Computer algebra independent integration tests

1-Algebraic-functions/1.1-Binomial-products/1.1.3-General/1.1.3.6-g-x-^m-a+b-x^n-^p-c+d-x^n-^q-e+f-x^n-^r

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Contents

Chapter 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 `https://rulebasedintegration.org`

The number of integrals in this report is [46]. This is test number [28].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

1. Mathematica 12.1 (64 bit) on windows 10.
2. Rubi 4.16.1 in Mathematica 12 on windows 10.
3. Maple 2020 (64 bit) on windows 10.
4. Maxima 5.43 on Linux. (via sagemath 8.9)
5. Fricas 1.3.6 on Linux (via sagemath 9.0)
6. Sympy 1.5 under Python 3.7.3 using Anaconda distribution.
7. Giac/Xcas 1.5 on Linux. (via sagemath 8.9)

Maxima, Fricas and Giac/Xcas were called from inside SageMath. 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.

1.2 Results

Important note: A number of problems in this test suite have no antiderivative in closed form. This means the antiderivative of these integrals can not be expressed in terms of elementary, special functions or `Hypergeometric2F1` functions. `RootSum` and `RootOf` are not allowed.

If a CAS returns the above integral unevaluated within the time limit, then the result is counted as passed and assigned an A grade.

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

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

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

System	solved	Failed
Rubi	% 100. (46)	% 0. (0)
Mathematica	% 100. (46)	% 0. (0)
Maple	% 26.09 (12)	% 73.91 (34)
Maxima	% 0. (0)	% 100. (46)
Fricas	% 26.09 (12)	% 73.91 (34)
Sympy	% 21.74 (10)	% 78.26 (36)
Giac	% 23.91 (11)	% 76.09 (35)

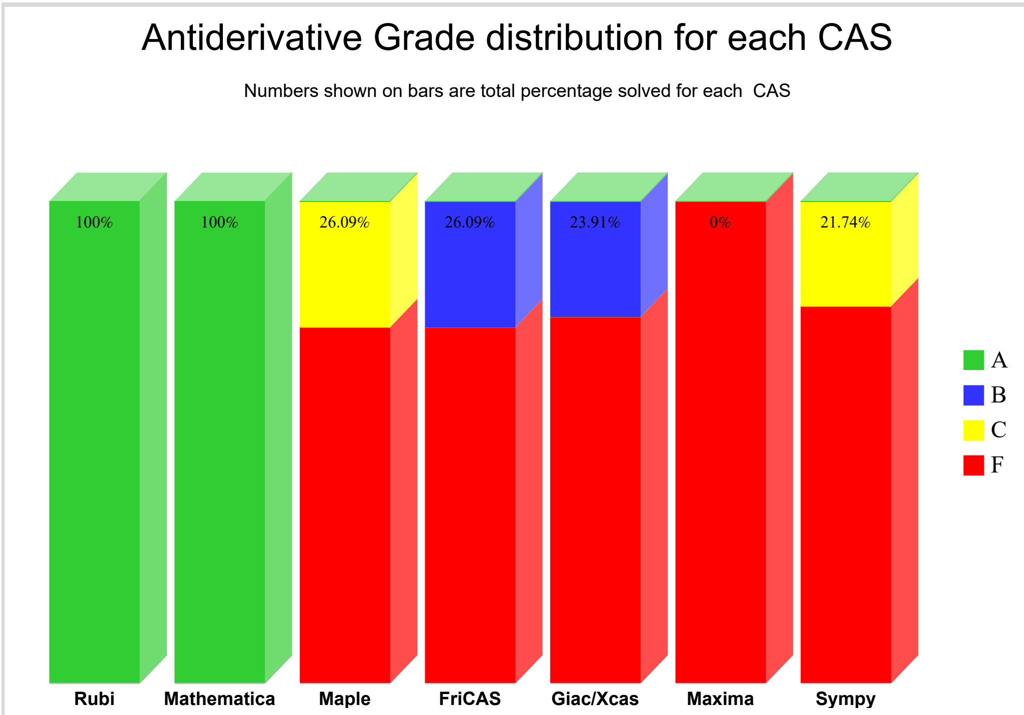
The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives 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.

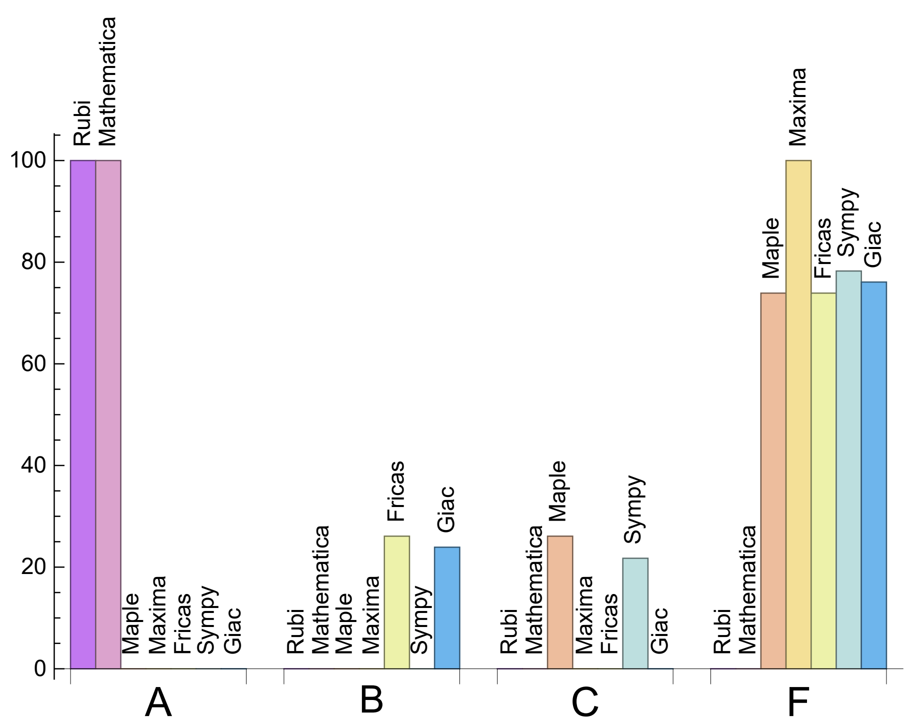
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	100.	0.	0.	0.
Mathematica	100.	0.	0.	0.
Maple	0.	0.	26.09	73.91
Maxima	0.	0.	0.	100.
Fricas	0.	26.09	0.	73.91
Sympy	0.	0.	21.74	78.26
Giac	0.	23.91	0.	76.09

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.



1.3 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
Rubi	0.47	238.	1.	211.5
Mathematica	0.34	163.46	0.72	153.5
Maple	0.12	5656.75	21.43	3691.
Maxima	Round[Mean[], 0.01]	Round[Mean[], 0.01]	Round[Mean[], 0.01]	Round[Median[], 0.0
Fricas	1.43	7135.5	27.95	4898.
Sympy	30.31	1694.7	10.17	1294.
Giac	1.28	7906.	34.88	4610.

1.4 list of integrals that has no closed form antiderivative

{}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.6 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 $\{43, 44\}$

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.

1.7 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.

1.8 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.

1.9 Important notes about some of the results

1.9.1 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.

1.9.2 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.

1.9.3 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-expression-size-in-s

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

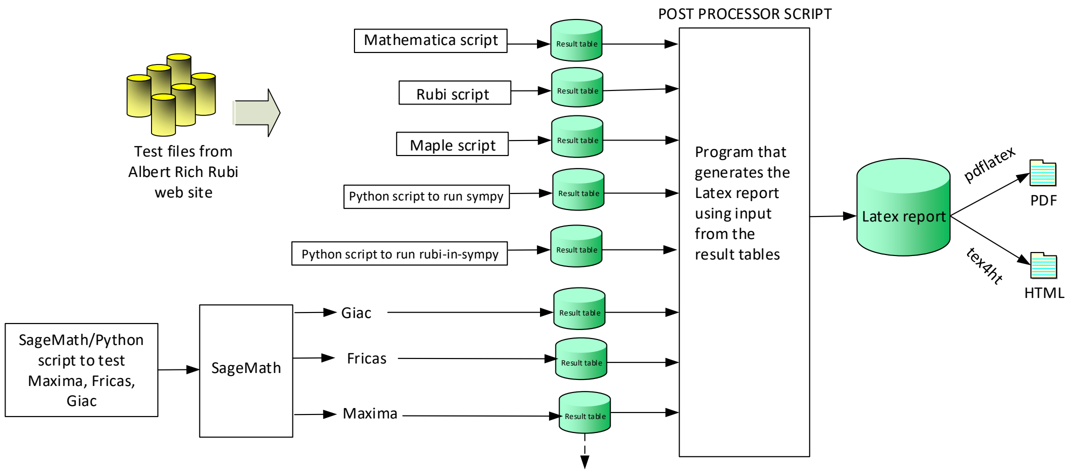
```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  except Exception as ee:
         leafCount =1
```

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

1.10 Design of the test system

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



One record (line) per one integral result. The line is CSV comma separated. It contains 13 fields. This is description of each record (line)

1. integer, the problem number.
2. integer. 0 or 1 for failed or passed. (this is not the grade field)
3. integer. Leaf size of result.
4. integer. Leaf size of the optimal antiderivative.
5. number. CPU time used to solve this integral. 0 if failed.
6. string. The integral in Latex format
7. string. The input used in CAS own syntx.
8. string. The result (antiderivative) produced by CAS in Latex format
9. string. The optimal antiderivative in Latex format.
10. integer. 0 or 1. Indicates if problem has known antiderivative or not
11. String. The result (antiderivative) in CAS own syntax.
12. String. The grade of the antiderivative. Can be “A”, “B”, “C”, or “F”
13. String. The optimal antiderivative in CAS own syntax.

High level overview of the CAS independent integration test build system

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Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 }

B grade: { }

C grade: { }

F grade: { }

2.1.3 Maple

A grade: { }

B grade: { }

C grade: { 1, 2, 3, 4, 8, 9, 10, 11, 15, 16, 17, 18 }

F grade: { 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 }

2.1.4 Maxima

A grade: {

B grade: { }

C grade: { }

F grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 }

2.1.5 FriCAS

A grade: { }

B grade: { 1, 2, 3, 4, 8, 9, 10, 11, 15, 16, 17, 18 }

C grade: { }

F grade: { 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 }

2.1.6 Sympy

A grade: { }

B grade: { }

C grade: { 5, 6, 12, 19, 22, 23, 24, 25, 31, 32 }

F grade: { 1, 2, 3, 4, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 20, 21, 26, 27, 28, 29, 30, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 }

2.1.7 Giac

A grade: { }

B grade: { 1, 2, 3, 4, 8, 9, 10, 11, 16, 17, 18 }

C grade: { }

F grade: { 5, 6, 7, 12, 13, 14, 15, 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 }

2.2 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
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	210	172	4972	0	6700	0	9351
normalized size	1	1.	0.82	23.68	0.	31.9	0.	44.53
time (sec)	N/A	0.27	0.605	0.152	0.	1.364	0.	1.669

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	160	160	129	2410	0	3420	0	4610
normalized size	1	1.	0.81	15.06	0.	21.38	0.	28.81
time (sec)	N/A	0.176	0.311	0.075	0.	1.212	0.	1.128

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	84	891	0	1354	0	1742
normalized size	1	1.	0.78	8.25	0.	12.54	0.	16.13
time (sec)	N/A	0.084	0.147	0.056	0.	1.135	0.	1.123

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	49	262	0	463	0	441
normalized size	1	1.	0.74	3.97	0.	7.02	0.	6.68
time (sec)	N/A	0.04	0.059	0.09	0.	1.081	0.	1.257

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	120	120	95	0	0	0	666	0
normalized size	1	1.	0.79	0.	0.	0.	5.55	0.
time (sec)	N/A	0.12	0.151	0.397	0.	0.	10.615	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	110	0	0	0	4129	0
normalized size	1	1.	0.62	0.	0.	0.	23.33	0.
time (sec)	N/A	0.258	0.153	0.379	0.	0.	52.69	0.

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	228	228	136	0	0	0	0	0
normalized size	1	1.	0.6	0.	0.	0.	0.	0.
time (sec)	N/A	0.273	0.162	0.354	0.	0.	0.	0.

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	318	318	273	11389	0	14151	0	20733
normalized size	1	1.	0.86	35.81	0.	44.5	0.	65.2
time (sec)	N/A	0.411	1.107	0.175	0.	1.796	0.	1.432

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	237	237	199	5908	0	7675	0	10939
normalized size	1	1.	0.84	24.93	0.	32.38	0.	46.16
time (sec)	N/A	0.31	0.544	0.116	0.	1.459	0.	1.294

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	160	160	129	2410	0	3268	0	4610
normalized size	1	1.	0.81	15.06	0.	20.42	0.	28.81
time (sec)	N/A	0.172	0.343	0.076	0.	1.248	0.	1.19

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	102	78	732	0	1208	0	1381
normalized size	1	1.	0.76	7.18	0.	11.84	0.	13.54
time (sec)	N/A	0.076	0.11	0.052	0.	1.12	0.	1.09

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	153	0	0	0	1085	0
normalized size	1	1.	0.83	0.	0.	0.	5.86	0.
time (sec)	N/A	0.226	0.26	0.505	0.	0.	27.206	0.

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	268	268	159	0	0	0	0	0
normalized size	1	1.	0.59	0.	0.	0.	0.	0.
time (sec)	N/A	0.669	0.246	0.5	0.	0.	0.	0.

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	322	322	168	0	0	0	0	0
normalized size	1	1.	0.52	0.	0.	0.	0.	0.
time (sec)	N/A	0.544	0.24	0.498	0.	0.	0.	0.

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	410	410	358	20937	0	24423	0	0
normalized size	1	1.	0.87	51.07	0.	59.57	0.	0.
time (sec)	N/A	0.624	0.943	0.266	0.	2.391	0.	0.

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	310	310	265	11389	0	14151	0	20733
normalized size	1	1.	0.85	36.74	0.	45.65	0.	66.88
time (sec)	N/A	0.414	1.136	0.179	0.	1.78	0.	1.463

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	210	172	4972	0	6376	0	9351
normalized size	1	1.	0.82	23.68	0.	30.36	0.	44.53
time (sec)	N/A	0.258	0.518	0.111	0.	1.404	0.	1.267

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	106	1609	0	2437	0	3075
normalized size	1	1.	0.77	11.74	0.	17.79	0.	22.45
time (sec)	N/A	0.111	0.15	0.067	0.	1.164	0.	1.158

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	270	270	229	0	0	0	1503	0
normalized size	1	1.	0.85	0.	0.	0.	5.57	0.
time (sec)	N/A	0.389	0.521	0.487	0.	0.	56.133	0.

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	394	389	217	0	0	0	0	0
normalized size	1	0.99	0.55	0.	0.	0.	0.	0.
time (sec)	N/A	1.024	0.443	0.492	0.	0.	0.	0.

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	380	380	332	0	0	0	0	0
normalized size	1	1.	0.87	0.	0.	0.	0.	0.
time (sec)	N/A	0.621	0.896	0.492	0.	0.	0.	0.

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	272	272	231	0	0	0	1503	0
normalized size	1	1.	0.85	0.	0.	0.	5.53	0.
time (sec)	N/A	0.398	0.53	0.493	0.	0.	56.49	0.

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	154	0	0	0	1085	0
normalized size	1	1.	0.82	0.	0.	0.	5.8	0.
time (sec)	N/A	0.254	0.289	0.491	0.	0.	26.428	0.

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	95	0	0	0	666	0
normalized size	1	1.	0.78	0.	0.	0.	5.46	0.
time (sec)	N/A	0.126	0.147	0.347	0.	0.	9.554	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	78	57	0	0	0	284	0
normalized size	1	1.	0.73	0.	0.	0.	3.64	0.
time (sec)	N/A	0.04	0.065	0.36	0.	0.	3.17	0.

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	127	102	0	0	0	0	0
normalized size	1	1.	0.8	0.	0.	0.	0.	0.
time (sec)	N/A	0.144	0.128	0.676	0.	0.	0.	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	212	212	152	0	0	0	0	0
normalized size	1	1.	0.72	0.	0.	0.	0.	0.
time (sec)	N/A	0.529	0.202	0.671	0.	0.	0.	0.

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	407	407	199	0	0	0	0	0
normalized size	1	1.	0.49	0.	0.	0.	0.	0.
time (sec)	N/A	1.247	0.264	0.677	0.	0.	0.	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	386	381	220	0	0	0	0	0
normalized size	1	0.99	0.57	0.	0.	0.	0.	0.
time (sec)	N/A	1.135	0.522	0.509	0.	0.	0.	0.

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	267	267	161	0	0	0	0	0
normalized size	1	1.	0.6	0.	0.	0.	0.	0.
time (sec)	N/A	0.675	0.304	0.54	0.	0.	0.	0.

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	110	0	0	0	4129	0
normalized size	1	1.	0.62	0.	0.	0.	23.2	0.
time (sec)	N/A	0.253	0.159	0.349	0.	0.	47.948	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	83	0	0	0	1897	0
normalized size	1	1.	0.78	0.	0.	0.	17.73	0.
time (sec)	N/A	0.056	0.071	0.358	0.	0.	12.835	0.

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	150	0	0	0	0	0
normalized size	1	1.	0.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.521	0.208	0.667	0.	0.	0.	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	315	315	209	0	0	0	0	0
normalized size	1	1.	0.66	0.	0.	0.	0.	0.
time (sec)	N/A	1.097	0.317	0.716	0.	0.	0.	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	567	567	270	0	0	0	0	0
normalized size	1	1.	0.48	0.	0.	0.	0.	0.
time (sec)	N/A	2.341	0.455	0.731	0.	0.	0.	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	322	322	172	0	0	0	0	0
normalized size	1	1.	0.53	0.	0.	0.	0.	0.
time (sec)	N/A	0.557	0.28	0.542	0.	0.	0.	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	228	228	136	0	0	0	0	0
normalized size	1	1.	0.6	0.	0.	0.	0.	0.
time (sec)	N/A	0.281	0.184	0.347	0.	0.	0.	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	83	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.056	0.073	0.366	0.	0.	0.	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	366	366	201	0	0	0	0	0
normalized size	1	1.	0.55	0.	0.	0.	0.	0.
time (sec)	N/A	1.217	0.267	0.698	0.	0.	0.	0.

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	482	482	271	0	0	0	0	0
normalized size	1	1.	0.56	0.	0.	0.	0.	0.
time (sec)	N/A	2.071	0.463	0.678	0.	0.	0.	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	162	0	0	0	0	0
normalized size	1	1.	0.77	0.	0.	0.	0.	0.
time (sec)	N/A	0.246	0.44	1.056	0.	0.	0.	0.

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	271	255	164	0	0	0	0	0
normalized size	1	0.94	0.61	0.	0.	0.	0.	0.
time (sec)	N/A	0.327	0.208	0.403	0.	0.	0.	0.

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	164	164	138	0	0	0	0	0
normalized size	1	1.	0.84	0.	0.	0.	0.	0.
time (sec)	N/A	0.179	0.252	0.676	0.	0.	0.	0.

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	304	304	138	0	0	0	0	0
normalized size	1	1.	0.45	0.	0.	0.	0.	0.
time (sec)	N/A	0.536	0.348	0.669	0.	0.	0.	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	139	139	124	0	0	0	0	0
normalized size	1	1.	0.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.115	0.155	0.795	0.	0.	0.	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	139	167	124	0	0	0	0	0
normalized size	1	1.2	0.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.118	0.052	0.8	0.	0.	0.	0.

2.3 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 [44] had the largest ratio of [0.1935]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	12	3	1.	29	0.103
2	A	10	3	1.	29	0.103
3	A	8	3	1.	27	0.111
4	A	6	3	1.	20	0.15
5	A	5	4	1.	29	0.138
6	A	3	3	1.	29	0.103
7	A	3	3	1.	29	0.103
8	A	14	3	1.	31	0.097
9	A	12	3	1.	31	0.097
10	A	10	3	1.	29	0.103
11	A	8	3	1.	22	0.136
12	A	7	4	1.	31	0.129
13	A	6	5	1.	31	0.161
14	A	4	3	1.	31	0.097
15	A	16	3	1.	31	0.097
16	A	14	3	1.	31	0.097
17	A	12	3	1.	29	0.103
18	A	10	3	1.	22	0.136
19	A	9	4	1.	31	0.129
20	A	8	5	0.99	31	0.161

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
21	A	11	4	1.	31	0.129
22	A	9	4	1.	31	0.129
23	A	7	4	1.	31	0.129
24	A	5	4	1.	29	0.138
25	A	2	2	1.	22	0.091
26	A	4	2	1.	31	0.065
27	A	5	3	1.	31	0.097
28	A	6	3	1.	31	0.097
29	A	8	5	0.99	31	0.161
30	A	6	5	1.	31	0.161
31	A	3	3	1.	29	0.103
32	A	2	2	1.	22	0.091
33	A	5	3	1.	31	0.097
34	A	6	3	1.	31	0.097
35	A	7	3	1.	31	0.097
36	A	4	3	1.	31	0.097
37	A	3	3	1.	29	0.103
38	A	2	2	1.	22	0.091
39	A	6	3	1.	31	0.097
40	A	7	3	1.	31	0.097
41	A	7	3	1.	31	0.097
42	A	4	4	0.94	29	0.138
43	A	6	5	1.	31	0.161
44	A	7	6	1.	31	0.194
45	A	4	4	1.	47	0.085
46	A	4	4	1.2	55	0.073

Chapter 3

Listing of integrals

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

Optimal. Leaf size=210

$$\frac{a^2x^{n+1}(ex)^m(aAd+aBc+3Abc)}{m+n+1}+\frac{a^3Ac(ex)^{m+1}}{e(m+1)}+\frac{b^2x^{4n+1}(ex)^m(3aBd+Abd+bBc)}{m+4n+1}+\frac{ax^{2n+1}(ex)^m(3Ab(ad+bc)+}{m+2n+1}$$

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

Rubi [A] time = 0.269805, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {570, 20, 30}

$$\frac{a^2x^{n+1}(ex)^m(aAd+aBc+3Abc)}{m+n+1}+\frac{a^3Ac(ex)^{m+1}}{e(m+1)}+\frac{b^2x^{4n+1}(ex)^m(3aBd+Abd+bBc)}{m+4n+1}+\frac{ax^{2n+1}(ex)^m(3Ab(ad+bc)+}{m+2n+1}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
```

```
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (ex)^m (a+bx^n)^3 (A+Bx^n)(c+dx^n)\,dx &= \int \left(a^3Ac(ex)^m + a^2(3Abc+aBc+aAd)x^n(ex)^m + a(3Ab(bc+ad)+aB(3bc\right.\\ &= \frac{a^3Ac(ex)^{1+m}}{e(1+m)} + \left(b^3Bd\right)\int x^{5n}(ex)^m\,dx + \left(a^2(3Abc+aBc+aAd)\right)\int x^n(ex)^m\\ &= \frac{a^3Ac(ex)^{1+m}}{e(1+m)} + \left(b^3Bdx^{-m}(ex)^m\right)\int x^{m+5n}\,dx + \left(a^2(3Abc+aBc+aAd)x^{-m}(e\right.\\ &= \frac{a^2(3Abc+aBc+aAd)x^{1+n}(ex)^m}{1+m+n} + \frac{a(3Ab(bc+ad)+aB(3bc+ad))x^{1+2n}(ex}{1+m+2n}\end{aligned}$$

Mathematica [A] time = 0.604957, size = 172, normalized size = 0.82

$$x(ex)^m\left(\frac{a^2x^n(aAd+aBc+3Abc)}{m+n+1}+\frac{a^3Ac}{m+1}+\frac{b^2x^{4n}(3aBd+Abd+bBc)}{m+4n+1}+\frac{ax^{2n}(3Ab(ad+bc)+aB(ad+3bc))}{m+2n+1}+\frac{bx^{3n}(A\right.$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.152, size = 4972, normalized size = 23.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(156*A*a^2*b*d*m^3*n*(x^n)^2+531*A*a^2*b*d*m^2*n^2*(x^n)^2+642*A*a^2*b*d*
m*n^3*(x^n)^2+156*A*a*b^2*c*m^3*n*(x^n)^2+531*A*a*b^2*c*m^2*n^2*(x^n)^2+642
*A*a*b^2*c*m*n^3*(x^n)^2+216*A*a*b^2*d*m^2*n*(x^n)^3+441*A*a*b^2*d*m*n^2*(x
^n)^3+156*B*a^2*b*c*m^3*n*(x^n)^2+3*A*a^2*b*d*m^5*(x^n)^2+3*A*a*b^2*c*m^5*(
x^n)^2+40*A*b^3*c*m*n^4*(x^n)^3+44*A*b^3*d*m^3*n*(x^n)^4+123*A*b^3*d*m^2*n^
2*(x^n)^4+122*A*b^3*d*m*n^3*(x^n)^4+3*B*a^2*b*d*m^5*(x^n)^3+154*A*a^3*d*n^3
*x^n+5*A*b^3*c*(x^n)^3*m+71*B*a^3*c*n^2*x^n+5*B*a^3*d*(x^n)^2*m+13*B*a^3*d*
(x^n)^2*n+3*B*a*b^2*c*m^5*(x^n)^3+15*B*a*b^2*d*m^4*(x^n)^4+90*B*a*b^2*d*n^4
*(x^n)^4+44*B*b^3*c*m^3*n*(x^n)^4+48*A*b^3*c*m*n*(x^n)^3+78*A*b^3*c*n^3*(x^
n)^3+10*A*b^3*d*m^2*(x^n)^4+41*A*b^3*d*n^2*(x^n)^4+5*m*b^3*B*d*(x^n)^5+10*b
^3*B*d*(x^n)^5*n+5*A*a^3*d*m^4*x^n+120*A*a^3*d*n^4*x^n+5*A*a^3*d*x^n*m+14*A
*a^3*d*x^n*n+5*B*a^3*c*x^n*m+10*A*b^3*c*m^2*(x^n)^3+49*A*b^3*c*n^2*(x^n)^3+
```

```
5*A*b^3*d*(x^n)^4*m+15*a^3*A*c*n+5*a^3*A*c*m+a^3*A*c+107*B*a^3*d*n^3*(x^n)^
2+5*B*b^3*c*(x^n)^4*m+11*B*b^3*c*(x^n)^4*n+10*A*a^3*d*m^3*x^n+50*B*b^3*d*n^
3*(x^n)^5+5*A*b^3*c*m^4*(x^n)^3+40*A*b^3*c*n^4*(x^n)^3+10*A*b^3*d*m^3*(x^n)
^4+60*B*b^3*d*m^2*n*(x^n)^5+105*B*b^3*d*m*n^2*(x^n)^5+14*B*a^3*c*x^n*n+30*A
*a*b^2*d*m^3*(x^n)^3+3*(x^n)^2*d*b*a^2*A+3*(x^n)^2*c*b^2*a*A+3*(x^n)^2*c*b*
a^2*B+11*A*b^3*d*m^4*n*(x^n)^4+41*A*b^3*d*m^3*n^2*(x^n)^4+61*A*b^3*d*m^2*n^
3*(x^n)^4+30*A*b^3*d*m*n^4*(x^n)^4+3*B*a*b^2*d*m^5*(x^n)^4+11*B*b^3*c*m^4*n
*(x^n)^4+180*A*a^2*b*d*m*n^4*(x^n)^2+39*A*a*b^2*c*m^4*n*(x^n)^2+321*A*a*b^2
*c*m^2*n^3*(x^n)^2+216*B*a*b^2*c*m^2*n*(x^n)^3+441*B*a*b^2*c*m*n^2*(x^n)^3+
132*B*a*b^2*d*m*n*(x^n)^4+156*A*a*b^2*c*m*n*(x^n)^2+156*B*a^2*b*c*m*n*(x^n)
^2+168*A*a^2*b*c*m*n*x^n+61*A*b^3*d*n^3*(x^n)^4+B*a^3*d*m^5*(x^n)^2+10*B*b^
3*c*m^3*(x^n)^4+61*B*b^3*c*n^3*(x^n)^4+10*B*b^3*d*m^2*(x^n)^5+35*B*b^3*d*n^
2*(x^n)^5+A*a^3*d*m^5*x^n+10*A*b^3*c*m^3*(x^n)^3+642*B*a^2*b*c*m*n^3*(x^n)^
2+216*B*a^2*b*d*m^2*n*(x^n)^3+441*B*a^2*b*d*m*n^2*(x^n)^3+10*B*a^3*d*m^2*(x
^n)^2+12*A*b^3*c*(x^n)^3*n+10*B*a^3*c*m^3*x^n+B*b^3*d*m^5*(x^n)^5+A*b^3*d*m
^5*(x^n)^4+B*a^3*c*m^5*x^n+5*B*a^3*d*m^4*(x^n)^2+60*B*a^3*d*n^4*(x^n)^2+10*
B*b^3*c*m^2*(x^n)^4+10*B*a^3*c*m^2*x^n+10*A*a^3*d*m^2*x^n+71*A*a^3*d*n^2*x^
n+59*B*a^3*d*n^2*(x^n)^2+41*B*b^3*c*n^2*(x^n)^4+154*B*a^3*c*n^3*x^n+274*A*a
^3*c*n^4+10*A*a^3*c*m^3+225*A*a^3*c*n^3+10*A*a^3*c*m^2+85*A*a^3*c*n^2+41*B*
b^3*c*m^3*n^2*(x^n)^4+61*B*b^3*c*m^2*n^3*(x^n)^4+30*B*b^3*c*m*n^4*(x^n)^4+4
0*B*b^3*d*m^3*n*(x^n)^5+105*B*b^3*d*m^2*n^2*(x^n)^5+100*B*b^3*d*m*n^3*(x^n)
^5+3*A*a*b^2*d*m^5*(x^n)^3+12*A*b^3*c*m^4*n*(x^n)^3+49*A*b^3*c*m^3*n^2*(x^n
)^3+78*A*b^3*c*m^2*n^3*(x^n)^3+3*x^n*c*b*a^2*A+3*(x^n)^3*A*a*b^2*d+3*(x^n)^
3*B*a^2*b*d+3*(x^n)^3*B*a*b^2*c+924*A*a^2*b*c*m*n^3*x^n+234*A*a^2*b*d*m^2*n
*(x^n)^2+531*A*a^2*b*d*m*n^2*(x^n)^2+234*A*a*b^2*c*m^2*n*(x^n)^2+531*A*a*b^
2*c*m*n^2*(x^n)^2+144*A*a*b^2*d*m*n*(x^n)^3+168*A*a^2*b*c*m^3*n*x^n+639*A*a
^2*b*c*m^2*n^2*x^n+A*b^3*c*(x^n)^3+B*a^3*d*(x^n)^2+A*a^3*d*x^n+B*a^3*c*x^n+
b^3*B*d*(x^n)^5+A*b^3*d*(x^n)^4+B*b^3*c*(x^n)^4+10*B*b^3*d*m^4*n*(x^n)^5+23
4*A*a*b^2*d*n^3*(x^n)^3+72*A*b^3*c*m^2*n*(x^n)^3+147*A*b^3*c*m*n^2*(x^n)^3+
44*A*b^3*d*m*n*(x^n)^4+14*B*a^3*c*m^4*n*x^n+71*B*a^3*c*m^3*n^2*x^n+35*B*b^3
*d*m^3*n^2*(x^n)^5+50*B*b^3*d*m^2*n^3*(x^n)^5+24*B*b^3*d*m*n^4*(x^n)^5+234*
B*a^2*b*c*m^2*n*(x^n)^2+198*B*a*b^2*d*m^2*n*(x^n)^4+369*B*a*b^2*d*m*n^2*(x^
n)^4+42*A*a^2*b*c*m^4*n*x^n+213*A*a^2*b*c*m^3*n^2*x^n+462*A*a^2*b*c*m^2*n^3
*x^n+360*A*a^2*b*c*m*n^4*x^n+177*A*a*b^2*c*m^3*n^2*(x^n)^2+531*B*a^2*b*c*m*
n^2*(x^n)^2+144*B*a^2*b*d*m*n*(x^n)^3+144*B*a*b^2*c*m*n*(x^n)^3+252*A*a^2*b
*c*m^2*n*x^n+639*A*a^2*b*c*m*n^2*x^n+156*A*a^2*b*d*m*n*(x^n)^2+180*A*a*b^2*
c*m*n^4*(x^n)^2+144*A*a*b^2*d*m^3*n*(x^n)^3+33*B*a*b^2*d*m^4*n*(x^n)^4+123*
B*a*b^2*d*m^3*n^2*(x^n)^4+183*B*a*b^2*d*m^2*n^3*(x^n)^4+90*B*a*b^2*d*m*n^4*
(x^n)^4+36*A*a*b^2*d*m^4*n*(x^n)^3+147*A*a*b^2*d*m^3*n^2*(x^n)^3+234*A*a*b^
2*d*m^2*n^3*(x^n)^3+120*A*a*b^2*d*m*n^4*(x^n)^3+120*A*a^3*c*n^5+A*a^3*c*m^5
+5*A*a^3*c*m^4+11*A*b^3*d*(x^n)^4*n+5*B*a^3*c*m^4*x^n+120*B*a^3*c*n^4*x^n+1
0*B*a^3*d*m^3*(x^n)^2+441*A*a*b^2*d*m^2*n^2*(x^n)^3+147*A*a*b^2*d*n^2*(x^n)
^3+30*A*a*b^2*d*m^2*(x^n)^3+531*B*a^2*b*c*m^2*n^2*(x^n)^2+120*B*a^2*b*d*m*n
^4*(x^n)^3+36*B*a*b^2*c*m^4*n*(x^n)^3+36*B*a^2*b*d*m^4*n*(x^n)^3+147*B*a^2*
b*d*m^3*n^2*(x^n)^3+234*B*a^2*b*d*m^2*n^3*(x^n)^3+321*B*a^2*b*c*m^2*n^3*(x^
n)^2+180*B*a^2*b*c*m*n^4*(x^n)^2+144*B*a^2*b*d*m^3*n*(x^n)^3+441*B*a^2*b*d*
m^2*n^2*(x^n)^3+468*B*a^2*b*d*m*n^3*(x^n)^3+144*B*a*b^2*c*m^3*n*(x^n)^3+441
*B*a*b^2*c*m^2*n^2*(x^n)^3+468*B*a*b^2*c*m*n^3*(x^n)^3+177*B*a^2*b*c*m^3*n^
2*(x^n)^2+468*A*a*b^2*d*m*n^3*(x^n)^3+39*B*a^2*b*c*m^4*n*(x^n)^2+56*B*a^3*c
*m^3*n*x^n+213*B*a^3*c*m^2*n^2*x^n+85*A*a^3*c*m^3*n^2+15*A*a^3*c*m^4*n+120*
A*a^3*d*m*n^4*x^n+3*A*a^2*b*c*m^5*x^n+15*A*a^2*b*d*m^4*(x^n)^2+180*A*a^2*b*
d*n^4*(x^n)^2+15*A*a*b^2*c*m^4*(x^n)^2+180*A*a*b^2*c*n^4*(x^n)^2+123*B*b^3*
c*m*n^2*(x^n)^4+15*B*a*b^2*d*(x^n)^4*m+33*B*a*b^2*d*(x^n)^4*n+84*A*a^3*d*m^
2*n*x^n+147*B*a^2*b*d*n^2*(x^n)^3+30*B*a*b^2*c*m^2*(x^n)^3+147*B*a*b^2*c*n^
2*(x^n)^3+321*B*a^2*b*c*n^3*(x^n)^2+30*B*a^2*b*d*m^2*(x^n)^3+214*B*a^3*d*m*
n^3*(x^n)^2+15*B*a^2*b*c*m^4*(x^n)^2+180*B*a^2*b*c*n^4*(x^n)^2+360*A*a^2*b*
c*n^4*x^n+30*A*a^2*b*d*m^3*(x^n)^2+321*A*a^2*b*d*n^3*(x^n)^2+30*A*a*b^2*c*m
^3*(x^n)^2+321*A*a*b^2*c*n^3*(x^n)^2+52*B*a^3*d*m^3*n*(x^n)^2+177*B*a^3*d*m
^2*n^2*(x^n)^2+15*A*a^2*b*c*m^4*x^n+56*A*a^3*d*m^3*n*x^n+213*A*a^3*d*m^2*n^
```

