c+dx^2\right)}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 3, 1, (3 + m)/2,
 -((b*x^2)/a), -((d*x^2)/c)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 3, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(a*d*
AppellF1[(3 + m)/2, 3, 2, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]
+ 3*b*c*AppellF1[(3 + m)/2, 4, 1, (5 + m)/2, -((b*x^2)/a), -((d*x
^2)/c)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 3, 1, (5 + m)/2,
-((b*x^2)/a), -((d*x^2)/c)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 3,
1, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(a*d*AppellF1[(
5 + m)/2, 3, 2, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] + 3*b*c*Ap
pellF1[(5 + m)/2, 4, 1, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])))
)/((3 + m)*(a + b*x^2)^3*(c + d*x^2))
```

Maple [F] time = 0.086, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)^3/(d*x^2+c),x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^3*(d*x^2 + c)), x)
```

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

$$\mathrm{integral}\left(\frac{\left(Bx^2+A\right)(ex)^m}{b^3dx^8+\left(b^3c+3\,ab^2d\right)x^6+3\left(ab^2c+a^2bd\right)x^4+a^3c+\left(3\,a^2bc+a^3d\right)x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b^3*d*x^8 + (b^3*c + 3*a*b^2*d)*x^6
 + 3*(a*b^2*c + a^2*b*d)*x^4 + a^3*c + (3*a^2*b*c + a^3*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)**3/(d*x**2+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^3*(d*x^2 + c)), x)
```

3.30 $\int \frac{(ex)^m(a+bx^2)^3(A+Bx^2)}{(c+dx^2)^2}\,dx$

Optimal. Leaf size=340

$$-\frac{b(ex)^{m+1}\left(3a^2d^2(Ad(m+1)-Bc(m+3))-3abcd(Ad(m+3)-Bc(m+5))+b^2c^2(Ad(m+5)-Bc(m+7))\right)}{2cd^4e(m+1)}-\frac{b^2(ex)^{m+3}(3ad(Ad(m+3)-Bc(m+5))-bc(Ad(m+5)-Bc(m+7)))}{2cd^3e^3(m+3)}+\frac{(ex)^{m+1}(bc-ad)^2\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(Ad(1-m)+Bc(m+1))+bc(Ad(m+5)-Bc(m+7)))}{2c^2d^4e(m+1)}-\frac{\left(a+bx^2\right)^3(ex)^{m+1}(Bc-Ad)}{2cde\left(c+dx^2\right)}-\frac{b^3(ex)^{m+5}(Ad(m+5)-Bc(m+7))}{2cd^2e^5(m+5)}$$

```
[Out] -(b*(3*a^2*d^2*(A*d*(1 + m) - B*c*(3 + m)) - 3*a*b*c*d*(A*d*(3 +
m) - B*c*(5 + m)) + b^2*c^2*(A*d*(5 + m) - B*c*(7 + m)))*(e*x)^(1
 + m))/(2*c*d^4*e*(1 + m)) - (b^2*(3*a*d*(A*d*(3 + m) - B*c*(5 +
m)) - b*c*(A*d*(5 + m) - B*c*(7 + m)))*(e*x)^(3 + m))/(2*c*d^3*e^
3*(3 + m)) - (b^3*(A*d*(5 + m) - B*c*(7 + m))*(e*x)^(5 + m))/(2*c
*d^2*e^5*(5 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^3)/(2*
c*d*e*(c + d*x^2)) + ((b*c - a*d)^2*(a*d*(A*d*(1 - m) + B*c*(1 +
m)) + b*c*(A*d*(5 + m) - B*c*(7 + m)))*(e*x)^(1 + m)*Hypergeometr
ic2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(2*c^2*d^4*e*(1 + m
))
```

Rubi [A] time = 1.85253, antiderivative size = 340, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097

$$-\frac{b(ex)^{m+1}\left(3a^2d^2(Ad(m+1)-Bc(m+3))-3abcd(Ad(m+3)-Bc(m+5))+b^2c^2(Ad(m+5)-Bc(m+7))\right)}{2cd^4e(m+1)}-\frac{b^2(ex)^{m+3}(3ad(Ad(m+3)-Bc(m+5))-bc(Ad(m+5)-Bc(m+7)))}{2cd^3e^3(m+3)}+\frac{(ex)^{m+1}(bc-ad)^2\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(Ad(1-m)+Bc(m+1))+bc(Ad(m+5)-Bc(m+7)))}{2c^2d^4e(m+1)}-\frac{\left(a+bx^2\right)^3(ex)^{m+1}(Bc-Ad)}{2cde\left(c+dx^2\right)}-\frac{b^3(ex)^{m+5}(Ad(m+5)-Bc(m+7))}{2cd^2e^5(m+5)}$$

Antiderivative was successfully verified.

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


```
[Out] -(b*(3*a^2*d^2*(A*d*(1 + m) - B*c*(3 + m)) - 3*a*b*c*d*(A*d*(3 +
m) - B*c*(5 + m)) + b^2*c^2*(A*d*(5 + m) - B*c*(7 + m)))*(e*x)^(1
 + m))/(2*c*d^4*e*(1 + m)) - (b^2*(3*a*d*(A*d*(3 + m) - B*c*(5 +
m)) - b*c*(A*d*(5 + m) - B*c*(7 + m)))*(e*x)^(3 + m))/(2*c*d^3*e^
3*(3 + m)) - (b^3*(A*d*(5 + m) - B*c*(7 + m))*(e*x)^(5 + m))/(2*c
*d^2*e^5*(5 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^3)/(2*
c*d*e*(c + d*x^2)) + ((b*c - a*d)^2*(a*d*(A*d*(1 - m) + B*c*(1 +
m)) + b*c*(A*d*(5 + m) - B*c*(7 + m)))*(e*x)^(1 + m)*Hypergeometr
ic2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(2*c^2*d^4*e*(1 + m
))
```

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

```
[Out] Timed out
```

Mathematica [A] time = 0.860965, size = 218, normalized size = 0.64

$$\frac{x(ex)^m\left(\frac{a^3A\,_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{a^2x^2(aB+3Ab)\,_2F_1\left(2,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+bx^4\left(bx^2\left(\frac{(3aB+Ab)\,_2F_1\left(2,\frac{m+7}{2};\frac{m+9}{2};-\frac{dx^2}{c}\right)}{m+7}+\frac{bBx^2\,_2F_1\left(2,\frac{m+9}{2};m\right.}{m+9}\right.\right.\right.}{c^2}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a^3*A*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(1 + m) + (a^2*(3*A*b + a*B)*x^2*Hypergeometric2F1[2,
 (3 + m)/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + b*x^4*((3*a*(A*b
+ a*B)*Hypergeometric2F1[2, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/
(5 + m) + b*x^2*(((A*b + 3*a*B)*Hypergeometric2F1[2, (7 + m)/2, (
9 + m)/2, -((d*x^2)/c)])/(7 + m) + (b*B*x^2*Hypergeometric2F1[2,
(9 + m)/2, (11 + m)/2, -((d*x^2)/c)])/(9 + m)))))/c^2
```

Maple [F] time = 0.063, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^3*(B*x^2+A)/(d*x^2+c)^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^3*(e*x)^m/(d*x^2 + c)^2, x)
```

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

$$\text{integral}\left(\frac{\left(Bb^3x^8+\left(3\,Bab^2+Ab^3\right)x^6+3\left(Ba^2b+Aab^2\right)x^4+Aa^3+\left(Ba^3+3\,Aa^2b\right)x^2\right)(ex)^m}{d^2x^4+2\,cdx^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b^3*x^8 + (3*B*a*b^2 + A*b^3)*x^6 + 3*(B*a^2*b + A*a*
b^2)*x^4 + A*a^3 + (B*a^3 + 3*A*a^2*b)*x^2)*(e*x)^m/(d^2*x^4 + 2*
```

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

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^3*(e*x)^m/(d*x^2 + c)^2, x)
```

3.31 $\int \frac{(ex)^m \left(a+bx^2\right)^2 \left(A+Bx^2\right)}{\left(c+dx^2\right)^2} \, dx$

Optimal. Leaf size=246

$$-\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(Ad(1-m)+Bc(m+1))+bc(Ad(m+3)-Bc(m+5)))}{2c^2d^3e(m+1)}$$
$$-\frac{b(ex)^{m+1}(2ad(Ad(m+1)-Bc(m+3))-bc(Ad(m+3)-Bc(m+5)))}{2cd^3e(m+1)}$$
$$-\frac{\left(a+bx^2\right)^2(ex)^{m+1}(Bc-Ad)}{2cde\left(c+dx^2\right)}-\frac{b^2(ex)^{m+3}(Ad(m+3)-Bc(m+5))}{2cd^2e^3(m+3)}$$

```
[Out] -(b*(2*a*d*(A*d*(1 + m) - B*c*(3 + m)) - b*c*(A*d*(3 + m) - B*c*(
5 + m)))*(e*x)^(1 + m))/(2*c*d^3*e*(1 + m)) - (b^2*(A*d*(3 + m) -
 B*c*(5 + m))*(e*x)^(3 + m))/(2*c*d^2*e^3*(3 + m)) - ((B*c - A*d)
*(e*x)^(1 + m)*(a + b*x^2)^2)/(2*c*d*e*(c + d*x^2)) - ((b*c - a*d
)*(a*d*(A*d*(1 - m) + B*c*(1 + m)) + b*c*(A*d*(3 + m) - B*c*(5 +
m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(2*c^2*d^3*e*(1 + m))
```

Rubi [A] time = 1.09599, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$-\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(Ad(1-m)+Bc(m+1))+bc(Ad(m+3)-Bc(m+5)))}{2c^2d^3e(m+1)}$$
$$-\frac{b(ex)^{m+1}(2ad(Ad(m+1)-Bc(m+3))-bc(Ad(m+3)-Bc(m+5)))}{2cd^3e(m+1)}$$
$$-\frac{\left(a+bx^2\right)^2(ex)^{m+1}(Bc-Ad)}{2cde\left(c+dx^2\right)}-\frac{b^2(ex)^{m+3}(Ad(m+3)-Bc(m+5))}{2cd^2e^3(m+3)}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*(2*a*d*(A*d*(1 + m) - B*c*(3 + m)) - b*c*(A*d*(3 + m) - B*c*(
5 + m)))*(e*x)^(1 + m))/(2*c*d^3*e*(1 + m)) - (b^2*(A*d*(3 + m) -
 B*c*(5 + m))*(e*x)^(3 + m))/(2*c*d^2*e^3*(3 + m)) - ((B*c - A*d)
*(e*x)^(1 + m)*(a + b*x^2)^2)/(2*c*d*e*(c + d*x^2)) - ((b*c - a*d
)*(a*d*(A*d*(1 - m) + B*c*(1 + m)) + b*c*(A*d*(3 + m) - B*c*(5 +
m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(2*c^2*d^3*e*(1 + m))
```

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((e*x)**m*(b*x**2+a)**2*(B*x**2+A)/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.466677, size = 170, normalized size = 0.69

$$\frac{x(ex)^m\left(\frac{a^2A\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{ax^2(aB+2Ab)\,{}_2F_1\left(2,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+bx^4\left(\frac{(2aB+Ab)\,{}_2F_1\left(2,\frac{m+5}{2};\frac{m+7}{2};-\frac{dx^2}{c}\right)}{m+5}+\frac{bBx^2\,{}_2F_1\left(2,\frac{m+7}{2};\frac{m+9}{2};-\frac{dx^2}{c}\right)}{m+7}\right.\right.}{c^2}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a^2*A*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(1 + m) + (a*(2*A*b + a*B)*x^2*Hypergeometric2F1[2, (
3 + m)/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + b*x^4*(((A*b + 2*a*
B)*Hypergeometric2F1[2, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/(5 +
 m) + (b*B*x^2*Hypergeometric2F1[2, (7 + m)/2, (9 + m)/2, -((d*x^
2)/c)])/(7 + m))))/c^2
```

Maple [F] time = 0.075, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (bx^2+a)^2 (Bx^2+A)}{(dx^2+c)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^2*(B*x^2+A)/(d*x^2+c)^2,x)
```

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

$$\int \frac{(Bx^2+A)(bx^2+a)^2 (ex)^m}{(dx^2+c)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^2*(e*x)^m/(d*x^2 + c)^2, x)
```

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

$$\mathrm{integral}\left(\frac{\left(Bb^2x^6 + \left(2\,Bab + Ab^2\right)x^4 + Aa^2 + \left(Ba^2 + 2\,Aab\right)x^2\right)(ex)^m}{d^2x^4 + 2\,cdx^2 + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b^2*x^6 + (2*B*a*b + A*b^2)*x^4 + A*a^2 + (B*a^2 + 2*
A*a*b)*x^2)*(e*x)^m/(d^2*x^4 + 2*c*d*x^2 + c^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((e*x)**m*(b*x**2+a)**2*(B*x**2+A)/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^2*(e*x)^m/(d*x^2 + c)^2, x)
```

3.32 $\int \frac{(ex)^m (a+bx^2) (A+Bx^2)}{(c+dx^2)^2} \, dx$

Optimal. Leaf size=171

$$\frac{(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right) (ad(Ad(1-m) + Bc(m+1)) + bc(Ad(m+1) - Bc(m+3)))}{2c^2d^2e(m+1)} - \frac{(A+Bx^2)(ex)^{m+1}(bc-ad)}{2cde(c+dx^2)} - \frac{B(ex)^{m+1}(ad(m+1) - bc(m+3))}{2cd^2e(m+1)}$$

```
[Out] -(B*(a*d*(1 + m) - b*c*(3 + m))*(e*x)^(1 + m))/(2*c*d^2*e*(1 + m)
) - ((b*c - a*d)*(e*x)^(1 + m)*(A + B*x^2))/(2*c*d*e*(c + d*x^2))
 + ((a*d*(A*d*(1 - m) + B*c*(1 + m)) + b*c*(A*d*(1 + m) - B*c*(3
+ m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -
((d*x^2)/c)])/(2*c^2*d^2*e*(1 + m))
```

Rubi [A] time = 0.606746, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$

$$\frac{(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right) (ad(Ad(1-m) + Bc(m+1)) + bc(Ad(m+1) - Bc(m+3)))}{2c^2d^2e(m+1)} - \frac{(A+Bx^2)(ex)^{m+1}(bc-ad)}{2cde(c+dx^2)} - \frac{B(ex)^{m+1}(ad(m+1) - bc(m+3))}{2cd^2e(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] -(B*(a*d*(1 + m) - b*c*(3 + m))*(e*x)^(1 + m))/(2*c*d^2*e*(1 + m)
) - ((b*c - a*d)*(e*x)^(1 + m)*(A + B*x^2))/(2*c*d*e*(c + d*x^2))
 + ((a*d*(A*d*(1 - m) + B*c*(1 + m)) + b*c*(A*d*(1 + m) - B*c*(3
+ m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -
((d*x^2)/c)])/(2*c^2*d^2*e*(1 + m))
```

Rubi in Sympy [A] time = 44.8882, size = 148, normalized size = 0.87

$$\frac{b(ex)^{m+1}(2Ad - (m+3)(Ad - Bc))}{2cd^2e(m+1)} + \frac{(ex)^{m+1}(a+bx^2)(Ad - Bc)}{2cde(c+dx^2)} + \frac{(ex)^{m+1}(ad(-Adm + Ad + Bcm + Bc) - bc(2Ad - (m+3)(Ad - Bc)))\, {}_2F_1\left(\begin{matrix} 1, \frac{m}{2} + \frac{1}{2} \\ \frac{m}{2} + \frac{3}{2} \end{matrix}\middle| -\frac{dx^2}{c}\right)}{2c^2d^2e(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)/(d*x**2+c)**2,x)
```

```
[Out] b*(e*x)**(m + 1)*(2*A*d - (m + 3)*(A*d - B*c))/(2*c*d**2*e*(m + 1
)) + (e*x)**(m + 1)*(a + b*x**2)*(A*d - B*c)/(2*c*d*e*(c + d*x**2
)) + (e*x)**(m + 1)*(a*d*(-A*d*m + A*d + B*c*m + B*c) - b*c*(2*A*
d - (m + 3)*(A*d - B*c)))*hyper((1, m/2 + 1/2), (m/2 + 3/2,), -d*
x**2/c)/(2*c**2*d**2*e*(m + 1))
```

Mathematica [A] time = 0.21294, size = 121, normalized size = 0.71

$$\frac{x(ex)^m \left(\frac{x^2(aB+Ab)\,{}_2F_1\left(2, \frac{m+3}{2}; \frac{m+5}{2}; -\frac{dx^2}{c}\right)}{m+3} + \frac{aA\,{}_2F_1\left(2, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right)}{m+1} + \frac{bBx^4\,{}_2F_1\left(2, \frac{m+5}{2}; \frac{m+7}{2}; -\frac{dx^2}{c}\right)}{m+5}\right)}{c^2}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a*A*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((d*
x^2)/c)])/(1 + m) + ((A*b + a*B)*x^2*Hypergeometric2F1[2, (3 + m)
/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + (b*B*x^4*Hypergeometric2F
1[2, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/(5 + m)))/c^2
```

Maple [F] time = 0.063, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)*(B*x^2+A)/(d*x^2+c)^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)*(e*x)^m/(d*x^2 + c)^2, x)
```