```
2*x^n+308*A*a^3*d*m*n^3*x^n+44*B*b^3*c*m*n*(x^n)^4+123*B*a*b^2*d*n^2*(x^n)^
4+234*B*a*b^2*c*n^3*(x^n)^3+30*B*a*b^2*d*m^2*(x^n)^4+30*B*a^2*b*d*m^3*(x^n)
^3+234*B*a^2*b*d*n^3*(x^n)^3+30*B*a*b^2*c*m^3*(x^n)^3+30*A*a*b^2*c*m^2*(x^n
)^2+177*A*a*b^2*c*n^2*(x^n)^2+15*A*a*b^2*d*(x^n)^3*m+123*B*b^3*c*m^2*n^2*(x
^n)^4+122*B*b^3*c*m*n^3*(x^n)^4+36*B*a^2*b*d*(x^n)^3*n+15*B*a*b^2*c*(x^n)^3
*m+36*B*a*b^2*c*(x^n)^3*n+56*A*a^3*d*m*n*x^n+213*A*a^3*d*m*n^2*x^n+30*A*a^2
*b*c*m^3*x^n+462*A*a^2*b*c*n^3*x^n+30*A*a^2*b*d*m^2*(x^n)^2+177*A*a^2*b*d*n
^2*(x^n)^2+120*B*a^3*c*m*n^4*x^n+39*B*a^2*b*c*(x^n)^2*n+15*A*a^2*b*c*x^n*m+
42*A*a^2*b*c*x^n*n+36*A*a*b^2*d*(x^n)^3*n+84*B*a^3*c*m^2*n*x^n+213*B*a^3*c*
m*n^2*x^n+52*B*a^3*d*m*n*(x^n)^2+30*B*a^2*b*c*m^2*(x^n)^2+177*B*a^2*b*c*n^2
*(x^n)^2+15*B*a^2*b*d*(x^n)^3*m+15*B*a*b^2*c*m^4*(x^n)^3+120*B*a*b^2*c*n^4*
(x^n)^3+30*A*a^2*b*c*m^2*x^n+213*A*a^2*b*c*n^2*x^n+15*A*a^2*b*d*(x^n)^2*m+3
9*A*a^2*b*d*(x^n)^2*n+15*A*a*b^2*c*(x^n)^2*m+39*A*a*b^2*c*(x^n)^2*n+56*B*a^
3*c*m*n*x^n+15*B*a^2*b*c*(x^n)^2*m+154*B*a^3*c*m^2*n^3*x^n+123*A*b^3*d*m*n^
2*(x^n)^4+13*B*a^3*d*m^4*n*(x^n)^2+59*B*a^3*d*m^3*n^2*(x^n)^2+107*B*a^3*d*m
^2*n^3*(x^n)^2+60*B*a^3*d*m*n^4*(x^n)^2+3*B*a^2*b*c*m^5*(x^n)^2+15*B*a^2*b*
d*m^4*(x^n)^3+120*B*a^2*b*d*n^4*(x^n)^3+154*A*a^3*d*m^2*n^3*x^n+66*B*b^3*c*
m^2*n*(x^n)^4+30*B*a*b^2*d*m^3*(x^n)^4+183*B*a*b^2*d*n^3*(x^n)^4+15*A*a*b^2
*d*m^4*(x^n)^3+120*A*a*b^2*d*n^4*(x^n)^3+48*A*b^3*c*m^3*n*(x^n)^3+147*A*b^3
*c*m^2*n^2*(x^n)^3+156*A*b^3*c*m*n^3*(x^n)^3+66*A*b^3*d*m^2*n*(x^n)^4+40*B*
b^3*d*m*n*(x^n)^5+14*A*a^3*d*m^4*n*x^n+71*A*a^3*d*m^3*n^2*x^n+177*B*a^3*d*m
*n^2*(x^n)^2+30*B*a^2*b*c*m^3*(x^n)^2+369*B*a*b^2*d*m^2*n^2*(x^n)^4+366*B*a
*b^2*d*m*n^3*(x^n)^4+39*A*a^2*b*d*m^4*n*(x^n)^2+177*A*a^2*b*d*m^3*n^2*(x^n)
^2+321*A*a^2*b*d*m^2*n^3*(x^n)^2+132*B*a*b^2*d*m^3*n*(x^n)^4+120*B*a*b^2*c*
m*n^4*(x^n)^3+147*B*a*b^2*c*m^3*n^2*(x^n)^3+234*B*a*b^2*c*m^2*n^3*(x^n)^3+B
*b^3*c*m^5*(x^n)^4+5*B*b^3*d*m^4*(x^n)^5+3*(x^n)^4*B*a*b^2*d+A*b^3*c*m^5*(x
^n)^3+5*A*b^3*d*m^4*(x^n)^4+30*A*b^3*d*n^4*(x^n)^4+5*B*b^3*c*m^4*(x^n)^4+30
*B*b^3*c*n^4*(x^n)^4+24*B*b^3*d*n^4*(x^n)^5+78*B*a^3*d*m^2*n*(x^n)^2+308*B*
a^3*c*m*n^3*x^n+225*A*a^3*c*m^2*n^3+274*A*a^3*c*m*n^4+60*A*a^3*c*m*n+255*A*
a^3*c*m*n^2+90*A*a^3*c*m^2*n+60*A*a^3*c*m^3*n+255*A*a^3*c*m^2*n^2+450*A*a^3
*c*m*n^3+10*B*b^3*d*m^3*(x^n)^5)/(1+m)/(m+n+1)/(1+m+2*n)/(1+m+3*n)/(1+m+4*n
)/(1+m+5*n)*exp(1/2*m*(-I*Pi*csgn(I*e*x)^3+I*Pi*csgn(I*e*x)^2*csgn(I*e)+I*P
i*csgn(I*e*x)^2*csgn(I*x)-I*Pi*csgn(I*e*x)*csgn(I*e)*csgn(I*x)+2*ln(e)+2*ln
(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.36415, size = 6700, normalized size = 31.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^3*d*m^5 + 5*B*b^3*d*m^4 + 10*B*b^3*d*m^3 + 10*B*b^3*d*m^2 + 5*B*b^3*d
*m + B*b^3*d + 24*(B*b^3*d*m + B*b^3*d)*n^4 + 50*(B*b^3*d*m^2 + 2*B*b^3*d*m
```

```
 + B*b^3*d)*n^3 + 35*(B*b^3*d*m^3 + 3*B*b^3*d*m^2 + 3*B*b^3*d*m + B*b^3*d)*
n^2 + 10*(B*b^3*d*m^4 + 4*B*b^3*d*m^3 + 6*B*b^3*d*m^2 + 4*B*b^3*d*m + B*b^3
*d)*n)*x*x^(5*n)*e^(m*log(e) + m*log(x)) + ((B*b^3*c + (3*B*a*b^2 + A*b^3)*
d)*m^5 + B*b^3*c + 5*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m^4 + 30*(B*b^3*c +
(3*B*a*b^2 + A*b^3)*d + (B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m)*n^4 + 10*(B*b^
3*c + (3*B*a*b^2 + A*b^3)*d)*m^3 + 61*(B*b^3*c + (B*b^3*c + (3*B*a*b^2 + A*
b^3)*d)*m^2 + (3*B*a*b^2 + A*b^3)*d + 2*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m
)*n^3 + 10*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m^2 + 41*(B*b^3*c + (B*b^3*c +
 (3*B*a*b^2 + A*b^3)*d)*m^3 + 3*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m^2 + (3*
B*a*b^2 + A*b^3)*d + 3*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m)*n^2 + (3*B*a*b^
2 + A*b^3)*d + 5*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m + 11*(B*b^3*c + (B*b^3
*c + (3*B*a*b^2 + A*b^3)*d)*m^4 + 4*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m^3 +
 6*(B*b^3*c + (3*B*a*b^2 + A*b^3)*d)*m^2 + (3*B*a*b^2 + A*b^3)*d + 4*(B*b^3
*c + (3*B*a*b^2 + A*b^3)*d)*m)*n)*x*x^(4*n)*e^(m*log(e) + m*log(x)) + (((3*
B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^5 + 5*((3*B*a*b^2 + A*b^3)*
c + 3*(B*a^2*b + A*a*b^2)*d)*m^4 + 40*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b +
 A*a*b^2)*d + ((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m)*n^4 + 10
*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^3 + 78*(((3*B*a*b^2 +
A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^2 + (3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*
b + A*a*b^2)*d + 2*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m)*n^3
 + 10*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^2 + 49*(((3*B*a*b
^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^3 + 3*((3*B*a*b^2 + A*b^3)*c + 3
*(B*a^2*b + A*a*b^2)*d)*m^2 + (3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)
*d + 3*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m)*n^2 + (3*B*a*b^
2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d + 5*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^
2*b + A*a*b^2)*d)*m + 12*(((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)
*m^4 + 4*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^3 + 6*((3*B*a*
b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*m^2 + (3*B*a*b^2 + A*b^3)*c + 3*(
B*a^2*b + A*a*b^2)*d + 4*((3*B*a*b^2 + A*b^3)*c + 3*(B*a^2*b + A*a*b^2)*d)*
m)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + ((3*(B*a^2*b + A*a*b^2)*c + (B*a^
3 + 3*A*a^2*b)*d)*m^5 + 5*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)
*m^4 + 60*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d + (3*(B*a^2*b +
A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m)*n^4 + 10*(3*(B*a^2*b + A*a*b^2)*c +
(B*a^3 + 3*A*a^2*b)*d)*m^3 + 107*((3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a
^2*b)*d)*m^2 + 3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d + 2*(3*(B*a^
2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m)*n^3 + 10*(3*(B*a^2*b + A*a*b^2
)*c + (B*a^3 + 3*A*a^2*b)*d)*m^2 + 59*((3*(B*a^2*b + A*a*b^2)*c + (B*a^3 +
3*A*a^2*b)*d)*m^3 + 3*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m^2
 + 3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d + 3*(3*(B*a^2*b + A*a*b^
2)*c + (B*a^3 + 3*A*a^2*b)*d)*m)*n^2 + 3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3
*A*a^2*b)*d + 5*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m + 13*((
3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m^4 + 4*(3*(B*a^2*b + A*a*
b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m^3 + 6*(3*(B*a^2*b + A*a*b^2)*c + (B*a^3 +
 3*A*a^2*b)*d)*m^2 + 3*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d + 4*(3
*(B*a^2*b + A*a*b^2)*c + (B*a^3 + 3*A*a^2*b)*d)*m)*n)*x*x^(2*n)*e^(m*log(e)
 + m*log(x)) + ((A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m^5 + A*a^3*d + 5*(A*a^3*
d + (B*a^3 + 3*A*a^2*b)*c)*m^4 + 120*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c + (A*
a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m)*n^4 + 10*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c
)*m^3 + 154*(A*a^3*d + (A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m^2 + (B*a^3 + 3*A
*a^2*b)*c + 2*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m)*n^3 + 10*(A*a^3*d + (B*a
^3 + 3*A*a^2*b)*c)*m^2 + 71*(A*a^3*d + (A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m^
3 + 3*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m^2 + (B*a^3 + 3*A*a^2*b)*c + 3*(A*
a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m)*n^2 + (B*a^3 + 3*A*a^2*b)*c + 5*(A*a^3*d
+ (B*a^3 + 3*A*a^2*b)*c)*m + 14*(A*a^3*d + (A*a^3*d + (B*a^3 + 3*A*a^2*b)*c
)*m^4 + 4*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c)*m^3 + 6*(A*a^3*d + (B*a^3 + 3*A
*a^2*b)*c)*m^2 + (B*a^3 + 3*A*a^2*b)*c + 4*(A*a^3*d + (B*a^3 + 3*A*a^2*b)*c
)*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) + (A*a^3*c*m^5 + 120*A*a^3*c*n^5 + 5*
A*a^3*c*m^4 + 10*A*a^3*c*m^3 + 10*A*a^3*c*m^2 + 5*A*a^3*c*m + A*a^3*c + 274
*(A*a^3*c*m + A*a^3*c)*n^4 + 225*(A*a^3*c*m^2 + 2*A*a^3*c*m + A*a^3*c)*n^3
```

```
+ 85*(A*a^3*c*m^3 + 3*A*a^3*c*m^2 + 3*A*a^3*c*m + A*a^3*c)*n^2 + 15*(A*a^3*
c*m^4 + 4*A*a^3*c*m^3 + 6*A*a^3*c*m^2 + 4*A*a^3*c*m + A*a^3*c)*n)*x*e^(m*lo
g(e) + m*log(x)))/(m^6 + 120*(m + 1)*n^5 + 6*m^5 + 274*(m^2 + 2*m + 1)*n^4
+ 15*m^4 + 225*(m^3 + 3*m^2 + 3*m + 1)*n^3 + 20*m^3 + 85*(m^4 + 4*m^3 + 6*m
^2 + 4*m + 1)*n^2 + 15*m^2 + 15*(m^5 + 5*m^4 + 10*m^3 + 10*m^2 + 5*m + 1)*n
 + 6*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.66911, size = 9351, normalized size = 44.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b^3*d*m^5*x*x^m*x^(5*n)*e^m + 10*B*b^3*d*m^4*n*x*x^m*x^(5*n)*e^m + 35*B*
b^3*d*m^3*n^2*x*x^m*x^(5*n)*e^m + 50*B*b^3*d*m^2*n^3*x*x^m*x^(5*n)*e^m + 24
*B*b^3*d*m*n^4*x*x^m*x^(5*n)*e^m + B*b^3*c*m^5*x*x^m*x^(4*n)*e^m + 3*B*a*b^
2*d*m^5*x*x^m*x^(4*n)*e^m + A*b^3*d*m^5*x*x^m*x^(4*n)*e^m + 11*B*b^3*c*m^4*
n*x*x^m*x^(4*n)*e^m + 33*B*a*b^2*d*m^4*n*x*x^m*x^(4*n)*e^m + 11*A*b^3*d*m^4
*n*x*x^m*x^(4*n)*e^m + 41*B*b^3*c*m^3*n^2*x*x^m*x^(4*n)*e^m + 123*B*a*b^2*d
*m^3*n^2*x*x^m*x^(4*n)*e^m + 41*A*b^3*d*m^3*n^2*x*x^m*x^(4*n)*e^m + 61*B*b^
3*c*m^2*n^3*x*x^m*x^(4*n)*e^m + 183*B*a*b^2*d*m^2*n^3*x*x^m*x^(4*n)*e^m + 6
1*A*b^3*d*m^2*n^3*x*x^m*x^(4*n)*e^m + 30*B*b^3*c*m*n^4*x*x^m*x^(4*n)*e^m +
90*B*a*b^2*d*m*n^4*x*x^m*x^(4*n)*e^m + 30*A*b^3*d*m*n^4*x*x^m*x^(4*n)*e^m +
 3*B*a*b^2*c*m^5*x*x^m*x^(3*n)*e^m + A*b^3*c*m^5*x*x^m*x^(3*n)*e^m + 3*B*a^
2*b*d*m^5*x*x^m*x^(3*n)*e^m + 3*A*a*b^2*d*m^5*x*x^m*x^(3*n)*e^m + 36*B*a*b^
2*c*m^4*n*x*x^m*x^(3*n)*e^m + 12*A*b^3*c*m^4*n*x*x^m*x^(3*n)*e^m + 36*B*a^2
*b*d*m^4*n*x*x^m*x^(3*n)*e^m + 36*A*a*b^2*d*m^4*n*x*x^m*x^(3*n)*e^m + 147*B
*a*b^2*c*m^3*n^2*x*x^m*x^(3*n)*e^m + 49*A*b^3*c*m^3*n^2*x*x^m*x^(3*n)*e^m +
 147*B*a^2*b*d*m^3*n^2*x*x^m*x^(3*n)*e^m + 147*A*a*b^2*d*m^3*n^2*x*x^m*x^(3
*n)*e^m + 234*B*a*b^2*c*m^2*n^3*x*x^m*x^(3*n)*e^m + 78*A*b^3*c*m^2*n^3*x*x^
m*x^(3*n)*e^m + 234*B*a^2*b*d*m^2*n^3*x*x^m*x^(3*n)*e^m + 234*A*a*b^2*d*m^2
*n^3*x*x^m*x^(3*n)*e^m + 120*B*a*b^2*c*m*n^4*x*x^m*x^(3*n)*e^m + 40*A*b^3*c
*m*n^4*x*x^m*x^(3*n)*e^m + 120*B*a^2*b*d*m*n^4*x*x^m*x^(3*n)*e^m + 120*A*a*
b^2*d*m*n^4*x*x^m*x^(3*n)*e^m + 3*B*a^2*b*c*m^5*x*x^m*x^(2*n)*e^m + 3*A*a*b
^2*c*m^5*x*x^m*x^(2*n)*e^m + B*a^3*d*m^5*x*x^m*x^(2*n)*e^m + 3*A*a^2*b*d*m^
5*x*x^m*x^(2*n)*e^m + 39*B*a^2*b*c*m^4*n*x*x^m*x^(2*n)*e^m + 39*A*a*b^2*c*m
^4*n*x*x^m*x^(2*n)*e^m + 13*B*a^3*d*m^4*n*x*x^m*x^(2*n)*e^m + 39*A*a^2*b*d*
m^4*n*x*x^m*x^(2*n)*e^m + 177*B*a^2*b*c*m^3*n^2*x*x^m*x^(2*n)*e^m + 177*A*a
*b^2*c*m^3*n^2*x*x^m*x^(2*n)*e^m + 59*B*a^3*d*m^3*n^2*x*x^m*x^(2*n)*e^m + 1
77*A*a^2*b*d*m^3*n^2*x*x^m*x^(2*n)*e^m + 321*B*a^2*b*c*m^2*n^3*x*x^m*x^(2*n
)*e^m + 321*A*a*b^2*c*m^2*n^3*x*x^m*x^(2*n)*e^m + 107*B*a^3*d*m^2*n^3*x*x^m
*x^(2*n)*e^m + 321*A*a^2*b*d*m^2*n^3*x*x^m*x^(2*n)*e^m + 180*B*a^2*b*c*m*n^
```

```
4*x*x^m*x^(2*n)*e^m + 180*A*a*b^2*c*m*n^4*x*x^m*x^(2*n)*e^m + 60*B*a^3*d*m*
n^4*x*x^m*x^(2*n)*e^m + 180*A*a^2*b*d*m*n^4*x*x^m*x^(2*n)*e^m + B*a^3*c*m^5
*x*x^m*x^n*e^m + 3*A*a^2*b*c*m^5*x*x^m*x^n*e^m + A*a^3*d*m^5*x*x^m*x^n*e^m
+ 14*B*a^3*c*m^4*n*x*x^m*x^n*e^m + 42*A*a^2*b*c*m^4*n*x*x^m*x^n*e^m + 14*A*
a^3*d*m^4*n*x*x^m*x^n*e^m + 71*B*a^3*c*m^3*n^2*x*x^m*x^n*e^m + 213*A*a^2*b*
c*m^3*n^2*x*x^m*x^n*e^m + 71*A*a^3*d*m^3*n^2*x*x^m*x^n*e^m + 154*B*a^3*c*m^
2*n^3*x*x^m*x^n*e^m + 462*A*a^2*b*c*m^2*n^3*x*x^m*x^n*e^m + 154*A*a^3*d*m^2
*n^3*x*x^m*x^n*e^m + 120*B*a^3*c*m*n^4*x*x^m*x^n*e^m + 360*A*a^2*b*c*m*n^4*
x*x^m*x^n*e^m + 120*A*a^3*d*m*n^4*x*x^m*x^n*e^m + A*a^3*c*m^5*x*x^m*e^m + 1
5*A*a^3*c*m^4*n*x*x^m*e^m + 85*A*a^3*c*m^3*n^2*x*x^m*e^m + 225*A*a^3*c*m^2*
n^3*x*x^m*e^m + 274*A*a^3*c*m*n^4*x*x^m*e^m + 120*A*a^3*c*n^5*x*x^m*e^m + 5
*B*b^3*d*m^4*x*x^m*x^(5*n)*e^m + 40*B*b^3*d*m^3*n*x*x^m*x^(5*n)*e^m + 105*B
*b^3*d*m^2*n^2*x*x^m*x^(5*n)*e^m + 100*B*b^3*d*m*n^3*x*x^m*x^(5*n)*e^m + 24
*B*b^3*d*n^4*x*x^m*x^(5*n)*e^m + 5*B*b^3*c*m^4*x*x^m*x^(4*n)*e^m + 15*B*a*b
^2*d*m^4*x*x^m*x^(4*n)*e^m + 5*A*b^3*d*m^4*x*x^m*x^(4*n)*e^m + 44*B*b^3*c*m
^3*n*x*x^m*x^(4*n)*e^m + 132*B*a*b^2*d*m^3*n*x*x^m*x^(4*n)*e^m + 44*A*b^3*d
*m^3*n*x*x^m*x^(4*n)*e^m + 123*B*b^3*c*m^2*n^2*x*x^m*x^(4*n)*e^m + 369*B*a*
b^2*d*m^2*n^2*x*x^m*x^(4*n)*e^m + 123*A*b^3*d*m^2*n^2*x*x^m*x^(4*n)*e^m + 1
22*B*b^3*c*m*n^3*x*x^m*x^(4*n)*e^m + 366*B*a*b^2*d*m*n^3*x*x^m*x^(4*n)*e^m
+ 122*A*b^3*d*m*n^3*x*x^m*x^(4*n)*e^m + 30*B*b^3*c*n^4*x*x^m*x^(4*n)*e^m +
90*B*a*b^2*d*n^4*x*x^m*x^(4*n)*e^m + 30*A*b^3*d*n^4*x*x^m*x^(4*n)*e^m + 15*
B*a*b^2*c*m^4*x*x^m*x^(3*n)*e^m + 5*A*b^3*c*m^4*x*x^m*x^(3*n)*e^m + 15*B*a^
2*b*d*m^4*x*x^m*x^(3*n)*e^m + 15*A*a*b^2*d*m^4*x*x^m*x^(3*n)*e^m + 144*B*a*
b^2*c*m^3*n*x*x^m*x^(3*n)*e^m + 48*A*b^3*c*m^3*n*x*x^m*x^(3*n)*e^m + 144*B*
a^2*b*d*m^3*n*x*x^m*x^(3*n)*e^m + 144*A*a*b^2*d*m^3*n*x*x^m*x^(3*n)*e^m + 4
41*B*a*b^2*c*m^2*n^2*x*x^m*x^(3*n)*e^m + 147*A*b^3*c*m^2*n^2*x*x^m*x^(3*n)*
e^m + 441*B*a^2*b*d*m^2*n^2*x*x^m*x^(3*n)*e^m + 441*A*a*b^2*d*m^2*n^2*x*x^m
*x^(3*n)*e^m + 468*B*a*b^2*c*m*n^3*x*x^m*x^(3*n)*e^m + 156*A*b^3*c*m*n^3*x*
x^m*x^(3*n)*e^m + 468*B*a^2*b*d*m*n^3*x*x^m*x^(3*n)*e^m + 468*A*a*b^2*d*m*n
^3*x*x^m*x^(3*n)*e^m + 120*B*a*b^2*c*n^4*x*x^m*x^(3*n)*e^m + 40*A*b^3*c*n^4
*x*x^m*x^(3*n)*e^m + 120*B*a^2*b*d*n^4*x*x^m*x^(3*n)*e^m + 120*A*a*b^2*d*n^
4*x*x^m*x^(3*n)*e^m + 15*B*a^2*b*c*m^4*x*x^m*x^(2*n)*e^m + 15*A*a*b^2*c*m^4
*x*x^m*x^(2*n)*e^m + 5*B*a^3*d*m^4*x*x^m*x^(2*n)*e^m + 15*A*a^2*b*d*m^4*x*x
^m*x^(2*n)*e^m + 156*B*a^2*b*c*m^3*n*x*x^m*x^(2*n)*e^m + 156*A*a*b^2*c*m^3*
n*x*x^m*x^(2*n)*e^m + 52*B*a^3*d*m^3*n*x*x^m*x^(2*n)*e^m + 156*A*a^2*b*d*m^
3*n*x*x^m*x^(2*n)*e^m + 531*B*a^2*b*c*m^2*n^2*x*x^m*x^(2*n)*e^m + 531*A*a*b
^2*c*m^2*n^2*x*x^m*x^(2*n)*e^m + 177*B*a^3*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 53
1*A*a^2*b*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 642*B*a^2*b*c*m*n^3*x*x^m*x^(2*n)*e
^m + 642*A*a*b^2*c*m*n^3*x*x^m*x^(2*n)*e^m + 214*B*a^3*d*m*n^3*x*x^m*x^(2*n
)*e^m + 642*A*a^2*b*d*m*n^3*x*x^m*x^(2*n)*e^m + 180*B*a^2*b*c*n^4*x*x^m*x^(
2*n)*e^m + 180*A*a*b^2*c*n^4*x*x^m*x^(2*n)*e^m + 60*B*a^3*d*n^4*x*x^m*x^(2*
n)*e^m + 180*A*a^2*b*d*n^4*x*x^m*x^(2*n)*e^m + 5*B*a^3*c*m^4*x*x^m*x^n*e^m
+ 15*A*a^2*b*c*m^4*x*x^m*x^n*e^m + 5*A*a^3*d*m^4*x*x^m*x^n*e^m + 56*B*a^3*c
*m^3*n*x*x^m*x^n*e^m + 168*A*a^2*b*c*m^3*n*x*x^m*x^n*e^m + 56*A*a^3*d*m^3*n
*x*x^m*x^n*e^m + 213*B*a^3*c*m^2*n^2*x*x^m*x^n*e^m + 639*A*a^2*b*c*m^2*n^2*
x*x^m*x^n*e^m + 213*A*a^3*d*m^2*n^2*x*x^m*x^n*e^m + 308*B*a^3*c*m*n^3*x*x^m
*x^n*e^m + 924*A*a^2*b*c*m*n^3*x*x^m*x^n*e^m + 308*A*a^3*d*m*n^3*x*x^m*x^n*
e^m + 120*B*a^3*c*n^4*x*x^m*x^n*e^m + 360*A*a^2*b*c*n^4*x*x^m*x^n*e^m + 120
*A*a^3*d*n^4*x*x^m*x^n*e^m + 5*A*a^3*c*m^4*x*x^m*e^m + 60*A*a^3*c*m^3*n*x*x
^m*e^m + 255*A*a^3*c*m^2*n^2*x*x^m*e^m + 450*A*a^3*c*m*n^3*x*x^m*e^m + 274*
A*a^3*c*n^4*x*x^m*e^m + 10*B*b^3*d*m^3*x*x^m*x^(5*n)*e^m + 60*B*b^3*d*m^2*n
*x*x^m*x^(5*n)*e^m + 105*B*b^3*d*m*n^2*x*x^m*x^(5*n)*e^m + 50*B*b^3*d*n^3*x
*x^m*x^(5*n)*e^m + 10*B*b^3*c*m^3*x*x^m*x^(4*n)*e^m + 30*B*a*b^2*d*m^3*x*x^
m*x^(4*n)*e^m + 10*A*b^3*d*m^3*x*x^m*x^(4*n)*e^m + 66*B*b^3*c*m^2*n*x*x^m*x
^(4*n)*e^m + 198*B*a*b^2*d*m^2*n*x*x^m*x^(4*n)*e^m + 66*A*b^3*d*m^2*n*x*x^m
*x^(4*n)*e^m + 123*B*b^3*c*m*n^2*x*x^m*x^(4*n)*e^m + 369*B*a*b^2*d*m*n^2*x*
x^m*x^(4*n)*e^m + 123*A*b^3*d*m*n^2*x*x^m*x^(4*n)*e^m + 61*B*b^3*c*n^3*x*x^
m*x^(4*n)*e^m + 183*B*a*b^2*d*n^3*x*x^m*x^(4*n)*e^m + 61*A*b^3*d*n^3*x*x^m*
x^(4*n)*e^m + 30*B*a*b^2*c*m^3*x*x^m*x^(3*n)*e^m + 10*A*b^3*c*m^3*x*x^m*x^(
```

```
3*n)*e^m + 30*B*a^2*b*d*m^3*x*x^m*x^(3*n)*e^m + 30*A*a*b^2*d*m^3*x*x^m*x^(3
*n)*e^m + 216*B*a*b^2*c*m^2*n*x*x^m*x^(3*n)*e^m + 72*A*b^3*c*m^2*n*x*x^m*x^
(3*n)*e^m + 216*B*a^2*b*d*m^2*n*x*x^m*x^(3*n)*e^m + 216*A*a*b^2*d*m^2*n*x*x
^m*x^(3*n)*e^m + 441*B*a*b^2*c*m*n^2*x*x^m*x^(3*n)*e^m + 147*A*b^3*c*m*n^2*
x*x^m*x^(3*n)*e^m + 441*B*a^2*b*d*m*n^2*x*x^m*x^(3*n)*e^m + 441*A*a*b^2*d*m
*n^2*x*x^m*x^(3*n)*e^m + 234*B*a*b^2*c*n^3*x*x^m*x^(3*n)*e^m + 78*A*b^3*c*n
^3*x*x^m*x^(3*n)*e^m + 234*B*a^2*b*d*n^3*x*x^m*x^(3*n)*e^m + 234*A*a*b^2*d*
n^3*x*x^m*x^(3*n)*e^m + 30*B*a^2*b*c*m^3*x*x^m*x^(2*n)*e^m + 30*A*a*b^2*c*m
^3*x*x^m*x^(2*n)*e^m + 10*B*a^3*d*m^3*x*x^m*x^(2*n)*e^m + 30*A*a^2*b*d*m^3*
x*x^m*x^(2*n)*e^m + 234*B*a^2*b*c*m^2*n*x*x^m*x^(2*n)*e^m + 234*A*a*b^2*c*m
^2*n*x*x^m*x^(2*n)*e^m + 78*B*a^3*d*m^2*n*x*x^m*x^(2*n)*e^m + 234*A*a^2*b*d
*m^2*n*x*x^m*x^(2*n)*e^m + 531*B*a^2*b*c*m*n^2*x*x^m*x^(2*n)*e^m + 531*A*a*
b^2*c*m*n^2*x*x^m*x^(2*n)*e^m + 177*B*a^3*d*m*n^2*x*x^m*x^(2*n)*e^m + 531*A
*a^2*b*d*m*n^2*x*x^m*x^(2*n)*e^m + 321*B*a^2*b*c*n^3*x*x^m*x^(2*n)*e^m + 32
1*A*a*b^2*c*n^3*x*x^m*x^(2*n)*e^m + 107*B*a^3*d*n^3*x*x^m*x^(2*n)*e^m + 321
*A*a^2*b*d*n^3*x*x^m*x^(2*n)*e^m + 10*B*a^3*c*m^3*x*x^m*x^n*e^m + 30*A*a^2*
b*c*m^3*x*x^m*x^n*e^m + 10*A*a^3*d*m^3*x*x^m*x^n*e^m + 84*B*a^3*c*m^2*n*x*x
^m*x^n*e^m + 252*A*a^2*b*c*m^2*n*x*x^m*x^n*e^m + 84*A*a^3*d*m^2*n*x*x^m*x^n
*e^m + 213*B*a^3*c*m*n^2*x*x^m*x^n*e^m + 639*A*a^2*b*c*m*n^2*x*x^m*x^n*e^m
 + 213*A*a^3*d*m*n^2*x*x^m*x^n*e^m + 154*B*a^3*c*n^3*x*x^m*x^n*e^m + 462*A*a
^2*b*c*n^3*x*x^m*x^n*e^m + 154*A*a^3*d*n^3*x*x^m*x^n*e^m + 10*A*a^3*c*m^3*x
*x^m*e^m + 90*A*a^3*c*m^2*n*x*x^m*e^m + 255*A*a^3*c*m*n^2*x*x^m*e^m + 225*A
*a^3*c*n^3*x*x^m*e^m + 10*B*b^3*d*m^2*x*x^m*x^(5*n)*e^m + 40*B*b^3*d*m*n*x*
x^m*x^(5*n)*e^m + 35*B*b^3*d*n^2*x*x^m*x^(5*n)*e^m + 10*B*b^3*c*m^2*x*x^m*x
^(4*n)*e^m + 30*B*a*b^2*d*m^2*x*x^m*x^(4*n)*e^m + 10*A*b^3*d*m^2*x*x^m*x^(4
*n)*e^m + 44*B*b^3*c*m*n*x*x^m*x^(4*n)*e^m + 132*B*a*b^2*d*m*n*x*x^m*x^(4*n
)*e^m + 44*A*b^3*d*m*n*x*x^m*x^(4*n)*e^m + 41*B*b^3*c*n^2*x*x^m*x^(4*n)*e^m
 + 123*B*a*b^2*d*n^2*x*x^m*x^(4*n)*e^m + 41*A*b^3*d*n^2*x*x^m*x^(4*n)*e^m +
 30*B*a*b^2*c*m^2*x*x^m*x^(3*n)*e^m + 10*A*b^3*c*m^2*x*x^m*x^(3*n)*e^m + 30
*B*a^2*b*d*m^2*x*x^m*x^(3*n)*e^m + 30*A*a*b^2*d*m^2*x*x^m*x^(3*n)*e^m + 144
*B*a*b^2*c*m*n*x*x^m*x^(3*n)*e^m + 48*A*b^3*c*m*n*x*x^m*x^(3*n)*e^m + 144*B
*a^2*b*d*m*n*x*x^m*x^(3*n)*e^m + 144*A*a*b^2*d*m*n*x*x^m*x^(3*n)*e^m + 147*
B*a*b^2*c*n^2*x*x^m*x^(3*n)*e^m + 49*A*b^3*c*n^2*x*x^m*x^(3*n)*e^m + 147*B*
a^2*b*d*n^2*x*x^m*x^(3*n)*e^m + 147*A*a*b^2*d*n^2*x*x^m*x^(3*n)*e^m + 30*B*
a^2*b*c*m^2*x*x^m*x^(2*n)*e^m + 30*A*a*b^2*c*m^2*x*x^m*x^(2*n)*e^m + 10*B*a
^3*d*m^2*x*x^m*x^(2*n)*e^m + 30*A*a^2*b*d*m^2*x*x^m*x^(2*n)*e^m + 156*B*a^2
*b*c*m*n*x*x^m*x^(2*n)*e^m + 156*A*a*b^2*c*m*n*x*x^m*x^(2*n)*e^m + 52*B*a^3
*d*m*n*x*x^m*x^(2*n)*e^m + 156*A*a^2*b*d*m*n*x*x^m*x^(2*n)*e^m + 177*B*a^2*
b*c*n^2*x*x^m*x^(2*n)*e^m + 177*A*a*b^2*c*n^2*x*x^m*x^(2*n)*e^m + 59*B*a^3*
d*n^2*x*x^m*x^(2*n)*e^m + 177*A*a^2*b*d*n^2*x*x^m*x^(2*n)*e^m + 10*B*a^3*c*
m^2*x*x^m*x^n*e^m + 30*A*a^2*b*c*m^2*x*x^m*x^n*e^m + 10*A*a^3*d*m^2*x*x^m*x
^n*e^m + 56*B*a^3*c*m*n*x*x^m*x^n*e^m + 168*A*a^2*b*c*m*n*x*x^m*x^n*e^m + 5
6*A*a^3*d*m*n*x*x^m*x^n*e^m + 71*B*a^3*c*n^2*x*x^m*x^n*e^m + 213*A*a^2*b*c*
n^2*x*x^m*x^n*e^m + 71*A*a^3*d*n^2*x*x^m*x^n*e^m + 10*A*a^3*c*m^2*x*x^m*e^m
 + 60*A*a^3*c*m*n*x*x^m*e^m + 85*A*a^3*c*n^2*x*x^m*e^m + 5*B*b^3*d*m*x*x^m*
x^(5*n)*e^m + 10*B*b^3*d*n*x*x^m*x^(5*n)*e^m + 5*B*b^3*c*m*x*x^m*x^(4*n)*e^
m + 15*B*a*b^2*d*m*x*x^m*x^(4*n)*e^m + 5*A*b^3*d*m*x*x^m*x^(4*n)*e^m + 11*B
*b^3*c*n*x*x^m*x^(4*n)*e^m + 33*B*a*b^2*d*n*x*x^m*x^(4*n)*e^m + 11*A*b^3*d*
n*x*x^m*x^(4*n)*e^m + 15*B*a*b^2*c*m*x*x^m*x^(3*n)*e^m + 5*A*b^3*c*m*x*x^m*
x^(3*n)*e^m + 15*B*a^2*b*d*m*x*x^m*x^(3*n)*e^m + 15*A*a*b^2*d*m*x*x^m*x^(3*
n)*e^m + 36*B*a*b^2*c*n*x*x^m*x^(3*n)*e^m + 12*A*b^3*c*n*x*x^m*x^(3*n)*e^m
 + 36*B*a^2*b*d*n*x*x^m*x^(3*n)*e^m + 36*A*a*b^2*d*n*x*x^m*x^(3*n)*e^m + 15*
B*a^2*b*c*m*x*x^m*x^(2*n)*e^m + 15*A*a*b^2*c*m*x*x^m*x^(2*n)*e^m + 5*B*a^3*
d*m*x*x^m*x^(2*n)*e^m + 15*A*a^2*b*d*m*x*x^m*x^(2*n)*e^m + 39*B*a^2*b*c*n*x
*x^m*x^(2*n)*e^m + 39*A*a*b^2*c*n*x*x^m*x^(2*n)*e^m + 13*B*a^3*d*n*x*x^m*x^
(2*n)*e^m + 39*A*a^2*b*d*n*x*x^m*x^(2*n)*e^m + 5*B*a^3*c*m*x*x^m*x^n*e^m +
15*A*a^2*b*c*m*x*x^m*x^n*e^m + 5*A*a^3*d*m*x*x^m*x^n*e^m + 14*B*a^3*c*n*x*x
^m*x^n*e^m + 42*A*a^2*b*c*n*x*x^m*x^n*e^m + 14*A*a^3*d*n*x*x^m*x^n*e^m + 5*
A*a^3*c*m*x*x^m*e^m + 15*A*a^3*c*n*x*x^m*e^m + B*b^3*d*x*x^m*x^(5*n)*e^m +
```

```
B*b^3*c*x*x^m*x^(4*n)*e^m + 3*B*a*b^2*d*x*x^m*x^(4*n)*e^m + A*b^3*d*x*x^m*x
^(4*n)*e^m + 3*B*a*b^2*c*x*x^m*x^(3*n)*e^m + A*b^3*c*x*x^m*x^(3*n)*e^m + 3*
B*a^2*b*d*x*x^m*x^(3*n)*e^m + 3*A*a*b^2*d*x*x^m*x^(3*n)*e^m + 3*B*a^2*b*c*x
*x^m*x^(2*n)*e^m + 3*A*a*b^2*c*x*x^m*x^(2*n)*e^m + B*a^3*d*x*x^m*x^(2*n)*e^
m + 3*A*a^2*b*d*x*x^m*x^(2*n)*e^m + B*a^3*c*x*x^m*x^n*e^m + 3*A*a^2*b*c*x*x
^m*x^n*e^m + A*a^3*d*x*x^m*x^n*e^m + A*a^3*c*x*x^m*e^m)/(m^6 + 15*m^5*n + 8
5*m^4*n^2 + 225*m^3*n^3 + 274*m^2*n^4 + 120*m*n^5 + 6*m^5 + 75*m^4*n + 340*
m^3*n^2 + 675*m^2*n^3 + 548*m*n^4 + 120*n^5 + 15*m^4 + 150*m^3*n + 510*m^2*
n^2 + 675*m*n^3 + 274*n^4 + 20*m^3 + 150*m^2*n + 340*m*n^2 + 225*n^3 + 15*m
^2 + 75*m*n + 85*n^2 + 6*m + 15*n + 1)
```

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

Optimal. Leaf size=160

$$\frac{a^2Ac(ex)^{m+1}}{e(m+1)}+\frac{ax^{n+1}(ex)^m(aAd+aBc+2Abc)}{m+n+1}+\frac{x^{2n+1}(ex)^m(Ab(2ad+bc)+aB(ad+2bc))}{m+2n+1}+\frac{bx^{3n+1}(ex)^m(2aBd+Abd}{m+3n+1}$$

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

Rubi [A] time = 0.176407, antiderivative size = 160, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {570, 20, 30}

$$\frac{a^2Ac(ex)^{m+1}}{e(m+1)}+\frac{ax^{n+1}(ex)^m(aAd+aBc+2Abc)}{m+n+1}+\frac{x^{2n+1}(ex)^m(Ab(2ad+bc)+aB(ad+2bc))}{m+2n+1}+\frac{bx^{3n+1}(ex)^m(2aBd+Abd}{m+3n+1}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int (ex)^m (a+bx^n)^2 (A+Bx^n)(c+dx^n)\, dx = \int \left(a^2Ac(ex)^m + a(2Abc+aBc+aAd)x^n(ex)^m + (aB(2bc+ad)+Ab(bc$$
$$= \frac{a^2Ac(ex)^{1+m}}{e(1+m)} + \left(b^2Bd\right)\int x^{4n}(ex)^m\, dx + (a(2Abc+aBc+aAd))\int x^n(ex$$
$$= \frac{a^2Ac(ex)^{1+m}}{e(1+m)} + \left(b^2Bdx^{-m}(ex)^m\right)\int x^{m+4n}\, dx + (a(2Abc+aBc+aAd)x^{-n}$$
$$= \frac{a(2Abc+aBc+aAd)x^{1+n}(ex)^m}{1+m+n} + \frac{(aB(2bc+ad)+Ab(bc+2ad))x^{1+2n}(e}{1+m+2n}$$

Mathematica [A] time = 0.310725, size = 129, normalized size = 0.81

$$x(ex)^m \left(\frac{a^2Ac}{m+1} + \frac{ax^n(aAd+aBc+2Abc)}{m+n+1} + \frac{x^{2n}(Ab(2ad+bc)+aB(ad+2bc))}{m+2n+1} + \frac{bx^{3n}(2aBd+Abd+bBc)}{m+3n+1} + \frac{b^2Bdx}{m+4n}$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.075, size = 2410, normalized size = 15.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(26*A*a^2*d*m^2*n^2*x^n+24*A*a^2*d*m*n^3*x^n+2*A*a*b*c*m^4*x^n+19*B*a^2*d
*m^2*n^2*(x^n)^2+12*B*a^2*d*m*n^3*(x^n)^2+2*B*a*b*c*m^4*(x^n)^2+8*B*a*b*d*m
^3*(x^n)^3+16*B*a*b*d*n^3*(x^n)^3+21*B*b^2*c*m^2*n*(x^n)^3+12*A*b^2*c*n^3*(
x^n)^2+6*B*a^2*c*m^2*x^n+26*B*a^2*c*n^2*x^n+4*B*a^2*d*(x^n)^2*m+8*B*a^2*d*(
x^n)^2*n+2*B*a*b*d*(x^n)^3+4*A*a^2*d*x^n*m+9*A*a^2*d*x^n*n+2*A*a*b*d*(x^n)^
2+24*B*a^2*c*m*n^3*x^n+24*B*a^2*d*m^2*n*(x^n)^2+38*B*a^2*d*m*n^2*(x^n)^2+6*
A*b^2*d*m^2*(x^n)^3+14*A*b^2*d*n^2*(x^n)^3+B*a^2*c*m^4*x^n+4*B*a^2*c*x^n*m+
9*B*a^2*c*x^n*n+2*B*a*b*c*(x^n)^2+76*B*a*b*c*m*n^2*(x^n)^2+42*B*a*b*d*m*n*(
x^n)^3+54*A*a*b*c*m^2*n*x^n+104*A*a*b*c*m*n^2*x^n+18*A*a*b*c*m^3*n*x^n+52*A
*a*b*c*m^2*n^2*x^n+48*A*a*b*c*m*n^3*x^n+48*A*a*b*d*m^2*n*(x^n)^2+76*A*a*b*d
*m*n^2*(x^n)^2+48*B*a*b*c*m^2*n*(x^n)^2+B*a^2*d*(x^n)^2+A*a^2*d*x^n+B*a^2*c
*x^n+26*A*a^2*d*n^2*x^n+4*A*b^2*c*(x^n)^2*m+6*B*a^2*d*m^2*(x^n)^2+19*B*a^2*
d*n^2*(x^n)^2+b^2*B*d*(x^n)^4+B*b^2*c*(x^n)^3+(x^n)^3*A*b^2*d+(x^n)^2*A*b^2
*c+24*B*a^2*d*m*n*(x^n)^2+12*B*a*b*c*m^2*(x^n)^2+38*B*a*b*c*n^2*(x^n)^2+8*B
*a*b*d*(x^n)^3*m+14*B*a*b*d*(x^n)^3*n+4*B*a^2*c*m^3*x^n+16*B*a*b*d*m*n^3*(x
^n)^3+14*B*a*b*d*m^3*n*(x^n)^3+28*B*a*b*d*m^2*n^2*(x^n)^3+35*A*a^2*c*n^2+24
*A*a^2*c*n^4+A*a^2*c*m^4+4*A*a^2*c*m^3+50*A*a^2*c*n^3+6*A*a^2*c*m^2+30*A*a^
2*c*m*n+a^2*A*c+10*A*a^2*c*m^3*n+35*A*a^2*c*m^2*n^2+50*A*a^2*c*m*n^3+30*A*a
^2*c*m^2*n+70*A*a^2*c*m*n^2+7*B*b^2*c*(x^n)^3*n+6*A*a^2*d*m^2*x^n+28*B*b^2*
c*m*n^2*(x^n)^3+18*B*b^2*d*m*n*(x^n)^4+9*A*a^2*d*m^3*n*x^n+B*b^2*d*m^4*(x^n
)^4+A*b^2*d*m^4*(x^n)^3+38*A*a*b*d*n^2*(x^n)^2+24*A*b^2*c*m*n*(x^n)^2+27*B*
a^2*c*m^2*n*x^n+52*B*a^2*c*m*n^2*x^n+8*A*a*b*d*m^3*(x^n)^2+24*A*a*b*d*n^3*(
```

```
x^n)^2+24*A*b^2*c*m^2*n*(x^n)^2+38*A*b^2*c*m*n^2*(x^n)^2+21*A*b^2*d*m*n*(x^
n)^3+9*B*a^2*c*m^3*n*x^n+26*B*a^2*c*m^2*n^2*x^n+22*B*b^2*d*m*n^2*(x^n)^4+2*
A*a*b*d*m^4*(x^n)^2+4*m*b^2*B*d*(x^n)^4+6*b^2*B*d*(x^n)^4*n+4*A*a^2*d*m^3*x
^n+24*A*a^2*d*n^3*x^n+6*A*b^2*c*m^2*(x^n)^2+19*A*b^2*c*n^2*(x^n)^2+4*A*b^2*
d*(x^n)^3*m+7*A*b^2*d*(x^n)^3*n+48*A*a*b*d*m*n*(x^n)^2+16*B*a*b*c*m^3*n*(x^
n)^2+38*B*a*b*c*m^2*n^2*(x^n)^2+24*B*a*b*c*m*n^3*(x^n)^2+42*B*a*b*d*m^2*n*(
x^n)^3+56*B*a*b*d*m*n^2*(x^n)^3+8*A*b^2*d*n^3*(x^n)^3+B*a^2*d*m^4*(x^n)^2+4
*a^2*A*c*m+10*a^2*A*c*n+4*B*b^2*c*m^3*(x^n)^3+8*B*b^2*c*n^3*(x^n)^3+6*B*b^2
*d*m^2*(x^n)^4+11*B*b^2*d*n^2*(x^n)^4+A*a^2*d*m^4*x^n+4*A*b^2*c*m^3*(x^n)^2
+24*B*a^2*c*n^3*x^n+8*A*b^2*c*(x^n)^2*n+4*B*a^2*d*m^3*(x^n)^2+12*B*a^2*d*n^
3*(x^n)^2+6*B*b^2*c*m^2*(x^n)^3+14*B*b^2*c*n^2*(x^n)^3+B*b^2*c*m^4*(x^n)^3+
4*B*b^2*d*m^3*(x^n)^4+6*B*b^2*d*n^3*(x^n)^4+A*b^2*c*m^4*(x^n)^2+4*A*b^2*d*m
^3*(x^n)^3+8*A*b^2*c*m^3*n*(x^n)^2+19*A*b^2*c*m^2*n^2*(x^n)^2+12*A*b^2*c*m*
n^3*(x^n)^2+21*A*b^2*d*m^2*n*(x^n)^3+28*A*b^2*d*m*n^2*(x^n)^3+8*B*a^2*d*m^3
*n*(x^n)^2+6*B*b^2*d*m^3*n*(x^n)^4+11*B*b^2*d*m^2*n^2*(x^n)^4+6*B*b^2*d*m*n
^3*(x^n)^4+7*A*b^2*d*m^3*n*(x^n)^3+14*A*b^2*d*m^2*n^2*(x^n)^3+8*A*b^2*d*m*n
^3*(x^n)^3+2*B*a*b*d*m^4*(x^n)^3+7*B*b^2*c*m^3*n*(x^n)^3+14*B*b^2*c*m^2*n^2
*(x^n)^3+8*B*b^2*c*m*n^3*(x^n)^3+18*B*b^2*d*m^2*n*(x^n)^4+2*A*a*b*c*x^n+48*
B*a*b*c*m*n*(x^n)^2+54*A*a*b*c*m*n*x^n+27*A*a^2*d*m*n*x^n+12*A*a*b*c*m^2*x^
n+52*A*a*b*c*n^2*x^n+8*A*a*b*d*(x^n)^2*m+16*A*a*b*d*(x^n)^2*n+27*B*a^2*c*m*
n*x^n+8*B*a*b*c*(x^n)^2*m+16*B*a*b*c*(x^n)^2*n+8*A*a*b*c*x^n*m+18*A*a*b*c*x
^n*n+8*B*a*b*c*m^3*(x^n)^2+24*B*a*b*c*n^3*(x^n)^2+12*B*a*b*d*m^2*(x^n)^3+28
*B*a*b*d*n^2*(x^n)^3+21*B*b^2*c*m*n*(x^n)^3+27*A*a^2*d*m^2*n*x^n+52*A*a^2*d
*m*n^2*x^n+8*A*a*b*c*m^3*x^n+48*A*a*b*c*n^3*x^n+12*A*a*b*d*m^2*(x^n)^2+16*A
*a*b*d*m^3*n*(x^n)^2+38*A*a*b*d*m^2*n^2*(x^n)^2+24*A*a*b*d*m*n^3*(x^n)^2+4*
B*b^2*c*(x^n)^3*m)/(1+m)/(m+n+1)/(1+m+2*n)/(1+m+3*n)/(1+m+4*n)*exp(1/2*m*(-
I*Pi*csgn(I*e*x)^3+I*Pi*csgn(I*e*x)^2*csgn(I*e)+I*Pi*csgn(I*e*x)^2*csgn(I*x
)-I*Pi*csgn(I*e*x)*csgn(I*e)*csgn(I*x)+2*ln(e)+2*ln(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError
```

Fricas [B] time = 1.21185, size = 3420, normalized size = 21.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] ((B*b^2*d*m^4 + 4*B*b^2*d*m^3 + 6*B*b^2*d*m^2 + 4*B*b^2*d*m + B*b^2*d + 6*(
B*b^2*d*m + B*b^2*d)*n^3 + 11*(B*b^2*d*m^2 + 2*B*b^2*d*m + B*b^2*d)*n^2 + 6
*(B*b^2*d*m^3 + 3*B*b^2*d*m^2 + 3*B*b^2*d*m + B*b^2*d)*n)*x*x^(4*n)*e^(m*lo
g(e) + m*log(x)) + ((B*b^2*c + (2*B*a*b + A*b^2)*d)*m^4 + B*b^2*c + 4*(B*b^
2*c + (2*B*a*b + A*b^2)*d)*m^3 + 8*(B*b^2*c + (2*B*a*b + A*b^2)*d + (B*b^2*
c + (2*B*a*b + A*b^2)*d)*m)*n^3 + 6*(B*b^2*c + (2*B*a*b + A*b^2)*d)*m^2 + 1
4*(B*b^2*c + (B*b^2*c + (2*B*a*b + A*b^2)*d)*m^2 + (2*B*a*b + A*b^2)*d + 2*
(B*b^2*c + (2*B*a*b + A*b^2)*d)*m)*n^2 + (2*B*a*b + A*b^2)*d + 4*(B*b^2*c +
```

```
(2*B*a*b + A*b^2)*d)*m + 7*(B*b^2*c + (B*b^2*c + (2*B*a*b + A*b^2)*d)*m^3
+ 3*(B*b^2*c + (2*B*a*b + A*b^2)*d)*m^2 + (2*B*a*b + A*b^2)*d + 3*(B*b^2*c
+ (2*B*a*b + A*b^2)*d)*m)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + (((2*B*a*b
 + A*b^2)*c + (B*a^2 + 2*A*a*b)*d)*m^4 + 4*((2*B*a*b + A*b^2)*c + (B*a^2 +
2*A*a*b)*d)*m^3 + 12*((2*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d + ((2*B*a*b
 + A*b^2)*c + (B*a^2 + 2*A*a*b)*d)*m)*n^3 + 6*((2*B*a*b + A*b^2)*c + (B*a^2
 + 2*A*a*b)*d)*m^2 + 19*(((2*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d)*m^2 +
(2*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d + 2*((2*B*a*b + A*b^2)*c + (B*a^2
 + 2*A*a*b)*d)*m)*n^2 + (2*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d + 4*((2*B
*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d)*m + 8*(((2*B*a*b + A*b^2)*c + (B*a^2
 + 2*A*a*b)*d)*m^3 + 3*((2*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d)*m^2 + (2
*B*a*b + A*b^2)*c + (B*a^2 + 2*A*a*b)*d + 3*((2*B*a*b + A*b^2)*c + (B*a^2 +
 2*A*a*b)*d)*m)*n)*x*x^(2*n)*e^(m*log(e) + m*log(x)) + ((A*a^2*d + (B*a^2 +
 2*A*a*b)*c)*m^4 + A*a^2*d + 4*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m^3 + 24*(A*
a^2*d + (B*a^2 + 2*A*a*b)*c + (A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m)*n^3 + 6*(A
*a^2*d + (B*a^2 + 2*A*a*b)*c)*m^2 + 26*(A*a^2*d + (A*a^2*d + (B*a^2 + 2*A*a
*b)*c)*m^2 + (B*a^2 + 2*A*a*b)*c + 2*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m)*n^2
 + (B*a^2 + 2*A*a*b)*c + 4*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m + 9*(A*a^2*d +
 (A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m^3 + 3*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m^
2 + (B*a^2 + 2*A*a*b)*c + 3*(A*a^2*d + (B*a^2 + 2*A*a*b)*c)*m)*n)*x*x^n*e^(
m*log(e) + m*log(x)) + (A*a^2*c*m^4 + 24*A*a^2*c*n^4 + 4*A*a^2*c*m^3 + 6*A*
a^2*c*m^2 + 4*A*a^2*c*m + A*a^2*c + 50*(A*a^2*c*m + A*a^2*c)*n^3 + 35*(A*a^
2*c*m^2 + 2*A*a^2*c*m + A*a^2*c)*n^2 + 10*(A*a^2*c*m^3 + 3*A*a^2*c*m^2 + 3*
A*a^2*c*m + A*a^2*c)*n)*x*e^(m*log(e) + m*log(x)))/(m^5 + 24*(m + 1)*n^4 +
5*m^4 + 50*(m^2 + 2*m + 1)*n^3 + 10*m^3 + 35*(m^3 + 3*m^2 + 3*m + 1)*n^2 +
10*m^2 + 10*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*n + 5*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.12811, size = 4610, normalized size = 28.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b^2*d*m^4*x*x^m*x^(4*n)*e^m + 6*B*b^2*d*m^3*n*x*x^m*x^(4*n)*e^m + 11*B*b
^2*d*m^2*n^2*x*x^m*x^(4*n)*e^m + 6*B*b^2*d*m*n^3*x*x^m*x^(4*n)*e^m + B*b^2*
c*m^4*x*x^m*x^(3*n)*e^m + 2*B*a*b*d*m^4*x*x^m*x^(3*n)*e^m + A*b^2*d*m^4*x*x
^m*x^(3*n)*e^m + 7*B*b^2*c*m^3*n*x*x^m*x^(3*n)*e^m + 14*B*a*b*d*m^3*n*x*x^m
*x^(3*n)*e^m + 7*A*b^2*d*m^3*n*x*x^m*x^(3*n)*e^m + 14*B*b^2*c*m^2*n^2*x*x^m
*x^(3*n)*e^m + 28*B*a*b*d*m^2*n^2*x*x^m*x^(3*n)*e^m + 14*A*b^2*d*m^2*n^2*x*
x^m*x^(3*n)*e^m + 8*B*b^2*c*m*n^3*x*x^m*x^(3*n)*e^m + 16*B*a*b*d*m*n^3*x*x^
m*x^(3*n)*e^m + 8*A*b^2*d*m*n^3*x*x^m*x^(3*n)*e^m + 2*B*a*b*c*m^4*x*x^m*x^(
2*n)*e^m + A*b^2*c*m^4*x*x^m*x^(2*n)*e^m + B*a^2*d*m^4*x*x^m*x^(2*n)*e^m +
```