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

$$\mathrm{integral}\left(\frac{\left(Bbx^4 + (Ba + Ab)x^2 + Aa\right) (ex)^m}{d^2x^4 + 2\,cdx^2 + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b*x^4 + (B*a + A*b)*x^2 + A*a)*(e*x)^m/(d^2*x^4 + 2*c
*d*x^2 + c^2), x)
```

Sympy [A] time = 152.577, size = 2076, normalized size = 12.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(b*x**2+a)*(B*x**2+A)/(d*x**2+c)**2,x)
```

```
[Out] A*a*(-c*e**m*m**2*x*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/
2 + 1/2)*gamma(m/2 + 1/2)/(8*c**3*gamma(m/2 + 3/2) + 8*c**2*d*x**
```

```
2*gamma(m/2 + 3/2)) + 2*c*e**m*m*x*x**m*gamma(m/2 + 1/2)/(8*c**3*
gamma(m/2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2)) + c*e**m*x*x**
m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/
2)/(8*c**3*gamma(m/2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2)) + 2
*c*e**m*x*x**m*gamma(m/2 + 1/2)/(8*c**3*gamma(m/2 + 3/2) + 8*c**2
*d*x**2*gamma(m/2 + 3/2)) - d*e**m*m**2*x**3*x**m*lerchphi(d*x**2
*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/(8*c**3*gamma(
m/2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2)) + d*e**m*x**3*x**m*l
erchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/
(8*c**3*gamma(m/2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2))) + A*b
*(-c*e**m*m**2*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/
2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**
2*gamma(m/2 + 5/2)) - 4*c*e**m*m*x**3*x**m*lerchphi(d*x**2*exp_po
lar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5
/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2)) + 2*c*e**m*m*x**3*x**m*gamm
a(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 +
 5/2)) - 3*c*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1,
 m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*
x**2*gamma(m/2 + 5/2)) + 6*c*e**m*x**3*x**m*gamma(m/2 + 3/2)/(8*c
**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2)) - d*e**m*m
**2*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*ga
mma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2
 + 5/2)) - 4*d*e**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c
, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**
2*d*x**2*gamma(m/2 + 5/2)) - 3*d*e**m*x**5*x**m*lerchphi(d*x**2*e
xp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/
2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2))) + B*a*(-c*e**m*m**2*x
**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m
/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/
2)) - 4*c*e**m*m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1,
m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x
**2*gamma(m/2 + 5/2)) + 2*c*e**m*m*x**3*x**m*gamma(m/2 + 3/2)/(8*
c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2)) - 3*c*e**
m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamm
a(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 +
 5/2)) + 6*c*e**m*x**3*x**m*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 +
5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2)) - d*e**m*m**2*x**5*x**m*le
rchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(
8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2)) - 4*d*e
**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*
gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m
/2 + 5/2)) - 3*d*e**m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c
, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**
2*d*x**2*gamma(m/2 + 5/2))) + B*b*(-c*e**m*m**2*x**5*x**m*lerchph
i(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(8*c**
3*gamma(m/2 + 7/2) + 8*c**2*d*x**2*gamma(m/2 + 7/2)) - 8*c*e**m*m
*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma
(m/2 + 5/2)/(8*c**3*gamma(m/2 + 7/2) + 8*c**2*d*x**2*gamma(m/2 +
7/2)) + 2*c*e**m*m*x**5*x**m*gamma(m/2 + 5/2)/(8*c**3*gamma(m/2 +
 7/2) + 8*c**2*d*x**2*gamma(m/2 + 7/2)) - 15*c*e**m*x**5*x**m*ler
chphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(8
*c**3*gamma(m/2 + 7/2) + 8*c**2*d*x**2*gamma(m/2 + 7/2)) + 10*c*e
**m*x**5*x**m*gamma(m/2 + 5/2)/(8*c**3*gamma(m/2 + 7/2) + 8*c**2*
d*x**2*gamma(m/2 + 7/2)) - d*e**m*m**2*x**7*x**m*lerchphi(d*x**2*
exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2 + 5/2)/(8*c**3*gamma(m
/2 + 7/2) + 8*c**2*d*x**2*gamma(m/2 + 7/2)) - 8*d*e**m*m*x**7*x**
m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/2)*gamma(m/2 + 5/
2)/(8*c**3*gamma(m/2 + 7/2) + 8*c**2*d*x**2*gamma(m/2 + 7/2)) - 1
5*d*e**m*x**7*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 5/
2)*gamma(m/2 + 5/2)/(8*c**3*gamma(m/2 + 7/2) + 8*c**2*d*x**2*gamm
a(m/2 + 7/2)))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)*(e*x)^m/(d*x^2 + c)^2, x)
```

3.33 $\int \frac{(ex)^m(A+Bx^2)}{(c+dx^2)^2}\,dx$

Optimal. Leaf size=103

$$\frac{(ex)^{m+1}(Ad(1-m)+Bc(m+1))\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{2c^2de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)}{2cde\,(c+dx^2)}$$

```
[Out] -((B*c - A*d)*(e*x)^(1 + m))/(2*c*d*e*(c + d*x^2)) + ((A*d*(1 - m
) + B*c*(1 + m))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3
 + m)/2, -((d*x^2)/c)])/(2*c^2*d*e*(1 + m))
```

Rubi [A] time = 0.154657, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{(ex)^{m+1}(Ad(1-m)+Bc(m+1))\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{2c^2de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)}{2cde\,(c+dx^2)}$$

Antiderivative was successfully verified.

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

```
[Out] -((B*c - A*d)*(e*x)^(1 + m))/(2*c*d*e*(c + d*x^2)) + ((A*d*(1 - m
) + B*c*(1 + m))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3
 + m)/2, -((d*x^2)/c)])/(2*c^2*d*e*(1 + m))
```

Rubi in Sympy [A] time = 16.3026, size = 78, normalized size = 0.76

$$\frac{(ex)^{m+1}\,(Ad-Bc)}{2cde\,(c+dx^2)}+\frac{(ex)^{m+1}\,(Ad\,(-m+1)+Bc\,(m+1))\,{}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{dx^2}{c}\right)}{2c^2de\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(B*x**2+A)/(d*x**2+c)**2,x)
```

```
[Out] (e*x)**(m + 1)*(A*d - B*c)/(2*c*d*e*(c + d*x**2)) + (e*x)**(m + 1
)*(A*d*(-m + 1) + B*c*(m + 1))*hyper((1, m/2 + 1/2), (m/2 + 3/2,)
, -d*x**2/c)/(2*c**2*d*e*(m + 1))
```

Mathematica [A] time = 0.0872696, size = 81, normalized size = 0.79

$$\frac{x(ex)^m\left((Ad-Bc)\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)+Bc\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\right)}{c^2d(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*(B*c*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x
^2)/c)] + (-(B*c) + A*d)*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/
2, -((d*x^2)/c)]))/(c^2*d*(1 + m))
```

Maple [F] time = 0.074, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (Bx^2 + A)}{(dx^2 + c)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(B*x^2+A)/(d*x^2+c)^2,x)

[Out] int((e*x)^m*(B*x^2+A)/(d*x^2+c)^2,x)
```

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

$$\int \frac{(Bx^2 + A)(ex)^m}{(dx^2 + c)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate((B*x^2 + A)*(e*x)^m/(d*x^2 + c)^2, x)
```

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

$$\text{integral}\left(\frac{(Bx^2 + A)(ex)^m}{d^2x^4 + 2\,cdx^2 + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integral((B*x^2 + A)*(e*x)^m/(d^2*x^4 + 2*c*d*x^2 + c^2), x)
```

Sympy [A] time = 68.88, size = 954, normalized size = 9.26

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((e*x)**m*(B*x**2+A)/(d*x**2+c)**2,x)

[Out] A*(-c*e**m*m**2*x*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2
+ 1/2)*gamma(m/2 + 1/2)/(8*c**3*gamma(m/2 + 3/2) + 8*c**2*d*x**2*
gamma(m/2 + 3/2)) + 2*c*e**m*m*x*x**m*gamma(m/2 + 1/2)/(8*c**3*ga
mma(m/2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2)) + c*e**m*x*x**m*
lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2)
/(8*c**3*gamma(m/2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2)) + 2*c
*e**m*x*x**m*gamma(m/2 + 1/2)/(8*c**3*gamma(m/2 + 3/2) + 8*c**2*d
*x**2*gamma(m/2 + 3/2)) - d*e**m*m**2*x**3*x**m*lerchphi(d*x**2*e
xp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/(8*c**3*gamma(m/
2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2)) + d*e**m*x**3*x**m*ler
chphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 1/2)*gamma(m/2 + 1/2)/(8
*c**3*gamma(m/2 + 3/2) + 8*c**2*d*x**2*gamma(m/2 + 3/2))) + B*(-c
*e**m*m**2*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 +
3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*ga
mma(m/2 + 5/2)) - 4*c*e**m*m*x**3*x**m*lerchphi(d*x**2*exp_polar(
I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2)
```

```
+ 8*c**2*d*x**2*gamma(m/2 + 5/2)) + 2*c*e**m*m*x**3*x**m*gamma(m/
2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2
)) - 3*c*e**m*x**3*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2
 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2
*gamma(m/2 + 5/2)) + 6*c*e**m*x**3*x**m*gamma(m/2 + 3/2)/(8*c**3*
gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2)) - d*e**m*m**2*
x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1, m/2 + 3/2)*gamma(
m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*x**2*gamma(m/2 + 5
/2)) - 4*d*e**m*m*x**5*x**m*lerchphi(d*x**2*exp_polar(I*pi)/c, 1,
 m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 + 5/2) + 8*c**2*d*
x**2*gamma(m/2 + 5/2)) - 3*d*e**m*x**5*x**m*lerchphi(d*x**2*exp_p
olar(I*pi)/c, 1, m/2 + 3/2)*gamma(m/2 + 3/2)/(8*c**3*gamma(m/2 +
5/2) + 8*c**2*d*x**2*gamma(m/2 + 5/2)))
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Bx^2 + A\right)(ex)^m}{\left(dx^2 + c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate((B*x^2 + A)*(e*x)^m/(d*x^2 + c)^2, x)
```

3.34 $\int \frac{(ex)^m (A+Bx^2)}{(a+bx^2)(c+dx^2)^2} \, dx$

Optimal. Leaf size=205

$$\frac{(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right) (ad(Ad(1-m)+Bc(m+1))+bc(Bc(1-m)-Ad(3-m)))}{2c^2e(m+1)(bc-ad)^2} + \frac{b(ex)^{m+1}(Ab-aB) {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{bx^2}{a}\right)}{ae(m+1)(bc-ad)^2} + \frac{(ex)^{m+1}(Bc-Ad)}{2ce\left(c+dx^2\right)(bc-ad)}$$

```
[Out] ((B*c - A*d)*(e*x)^(1 + m))/(2*c*(b*c - a*d)*e*(c + d*x^2)) + (b*
(A*b - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)
/2, -((b*x^2)/a)])/(a*(b*c - a*d)^2*e*(1 + m)) + ((b*c*(B*c*(1 -
m) - A*d*(3 - m)) + a*d*(A*d*(1 - m) + B*c*(1 + m)))*(e*x)^(1 + m
)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(2*c^
2*(b*c - a*d)^2*e*(1 + m))
```

Rubi [A] time = 1.04792, antiderivative size = 205, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right) (ad(Ad(1-m)+Bc(m+1))+bc(Bc(1-m)-Ad(3-m)))}{2c^2e(m+1)(bc-ad)^2} + \frac{b(ex)^{m+1}(Ab-aB) {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{bx^2}{a}\right)}{ae(m+1)(bc-ad)^2} + \frac{(ex)^{m+1}(Bc-Ad)}{2ce\left(c+dx^2\right)(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] ((B*c - A*d)*(e*x)^(1 + m))/(2*c*(b*c - a*d)*e*(c + d*x^2)) + (b*
(A*b - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)
/2, -((b*x^2)/a)])/(a*(b*c - a*d)^2*e*(1 + m)) + ((b*c*(B*c*(1 -
m) - A*d*(3 - m)) + a*d*(A*d*(1 - m) + B*c*(1 + m)))*(e*x)^(1 + m
)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(2*c^
2*(b*c - a*d)^2*e*(1 + m))
```

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((e*x)**m*(B*x**2+A)/(b*x**2+a)/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

Mathematica [C] time = 0.975591, size = 377, normalized size = 1.84

$$\frac{acx(ex)^m \left(\frac{A(m+3)^2 F_1\left(\frac{m+1}{2};2,1;\frac{m+3}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};2,1;\frac{m+3}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)-2x^2\left(bcF_1\left(\frac{m+3}{2};2,2;\frac{m+5}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)+2adF_1\left(\frac{m+3}{2};3,1;\frac{m+5}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)\right)\right)} + \frac{\cdots}{ac(m+5)F_1\left(\cdots\right.} \cdots}{(m+3)\left(a+bx^2\right)\left(c+dx^2\right)^2}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 2, 1, (3 + m)/2,
 -((d*x^2)/c), -((b*x^2)/a)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 2, 1, (3 + m)/2, -((d*x^2)/c), -((b*x^2)/a)] - 2*x^2*(b*c*
AppellF1[(3 + m)/2, 2, 2, (5 + m)/2, -((d*x^2)/c), -((b*x^2)/a)]
+ 2*a*d*AppellF1[(3 + m)/2, 3, 1, (5 + m)/2, -((d*x^2)/c), -((b*x
^2)/a)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 2, 1, (5 + m)/2,
-((d*x^2)/c), -((b*x^2)/a)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 2,
1, (5 + m)/2, -((d*x^2)/c), -((b*x^2)/a)] - 2*x^2*(b*c*AppellF1[(
5 + m)/2, 2, 2, (7 + m)/2, -((d*x^2)/c), -((b*x^2)/a)] + 2*a*d*Ap
pellF1[(5 + m)/2, 3, 1, (7 + m)/2, -((d*x^2)/c), -((b*x^2)/a)])))
)/((3 + m)*(a + b*x^2)*(c + d*x^2)^2)
```

Maple [F] time = 0.102, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (Bx^2 + A)}{(bx^2 + a)(dx^2 + c)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)/(d*x^2+c)^2,x)
```

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

$$\int \frac{(Bx^2 + A)(ex)^m}{(bx^2 + a)(dx^2 + c)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)*(d*x^2 + c)^2), x)
```

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

$$\text{integral}\left(\frac{(Bx^2 + A)(ex)^m}{bd^2x^6 + (2\,bcd + ad^2)x^4 + ac^2 + (bc^2 + 2\,acd)x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b*d^2*x^6 + (2*b*c*d + a*d^2)*x^4 +
 a*c^2 + (b*c^2 + 2*a*c*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(ex)^m}{(bx^2 + a)(dx^2 + c)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)*(d*x^2 + c)^2), x)
```

3.35 $\int \frac{(ex)^m (A+Bx^2)}{(a+bx^2)^2 (c+dx^2)^2} \, dx$

Optimal. Leaf size=304

$$\frac{b(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{bx^2}{a}\right) (Ab(bc(1-m) - ad(5-m)) + aB(ad(3-m) + bc(m+1)))}{2a^2 e(m+1)(bc-ad)^3} - \frac{d(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right) (ad(Ad(1-m) + Bc(m+1)) + bc(Bc(3-m) - Ad(5-m)))}{2c^2 e(m+1)(bc-ad)^3} + \frac{d(ex)^{m+1}(aAd - 2aBc + Abc)}{2ace\,(c+dx^2)\,(bc-ad)^2} + \frac{(ex)^{m+1}(Ab-aB)}{2ae\,(a+bx^2)\,(c+dx^2)\,(bc-ad)}$$

```
[Out] (d*(A*b*c - 2*a*B*c + a*A*d)*(e*x)^(1 + m))/(2*a*c*(b*c - a*d)^2*
e*(c + d*x^2)) + ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)*e*(
a + b*x^2)*(c + d*x^2)) + (b*(A*b*(b*c*(1 - m) - a*d*(5 - m)) + a
*B*(a*d*(3 - m) + b*c*(1 + m)))*(e*x)^(1 + m)*Hypergeometric2F1[1
, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(2*a^2*(b*c - a*d)^3*e*(1
+ m)) - (d*(b*c*(B*c*(3 - m) - A*d*(5 - m)) + a*d*(A*d*(1 - m) +
B*c*(1 + m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 +
m)/2, -((d*x^2)/c)])/(2*c^2*(b*c - a*d)^3*e*(1 + m))
```

Rubi [A] time = 2.04235, antiderivative size = 304, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{b(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{bx^2}{a}\right) (Ab(bc(1-m) - ad(5-m)) + aB(ad(3-m) + bc(m+1)))}{2a^2 e(m+1)(bc-ad)^3} - \frac{d(ex)^{m+1} {}_2F_1\left(1, \frac{m+1}{2}; \frac{m+3}{2}; -\frac{dx^2}{c}\right) (ad(Ad(1-m) + Bc(m+1)) + bc(Bc(3-m) - Ad(5-m)))}{2c^2 e(m+1)(bc-ad)^3} + \frac{d(ex)^{m+1}(aAd - 2aBc + Abc)}{2ace\,(c+dx^2)\,(bc-ad)^2} + \frac{(ex)^{m+1}(Ab-aB)}{2ae\,(a+bx^2)\,(c+dx^2)\,(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] (d*(A*b*c - 2*a*B*c + a*A*d)*(e*x)^(1 + m))/(2*a*c*(b*c - a*d)^2*
e*(c + d*x^2)) + ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)*e*(
a + b*x^2)*(c + d*x^2)) + (b*(A*b*(b*c*(1 - m) - a*d*(5 - m)) + a
*B*(a*d*(3 - m) + b*c*(1 + m)))*(e*x)^(1 + m)*Hypergeometric2F1[1
, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/(2*a^2*(b*c - a*d)^3*e*(1
+ m)) - (d*(b*c*(B*c*(3 - m) - A*d*(5 - m)) + a*d*(A*d*(1 - m) +
B*c*(1 + m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 +
m)/2, -((d*x^2)/c)])/(2*c^2*(b*c - a*d)^3*e*(1 + m))
```

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((e*x)**m*(B*x**2+A)/(b*x**2+a)**2/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

Mathematica [C] time = 0.856041, size = 375, normalized size = 1.23

$$\frac{acx(ex)^m\left(\frac{A(m+3)^2F_1\left(\frac{m+1}{2};2,2;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};2,2;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-4x^2\left(adF_1\left(\frac{m+3}{2};2,3;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)+bcF_1\left(\frac{m+3}{2};3,2;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)\right)}+\frac{\ldots}{ac(m+5)F_1\left(\frac{m+\ldots}{2}\ldots\right.}\right.}{(m+3)\left(a+bx^2\right)^2\left(c+dx^2\right)^2}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 2, 2, (3 + m)/2,
 -((b*x^2)/a), -((d*x^2)/c)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 2, 2, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 4*x^2*(a*d*
AppellF1[(3 + m)/2, 2, 3, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]
+ b*c*AppellF1[(3 + m)/2, 3, 2, (5 + m)/2, -((b*x^2)/a), -((d*x^2
)/c)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 2, 2, (5 + m)/2, -(
(b*x^2)/a), -((d*x^2)/c)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 2, 2,
 (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 4*x^2*(a*d*AppellF1[(5
+ m)/2, 2, 3, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] + b*c*Appell
F1[(5 + m)/2, 3, 2, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]))))/((
3 + m)*(a + b*x^2)^2*(c + d*x^2)^2)
```

Maple [F] time = 0.079, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)^2/(d*x^2+c)^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^2*(d*x^2 + c)^2), x)
```

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

$$\text{integral}\left(\frac{\left(Bx^2+A\right)(ex)^m}{b^2d^2x^8+2\left(b^2cd+abd^2\right)x^6+\left(b^2c^2+4\,abcd+a^2d^2\right)x^4+a^2c^2+2\left(abc^2+a^2cd\right)x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b^2*d^2*x^8 + 2*(b^2*c*d + a*b*d^2)
*x^6 + (b^2*c^2 + 4*a*b*c*d + a^2*d^2)*x^4 + a^2*c^2 + 2*(a*b*c^2
 + a^2*c*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)**2/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)\,(ex)^m}{(bx^2 + a)^2(dx^2 + c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^2*(d*x^2 + c)^2), x)
```

3.36 $\int \frac{(ex)^m (A+Bx^2)}{(a+bx^2)^3 (c+dx^2)^2} \, dx$

Optimal. Leaf size=491

$$-\frac{d(ex)^{m+1}\left(A\left(4a^2d^2+abcd(11-m)-b^2c^2(3-m)\right)-aBc(ad(11-m)+bc(m+1))\right)}{8a^2ce\left(c+dx^2\right)(bc-ad)^3}$$
$$+\frac{(ex)^{m+1}(Ab(bc(3-m)-ad(9-m))+aB(ad(5-m)+bc(m+1)))}{8a^2e\left(a+bx^2\right)\left(c+dx^2\right)(bc-ad)^2}$$
$$+\frac{b(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(Ab\left(a^2d^2\left(m^2-12m+35\right)-2abcd\left(m^2-8m+7\right)+b^2c^2\left(m^2-4m+3\right)\right)+aB\left(-a^2d^2\right.\right.}{8a^3e(m+1)(bc-ad)^4}$$
$$+\frac{d^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(Ad(1-m)+Bc(m+1))+bc(Bc(5-m)-Ad(7-m)))}{2c^2e(m+1)(bc-ad)^4}$$
$$+\frac{(ex)^{m+1}(Ab-aB)}{4ae\left(a+bx^2\right)^2\left(c+dx^2\right)(bc-ad)}$$

```
[Out] -(d*(A*(4*a^2*d^2 - b^2*c^2*(3 - m) + a*b*c*d*(11 - m)) - a*B*c*(
a*d*(11 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*c*(b*c - a*d)^
3*e*(c + d*x^2)) + ((A*b - a*B)*(e*x)^(1 + m))/(4*a*(b*c - a*d)*e
*(a + b*x^2)^2*(c + d*x^2)) + ((A*b*(b*c*(3 - m) - a*d*(9 - m)) +
 a*B*(a*d*(5 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*(b*c - a*
d)^2*e*(a + b*x^2)*(c + d*x^2)) + (b*(a*B*(b^2*c^2*(1 - m^2) - 2*
a*b*c*d*(5 + 4*m - m^2) - a^2*d^2*(15 - 8*m + m^2)) + A*b*(a^2*d^
2*(35 - 12*m + m^2) - 2*a*b*c*d*(7 - 8*m + m^2) + b^2*c^2*(3 - 4*
m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/
2, -((b*x^2)/a)])/(8*a^3*(b*c - a*d)^4*e*(1 + m)) + (d^2*(b*c*(B*
c*(5 - m) - A*d*(7 - m)) + a*d*(A*d*(1 - m) + B*c*(1 + m)))*(e*x)
^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)]
)/(2*c^2*(b*c - a*d)^4*e*(1 + m))
```

Rubi [A] time = 4.05301, antiderivative size = 491, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$-\frac{d(ex)^{m+1}\left(A\left(4a^2d^2+abcd(11-m)-b^2c^2(3-m)\right)-aBc(ad(11-m)+bc(m+1))\right)}{8a^2ce\left(c+dx^2\right)(bc-ad)^3}$$
$$+\frac{(ex)^{m+1}(Ab(bc(3-m)-ad(9-m))+aB(ad(5-m)+bc(m+1)))}{8a^2e\left(a+bx^2\right)\left(c+dx^2\right)(bc-ad)^2}$$
$$+\frac{b(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(Ab\left(a^2d^2\left(m^2-12m+35\right)-2abcd\left(m^2-8m+7\right)+b^2c^2\left(m^2-4m+3\right)\right)+aB\left(-a^2d^2\right.\right.}{8a^3e(m+1)(bc-ad)^4}$$
$$+\frac{d^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(Ad(1-m)+Bc(m+1))+bc(Bc(5-m)-Ad(7-m)))}{2c^2e(m+1)(bc-ad)^4}$$
$$+\frac{(ex)^{m+1}(Ab-aB)}{4ae\left(a+bx^2\right)^2\left(c+dx^2\right)(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] -(d*(A*(4*a^2*d^2 - b^2*c^2*(3 - m) + a*b*c*d*(11 - m)) - a*B*c*(
a*d*(11 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*c*(b*c - a*d)^
3*e*(c + d*x^2)) + ((A*b - a*B)*(e*x)^(1 + m))/(4*a*(b*c - a*d)*e
*(a + b*x^2)^2*(c + d*x^2)) + ((A*b*(b*c*(3 - m) - a*d*(9 - m)) +
 a*B*(a*d*(5 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*(b*c - a*
d)^2*e*(a + b*x^2)*(c + d*x^2)) + (b*(a*B*(b^2*c^2*(1 - m^2) - 2*
a*b*c*d*(5 + 4*m - m^2) - a^2*d^2*(15 - 8*m + m^2)) + A*b*(a^2*d^
2*(35 - 12*m + m^2) - 2*a*b*c*d*(7 - 8*m + m^2) + b^2*c^2*(3 - 4*
m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/
2, -((b*x^2)/a)])/(8*a^3*(b*c - a*d)^4*e*(1 + m)) + (d^2*(b*c*(B*
c*(5 - m) - A*d*(7 - m)) + a*d*(A*d*(1 - m) + B*c*(1 + m)))*(e*x)
^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)]
```

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

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((e*x)**m*(B*x**2+A)/(b*x**2+a)**3/(d*x**2+c)**2,x)

[Out] Timed out
```

Mathematica [C] time = 1.4808, size = 379, normalized size = 0.77

$$\frac{acx(ex)^m\left(\frac{A(m+3)^2F_1\left(\frac{m+1}{2};3,2;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};3,2;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-2x^2\left(2adF_1\left(\frac{m+3}{2};3,3;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)+3bcF_1\left(\frac{m+3}{2};4,2;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)\right)}+\frac{}{ac(m+5)F_1(}\right.}{(m+3)\left(a+bx^2\right)^3\left(c+dx^2\right)^2}$$

Warning: Unable to verify antiderivative.

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

[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 3, 2, (3 + m)/2,
 -((b*x^2)/a), -((d*x^2)/c)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 3, 2, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(2*a*
d*AppellF1[(3 + m)/2, 3, 3, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)
] + 3*b*c*AppellF1[(3 + m)/2, 4, 2, (5 + m)/2, -((b*x^2)/a), -((d
*x^2)/c)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 3, 2, (5 + m)/2
, -((b*x^2)/a), -((d*x^2)/c)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 3
, 2, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(2*a*d*Appell
F1[(5 + m)/2, 3, 3, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] + 3*b*
c*AppellF1[(5 + m)/2, 4, 2, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)
]))))/((3 + m)*(a + b*x^2)^3*(c + d*x^2)^2)
```

Maple [F] time = 0.109, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)^3/(d*x^2+c)^2,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^3*(d*x^2 + c)^2), x)
```

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

$$\text{integral}\left(\frac{(Bx^2 + A)\,(ex)^m}{b^3d^2x^{10} + (2\,b^3cd + 3\,ab^2d^2)x^8 + (b^3c^2 + 6\,ab^2cd + 3\,a^2bd^2)x^6 + a^3c^2 + (3\,ab^2c^2 + 6\,a^2bcd + a^3d^2)x^4 + (3\,a^2bc^2 + 2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b^3*d^2*x^10 + (2*b^3*c*d + 3*a*b^2
*d^2)*x^8 + (b^3*c^2 + 6*a*b^2*c*d + 3*a^2*b*d^2)*x^6 + a^3*c^2 +
 (3*a*b^2*c^2 + 6*a^2*b*c*d + a^3*d^2)*x^4 + (3*a^2*b*c^2 + 2*a^3
*c*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)**3/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^3*(d*x^2 + c)^2), x)
```

3.37 $\int \frac{(ex)^m \left(a+bx^2\right)^3 \left(A+Bx^2\right)}{\left(c+dx^2\right)^3}\,dx$

Optimal. Leaf size=433

$$-\frac{b(ex)^{m+1}\left(2a^2d^2(m+1)(Ad(3-m)+Bc(m+1))+3abcd(m+3)(Ad(m+1)-Bc(m+5))-b^2c^2(m+5)(Ad(m+3)-Bc(m\right.}{8c^2d^4e(m+1)}$$
$$-\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(-m^2-2m+3\right)+Bc\left(m^2+\right.\right.\right.}{8c^3d^4e(m+1)}$$
$$-\frac{b^2(ex)^{m+3}(ad(m+3)(Ad(3-m)+Bc(m+1))+bc(m+5)(Ad(m+3)-Bc(m+7)))}{8c^2d^3e^3(m+3)}$$
$$+\frac{\left(a+bx^2\right)^2(ex)^{m+1}(ad(Ad(3-m)+Bc(m+1))+bc(Ad(m+3)-Bc(m+7)))}{8c^2d^2e\left(c+dx^2\right)}$$
$$-\frac{\left(a+bx^2\right)^3(ex)^{m+1}(Bc-Ad)}{4cde\left(c+dx^2\right)^2}$$

```
[Out] -(b*(2*a^2*d^2*(1 + m)*(A*d*(3 - m) + B*c*(1 + m)) + 3*a*b*c*d*(3
 + m)*(A*d*(1 + m) - B*c*(5 + m)) - b^2*c^2*(5 + m)*(A*d*(3 + m)
- B*c*(7 + m)))*(e*x)^(1 + m))/(8*c^2*d^4*e*(1 + m)) - (b^2*(a*d*
(3 + m)*(A*d*(3 - m) + B*c*(1 + m)) + b*c*(5 + m)*(A*d*(3 + m) -
B*c*(7 + m)))*(e*x)^(3 + m))/(8*c^2*d^3*e^3*(3 + m)) - ((B*c - A*
d)*(e*x)^(1 + m)*(a + b*x^2)^3)/(4*c*d*e*(c + d*x^2)^2) + ((a*d*(
A*d*(3 - m) + B*c*(1 + m)) + b*c*(A*d*(3 + m) - B*c*(7 + m)))*(e*
x)^(1 + m)*(a + b*x^2)^2)/(8*c^2*d^2*e*(c + d*x^2)) - ((b*c - a*d
)*(a^2*d^2*(1 - m)*(A*d*(3 - m) + B*c*(1 + m)) + b^2*c^2*(5 + m)*
(A*d*(3 + m) - B*c*(7 + m)) + 2*a*b*c*d*(A*d*(3 - 2*m - m^2) + B*
c*(5 + 6*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2,
 (3 + m)/2, -((d*x^2)/c)])/(8*c^3*d^4*e*(1 + m))
```

Rubi [A] time = 2.90605, antiderivative size = 433, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$-\frac{b(ex)^{m+1}\left(2a^2d^2(m+1)(Ad(3-m)+Bc(m+1))+3abcd(m+3)(Ad(m+1)-Bc(m+5))-b^2c^2(m+5)(Ad(m+3)-Bc(m\right.}{8c^2d^4e(m+1)}$$
$$-\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(-m^2-2m+3\right)+Bc\left(m^2+\right.\right.\right.}{8c^3d^4e(m+1)}$$
$$-\frac{b^2(ex)^{m+3}(ad(m+3)(Ad(3-m)+Bc(m+1))+bc(m+5)(Ad(m+3)-Bc(m+7)))}{8c^2d^3e^3(m+3)}$$
$$+\frac{\left(a+bx^2\right)^2(ex)^{m+1}(ad(Ad(3-m)+Bc(m+1))+bc(Ad(m+3)-Bc(m+7)))}{8c^2d^2e\left(c+dx^2\right)}$$
$$-\frac{\left(a+bx^2\right)^3(ex)^{m+1}(Bc-Ad)}{4cde\left(c+dx^2\right)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*(2*a^2*d^2*(1 + m)*(A*d*(3 - m) + B*c*(1 + m)) + 3*a*b*c*d*(3
 + m)*(A*d*(1 + m) - B*c*(5 + m)) - b^2*c^2*(5 + m)*(A*d*(3 + m)
- B*c*(7 + m)))*(e*x)^(1 + m))/(8*c^2*d^4*e*(1 + m)) - (b^2*(a*d*
(3 + m)*(A*d*(3 - m) + B*c*(1 + m)) + b*c*(5 + m)*(A*d*(3 + m) -
B*c*(7 + m)))*(e*x)^(3 + m))/(8*c^2*d^3*e^3*(3 + m)) - ((B*c - A*
d)*(e*x)^(1 + m)*(a + b*x^2)^3)/(4*c*d*e*(c + d*x^2)^2) + ((a*d*(
A*d*(3 - m) + B*c*(1 + m)) + b*c*(A*d*(3 + m) - B*c*(7 + m)))*(e*
x)^(1 + m)*(a + b*x^2)^2)/(8*c^2*d^2*e*(c + d*x^2)) - ((b*c - a*d
)*(a^2*d^2*(1 - m)*(A*d*(3 - m) + B*c*(1 + m)) + b^2*c^2*(5 + m)*
(A*d*(3 + m) - B*c*(7 + m)) + 2*a*b*c*d*(A*d*(3 - 2*m - m^2) + B*
c*(5 + 6*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2,
 (3 + m)/2, -((d*x^2)/c)])/(8*c^3*d^4*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [A] time = 0.943397, size = 218, normalized size = 0.5

$$\frac{x(ex)^m\left(\frac{a^3A\,{}_2F_1\left(3,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{a^2x^2(aB+3Ab)\,{}_2F_1\left(3,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+bx^4\left(bx^2\left(\frac{(3aB+Ab)\,{}_2F_1\left(3,\frac{m+7}{2};\frac{m+9}{2};-\frac{dx^2}{c}\right)}{m+7}+\frac{bBx^2\,{}_2F_1\left(3,\frac{m+9}{2};m\right.}{m+9}\right.\right.\right.}{c^3}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a^3*A*Hypergeometric2F1[3, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(1 + m) + (a^2*(3*A*b + a*B)*x^2*Hypergeometric2F1[3,
 (3 + m)/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + b*x^4*((3*a*(A*b
+ a*B)*Hypergeometric2F1[3, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/
(5 + m) + b*x^2*(((A*b + 3*a*B)*Hypergeometric2F1[3, (7 + m)/2, (
9 + m)/2, -((d*x^2)/c)])/(7 + m) + (b*B*x^2*Hypergeometric2F1[3,
(9 + m)/2, (11 + m)/2, -((d*x^2)/c)])/(9 + m)))))/c^3
```

Maple [F] time = 0.076, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^3*(B*x^2+A)/(d*x^2+c)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^3*(e*x)^m/(d*x^2 + c)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bb^3x^8+\left(3\,Bab^2+Ab^3\right)x^6+3\left(Ba^2b+Aab^2\right)x^4+Aa^3+\left(Ba^3+3\,Aa^2b\right)x^2\right)(ex)^m}{d^3x^6+3\,cd^2x^4+3\,c^2dx^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b^3*x^8 + (3*B*a*b^2 + A*b^3)*x^6 + 3*(B*a^2*b + A*a*
b^2)*x^4 + A*a^3 + (B*a^3 + 3*A*a^2*b)*x^2)*(e*x)^m/(d^3*x^6 + 3*
c*d^2*x^4 + 3*c^2*d*x^2 + c^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((e*x)**m*(b*x**2+a)**3*(B*x**2+A)/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^3*(e*x)^m/(d*x^2 + c)^3, x)
```

3.38 $\int \frac{(ex)^m (a+bx^2)^2 (A+Bx^2)}{(c+dx^2)^3} \, dx$

Optimal. Leaf size=292

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(ad(1-m)+bc(m+1))(Ad(3-m)+Bc(m+1))-bc(ad(m+1)-bc(m+3))(Ad(m+1)}{8c^3d^3e(m+1)}$$
$$+\frac{b(ex)^{m+1}(ad(m+1)-bc(m+3))(Ad(m+1)-Bc(m+5))}{8c^2d^3e(m+1)}$$
$$-\frac{(ex)^{m+1}(bc-ad)\left(a(Ad(3-m)+Bc(m+1))-bx^2(Ad(m+1)-Bc(m+5))\right)}{8c^2d^2e(c+dx^2)}$$
$$-\frac{(a+bx^2)^2(ex)^{m+1}(Bc-Ad)}{4cde(c+dx^2)^2}$$

```
[Out] (b*(a*d*(1 + m) - b*c*(3 + m))*(A*d*(1 + m) - B*c*(5 + m))*(e*x)^
(1 + m))/(8*c^2*d^3*e*(1 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*(a +
b*x^2)^2)/(4*c*d*e*(c + d*x^2)^2) - ((b*c - a*d)*(e*x)^(1 + m)*(a
*(A*d*(3 - m) + B*c*(1 + m)) - b*(A*d*(1 + m) - B*c*(5 + m))*x^2)
)/(8*c^2*d^2*e*(c + d*x^2)) + ((a*d*(a*d*(1 - m) + b*c*(1 + m))*(
A*d*(3 - m) + B*c*(1 + m)) - b*c*(a*d*(1 + m) - b*c*(3 + m))*(A*d
*(1 + m) - B*c*(5 + m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 +
m)/2, (3 + m)/2, -((d*x^2)/c)])/(8*c^3*d^3*e*(1 + m))
```

Rubi [A] time = 1.1202, antiderivative size = 292, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{(ex)^{m+1} {}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(ad(1-m)+bc(m+1))(Ad(3-m)+Bc(m+1))-bc(ad(m+1)-bc(m+3))(Ad(m+1)}{8c^3d^3e(m+1)}$$
$$+\frac{b(ex)^{m+1}(ad(m+1)-bc(m+3))(Ad(m+1)-Bc(m+5))}{8c^2d^3e(m+1)}$$
$$-\frac{(ex)^{m+1}(bc-ad)\left(a(Ad(3-m)+Bc(m+1))-bx^2(Ad(m+1)-Bc(m+5))\right)}{8c^2d^2e(c+dx^2)}$$
$$-\frac{(a+bx^2)^2(ex)^{m+1}(Bc-Ad)}{4cde(c+dx^2)^2}$$

Antiderivative was successfully verified.