```
2*A*a*b*d*m^4*x*x^m*x^(2*n)*e^m + 16*B*a*b*c*m^3*n*x*x^m*x^(2*n)*e^m + 8*A*
b^2*c*m^3*n*x*x^m*x^(2*n)*e^m + 8*B*a^2*d*m^3*n*x*x^m*x^(2*n)*e^m + 16*A*a*
b*d*m^3*n*x*x^m*x^(2*n)*e^m + 38*B*a*b*c*m^2*n^2*x*x^m*x^(2*n)*e^m + 19*A*b
^2*c*m^2*n^2*x*x^m*x^(2*n)*e^m + 19*B*a^2*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 38*
A*a*b*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 24*B*a*b*c*m*n^3*x*x^m*x^(2*n)*e^m + 12
*A*b^2*c*m*n^3*x*x^m*x^(2*n)*e^m + 12*B*a^2*d*m*n^3*x*x^m*x^(2*n)*e^m + 24*
A*a*b*d*m*n^3*x*x^m*x^(2*n)*e^m + B*a^2*c*m^4*x*x^m*x^n*e^m + 2*A*a*b*c*m^4
*x*x^m*x^n*e^m + A*a^2*d*m^4*x*x^m*x^n*e^m + 9*B*a^2*c*m^3*n*x*x^m*x^n*e^m
+ 18*A*a*b*c*m^3*n*x*x^m*x^n*e^m + 9*A*a^2*d*m^3*n*x*x^m*x^n*e^m + 26*B*a^2
*c*m^2*n^2*x*x^m*x^n*e^m + 52*A*a*b*c*m^2*n^2*x*x^m*x^n*e^m + 26*A*a^2*d*m^
2*n^2*x*x^m*x^n*e^m + 24*B*a^2*c*m*n^3*x*x^m*x^n*e^m + 48*A*a*b*c*m*n^3*x*x
^m*x^n*e^m + 24*A*a^2*d*m*n^3*x*x^m*x^n*e^m + A*a^2*c*m^4*x*x^m*e^m + 10*A*
a^2*c*m^3*n*x*x^m*e^m + 35*A*a^2*c*m^2*n^2*x*x^m*e^m + 50*A*a^2*c*m*n^3*x*x
^m*e^m + 24*A*a^2*c*n^4*x*x^m*e^m + 4*B*b^2*d*m^3*x*x^m*x^(4*n)*e^m + 18*B*
b^2*d*m^2*n*x*x^m*x^(4*n)*e^m + 22*B*b^2*d*m*n^2*x*x^m*x^(4*n)*e^m + 6*B*b^
2*d*n^3*x*x^m*x^(4*n)*e^m + 4*B*b^2*c*m^3*x*x^m*x^(3*n)*e^m + 8*B*a*b*d*m^3
*x*x^m*x^(3*n)*e^m + 4*A*b^2*d*m^3*x*x^m*x^(3*n)*e^m + 21*B*b^2*c*m^2*n*x*x
^m*x^(3*n)*e^m + 42*B*a*b*d*m^2*n*x*x^m*x^(3*n)*e^m + 21*A*b^2*d*m^2*n*x*x^
m*x^(3*n)*e^m + 28*B*b^2*c*m*n^2*x*x^m*x^(3*n)*e^m + 56*B*a*b*d*m*n^2*x*x^m
*x^(3*n)*e^m + 28*A*b^2*d*m*n^2*x*x^m*x^(3*n)*e^m + 8*B*b^2*c*n^3*x*x^m*x^(
3*n)*e^m + 16*B*a*b*d*n^3*x*x^m*x^(3*n)*e^m + 8*A*b^2*d*n^3*x*x^m*x^(3*n)*e
^m + 8*B*a*b*c*m^3*x*x^m*x^(2*n)*e^m + 4*A*b^2*c*m^3*x*x^m*x^(2*n)*e^m + 4*
B*a^2*d*m^3*x*x^m*x^(2*n)*e^m + 8*A*a*b*d*m^3*x*x^m*x^(2*n)*e^m + 48*B*a*b*
c*m^2*n*x*x^m*x^(2*n)*e^m + 24*A*b^2*c*m^2*n*x*x^m*x^(2*n)*e^m + 24*B*a^2*d
*m^2*n*x*x^m*x^(2*n)*e^m + 48*A*a*b*d*m^2*n*x*x^m*x^(2*n)*e^m + 76*B*a*b*c*
m*n^2*x*x^m*x^(2*n)*e^m + 38*A*b^2*c*m*n^2*x*x^m*x^(2*n)*e^m + 38*B*a^2*d*m
*n^2*x*x^m*x^(2*n)*e^m + 76*A*a*b*d*m*n^2*x*x^m*x^(2*n)*e^m + 24*B*a*b*c*n^
3*x*x^m*x^(2*n)*e^m + 12*A*b^2*c*n^3*x*x^m*x^(2*n)*e^m + 12*B*a^2*d*n^3*x*x
^m*x^(2*n)*e^m + 24*A*a*b*d*n^3*x*x^m*x^(2*n)*e^m + 4*B*a^2*c*m^3*x*x^m*x^n
*e^m + 8*A*a*b*c*m^3*x*x^m*x^n*e^m + 4*A*a^2*d*m^3*x*x^m*x^n*e^m + 27*B*a^2
*c*m^2*n*x*x^m*x^n*e^m + 54*A*a*b*c*m^2*n*x*x^m*x^n*e^m + 27*A*a^2*d*m^2*n*
x*x^m*x^n*e^m + 52*B*a^2*c*m*n^2*x*x^m*x^n*e^m + 104*A*a*b*c*m*n^2*x*x^m*x^
n*e^m + 52*A*a^2*d*m*n^2*x*x^m*x^n*e^m + 24*B*a^2*c*n^3*x*x^m*x^n*e^m + 48*
A*a*b*c*n^3*x*x^m*x^n*e^m + 24*A*a^2*d*n^3*x*x^m*x^n*e^m + 4*A*a^2*c*m^3*x*
x^m*e^m + 30*A*a^2*c*m^2*n*x*x^m*e^m + 70*A*a^2*c*m*n^2*x*x^m*e^m + 50*A*a^
2*c*n^3*x*x^m*e^m + 6*B*b^2*d*m^2*x*x^m*x^(4*n)*e^m + 18*B*b^2*d*m*n*x*x^m*
x^(4*n)*e^m + 11*B*b^2*d*n^2*x*x^m*x^(4*n)*e^m + 6*B*b^2*c*m^2*x*x^m*x^(3*n
)*e^m + 12*B*a*b*d*m^2*x*x^m*x^(3*n)*e^m + 6*A*b^2*d*m^2*x*x^m*x^(3*n)*e^m
+ 21*B*b^2*c*m*n*x*x^m*x^(3*n)*e^m + 42*B*a*b*d*m*n*x*x^m*x^(3*n)*e^m + 21*
A*b^2*d*m*n*x*x^m*x^(3*n)*e^m + 14*B*b^2*c*n^2*x*x^m*x^(3*n)*e^m + 28*B*a*b
*d*n^2*x*x^m*x^(3*n)*e^m + 14*A*b^2*d*n^2*x*x^m*x^(3*n)*e^m + 12*B*a*b*c*m^
2*x*x^m*x^(2*n)*e^m + 6*A*b^2*c*m^2*x*x^m*x^(2*n)*e^m + 6*B*a^2*d*m^2*x*x^m
*x^(2*n)*e^m + 12*A*a*b*d*m^2*x*x^m*x^(2*n)*e^m + 48*B*a*b*c*m*n*x*x^m*x^(2
*n)*e^m + 24*A*b^2*c*m*n*x*x^m*x^(2*n)*e^m + 24*B*a^2*d*m*n*x*x^m*x^(2*n)*e
^m + 48*A*a*b*d*m*n*x*x^m*x^(2*n)*e^m + 38*B*a*b*c*n^2*x*x^m*x^(2*n)*e^m +
19*A*b^2*c*n^2*x*x^m*x^(2*n)*e^m + 19*B*a^2*d*n^2*x*x^m*x^(2*n)*e^m + 38*A*
a*b*d*n^2*x*x^m*x^(2*n)*e^m + 6*B*a^2*c*m^2*x*x^m*x^n*e^m + 12*A*a*b*c*m^2*
x*x^m*x^n*e^m + 6*A*a^2*d*m^2*x*x^m*x^n*e^m + 27*B*a^2*c*m*n*x*x^m*x^n*e^m
+ 54*A*a*b*c*m*n*x*x^m*x^n*e^m + 27*A*a^2*d*m*n*x*x^m*x^n*e^m + 26*B*a^2*c*
n^2*x*x^m*x^n*e^m + 52*A*a*b*c*n^2*x*x^m*x^n*e^m + 26*A*a^2*d*n^2*x*x^m*x^n
*e^m + 6*A*a^2*c*m^2*x*x^m*e^m + 30*A*a^2*c*m*n*x*x^m*e^m + 35*A*a^2*c*n^2*
x*x^m*e^m + 4*B*b^2*d*m*x*x^m*x^(4*n)*e^m + 6*B*b^2*d*n*x*x^m*x^(4*n)*e^m +
 4*B*b^2*c*m*x*x^m*x^(3*n)*e^m + 8*B*a*b*d*m*x*x^m*x^(3*n)*e^m + 4*A*b^2*d*
m*x*x^m*x^(3*n)*e^m + 7*B*b^2*c*n*x*x^m*x^(3*n)*e^m + 14*B*a*b*d*n*x*x^m*x^
(3*n)*e^m + 7*A*b^2*d*n*x*x^m*x^(3*n)*e^m + 8*B*a*b*c*m*x*x^m*x^(2*n)*e^m +
 4*A*b^2*c*m*x*x^m*x^(2*n)*e^m + 4*B*a^2*d*m*x*x^m*x^(2*n)*e^m + 8*A*a*b*d*
m*x*x^m*x^(2*n)*e^m + 16*B*a*b*c*n*x*x^m*x^(2*n)*e^m + 8*A*b^2*c*n*x*x^m*x^
(2*n)*e^m + 8*B*a^2*d*n*x*x^m*x^(2*n)*e^m + 16*A*a*b*d*n*x*x^m*x^(2*n)*e^m
+ 4*B*a^2*c*m*x*x^m*x^n*e^m + 8*A*a*b*c*m*x*x^m*x^n*e^m + 4*A*a^2*d*m*x*x^m
```

```
*x^n*e^m + 9*B*a^2*c*n*x*x^m*x^n*e^m + 18*A*a*b*c*n*x*x^m*x^n*e^m + 9*A*a^2
*d*n*x*x^m*x^n*e^m + 4*A*a^2*c*m*x*x^m*e^m + 10*A*a^2*c*n*x*x^m*e^m + B*b^2
*d*x*x^m*x^(4*n)*e^m + B*b^2*c*x*x^m*x^(3*n)*e^m + 2*B*a*b*d*x*x^m*x^(3*n)*
e^m + A*b^2*d*x*x^m*x^(3*n)*e^m + 2*B*a*b*c*x*x^m*x^(2*n)*e^m + A*b^2*c*x*x
^m*x^(2*n)*e^m + B*a^2*d*x*x^m*x^(2*n)*e^m + 2*A*a*b*d*x*x^m*x^(2*n)*e^m +
B*a^2*c*x*x^m*x^n*e^m + 2*A*a*b*c*x*x^m*x^n*e^m + A*a^2*d*x*x^m*x^n*e^m + A
*a^2*c*x*x^m*e^m)/(m^5 + 10*m^4*n + 35*m^3*n^2 + 50*m^2*n^3 + 24*m*n^4 + 5*
m^4 + 40*m^3*n + 105*m^2*n^2 + 100*m*n^3 + 24*n^4 + 10*m^3 + 60*m^2*n + 105
*m*n^2 + 50*n^3 + 10*m^2 + 40*m*n + 35*n^2 + 5*m + 10*n + 1)
```

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

Optimal. Leaf size=108

$$\frac{x^{n+1}(ex)^m(aAd+aBc+Abc)}{m+n+1}+\frac{x^{2n+1}(ex)^m(aBd+Abd+bBc)}{m+2n+1}+\frac{aAc(ex)^{m+1}}{e(m+1)}+\frac{bBdx^{3n+1}(ex)^m}{m+3n+1}$$

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

Rubi [A] time = 0.0838475, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {570, 20, 30}

$$\frac{x^{n+1}(ex)^m(aAd+aBc+Abc)}{m+n+1}+\frac{x^{2n+1}(ex)^m(aBd+Abd+bBc)}{m+2n+1}+\frac{aAc(ex)^{m+1}}{e(m+1)}+\frac{bBdx^{3n+1}(ex)^m}{m+3n+1}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (ex)^m (a+bx^n)(A+Bx^n)(c+dx^n)\,dx &= \int \left(aAc(ex)^m+(Abc+aBc+aAd)x^n(ex)^m+(bBc+Abd+aBd)x^{2n}(ex)^m+\right.\\ &= \frac{aAc(ex)^{1+m}}{e(1+m)}+(bBd)\int x^{3n}(ex)^m\,dx+(Abc+aBc+aAd)\int x^n(ex)^m\,dx+(b\\ &= \frac{aAc(ex)^{1+m}}{e(1+m)}+\left(bBdx^{-m}(ex)^m\right)\int x^{m+3n}\,dx+\left((Abc+aBc+aAd)x^{-m}(ex)^m\right)\int\\ &= \frac{(Abc+aBc+aAd)x^{1+n}(ex)^m}{1+m+n}+\frac{(bBc+Abd+aBd)x^{1+2n}(ex)^m}{1+m+2n}+\frac{bBdx^{1+3n}(e}{1+m+3}\end{aligned}$$

Mathematica [A] time = 0.146838, size = 84, normalized size = 0.78

$$x(ex)^m\left(\frac{x^n(aAd+aBc+Abc)}{m+n+1}+\frac{x^{2n}(aBd+Abd+bBc)}{m+2n+1}+\frac{aAc}{m+1}+\frac{bBdx^{3n}}{m+3n+1}\right)$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.056, size = 891, normalized size = 8.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(3*A*a*c*m+d*b*(x^n)^2*A+d*a*(x^n)^2*B+c*b*(x^n)^2*B+d*a*x^n*A+c*b*x^n*A+
3*B*a*d*m^2*(x^n)^2+3*B*a*d*n^2*(x^n)^2+3*B*b*c*m^2*(x^n)^2+3*B*b*c*n^2*(x^
n)^2+6*A*b*c*m*n^2*x^n+5*A*a*d*m^2*n*x^n+6*A*a*d*m*n^2*x^n+5*A*b*c*m^2*n*x^
n+c*a*B*x^n+d*b*(x^n)^3*B+10*A*a*d*m*n*x^n+10*A*b*c*m*n*x^n+B*b*d*m^3*(x^n)
^3+A*b*d*m^3*(x^n)^2+B*a*d*m^3*(x^n)^2+B*b*c*m^3*(x^n)^2+3*A*x^n*b*c*m+5*A*
x^n*b*c*n+3*B*x^n*a*c*m+5*B*x^n*a*c*n+4*B*(x^n)^2*a*d*n+3*B*(x^n)^2*b*c*m+4
*B*(x^n)^2*b*c*n+3*A*x^n*a*d*m+5*A*x^n*a*d*n+3*A*(x^n)^2*b*d*m+4*A*(x^n)^2*
b*d*n+3*B*(x^n)^2*a*d*m+3*B*(x^n)^3*b*d*m+3*B*(x^n)^3*b*d*n+B*a*c*m^3*x^n+a
*A*c+3*B*a*c*m^2*x^n+6*B*a*c*n^2*x^n+10*B*a*c*m*n*x^n+8*B*b*c*m*n*(x^n)^2+6
*B*b*d*m*n*(x^n)^3+4*B*b*c*m^2*n*(x^n)^2+3*B*b*c*m*n^2*(x^n)^2+3*B*a*d*m*n^
2*(x^n)^2+3*A*b*d*m*n^2*(x^n)^2+4*B*a*d*m^2*n*(x^n)^2+4*A*b*d*m^2*n*(x^n)^2
+2*B*b*d*m*n^2*(x^n)^3+3*B*b*d*m^2*n*(x^n)^3+3*A*a*d*m^2*x^n+6*A*a*d*n^2*x^
n+3*A*b*c*m^2*x^n+6*A*b*c*n^2*x^n+6*A*a*c*m^2*n+11*A*a*c*m*n^2+12*A*a*c*m*n
+3*B*b*d*m^2*(x^n)^3+2*B*b*d*n^2*(x^n)^3+A*a*d*m^3*x^n+A*b*c*m^3*x^n+3*A*b*
d*m^2*(x^n)^2+3*A*b*d*n^2*(x^n)^2+6*A*a*c*n^3+A*a*c*m^3+3*A*a*c*m^2+11*A*a*
c*n^2+6*a*A*c*n+5*B*a*c*m^2*n*x^n+6*B*a*c*m*n^2*x^n+8*B*a*d*m*n*(x^n)^2+8*A
*b*d*m*n*(x^n)^2)/(1+m)/(m+n+1)/(1+m+2*n)/(1+m+3*n)*exp(1/2*m*(-I*Pi*csgn(I
*e*x)^3+I*Pi*csgn(I*e*x)^2*csgn(I*e)+I*Pi*csgn(I*e*x)^2*csgn(I*x)-I*Pi*csgn
(I*e*x)*csgn(I*e)*csgn(I*x)+2*ln(e)+2*ln(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.13548, size = 1354, normalized size = 12.54

$$\frac{\left(Bbdm^3 + 3\,Bbdm^2 + 3\,Bbdm + Bbd + 2\,(Bbdm + Bbd)n^2 + 3\left(Bbdm^2 + 2\,Bbdm + Bbd\right)n\right)xx^{3\,n}e^{(m\log(e)+m\log(x))} + \left((Bbc + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b*d*m^3 + 3*B*b*d*m^2 + 3*B*b*d*m + B*b*d + 2*(B*b*d*m + B*b*d)*n^2 + 3
*(B*b*d*m^2 + 2*B*b*d*m + B*b*d)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + ((B
*b*c + (B*a + A*b)*d)*m^3 + B*b*c + 3*(B*b*c + (B*a + A*b)*d)*m^2 + 3*(B*b*
c + (B*a + A*b)*d + (B*b*c + (B*a + A*b)*d)*m)*n^2 + (B*a + A*b)*d + 3*(B*b
*c + (B*a + A*b)*d)*m + 4*(B*b*c + (B*b*c + (B*a + A*b)*d)*m^2 + (B*a + A*b
)*d + 2*(B*b*c + (B*a + A*b)*d)*m)*n)*x*x^(2*n)*e^(m*log(e) + m*log(x)) + (
(A*a*d + (B*a + A*b)*c)*m^3 + A*a*d + 3*(A*a*d + (B*a + A*b)*c)*m^2 + 6*(A*
a*d + (B*a + A*b)*c + (A*a*d + (B*a + A*b)*c)*m)*n^2 + (B*a + A*b)*c + 3*(A
*a*d + (B*a + A*b)*c)*m + 5*(A*a*d + (A*a*d + (B*a + A*b)*c)*m^2 + (B*a + A
*b)*c + 2*(A*a*d + (B*a + A*b)*c)*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) + (A*
a*c*m^3 + 6*A*a*c*n^3 + 3*A*a*c*m^2 + 3*A*a*c*m + A*a*c + 11*(A*a*c*m + A*a
*c)*n^2 + 6*(A*a*c*m^2 + 2*A*a*c*m + A*a*c)*n)*x*e^(m*log(e) + m*log(x)))/(
m^4 + 6*(m + 1)*n^3 + 4*m^3 + 11*(m^2 + 2*m + 1)*n^2 + 6*m^2 + 6*(m^3 + 3*m
^2 + 3*m + 1)*n + 4*m + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.12256, size = 1742, normalized size = 16.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b*d*m^3*x*x^m*x^(3*n)*e^m + 3*B*b*d*m^2*n*x*x^m*x^(3*n)*e^m + 2*B*b*d*m*
n^2*x*x^m*x^(3*n)*e^m + B*b*c*m^3*x*x^m*x^(2*n)*e^m + B*a*d*m^3*x*x^m*x^(2*
n)*e^m + A*b*d*m^3*x*x^m*x^(2*n)*e^m + 4*B*b*c*m^2*n*x*x^m*x^(2*n)*e^m + 4*
B*a*d*m^2*n*x*x^m*x^(2*n)*e^m + 4*A*b*d*m^2*n*x*x^m*x^(2*n)*e^m + 3*B*b*c*m
*n^2*x*x^m*x^(2*n)*e^m + 3*B*a*d*m*n^2*x*x^m*x^(2*n)*e^m + 3*A*b*d*m*n^2*x*
x^m*x^(2*n)*e^m + B*a*c*m^3*x*x^m*x^n*e^m + A*b*c*m^3*x*x^m*x^n*e^m + A*a*d
*m^3*x*x^m*x^n*e^m + 5*B*a*c*m^2*n*x*x^m*x^n*e^m + 5*A*b*c*m^2*n*x*x^m*x^n*
e^m + 5*A*a*d*m^2*n*x*x^m*x^n*e^m + 6*B*a*c*m*n^2*x*x^m*x^n*e^m + 6*A*b*c*m
*n^2*x*x^m*x^n*e^m + 6*A*a*d*m*n^2*x*x^m*x^n*e^m + A*a*c*m^3*x*x^m*e^m + 6*
A*a*c*m^2*n*x*x^m*e^m + 11*A*a*c*m*n^2*x*x^m*e^m + 6*A*a*c*n^3*x*x^m*e^m +
3*B*b*d*m^2*x*x^m*x^(3*n)*e^m + 6*B*b*d*m*n*x*x^m*x^(3*n)*e^m + 2*B*b*d*n^2
```

```
*x*x^m*x^(3*n)*e^m + 3*B*b*c*m^2*x*x^m*x^(2*n)*e^m + 3*B*a*d*m^2*x*x^m*x^(2
*n)*e^m + 3*A*b*d*m^2*x*x^m*x^(2*n)*e^m + 8*B*b*c*m*n*x*x^m*x^(2*n)*e^m + 8
*B*a*d*m*n*x*x^m*x^(2*n)*e^m + 8*A*b*d*m*n*x*x^m*x^(2*n)*e^m + 3*B*b*c*n^2*
x*x^m*x^(2*n)*e^m + 3*B*a*d*n^2*x*x^m*x^(2*n)*e^m + 3*A*b*d*n^2*x*x^m*x^(2*
n)*e^m + 3*B*a*c*m^2*x*x^m*x^n*e^m + 3*A*b*c*m^2*x*x^m*x^n*e^m + 3*A*a*d*m^
2*x*x^m*x^n*e^m + 10*B*a*c*m*n*x*x^m*x^n*e^m + 10*A*b*c*m*n*x*x^m*x^n*e^m +
 10*A*a*d*m*n*x*x^m*x^n*e^m + 6*B*a*c*n^2*x*x^m*x^n*e^m + 6*A*b*c*n^2*x*x^m
*x^n*e^m + 6*A*a*d*n^2*x*x^m*x^n*e^m + 3*A*a*c*m^2*x*x^m*e^m + 12*A*a*c*m*n
*x*x^m*e^m + 11*A*a*c*n^2*x*x^m*e^m + 3*B*b*d*m*x*x^m*x^(3*n)*e^m + 3*B*b*d
*n*x*x^m*x^(3*n)*e^m + 3*B*b*c*m*x*x^m*x^(2*n)*e^m + 3*B*a*d*m*x*x^m*x^(2*n
)*e^m + 3*A*b*d*m*x*x^m*x^(2*n)*e^m + 4*B*b*c*n*x*x^m*x^(2*n)*e^m + 4*B*a*d
*n*x*x^m*x^(2*n)*e^m + 4*A*b*d*n*x*x^m*x^(2*n)*e^m + 3*B*a*c*m*x*x^m*x^n*e^
m + 3*A*b*c*m*x*x^m*x^n*e^m + 3*A*a*d*m*x*x^m*x^n*e^m + 5*B*a*c*n*x*x^m*x^n
*e^m + 5*A*b*c*n*x*x^m*x^n*e^m + 5*A*a*d*n*x*x^m*x^n*e^m + 3*A*a*c*m*x*x^m*
e^m + 6*A*a*c*n*x*x^m*e^m + B*b*d*x*x^m*x^(3*n)*e^m + B*b*c*x*x^m*x^(2*n)*e
^m + B*a*d*x*x^m*x^(2*n)*e^m + A*b*d*x*x^m*x^(2*n)*e^m + B*a*c*x*x^m*x^n*e^
m + A*b*c*x*x^m*x^n*e^m + A*a*d*x*x^m*x^n*e^m + A*a*c*x*x^m*e^m)/(m^4 + 6*m
^3*n + 11*m^2*n^2 + 6*m*n^3 + 4*m^3 + 18*m^2*n + 22*m*n^2 + 6*n^3 + 6*m^2 +
 18*m*n + 11*n^2 + 4*m + 6*n + 1)
```

3.4 $\int (ex)^m (A+Bx^n)(c+dx^n)\,dx$

Optimal. Leaf size=66

$$\frac{x^{n+1}(ex)^m(Ad+Bc)}{m+n+1}+\frac{Ac(ex)^{m+1}}{e(m+1)}+\frac{Bdx^{2n+1}(ex)^m}{m+2n+1}$$

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

Rubi [A] time = 0.0399767, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.15, Rules used = {448, 20, 30}

$$\frac{x^{n+1}(ex)^m(Ad+Bc)}{m+n+1}+\frac{Ac(ex)^{m+1}}{e(m+1)}+\frac{Bdx^{2n+1}(ex)^m}{m+2n+1}$$

Antiderivative was successfully verified.

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

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

Rule 448

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(e*x)^m*(a + b*x^n)^p*(c + d*x^
n)^q, x], x] /; FreeQ[{a, b, c, d, e, m, n}, x] && NeQ[b*c - a*d, 0] && IGt
Q[p, 0] && IGtQ[q, 0]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (ex)^m (A+Bx^n)(c+dx^n)\,dx &= \int \left(Ac(ex)^m+(Bc+Ad)x^n(ex)^m+Bdx^{2n}(ex)^m\right)dx\\ &= \frac{Ac(ex)^{1+m}}{e(1+m)}+(Bd)\int x^{2n}(ex)^m\,dx+(Bc+Ad)\int x^n(ex)^m\,dx\\ &= \frac{Ac(ex)^{1+m}}{e(1+m)}+\left(Bdx^{-m}(ex)^m\right)\int x^{m+2n}\,dx+\left((Bc+Ad)x^{-m}(ex)^m\right)\int x^{m+n}\,dx\\ &= \frac{(Bc+Ad)x^{1+n}(ex)^m}{1+m+n}+\frac{Bdx^{1+2n}(ex)^m}{1+m+2n}+\frac{Ac(ex)^{1+m}}{e(1+m)}\end{aligned}$$

Mathematica [A] time = 0.059067, size = 49, normalized size = 0.74

$$x(ex)^m\left(\frac{x^n(Ad+Bc)}{m+n+1}+\frac{Ac}{m+1}+\frac{Bdx^{2n}}{m+2n+1}\right)$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.09, size = 262, normalized size = 4.

$$\frac{\left(Bdm^2\left(x^n\right)^2+Bdmn\left(x^n\right)^2+Adm^2x^n+2\,Admnx^n+Bcm^2x^n+2\,Bcmnx^n+2\,B\left(x^n\right)^2dm+B\left(x^n\right)^2dn+Acm^2+3\,Ac\right.}{(1+m)\,(m+n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(B*d*m^2*(x^n)^2+B*d*m*n*(x^n)^2+A*d*m^2*x^n+2*A*d*m*n*x^n+B*c*m^2*x^n+2*
B*c*m*n*x^n+2*B*(x^n)^2*d*m+B*(x^n)^2*d*n+A*c*m^2+3*A*c*m*n+2*A*c*n^2+2*A*x
^n*d*m+2*A*x^n*d*n+2*B*x^n*c*m+2*B*x^n*c*n+d*(x^n)^2*B+2*A*c*m+3*A*c*n+d*x^
n*A+c*B*x^n+A*c)/(1+m)/(m+n+1)/(1+m+2*n)*exp(1/2*m*(-I*Pi*csgn(I*e*x)^3+I*P
i*csgn(I*e*x)^2*csgn(I*e)+I*Pi*csgn(I*e*x)^2*csgn(I*x)-I*Pi*csgn(I*e*x)*csg
n(I*e)*csgn(I*x)+2*ln(e)+2*ln(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.08085, size = 463, normalized size = 7.02

$$\frac{\left(Bdm^2+2\,Bdm+Bd+(Bdm+Bd)n\right)xx^{2\,n}e^{(m\log(e)+m\log(x))}+\left((Bc+Ad)m^2+Bc+Ad+2\,(Bc+Ad)m+2\,(Bc+Ad\right.}{m^3+2\,(m+1)n^2+3\,m^2+3\left(m^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
+ 3*m^2 + 3*(m^2 + 2*m + 1)*n + 3*m + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.25673, size = 441, normalized size = 6.68

$$\frac{Bdm^2xx^mx^{2n}e^m + Bdmnxx^mx^{2n}e^m + Bcm^2xx^mx^ne^m + Adm^2xx^mx^ne^m + 2\,Bcmnxx^mx^ne^m + 2\,Admnxx^mx^ne^m + Acm^2xx^m}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=120

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

```
[Out] (B*d*x^(1 + n)*(e*x)^m)/(b*(1 + m + n)) + ((b*B*c + A*b*d - a*B*d)*(e*x)^(1
 + m))/(b^2*e*(1 + m)) + ((A*b - a*B)*(b*c - a*d)*(e*x)^(1 + m)*Hypergeomet
ric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)])/(a*b^2*e*(1 + m))
```

Rubi [A] time = 0.119727, antiderivative size = 120, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used = {570, 20, 30, 364}

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

Antiderivative was successfully verified.

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

```
[Out] (B*d*x^(1 + n)*(e*x)^m)/(b*(1 + m + n)) + ((b*B*c + A*b*d - a*B*d)*(e*x)^(1
 + m))/(b^2*e*(1 + m)) + ((A*b - a*B)*(b*c - a*d)*(e*x)^(1 + m)*Hypergeomet
ric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)])/(a*b^2*e*(1 + m))
```

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)(c+dx^n)}{a+bx^n} dx = \int \left(\frac{(bBc+Abd-aBd)(ex)^m}{b^2} + \frac{Bdx^n(ex)^m}{b} + \frac{(Ab-aB)(bc-ad)(ex)^m}{b^2(a+bx^n)} \right) dx$$
$$= \frac{(bBc+Abd-aBd)(ex)^{1+m}}{b^2e(1+m)} + \frac{(Bd)\int x^n(ex)^m\,dx}{b} + \frac{((Ab-aB)(bc-ad))\int \frac{(ex)^m}{a+bx^n}\,dx}{b^2}$$
$$= \frac{(bBc+Abd-aBd)(ex)^{1+m}}{b^2e(1+m)} + \frac{(Ab-aB)(bc-ad)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{bx^n}{a}\right)}{ab^2e(1+m)} + \cdots$$
$$= \frac{Bdx^{1+n}(ex)^m}{b(1+m+n)} + \frac{(bBc+Abd-aBd)(ex)^{1+m}}{b^2e(1+m)} + \frac{(Ab-aB)(bc-ad)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\cdots\right)}{ab^2e(1+m)}$$

Mathematica [A] time = 0.150969, size = 95, normalized size = 0.79

$$\frac{x(ex)^m\left(\frac{(aB-Ab)(ad-bc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)}+\frac{-aBd+Abd+bBc}{m+1}+\frac{bBdx^n}{m+n+1}\right)}{b^2}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.397, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\left(\left(b^2ce^m-abde^m\right)A-\left(abce^m-a^2de^m\right)B\right)\int \frac{x^m}{b^3x^n+ab^2}dx + \frac{Bbde^m(m+1)xe^{(m\log(x)+n\log(x))}+(Abde^m(m+n+1)+(bce\cdots}{\left(m^2+m(n+2)+n+1\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 10.6152, size = 666, normalized size = 5.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*c*e**m*m*x*x**m*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/
n + 1/n)/(a*n**2*gamma(m/n + 1 + 1/n)) + A*c*e**m*x*x**m*lerchphi(b*x**n*ex
p_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)/(a*n**2*gamma(m/n + 1 + 1/n
)) + A*d*e**m*m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 +
 1/n)*gamma(m/n + 1 + 1/n)/(a*n**2*gamma(m/n + 2 + 1/n)) + A*d*e**m*x*x**m*
x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1
/n)/(a*n*gamma(m/n + 2 + 1/n)) + A*d*e**m*x*x**m*x**n*lerchphi(b*x**n*exp_p
olar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n**2*gamma(m/n + 2
+ 1/n)) + B*c*e**m*m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n
+ 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n**2*gamma(m/n + 2 + 1/n)) + B*c*e**m*x*
x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n +
1 + 1/n)/(a*n*gamma(m/n + 2 + 1/n)) + B*c*e**m*x*x**m*x**n*lerchphi(b*x**n*
exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n**2*gamma(m/n
 + 2 + 1/n)) + B*d*e**m*m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a
, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n**2*gamma(m/n + 3 + 1/n)) + 2*
B*d*e**m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/
n)*gamma(m/n + 2 + 1/n)/(a*n*gamma(m/n + 3 + 1/n)) + B*d*e**m*x*x**m*x**(2*
n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n
)/(a*n**2*gamma(m/n + 3 + 1/n))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=177

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

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

Rubi [A] time = 0.258143, antiderivative size = 177, 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, Rules used = {594, 459, 364}

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

Antiderivative was successfully verified.