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



```
[Out] (b*(a*d*(1 + m) - b*c*(3 + m))*(A*d*(1 + m) - B*c*(5 + m))*(e*x)^
(1 + m))/(8*c^2*d^3*e*(1 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*(a +
b*x^2)^2)/(4*c*d*e*(c + d*x^2)^2) - ((b*c - a*d)*(e*x)^(1 + m)*(a
*(A*d*(3 - m) + B*c*(1 + m)) - b*(A*d*(1 + m) - B*c*(5 + m))*x^2)
)/(8*c^2*d^2*e*(c + d*x^2)) + ((a*d*(a*d*(1 - m) + b*c*(1 + m))*(
A*d*(3 - m) + B*c*(1 + m)) - b*c*(a*d*(1 + m) - b*c*(3 + m))*(A*d
*(1 + m) - B*c*(5 + m)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 +
m)/2, (3 + m)/2, -((d*x^2)/c)])/(8*c^3*d^3*e*(1 + m))
```

Rubi in Sympy [A] time = 114.425, size = 286, normalized size = 0.98

$$\frac{b(ex)^{m+1}(Adm+Ad-Bcm-5Bc)(adm+ad-bcm-3bc)}{8c^2d^3e(m+1)}+\frac{(ex)^{m+1}(a+bx^2)^2(Ad-Bc)}{4cde(c+dx^2)^2}$$
$$+\frac{(ex)^{m+1}(ad-bc)\left(a(-Adm+3Ad+Bcm+Bc)+bx^2(4Ad-(m+5)(Ad-Bc))\right)}{8c^2d^2e(c+dx^2)}$$
$$+\frac{(ex)^{m+1}(ad(2ad-(m+1)(ad-bc))(-Adm+3Ad+Bcm+Bc)-bc(Adm+Ad-Bcm-5Bc)(adm+ad-bcm-3bc))_2}{8c^3d^3e(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*(e*x)**(m + 1)*(A*d*m + A*d - B*c*m - 5*B*c)*(a*d*m + a*d - b*c
*m - 3*b*c)/(8*c**2*d**3*e*(m + 1)) + (e*x)**(m + 1)*(a + b*x**2)
**2*(A*d - B*c)/(4*c*d*e*(c + d*x**2)**2) + (e*x)**(m + 1)*(a*d -
 b*c)*(a*(-A*d*m + 3*A*d + B*c*m + B*c) + b*x**2*(4*A*d - (m + 5)
*(A*d - B*c)))/(8*c**2*d**2*e*(c + d*x**2)) + (e*x)**(m + 1)*(a*d
*(2*a*d - (m + 1)*(a*d - b*c))*(-A*d*m + 3*A*d + B*c*m + B*c) - b
*c*(A*d*m + A*d - B*c*m - 5*B*c)*(a*d*m + a*d - b*c*m - 3*b*c))*h
yper((1, m/2 + 1/2), (m/2 + 3/2,), -d*x**2/c)/(8*c**3*d**3*e*(m +
 1))
```

Mathematica [A] time = 0.480027, size = 170, normalized size = 0.58

$$\frac{x(ex)^m \left(\frac{a^2 A\, {}_2F_1\left(3,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{ax^2(aB+2Ab)\, {}_2F_1\left(3,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+bx^4\left(\frac{(2aB+Ab)\, {}_2F_1\left(3,\frac{m+5}{2};\frac{m+7}{2};-\frac{dx^2}{c}\right)}{m+5}+\frac{bBx^2\, {}_2F_1\left(3,\frac{m+7}{2};\frac{m+9}{2};-\frac{dx^2}{c}\right)}{m+7}\right)\right)}{c^3}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a^2*A*Hypergeometric2F1[3, (1 + m)/2, (3 + m)/2, -((
d*x^2)/c)])/(1 + m) + (a*(2*A*b + a*B)*x^2*Hypergeometric2F1[3, (
3 + m)/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + b*x^4*(((A*b + 2*a*
B)*Hypergeometric2F1[3, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/(5 +
 m) + (b*B*x^2*Hypergeometric2F1[3, (7 + m)/2, (9 + m)/2, -((d*x^
2)/c)])/(7 + m))))/c^3
```

Maple [F] time = 0.1, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^2*(B*x^2+A)/(d*x^2+c)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^2*(e*x)^m/(d*x^2 + c)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bb^2x^6+\left(2\,Bab+Ab^2\right)x^4+Aa^2+\left(Ba^2+2\,Aab\right)x^2\right)(ex)^m}{d^3x^6+3\,cd^2x^4+3\,c^2dx^2+c^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b^2*x^6 + (2*B*a*b + A*b^2)*x^4 + A*a^2 + (B*a^2 + 2*
A*a*b)*x^2)*(e*x)^m/(d^3*x^6 + 3*c*d^2*x^4 + 3*c^2*d*x^2 + c^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((e*x)**m*(b*x**2+a)**2*(B*x**2+A)/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^2*(e*x)^m/(d*x^2 + c)^3, x)
```

3.39 $\int \frac{(ex)^m(a+bx^2)(A+Bx^2)}{(c+dx^2)^3}\,dx$

Optimal. Leaf size=208

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(1-m)(Ad(3-m)+Bc(m+1))+bc(m+1)(Ad(1-m)+Bc(m+3)))}{8c^3d^2e(m+1)}+\frac{(ex)^{m+1}(ad(Ad(3-m)-B(c-cm))+bc(Ad(m+1)-Bc(m+3)))}{8c^2d^2e\,(c+dx^2)}-\frac{(A+Bx^2)\,(ex)^{m+1}(bc-ad)}{4cde\,(c+dx^2)^2}$$

```
[Out] -((b*c - a*d)*(e*x)^(1 + m)*(A + B*x^2))/(4*c*d*e*(c + d*x^2)^2)
+ ((b*c*(A*d*(1 + m) - B*c*(3 + m)) + a*d*(A*d*(3 - m) - B*(c - c
*m)))*(e*x)^(1 + m))/(8*c^2*d^2*e*(c + d*x^2)) + ((a*d*(1 - m)*(A
*d*(3 - m) + B*c*(1 + m)) + b*c*(1 + m)*(A*d*(1 - m) + B*c*(3 + m
)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d
*x^2)/c)])/(8*c^3*d^2*e*(1 + m))
```

Rubi [A] time = 0.804172, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)(ad(1-m)(Ad(3-m)+Bc(m+1))+bc(m+1)(Ad(1-m)+Bc(m+3)))}{8c^3d^2e(m+1)}+\frac{(ex)^{m+1}(ad(Ad(3-m)-B(c-cm))+bc(Ad(m+1)-Bc(m+3)))}{8c^2d^2e\,(c+dx^2)}-\frac{(A+Bx^2)\,(ex)^{m+1}(bc-ad)}{4cde\,(c+dx^2)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*c - a*d)*(e*x)^(1 + m)*(A + B*x^2))/(4*c*d*e*(c + d*x^2)^2)
+ ((b*c*(A*d*(1 + m) - B*c*(3 + m)) + a*d*(A*d*(3 - m) - B*(c - c
*m)))*(e*x)^(1 + m))/(8*c^2*d^2*e*(c + d*x^2)) + ((a*d*(1 - m)*(A
*d*(3 - m) + B*c*(1 + m)) + b*c*(1 + m)*(A*d*(1 - m) + B*c*(3 + m
)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d
*x^2)/c)])/(8*c^3*d^2*e*(1 + m))
```

Rubi in Sympy [A] time = 48.1512, size = 194, normalized size = 0.93

$$\frac{(ex)^{m+1}\left(a+bx^2\right)(Ad-Bc)}{4cde\left(c+dx^2\right)^2}+\frac{(ex)^{m+1}\left(ad\left(-Adm+3Ad+Bcm+Bc\right)-bc\left(-Adm+Ad+Bcm+3Bc\right)\right)}{8c^2d^2e\left(c+dx^2\right)}+\frac{(ex)^{m+1}\left(ad\left(-m+1\right)\left(-Adm+3Ad+Bcm+Bc\right)+bc\left(m+1\right)\left(-Adm+Ad+Bcm+3Bc\right)\right){}_2F_1\left(\begin{matrix}1,\frac{m}{2}+\frac{1}{2}\\\frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{dx^2}{c}\right)}{8c^3d^2e\left(m+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (e*x)**(m + 1)*(a + b*x**2)*(A*d - B*c)/(4*c*d*e*(c + d*x**2)**2)
 + (e*x)**(m + 1)*(a*d*(-A*d*m + 3*A*d + B*c*m + B*c) - b*c*(-A*d
*m + A*d + B*c*m + 3*B*c))/(8*c**2*d**2*e*(c + d*x**2)) + (e*x)**
(m + 1)*(a*d*(-m + 1)*(-A*d*m + 3*A*d + B*c*m + B*c) + b*c*(m + 1
)*(-A*d*m + A*d + B*c*m + 3*B*c))*hyper((1, m/2 + 1/2), (m/2 + 3/
2,), -d*x**2/c)/(8*c**3*d**2*e*(m + 1))
```

Mathematica [A] time = 0.229325, size = 121, normalized size = 0.58

$$\frac{x(ex)^m\left(\frac{x^2(aB+Ab)\,{}_2F_1\left(3,\frac{m+3}{2};\frac{m+5}{2};-\frac{dx^2}{c}\right)}{m+3}+\frac{aA\,{}_2F_1\left(3,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{m+1}+\frac{bBx^4\,{}_2F_1\left(3,\frac{m+5}{2};\frac{m+7}{2};-\frac{dx^2}{c}\right)}{m+5}\right)}{c^3}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((a*A*Hypergeometric2F1[3, (1 + m)/2, (3 + m)/2, -((d*
x^2)/c)])/(1 + m) + ((A*b + a*B)*x^2*Hypergeometric2F1[3, (3 + m)
/2, (5 + m)/2, -((d*x^2)/c)])/(3 + m) + (b*B*x^4*Hypergeometric2F
1[3, (5 + m)/2, (7 + m)/2, -((d*x^2)/c)])/(5 + m)))/c^3
```

Maple [F] time = 0.086, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)*(B*x^2+A)/(d*x^2+c)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)*(e*x)^m/(d*x^2 + c)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bbx^4+(Ba+Ab)x^2+Aa\right)(ex)^m}{d^3x^6+3\,cd^2x^4+3\,c^2dx^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*b*x^4 + (B*a + A*b)*x^2 + A*a)*(e*x)^m/(d^3*x^6 + 3*c
*d^2*x^4 + 3*c^2*d*x^2 + c^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((e*x)**m*(b*x**2+a)*(B*x**2+A)/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(bx^2 + a)(ex)^m}{(dx^2 + c)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)*(e*x)^m/(d*x^2 + c)^3, x)
```

3.40 $\int \frac{(ex)^m(A+Bx^2)}{(c+dx^2)^3}\,dx$

Optimal. Leaf size=103

$$\frac{(ex)^{m+1}(Ad(3-m)+Bc(m+1))\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{4c^3de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)}{4cde\,(c+dx^2)^2}$$

```
[Out] -((B*c - A*d)*(e*x)^(1 + m))/(4*c*d*e*(c + d*x^2)^2) + ((A*d*(3 -
 m) + B*c*(1 + m))*(e*x)^(1 + m)*Hypergeometric2F1[2, (1 + m)/2,
(3 + m)/2, -((d*x^2)/c)])/(4*c^3*d*e*(1 + m))
```

Rubi [A] time = 0.152584, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091

$$\frac{(ex)^{m+1}(Ad(3-m)+Bc(m+1))\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)}{4c^3de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)}{4cde\,(c+dx^2)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -((B*c - A*d)*(e*x)^(1 + m))/(4*c*d*e*(c + d*x^2)^2) + ((A*d*(3 -
 m) + B*c*(1 + m))*(e*x)^(1 + m)*Hypergeometric2F1[2, (1 + m)/2,
(3 + m)/2, -((d*x^2)/c)])/(4*c^3*d*e*(1 + m))
```

Rubi in Sympy [A] time = 16.6257, size = 80, normalized size = 0.78

$$\frac{(ex)^{m+1}(Ad-Bc)}{4cde\,(c+dx^2)^2}+\frac{(ex)^{m+1}(Ad(-m+3)+Bc(m+1))\,{}_2F_1\left(\begin{matrix}2,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{dx^2}{c}\right)}{4c^3de\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (e*x)**(m + 1)*(A*d - B*c)/(4*c*d*e*(c + d*x**2)**2) + (e*x)**(m
+ 1)*(A*d*(-m + 3) + B*c*(m + 1))*hyper((2, m/2 + 1/2), (m/2 + 3/
2,), -d*x**2/c)/(4*c**3*d*e*(m + 1))
```

Mathematica [A] time = 0.0907193, size = 81, normalized size = 0.79

$$\frac{x(ex)^m\left((Ad-Bc)\,{}_2F_1\left(3,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)+Bc\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\right)}{c^3d(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*(B*c*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((d*x
^2)/c)] + (-(B*c) + A*d)*Hypergeometric2F1[3, (1 + m)/2, (3 + m)/
2, -((d*x^2)/c)]))/(c^3*d*(1 + m))
```

Maple [F] time = 0.079, size = 0, normalized size = 0.

$$\int \frac{(ex)^m \left(Bx^2 + A\right)}{\left(dx^2 + c\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(d*x^2+c)^3,x)
```

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

$$\int \frac{\left(Bx^2 + A\right)(ex)^m}{\left(dx^2 + c\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/(d*x^2 + c)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bx^2 + A\right)(ex)^m}{d^3x^6 + 3\,cd^2x^4 + 3\,c^2dx^2 + c^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(d^3*x^6 + 3*c*d^2*x^4 + 3*c^2*d*x^2
 + c^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((e*x)**m*(B*x**2+A)/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Bx^2 + A\right)(ex)^m}{\left(dx^2 + c\right)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/(d*x^2 + c)^3, x)
```

3.41 $\int \frac{(ex)^m\left(A+Bx^2\right)}{(a+bx^2)(c+dx^2)^3}\,dx$

Optimal. Leaf size=333

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(-a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(m^2-6m+5\right)+Bc\left(-m^2+2m+3\right)\right)\right.}{8c^3e(m+1)(bc-ad)^3}$$
$$+\frac{b^2(ex)^{m+1}(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ae(m+1)(bc-ad)^3}$$
$$+\frac{(ex)^{m+1}(ad(Ad(3-m)+Bc(m+1))+bc(Bc(3-m)-Ad(7-m)))}{8c^2e\left(c+dx^2\right)(bc-ad)^2}+\frac{(ex)^{m+1}(Bc-Ad)}{4ce\left(c+dx^2\right)^2(bc-ad)}$$

```
[Out] ((B*c - A*d)*(e*x)^(1 + m))/(4*c*(b*c - a*d)*e*(c + d*x^2)^2) + (
(b*c*(B*c*(3 - m) - A*d*(7 - m)) + a*d*(A*d*(3 - m) + B*c*(1 + m)
))*(e*x)^(1 + m))/(8*c^2*(b*c - a*d)^2*e*(c + d*x^2)) + (b^2*(A*b
 - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2,
-((b*x^2)/a)])/(a*(b*c - a*d)^3*e*(1 + m)) + ((b^2*c^2*(B*c*(1 -
m) - A*d*(5 - m))*(3 - m) - a^2*d^2*(1 - m)*(A*d*(3 - m) + B*c*(1
 + m)) + 2*a*b*c*d*(B*c*(3 + 2*m - m^2) + A*d*(5 - 6*m + m^2)))*(
e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)
/c)])/(8*c^3*(b*c - a*d)^3*e*(1 + m))
```

Rubi [A] time = 2.08568, antiderivative size = 333, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(-a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(m^2-6m+5\right)+Bc\left(-m^2+2m+3\right)\right)\right.}{8c^3e(m+1)(bc-ad)^3}$$
$$+\frac{b^2(ex)^{m+1}(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)}{ae(m+1)(bc-ad)^3}$$
$$+\frac{(ex)^{m+1}(ad(Ad(3-m)+Bc(m+1))+bc(Bc(3-m)-Ad(7-m)))}{8c^2e\left(c+dx^2\right)(bc-ad)^2}+\frac{(ex)^{m+1}(Bc-Ad)}{4ce\left(c+dx^2\right)^2(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] ((B*c - A*d)*(e*x)^(1 + m))/(4*c*(b*c - a*d)*e*(c + d*x^2)^2) + (
(b*c*(B*c*(3 - m) - A*d*(7 - m)) + a*d*(A*d*(3 - m) + B*c*(1 + m)
))*(e*x)^(1 + m))/(8*c^2*(b*c - a*d)^2*e*(c + d*x^2)) + (b^2*(A*b
 - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2,
-((b*x^2)/a)])/(a*(b*c - a*d)^3*e*(1 + m)) + ((b^2*c^2*(B*c*(1 -
m) - A*d*(5 - m))*(3 - m) - a^2*d^2*(1 - m)*(A*d*(3 - m) + B*c*(1
 + m)) + 2*a*b*c*d*(B*c*(3 + 2*m - m^2) + A*d*(5 - 6*m + m^2)))*(
e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)
/c)])/(8*c^3*(b*c - a*d)^3*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [C] time = 1.00714, size = 377, normalized size = 1.13

$$\frac{acx(ex)^m\left(\frac{A(m+3)^2F_1\left(\frac{m+1}{2};3,1;\frac{m+3}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};3,1;\frac{m+3}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)-2x^2\left(bcF_1\left(\frac{m+3}{2};3,2;\frac{m+5}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)+3adF_1\left(\frac{m+3}{2};4,1;\frac{m+5}{2};-\frac{dx^2}{c},-\frac{bx^2}{a}\right)\right)\right)}+\frac{\cdots}{ac(m+5)F_1\left(\frac{m}{\cdots}\right.\cdots}\right.}{(m+3)\left(a+bx^2\right)\left(c+dx^2\right)^3}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 3, 1, (3 + m)/2,
 -((d*x^2)/c), -((b*x^2)/a)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 3, 1, (3 + m)/2, -((d*x^2)/c), -((b*x^2)/a)] - 2*x^2*(b*c*
AppellF1[(3 + m)/2, 3, 2, (5 + m)/2, -((d*x^2)/c), -((b*x^2)/a)]
+ 3*a*d*AppellF1[(3 + m)/2, 4, 1, (5 + m)/2, -((d*x^2)/c), -((b*x
^2)/a)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 3, 1, (5 + m)/2,
-((d*x^2)/c), -((b*x^2)/a)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 3,
1, (5 + m)/2, -((d*x^2)/c), -((b*x^2)/a)] - 2*x^2*(b*c*AppellF1[(
5 + m)/2, 3, 2, (7 + m)/2, -((d*x^2)/c), -((b*x^2)/a)] + 3*a*d*Ap
pellF1[(5 + m)/2, 4, 1, (7 + m)/2, -((d*x^2)/c), -((b*x^2)/a)])))
)/((3 + m)*(a + b*x^2)*(c + d*x^2)^3)
```

Maple [F] time = 0.089, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)/(d*x^2+c)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)*(d*x^2 + c)^3), x)
```

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

$$\mathrm{integral}\left(\frac{\left(Bx^2+A\right)(ex)^m}{bd^3x^8+\left(3\,bcd^2+ad^3\right)x^6+3\left(bc^2d+acd^2\right)x^4+ac^3+\left(bc^3+3\,ac^2d\right)x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b*d^3*x^8 + (3*b*c*d^2 + a*d^3)*x^6
 + 3*(b*c^2*d + a*c*d^2)*x^4 + a*c^3 + (b*c^3 + 3*a*c^2*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)*(d*x^2 + c)^3), x)
```

3.42 $\int \frac{(ex)^m (A+Bx^2)}{(a+bx^2)^2 (c+dx^2)^3} \, dx$

Optimal. Leaf size=452

$$\frac{d(ex)^{m+1}\left(A\left(-a^2d^2(3-m)+abcd(11-m)+4b^2c^2\right)-aBc(ad(m+1)+bc(11-m))\right)}{8ac^2e\left(c+dx^2\right)(bc-ad)^3} - \frac{d(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(-a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(m^2-8m+7\right)+Bc\left(-m^2+4m+5\right.\right.\right.}{8c^3e(m+1)(bc-ad)^4} + \frac{b^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(bc(1-m)-ad(7-m))+aB(ad(5-m)+bc(m+1)))}{2a^2e(m+1)(bc-ad)^4} + \frac{d(ex)^{m+1}(aAd-3aBc+2Abc)}{4ace\left(c+dx^2\right)^2(bc-ad)^2} + \frac{(ex)^{m+1}(Ab-aB)}{2ae\left(a+bx^2\right)\left(c+dx^2\right)^2(bc-ad)}$$

```
[Out] (d*(2*A*b*c - 3*a*B*c + a*A*d)*(e*x)^(1 + m))/(4*a*c*(b*c - a*d)^
2*e*(c + d*x^2)^2) + ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)
*e*(a + b*x^2)*(c + d*x^2)^2) + (d*(A*(4*b^2*c^2 - a^2*d^2*(3 - m
) + a*b*c*d*(11 - m)) - a*B*c*(b*c*(11 - m) + a*d*(1 + m)))*(e*x)
^(1 + m))/(8*a*c^2*(b*c - a*d)^3*e*(c + d*x^2)) + (b^2*(A*b*(b*c*
(1 - m) - a*d*(7 - m)) + a*B*(a*d*(5 - m) + b*c*(1 + m)))*(e*x)^(
1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/
(2*a^2*(b*c - a*d)^4*e*(1 + m)) - (d*(b^2*c^2*(B*c*(3 - m) - A*d*
(7 - m))*(5 - m) - a^2*d^2*(1 - m)*(A*d*(3 - m) + B*c*(1 + m)) +
2*a*b*c*d*(B*c*(5 + 4*m - m^2) + A*d*(7 - 8*m + m^2)))*(e*x)^(1 +
 m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(8*
c^3*(b*c - a*d)^4*e*(1 + m))
```

Rubi [A] time = 3.59139, antiderivative size = 452, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{d(ex)^{m+1}\left(A\left(-a^2d^2(3-m)+abcd(11-m)+4b^2c^2\right)-aBc(ad(m+1)+bc(11-m))\right)}{8ac^2e\left(c+dx^2\right)(bc-ad)^3} - \frac{d(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(-a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(m^2-8m+7\right)+Bc\left(-m^2+4m+5\right.\right.\right.}{8c^3e(m+1)(bc-ad)^4} + \frac{b^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(bc(1-m)-ad(7-m))+aB(ad(5-m)+bc(m+1)))}{2a^2e(m+1)(bc-ad)^4} + \frac{d(ex)^{m+1}(aAd-3aBc+2Abc)}{4ace\left(c+dx^2\right)^2(bc-ad)^2} + \frac{(ex)^{m+1}(Ab-aB)}{2ae\left(a+bx^2\right)\left(c+dx^2\right)^2(bc-ad)}$$

Antiderivative was successfully verified.

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


```
[Out] (d*(2*A*b*c - 3*a*B*c + a*A*d)*(e*x)^(1 + m))/(4*a*c*(b*c - a*d)^
2*e*(c + d*x^2)^2) + ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)
*e*(a + b*x^2)*(c + d*x^2)^2) + (d*(A*(4*b^2*c^2 - a^2*d^2*(3 - m
) + a*b*c*d*(11 - m)) - a*B*c*(b*c*(11 - m) + a*d*(1 + m)))*(e*x)
^(1 + m))/(8*a*c^2*(b*c - a*d)^3*e*(c + d*x^2)) + (b^2*(A*b*(b*c*
(1 - m) - a*d*(7 - m)) + a*B*(a*d*(5 - m) + b*c*(1 + m)))*(e*x)^(
1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((b*x^2)/a)])/
(2*a^2*(b*c - a*d)^4*e*(1 + m)) - (d*(b^2*c^2*(B*c*(3 - m) - A*d*
(7 - m))*(5 - m) - a^2*d^2*(1 - m)*(A*d*(3 - m) + B*c*(1 + m)) +
2*a*b*c*d*(B*c*(5 + 4*m - m^2) + A*d*(7 - 8*m + m^2)))*(e*x)^(1 +
 m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((d*x^2)/c)])/(8*
c^3*(b*c - a*d)^4*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [C] time = 1.13317, size = 379, normalized size = 0.84

$$\frac{acx(ex)^m\left(\frac{A(m+3)^2F_1\left(\frac{m+1}{2};2,3;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};2,3;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-2x^2\left(3adF_1\left(\frac{m+3}{2};2,4;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)+2bcF_1\left(\frac{m+3}{2};3,3;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)\right)}+\frac{}{ac(m+5)F_1(}\right.}{(m+3)(a+bx^2)^2(c+dx^2)^3}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 2, 3, (3 + m)/2,
 -((b*x^2)/a), -((d*x^2)/c)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 2, 3, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(3*a*
d*AppellF1[(3 + m)/2, 2, 4, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)
] + 2*b*c*AppellF1[(3 + m)/2, 3, 3, (5 + m)/2, -((b*x^2)/a), -((d
*x^2)/c)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 2, 3, (5 + m)/2
, -((b*x^2)/a), -((d*x^2)/c)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 2
, 3, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 2*x^2*(3*a*d*Appell
F1[(5 + m)/2, 2, 4, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] + 2*b*
c*AppellF1[(5 + m)/2, 3, 3, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)
]))))/((3 + m)*(a + b*x^2)^2*(c + d*x^2)^3)
```

Maple [F] time = 0.114, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)^2/(d*x^2+c)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^2*(d*x^2 + c)^3), x)
```

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

$$\text{integral}\left(\frac{\left(Bx^2+A\right)(ex)^m}{b^2d^3x^{10}+(3\,b^2cd^2+2\,abd^3)x^8+(3\,b^2c^2d+6\,abcd^2+a^2d^3)x^6+a^2c^3+(b^2c^3+6\,abc^2d+3\,a^2cd^2)x^4+(2\,abc^3+3\,a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b^2*d^3*x^10 + (3*b^2*c*d^2 + 2*a*b
*d^3)*x^8 + (3*b^2*c^2*d + 6*a*b*c*d^2 + a^2*d^3)*x^6 + a^2*c^3 +
 (b^2*c^3 + 6*a*b*c^2*d + 3*a^2*c*d^2)*x^4 + (2*a*b*c^3 + 3*a^2*c
^2*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)**2/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^2*(d*x^2 + c)^3), x)
```

3.43 $\int \frac{(ex)^m(A+Bx^2)}{(a+bx^2)^3(c+dx^2)^3}\,dx$

Optimal. Leaf size=665

$$\frac{d(ex)^{m+1}\left(A(ad+bc)\left(a^2d^2(3-m)-2abcd(9-m)+b^2c^2(3-m)\right)+aBc\left(a^2d^2(m+1)+2abcd(11-m)+b^2c^2(m+1)\right)\right)}{8a^2c^2e\left(c+dx^2\right)(bc-ad)^4}$$
$$-\frac{d(ex)^{m+1}\left(A\left(2a^2d^2+abcd(13-m)-b^2c^2(3-m)\right)-aBc(ad(11-m)+bc(m+1))\right)}{8a^2ce\left(c+dx^2\right)^2(bc-ad)^3}$$
$$+\frac{d^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(-a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(m^2-10m+9\right)+Bc\left(-m^2+6m+\right.\right.\right.}{8c^3e(m+1)(bc-ad)^5}$$
$$+\frac{(ex)^{m+1}(Ab(bc(3-m)-ad(11-m))+aB(ad(7-m)+bc(m+1)))}{8a^2e\left(a+bx^2\right)\left(c+dx^2\right)^2(bc-ad)^2}$$
$$+\frac{b^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(Ab\left(a^2d^2\left(m^2-16m+63\right)-2abcd\left(m^2-10m+9\right)+b^2c^2\left(m^2-4m+3\right)\right)+aB\left(-a^2\right.\right.}{8a^3e(m+1)(bc-ad)^5}$$
$$+\frac{(ex)^{m+1}(Ab-aB)}{4ae\left(a+bx^2\right)^2\left(c+dx^2\right)^2(bc-ad)}$$

```
[Out] -(d*(A*(2*a^2*d^2 - b^2*c^2*(3 - m) + a*b*c*d*(13 - m)) - a*B*c*(
a*d*(11 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*c*(b*c - a*d)^
3*e*(c + d*x^2)^2) + ((A*b - a*B)*(e*x)^(1 + m))/(4*a*(b*c - a*d)
*e*(a + b*x^2)^2*(c + d*x^2)^2) + ((A*b*(b*c*(3 - m) - a*d*(11 -
m)) + a*B*(a*d*(7 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*(b*c
 - a*d)^2*e*(a + b*x^2)*(c + d*x^2)^2) + (d*(A*(b*c + a*d)*(b^2*c
^2*(3 - m) + a^2*d^2*(3 - m) - 2*a*b*c*d*(9 - m)) + a*B*c*(2*a*b*
c*d*(11 - m) + b^2*c^2*(1 + m) + a^2*d^2*(1 + m)))*(e*x)^(1 + m))
/(8*a^2*c^2*(b*c - a*d)^4*e*(c + d*x^2)) + (b^2*(a*B*(b^2*c^2*(1
- m^2) - 2*a*b*c*d*(7 + 6*m - m^2) - a^2*d^2*(35 - 12*m + m^2)) +
 A*b*(a^2*d^2*(63 - 16*m + m^2) - 2*a*b*c*d*(9 - 10*m + m^2) + b^
2*c^2*(3 - 4*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m
)/2, (3 + m)/2, -((b*x^2)/a)])/(8*a^3*(b*c - a*d)^5*e*(1 + m)) +
(d^2*(b^2*c^2*(B*c*(5 - m) - A*d*(9 - m))*(7 - m) - a^2*d^2*(1 -
m)*(A*d*(3 - m) + B*c*(1 + m)) + 2*a*b*c*d*(B*c*(7 + 6*m - m^2) +
 A*d*(9 - 10*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m
)/2, (3 + m)/2, -((d*x^2)/c)])/(8*c^3*(b*c - a*d)^5*e*(1 + m))
```

Rubi [A] time = 6.36791, antiderivative size = 665, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.097$

$$\frac{d(ex)^{m+1}\left(A(ad+bc)\left(a^2d^2(3-m)-2abcd(9-m)+b^2c^2(3-m)\right)+aBc\left(a^2d^2(m+1)+2abcd(11-m)+b^2c^2(m+1)\right)\right)}{8a^2c^2e\left(c+dx^2\right)(bc-ad)^4}$$
$$-\frac{d(ex)^{m+1}\left(A\left(2a^2d^2+abcd(13-m)-b^2c^2(3-m)\right)-aBc(ad(11-m)+bc(m+1))\right)}{8a^2ce\left(c+dx^2\right)^2(bc-ad)^3}$$
$$+\frac{d^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{dx^2}{c}\right)\left(-a^2d^2(1-m)(Ad(3-m)+Bc(m+1))+2abcd\left(Ad\left(m^2-10m+9\right)+Bc\left(-m^2+6m+\right.\right.\right.}{8c^3e(m+1)(bc-ad)^5}$$
$$+\frac{(ex)^{m+1}(Ab(bc(3-m)-ad(11-m))+aB(ad(7-m)+bc(m+1)))}{8a^2e\left(a+bx^2\right)\left(c+dx^2\right)^2(bc-ad)^2}$$
$$+\frac{b^2(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(Ab\left(a^2d^2\left(m^2-16m+63\right)-2abcd\left(m^2-10m+9\right)+b^2c^2\left(m^2-4m+3\right)\right)+aB\left(-a^2\right.\right.}{8a^3e(m+1)(bc-ad)^5}$$
$$+\frac{(ex)^{m+1}(Ab-aB)}{4ae\left(a+bx^2\right)^2\left(c+dx^2\right)^2(bc-ad)}$$

Antiderivative was successfully verified.

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


```
[Out] -(d*(A*(2*a^2*d^2 - b^2*c^2*(3 - m) + a*b*c*d*(13 - m)) - a*B*c*(
a*d*(11 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*c*(b*c - a*d)^
3*e*(c + d*x^2)^2) + ((A*b - a*B)*(e*x)^(1 + m))/(4*a*(b*c - a*d)
```

```
*e*(a + b*x^2)^2*(c + d*x^2)^2) + ((A*b*(b*c*(3 - m) - a*d*(11 -
m)) + a*B*(a*d*(7 - m) + b*c*(1 + m)))*(e*x)^(1 + m))/(8*a^2*(b*c
 - a*d)^2*e*(a + b*x^2)*(c + d*x^2)^2) + (d*(A*(b*c + a*d)*(b^2*c
^2*(3 - m) + a^2*d^2*(3 - m) - 2*a*b*c*d*(9 - m)) + a*B*c*(2*a*b*
c*d*(11 - m) + b^2*c^2*(1 + m) + a^2*d^2*(1 + m)))*(e*x)^(1 + m))
/(8*a^2*c^2*(b*c - a*d)^4*e*(c + d*x^2)) + (b^2*(a*B*(b^2*c^2*(1
- m^2) - 2*a*b*c*d*(7 + 6*m - m^2) - a^2*d^2*(35 - 12*m + m^2)) +
 A*b*(a^2*d^2*(63 - 16*m + m^2) - 2*a*b*c*d*(9 - 10*m + m^2) + b^
2*c^2*(3 - 4*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m
)/2, (3 + m)/2, -((b*x^2)/a)])/(8*a^3*(b*c - a*d)^5*e*(1 + m)) +
(d^2*(b^2*c^2*(B*c*(5 - m) - A*d*(9 - m))*(7 - m) - a^2*d^2*(1 -
m)*(A*d*(3 - m) + B*c*(1 + m)) + 2*a*b*c*d*(B*c*(7 + 6*m - m^2) +
 A*d*(9 - 10*m + m^2)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m
)/2, (3 + m)/2, -((d*x^2)/c)])/(8*c^3*(b*c - a*d)^5*e*(1 + m))
```

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

```
[Out] Timed out
```

Mathematica [C] time = 1.94516, size = 375, normalized size = 0.56

$$\frac{acx(ex)^m\left(\frac{A(m+3)^2F_1\left(\frac{m+1}{2};3,3;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{(m+1)\left(ac(m+3)F_1\left(\frac{m+1}{2};3,3;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-6x^2\left(adF_1\left(\frac{m+3}{2};3,4;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)+bcF_1\left(\frac{m+3}{2};4,3;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)\right)}+\frac{\cdots}{ac(m+5)F_1\left(\frac{m+\cdots}{2}\cdots\right.}\cdots\right.}{(m+3)\left(a+bx^2\right)^3\left(c+dx^2\right)^3}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*x*(e*x)^m*((A*(3 + m)^2*AppellF1[(1 + m)/2, 3, 3, (3 + m)/2,
 -((b*x^2)/a), -((d*x^2)/c)])/((1 + m)*(a*c*(3 + m)*AppellF1[(1 +
 m)/2, 3, 3, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 6*x^2*(a*d*
AppellF1[(3 + m)/2, 3, 4, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]
+ b*c*AppellF1[(3 + m)/2, 4, 3, (5 + m)/2, -((b*x^2)/a), -((d*x^2
)/c)]))) + (B*(5 + m)*x^2*AppellF1[(3 + m)/2, 3, 3, (5 + m)/2, -(
(b*x^2)/a), -((d*x^2)/c)])/(a*c*(5 + m)*AppellF1[(3 + m)/2, 3, 3,
 (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - 6*x^2*(a*d*AppellF1[(5
+ m)/2, 3, 4, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] + b*c*Appell
F1[(5 + m)/2, 4, 3, (7 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]))))/((
3 + m)*(a + b*x^2)^3*(c + d*x^2)^3)
```

Maple [F] time = 0.11, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(B*x^2+A)/(b*x^2+a)^3/(d*x^2+c)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^3*(d*x^2 + c)^3), x)
```

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

$$\text{integral}\left(\frac{(Bx^2 + A)(ex)^m}{b^3d^3x^{12} + 3(b^3cd^2 + ab^2d^3)x^{10} + 3(b^3c^2d + 3ab^2cd^2 + a^2bd^3)x^8 + (b^3c^3 + 9ab^2c^2d + 9a^2bcd^2 + a^3d^3)x^6 + a^3c^3 + 3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(e*x)^m/(b^3*d^3*x^12 + 3*(b^3*c*d^2 + a*b^2
*d^3)*x^10 + 3*(b^3*c^2*d + 3*a*b^2*c*d^2 + a^2*b*d^3)*x^8 + (b^3
*c^3 + 9*a*b^2*c^2*d + 9*a^2*b*c*d^2 + a^3*d^3)*x^6 + a^3*c^3 + 3
*(a*b^2*c^3 + 3*a^2*b*c^2*d + a^3*c*d^2)*x^4 + 3*(a^2*b*c^3 + a^3
*c^2*d)*x^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((e*x)**m*(B*x**2+A)/(b*x**2+a)**3/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(e*x)^m/((b*x^2 + a)^3*(d*x^2 + c)^3), x)
```

3.44 $\int (ex)^m \left(a+bx^2\right)^p \left(A+Bx^2\right) \left(c+dx^2\right)^3 \, dx$

Optimal. Leaf size=1059

result too large to display

```
[Out] -(((a^3*B*d^3*(105 + 71*m + 15*m^2 + m^3) - a^2*b*d^2*(5 + m)*(A*
d*(3 + m)*(9 + m + 2*p) + 2*B*c*(30 + 13*m + m^2 + 2*p + 2*m*p))
+ a*b^2*c*d*(2*A*d*(216 + m^3 + 84*p + 8*p^2 + 4*m^2*(5 + p) + m*
(123 + 44*p + 4*p^2)) + B*c*(267 + m^3 + 40*p + 4*p^2 + m^2*(21 +
 4*p) + m*(143 + 44*p + 4*p^2))) - b^3*c^2*(48*B*c + A*d*(513 + m
^3 + 366*p + 92*p^2 + 8*p^3 + m^2*(23 + 6*p) + m*(183 + 92*p + 12
*p^2))))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(b^4*e*(3 + m + 2*p)*
(5 + m + 2*p)*(7 + m + 2*p)*(9 + m + 2*p))) + ((a^2*B*d^2*(35 + 1
2*m + m^2) + b^2*c*(24*B*c + A*d*(99 + m^2 + 40*p + 4*p^2 + 4*m*(
5 + p))) - a*b*d*(A*d*(5 + m)*(9 + m + 2*p) + B*c*(65 + m^2 + 2*p
 + 2*m*(9 + p))))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p)*(c + d*x^2))/
(b^3*e*(5 + m + 2*p)*(7 + m + 2*p)*(9 + m + 2*p)) - ((a*B*d*(7 +
m) - b*(6*B*c + A*d*(9 + m + 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^(1
+ p)*(c + d*x^2)^2)/(b^2*e*(7 + m + 2*p)*(9 + m + 2*p)) + (B*(e*x
)^(1 + m)*(a + b*x^2)^(1 + p)*(c + d*x^2)^3)/(b*e*(9 + m + 2*p))
+ ((a*(1 + m)*(a^3*B*d^3*(105 + 71*m + 15*m^2 + m^3) - a^2*b*d^2*
(5 + m)*(A*d*(3 + m)*(9 + m + 2*p) + 2*B*c*(30 + 13*m + m^2 + 2*p
 + 2*m*p)) + a*b^2*c*d*(2*A*d*(216 + m^3 + 84*p + 8*p^2 + 4*m^2*(
5 + p) + m*(123 + 44*p + 4*p^2)) + B*c*(267 + m^3 + 40*p + 4*p^2
+ m^2*(21 + 4*p) + m*(143 + 44*p + 4*p^2))) - b^3*c^2*(48*B*c + A
*d*(513 + m^3 + 366*p + 92*p^2 + 8*p^3 + m^2*(23 + 6*p) + m*(183
+ 92*p + 12*p^2)))) - b*c*(3 + m + 2*p)*(2*b*c*(2 + p)*(2*b*c*(3
+ p)*(a*B*(1 + m) - A*b*(9 + m + 2*p)) + (b*c - a*d)*(1 + m)*(a*B
*(7 + m) - A*b*(9 + m + 2*p))) + (1 + m)*(b*c*(2*b*c*(3 + p)*(a*B
*(1 + m) - A*b*(9 + m + 2*p)) + (b*c - a*d)*(1 + m)*(a*B*(7 + m)
- A*b*(9 + m + 2*p))) - a*(2*b*c*d*(3 + p)*(a*B*(1 + m) - A*b*(9
+ m + 2*p)) + d*(b*c - a*d)*(1 + m)*(a*B*(7 + m) - A*b*(9 + m + 2
*p)) + 4*(b*c - a*d)*(a*B*d*(7 + m) - b*(6*B*c + A*d*(9 + m + 2*p
)))))))*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1[(1 + m)/2,
-p, (3 + m)/2, -((b*x^2)/a)])/(b^4*e*(1 + m)*(3 + m + 2*p)*(5 + m
 + 2*p)*(7 + m + 2*p)*(9 + m + 2*p)*(1 + (b*x^2)/a)^p)
```