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

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

Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m(A+Bx^n)(c+dx^n)}{(a+bx^n)^2}\,dx = \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)}{aben(a+bx^n)} - \frac{\int \frac{(ex)^m(-c(aB(1+m)-Ab(1+m-n))+d(Ab(1+m)-aB(1+m+n))x^n)}{a+bx^n}\,dx}{abn}$$

$$= -\frac{d(Ab(1+m)-aB(1+m+n))(ex)^{1+m}}{ab^2e(1+m)n} + \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)}{aben(a+bx^n)} + \frac{(bc(aB(1$$

$$= -\frac{d(Ab(1+m)-aB(1+m+n))(ex)^{1+m}}{ab^2e(1+m)n} + \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)}{aben(a+bx^n)} + \frac{(bc(aB(1$$

Mathematica [A] time = 0.153247, size = 110, normalized size = 0.62

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

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*(a^2*B*d + a*(b*B*c + A*b*d - 2*a*B*d)*Hypergeometric2F1[1, (1 +
 m)/n, (1 + m + n)/n, -((b*x^n)/a)] + (A*b - a*B)*(b*c - a*d)*Hypergeometri
c2F1[2, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)]))/(a^2*b^2*(1 + m))
```

Maple [F] time = 0.379, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(b^2ce^m(m-n+1)-abde^m(m+1)\right)A+\left(a^2de^m(m+n+1)-abce^m(m+1)\right)B\right)\int \frac{x^m}{ab^3nx^n+a^2b^2n}\,dx + \frac{Babde^mnxe^{(}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 52.6897, size = 4129, normalized size = 23.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*c*(-e**m*m**2*x*x**m*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*gam
ma(m/n + 1/n)/(a*(a*n**3*gamma(m/n + 1 + 1/n) + b*n**3*x**n*gamma(m/n + 1 +
 1/n))) + e**m*m*n*x*x**m*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*
gamma(m/n + 1/n)/(a*(a*n**3*gamma(m/n + 1 + 1/n) + b*n**3*x**n*gamma(m/n +
1 + 1/n))) + e**m*m*n*x*x**m*gamma(m/n + 1/n)/(a*(a*n**3*gamma(m/n + 1 + 1/
n) + b*n**3*x**n*gamma(m/n + 1 + 1/n))) - 2*e**m*m*x*x**m*lerchphi(b*x**n*e
xp_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)/(a*(a*n**3*gamma(m/n + 1 +
 1/n) + b*n**3*x**n*gamma(m/n + 1 + 1/n))) + e**m*n*x*x**m*lerchphi(b*x**n*
exp_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)/(a*(a*n**3*gamma(m/n + 1
+ 1/n) + b*n**3*x**n*gamma(m/n + 1 + 1/n))) + e**m*n*x*x**m*gamma(m/n + 1/n
)/(a*(a*n**3*gamma(m/n + 1 + 1/n) + b*n**3*x**n*gamma(m/n + 1 + 1/n))) - e*
*m*x*x**m*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)
/(a*(a*n**3*gamma(m/n + 1 + 1/n) + b*n**3*x**n*gamma(m/n + 1 + 1/n))) - b*e
**m*m**2*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*gamma
(m/n + 1/n)/(a**2*(a*n**3*gamma(m/n + 1 + 1/n) + b*n**3*x**n*gamma(m/n + 1
+ 1/n))) + b*e**m*m*n*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n
 + 1/n)*gamma(m/n + 1/n)/(a**2*(a*n**3*gamma(m/n + 1 + 1/n) + b*n**3*x**n*g
amma(m/n + 1 + 1/n))) - 2*b*e**m*m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*
pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)/(a**2*(a*n**3*gamma(m/n + 1 + 1/n) +
b*n**3*x**n*gamma(m/n + 1 + 1/n))) + b*e**m*n*x*x**m*x**n*lerchphi(b*x**n*e
xp_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)/(a**2*(a*n**3*gamma(m/n +
1 + 1/n) + b*n**3*x**n*gamma(m/n + 1 + 1/n))) - b*e**m*x*x**m*x**n*lerchphi
(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)/(a**2*(a*n**3*gam
ma(m/n + 1 + 1/n) + b*n**3*x**n*gamma(m/n + 1 + 1/n)))) + A*d*(-e**m*m**2*x
*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n +
 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n
))) - e**m*m*n*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 +
1/n)*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gam
ma(m/n + 2 + 1/n))) + e**m*m*n*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(a*(a*n**3*
gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - 2*e**m*m*x*x**m
*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 +
1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) +
 e**m*n**2*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n)
 + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - e**m*n*x*x**m*x**n*lerchphi(b*x**n*
exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(
```

```
m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**m*n*x*x**m*x**n*ga
mma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n
+ 2 + 1/n))) - e**m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n +
 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**
n*gamma(m/n + 2 + 1/n))) - b*e**m*m**2*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_
polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a**2*(a*n**3*gamma(m
/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - b*e**m*m*n*x*x**m*x**(
2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1
/n)/(a**2*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n)))
 - 2*b*e**m*m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1
 + 1/n)*gamma(m/n + 1 + 1/n)/(a**2*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x*
*n*gamma(m/n + 2 + 1/n))) - b*e**m*n*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_po
lar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a**2*(a*n**3*gamma(m/n
 + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - b*e**m*x*x**m*x**(2*n)*l
erchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a
**2*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n)))) + B*
c*(-e**m*m**2*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1
/n)*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamm
a(m/n + 2 + 1/n))) - e**m*m*n*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a
, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) +
b*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**m*m*n*x*x**m*x**n*gamma(m/n + 1 + 1
/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) -
2*e**m*m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*g
amma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n
 + 2 + 1/n))) + e**m*n**2*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma
(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - e**m*n*x*x**m*x**n*l
erchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a
*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**m*n
*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*
x**n*gamma(m/n + 2 + 1/n))) - e**m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*
pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*(a*n**3*gamma(m/n + 2 + 1/
n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - b*e**m*m**2*x*x**m*x**(2*n)*lerch
phi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a**2*
(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - b*e**m*
m*n*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*ga
mma(m/n + 1 + 1/n)/(a**2*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m
/n + 2 + 1/n))) - 2*b*e**m*m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi
)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a**2*(a*n**3*gamma(m/n + 2 + 1
/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - b*e**m*n*x*x**m*x**(2*n)*lerchph
i(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a**2*(a
*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2 + 1/n))) - b*e**m*x*
x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/
n + 1 + 1/n)/(a**2*(a*n**3*gamma(m/n + 2 + 1/n) + b*n**3*x**n*gamma(m/n + 2
 + 1/n)))) + B*d*(-e**m*m**2*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi
)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*(a*n**3*gamma(m/n + 3 + 1/n)
 + b*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3*e**m*m*n*x*x**m*x**(2*n)*lerchphi
(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*(a*n**
3*gamma(m/n + 3 + 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) + e**m*m*n*x*x*
*m*x**(2*n)*gamma(m/n + 2 + 1/n)/(a*(a*n**3*gamma(m/n + 3 + 1/n) + b*n**3*x
**n*gamma(m/n + 3 + 1/n))) - 2*e**m*m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_p
olar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*(a*n**3*gamma(m/n +
 3 + 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) - 2*e**m*n**2*x*x**m*x**(2*n
)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)
/(a*(a*n**3*gamma(m/n + 3 + 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) + 2*e
**m*n**2*x*x**m*x**(2*n)*gamma(m/n + 2 + 1/n)/(a*(a*n**3*gamma(m/n + 3 + 1/
n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3*e**m*n*x*x**m*x**(2*n)*lerchphi
(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*(a*n**
3*gamma(m/n + 3 + 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) + e**m*n*x*x**m
*x**(2*n)*gamma(m/n + 2 + 1/n)/(a*(a*n**3*gamma(m/n + 3 + 1/n) + b*n**3*x**
```

```
n*gamma(m/n + 3 + 1/n))) - e**m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I
*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*(a*n**3*gamma(m/n + 3 + 1
/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) - b*e**m*m**2*x*x**m*x**(3*n)*lerc
hphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a**2
*(a*n**3*gamma(m/n + 3 + 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3*b*e*
*m*m*n*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)
*gamma(m/n + 2 + 1/n)/(a**2*(a*n**3*gamma(m/n + 3 + 1/n) + b*n**3*x**n*gamm
a(m/n + 3 + 1/n))) - 2*b*e**m*m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I
*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a**2*(a*n**3*gamma(m/n + 3
+ 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) - 2*b*e**m*n**2*x*x**m*x**(3*n)
*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/
(a**2*(a*n**3*gamma(m/n + 3 + 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3
*b*e**m*n*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1
/n)*gamma(m/n + 2 + 1/n)/(a**2*(a*n**3*gamma(m/n + 3 + 1/n) + b*n**3*x**n*g
amma(m/n + 3 + 1/n))) - b*e**m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*
pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a**2*(a*n**3*gamma(m/n + 3 +
 1/n) + b*n**3*x**n*gamma(m/n + 3 + 1/n))))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=228

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

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

Rubi [A] time = 0.272938, antiderivative size = 228, 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, Rules used = {594, 457, 364}

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

Antiderivative was successfully verified.

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

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

Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 457

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> -Simp[((b*c - a*d)*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*
b*e*n*(p + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*b*n*(p
 + 1)), Int[(e*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, m,
 n}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1] && (( !IntegerQ[p + 1/2] && NeQ[
p, -5/4]) ||  !RationalQ[m] || (IGtQ[n, 0] && ILtQ[p + 1/2, 0] && LeQ[-1, m
, -(n*(p + 1))]))
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)(c+dx^n)}{(a+bx^n)^3}\,dx = \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)}{2aben(a+bx^n)^2} - \frac{\int \frac{(ex)^m(-c(aB(1+m)-Ab(1+m-2n))+d(Ab(1+m-n)-aB(1+m+n))x^n)}{(a+bx^n)^2}\,dx}{2abn}$$

$$= -\frac{(Ab(bc(1+m-2n)-ad(1+m-n))-aB(bc(1+m)-ad(1+m+n)))(ex)^{1+m}}{2a^2b^2en^2(a+bx^n)} + \frac{(A}{}$$

$$= -\frac{(Ab(bc(1+m-2n)-ad(1+m-n))-aB(bc(1+m)-ad(1+m+n)))(ex)^{1+m}}{2a^2b^2en^2(a+bx^n)} + \frac{(A}{}$$

Mathematica [A] time = 0.161867, size = 136, normalized size = 0.6

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.354, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\left(\left(\left(m^2-m(3n-2)+2n^2-3n+1\right)b^2ce^m-\left(m^2-m(n-2)-n+1\right)abde^m\right)A-\left(\left(m^2-m(n-2)-n+1\right)abce^m-\left(m^2+\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=318

$$\frac{ax^{2n+1}(ex)^m\left(A\left(a^2d^2+6abcd+3b^2c^2\right)+aBc(2ad+3bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m\left(Ab\left(3a^2d^2+6abcd+b^2c^2\right)+aB\left(a^2d^2+6abcd\right.\right.}{m+3n+1}$$

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

Rubi [A] time = 0.411183, antiderivative size = 318, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {570, 20, 30}

$$\frac{ax^{2n+1}(ex)^m\left(A\left(a^2d^2+6abcd+3b^2c^2\right)+aBc(2ad+3bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m\left(Ab\left(3a^2d^2+6abcd+b^2c^2\right)+aB\left(a^2d^2+6abcd\right.\right.}{m+3n+1}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int (ex)^m (a+bx^n)^3 (A+Bx^n) (c+dx^n)^2 \, dx = \int \left(a^3Ac^2(ex)^m + a^2c(3Abc+aBc+2aAd)x^n(ex)^m + a\left(aBc(3bc+2ad)\right.\right.$$
$$= \frac{a^3Ac^2(ex)^{1+m}}{e(1+m)} + \left(b^3Bd^2\right)\int x^{6n}(ex)^m \, dx + \left(a^2c(3Abc+aBc+2aAd)\right)\int$$
$$= \frac{a^3Ac^2(ex)^{1+m}}{e(1+m)} + \left(b^3Bd^2x^{-m}(ex)^m\right)\int x^{m+6n} \, dx + \left(a^2c(3Abc+aBc+2a\right.$$
$$= \frac{a^2c(3Abc+aBc+2aAd)x^{1+n}(ex)^m}{1+m+n} + \frac{a\left(aBc(3bc+2ad)+A\left(3b^2c^2+6\right.\right.}{1+m+2}$$

Mathematica [A] time = 1.10686, size = 273, normalized size = 0.86

$$x(ex)^m\left(\frac{ax^{2n}\left(A\left(a^2d^2+6abcd+3b^2c^2\right)+aBc(2ad+3bc)\right)}{m+2n+1}+\frac{x^{3n}\left(Ab\left(3a^2d^2+6abcd+b^2c^2\right)+aB\left(a^2d^2+6abcd+3\right.\right.}{m+3n+1}\right.$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.175, size = 11389, normalized size = 35.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] result too large to display
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.79572, size = 14151, normalized size = 44.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^3*d^2*m^6 + 6*B*b^3*d^2*m^5 + 15*B*b^3*d^2*m^4 + 20*B*b^3*d^2*m^3 + 1
5*B*b^3*d^2*m^2 + 6*B*b^3*d^2*m + B*b^3*d^2 + 120*(B*b^3*d^2*m + B*b^3*d^2)
*n^5 + 274*(B*b^3*d^2*m^2 + 2*B*b^3*d^2*m + B*b^3*d^2)*n^4 + 225*(B*b^3*d^2
*m^3 + 3*B*b^3*d^2*m^2 + 3*B*b^3*d^2*m + B*b^3*d^2)*n^3 + 85*(B*b^3*d^2*m^4
 + 4*B*b^3*d^2*m^3 + 6*B*b^3*d^2*m^2 + 4*B*b^3*d^2*m + B*b^3*d^2)*n^2 + 15*
(B*b^3*d^2*m^5 + 5*B*b^3*d^2*m^4 + 10*B*b^3*d^2*m^3 + 10*B*b^3*d^2*m^2 + 5*
B*b^3*d^2*m + B*b^3*d^2)*n)*x*x^(6*n)*e^(m*log(e) + m*log(x)) + ((2*B*b^3*c
*d + (3*B*a*b^2 + A*b^3)*d^2)*m^6 + 2*B*b^3*c*d + 6*(2*B*b^3*c*d + (3*B*a*b
^2 + A*b^3)*d^2)*m^5 + 144*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2 + (2*B*b^
3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m)*n^5 + 15*(2*B*b^3*c*d + (3*B*a*b^2 + A*
b^3)*d^2)*m^4 + 324*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2 + (2*B*b^3*c*d +
 (3*B*a*b^2 + A*b^3)*d^2)*m^2 + 2*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m
)*n^4 + 20*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^3 + 260*(2*B*b^3*c*d +
 (2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^3 + (3*B*a*b^2 + A*b^3)*d^2 + 3*
(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^2 + 3*(2*B*b^3*c*d + (3*B*a*b^2 +
 A*b^3)*d^2)*m)*n^3 + (3*B*a*b^2 + A*b^3)*d^2 + 15*(2*B*b^3*c*d + (3*B*a*b^
2 + A*b^3)*d^2)*m^2 + 95*(2*B*b^3*c*d + (2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*
d^2)*m^4 + 4*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^3 + (3*B*a*b^2 + A*b
^3)*d^2 + 6*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^2 + 4*(2*B*b^3*c*d +
(3*B*a*b^2 + A*b^3)*d^2)*m)*n^2 + 6*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)
*m + 16*(2*B*b^3*c*d + (2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^5 + 5*(2*B
*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m^4 + 10*(2*B*b^3*c*d + (3*B*a*b^2 + A*
b^3)*d^2)*m^3 + (3*B*a*b^2 + A*b^3)*d^2 + 10*(2*B*b^3*c*d + (3*B*a*b^2 + A*
b^3)*d^2)*m^2 + 5*(2*B*b^3*c*d + (3*B*a*b^2 + A*b^3)*d^2)*m)*n)*x*x^(5*n)*e
^(m*log(e) + m*log(x)) + ((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 + B*b^3*c^2 + 6*(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 + 180*(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 + (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)*n^5 + 15*(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 + 396*(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 + (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 + 2*(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)*n^4 + 20*(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 + 307*(B*b^3*c^2 + (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 + 2*(3*B*a*b^2 + A
*b^3)*c*d + 3*(B*a^2*b + A*a*b^2)*d^2 + 3*(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 + 3*(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)*n^3 + 2*(3*B*a*b^2 + A*b^3)*c*d + 3*
(B*a^2*b + A*a*b^2)*d^2 + 15*(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 + 107*(B*b^3*c^2 + (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 + 4*(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 + 2*(3*B*a*b^2 + A*b^3)*c*d + 3*
(B*a^2*b + A*a*b^2)*d^2 + 6*(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 + 4*(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)*n^2 + 6*(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 + 17*(B*b^3*c^2 + (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 + 5*(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 + 10*(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 + 2*(3*B*a*b^2 + A*b^3)*c*d +
 3*(B*a^2*b + A*a*b^2)*d^2 + 10*(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 + 5*(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)*n)*x*x^(4*n)*e^(m*log(e) + m*log(x)) + (((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 + 6*((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 + 240*((3*B*a*b^2 + A*b^3)*c^2 + 6*(B*a^2*b + A*a*b^2)*c*d
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+ (B*a^3 + 3*A*a^2*b)*d^2 + ((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)*n^5 + 15*((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 + 508*((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 + ((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
+ 2*((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)*n^4 + 20*((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 + 372*(((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 + (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 + 3*((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 + 3*((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)
*n^3 + (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 + 15*((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 + 121*(((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 + 4*((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 + (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 + 6*((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 + 4*
((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)*n^2 + 6*((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 + 18*(((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 + 5*((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 + 10*((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 + (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 + 10*
((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 + 5*((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)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + ((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 + A*a^3*d^2 + 6*(
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 + 36
0*(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 + (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)*n^5 + 15
*(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 +
702*(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 + (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 + 2*(
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)*n^4 +
 20*(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
 + 461*(A*a^3*d^2 + (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 + 3*(B*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*b)*c*d +
3*(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 +
 3*(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)*n
^3 + 3*(B*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*b)*c*d + 15*(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 + 137*(A*a^3*d
^2 + (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 + 4*(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 + 3*(B*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*b)*c*d + 6*(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 + 4*(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)*n^2 + 6*(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 + 19*(A*a^3*
d^2 + (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 + 5*(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 + 10*(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 + 3*(B*a^2*b + A*a*b^2)*c^2 + 2*(B*a^3 + 3*A*a^2*b)*c*d + 10*(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 + 5*(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)*n)*x*x^(2*n
)*e^(m*log(e) + m*log(x)) + ((2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^6 +
2*A*a^3*c*d + 6*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^5 + 720*(2*A*a^3*
c*d + (B*a^3 + 3*A*a^2*b)*c^2 + (2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m)*
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n^5 + 15*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^4 + 1044*(2*A*a^3*c*d +
(B*a^3 + 3*A*a^2*b)*c^2 + (2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^2 + 2*(
2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m)*n^4 + 20*(2*A*a^3*c*d + (B*a^3 +
3*A*a^2*b)*c^2)*m^3 + 580*(2*A*a^3*c*d + (2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)
*c^2)*m^3 + (B*a^3 + 3*A*a^2*b)*c^2 + 3*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*
c^2)*m^2 + 3*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m)*n^3 + (B*a^3 + 3*A*
a^2*b)*c^2 + 15*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^2 + 155*(2*A*a^3*
c*d + (2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^4 + 4*(2*A*a^3*c*d + (B*a^3
 + 3*A*a^2*b)*c^2)*m^3 + (B*a^3 + 3*A*a^2*b)*c^2 + 6*(2*A*a^3*c*d + (B*a^3
+ 3*A*a^2*b)*c^2)*m^2 + 4*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m)*n^2 +
6*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m + 20*(2*A*a^3*c*d + (2*A*a^3*c*
d + (B*a^3 + 3*A*a^2*b)*c^2)*m^5 + 5*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2
)*m^4 + 10*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^3 + (B*a^3 + 3*A*a^2*b
)*c^2 + 10*(2*A*a^3*c*d + (B*a^3 + 3*A*a^2*b)*c^2)*m^2 + 5*(2*A*a^3*c*d + (
B*a^3 + 3*A*a^2*b)*c^2)*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) + (A*a^3*c^2*m^
6 + 720*A*a^3*c^2*n^6 + 6*A*a^3*c^2*m^5 + 15*A*a^3*c^2*m^4 + 20*A*a^3*c^2*m
^3 + 15*A*a^3*c^2*m^2 + 6*A*a^3*c^2*m + A*a^3*c^2 + 1764*(A*a^3*c^2*m + A*a
^3*c^2)*n^5 + 1624*(A*a^3*c^2*m^2 + 2*A*a^3*c^2*m + A*a^3*c^2)*n^4 + 735*(A
*a^3*c^2*m^3 + 3*A*a^3*c^2*m^2 + 3*A*a^3*c^2*m + A*a^3*c^2)*n^3 + 175*(A*a^
3*c^2*m^4 + 4*A*a^3*c^2*m^3 + 6*A*a^3*c^2*m^2 + 4*A*a^3*c^2*m + A*a^3*c^2)*
n^2 + 21*(A*a^3*c^2*m^5 + 5*A*a^3*c^2*m^4 + 10*A*a^3*c^2*m^3 + 10*A*a^3*c^2
*m^2 + 5*A*a^3*c^2*m + A*a^3*c^2)*n)*x*e^(m*log(e) + m*log(x)))/(m^7 + 720*
(m + 1)*n^6 + 7*m^6 + 1764*(m^2 + 2*m + 1)*n^5 + 21*m^5 + 1624*(m^3 + 3*m^2
 + 3*m + 1)*n^4 + 35*m^4 + 735*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*n^3 + 35*m^3
 + 175*(m^5 + 5*m^4 + 10*m^3 + 10*m^2 + 5*m + 1)*n^2 + 21*m^2 + 21*(m^6 + 6
*m^5 + 15*m^4 + 20*m^3 + 15*m^2 + 6*m + 1)*n + 7*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.43246, size = 20733, normalized size = 65.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b^3*d^2*m^6*x*x^m*x^(6*n)*e^m + 15*B*b^3*d^2*m^5*n*x*x^m*x^(6*n)*e^m + 8
5*B*b^3*d^2*m^4*n^2*x*x^m*x^(6*n)*e^m + 225*B*b^3*d^2*m^3*n^3*x*x^m*x^(6*n)
*e^m + 274*B*b^3*d^2*m^2*n^4*x*x^m*x^(6*n)*e^m + 120*B*b^3*d^2*m*n^5*x*x^m*
x^(6*n)*e^m + 2*B*b^3*c*d*m^6*x*x^m*x^(5*n)*e^m + 3*B*a*b^2*d^2*m^6*x*x^m*x
^(5*n)*e^m + A*b^3*d^2*m^6*x*x^m*x^(5*n)*e^m + 32*B*b^3*c*d*m^5*n*x*x^m*x^(
5*n)*e^m + 48*B*a*b^2*d^2*m^5*n*x*x^m*x^(5*n)*e^m + 16*A*b^3*d^2*m^5*n*x*x^
m*x^(5*n)*e^m + 190*B*b^3*c*d*m^4*n^2*x*x^m*x^(5*n)*e^m + 285*B*a*b^2*d^2*m
^4*n^2*x*x^m*x^(5*n)*e^m + 95*A*b^3*d^2*m^4*n^2*x*x^m*x^(5*n)*e^m + 520*B*b
^3*c*d*m^3*n^3*x*x^m*x^(5*n)*e^m + 780*B*a*b^2*d^2*m^3*n^3*x*x^m*x^(5*n)*e^
```

m + 260*A*b^3*d^2*m^3*n^3*x*x^m*x^(5*n)*e^m + 648*B*b^3*c*d*m^2*n^4*x*x^m*x
^(5*n)*e^m + 972*B*a*b^2*d^2*m^2*n^4*x*x^m*x^(5*n)*e^m + 324*A*b^3*d^2*m^2*
n^4*x*x^m*x^(5*n)*e^m + 288*B*b^3*c*d*m*n^5*x*x^m*x^(5*n)*e^m + 432*B*a*b^2
*d^2*m*n^5*x*x^m*x^(5*n)*e^m + 144*A*b^3*d^2*m*n^5*x*x^m*x^(5*n)*e^m + B*b^
3*c^2*m^6*x*x^m*x^(4*n)*e^m + 6*B*a*b^2*c*d*m^6*x*x^m*x^(4*n)*e^m + 2*A*b^3
*c*d*m^6*x*x^m*x^(4*n)*e^m + 3*B*a^2*b*d^2*m^6*x*x^m*x^(4*n)*e^m + 3*A*a*b^
2*d^2*m^6*x*x^m*x^(4*n)*e^m + 17*B*b^3*c^2*m^5*n*x*x^m*x^(4*n)*e^m + 102*B*
a*b^2*c*d*m^5*n*x*x^m*x^(4*n)*e^m + 34*A*b^3*c*d*m^5*n*x*x^m*x^(4*n)*e^m +
51*B*a^2*b*d^2*m^5*n*x*x^m*x^(4*n)*e^m + 51*A*a*b^2*d^2*m^5*n*x*x^m*x^(4*n)
*e^m + 107*B*b^3*c^2*m^4*n^2*x*x^m*x^(4*n)*e^m + 642*B*a*b^2*c*d*m^4*n^2*x*
x^m*x^(4*n)*e^m + 214*A*b^3*c*d*m^4*n^2*x*x^m*x^(4*n)*e^m + 321*B*a^2*b*d^2
*m^4*n^2*x*x^m*x^(4*n)*e^m + 321*A*a*b^2*d^2*m^4*n^2*x*x^m*x^(4*n)*e^m + 30
7*B*b^3*c^2*m^3*n^3*x*x^m*x^(4*n)*e^m + 1842*B*a*b^2*c*d*m^3*n^3*x*x^m*x^(4
*n)*e^m + 614*A*b^3*c*d*m^3*n^3*x*x^m*x^(4*n)*e^m + 921*B*a^2*b*d^2*m^3*n^3
*x*x^m*x^(4*n)*e^m + 921*A*a*b^2*d^2*m^3*n^3*x*x^m*x^(4*n)*e^m + 396*B*b^3*
c^2*m^2*n^4*x*x^m*x^(4*n)*e^m + 2376*B*a*b^2*c*d*m^2*n^4*x*x^m*x^(4*n)*e^m
+ 792*A*b^3*c*d*m^2*n^4*x*x^m*x^(4*n)*e^m + 1188*B*a^2*b*d^2*m^2*n^4*x*x^m*
x^(4*n)*e^m + 1188*A*a*b^2*d^2*m^2*n^4*x*x^m*x^(4*n)*e^m + 180*B*b^3*c^2*m*
n^5*x*x^m*x^(4*n)*e^m + 1080*B*a*b^2*c*d*m*n^5*x*x^m*x^(4*n)*e^m + 360*A*b^
3*c*d*m*n^5*x*x^m*x^(4*n)*e^m + 540*B*a^2*b*d^2*m*n^5*x*x^m*x^(4*n)*e^m + 5
40*A*a*b^2*d^2*m*n^5*x*x^m*x^(4*n)*e^m + 3*B*a*b^2*c^2*m^6*x*x^m*x^(3*n)*e^
m + A*b^3*c^2*m^6*x*x^m*x^(3*n)*e^m + 6*B*a^2*b*c*d*m^6*x*x^m*x^(3*n)*e^m +
 6*A*a*b^2*c*d*m^6*x*x^m*x^(3*n)*e^m + B*a^3*d^2*m^6*x*x^m*x^(3*n)*e^m + 3*
A*a^2*b*d^2*m^6*x*x^m*x^(3*n)*e^m + 54*B*a*b^2*c^2*m^5*n*x*x^m*x^(3*n)*e^m
+ 18*A*b^3*c^2*m^5*n*x*x^m*x^(3*n)*e^m + 108*B*a^2*b*c*d*m^5*n*x*x^m*x^(3*n
)*e^m + 108*A*a*b^2*c*d*m^5*n*x*x^m*x^(3*n)*e^m + 18*B*a^3*d^2*m^5*n*x*x^m*
x^(3*n)*e^m + 54*A*a^2*b*d^2*m^5*n*x*x^m*x^(3*n)*e^m + 363*B*a*b^2*c^2*m^4*
n^2*x*x^m*x^(3*n)*e^m + 121*A*b^3*c^2*m^4*n^2*x*x^m*x^(3*n)*e^m + 726*B*a^2
*b*c*d*m^4*n^2*x*x^m*x^(3*n)*e^m + 726*A*a*b^2*c*d*m^4*n^2*x*x^m*x^(3*n)*e^
m + 121*B*a^3*d^2*m^4*n^2*x*x^m*x^(3*n)*e^m + 363*A*a^2*b*d^2*m^4*n^2*x*x^m
*x^(3*n)*e^m + 1116*B*a*b^2*c^2*m^3*n^3*x*x^m*x^(3*n)*e^m + 372*A*b^3*c^2*m
^3*n^3*x*x^m*x^(3*n)*e^m + 2232*B*a^2*b*c*d*m^3*n^3*x*x^m*x^(3*n)*e^m + 223
2*A*a*b^2*c*d*m^3*n^3*x*x^m*x^(3*n)*e^m + 372*B*a^3*d^2*m^3*n^3*x*x^m*x^(3*
n)*e^m + 1116*A*a^2*b*d^2*m^3*n^3*x*x^m*x^(3*n)*e^m + 1524*B*a*b^2*c^2*m^2*
n^4*x*x^m*x^(3*n)*e^m + 508*A*b^3*c^2*m^2*n^4*x*x^m*x^(3*n)*e^m + 3048*B*a^
2*b*c*d*m^2*n^4*x*x^m*x^(3*n)*e^m + 3048*A*a*b^2*c*d*m^2*n^4*x*x^m*x^(3*n)*
e^m + 508*B*a^3*d^2*m^2*n^4*x*x^m*x^(3*n)*e^m + 1524*A*a^2*b*d^2*m^2*n^4*x*
x^m*x^(3*n)*e^m + 720*B*a*b^2*c^2*m*n^5*x*x^m*x^(3*n)*e^m + 240*A*b^3*c^2*m
*n^5*x*x^m*x^(3*n)*e^m + 1440*B*a^2*b*c*d*m*n^5*x*x^m*x^(3*n)*e^m + 1440*A*
a*b^2*c*d*m*n^5*x*x^m*x^(3*n)*e^m + 240*B*a^3*d^2*m*n^5*x*x^m*x^(3*n)*e^m +
 720*A*a^2*b*d^2*m*n^5*x*x^m*x^(3*n)*e^m + 3*B*a^2*b*c^2*m^6*x*x^m*x^(2*n)*
e^m + 3*A*a*b^2*c^2*m^6*x*x^m*x^(2*n)*e^m + 2*B*a^3*c*d*m^6*x*x^m*x^(2*n)*e
^m + 6*A*a^2*b*c*d*m^6*x*x^m*x^(2*n)*e^m + A*a^3*d^2*m^6*x*x^m*x^(2*n)*e^m
+ 57*B*a^2*b*c^2*m^5*n*x*x^m*x^(2*n)*e^m + 57*A*a*b^2*c^2*m^5*n*x*x^m*x^(2*
n)*e^m + 38*B*a^3*c*d*m^5*n*x*x^m*x^(2*n)*e^m + 114*A*a^2*b*c*d*m^5*n*x*x^m
*x^(2*n)*e^m + 19*A*a^3*d^2*m^5*n*x*x^m*x^(2*n)*e^m + 411*B*a^2*b*c^2*m^4*n
^2*x*x^m*x^(2*n)*e^m + 411*A*a*b^2*c^2*m^4*n^2*x*x^m*x^(2*n)*e^m + 274*B*a^
3*c*d*m^4*n^2*x*x^m*x^(2*n)*e^m + 822*A*a^2*b*c*d*m^4*n^2*x*x^m*x^(2*n)*e^m
 + 137*A*a^3*d^2*m^4*n^2*x*x^m*x^(2*n)*e^m + 1383*B*a^2*b*c^2*m^3*n^3*x*x^m
*x^(2*n)*e^m + 1383*A*a*b^2*c^2*m^3*n^3*x*x^m*x^(2*n)*e^m + 922*B*a^3*c*d*m
^3*n^3*x*x^m*x^(2*n)*e^m + 2766*A*a^2*b*c*d*m^3*n^3*x*x^m*x^(2*n)*e^m + 461
*A*a^3*d^2*m^3*n^3*x*x^m*x^(2*n)*e^m + 2106*B*a^2*b*c^2*m^2*n^4*x*x^m*x^(2*
n)*e^m + 2106*A*a*b^2*c^2*m^2*n^4*x*x^m*x^(2*n)*e^m + 1404*B*a^3*c*d*m^2*n^
4*x*x^m*x^(2*n)*e^m + 4212*A*a^2*b*c*d*m^2*n^4*x*x^m*x^(2*n)*e^m + 702*A*a^
3*d^2*m^2*n^4*x*x^m*x^(2*n)*e^m + 1080*B*a^2*b*c^2*m*n^5*x*x^m*x^(2*n)*e^m
+ 1080*A*a*b^2*c^2*m*n^5*x*x^m*x^(2*n)*e^m + 720*B*a^3*c*d*m*n^5*x*x^m*x^(2
*n)*e^m + 2160*A*a^2*b*c*d*m*n^5*x*x^m*x^(2*n)*e^m + 360*A*a^3*d^2*m*n^5*x*
x^m*x^(2*n)*e^m + B*a^3*c^2*m^6*x*x^m*x^n*e^m + 3*A*a^2*b*c^2*m^6*x*x^m*x^n
*e^m + 2*A*a^3*c*d*m^6*x*x^m*x^n*e^m + 20*B*a^3*c^2*m^5*n*x*x^m*x^n*e^m + 6

```
0*A*a^2*b*c^2*m^5*n*x*x^m*x^n*e^m + 40*A*a^3*c*d*m^5*n*x*x^m*x^n*e^m + 155*
B*a^3*c^2*m^4*n^2*x*x^m*x^n*e^m + 465*A*a^2*b*c^2*m^4*n^2*x*x^m*x^n*e^m + 3
10*A*a^3*c*d*m^4*n^2*x*x^m*x^n*e^m + 580*B*a^3*c^2*m^3*n^3*x*x^m*x^n*e^m +
1740*A*a^2*b*c^2*m^3*n^3*x*x^m*x^n*e^m + 1160*A*a^3*c*d*m^3*n^3*x*x^m*x^n*e
^m + 1044*B*a^3*c^2*m^2*n^4*x*x^m*x^n*e^m + 3132*A*a^2*b*c^2*m^2*n^4*x*x^m*
x^n*e^m + 2088*A*a^3*c*d*m^2*n^4*x*x^m*x^n*e^m + 720*B*a^3*c^2*m*n^5*x*x^m*
x^n*e^m + 2160*A*a^2*b*c^2*m*n^5*x*x^m*x^n*e^m + 1440*A*a^3*c*d*m*n^5*x*x^m
*x^n*e^m + A*a^3*c^2*m^6*x*x^m*e^m + 21*A*a^3*c^2*m^5*n*x*x^m*e^m + 175*A*a
^3*c^2*m^4*n^2*x*x^m*e^m + 735*A*a^3*c^2*m^3*n^3*x*x^m*e^m + 1624*A*a^3*c^2
*m^2*n^4*x*x^m*e^m + 1764*A*a^3*c^2*m*n^5*x*x^m*e^m + 720*A*a^3*c^2*n^6*x*x
^m*e^m + 6*B*b^3*d^2*m^5*x*x^m*x^(6*n)*e^m + 75*B*b^3*d^2*m^4*n*x*x^m*x^(6*
n)*e^m + 340*B*b^3*d^2*m^3*n^2*x*x^m*x^(6*n)*e^m + 675*B*b^3*d^2*m^2*n^3*x*
x^m*x^(6*n)*e^m + 548*B*b^3*d^2*m*n^4*x*x^m*x^(6*n)*e^m + 120*B*b^3*d^2*n^5
*x*x^m*x^(6*n)*e^m + 12*B*b^3*c*d*m^5*x*x^m*x^(5*n)*e^m + 18*B*a*b^2*d^2*m^
5*x*x^m*x^(5*n)*e^m + 6*A*b^3*d^2*m^5*x*x^m*x^(5*n)*e^m + 160*B*b^3*c*d*m^4
*n*x*x^m*x^(5*n)*e^m + 240*B*a*b^2*d^2*m^4*n*x*x^m*x^(5*n)*e^m + 80*A*b^3*d
^2*m^4*n*x*x^m*x^(5*n)*e^m + 760*B*b^3*c*d*m^3*n^2*x*x^m*x^(5*n)*e^m + 1140
*B*a*b^2*d^2*m^3*n^2*x*x^m*x^(5*n)*e^m + 380*A*b^3*d^2*m^3*n^2*x*x^m*x^(5*n
)*e^m + 1560*B*b^3*c*d*m^2*n^3*x*x^m*x^(5*n)*e^m + 2340*B*a*b^2*d^2*m^2*n^3
*x*x^m*x^(5*n)*e^m + 780*A*b^3*d^2*m^2*n^3*x*x^m*x^(5*n)*e^m + 1296*B*b^3*c
*d*m*n^4*x*x^m*x^(5*n)*e^m + 1944*B*a*b^2*d^2*m*n^4*x*x^m*x^(5*n)*e^m + 648
*A*b^3*d^2*m*n^4*x*x^m*x^(5*n)*e^m + 288*B*b^3*c*d*n^5*x*x^m*x^(5*n)*e^m +
432*B*a*b^2*d^2*n^5*x*x^m*x^(5*n)*e^m + 144*A*b^3*d^2*n^5*x*x^m*x^(5*n)*e^m
 + 6*B*b^3*c^2*m^5*x*x^m*x^(4*n)*e^m + 36*B*a*b^2*c*d*m^5*x*x^m*x^(4*n)*e^m
 + 12*A*b^3*c*d*m^5*x*x^m*x^(4*n)*e^m + 18*B*a^2*b*d^2*m^5*x*x^m*x^(4*n)*e^
m + 18*A*a*b^2*d^2*m^5*x*x^m*x^(4*n)*e^m + 85*B*b^3*c^2*m^4*n*x*x^m*x^(4*n)
*e^m + 510*B*a*b^2*c*d*m^4*n*x*x^m*x^(4*n)*e^m + 170*A*b^3*c*d*m^4*n*x*x^m*
x^(4*n)*e^m + 255*B*a^2*b*d^2*m^4*n*x*x^m*x^(4*n)*e^m + 255*A*a*b^2*d^2*m^4
*n*x*x^m*x^(4*n)*e^m + 428*B*b^3*c^2*m^3*n^2*x*x^m*x^(4*n)*e^m + 2568*B*a*b
^2*c*d*m^3*n^2*x*x^m*x^(4*n)*e^m + 856*A*b^3*c*d*m^3*n^2*x*x^m*x^(4*n)*e^m
+ 1284*B*a^2*b*d^2*m^3*n^2*x*x^m*x^(4*n)*e^m + 1284*A*a*b^2*d^2*m^3*n^2*x*x
^m*x^(4*n)*e^m + 921*B*b^3*c^2*m^2*n^3*x*x^m*x^(4*n)*e^m + 5526*B*a*b^2*c*d
*m^2*n^3*x*x^m*x^(4*n)*e^m + 1842*A*b^3*c*d*m^2*n^3*x*x^m*x^(4*n)*e^m + 276
3*B*a^2*b*d^2*m^2*n^3*x*x^m*x^(4*n)*e^m + 2763*A*a*b^2*d^2*m^2*n^3*x*x^m*x^
(4*n)*e^m + 792*B*b^3*c^2*m*n^4*x*x^m*x^(4*n)*e^m + 4752*B*a*b^2*c*d*m*n^4*
x*x^m*x^(4*n)*e^m + 1584*A*b^3*c*d*m*n^4*x*x^m*x^(4*n)*e^m + 2376*B*a^2*b*d
^2*m*n^4*x*x^m*x^(4*n)*e^m + 2376*A*a*b^2*d^2*m*n^4*x*x^m*x^(4*n)*e^m + 180
*B*b^3*c^2*n^5*x*x^m*x^(4*n)*e^m + 1080*B*a*b^2*c*d*n^5*x*x^m*x^(4*n)*e^m +
 360*A*b^3*c*d*n^5*x*x^m*x^(4*n)*e^m + 540*B*a^2*b*d^2*n^5*x*x^m*x^(4*n)*e^
m + 540*A*a*b^2*d^2*n^5*x*x^m*x^(4*n)*e^m + 18*B*a*b^2*c^2*m^5*x*x^m*x^(3*n
)*e^m + 6*A*b^3*c^2*m^5*x*x^m*x^(3*n)*e^m + 36*B*a^2*b*c*d*m^5*x*x^m*x^(3*n
)*e^m + 36*A*a*b^2*c*d*m^5*x*x^m*x^(3*n)*e^m + 6*B*a^3*d^2*m^5*x*x^m*x^(3*n
)*e^m + 18*A*a^2*b*d^2*m^5*x*x^m*x^(3*n)*e^m + 270*B*a*b^2*c^2*m^4*n*x*x^m*
x^(3*n)*e^m + 90*A*b^3*c^2*m^4*n*x*x^m*x^(3*n)*e^m + 540*B*a^2*b*c*d*m^4*n*
x*x^m*x^(3*n)*e^m + 540*A*a*b^2*c*d*m^4*n*x*x^m*x^(3*n)*e^m + 90*B*a^3*d^2*
m^4*n*x*x^m*x^(3*n)*e^m + 270*A*a^2*b*d^2*m^4*n*x*x^m*x^(3*n)*e^m + 1452*B*
a*b^2*c^2*m^3*n^2*x*x^m*x^(3*n)*e^m + 484*A*b^3*c^2*m^3*n^2*x*x^m*x^(3*n)*e
^m + 2904*B*a^2*b*c*d*m^3*n^2*x*x^m*x^(3*n)*e^m + 2904*A*a*b^2*c*d*m^3*n^2*
x*x^m*x^(3*n)*e^m + 484*B*a^3*d^2*m^3*n^2*x*x^m*x^(3*n)*e^m + 1452*A*a^2*b*
d^2*m^3*n^2*x*x^m*x^(3*n)*e^m + 3348*B*a*b^2*c^2*m^2*n^3*x*x^m*x^(3*n)*e^m
+ 1116*A*b^3*c^2*m^2*n^3*x*x^m*x^(3*n)*e^m + 6696*B*a^2*b*c*d*m^2*n^3*x*x^m
*x^(3*n)*e^m + 6696*A*a*b^2*c*d*m^2*n^3*x*x^m*x^(3*n)*e^m + 1116*B*a^3*d^2*
m^2*n^3*x*x^m*x^(3*n)*e^m + 3348*A*a^2*b*d^2*m^2*n^3*x*x^m*x^(3*n)*e^m + 30
48*B*a*b^2*c^2*m*n^4*x*x^m*x^(3*n)*e^m + 1016*A*b^3*c^2*m*n^4*x*x^m*x^(3*n)
*e^m + 6096*B*a^2*b*c*d*m*n^4*x*x^m*x^(3*n)*e^m + 6096*A*a*b^2*c*d*m*n^4*x*
x^m*x^(3*n)*e^m + 1016*B*a^3*d^2*m*n^4*x*x^m*x^(3*n)*e^m + 3048*A*a^2*b*d^2
*m*n^4*x*x^m*x^(3*n)*e^m + 720*B*a*b^2*c^2*n^5*x*x^m*x^(3*n)*e^m + 240*A*b^
3*c^2*n^5*x*x^m*x^(3*n)*e^m + 1440*B*a^2*b*c*d*n^5*x*x^m*x^(3*n)*e^m + 1440
*A*a*b^2*c*d*n^5*x*x^m*x^(3*n)*e^m + 240*B*a^3*d^2*n^5*x*x^m*x^(3*n)*e^m +
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720*A*a^2*b*d^2*n^5*x*x^m*x^(3*n)*e^m + 18*B*a^2*b*c^2*m^5*x*x^m*x^(2*n)*e^
m + 18*A*a*b^2*c^2*m^5*x*x^m*x^(2*n)*e^m + 12*B*a^3*c*d*m^5*x*x^m*x^(2*n)*e
^m + 36*A*a^2*b*c*d*m^5*x*x^m*x^(2*n)*e^m + 6*A*a^3*d^2*m^5*x*x^m*x^(2*n)*e
^m + 285*B*a^2*b*c^2*m^4*n*x*x^m*x^(2*n)*e^m + 285*A*a*b^2*c^2*m^4*n*x*x^m*
x^(2*n)*e^m + 190*B*a^3*c*d*m^4*n*x*x^m*x^(2*n)*e^m + 570*A*a^2*b*c*d*m^4*n
*x*x^m*x^(2*n)*e^m + 95*A*a^3*d^2*m^4*n*x*x^m*x^(2*n)*e^m + 1644*B*a^2*b*c^
2*m^3*n^2*x*x^m*x^(2*n)*e^m + 1644*A*a*b^2*c^2*m^3*n^2*x*x^m*x^(2*n)*e^m +
1096*B*a^3*c*d*m^3*n^2*x*x^m*x^(2*n)*e^m + 3288*A*a^2*b*c*d*m^3*n^2*x*x^m*x
^(2*n)*e^m + 548*A*a^3*d^2*m^3*n^2*x*x^m*x^(2*n)*e^m + 4149*B*a^2*b*c^2*m^2
*n^3*x*x^m*x^(2*n)*e^m + 4149*A*a*b^2*c^2*m^2*n^3*x*x^m*x^(2*n)*e^m + 2766*
B*a^3*c*d*m^2*n^3*x*x^m*x^(2*n)*e^m + 8298*A*a^2*b*c*d*m^2*n^3*x*x^m*x^(2*n
)*e^m + 1383*A*a^3*d^2*m^2*n^3*x*x^m*x^(2*n)*e^m + 4212*B*a^2*b*c^2*m*n^4*x
*x^m*x^(2*n)*e^m + 4212*A*a*b^2*c^2*m*n^4*x*x^m*x^(2*n)*e^m + 2808*B*a^3*c*
d*m*n^4*x*x^m*x^(2*n)*e^m + 8424*A*a^2*b*c*d*m*n^4*x*x^m*x^(2*n)*e^m + 1404
*A*a^3*d^2*m*n^4*x*x^m*x^(2*n)*e^m + 1080*B*a^2*b*c^2*n^5*x*x^m*x^(2*n)*e^m
 + 1080*A*a*b^2*c^2*n^5*x*x^m*x^(2*n)*e^m + 720*B*a^3*c*d*n^5*x*x^m*x^(2*n)
*e^m + 2160*A*a^2*b*c*d*n^5*x*x^m*x^(2*n)*e^m + 360*A*a^3*d^2*n^5*x*x^m*x^(
2*n)*e^m + 6*B*a^3*c^2*m^5*x*x^m*x^n*e^m + 18*A*a^2*b*c^2*m^5*x*x^m*x^n*e^m
 + 12*A*a^3*c*d*m^5*x*x^m*x^n*e^m + 100*B*a^3*c^2*m^4*n*x*x^m*x^n*e^m + 300
*A*a^2*b*c^2*m^4*n*x*x^m*x^n*e^m + 200*A*a^3*c*d*m^4*n*x*x^m*x^n*e^m + 620*
B*a^3*c^2*m^3*n^2*x*x^m*x^n*e^m + 1860*A*a^2*b*c^2*m^3*n^2*x*x^m*x^n*e^m +
1240*A*a^3*c*d*m^3*n^2*x*x^m*x^n*e^m + 1740*B*a^3*c^2*m^2*n^3*x*x^m*x^n*e^m
 + 5220*A*a^2*b*c^2*m^2*n^3*x*x^m*x^n*e^m + 3480*A*a^3*c*d*m^2*n^3*x*x^m*x^
n*e^m + 2088*B*a^3*c^2*m*n^4*x*x^m*x^n*e^m + 6264*A*a^2*b*c^2*m*n^4*x*x^m*x
^n*e^m + 4176*A*a^3*c*d*m*n^4*x*x^m*x^n*e^m + 720*B*a^3*c^2*n^5*x*x^m*x^n*e
^m + 2160*A*a^2*b*c^2*n^5*x*x^m*x^n*e^m + 1440*A*a^3*c*d*n^5*x*x^m*x^n*e^m
+ 6*A*a^3*c^2*m^5*x*x^m*e^m + 105*A*a^3*c^2*m^4*n*x*x^m*e^m + 700*A*a^3*c^2
*m^3*n^2*x*x^m*e^m + 2205*A*a^3*c^2*m^2*n^3*x*x^m*e^m + 3248*A*a^3*c^2*m*n^
4*x*x^m*e^m + 1764*A*a^3*c^2*n^5*x*x^m*e^m + 15*B*b^3*d^2*m^4*x*x^m*x^(6*n)
*e^m + 150*B*b^3*d^2*m^3*n*x*x^m*x^(6*n)*e^m + 510*B*b^3*d^2*m^2*n^2*x*x^m*
x^(6*n)*e^m + 675*B*b^3*d^2*m*n^3*x*x^m*x^(6*n)*e^m + 274*B*b^3*d^2*n^4*x*x
^m*x^(6*n)*e^m + 30*B*b^3*c*d*m^4*x*x^m*x^(5*n)*e^m + 45*B*a*b^2*d^2*m^4*x*
x^m*x^(5*n)*e^m + 15*A*b^3*d^2*m^4*x*x^m*x^(5*n)*e^m + 320*B*b^3*c*d*m^3*n*
x*x^m*x^(5*n)*e^m + 480*B*a*b^2*d^2*m^3*n*x*x^m*x^(5*n)*e^m + 160*A*b^3*d^2
*m^3*n*x*x^m*x^(5*n)*e^m + 1140*B*b^3*c*d*m^2*n^2*x*x^m*x^(5*n)*e^m + 1710*
B*a*b^2*d^2*m^2*n^2*x*x^m*x^(5*n)*e^m + 570*A*b^3*d^2*m^2*n^2*x*x^m*x^(5*n)
*e^m + 1560*B*b^3*c*d*m*n^3*x*x^m*x^(5*n)*e^m + 2340*B*a*b^2*d^2*m*n^3*x*x^
m*x^(5*n)*e^m + 780*A*b^3*d^2*m*n^3*x*x^m*x^(5*n)*e^m + 648*B*b^3*c*d*n^4*x
*x^m*x^(5*n)*e^m + 972*B*a*b^2*d^2*n^4*x*x^m*x^(5*n)*e^m + 324*A*b^3*d^2*n^
4*x*x^m*x^(5*n)*e^m + 15*B*b^3*c^2*m^4*x*x^m*x^(4*n)*e^m + 90*B*a*b^2*c*d*m
^4*x*x^m*x^(4*n)*e^m + 30*A*b^3*c*d*m^4*x*x^m*x^(4*n)*e^m + 45*B*a^2*b*d^2*
m^4*x*x^m*x^(4*n)*e^m + 45*A*a*b^2*d^2*m^4*x*x^m*x^(4*n)*e^m + 170*B*b^3*c^
2*m^3*n*x*x^m*x^(4*n)*e^m + 1020*B*a*b^2*c*d*m^3*n*x*x^m*x^(4*n)*e^m + 340*
A*b^3*c*d*m^3*n*x*x^m*x^(4*n)*e^m + 510*B*a^2*b*d^2*m^3*n*x*x^m*x^(4*n)*e^m
 + 510*A*a*b^2*d^2*m^3*n*x*x^m*x^(4*n)*e^m + 642*B*b^3*c^2*m^2*n^2*x*x^m*x^
(4*n)*e^m + 3852*B*a*b^2*c*d*m^2*n^2*x*x^m*x^(4*n)*e^m + 1284*A*b^3*c*d*m^2
*n^2*x*x^m*x^(4*n)*e^m + 1926*B*a^2*b*d^2*m^2*n^2*x*x^m*x^(4*n)*e^m + 1926*
A*a*b^2*d^2*m^2*n^2*x*x^m*x^(4*n)*e^m + 921*B*b^3*c^2*m*n^3*x*x^m*x^(4*n)*e
^m + 5526*B*a*b^2*c*d*m*n^3*x*x^m*x^(4*n)*e^m + 1842*A*b^3*c*d*m*n^3*x*x^m*
x^(4*n)*e^m + 2763*B*a^2*b*d^2*m*n^3*x*x^m*x^(4*n)*e^m + 2763*A*a*b^2*d^2*m
*n^3*x*x^m*x^(4*n)*e^m + 396*B*b^3*c^2*n^4*x*x^m*x^(4*n)*e^m + 2376*B*a*b^2
*c*d*n^4*x*x^m*x^(4*n)*e^m + 792*A*b^3*c*d*n^4*x*x^m*x^(4*n)*e^m + 1188*B*a
^2*b*d^2*n^4*x*x^m*x^(4*n)*e^m + 1188*A*a*b^2*d^2*n^4*x*x^m*x^(4*n)*e^m + 4
5*B*a*b^2*c^2*m^4*x*x^m*x^(3*n)*e^m + 15*A*b^3*c^2*m^4*x*x^m*x^(3*n)*e^m +
90*B*a^2*b*c*d*m^4*x*x^m*x^(3*n)*e^m + 90*A*a*b^2*c*d*m^4*x*x^m*x^(3*n)*e^m
 + 15*B*a^3*d^2*m^4*x*x^m*x^(3*n)*e^m + 45*A*a^2*b*d^2*m^4*x*x^m*x^(3*n)*e^
m + 540*B*a*b^2*c^2*m^3*n*x*x^m*x^(3*n)*e^m + 180*A*b^3*c^2*m^3*n*x*x^m*x^(
3*n)*e^m + 1080*B*a^2*b*c*d*m^3*n*x*x^m*x^(3*n)*e^m + 1080*A*a*b^2*c*d*m^3*
n*x*x^m*x^(3*n)*e^m + 180*B*a^3*d^2*m^3*n*x*x^m*x^(3*n)*e^m + 540*A*a^2*b*d
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^2*m^3*n*x*x^m*x^(3*n)*e^m + 2178*B*a*b^2*c^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 7
26*A*b^3*c^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 4356*B*a^2*b*c*d*m^2*n^2*x*x^m*x^(
3*n)*e^m + 4356*A*a*b^2*c*d*m^2*n^2*x*x^m*x^(3*n)*e^m + 726*B*a^3*d^2*m^2*n
^2*x*x^m*x^(3*n)*e^m + 2178*A*a^2*b*d^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 3348*B*
a*b^2*c^2*m*n^3*x*x^m*x^(3*n)*e^m + 1116*A*b^3*c^2*m*n^3*x*x^m*x^(3*n)*e^m
+ 6696*B*a^2*b*c*d*m*n^3*x*x^m*x^(3*n)*e^m + 6696*A*a*b^2*c*d*m*n^3*x*x^m*x
^(3*n)*e^m + 1116*B*a^3*d^2*m*n^3*x*x^m*x^(3*n)*e^m + 3348*A*a^2*b*d^2*m*n^
3*x*x^m*x^(3*n)*e^m + 1524*B*a*b^2*c^2*n^4*x*x^m*x^(3*n)*e^m + 508*A*b^3*c^
2*n^4*x*x^m*x^(3*n)*e^m + 3048*B*a^2*b*c*d*n^4*x*x^m*x^(3*n)*e^m + 3048*A*a
*b^2*c*d*n^4*x*x^m*x^(3*n)*e^m + 508*B*a^3*d^2*n^4*x*x^m*x^(3*n)*e^m + 1524
*A*a^2*b*d^2*n^4*x*x^m*x^(3*n)*e^m + 45*B*a^2*b*c^2*m^4*x*x^m*x^(2*n)*e^m +
45*A*a*b^2*c^2*m^4*x*x^m*x^(2*n)*e^m + 30*B*a^3*c*d*m^4*x*x^m*x^(2*n)*e^m
+ 90*A*a^2*b*c*d*m^4*x*x^m*x^(2*n)*e^m + 15*A*a^3*d^2*m^4*x*x^m*x^(2*n)*e^m
+ 570*B*a^2*b*c^2*m^3*n*x*x^m*x^(2*n)*e^m + 570*A*a*b^2*c^2*m^3*n*x*x^m*x^
(2*n)*e^m + 380*B*a^3*c*d*m^3*n*x*x^m*x^(2*n)*e^m + 1140*A*a^2*b*c*d*m^3*n*
x*x^m*x^(2*n)*e^m + 190*A*a^3*d^2*m^3*n*x*x^m*x^(2*n)*e^m + 2466*B*a^2*b*c^
2*m^2*n^2*x*x^m*x^(2*n)*e^m + 2466*A*a*b^2*c^2*m^2*n^2*x*x^m*x^(2*n)*e^m +
1644*B*a^3*c*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 4932*A*a^2*b*c*d*m^2*n^2*x*x^m*x
^(2*n)*e^m + 822*A*a^3*d^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 4149*B*a^2*b*c^2*m*n
^3*x*x^m*x^(2*n)*e^m + 4149*A*a*b^2*c^2*m*n^3*x*x^m*x^(2*n)*e^m + 2766*B*a^
3*c*d*m*n^3*x*x^m*x^(2*n)*e^m + 8298*A*a^2*b*c*d*m*n^3*x*x^m*x^(2*n)*e^m +
1383*A*a^3*d^2*m*n^3*x*x^m*x^(2*n)*e^m + 2106*B*a^2*b*c^2*n^4*x*x^m*x^(2*n)
*e^m + 2106*A*a*b^2*c^2*n^4*x*x^m*x^(2*n)*e^m + 1404*B*a^3*c*d*n^4*x*x^m*x^
(2*n)*e^m + 4212*A*a^2*b*c*d*n^4*x*x^m*x^(2*n)*e^m + 702*A*a^3*d^2*n^4*x*x^
m*x^(2*n)*e^m + 15*B*a^3*c^2*m^4*x*x^m*x^n*e^m + 45*A*a^2*b*c^2*m^4*x*x^m*x
^n*e^m + 30*A*a^3*c*d*m^4*x*x^m*x^n*e^m + 200*B*a^3*c^2*m^3*n*x*x^m*x^n*e^m
+ 600*A*a^2*b*c^2*m^3*n*x*x^m*x^n*e^m + 400*A*a^3*c*d*m^3*n*x*x^m*x^n*e^m
+ 930*B*a^3*c^2*m^2*n^2*x*x^m*x^n*e^m + 2790*A*a^2*b*c^2*m^2*n^2*x*x^m*x^n*
e^m + 1860*A*a^3*c*d*m^2*n^2*x*x^m*x^n*e^m + 1740*B*a^3*c^2*m*n^3*x*x^m*x^n
*e^m + 5220*A*a^2*b*c^2*m*n^3*x*x^m*x^n*e^m + 3480*A*a^3*c*d*m*n^3*x*x^m*x^
n*e^m + 1044*B*a^3*c^2*n^4*x*x^m*x^n*e^m + 3132*A*a^2*b*c^2*n^4*x*x^m*x^n*e
^m + 2088*A*a^3*c*d*n^4*x*x^m*x^n*e^m + 15*A*a^3*c^2*m^4*x*x^m*e^m + 210*A*
a^3*c^2*m^3*n*x*x^m*e^m + 1050*A*a^3*c^2*m^2*n^2*x*x^m*e^m + 2205*A*a^3*c^2
*m*n^3*x*x^m*e^m + 1624*A*a^3*c^2*n^4*x*x^m*e^m + 20*B*b^3*d^2*m^3*x*x^m*x^
(6*n)*e^m + 150*B*b^3*d^2*m^2*n*x*x^m*x^(6*n)*e^m + 340*B*b^3*d^2*m*n^2*x*x
^m*x^(6*n)*e^m + 225*B*b^3*d^2*n^3*x*x^m*x^(6*n)*e^m + 40*B*b^3*c*d*m^3*x*x
^m*x^(5*n)*e^m + 60*B*a*b^2*d^2*m^3*x*x^m*x^(5*n)*e^m + 20*A*b^3*d^2*m^3*x*
x^m*x^(5*n)*e^m + 320*B*b^3*c*d*m^2*n*x*x^m*x^(5*n)*e^m + 480*B*a*b^2*d^2*m
^2*n*x*x^m*x^(5*n)*e^m + 160*A*b^3*d^2*m^2*n*x*x^m*x^(5*n)*e^m + 760*B*b^3*
c*d*m*n^2*x*x^m*x^(5*n)*e^m + 1140*B*a*b^2*d^2*m*n^2*x*x^m*x^(5*n)*e^m + 38
0*A*b^3*d^2*m*n^2*x*x^m*x^(5*n)*e^m + 520*B*b^3*c*d*n^3*x*x^m*x^(5*n)*e^m +
780*B*a*b^2*d^2*n^3*x*x^m*x^(5*n)*e^m + 260*A*b^3*d^2*n^3*x*x^m*x^(5*n)*e^
m + 20*B*b^3*c^2*m^3*x*x^m*x^(4*n)*e^m + 120*B*a*b^2*c*d*m^3*x*x^m*x^(4*n)*
e^m + 40*A*b^3*c*d*m^3*x*x^m*x^(4*n)*e^m + 60*B*a^2*b*d^2*m^3*x*x^m*x^(4*n)
*e^m + 60*A*a*b^2*d^2*m^3*x*x^m*x^(4*n)*e^m + 170*B*b^3*c^2*m^2*n*x*x^m*x^(
4*n)*e^m + 1020*B*a*b^2*c*d*m^2*n*x*x^m*x^(4*n)*e^m + 340*A*b^3*c*d*m^2*n*x
*x^m*x^(4*n)*e^m + 510*B*a^2*b*d^2*m^2*n*x*x^m*x^(4*n)*e^m + 510*A*a*b^2*d^
2*m^2*n*x*x^m*x^(4*n)*e^m + 428*B*b^3*c^2*m*n^2*x*x^m*x^(4*n)*e^m + 2568*B*
a*b^2*c*d*m*n^2*x*x^m*x^(4*n)*e^m + 856*A*b^3*c*d*m*n^2*x*x^m*x^(4*n)*e^m +
1284*B*a^2*b*d^2*m*n^2*x*x^m*x^(4*n)*e^m + 1284*A*a*b^2*d^2*m*n^2*x*x^m*x^
(4*n)*e^m + 307*B*b^3*c^2*n^3*x*x^m*x^(4*n)*e^m + 1842*B*a*b^2*c*d*n^3*x*x^
m*x^(4*n)*e^m + 614*A*b^3*c*d*n^3*x*x^m*x^(4*n)*e^m + 921*B*a^2*b*d^2*n^3*x
*x^m*x^(4*n)*e^m + 921*A*a*b^2*d^2*n^3*x*x^m*x^(4*n)*e^m + 60*B*a*b^2*c^2*m
^3*x*x^m*x^(3*n)*e^m + 20*A*b^3*c^2*m^3*x*x^m*x^(3*n)*e^m + 120*B*a^2*b*c*d
*m^3*x*x^m*x^(3*n)*e^m + 120*A*a*b^2*c*d*m^3*x*x^m*x^(3*n)*e^m + 20*B*a^3*d
^2*m^3*x*x^m*x^(3*n)*e^m + 60*A*a^2*b*d^2*m^3*x*x^m*x^(3*n)*e^m + 540*B*a*b
^2*c^2*m^2*n*x*x^m*x^(3*n)*e^m + 180*A*b^3*c^2*m^2*n*x*x^m*x^(3*n)*e^m + 10
80*B*a^2*b*c*d*m^2*n*x*x^m*x^(3*n)*e^m + 1080*A*a*b^2*c*d*m^2*n*x*x^m*x^(3*
n)*e^m + 180*B*a^3*d^2*m^2*n*x*x^m*x^(3*n)*e^m + 540*A*a^2*b*d^2*m^2*n*x*x^