Rubi [A] time = 6.6316, antiderivative size = 1047, normalized size of antiderivative = 0.99, number of steps used = 6, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$

$$-\frac{\left(-c^2\left(48Bc+Ad\left(m^3+(6p+23)m^2+\left(12p^2+92p+183\right)m+8p^3+92p^2+366p+513\right)\right)b^3+acd\left(2Ad\left(m^3+4(p+5)m^2\right.\right.\cdots}{\cdots}$$

$$+\frac{B\left(bx^2+a\right)^{p+1}\left(dx^2+c\right)^3(ex)^{m+1}}{be(m+2p+9)}$$

$$+\frac{(6bBc-aBd(m+7)+Abd(m+2p+9))\left(bx^2+a\right)^{p+1}\left(dx^2+c\right)^2(ex)^{m+1}}{b^2e(m+2p+7)(m+2p+9)}$$

$$+\frac{\left(c\left(24Bc+Ad\left(m^2+4(p+5)m+4p^2+40p+99\right)\right)b^2-ad\left(Ad(m+5)(m+2p+9)+Bc\left(m^2+2(p+9)m+2p+65\right)\right)b+a^2\cdots}{b^3e(m+2p+5)(m+2p+7)(m+2p+9)}$$

$$-\frac{\left(c\left(2b^2(p+3)(aB(m+1)-Ab(m+2p+9))c^2-2abd(p+3)(aB(m+1)-Ab(m+2p+9))c+b(bc-ad)(m+1)(aB(m+7)\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In]  Int[(e*x)^m*(a + b*x^2)^p*(A + B*x^2)*(c + d*x^2)^3,x]
```

```
[Out] -(((a^3*B*d^3*(105 + 71*m + 15*m^2 + m^3) - a^2*b*d^2*(5 + m)*(A*
d*(3 + m)*(9 + m + 2*p) + 2*B*c*(30 + 13*m + m^2 + 2*p + 2*m*p))
+ a*b^2*c*d*(2*A*d*(216 + m^3 + 84*p + 8*p^2 + 4*m^2*(5 + p) + m*
(123 + 44*p + 4*p^2)) + B*c*(267 + m^3 + 40*p + 4*p^2 + m^2*(21 +
 4*p) + m*(143 + 44*p + 4*p^2))) - b^3*c^2*(48*B*c + A*d*(513 + m
^3 + 366*p + 92*p^2 + 8*p^3 + m^2*(23 + 6*p) + m*(183 + 92*p + 12
*p^2))))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(b^4*e*(3 + m + 2*p)*
(5 + m + 2*p)*(7 + m + 2*p)*(9 + m + 2*p))) + ((a^2*B*d^2*(35 + 1
2*m + m^2) + b^2*c*(24*B*c + A*d*(99 + m^2 + 40*p + 4*p^2 + 4*m*(
```

```
5 + p))) - a*b*d*(A*d*(5 + m)*(9 + m + 2*p) + B*c*(65 + m^2 + 2*p
 + 2*m*(9 + p))))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p)*(c + d*x^2))/
(b^3*e*(5 + m + 2*p)*(7 + m + 2*p)*(9 + m + 2*p)) + ((6*b*B*c - a
*B*d*(7 + m) + A*b*d*(9 + m + 2*p))*(e*x)^(1 + m)*(a + b*x^2)^(1
+ p)*(c + d*x^2)^2)/(b^2*e*(7 + m + 2*p)*(9 + m + 2*p)) + (B*(e*x
)^(1 + m)*(a + b*x^2)^(1 + p)*(c + d*x^2)^3)/(b*e*(9 + m + 2*p))
- ((c*(2*b^2*c^2*(3 + p)*(a*B*(1 + m) - A*b*(9 + m + 2*p)) - 2*a*
b*c*d*(3 + p)*(a*B*(1 + m) - A*b*(9 + m + 2*p)) + b*c*(b*c - a*d)
*(1 + m)*(a*B*(7 + m) - A*b*(9 + m + 2*p)) - a*d*(b*c - a*d)*(1 +
 m)*(a*B*(7 + m) - A*b*(9 + m + 2*p)) + 4*a*(b*c - a*d)*(6*b*B*c
- a*B*d*(7 + m) + A*b*d*(9 + m + 2*p)) + (2*b*c*(2 + p)*(2*b*c*(3
 + p)*(a*B*(1 + m) - A*b*(9 + m + 2*p)) + (b*c - a*d)*(1 + m)*(a*
B*(7 + m) - A*b*(9 + m + 2*p))))/(1 + m)) - (a*(a^3*B*d^3*(105 +
71*m + 15*m^2 + m^3) - a^2*b*d^2*(5 + m)*(A*d*(3 + m)*(9 + m + 2*
p) + 2*B*c*(30 + 13*m + m^2 + 2*p + 2*m*p)) + a*b^2*c*d*(2*A*d*(2
16 + m^3 + 84*p + 8*p^2 + 4*m^2*(5 + p) + m*(123 + 44*p + 4*p^2))
 + B*c*(267 + m^3 + 40*p + 4*p^2 + m^2*(21 + 4*p) + m*(143 + 44*p
 + 4*p^2))) - b^3*c^2*(48*B*c + A*d*(513 + m^3 + 366*p + 92*p^2 +
 8*p^3 + m^2*(23 + 6*p) + m*(183 + 92*p + 12*p^2))))))/(b*(3 + m +
 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1[(1 + m)/2,
-p, (3 + m)/2, -((b*x^2)/a)])/(b^3*e*(5 + m + 2*p)*(7 + m + 2*p)*
(9 + m + 2*p)*(1 + (b*x^2)/a)^p)
```

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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)*(d*x**2+c)**3,x)

[Out] Timed out
```

Mathematica [A] time = 0.868184, size = 248, normalized size = 0.23

$$x(ex)^m\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}\left(\frac{c^2x^2(3Ad+Bc)\,{}_2F_1\left(\frac{m+3}{2},-p;\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+dx^4\left(dx^2\left(\frac{(Ad+3Bc)\,{}_2F_1\left(\frac{m+7}{2},-p;\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}+\frac{Bdx^2\,{}_2F_1\left(\frac{m+9}{2},-p;\frac{m+11}{2};-\frac{bx^2}{a}\right)}{m+9}\right)+\frac{3c(Ad+Bc)\,{}_2F_1\left(\frac{m+5}{2},-p;\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}\right)+\frac{Ac^3\,{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)}{m+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(e*x)^m*(a + b*x^2)^p*(A + B*x^2)*(c + d*x^2)^3,x]

[Out] (x*(e*x)^m*(a + b*x^2)^p*((A*c^3*Hypergeometric2F1[(1 + m)/2, -p,
 (3 + m)/2, -((b*x^2)/a)])/(1 + m) + (c^2*(B*c + 3*A*d)*x^2*Hyper
geometric2F1[(3 + m)/2, -p, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d
*x^4*((3*c*(B*c + A*d)*Hypergeometric2F1[(5 + m)/2, -p, (7 + m)/2
, -((b*x^2)/a)])/(5 + m) + d*x^2*(((3*B*c + A*d)*Hypergeometric2F
1[(7 + m)/2, -p, (9 + m)/2, -((b*x^2)/a)])/(7 + m) + (B*d*x^2*Hyp
ergeometric2F1[(9 + m)/2, -p, (11 + m)/2, -((b*x^2)/a)])/(9 + m))
)))/(1 + (b*x^2)/a)^p
```

Maple [F] time = 0.111, size = 0, normalized size = 0.

$$\int (ex)^m \left(bx^2+a\right)^p \left(Bx^2+A\right) \left(dx^2+c\right)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)*(d*x^2+c)^3,x)

[Out] int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)*(d*x^2+c)^3,x)
```

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

$$\int \left(Bx^2+A\right) \left(dx^2+c\right)^3 \left(bx^2+a\right)^p (ex)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(b*x^2 + a)^p*(e*x)^m, x)
```

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

$$\text{integral}\left(\left(Bd^3x^8 + \left(3\,Bcd^2 + Ad^3\right)x^6 + 3\left(Bc^2d + Acd^2\right)x^4 + Ac^3 + \left(Bc^3 + 3\,Ac^2d\right)x^2\right)\left(bx^2+a\right)^p (ex)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integral((B*d^3*x^8 + (3*B*c*d^2 + A*d^3)*x^6 + 3*(B*c^2*d + A*c*
d^2)*x^4 + A*c^3 + (B*c^3 + 3*A*c^2*d)*x^2)*(b*x^2 + a)^p*(e*x)^m
, 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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)*(d*x**2+c)**3,x)

[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Bx^2+A\right) \left(dx^2+c\right)^3 \left(bx^2+a\right)^p (ex)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] integrate((B*x^2 + A)*(d*x^2 + c)^3*(b*x^2 + a)^p*(e*x)^m, x)
```

3.45 $\int (ex)^m \left(a+bx^2\right)^p \left(A+Bx^2\right) \left(c+dx^2\right)^2 \, dx$

Optimal. Leaf size=495

$$\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}\left(a^2Bd^2\left(m^2+8m+15\right)-abd\left(Ad(m+3)(m+2p+7)+Bc\left(m^2+2m(p+6)+2p+27\right)\right)+b^2c\left(Ad(m\right.\right.}{b^3e(m+2p+3)(m+2p+5)(m+2p+7)}$$
$$-\frac{(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)(bc(m+2p+3)((m+1)(bc-ad)(aB(m+5)-Ab(m+2p+7))}{}$$
$$-\frac{\left(c+dx^2\right)(ex)^{m+1}\left(a+bx^2\right)^{p+1}(aBd(m+5)-b(Ad(m+2p+7)+4Bc))}{b^2e(m+2p+5)(m+2p+7)}$$
$$+\frac{B\left(c+dx^2\right)^2(ex)^{m+1}\left(a+bx^2\right)^{p+1}}{be(m+2p+7)}$$

```
[Out] ((a^2*B*d^2*(15 + 8*m + m^2) + b^2*c*(8*B*c + A*d*(7 + m + 2*p)^2
) - a*b*d*(A*d*(3 + m)*(7 + m + 2*p) + B*c*(27 + m^2 + 2*p + 2*m*
(6 + p))))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(b^3*e*(3 + m + 2*p
)*(5 + m + 2*p)*(7 + m + 2*p)) - ((a*B*d*(5 + m) - b*(4*B*c + A*d
*(7 + m + 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p)*(c + d*x^2))/(
b^2*e*(5 + m + 2*p)*(7 + m + 2*p)) + (B*(e*x)^(1 + m)*(a + b*x^2)
^(1 + p)*(c + d*x^2)^2)/(b*e*(7 + m + 2*p)) - ((b*c*(3 + m + 2*p)
*(2*b*c*(2 + p)*(a*B*(1 + m) - A*b*(7 + m + 2*p)) + (b*c - a*d)*(
1 + m)*(a*B*(5 + m) - A*b*(7 + m + 2*p))) - a*(1 + m)*(2*b*c*d*(2
 + p)*(a*B*(1 + m) - A*b*(7 + m + 2*p)) + d*(b*c - a*d)*(1 + m)*(
a*B*(5 + m) - A*b*(7 + m + 2*p)) + 2*(b*c - a*d)*(a*B*d*(5 + m) -
 b*(4*B*c + A*d*(7 + m + 2*p)))))*(e*x)^(1 + m)*(a + b*x^2)^p*Hyp
ergeometric2F1[(1 + m)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(b^3*e*(1
 + m)*(3 + m + 2*p)*(5 + m + 2*p)*(7 + m + 2*p)*(1 + (b*x^2)/a)^p
)
```

Rubi [A] time = 1.93388, antiderivative size = 464, normalized size of antiderivative = 0.94, number of steps used = 5, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$

$$-\frac{(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(\frac{a\left(a^2Bd^2\left(m^2+8m+15\right)-abd\left(Ad(m+3)(m+2p+7)+Bc\left(m^2+2m(p+6)+2p+27\right)\right)+b\right.}{b(m+2p+3)}\right.}{b^2e(m+2p+5)(m+2p+7}$$
$$+\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}\left(a^2Bd^2\left(m^2+8m+15\right)-abd\left(Ad(m+3)(m+2p+7)+Bc\left(m^2+2m(p+6)+2p+27\right)\right)+b^2c\left(Ad(m\right.\right.}{b^3e(m+2p+3)(m+2p+5)(m+2p+7)}$$
$$+\frac{\left(c+dx^2\right)(ex)^{m+1}\left(a+bx^2\right)^{p+1}(-aBd(m+5)+Abd(m+2p+7)+4bBc)}{b^2e(m+2p+5)(m+2p+7)}$$
$$+\frac{B\left(c+dx^2\right)^2(ex)^{m+1}\left(a+bx^2\right)^{p+1}}{be(m+2p+7)}$$

Antiderivative was successfully verified.

```
[In]  Int[(e*x)^m*(a + b*x^2)^p*(A + B*x^2)*(c + d*x^2)^2,x]
```

```
[Out] ((a^2*B*d^2*(15 + 8*m + m^2) + b^2*c*(8*B*c + A*d*(7 + m + 2*p)^2
) - a*b*d*(A*d*(3 + m)*(7 + m + 2*p) + B*c*(27 + m^2 + 2*p + 2*m*
(6 + p))))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(b^3*e*(3 + m + 2*p
)*(5 + m + 2*p)*(7 + m + 2*p)) + ((4*b*B*c - a*B*d*(5 + m) + A*b*
d*(7 + m + 2*p))*(e*x)^(1 + m)*(a + b*x^2)^(1 + p)*(c + d*x^2))/(
b^2*e*(5 + m + 2*p)*(7 + m + 2*p)) + (B*(e*x)^(1 + m)*(a + b*x^2)
^(1 + p)*(c + d*x^2)^2)/(b*e*(7 + m + 2*p)) - ((c*((2*b*c*(2 + p)
*(a*B*(1 + m) - A*b*(7 + m + 2*p)))/(1 + m) + (b*c - a*d)*(a*B*(5
 + m) - A*b*(7 + m + 2*p))) + (a*(a^2*B*d^2*(15 + 8*m + m^2) + b^
2*c*(8*B*c + A*d*(7 + m + 2*p)^2) - a*b*d*(A*d*(3 + m)*(7 + m + 2
*p) + B*c*(27 + m^2 + 2*p + 2*m*(6 + p)))))/(b*(3 + m + 2*p)))*(e
*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1[(1 + m)/2, -p, (3 + m
)/2, -((b*x^2)/a)])/(b^2*e*(5 + m + 2*p)*(7 + m + 2*p)*(1 + (b*x^
2)/a)^p)
```

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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.547255, size = 198, normalized size = 0.4

$$x(ex)^m \left(a+bx^2\right)^p \left(\frac{bx^2}{a}+1\right)^{-p} \left(\frac{cx^2(2Ad+Bc)\, {}_2F_1\left(\frac{m+3}{2},-p;\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3} + dx^4\left(\frac{(Ad+2Bc)\, {}_2F_1\left(\frac{m+5}{2},-p;\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}+\frac{Bdx^2\, {}_2F_1\left(\frac{m+7}{2},-p;\frac{m+9}{2};-\frac{bx^2}{a}\right)}{m+7}\right) + \frac{Ac^2\, {}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)}{m+1}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(e*x)^m*(a + b*x^2)^p*(A + B*x^2)*(c + d*x^2)^2,x]
```

```
[Out] (x*(e*x)^m*(a + b*x^2)^p*((A*c^2*Hypergeometric2F1[(1 + m)/2, -p,
 (3 + m)/2, -((b*x^2)/a)])/(1 + m) + (c*(B*c + 2*A*d)*x^2*Hyperge
ometric2F1[(3 + m)/2, -p, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + d*x
^4*(((2*B*c + A*d)*Hypergeometric2F1[(5 + m)/2, -p, (7 + m)/2, -(
(b*x^2)/a)])/(5 + m) + (B*d*x^2*Hypergeometric2F1[(7 + m)/2, -p,
(9 + m)/2, -((b*x^2)/a)])/(7 + m))))/(1 + (b*x^2)/a)^p
```

Maple [F] time = 0.094, size = 0, normalized size = 0.

$$\int (ex)^m \left(bx^2+a\right)^p \left(Bx^2+A\right) \left(dx^2+c\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)*(d*x^2+c)^2,x)
```

```
[Out] int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)*(d*x^2+c)^2,x)
```

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

$$\int \left(Bx^2+A\right)\left(dx^2+c\right)^2\left(bx^2+a\right)^p (ex)^m\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(b*x^2 + a)^p*(e*x)^m, x)
```

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

$$\text{integral}\left(\left(Bd^2x^6 + \left(2\,Bcd + Ad^2\right)x^4 + Ac^2 + \left(Bc^2 + 2\,Acd\right)x^2\right)\left(bx^2 + a\right)^p (ex)^m , x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d^2*x^6 + (2*B*c*d + A*d^2)*x^4 + A*c^2 + (B*c^2 + 2*
A*c*d)*x^2)*(b*x^2 + a)^p*(e*x)^m, 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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)*(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Bx^2 + A\right)\left(dx^2 + c\right)^2 \left(bx^2 + a\right)^p (ex)^m \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)^2*(b*x^2 + a)^p*(e*x)^m, x)
```

3.46 $\int (ex)^m \left(a+bx^2\right)^p \left(A+Bx^2\right) \left(c+dx^2\right) dx$

Optimal. Leaf size=253

$$-\frac{(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)(Ab(m+2p+3)(ad(m+1)-bc(m+2p+5))-a(m+1)(aBd(m}{b^2e(m+1)(m+2p+3)(m+2p+5)}$$
$$-\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(aBd(m+3)-b(2Ad+Bc(m+2p+5)))}{b^2e(m+2p+3)(m+2p+5)}+\frac{d\left(A+Bx^2\right)(ex)^{m+1}\left(a+bx^2\right)^{p+1}}{be(m+2p+5)}$$

```
[Out] -(((a*B*d*(3 + m) - b*(2*A*d + B*c*(5 + m + 2*p)))*(e*x)^(1 + m)*
(a + b*x^2)^(1 + p))/(b^2*e*(3 + m + 2*p)*(5 + m + 2*p))) + (d*(e
*x)^(1 + m)*(a + b*x^2)^(1 + p)*(A + B*x^2))/(b*e*(5 + m + 2*p))
- ((A*b*(3 + m + 2*p)*(a*d*(1 + m) - b*c*(5 + m + 2*p)) - a*(1 +
m)*(a*B*d*(3 + m) - b*(2*A*d + B*c*(5 + m + 2*p))))*(e*x)^(1 + m)
*(a + b*x^2)^p*Hypergeometric2F1[(1 + m)/2, -p, (3 + m)/2, -((b*x
^2)/a)])/(b^2*e*(1 + m)*(3 + m + 2*p)*(5 + m + 2*p)*(1 + (b*x^2)/
a)^p)
```

Rubi [A] time = 0.615577, antiderivative size = 238, normalized size of antiderivative = 0.94, number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.138$

$$\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(-aBd(m+3)+2Abd+bBc(m+2p+5))}{b^2e(m+2p+3)(m+2p+5)}$$
$$-\frac{(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)\left(\frac{a(-aBd(m+3)+2Abd+bBc(m+2p+5))}{b(m+2p+3)}+aAd-\frac{Abc(m+2p+5)}{m+1}\right)}{be(m+2p+5)}$$
$$+\frac{d\left(A+Bx^2\right)(ex)^{m+1}\left(a+bx^2\right)^{p+1}}{be(m+2p+5)}$$