```
m*x^(3*n)*e^m + 1452*B*a*b^2*c^2*m*n^2*x*x^m*x^(3*n)*e^m + 484*A*b^3*c^2*m*
n^2*x*x^m*x^(3*n)*e^m + 2904*B*a^2*b*c*d*m*n^2*x*x^m*x^(3*n)*e^m + 2904*A*a
*b^2*c*d*m*n^2*x*x^m*x^(3*n)*e^m + 484*B*a^3*d^2*m*n^2*x*x^m*x^(3*n)*e^m +
1452*A*a^2*b*d^2*m*n^2*x*x^m*x^(3*n)*e^m + 1116*B*a*b^2*c^2*n^3*x*x^m*x^(3*
n)*e^m + 372*A*b^3*c^2*n^3*x*x^m*x^(3*n)*e^m + 2232*B*a^2*b*c*d*n^3*x*x^m*x
^(3*n)*e^m + 2232*A*a*b^2*c*d*n^3*x*x^m*x^(3*n)*e^m + 372*B*a^3*d^2*n^3*x*x
^m*x^(3*n)*e^m + 1116*A*a^2*b*d^2*n^3*x*x^m*x^(3*n)*e^m + 60*B*a^2*b*c^2*m^
3*x*x^m*x^(2*n)*e^m + 60*A*a*b^2*c^2*m^3*x*x^m*x^(2*n)*e^m + 40*B*a^3*c*d*m
^3*x*x^m*x^(2*n)*e^m + 120*A*a^2*b*c*d*m^3*x*x^m*x^(2*n)*e^m + 20*A*a^3*d^2
*m^3*x*x^m*x^(2*n)*e^m + 570*B*a^2*b*c^2*m^2*n*x*x^m*x^(2*n)*e^m + 570*A*a*
b^2*c^2*m^2*n*x*x^m*x^(2*n)*e^m + 380*B*a^3*c*d*m^2*n*x*x^m*x^(2*n)*e^m + 1
140*A*a^2*b*c*d*m^2*n*x*x^m*x^(2*n)*e^m + 190*A*a^3*d^2*m^2*n*x*x^m*x^(2*n)
*e^m + 1644*B*a^2*b*c^2*m*n^2*x*x^m*x^(2*n)*e^m + 1644*A*a*b^2*c^2*m*n^2*x*
x^m*x^(2*n)*e^m + 1096*B*a^3*c*d*m*n^2*x*x^m*x^(2*n)*e^m + 3288*A*a^2*b*c*d
*m*n^2*x*x^m*x^(2*n)*e^m + 548*A*a^3*d^2*m*n^2*x*x^m*x^(2*n)*e^m + 1383*B*a
^2*b*c^2*n^3*x*x^m*x^(2*n)*e^m + 1383*A*a*b^2*c^2*n^3*x*x^m*x^(2*n)*e^m + 9
22*B*a^3*c*d*n^3*x*x^m*x^(2*n)*e^m + 2766*A*a^2*b*c*d*n^3*x*x^m*x^(2*n)*e^m
 + 461*A*a^3*d^2*n^3*x*x^m*x^(2*n)*e^m + 20*B*a^3*c^2*m^3*x*x^m*x^n*e^m + 6
0*A*a^2*b*c^2*m^3*x*x^m*x^n*e^m + 40*A*a^3*c*d*m^3*x*x^m*x^n*e^m + 200*B*a^
3*c^2*m^2*n*x*x^m*x^n*e^m + 600*A*a^2*b*c^2*m^2*n*x*x^m*x^n*e^m + 400*A*a^3
*c*d*m^2*n*x*x^m*x^n*e^m + 620*B*a^3*c^2*m*n^2*x*x^m*x^n*e^m + 1860*A*a^2*b
*c^2*m*n^2*x*x^m*x^n*e^m + 1240*A*a^3*c*d*m*n^2*x*x^m*x^n*e^m + 580*B*a^3*c
^2*n^3*x*x^m*x^n*e^m + 1740*A*a^2*b*c^2*n^3*x*x^m*x^n*e^m + 1160*A*a^3*c*d*
n^3*x*x^m*x^n*e^m + 20*A*a^3*c^2*m^3*x*x^m*e^m + 210*A*a^3*c^2*m^2*n*x*x^m*
e^m + 700*A*a^3*c^2*m*n^2*x*x^m*e^m + 735*A*a^3*c^2*n^3*x*x^m*e^m + 15*B*b^
3*d^2*m^2*x*x^m*x^(6*n)*e^m + 75*B*b^3*d^2*m*n*x*x^m*x^(6*n)*e^m + 85*B*b^3
*d^2*n^2*x*x^m*x^(6*n)*e^m + 30*B*b^3*c*d*m^2*x*x^m*x^(5*n)*e^m + 45*B*a*b^
2*d^2*m^2*x*x^m*x^(5*n)*e^m + 15*A*b^3*d^2*m^2*x*x^m*x^(5*n)*e^m + 160*B*b^
3*c*d*m*n*x*x^m*x^(5*n)*e^m + 240*B*a*b^2*d^2*m*n*x*x^m*x^(5*n)*e^m + 80*A*
b^3*d^2*m*n*x*x^m*x^(5*n)*e^m + 190*B*b^3*c*d*n^2*x*x^m*x^(5*n)*e^m + 285*B
*a*b^2*d^2*n^2*x*x^m*x^(5*n)*e^m + 95*A*b^3*d^2*n^2*x*x^m*x^(5*n)*e^m + 15*
B*b^3*c^2*m^2*x*x^m*x^(4*n)*e^m + 90*B*a*b^2*c*d*m^2*x*x^m*x^(4*n)*e^m + 30
*A*b^3*c*d*m^2*x*x^m*x^(4*n)*e^m + 45*B*a^2*b*d^2*m^2*x*x^m*x^(4*n)*e^m + 4
5*A*a*b^2*d^2*m^2*x*x^m*x^(4*n)*e^m + 85*B*b^3*c^2*m*n*x*x^m*x^(4*n)*e^m +
510*B*a*b^2*c*d*m*n*x*x^m*x^(4*n)*e^m + 170*A*b^3*c*d*m*n*x*x^m*x^(4*n)*e^m
 + 255*B*a^2*b*d^2*m*n*x*x^m*x^(4*n)*e^m + 255*A*a*b^2*d^2*m*n*x*x^m*x^(4*n
)*e^m + 107*B*b^3*c^2*n^2*x*x^m*x^(4*n)*e^m + 642*B*a*b^2*c*d*n^2*x*x^m*x^(
4*n)*e^m + 214*A*b^3*c*d*n^2*x*x^m*x^(4*n)*e^m + 321*B*a^2*b*d^2*n^2*x*x^m*
x^(4*n)*e^m + 321*A*a*b^2*d^2*n^2*x*x^m*x^(4*n)*e^m + 45*B*a*b^2*c^2*m^2*x*
x^m*x^(3*n)*e^m + 15*A*b^3*c^2*m^2*x*x^m*x^(3*n)*e^m + 90*B*a^2*b*c*d*m^2*x
*x^m*x^(3*n)*e^m + 90*A*a*b^2*c*d*m^2*x*x^m*x^(3*n)*e^m + 15*B*a^3*d^2*m^2*
x*x^m*x^(3*n)*e^m + 45*A*a^2*b*d^2*m^2*x*x^m*x^(3*n)*e^m + 270*B*a*b^2*c^2*
m*n*x*x^m*x^(3*n)*e^m + 90*A*b^3*c^2*m*n*x*x^m*x^(3*n)*e^m + 540*B*a^2*b*c*
d*m*n*x*x^m*x^(3*n)*e^m + 540*A*a*b^2*c*d*m*n*x*x^m*x^(3*n)*e^m + 90*B*a^3*
d^2*m*n*x*x^m*x^(3*n)*e^m + 270*A*a^2*b*d^2*m*n*x*x^m*x^(3*n)*e^m + 363*B*a
*b^2*c^2*n^2*x*x^m*x^(3*n)*e^m + 121*A*b^3*c^2*n^2*x*x^m*x^(3*n)*e^m + 726*
B*a^2*b*c*d*n^2*x*x^m*x^(3*n)*e^m + 726*A*a*b^2*c*d*n^2*x*x^m*x^(3*n)*e^m +
 121*B*a^3*d^2*n^2*x*x^m*x^(3*n)*e^m + 363*A*a^2*b*d^2*n^2*x*x^m*x^(3*n)*e^
m + 45*B*a^2*b*c^2*m^2*x*x^m*x^(2*n)*e^m + 45*A*a*b^2*c^2*m^2*x*x^m*x^(2*n)
*e^m + 30*B*a^3*c*d*m^2*x*x^m*x^(2*n)*e^m + 90*A*a^2*b*c*d*m^2*x*x^m*x^(2*n
)*e^m + 15*A*a^3*d^2*m^2*x*x^m*x^(2*n)*e^m + 285*B*a^2*b*c^2*m*n*x*x^m*x^(2
*n)*e^m + 285*A*a*b^2*c^2*m*n*x*x^m*x^(2*n)*e^m + 190*B*a^3*c*d*m*n*x*x^m*x
^(2*n)*e^m + 570*A*a^2*b*c*d*m*n*x*x^m*x^(2*n)*e^m + 95*A*a^3*d^2*m*n*x*x^m
*x^(2*n)*e^m + 411*B*a^2*b*c^2*n^2*x*x^m*x^(2*n)*e^m + 411*A*a*b^2*c^2*n^2*
x*x^m*x^(2*n)*e^m + 274*B*a^3*c*d*n^2*x*x^m*x^(2*n)*e^m + 822*A*a^2*b*c*d*n
^2*x*x^m*x^(2*n)*e^m + 137*A*a^3*d^2*n^2*x*x^m*x^(2*n)*e^m + 15*B*a^3*c^2*m
^2*x*x^m*x^n*e^m + 45*A*a^2*b*c^2*m^2*x*x^m*x^n*e^m + 30*A*a^3*c*d*m^2*x*x^
m*x^n*e^m + 100*B*a^3*c^2*m*n*x*x^m*x^n*e^m + 300*A*a^2*b*c^2*m*n*x*x^m*x^n
*e^m + 200*A*a^3*c*d*m*n*x*x^m*x^n*e^m + 155*B*a^3*c^2*n^2*x*x^m*x^n*e^m +
```

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465*A*a^2*b*c^2*n^2*x*x^m*x^n*e^m + 310*A*a^3*c*d*n^2*x*x^m*x^n*e^m + 15*A*
a^3*c^2*m^2*x*x^m*e^m + 105*A*a^3*c^2*m*n*x*x^m*e^m + 175*A*a^3*c^2*n^2*x*x
^m*e^m + 6*B*b^3*d^2*m*x*x^m*x^(6*n)*e^m + 15*B*b^3*d^2*n*x*x^m*x^(6*n)*e^m
 + 12*B*b^3*c*d*m*x*x^m*x^(5*n)*e^m + 18*B*a*b^2*d^2*m*x*x^m*x^(5*n)*e^m +
6*A*b^3*d^2*m*x*x^m*x^(5*n)*e^m + 32*B*b^3*c*d*n*x*x^m*x^(5*n)*e^m + 48*B*a
*b^2*d^2*n*x*x^m*x^(5*n)*e^m + 16*A*b^3*d^2*n*x*x^m*x^(5*n)*e^m + 6*B*b^3*c
^2*m*x*x^m*x^(4*n)*e^m + 36*B*a*b^2*c*d*m*x*x^m*x^(4*n)*e^m + 12*A*b^3*c*d*
m*x*x^m*x^(4*n)*e^m + 18*B*a^2*b*d^2*m*x*x^m*x^(4*n)*e^m + 18*A*a*b^2*d^2*m
*x*x^m*x^(4*n)*e^m + 17*B*b^3*c^2*n*x*x^m*x^(4*n)*e^m + 102*B*a*b^2*c*d*n*x
*x^m*x^(4*n)*e^m + 34*A*b^3*c*d*n*x*x^m*x^(4*n)*e^m + 51*B*a^2*b*d^2*n*x*x^
m*x^(4*n)*e^m + 51*A*a*b^2*d^2*n*x*x^m*x^(4*n)*e^m + 18*B*a*b^2*c^2*m*x*x^m
*x^(3*n)*e^m + 6*A*b^3*c^2*m*x*x^m*x^(3*n)*e^m + 36*B*a^2*b*c*d*m*x*x^m*x^(
3*n)*e^m + 36*A*a*b^2*c*d*m*x*x^m*x^(3*n)*e^m + 6*B*a^3*d^2*m*x*x^m*x^(3*n)
*e^m + 18*A*a^2*b*d^2*m*x*x^m*x^(3*n)*e^m + 54*B*a*b^2*c^2*n*x*x^m*x^(3*n)*
e^m + 18*A*b^3*c^2*n*x*x^m*x^(3*n)*e^m + 108*B*a^2*b*c*d*n*x*x^m*x^(3*n)*e^
m + 108*A*a*b^2*c*d*n*x*x^m*x^(3*n)*e^m + 18*B*a^3*d^2*n*x*x^m*x^(3*n)*e^m
+ 54*A*a^2*b*d^2*n*x*x^m*x^(3*n)*e^m + 18*B*a^2*b*c^2*m*x*x^m*x^(2*n)*e^m +
 18*A*a*b^2*c^2*m*x*x^m*x^(2*n)*e^m + 12*B*a^3*c*d*m*x*x^m*x^(2*n)*e^m + 36
*A*a^2*b*c*d*m*x*x^m*x^(2*n)*e^m + 6*A*a^3*d^2*m*x*x^m*x^(2*n)*e^m + 57*B*a
^2*b*c^2*n*x*x^m*x^(2*n)*e^m + 57*A*a*b^2*c^2*n*x*x^m*x^(2*n)*e^m + 38*B*a^
3*c*d*n*x*x^m*x^(2*n)*e^m + 114*A*a^2*b*c*d*n*x*x^m*x^(2*n)*e^m + 19*A*a^3*
d^2*n*x*x^m*x^(2*n)*e^m + 6*B*a^3*c^2*m*x*x^m*x^n*e^m + 18*A*a^2*b*c^2*m*x*
x^m*x^n*e^m + 12*A*a^3*c*d*m*x*x^m*x^n*e^m + 20*B*a^3*c^2*n*x*x^m*x^n*e^m +
 60*A*a^2*b*c^2*n*x*x^m*x^n*e^m + 40*A*a^3*c*d*n*x*x^m*x^n*e^m + 6*A*a^3*c^
2*m*x*x^m*e^m + 21*A*a^3*c^2*n*x*x^m*e^m + B*b^3*d^2*x*x^m*x^(6*n)*e^m + 2*
B*b^3*c*d*x*x^m*x^(5*n)*e^m + 3*B*a*b^2*d^2*x*x^m*x^(5*n)*e^m + A*b^3*d^2*x
*x^m*x^(5*n)*e^m + B*b^3*c^2*x*x^m*x^(4*n)*e^m + 6*B*a*b^2*c*d*x*x^m*x^(4*n
)*e^m + 2*A*b^3*c*d*x*x^m*x^(4*n)*e^m + 3*B*a^2*b*d^2*x*x^m*x^(4*n)*e^m + 3
*A*a*b^2*d^2*x*x^m*x^(4*n)*e^m + 3*B*a*b^2*c^2*x*x^m*x^(3*n)*e^m + A*b^3*c^
2*x*x^m*x^(3*n)*e^m + 6*B*a^2*b*c*d*x*x^m*x^(3*n)*e^m + 6*A*a*b^2*c*d*x*x^m
*x^(3*n)*e^m + B*a^3*d^2*x*x^m*x^(3*n)*e^m + 3*A*a^2*b*d^2*x*x^m*x^(3*n)*e^
m + 3*B*a^2*b*c^2*x*x^m*x^(2*n)*e^m + 3*A*a*b^2*c^2*x*x^m*x^(2*n)*e^m + 2*B
*a^3*c*d*x*x^m*x^(2*n)*e^m + 6*A*a^2*b*c*d*x*x^m*x^(2*n)*e^m + A*a^3*d^2*x*
x^m*x^(2*n)*e^m + B*a^3*c^2*x*x^m*x^n*e^m + 3*A*a^2*b*c^2*x*x^m*x^n*e^m + 2
*A*a^3*c*d*x*x^m*x^n*e^m + A*a^3*c^2*x*x^m*e^m)/(m^7 + 21*m^6*n + 175*m^5*n
^2 + 735*m^4*n^3 + 1624*m^3*n^4 + 1764*m^2*n^5 + 720*m*n^6 + 7*m^6 + 126*m^
5*n + 875*m^4*n^2 + 2940*m^3*n^3 + 4872*m^2*n^4 + 3528*m*n^5 + 720*n^6 + 21
*m^5 + 315*m^4*n + 1750*m^3*n^2 + 4410*m^2*n^3 + 4872*m*n^4 + 1764*n^5 + 35
*m^4 + 420*m^3*n + 1750*m^2*n^2 + 2940*m*n^3 + 1624*n^4 + 35*m^3 + 315*m^2*
n + 875*m*n^2 + 735*n^3 + 21*m^2 + 126*m*n + 175*n^2 + 7*m + 21*n + 1)
```

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

Optimal. Leaf size=237

$$\frac{x^{2n+1}(ex)^m \left(A\left(a^2d^2+4abcd+b^2c^2\right)+2aBc(ad+bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m \left(a^2Bd^2+2abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{m+3n+1}+\ldots$$

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

Rubi [A] time = 0.310404, antiderivative size = 237, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {570, 20, 30}

$$\frac{x^{2n+1}(ex)^m \left(A\left(a^2d^2+4abcd+b^2c^2\right)+2aBc(ad+bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m \left(a^2Bd^2+2abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{m+3n+1}+\ldots$$

Antiderivative was successfully verified.

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


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


Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule steps

$$\int (ex)^m (a+bx^n)^2 (A+Bx^n)(c+dx^n)^2\,dx = \int \left(a^2Ac^2(ex)^m + ac(aBc+2A(bc+ad))x^n(ex)^m + \left(2aBc(bc+ad)+A\left(b^2c\right.\right.\right.$$

$$= \frac{a^2Ac^2(ex)^{1+m}}{e(1+m)} + \left(b^2Bd^2\right)\int x^{5n}(ex)^m\,dx + (bd(2bBc+Abd+2aBd))\int x^{4n}$$

$$= \frac{a^2Ac^2(ex)^{1+m}}{e(1+m)} + \left(b^2Bd^2x^{-m}(ex)^m\right)\int x^{m+5n}\,dx + (bd(2bBc+Abd+2aBd)x$$

$$= \frac{ac(aBc+2A(bc+ad))x^{1+n}(ex)^m}{1+m+n} + \frac{\left(2aBc(bc+ad)+A\left(b^2c^2+4abcd+a^2\right.\right.}{1+m+2n}$$

Mathematica [A] time = 0.543626, size = 199, normalized size = 0.84

$$x(ex)^m\left(\frac{x^{2n}\left(A\left(a^2d^2+4abcd+b^2c^2\right)+2aBc(ad+bc)\right)}{m+2n+1} + \frac{x^{3n}\left(a^2Bd^2+2abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{m+3n+1} + \frac{a^2Ac^2}{m+1} + \frac{ac}{}\right.$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.116, size = 5908, normalized size = 24.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] result too large to display
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.45928, size = 7675, normalized size = 32.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^2*d^2*m^5 + 5*B*b^2*d^2*m^4 + 10*B*b^2*d^2*m^3 + 10*B*b^2*d^2*m^2 + 5
*B*b^2*d^2*m + B*b^2*d^2 + 24*(B*b^2*d^2*m + B*b^2*d^2)*n^4 + 50*(B*b^2*d^2
*m^2 + 2*B*b^2*d^2*m + B*b^2*d^2)*n^3 + 35*(B*b^2*d^2*m^3 + 3*B*b^2*d^2*m^2
 + 3*B*b^2*d^2*m + B*b^2*d^2)*n^2 + 10*(B*b^2*d^2*m^4 + 4*B*b^2*d^2*m^3 + 6
*B*b^2*d^2*m^2 + 4*B*b^2*d^2*m + B*b^2*d^2)*n)*x*x^(5*n)*e^(m*log(e) + m*lo
g(x)) + ((2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*m^5 + 2*B*b^2*c*d + 5*(2*B*b
^2*c*d + (2*B*a*b + A*b^2)*d^2)*m^4 + 30*(2*B*b^2*c*d + (2*B*a*b + A*b^2)*d
^2 + (2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*m)*n^4 + 10*(2*B*b^2*c*d + (2*B*
a*b + A*b^2)*d^2)*m^3 + 61*(2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2 + (2*B*b^2*
c*d + (2*B*a*b + A*b^2)*d^2)*m^2 + 2*(2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*
m)*n^3 + (2*B*a*b + A*b^2)*d^2 + 10*(2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*m
^2 + 41*(2*B*b^2*c*d + (2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*m^3 + (2*B*a*b
 + A*b^2)*d^2 + 3*(2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*m^2 + 3*(2*B*b^2*c*
d + (2*B*a*b + A*b^2)*d^2)*m)*n^2 + 5*(2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)
*m + 11*(2*B*b^2*c*d + (2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*m^4 + 4*(2*B*b
^2*c*d + (2*B*a*b + A*b^2)*d^2)*m^3 + (2*B*a*b + A*b^2)*d^2 + 6*(2*B*b^2*c*
d + (2*B*a*b + A*b^2)*d^2)*m^2 + 4*(2*B*b^2*c*d + (2*B*a*b + A*b^2)*d^2)*m)
*n)*x*x^(4*n)*e^(m*log(e) + m*log(x)) + ((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 + B*b^2*c^2 + 5*(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 + 40*(B*b^2*c^2 + 2*(2*B*a*b + A*b^2
)*c*d + (B*a^2 + 2*A*a*b)*d^2 + (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)*n^4 + 10*(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 + 78*(B*b^2*c^2 + 2*(2*B*a*b + A*b^2)*c*d + (B*a^2 +
2*A*a*b)*d^2 + (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 + 2*(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)*
n^3 + 2*(2*B*a*b + A*b^2)*c*d + (B*a^2 + 2*A*a*b)*d^2 + 10*(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 + 49*(B*b^2*c^2 + (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 + 2*(2*B*a*b + A
*b^2)*c*d + (B*a^2 + 2*A*a*b)*d^2 + 3*(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 + 3*(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)*n^2 + 5*(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 + 12*(B*b^2*c^2 + (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 + 4*(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 + 2*(2*B*a*b + A*b^2)*c*d + (B*a^2 + 2*A*a*b)*d^2 +
 6*(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 + 4*(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)*n)*x*x^(3*n)
*e^(m*log(e) + m*log(x)) + ((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 + A*a^2*d^2 + 5*(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 + 60*(A*a^2*d^2 + (2*B*a*b + A*b^2)*c^2 + 2*(B*a^
2 + 2*A*a*b)*c*d + (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)*n^4 + 10*(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 + 107*(A*a^2*d^2 + (2*B*a*b + A*b^2)*c^2 + 2*(B*a^2 + 2*A*a*b)*c*d
 + (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 + 2*(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)*n^3 + (2*B*a
*b + A*b^2)*c^2 + 2*(B*a^2 + 2*A*a*b)*c*d + 10*(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 + 59*(A*a^2*d^2 + (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 + (2*B*a*b + A*b^2)*c^2 + 2*
(B*a^2 + 2*A*a*b)*c*d + 3*(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 + 3*(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)*n^2 + 5*(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 + 13*(A*a^2*d^2 + (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 + 4*(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 + (2*B*a*b + A*b^2)*c^2 + 2*(B*a^2 + 2*A*a*b)*c*d + 6*(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 + 4*(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)*n)*x*x^(2*n)*e^(m*log(e)
```

```
 + m*log(x)) + ((2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^5 + 2*A*a^2*c*d + 5
*(2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^4 + 120*(2*A*a^2*c*d + (B*a^2 + 2*
A*a*b)*c^2 + (2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m)*n^4 + 10*(2*A*a^2*c*d
 + (B*a^2 + 2*A*a*b)*c^2)*m^3 + 154*(2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2 +
(2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^2 + 2*(2*A*a^2*c*d + (B*a^2 + 2*A*a
*b)*c^2)*m)*n^3 + (B*a^2 + 2*A*a*b)*c^2 + 10*(2*A*a^2*c*d + (B*a^2 + 2*A*a*
b)*c^2)*m^2 + 71*(2*A*a^2*c*d + (2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^3 +
 (B*a^2 + 2*A*a*b)*c^2 + 3*(2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^2 + 3*(2
*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m)*n^2 + 5*(2*A*a^2*c*d + (B*a^2 + 2*A*
a*b)*c^2)*m + 14*(2*A*a^2*c*d + (2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^4 +
 4*(2*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^3 + (B*a^2 + 2*A*a*b)*c^2 + 6*(2
*A*a^2*c*d + (B*a^2 + 2*A*a*b)*c^2)*m^2 + 4*(2*A*a^2*c*d + (B*a^2 + 2*A*a*b
)*c^2)*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) + (A*a^2*c^2*m^5 + 120*A*a^2*c^2
*n^5 + 5*A*a^2*c^2*m^4 + 10*A*a^2*c^2*m^3 + 10*A*a^2*c^2*m^2 + 5*A*a^2*c^2*
m + A*a^2*c^2 + 274*(A*a^2*c^2*m + A*a^2*c^2)*n^4 + 225*(A*a^2*c^2*m^2 + 2*
A*a^2*c^2*m + A*a^2*c^2)*n^3 + 85*(A*a^2*c^2*m^3 + 3*A*a^2*c^2*m^2 + 3*A*a^
2*c^2*m + A*a^2*c^2)*n^2 + 15*(A*a^2*c^2*m^4 + 4*A*a^2*c^2*m^3 + 6*A*a^2*c^
2*m^2 + 4*A*a^2*c^2*m + A*a^2*c^2)*n)*x*e^(m*log(e) + m*log(x)))/(m^6 + 120
*(m + 1)*n^5 + 6*m^5 + 274*(m^2 + 2*m + 1)*n^4 + 15*m^4 + 225*(m^3 + 3*m^2
+ 3*m + 1)*n^3 + 20*m^3 + 85*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*n^2 + 15*m^2 +
 15*(m^5 + 5*m^4 + 10*m^3 + 10*m^2 + 5*m + 1)*n + 6*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.29441, size = 10939, normalized size = 46.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b^2*d^2*m^5*x*x^m*x^(5*n)*e^m + 10*B*b^2*d^2*m^4*n*x*x^m*x^(5*n)*e^m + 3
5*B*b^2*d^2*m^3*n^2*x*x^m*x^(5*n)*e^m + 50*B*b^2*d^2*m^2*n^3*x*x^m*x^(5*n)*
e^m + 24*B*b^2*d^2*m*n^4*x*x^m*x^(5*n)*e^m + 2*B*b^2*c*d*m^5*x*x^m*x^(4*n)*
e^m + 2*B*a*b*d^2*m^5*x*x^m*x^(4*n)*e^m + A*b^2*d^2*m^5*x*x^m*x^(4*n)*e^m +
 22*B*b^2*c*d*m^4*n*x*x^m*x^(4*n)*e^m + 22*B*a*b*d^2*m^4*n*x*x^m*x^(4*n)*e^
m + 11*A*b^2*d^2*m^4*n*x*x^m*x^(4*n)*e^m + 82*B*b^2*c*d*m^3*n^2*x*x^m*x^(4*
n)*e^m + 82*B*a*b*d^2*m^3*n^2*x*x^m*x^(4*n)*e^m + 41*A*b^2*d^2*m^3*n^2*x*x^
m*x^(4*n)*e^m + 122*B*b^2*c*d*m^2*n^3*x*x^m*x^(4*n)*e^m + 122*B*a*b*d^2*m^2
*n^3*x*x^m*x^(4*n)*e^m + 61*A*b^2*d^2*m^2*n^3*x*x^m*x^(4*n)*e^m + 60*B*b^2*
c*d*m*n^4*x*x^m*x^(4*n)*e^m + 60*B*a*b*d^2*m*n^4*x*x^m*x^(4*n)*e^m + 30*A*b
^2*d^2*m*n^4*x*x^m*x^(4*n)*e^m + B*b^2*c^2*m^5*x*x^m*x^(3*n)*e^m + 4*B*a*b*
c*d*m^5*x*x^m*x^(3*n)*e^m + 2*A*b^2*c*d*m^5*x*x^m*x^(3*n)*e^m + B*a^2*d^2*m
^5*x*x^m*x^(3*n)*e^m + 2*A*a*b*d^2*m^5*x*x^m*x^(3*n)*e^m + 12*B*b^2*c^2*m^4
*n*x*x^m*x^(3*n)*e^m + 48*B*a*b*c*d*m^4*n*x*x^m*x^(3*n)*e^m + 24*A*b^2*c*d*
```