Antiderivative was successfully verified.

```
[In]  Int[(e*x)^m*(a + b*x^2)^p*(A + B*x^2)*(c + d*x^2),x]
```

```
[Out] ((2*A*b*d - a*B*d*(3 + m) + b*B*c*(5 + m + 2*p))*(e*x)^(1 + m)*(a
 + b*x^2)^(1 + p))/(b^2*e*(3 + m + 2*p)*(5 + m + 2*p)) + (d*(e*x)
^(1 + m)*(a + b*x^2)^(1 + p)*(A + B*x^2))/(b*e*(5 + m + 2*p)) - (
(a*A*d - (A*b*c*(5 + m + 2*p))/(1 + m) + (a*(2*A*b*d - a*B*d*(3 +
 m) + b*B*c*(5 + m + 2*p)))/(b*(3 + m + 2*p)))*(e*x)^(1 + m)*(a +
 b*x^2)^p*Hypergeometric2F1[(1 + m)/2, -p, (3 + m)/2, -((b*x^2)/a
)])/(b*e*(5 + m + 2*p)*(1 + (b*x^2)/a)^p)
```

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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 0.226034, size = 147, normalized size = 0.58

$$x(ex)^m\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}\left(\frac{x^2(Ad+Bc)\,{}_2F_1\left(\frac{m+3}{2},-p;\frac{m+5}{2};-\frac{bx^2}{a}\right)}{m+3}+\frac{Ac\,{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)}{m+1}+\frac{Bdx^4\,{}_2F_1\left(\frac{m+5}{2},-p;\frac{m+7}{2};-\frac{bx^2}{a}\right)}{m+5}\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[(e*x)^m*(a + b*x^2)^p*(A + B*x^2)*(c + d*x^2),x]
```

```
[Out] (x*(e*x)^m*(a + b*x^2)^p*((A*c*Hypergeometric2F1[(1 + m)/2, -p, (
3 + m)/2, -((b*x^2)/a)])/(1 + m) + ((B*c + A*d)*x^2*Hypergeometri
c2F1[(3 + m)/2, -p, (5 + m)/2, -((b*x^2)/a)])/(3 + m) + (B*d*x^4*
Hypergeometric2F1[(5 + m)/2, -p, (7 + m)/2, -((b*x^2)/a)])/(5 + m
)))/(1 + (b*x^2)/a)^p
```

Maple [F] time = 0.08, size = 0, normalized size = 0.

$$\int (ex)^m\left(bx^2+a\right)^p\left(Bx^2+A\right)\left(dx^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)*(d*x^2+c),x)
```

```
[Out] int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)*(d*x^2+c),x)
```

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

$$\int \left(Bx^2+A\right)\left(dx^2+c\right)\left(bx^2+a\right)^p(ex)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(b*x^2 + a)^p*(e*x)^m, x)
```

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

$$\text{integral}\left(\left(Bdx^4+(Bc+Ad)x^2+Ac\right)\left(bx^2+a\right)^p(ex)^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d*x^4 + (B*c + A*d)*x^2 + A*c)*(b*x^2 + a)^p*(e*x)^m,
 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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)*(d*x**2+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \left(Bx^2 + A\right)\left(dx^2 + c\right)\left(bx^2 + a\right)^p (ex)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(d*x^2 + c)*(b*x^2 + a)^p*(e*x)^m, x)
```

3.47 $\int \frac{(ex)^m(a+bx^2)^p(A+Bx^2)}{c+dx^2}\,dx$

Optimal. Leaf size=162

$$\frac{B(ex)^{m+1}(a+bx^2)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)}{de(m+1)}-\frac{(ex)^{m+1}(a+bx^2)^p\left(\frac{bx^2}{a}+1\right)^{-p}(Bc-Ad)F_1\left(\frac{m+1}{2};-p,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{cde(m+1)}$$

```
[Out] -(((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^p*AppellF1[(1 + m)/2, -p
, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(c*d*e*(1 + m)*(1 +
(b*x^2)/a)^p)) + (B*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1
[(1 + m)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(d*e*(1 + m)*(1 + (b*x^
2)/a)^p)
```

Rubi [A] time = 0.445689, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161

$$\frac{B(ex)^{m+1}(a+bx^2)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)}{de(m+1)}-\frac{(ex)^{m+1}(a+bx^2)^p\left(\frac{bx^2}{a}+1\right)^{-p}(Bc-Ad)F_1\left(\frac{m+1}{2};-p,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{cde(m+1)}$$

Antiderivative was successfully verified.

```
[In]  Int[((e*x)^m*(a + b*x^2)^p*(A + B*x^2))/(c + d*x^2),x]
```

```
[Out] -(((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^p*AppellF1[(1 + m)/2, -p
, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(c*d*e*(1 + m)*(1 +
(b*x^2)/a)^p)) + (B*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1
[(1 + m)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(d*e*(1 + m)*(1 + (b*x^
2)/a)^p)
```

Rubi in Sympy [A] time = 66.4841, size = 124, normalized size = 0.77

$$\frac{B\,(ex)^{m+1}\left(1+\frac{bx^2}{a}\right)^{-p}(a+bx^2)^p\,{}_2F_1\left(\begin{matrix}-p,\frac{m}{2}+\frac{1}{2}\\ \frac{m}{2}+\frac{3}{2}\end{matrix}\middle|-\frac{bx^2}{a}\right)}{de\,(m+1)}+\frac{(ex)^{m+1}\left(1+\frac{bx^2}{a}\right)^{-p}(a+bx^2)^p\,(Ad-Bc)\,\mathrm{appellf}_1\left(\frac{m}{2}+\frac{1}{2},1,-p,\frac{m}{2}+\frac{3}{2},-\frac{dx^2}{c},-\frac{bx^2}{a}\right)}{cde\,(m+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((e*x)**m*(b*x**2+a)**p*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] B*(e*x)**(m + 1)*(1 + b*x**2/a)**(-p)*(a + b*x**2)**p*hyper((-p,
m/2 + 1/2), (m/2 + 3/2,), -b*x**2/a)/(d*e*(m + 1)) + (e*x)**(m +
1)*(1 + b*x**2/a)**(-p)*(a + b*x**2)**p*(A*d - B*c)*appellf1(m/2
+ 1/2, 1, -p, m/2 + 3/2, -d*x**2/c, -b*x**2/a)/(c*d*e*(m + 1))
```

Mathematica [B] time = 0.756713, size = 446, normalized size = 2.75

$$\frac{x(ex)^m\left(a+bx^2\right)^p\left(aAcd(m+3)F_1\left(\frac{m+1}{2};-p,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-aBc^2(m+3)F_1\left(\frac{m+1}{2};-p,1;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)+B\left(c+\right.\right.}{d(m+1)\left(c+dx^2\right)\left(2x^2\left(bcpF_1\left(\frac{m+3}{2};1-p,1;\right.\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[((e*x)^m*(a + b*x^2)^p*(A + B*x^2))/(c + d*x^2),x]
```

```
[Out] (x*(e*x)^m*(a + b*x^2)^p*(-(a*B*c^2*(3 + m)*AppellF1[(1 + m)/2, -
p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]) + a*A*c*d*(3 + m)*A
ppellF1[(1 + m)/2, -p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]
+ (B*(c + d*x^2)*(a*c*(3 + m)*AppellF1[(1 + m)/2, -p, 1, (3 + m)/
2, -((b*x^2)/a), -((d*x^2)/c)] + 2*x^2*(b*c*p*AppellF1[(3 + m)/2,
 1 - p, 1, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] - a*d*AppellF1[
(3 + m)/2, -p, 2, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]))*Hyperg
eometric2F1[(1 + m)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(1 + (b*x^2)
/a)^p))/(d*(1 + m)*(c + d*x^2)*(a*c*(3 + m)*AppellF1[(1 + m)/2, -
p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] + 2*x^2*(b*c*p*Appel
lF1[(3 + m)/2, 1 - p, 1, (5 + m)/2, -((b*x^2)/a), -((d*x^2)/c)] -
 a*d*AppellF1[(3 + m)/2, -p, 2, (5 + m)/2, -((b*x^2)/a), -((d*x^2
)/c)])))
```

Maple [F] time = 0.09, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (bx^2+a)^p (Bx^2+A)}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)/(d*x^2+c),x)
```

```
[Out] int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)/(d*x^2+c),x)
```

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

$$\int \frac{(Bx^2+A)(bx^2+a)^p (ex)^m}{dx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d*x^2 + c), x)
```

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

$$\text{integral}\left(\frac{(Bx^2+A)(bx^2+a)^p (ex)^m}{dx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d*x^2 + c), 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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)/(d*x**2+c),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(Bx^2 + A\right)\left(bx^2 + a\right)^p (ex)^m}{dx^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d*x^2 + c), x)
```

3.48 $\int \frac{(ex)^m (a+bx^2)^p (A+Bx^2)}{(c+dx^2)^2} \, dx$

Optimal. Leaf size=295

$$-\frac{(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}(ad(Ad(1-m)+Bc(m+1))-bc(Ad(-m-2p+1)+Bc(m+2p+1)))F_1\left(\frac{m+1}{2};-p,1;\frac{m+3}{2};\right.}{2c^2de(m+1)(bc-ad)}$$
$$-\frac{b(m+2p+1)(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}(Bc-Ad)\,{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)}{2cde(m+1)(bc-ad)}$$
$$+\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(Bc-Ad)}{2ce\left(c+dx^2\right)(bc-ad)}$$

```
[Out] ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(2*c*(b*c - a*d)*
e*(c + d*x^2)) - ((a*d*(A*d*(1 - m) + B*c*(1 + m)) - b*c*(A*d*(1
- m - 2*p) + B*c*(1 + m + 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^p*Appe
llF1[(1 + m)/2, -p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(2
*c^2*d*(b*c - a*d)*e*(1 + m)*(1 + (b*x^2)/a)^p) - (b*(B*c - A*d)*
(1 + m + 2*p)*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1[(1 +
m)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(2*c*d*(b*c - a*d)*e*(1 + m)*
(1 + (b*x^2)/a)^p)
```

Rubi [A] time = 1.22217, antiderivative size = 295, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.194$

$$-\frac{(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}(ad(Ad(1-m)+Bc(m+1))-bc(Ad(-m-2p+1)+Bc(m+2p+1)))F_1\left(\frac{m+1}{2};-p,1;\frac{m+3}{2};\right.}{2c^2de(m+1)(bc-ad)}$$
$$-\frac{b(m+2p+1)(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}(Bc-Ad)\,{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)}{2cde(m+1)(bc-ad)}$$
$$+\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(Bc-Ad)}{2ce\left(c+dx^2\right)(bc-ad)}$$

Antiderivative was successfully verified.

```
[In]  Int[((e*x)^m*(a + b*x^2)^p*(A + B*x^2))/(c + d*x^2)^2,x]
```

```
[Out] ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(2*c*(b*c - a*d)*
e*(c + d*x^2)) - ((a*d*(A*d*(1 - m) + B*c*(1 + m)) - b*c*(A*d*(1
- m - 2*p) + B*c*(1 + m + 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^p*Appe
llF1[(1 + m)/2, -p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(2
*c^2*d*(b*c - a*d)*e*(1 + m)*(1 + (b*x^2)/a)^p) - (b*(B*c - A*d)*
(1 + m + 2*p)*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1[(1 +
m)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(2*c*d*(b*c - a*d)*e*(1 + m)*
(1 + (b*x^2)/a)^p)
```

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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.3997, size = 403, normalized size = 1.37

$$\frac{ac(m+3)x(ex)^m\left(a+bx^2\right)^p\left(\frac{(Ad-Bc)F_1\left(\frac{m+1}{2};-p,2;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{2x^2\left(bcpF_1\left(\frac{m+3}{2};1-p,2;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-2adF_1\left(\frac{m+3}{2};-p,3;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)+ac(m+3)F_1\left(\frac{m+1}{2};-p,2;\frac{m+3}{2};-\frac{bx^2}{a},-\right.}\right.}{d(m+1)\left(c+dx^2\right)^2}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[((e*x)^m*(a + b*x^2)^p*(A + B*x^2))/(c + d*x^2)^2,x]
```

```
[Out] (a*c*(3 + m)*x*(e*x)^m*(a + b*x^2)^p*((B*(c + d*x^2)*AppellF1[(1
+ m)/2, -p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(a*c*(3 +
m)*AppellF1[(1 + m)/2, -p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/
c)] + 2*x^2*(b*c*p*AppellF1[(3 + m)/2, 1 - p, 1, (5 + m)/2, -((b*
x^2)/a), -((d*x^2)/c)] - a*d*AppellF1[(3 + m)/2, -p, 2, (5 + m)/2
, -((b*x^2)/a), -((d*x^2)/c)])) + ((-(B*c) + A*d)*AppellF1[(1 + m
)/2, -p, 2, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(a*c*(3 + m)*
AppellF1[(1 + m)/2, -p, 2, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)]
 + 2*x^2*(b*c*p*AppellF1[(3 + m)/2, 1 - p, 2, (5 + m)/2, -((b*x^2
)/a), -((d*x^2)/c)] - 2*a*d*AppellF1[(3 + m)/2, -p, 3, (5 + m)/2,
 -((b*x^2)/a), -((d*x^2)/c)]))))/(d*(1 + m)*(c + d*x^2)^2)
```

Maple [F] time = 0.096, size = 0, normalized size = 0.

$$\int \frac{(ex)^m\left(bx^2+a\right)^p\left(Bx^2+A\right)}{\left(dx^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)/(d*x^2+c)^2,x)
```

```
[Out] int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)/(d*x^2+c)^2,x)
```

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

$$\int \frac{\left(Bx^2+A\right)\left(bx^2+a\right)^p(ex)^m}{\left(dx^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d*x^2 + c)^2, x)
```

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

$$\text{integral}\left(\frac{\left(Bx^2+A\right)\left(bx^2+a\right)^p(ex)^m}{d^2x^4+2\,cdx^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d^2*x^4 + 2*c*d*x^2 +
 c^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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)/(d*x**2+c)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(Bx^2 + A)(bx^2 + a)^p (ex)^m}{(dx^2 + c)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d*x^2 + c)^2, x)
```

3.49 $\int \frac{(ex)^m (a+bx^2)^p (A+Bx^2)}{(c+dx^2)^3} \, dx$

Optimal. Leaf size=483

$$\frac{(ex)^{m+1} \left(a+bx^2\right)^p \left(\frac{bx^2}{a}+1\right)^{-p} \left(a^2d^2(1-m)(Ad(3-m)+Bc(m+1))-2abcd(Ad(1-m)(-m-2p+3)+Bc(m+1)(-m-\cdots\right.}{8c^3de(m+1)(bc-ad)^2}$$
$$-\frac{b(m+2p+1)(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)(ad(Ad(3-m)+Bc(m+1))+bc(Bc(-m-2p+1)\cdots}{8c^2de(m+1)(bc-ad)^2}$$
$$+\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(ad(Ad(3-m)+Bc(m+1))+bc(Bc(-m-2p+1)-Ad(-m-2p+5)))}{8c^2e\left(c+dx^2\right)(bc-ad)^2}$$
$$+\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(Bc-Ad)}{4ce\left(c+dx^2\right)^2(bc-ad)}$$

```
[Out] ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(4*c*(b*c - a*d)*
e*(c + d*x^2)^2) + ((a*d*(A*d*(3 - m) + B*c*(1 + m)) + b*c*(B*c*(
1 - m - 2*p) - A*d*(5 - m - 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^(1 +
 p))/(8*c^2*(b*c - a*d)^2*e*(c + d*x^2)) + ((a^2*d^2*(1 - m)*(A*d
*(3 - m) + B*c*(1 + m)) - 2*a*b*c*d*(B*c*(1 + m)*(1 - m - 2*p) +
A*d*(1 - m)*(3 - m - 2*p)) + b^2*c^2*(1 - m - 2*p)*(A*d*(3 - m -
2*p) + B*c*(1 + m + 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^p*AppellF1[(
1 + m)/2, -p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(8*c^3*d
*(b*c - a*d)^2*e*(1 + m)*(1 + (b*x^2)/a)^p) - (b*(a*d*(A*d*(3 - m
) + B*c*(1 + m)) + b*c*(B*c*(1 - m - 2*p) - A*d*(5 - m - 2*p)))*(
1 + m + 2*p)*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1[(1 + m
)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(8*c^2*d*(b*c - a*d)^2*e*(1 +
m)*(1 + (b*x^2)/a)^p)
```

Rubi [A] time = 2.89441, antiderivative size = 483, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194

$$\frac{(ex)^{m+1} \left(a+bx^2\right)^p \left(\frac{bx^2}{a}+1\right)^{-p} \left(a^2d^2(1-m)(Ad(3-m)+Bc(m+1))-2abcd(Ad(1-m)(-m-2p+3)+Bc(m+1)(-m-\cdots\right.}{8c^3de(m+1)(bc-ad)^2}$$
$$-\frac{b(m+2p+1)(ex)^{m+1}\left(a+bx^2\right)^p\left(\frac{bx^2}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{2},-p;\frac{m+3}{2};-\frac{bx^2}{a}\right)(ad(Ad(3-m)+Bc(m+1))+bc(Bc(-m-2p+1)\cdots}{8c^2de(m+1)(bc-ad)^2}$$
$$+\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(ad(Ad(3-m)+Bc(m+1))+bc(Bc(-m-2p+1)-Ad(-m-2p+5)))}{8c^2e\left(c+dx^2\right)(bc-ad)^2}$$
$$+\frac{(ex)^{m+1}\left(a+bx^2\right)^{p+1}(Bc-Ad)}{4ce\left(c+dx^2\right)^2(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^2)^(1 + p))/(4*c*(b*c - a*d)*
e*(c + d*x^2)^2) + ((a*d*(A*d*(3 - m) + B*c*(1 + m)) + b*c*(B*c*(
1 - m - 2*p) - A*d*(5 - m - 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^(1 +
 p))/(8*c^2*(b*c - a*d)^2*e*(c + d*x^2)) + ((a^2*d^2*(1 - m)*(A*d
*(3 - m) + B*c*(1 + m)) - 2*a*b*c*d*(B*c*(1 + m)*(1 - m - 2*p) +
A*d*(1 - m)*(3 - m - 2*p)) + b^2*c^2*(1 - m - 2*p)*(A*d*(3 - m -
2*p) + B*c*(1 + m + 2*p)))*(e*x)^(1 + m)*(a + b*x^2)^p*AppellF1[(
1 + m)/2, -p, 1, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(8*c^3*d
*(b*c - a*d)^2*e*(1 + m)*(1 + (b*x^2)/a)^p) - (b*(a*d*(A*d*(3 - m
) + B*c*(1 + m)) + b*c*(B*c*(1 - m - 2*p) - A*d*(5 - m - 2*p)))*(
1 + m + 2*p)*(e*x)^(1 + m)*(a + b*x^2)^p*Hypergeometric2F1[(1 + m
)/2, -p, (3 + m)/2, -((b*x^2)/a)])/(8*c^2*d*(b*c - a*d)^2*e*(1 +
m)*(1 + (b*x^2)/a)^p)
```

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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.70517, size = 403, normalized size = 0.83

$$\frac{ac(m+3)x(ex)^m\left(a+bx^2\right)^p\left(\frac{(Ad-Bc)F_1\left(\frac{m+1}{2};-p,3;\frac{m+3}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)}{2x^2\left(bcpF_1\left(\frac{m+3}{2};1-p,3;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)-3adF_1\left(\frac{m+3}{2};-p,4;\frac{m+5}{2};-\frac{bx^2}{a},-\frac{dx^2}{c}\right)\right)+ac(m+3)F_1\left(\frac{m+1}{2};-p,3;\frac{m+3}{2};-\frac{bx^2}{a},-\right.}\right.}{d(m+1)\left(c+dx^2\right)}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (a*c*(3 + m)*x*(e*x)^m*(a + b*x^2)^p*((B*(c + d*x^2)*AppellF1[(1
+ m)/2, -p, 2, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(a*c*(3 +
m)*AppellF1[(1 + m)/2, -p, 2, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/
c)] + 2*x^2*(b*c*p*AppellF1[(3 + m)/2, 1 - p, 2, (5 + m)/2, -((b*
x^2)/a), -((d*x^2)/c)] - 2*a*d*AppellF1[(3 + m)/2, -p, 3, (5 + m)
/2, -((b*x^2)/a), -((d*x^2)/c)])) + ((-(B*c) + A*d)*AppellF1[(1 +
 m)/2, -p, 3, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c)])/(a*c*(3 + m
)*AppellF1[(1 + m)/2, -p, 3, (3 + m)/2, -((b*x^2)/a), -((d*x^2)/c
)] + 2*x^2*(b*c*p*AppellF1[(3 + m)/2, 1 - p, 3, (5 + m)/2, -((b*x
^2)/a), -((d*x^2)/c)] - 3*a*d*AppellF1[(3 + m)/2, -p, 4, (5 + m)/
2, -((b*x^2)/a), -((d*x^2)/c)]))))/(d*(1 + m)*(c + d*x^2)^3)
```

Maple [F] time = 0.116, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e*x)^m*(b*x^2+a)^p*(B*x^2+A)/(d*x^2+c)^3,x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d*x^2 + c)^3, x)
```

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

$$\text{integral}\left(\frac{\left(Bx^2+A\right)\left(bx^2+a\right)^p(ex)^m}{d^3x^6+3\,cd^2x^4+3\,c^2dx^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d^3*x^6 + 3*c*d^2*x^4
 + 3*c^2*d*x^2 + c^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((e*x)**m*(b*x**2+a)**p*(B*x**2+A)/(d*x**2+c)**3,x)
```

```
[Out] Timed out
```

GIAC/XCAS [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((B*x^2 + A)*(b*x^2 + a)^p*(e*x)^m/(d*x^2 + c)^3, x)
```

3.50 $\int \frac{\sqrt{a+bx^2}\left(A+Bx^2\right)\left(c+dx^2\right)}{x}\,dx$

Optimal. Leaf size=84

$$-\frac{\left(a+bx^2\right)^{3/2}\left(2aBd-5b(Ad+Bc)-3bBdx^2\right)}{15b^2}+Ac\sqrt{a+bx^2}-\sqrt{a}Ac\tanh^{-1}\left(\frac{\sqrt{a+bx^2}}{\sqrt{a}}\right)$$

```
[Out] A*c*Sqrt[a + b*x^2] - ((a + b*x^2)^(3/2)*(2*a*B*d - 5*b*(B*c + A*
d) - 3*b*B*d*x^2))/(15*b^2) - Sqrt[a]*A*c*ArcTanh[Sqrt[a + b*x^2]
/Sqrt[a]]
```

Rubi [A] time = 0.249962, antiderivative size = 84, 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

$$-\frac{\left(a+bx^2\right)^{3/2}\left(2aBd-5b(Ad+Bc)-3bBdx^2\right)}{15b^2}+Ac\sqrt{a+bx^2}-\sqrt{a}Ac\tanh^{-1}\left(\frac{\sqrt{a+bx^2}}{\sqrt{a}}\right)$$

Antiderivative was successfully verified.

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

```
[Out] A*c*Sqrt[a + b*x^2] - ((a + b*x^2)^(3/2)*(2*a*B*d - 5*b*(B*c + A*
d) - 3*b*B*d*x^2))/(15*b^2) - Sqrt[a]*A*c*ArcTanh[Sqrt[a + b*x^2]
/Sqrt[a]]
```

Rubi in Sympy [A] time = 21.3805, size = 83, normalized size = 0.99

$$-A\sqrt{a}c\,\text{atanh}\left(\frac{\sqrt{a+bx^2}}{\sqrt{a}}\right)+Ac\sqrt{a+bx^2}+\frac{2\left(a+bx^2\right)^{\frac{3}{2}}\left(-Bad+\frac{3Bbdx^2}{2}+\frac{5b(Ad+Bc)}{2}\right)}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -A*sqrt(a)*c*atanh(sqrt(a + b*x**2)/sqrt(a)) + A*c*sqrt(a + b*x**
2) + 2*(a + b*x**2)**(3/2)*(-B*a*d + 3*B*b*d*x**2/2 + 5*b*(A*d +
B*c)/2)/(15*b**2)
```

Mathematica [A] time = 0.271426, size = 103, normalized size = 1.23

$$\frac{\sqrt{a+bx^2}\left(5Ab\left(ad+3bc+bdx^2\right)-B\left(a+bx^2\right)\left(2ad-5bc-3bdx^2\right)\right)}{15b^2}-\sqrt{a}Ac\log\left(\sqrt{a}\sqrt{a+bx^2}+a\right)+\sqrt{a}Ac\log(x)$$

Antiderivative was successfully verified.

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

```
[Out] (Sqrt[a + b*x^2]*(-(B*(a + b*x^2)*(-5*b*c + 2*a*d - 3*b*d*x^2)) +
 5*A*b*(3*b*c + a*d + b*d*x^2)))/(15*b^2) + Sqrt[a]*A*c*Log[x] -
Sqrt[a]*A*c*Log[a + Sqrt[a]*Sqrt[a + b*x^2]]
```

Maple [A] time = 0.013, size = 112, normalized size = 1.3

$$\frac{Ad}{3b}\left(bx^2+a\right)^{\frac{3}{2}} - A\sqrt{a}\ln\left(\frac{1}{x}\left(2a+2\sqrt{a}\sqrt{bx^2+a}\right)\right)c + Ac\sqrt{bx^2+a} + \frac{Bc}{3b}\left(bx^2+a\right)^{\frac{3}{2}} + \frac{Bdx^2}{5b}\left(bx^2+a\right)^{\frac{3}{2}} - \frac{2aBd}{15b^2}\left(bx^2+a\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*A*d/b*(b*x^2+a)^(3/2)-A*a^(1/2)*ln((2*a+2*a^(1/2)*(b*x^2+a)^(
1/2))/x)*c+A*c*(b*x^2+a)^(1/2)+1/3*B*c/b*(b*x^2+a)^(3/2)+1/5*B*d*
x^2*(b*x^2+a)^(3/2)/b-2/15*B*d*a/b^2*(b*x^2+a)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.269431, size = 1, normalized size = 0.01

$$\left[\frac{15A\sqrt{a}b^2c\log\left(-\frac{bx^2-2\sqrt{bx^2+a}\sqrt{a}+2a}{x^2}\right) + 2\left(3Bb^2dx^4 + \left(5Bb^2c + \left(Bab+5Ab^2\right)d\right)x^2 + 5\left(Bab+3Ab^2\right)c - \left(2Ba^2-5Aab\right)d\right.}{30b^2}\right.$$

$$-\frac{15A\sqrt{-a}b^2c\arctan\left(\frac{a}{\sqrt{bx^2+a}\sqrt{-a}}\right) - \left(3Bb^2dx^4 + \left(5Bb^2c + \left(Bab+5Ab^2\right)d\right)x^2 + 5\left(Bab+3Ab^2\right)c - \left(2Ba^2-5Aab\right)d\right)\sqrt{b}}{15b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/30*(15*A*sqrt(a)*b^2*c*log(-(b*x^2 - 2*sqrt(b*x^2 + a)*sqrt(a)
 + 2*a)/x^2) + 2*(3*B*b^2*d*x^4 + (5*B*b^2*c + (B*a*b + 5*A*b^2)*
d)*x^2 + 5*(B*a*b + 3*A*b^2)*c - (2*B*a^2 - 5*A*a*b)*d)*sqrt(b*x^
2 + a))/b^2, -1/15*(15*A*sqrt(-a)*b^2*c*arctan(a/(sqrt(b*x^2 + a)
*sqrt(-a))) - (3*B*b^2*d*x^4 + (5*B*b^2*c + (B*a*b + 5*A*b^2)*d)*
x^2 + 5*(B*a*b + 3*A*b^2)*c - (2*B*a^2 - 5*A*a*b)*d)*sqrt(b*x^2 +
 a))/b^2]
```

Sympy [A] time = 19.4673, size = 160, normalized size = 1.9

$$-Aac\left(\begin{cases} -\frac{\operatorname{atan}\left(\frac{\sqrt{a+bx^2}}{\sqrt{-a}}\right)}{\sqrt{-a}} & \text{for } -a > 0 \\ \frac{\operatorname{acoth}\left(\frac{\sqrt{a+bx^2}}{\sqrt{a}}\right)}{\sqrt{a}} & \text{for } -a < 0 \wedge a < a+bx^2 \\ \frac{\operatorname{atanh}\left(\frac{\sqrt{a+bx^2}}{\sqrt{a}}\right)}{\sqrt{a}} & \text{for } a > a+bx^2 \wedge -a < 0 \end{cases}\right) + Ac\sqrt{a+bx^2} + \frac{Bd\left(a+bx^2\right)^{\frac{5}{2}}}{5b^2} + \frac{\left(a+bx^2\right)^{\frac{3}{2}}\left(2Abd-2Bad+2Bbc\right)}{6b^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

GIAC/XCAS [A] time = 0.220893, size = 153, normalized size = 1.82

$$\frac{Aac\arctan\left(\frac{\sqrt{bx^2+a}}{\sqrt{-a}}\right)}{\sqrt{-a}} + \frac{5\left(bx^2+a\right)^{\frac{3}{2}}Bb^9c + 15\sqrt{bx^2+a}Ab^{10}c + 3\left(bx^2+a\right)^{\frac{5}{2}}Bb^8d - 5\left(bx^2+a\right)^{\frac{3}{2}}Bab^8d + 5\left(bx^2+a\right)^{\frac{3}{2}}Ab^9d}{15\,b^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*a*c*arctan(sqrt(b*x^2 + a)/sqrt(-a))/sqrt(-a) + 1/15*(5*(b*x^2
+ a)^(3/2)*B*b^9*c + 15*sqrt(b*x^2 + a)*A*b^10*c + 3*(b*x^2 + a)^
(5/2)*B*b^8*d - 5*(b*x^2 + a)^(3/2)*B*a*b^8*d + 5*(b*x^2 + a)^(3/
2)*A*b^9*d)/b^10
```

3.51 $\int \frac{(a+bx^2)(A+Bx^2)\sqrt{c+dx^2}}{x}\,dx$

Optimal. Leaf size=84

$$-\frac{(c+dx^2)^{3/2}(-5d(aB+Ab)+2bBc-3bBdx^2)}{15d^2}+aA\sqrt{c+dx^2}-aA\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c+dx^2}}{\sqrt{c}}\right)$$

```
[Out] a*A*Sqrt[c + d*x^2] - ((c + d*x^2)^(3/2)*(2*b*B*c - 5*(A*b + a*B)
*d - 3*b*B*d*x^2))/(15*d^2) - a*A*Sqrt[c]*ArcTanh[Sqrt[c + d*x^2]
/Sqrt[c]]
```

Rubi [A] time = 0.253958, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.172$

$$-\frac{(c+dx^2)^{3/2}(-5d(aB+Ab)+2bBc-3bBdx^2)}{15d^2}+aA\sqrt{c+dx^2}-aA\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c+dx^2}}{\sqrt{c}}\right)$$

Antiderivative was successfully verified.

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

```
[Out] a*A*Sqrt[c + d*x^2] - ((c + d*x^2)^(3/2)*(2*b*B*c - 5*(A*b + a*B)
*d - 3*b*B*d*x^2))/(15*d^2) - a*A*Sqrt[c]*ArcTanh[Sqrt[c + d*x^2]
/Sqrt[c]]
```

Rubi in Sympy [A] time = 20.6677, size = 83, normalized size = 0.99

$$-Aa\sqrt{c}\,\mathrm{atanh}\left(\frac{\sqrt{c+dx^2}}{\sqrt{c}}\right)+Aa\sqrt{c+dx^2}+\frac{2(c+dx^2)^{\frac{3}{2}}\left(-Bbc+\frac{3Bbdx^2}{2}+\frac{5d(Ab+Ba)}{2}\right)}{15d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -A*a*sqrt(c)*atanh(sqrt(c + d*x**2)/sqrt(c)) + A*a*sqrt(c + d*x**
2) + 2*(c + d*x**2)**(3/2)*(-B*b*c + 3*B*b*d*x**2/2 + 5*d*(A*b +
B*a)/2)/(15*d**2)
```

Mathematica [A] time = 0.299313, size = 103, normalized size = 1.23

$$\frac{\sqrt{c+dx^2}\left(5ad\left(3Ad+Bc+Bdx^2\right)-b\left(c+dx^2\right)\left(-5Ad+2Bc-3Bdx^2\right)\right)}{15d^2} - aA\sqrt{c}\log\left(\sqrt{c}\sqrt{c+dx^2}+c\right)+aA\sqrt{c}\log(x)$$

Antiderivative was successfully verified.

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

```
[Out] (Sqrt[c + d*x^2]*(-(b*(c + d*x^2)*(2*B*c - 5*A*d - 3*B*d*x^2)) +
5*a*d*(B*c + 3*A*d + B*d*x^2)))/(15*d^2) + a*A*Sqrt[c]*Log[x] - a
*A*Sqrt[c]*Log[c + Sqrt[c]*Sqrt[c + d*x^2]]
```

Maple [A] time = 0.01, size = 112, normalized size = 1.3

$$\frac{Ab}{3\,d}\left(dx^{2}+c\right)^{\frac{3}{2}}-A\sqrt{c}\ln\left(\frac{1}{x}\left(2\,c+2\,\sqrt{c}\sqrt{dx^{2}+c}\right)\right)a+aA\sqrt{dx^{2}+c}+\frac{Ba}{3\,d}\left(dx^{2}+c\right)^{\frac{3}{2}}+\frac{Bbx^{2}}{5\,d}\left(dx^{2}+c\right)^{\frac{3}{2}}-\frac{2\,bBc}{15\,d^{2}}\left(dx^{2}+c\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*A*b*(d*x^2+c)^(3/2)/d-A*c^(1/2)*ln((2*c+2*c^(1/2)*(d*x^2+c)^(
1/2))/x)*a+a*A*(d*x^2+c)^(1/2)+1/3*B*a*(d*x^2+c)^(3/2)/d+1/5*B*b*
x^2*(d*x^2+c)^(3/2)/d-2/15*B*b*c/d^2*(d*x^2+c)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.276625, size = 1, normalized size = 0.01

$$\left[\frac{15\,Aa\sqrt{c}d^{2}\log\left(-\frac{dx^{2}-2\,\sqrt{dx^{2}+c}\sqrt{c}+2\,c}{x^{2}}\right)+2\,\left(3\,Bbd^{2}x^{4}-2\,Bbc^{2}+15\,Aad^{2}+5\,(Ba+Ab)cd+\left(Bbcd+5\,(Ba+Ab)d^{2}\right)x^{2}\right)\sqrt{dx^{2}}}{30\,d^{2}}\right.$$

$$\left.-\frac{15\,Aa\sqrt{-c}d^{2}\arctan\left(\frac{c}{\sqrt{dx^{2}+c}\sqrt{-c}}\right)-\left(3\,Bbd^{2}x^{4}-2\,Bbc^{2}+15\,Aad^{2}+5\,(Ba+Ab)cd+\left(Bbcd+5\,(Ba+Ab)d^{2}\right)x^{2}\right)\sqrt{dx^{2}+c}}{15\,d^{2}}\right]$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/30*(15*A*a*sqrt(c)*d^2*log(-(d*x^2 - 2*sqrt(d*x^2 + c)*sqrt(c)
 + 2*c)/x^2) + 2*(3*B*b*d^2*x^4 - 2*B*b*c^2 + 15*A*a*d^2 + 5*(B*a
 + A*b)*c*d + (B*b*c*d + 5*(B*a + A*b)*d^2)*x^2)*sqrt(d*x^2 + c))
/d^2, -1/15*(15*A*a*sqrt(-c)*d^2*arctan(c/(sqrt(d*x^2 + c)*sqrt(-
c))) - (3*B*b*d^2*x^4 - 2*B*b*c^2 + 15*A*a*d^2 + 5*(B*a + A*b)*c*
d + (B*b*c*d + 5*(B*a + A*b)*d^2)*x^2)*sqrt(d*x^2 + c))/d^2]
```

Sympy [A] time = 20.331, size = 160, normalized size = 1.9

$$-Aac\left(\begin{cases}-\frac{\operatorname{atan}\left(\frac{\sqrt{c+dx^{2}}}{\sqrt{-c}}\right)}{\sqrt{-c}} & \text{for}\ -c>0\\ \frac{\operatorname{acoth}\left(\frac{\sqrt{c+dx^{2}}}{\sqrt{c}}\right)}{\sqrt{c}} & \text{for}\ -c<0\wedge c<c+dx^{2}\\ \frac{\operatorname{atanh}\left(\frac{\sqrt{c+dx^{2}}}{\sqrt{c}}\right)}{\sqrt{c}} & \text{for}\ c>c+dx^{2}\wedge -c<0\end{cases}\right)+Aa\sqrt{c+dx^{2}}+\frac{Bb\left(c+dx^{2}\right)^{\frac{5}{2}}}{5d^{2}}+\frac{\left(c+dx^{2}\right)^{\frac{3}{2}}\left(2Abd+2Bad-2Bbc\right)}{6d^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

GIAC/XCAS [A] time = 0.220498, size = 153, normalized size = 1.82

$$\frac{Aac\arctan\left(\frac{\sqrt{dx^2+c}}{\sqrt{-c}}\right)}{\sqrt{-c}} + \frac{3\left(dx^2+c\right)^{\frac{5}{2}}Bbd^8 - 5\left(dx^2+c\right)^{\frac{3}{2}}Bbcd^8 + 5\left(dx^2+c\right)^{\frac{3}{2}}Bad^9 + 5\left(dx^2+c\right)^{\frac{3}{2}}Abd^9 + 15\sqrt{dx^2+c}Aad^{10}}{15\,d^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*a*c*arctan(sqrt(d*x^2 + c)/sqrt(-c))/sqrt(-c) + 1/15*(3*(d*x^2
+ c)^(5/2)*B*b*d^8 - 5*(d*x^2 + c)^(3/2)*B*b*c*d^8 + 5*(d*x^2 + c
)^(3/2)*B*a*d^9 + 5*(d*x^2 + c)^(3/2)*A*b*d^9 + 15*sqrt(d*x^2 + c
)*A*a*d^10)/d^10
```

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:
```