```
m^4*n*x*x^m*x^(3*n)*e^m + 12*B*a^2*d^2*m^4*n*x*x^m*x^(3*n)*e^m + 24*A*a*b*d
^2*m^4*n*x*x^m*x^(3*n)*e^m + 49*B*b^2*c^2*m^3*n^2*x*x^m*x^(3*n)*e^m + 196*B
*a*b*c*d*m^3*n^2*x*x^m*x^(3*n)*e^m + 98*A*b^2*c*d*m^3*n^2*x*x^m*x^(3*n)*e^m
 + 49*B*a^2*d^2*m^3*n^2*x*x^m*x^(3*n)*e^m + 98*A*a*b*d^2*m^3*n^2*x*x^m*x^(3
*n)*e^m + 78*B*b^2*c^2*m^2*n^3*x*x^m*x^(3*n)*e^m + 312*B*a*b*c*d*m^2*n^3*x*
x^m*x^(3*n)*e^m + 156*A*b^2*c*d*m^2*n^3*x*x^m*x^(3*n)*e^m + 78*B*a^2*d^2*m^
2*n^3*x*x^m*x^(3*n)*e^m + 156*A*a*b*d^2*m^2*n^3*x*x^m*x^(3*n)*e^m + 40*B*b^
2*c^2*m*n^4*x*x^m*x^(3*n)*e^m + 160*B*a*b*c*d*m*n^4*x*x^m*x^(3*n)*e^m + 80*
A*b^2*c*d*m*n^4*x*x^m*x^(3*n)*e^m + 40*B*a^2*d^2*m*n^4*x*x^m*x^(3*n)*e^m +
80*A*a*b*d^2*m*n^4*x*x^m*x^(3*n)*e^m + 2*B*a*b*c^2*m^5*x*x^m*x^(2*n)*e^m +
A*b^2*c^2*m^5*x*x^m*x^(2*n)*e^m + 2*B*a^2*c*d*m^5*x*x^m*x^(2*n)*e^m + 4*A*a
*b*c*d*m^5*x*x^m*x^(2*n)*e^m + A*a^2*d^2*m^5*x*x^m*x^(2*n)*e^m + 26*B*a*b*c
^2*m^4*n*x*x^m*x^(2*n)*e^m + 13*A*b^2*c^2*m^4*n*x*x^m*x^(2*n)*e^m + 26*B*a^
2*c*d*m^4*n*x*x^m*x^(2*n)*e^m + 52*A*a*b*c*d*m^4*n*x*x^m*x^(2*n)*e^m + 13*A
*a^2*d^2*m^4*n*x*x^m*x^(2*n)*e^m + 118*B*a*b*c^2*m^3*n^2*x*x^m*x^(2*n)*e^m
+ 59*A*b^2*c^2*m^3*n^2*x*x^m*x^(2*n)*e^m + 118*B*a^2*c*d*m^3*n^2*x*x^m*x^(2
*n)*e^m + 236*A*a*b*c*d*m^3*n^2*x*x^m*x^(2*n)*e^m + 59*A*a^2*d^2*m^3*n^2*x*
x^m*x^(2*n)*e^m + 214*B*a*b*c^2*m^2*n^3*x*x^m*x^(2*n)*e^m + 107*A*b^2*c^2*m
^2*n^3*x*x^m*x^(2*n)*e^m + 214*B*a^2*c*d*m^2*n^3*x*x^m*x^(2*n)*e^m + 428*A*
a*b*c*d*m^2*n^3*x*x^m*x^(2*n)*e^m + 107*A*a^2*d^2*m^2*n^3*x*x^m*x^(2*n)*e^m
 + 120*B*a*b*c^2*m*n^4*x*x^m*x^(2*n)*e^m + 60*A*b^2*c^2*m*n^4*x*x^m*x^(2*n)
*e^m + 120*B*a^2*c*d*m*n^4*x*x^m*x^(2*n)*e^m + 240*A*a*b*c*d*m*n^4*x*x^m*x^
(2*n)*e^m + 60*A*a^2*d^2*m*n^4*x*x^m*x^(2*n)*e^m + B*a^2*c^2*m^5*x*x^m*x^n*
e^m + 2*A*a*b*c^2*m^5*x*x^m*x^n*e^m + 2*A*a^2*c*d*m^5*x*x^m*x^n*e^m + 14*B*
a^2*c^2*m^4*n*x*x^m*x^n*e^m + 28*A*a*b*c^2*m^4*n*x*x^m*x^n*e^m + 28*A*a^2*c
*d*m^4*n*x*x^m*x^n*e^m + 71*B*a^2*c^2*m^3*n^2*x*x^m*x^n*e^m + 142*A*a*b*c^2
*m^3*n^2*x*x^m*x^n*e^m + 142*A*a^2*c*d*m^3*n^2*x*x^m*x^n*e^m + 154*B*a^2*c^
2*m^2*n^3*x*x^m*x^n*e^m + 308*A*a*b*c^2*m^2*n^3*x*x^m*x^n*e^m + 308*A*a^2*c
*d*m^2*n^3*x*x^m*x^n*e^m + 120*B*a^2*c^2*m*n^4*x*x^m*x^n*e^m + 240*A*a*b*c^
2*m*n^4*x*x^m*x^n*e^m + 240*A*a^2*c*d*m*n^4*x*x^m*x^n*e^m + A*a^2*c^2*m^5*x
*x^m*e^m + 15*A*a^2*c^2*m^4*n*x*x^m*e^m + 85*A*a^2*c^2*m^3*n^2*x*x^m*e^m +
225*A*a^2*c^2*m^2*n^3*x*x^m*e^m + 274*A*a^2*c^2*m*n^4*x*x^m*e^m + 120*A*a^2
*c^2*n^5*x*x^m*e^m + 5*B*b^2*d^2*m^4*x*x^m*x^(5*n)*e^m + 40*B*b^2*d^2*m^3*n
*x*x^m*x^(5*n)*e^m + 105*B*b^2*d^2*m^2*n^2*x*x^m*x^(5*n)*e^m + 100*B*b^2*d^
2*m*n^3*x*x^m*x^(5*n)*e^m + 24*B*b^2*d^2*n^4*x*x^m*x^(5*n)*e^m + 10*B*b^2*c
*d*m^4*x*x^m*x^(4*n)*e^m + 10*B*a*b*d^2*m^4*x*x^m*x^(4*n)*e^m + 5*A*b^2*d^2
*m^4*x*x^m*x^(4*n)*e^m + 88*B*b^2*c*d*m^3*n*x*x^m*x^(4*n)*e^m + 88*B*a*b*d^
2*m^3*n*x*x^m*x^(4*n)*e^m + 44*A*b^2*d^2*m^3*n*x*x^m*x^(4*n)*e^m + 246*B*b^
2*c*d*m^2*n^2*x*x^m*x^(4*n)*e^m + 246*B*a*b*d^2*m^2*n^2*x*x^m*x^(4*n)*e^m +
 123*A*b^2*d^2*m^2*n^2*x*x^m*x^(4*n)*e^m + 244*B*b^2*c*d*m*n^3*x*x^m*x^(4*n
)*e^m + 244*B*a*b*d^2*m*n^3*x*x^m*x^(4*n)*e^m + 122*A*b^2*d^2*m*n^3*x*x^m*x
^(4*n)*e^m + 60*B*b^2*c*d*n^4*x*x^m*x^(4*n)*e^m + 60*B*a*b*d^2*n^4*x*x^m*x^
(4*n)*e^m + 30*A*b^2*d^2*n^4*x*x^m*x^(4*n)*e^m + 5*B*b^2*c^2*m^4*x*x^m*x^(3
*n)*e^m + 20*B*a*b*c*d*m^4*x*x^m*x^(3*n)*e^m + 10*A*b^2*c*d*m^4*x*x^m*x^(3*
n)*e^m + 5*B*a^2*d^2*m^4*x*x^m*x^(3*n)*e^m + 10*A*a*b*d^2*m^4*x*x^m*x^(3*n)
*e^m + 48*B*b^2*c^2*m^3*n*x*x^m*x^(3*n)*e^m + 192*B*a*b*c*d*m^3*n*x*x^m*x^(
3*n)*e^m + 96*A*b^2*c*d*m^3*n*x*x^m*x^(3*n)*e^m + 48*B*a^2*d^2*m^3*n*x*x^m*
x^(3*n)*e^m + 96*A*a*b*d^2*m^3*n*x*x^m*x^(3*n)*e^m + 147*B*b^2*c^2*m^2*n^2*
x*x^m*x^(3*n)*e^m + 588*B*a*b*c*d*m^2*n^2*x*x^m*x^(3*n)*e^m + 294*A*b^2*c*d
*m^2*n^2*x*x^m*x^(3*n)*e^m + 147*B*a^2*d^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 294*
A*a*b*d^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 156*B*b^2*c^2*m*n^3*x*x^m*x^(3*n)*e^m
 + 624*B*a*b*c*d*m*n^3*x*x^m*x^(3*n)*e^m + 312*A*b^2*c*d*m*n^3*x*x^m*x^(3*n
)*e^m + 156*B*a^2*d^2*m*n^3*x*x^m*x^(3*n)*e^m + 312*A*a*b*d^2*m*n^3*x*x^m*x
^(3*n)*e^m + 40*B*b^2*c^2*n^4*x*x^m*x^(3*n)*e^m + 160*B*a*b*c*d*n^4*x*x^m*x
^(3*n)*e^m + 80*A*b^2*c*d*n^4*x*x^m*x^(3*n)*e^m + 40*B*a^2*d^2*n^4*x*x^m*x^
(3*n)*e^m + 80*A*a*b*d^2*n^4*x*x^m*x^(3*n)*e^m + 10*B*a*b*c^2*m^4*x*x^m*x^(
2*n)*e^m + 5*A*b^2*c^2*m^4*x*x^m*x^(2*n)*e^m + 10*B*a^2*c*d*m^4*x*x^m*x^(2*
n)*e^m + 20*A*a*b*c*d*m^4*x*x^m*x^(2*n)*e^m + 5*A*a^2*d^2*m^4*x*x^m*x^(2*n)
*e^m + 104*B*a*b*c^2*m^3*n*x*x^m*x^(2*n)*e^m + 52*A*b^2*c^2*m^3*n*x*x^m*x^(
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2*n)*e^m + 104*B*a^2*c*d*m^3*n*x*x^m*x^(2*n)*e^m + 208*A*a*b*c*d*m^3*n*x*x^
m*x^(2*n)*e^m + 52*A*a^2*d^2*m^3*n*x*x^m*x^(2*n)*e^m + 354*B*a*b*c^2*m^2*n^
2*x*x^m*x^(2*n)*e^m + 177*A*b^2*c^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 354*B*a^2*c
*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 708*A*a*b*c*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 17
7*A*a^2*d^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 428*B*a*b*c^2*m*n^3*x*x^m*x^(2*n)*e
^m + 214*A*b^2*c^2*m*n^3*x*x^m*x^(2*n)*e^m + 428*B*a^2*c*d*m*n^3*x*x^m*x^(2
*n)*e^m + 856*A*a*b*c*d*m*n^3*x*x^m*x^(2*n)*e^m + 214*A*a^2*d^2*m*n^3*x*x^m
*x^(2*n)*e^m + 120*B*a*b*c^2*n^4*x*x^m*x^(2*n)*e^m + 60*A*b^2*c^2*n^4*x*x^m
*x^(2*n)*e^m + 120*B*a^2*c*d*n^4*x*x^m*x^(2*n)*e^m + 240*A*a*b*c*d*n^4*x*x^
m*x^(2*n)*e^m + 60*A*a^2*d^2*n^4*x*x^m*x^(2*n)*e^m + 5*B*a^2*c^2*m^4*x*x^m*
x^n*e^m + 10*A*a*b*c^2*m^4*x*x^m*x^n*e^m + 10*A*a^2*c*d*m^4*x*x^m*x^n*e^m +
 56*B*a^2*c^2*m^3*n*x*x^m*x^n*e^m + 112*A*a*b*c^2*m^3*n*x*x^m*x^n*e^m + 112
*A*a^2*c*d*m^3*n*x*x^m*x^n*e^m + 213*B*a^2*c^2*m^2*n^2*x*x^m*x^n*e^m + 426*
A*a*b*c^2*m^2*n^2*x*x^m*x^n*e^m + 426*A*a^2*c*d*m^2*n^2*x*x^m*x^n*e^m + 308
*B*a^2*c^2*m*n^3*x*x^m*x^n*e^m + 616*A*a*b*c^2*m*n^3*x*x^m*x^n*e^m + 616*A*
a^2*c*d*m*n^3*x*x^m*x^n*e^m + 120*B*a^2*c^2*n^4*x*x^m*x^n*e^m + 240*A*a*b*c
^2*n^4*x*x^m*x^n*e^m + 240*A*a^2*c*d*n^4*x*x^m*x^n*e^m + 5*A*a^2*c^2*m^4*x*
x^m*e^m + 60*A*a^2*c^2*m^3*n*x*x^m*e^m + 255*A*a^2*c^2*m^2*n^2*x*x^m*e^m +
450*A*a^2*c^2*m*n^3*x*x^m*e^m + 274*A*a^2*c^2*n^4*x*x^m*e^m + 10*B*b^2*d^2*
m^3*x*x^m*x^(5*n)*e^m + 60*B*b^2*d^2*m^2*n*x*x^m*x^(5*n)*e^m + 105*B*b^2*d^
2*m*n^2*x*x^m*x^(5*n)*e^m + 50*B*b^2*d^2*n^3*x*x^m*x^(5*n)*e^m + 20*B*b^2*c
*d*m^3*x*x^m*x^(4*n)*e^m + 20*B*a*b*d^2*m^3*x*x^m*x^(4*n)*e^m + 10*A*b^2*d^
2*m^3*x*x^m*x^(4*n)*e^m + 132*B*b^2*c*d*m^2*n*x*x^m*x^(4*n)*e^m + 132*B*a*b
*d^2*m^2*n*x*x^m*x^(4*n)*e^m + 66*A*b^2*d^2*m^2*n*x*x^m*x^(4*n)*e^m + 246*B
*b^2*c*d*m*n^2*x*x^m*x^(4*n)*e^m + 246*B*a*b*d^2*m*n^2*x*x^m*x^(4*n)*e^m +
123*A*b^2*d^2*m*n^2*x*x^m*x^(4*n)*e^m + 122*B*b^2*c*d*n^3*x*x^m*x^(4*n)*e^m
 + 122*B*a*b*d^2*n^3*x*x^m*x^(4*n)*e^m + 61*A*b^2*d^2*n^3*x*x^m*x^(4*n)*e^m
 + 10*B*b^2*c^2*m^3*x*x^m*x^(3*n)*e^m + 40*B*a*b*c*d*m^3*x*x^m*x^(3*n)*e^m
+ 20*A*b^2*c*d*m^3*x*x^m*x^(3*n)*e^m + 10*B*a^2*d^2*m^3*x*x^m*x^(3*n)*e^m +
 20*A*a*b*d^2*m^3*x*x^m*x^(3*n)*e^m + 72*B*b^2*c^2*m^2*n*x*x^m*x^(3*n)*e^m
+ 288*B*a*b*c*d*m^2*n*x*x^m*x^(3*n)*e^m + 144*A*b^2*c*d*m^2*n*x*x^m*x^(3*n)
*e^m + 72*B*a^2*d^2*m^2*n*x*x^m*x^(3*n)*e^m + 144*A*a*b*d^2*m^2*n*x*x^m*x^(
3*n)*e^m + 147*B*b^2*c^2*m*n^2*x*x^m*x^(3*n)*e^m + 588*B*a*b*c*d*m*n^2*x*x^
m*x^(3*n)*e^m + 294*A*b^2*c*d*m*n^2*x*x^m*x^(3*n)*e^m + 147*B*a^2*d^2*m*n^2
*x*x^m*x^(3*n)*e^m + 294*A*a*b*d^2*m*n^2*x*x^m*x^(3*n)*e^m + 78*B*b^2*c^2*n
^3*x*x^m*x^(3*n)*e^m + 312*B*a*b*c*d*n^3*x*x^m*x^(3*n)*e^m + 156*A*b^2*c*d*
n^3*x*x^m*x^(3*n)*e^m + 78*B*a^2*d^2*n^3*x*x^m*x^(3*n)*e^m + 156*A*a*b*d^2*
n^3*x*x^m*x^(3*n)*e^m + 20*B*a*b*c^2*m^3*x*x^m*x^(2*n)*e^m + 10*A*b^2*c^2*m
^3*x*x^m*x^(2*n)*e^m + 20*B*a^2*c*d*m^3*x*x^m*x^(2*n)*e^m + 40*A*a*b*c*d*m^
3*x*x^m*x^(2*n)*e^m + 10*A*a^2*d^2*m^3*x*x^m*x^(2*n)*e^m + 156*B*a*b*c^2*m^
2*n*x*x^m*x^(2*n)*e^m + 78*A*b^2*c^2*m^2*n*x*x^m*x^(2*n)*e^m + 156*B*a^2*c*
d*m^2*n*x*x^m*x^(2*n)*e^m + 312*A*a*b*c*d*m^2*n*x*x^m*x^(2*n)*e^m + 78*A*a^
2*d^2*m^2*n*x*x^m*x^(2*n)*e^m + 354*B*a*b*c^2*m*n^2*x*x^m*x^(2*n)*e^m + 177
*A*b^2*c^2*m*n^2*x*x^m*x^(2*n)*e^m + 354*B*a^2*c*d*m*n^2*x*x^m*x^(2*n)*e^m
+ 708*A*a*b*c*d*m*n^2*x*x^m*x^(2*n)*e^m + 177*A*a^2*d^2*m*n^2*x*x^m*x^(2*n)
*e^m + 214*B*a*b*c^2*n^3*x*x^m*x^(2*n)*e^m + 107*A*b^2*c^2*n^3*x*x^m*x^(2*n
)*e^m + 214*B*a^2*c*d*n^3*x*x^m*x^(2*n)*e^m + 428*A*a*b*c*d*n^3*x*x^m*x^(2*
n)*e^m + 107*A*a^2*d^2*n^3*x*x^m*x^(2*n)*e^m + 10*B*a^2*c^2*m^3*x*x^m*x^n*e
^m + 20*A*a*b*c^2*m^3*x*x^m*x^n*e^m + 20*A*a^2*c*d*m^3*x*x^m*x^n*e^m + 84*B
*a^2*c^2*m^2*n*x*x^m*x^n*e^m + 168*A*a*b*c^2*m^2*n*x*x^m*x^n*e^m + 168*A*a^
2*c*d*m^2*n*x*x^m*x^n*e^m + 213*B*a^2*c^2*m*n^2*x*x^m*x^n*e^m + 426*A*a*b*c
^2*m*n^2*x*x^m*x^n*e^m + 426*A*a^2*c*d*m*n^2*x*x^m*x^n*e^m + 154*B*a^2*c^2*
n^3*x*x^m*x^n*e^m + 308*A*a*b*c^2*n^3*x*x^m*x^n*e^m + 308*A*a^2*c*d*n^3*x*x
^m*x^n*e^m + 10*A*a^2*c^2*m^3*x*x^m*e^m + 90*A*a^2*c^2*m^2*n*x*x^m*e^m + 25
5*A*a^2*c^2*m*n^2*x*x^m*e^m + 225*A*a^2*c^2*n^3*x*x^m*e^m + 10*B*b^2*d^2*m^
2*x*x^m*x^(5*n)*e^m + 40*B*b^2*d^2*m*n*x*x^m*x^(5*n)*e^m + 35*B*b^2*d^2*n^2
*x*x^m*x^(5*n)*e^m + 20*B*b^2*c*d*m^2*x*x^m*x^(4*n)*e^m + 20*B*a*b*d^2*m^2*
x*x^m*x^(4*n)*e^m + 10*A*b^2*d^2*m^2*x*x^m*x^(4*n)*e^m + 88*B*b^2*c*d*m*n*x
*x^m*x^(4*n)*e^m + 88*B*a*b*d^2*m*n*x*x^m*x^(4*n)*e^m + 44*A*b^2*d^2*m*n*x*
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x^m*x^(4*n)*e^m + 82*B*b^2*c*d*n^2*x*x^m*x^(4*n)*e^m + 82*B*a*b*d^2*n^2*x*x
^m*x^(4*n)*e^m + 41*A*b^2*d^2*n^2*x*x^m*x^(4*n)*e^m + 10*B*b^2*c^2*m^2*x*x^
m*x^(3*n)*e^m + 40*B*a*b*c*d*m^2*x*x^m*x^(3*n)*e^m + 20*A*b^2*c*d*m^2*x*x^m
*x^(3*n)*e^m + 10*B*a^2*d^2*m^2*x*x^m*x^(3*n)*e^m + 20*A*a*b*d^2*m^2*x*x^m*
x^(3*n)*e^m + 48*B*b^2*c^2*m*n*x*x^m*x^(3*n)*e^m + 192*B*a*b*c*d*m*n*x*x^m*
x^(3*n)*e^m + 96*A*b^2*c*d*m*n*x*x^m*x^(3*n)*e^m + 48*B*a^2*d^2*m*n*x*x^m*x
^(3*n)*e^m + 96*A*a*b*d^2*m*n*x*x^m*x^(3*n)*e^m + 49*B*b^2*c^2*n^2*x*x^m*x^
(3*n)*e^m + 196*B*a*b*c*d*n^2*x*x^m*x^(3*n)*e^m + 98*A*b^2*c*d*n^2*x*x^m*x^
(3*n)*e^m + 49*B*a^2*d^2*n^2*x*x^m*x^(3*n)*e^m + 98*A*a*b*d^2*n^2*x*x^m*x^(
3*n)*e^m + 20*B*a*b*c^2*m^2*x*x^m*x^(2*n)*e^m + 10*A*b^2*c^2*m^2*x*x^m*x^(2
*n)*e^m + 20*B*a^2*c*d*m^2*x*x^m*x^(2*n)*e^m + 40*A*a*b*c*d*m^2*x*x^m*x^(2*
n)*e^m + 10*A*a^2*d^2*m^2*x*x^m*x^(2*n)*e^m + 104*B*a*b*c^2*m*n*x*x^m*x^(2*
n)*e^m + 52*A*b^2*c^2*m*n*x*x^m*x^(2*n)*e^m + 104*B*a^2*c*d*m*n*x*x^m*x^(2*
n)*e^m + 208*A*a*b*c*d*m*n*x*x^m*x^(2*n)*e^m + 52*A*a^2*d^2*m*n*x*x^m*x^(2*
n)*e^m + 118*B*a*b*c^2*n^2*x*x^m*x^(2*n)*e^m + 59*A*b^2*c^2*n^2*x*x^m*x^(2*
n)*e^m + 118*B*a^2*c*d*n^2*x*x^m*x^(2*n)*e^m + 236*A*a*b*c*d*n^2*x*x^m*x^(2
*n)*e^m + 59*A*a^2*d^2*n^2*x*x^m*x^(2*n)*e^m + 10*B*a^2*c^2*m^2*x*x^m*x^n*e
^m + 20*A*a*b*c^2*m^2*x*x^m*x^n*e^m + 20*A*a^2*c*d*m^2*x*x^m*x^n*e^m + 56*B
*a^2*c^2*m*n*x*x^m*x^n*e^m + 112*A*a*b*c^2*m*n*x*x^m*x^n*e^m + 112*A*a^2*c*
d*m*n*x*x^m*x^n*e^m + 71*B*a^2*c^2*n^2*x*x^m*x^n*e^m + 142*A*a*b*c^2*n^2*x*
x^m*x^n*e^m + 142*A*a^2*c*d*n^2*x*x^m*x^n*e^m + 10*A*a^2*c^2*m^2*x*x^m*e^m
 + 60*A*a^2*c^2*m*n*x*x^m*e^m + 85*A*a^2*c^2*n^2*x*x^m*e^m + 5*B*b^2*d^2*m*x
*x^m*x^(5*n)*e^m + 10*B*b^2*d^2*n*x*x^m*x^(5*n)*e^m + 10*B*b^2*c*d*m*x*x^m*
x^(4*n)*e^m + 10*B*a*b*d^2*m*x*x^m*x^(4*n)*e^m + 5*A*b^2*d^2*m*x*x^m*x^(4*n
)*e^m + 22*B*b^2*c*d*n*x*x^m*x^(4*n)*e^m + 22*B*a*b*d^2*n*x*x^m*x^(4*n)*e^m
 + 11*A*b^2*d^2*n*x*x^m*x^(4*n)*e^m + 5*B*b^2*c^2*m*x*x^m*x^(3*n)*e^m + 20*
B*a*b*c*d*m*x*x^m*x^(3*n)*e^m + 10*A*b^2*c*d*m*x*x^m*x^(3*n)*e^m + 5*B*a^2*
d^2*m*x*x^m*x^(3*n)*e^m + 10*A*a*b*d^2*m*x*x^m*x^(3*n)*e^m + 12*B*b^2*c^2*n
*x*x^m*x^(3*n)*e^m + 48*B*a*b*c*d*n*x*x^m*x^(3*n)*e^m + 24*A*b^2*c*d*n*x*x^
m*x^(3*n)*e^m + 12*B*a^2*d^2*n*x*x^m*x^(3*n)*e^m + 24*A*a*b*d^2*n*x*x^m*x^(
3*n)*e^m + 10*B*a*b*c^2*m*x*x^m*x^(2*n)*e^m + 5*A*b^2*c^2*m*x*x^m*x^(2*n)*e
^m + 10*B*a^2*c*d*m*x*x^m*x^(2*n)*e^m + 20*A*a*b*c*d*m*x*x^m*x^(2*n)*e^m +
5*A*a^2*d^2*m*x*x^m*x^(2*n)*e^m + 26*B*a*b*c^2*n*x*x^m*x^(2*n)*e^m + 13*A*b
^2*c^2*n*x*x^m*x^(2*n)*e^m + 26*B*a^2*c*d*n*x*x^m*x^(2*n)*e^m + 52*A*a*b*c*
d*n*x*x^m*x^(2*n)*e^m + 13*A*a^2*d^2*n*x*x^m*x^(2*n)*e^m + 5*B*a^2*c^2*m*x*
x^m*x^n*e^m + 10*A*a*b*c^2*m*x*x^m*x^n*e^m + 10*A*a^2*c*d*m*x*x^m*x^n*e^m +
 14*B*a^2*c^2*n*x*x^m*x^n*e^m + 28*A*a*b*c^2*n*x*x^m*x^n*e^m + 28*A*a^2*c*d
*n*x*x^m*x^n*e^m + 5*A*a^2*c^2*m*x*x^m*e^m + 15*A*a^2*c^2*n*x*x^m*e^m + B*b
^2*d^2*x*x^m*x^(5*n)*e^m + 2*B*b^2*c*d*x*x^m*x^(4*n)*e^m + 2*B*a*b*d^2*x*x^
m*x^(4*n)*e^m + A*b^2*d^2*x*x^m*x^(4*n)*e^m + B*b^2*c^2*x*x^m*x^(3*n)*e^m +
 4*B*a*b*c*d*x*x^m*x^(3*n)*e^m + 2*A*b^2*c*d*x*x^m*x^(3*n)*e^m + B*a^2*d^2*
x*x^m*x^(3*n)*e^m + 2*A*a*b*d^2*x*x^m*x^(3*n)*e^m + 2*B*a*b*c^2*x*x^m*x^(2*
n)*e^m + A*b^2*c^2*x*x^m*x^(2*n)*e^m + 2*B*a^2*c*d*x*x^m*x^(2*n)*e^m + 4*A*
a*b*c*d*x*x^m*x^(2*n)*e^m + A*a^2*d^2*x*x^m*x^(2*n)*e^m + B*a^2*c^2*x*x^m*x
^n*e^m + 2*A*a*b*c^2*x*x^m*x^n*e^m + 2*A*a^2*c*d*x*x^m*x^n*e^m + A*a^2*c^2*
x*x^m*e^m)/(m^6 + 15*m^5*n + 85*m^4*n^2 + 225*m^3*n^3 + 274*m^2*n^4 + 120*m
*n^5 + 6*m^5 + 75*m^4*n + 340*m^3*n^2 + 675*m^2*n^3 + 548*m*n^4 + 120*n^5 +
 15*m^4 + 150*m^3*n + 510*m^2*n^2 + 675*m*n^3 + 274*n^4 + 20*m^3 + 150*m^2*
n + 340*m*n^2 + 225*n^3 + 15*m^2 + 75*m*n + 85*n^2 + 6*m + 15*n + 1)
```

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

Optimal. Leaf size=160

$$\frac{cx^{n+1}(ex)^m(2aAd + aBc + Abc)}{m + n + 1} + \frac{x^{2n+1}(ex)^m(ad(Ad + 2Bc) + bc(2Ad + Bc))}{m + 2n + 1} + \frac{dx^{3n+1}(ex)^m(aBd + Abd + 2bBc)}{m + 3n + 1} + \frac{aAc^2 \ldots}{e(\ldots}$$

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

Rubi [A] time = 0.171506, antiderivative size = 160, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {570, 20, 30}

$$\frac{cx^{n+1}(ex)^m(2aAd + aBc + Abc)}{m + n + 1} + \frac{x^{2n+1}(ex)^m(ad(Ad + 2Bc) + bc(2Ad + Bc))}{m + 2n + 1} + \frac{dx^{3n+1}(ex)^m(aBd + Abd + 2bBc)}{m + 3n + 1} + \frac{aAc^2 \ldots}{e(\ldots}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int (ex)^m (a+bx^n)(A+Bx^n)(c+dx^n)^2\,dx = \int \left(aAc^2(ex)^m + c(Abc+aBc+2aAd)x^n(ex)^m + (ad(2Bc+Ad)+bc(Bc\right.$$
$$= \frac{aAc^2(ex)^{1+m}}{e(1+m)} + \left(bBd^2\right)\int x^{4n}(ex)^m\,dx + (c(Abc+aBc+2aAd))\int x^n(ex$$
$$= \frac{aAc^2(ex)^{1+m}}{e(1+m)} + \left(bBd^2x^{-m}(ex)^m\right)\int x^{m+4n}\,dx + (c(Abc+aBc+2aAd)x^{-n}$$
$$= \frac{c(Abc+aBc+2aAd)x^{1+n}(ex)^m}{1+m+n} + \frac{(ad(2Bc+Ad)+bc(Bc+2Ad))x^{1+2n}(}{1+m+2n}$$

Mathematica [A] time = 0.342733, size = 129, normalized size = 0.81

$$x(ex)^m\left(\frac{cx^n(2aAd+aBc+Abc)}{m+n+1}+\frac{x^{2n}(ad(Ad+2Bc)+bc(2Ad+Bc))}{m+2n+1}+\frac{dx^{3n}(aBd+Abd+2bBc)}{m+3n+1}+\frac{aAc^2}{m+1}+\frac{bBd^2}{m+4n}\right.$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.076, size = 2410, normalized size = 15.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(26*B*a*c^2*n^2*x^n+4*B*b*c^2*(x^n)^2*m+8*B*b*c^2*(x^n)^2*n+4*A*b*c^2*x^n
*m+14*B*b*c*d*(x^n)^3*n+12*A*a*c*d*m^2*x^n+52*A*a*c*d*n^2*x^n+27*A*b*c^2*m*
n*x^n+8*A*b*c*d*(x^n)^2*m+12*A*a*d^2*m*n^3*(x^n)^2+2*A*b*c*d*m^4*(x^n)^2+8*
A*b*c*d*m^3*(x^n)^2+24*A*b*c*d*n^3*(x^n)^2+14*B*b*c*d*m^3*n*(x^n)^3+28*B*b*
c*d*m^2*n^2*(x^n)^3+16*B*b*c*d*m*n^3*(x^n)^3+4*B*b*c^2*m^3*(x^n)^2+6*B*a*d^
2*m^2*(x^n)^3+14*B*a*d^2*n^2*(x^n)^3+12*B*b*c^2*n^3*(x^n)^2+4*A*a*c^2*m^3+5
0*A*a*c^2*n^3+6*A*a*c^2*m^2+35*A*a*c^2*n^2+b*B*d^2*(x^n)^4+A*b*d^2*(x^n)^3+
B*a*d^2*(x^n)^3+A*a*d^2*(x^n)^2+24*A*a*c^2*n^4+A*a*c^2*m^4+9*A*b*c^2*x^n*n+
4*B*a*c^2*x^n*m+9*B*a*c^2*x^n*n+A*a*d^2*m^4*(x^n)^2+2*A*a*c*d*m^4*x^n+24*A*
a*d^2*m^2*n*(x^n)^2+38*A*a*d^2*m*n^2*(x^n)^2+9*A*b*c^2*m^3*n*x^n+26*A*b*c^2
*m^2*n^2*x^n+24*A*b*c^2*m*n^3*x^n+19*B*b*c^2*m^2*n^2*(x^n)^2+50*A*a*c^2*m*n
^3+6*B*b*c^2*m^2*(x^n)^2+19*B*b*c^2*n^2*(x^n)^2+4*A*a*d^2*(x^n)^2*m+8*A*a*d
^2*(x^n)^2*n+6*A*b*c^2*m^2*x^n+26*A*b*c^2*n^2*x^n+6*B*a*c^2*m^2*x^n+48*B*a*
c*d*m*n*(x^n)^2+54*A*a*c*d*m*n*x^n+8*B*b*c^2*m^3*n*(x^n)^2+6*B*b*d^2*m^2*(x
^n)^4+11*B*b*d^2*n^2*(x^n)^4+4*A*a*d^2*m^3*(x^n)^2+12*A*a*d^2*n^3*(x^n)^2+A
*b*c^2*m^4*x^n+21*A*b*d^2*m^2*n*(x^n)^3+28*A*b*d^2*m*n^2*(x^n)^3+12*B*b*c^2
*m*n^3*(x^n)^2+8*B*b*c*d*m^3*(x^n)^3+16*B*b*c*d*n^3*(x^n)^3+18*B*b*d^2*m*n*
(x^n)^4+4*a*A*c^2*m+10*a*A*c^2*n+a*A*c^2+30*A*a*c^2*m*n+4*A*b*d^2*m^3*(x^n)
^3+8*A*b*d^2*n^3*(x^n)^3+4*B*a*d^2*m^3*(x^n)^3+8*B*a*d^2*n^3*(x^n)^3+B*b*c^
2*m^4*(x^n)^2+16*A*b*c*d*m^3*n*(x^n)^2+38*A*b*c*d*m^2*n^2*(x^n)^2+24*A*b*c*
d*m*n^3*(x^n)^2+16*B*a*c*d*m^3*n*(x^n)^2+38*B*a*c*d*m^2*n^2*(x^n)^2+24*B*a*
c*d*m*n^3*(x^n)^2+B*a*d^2*m^4*(x^n)^3+4*B*b*d^2*m^3*(x^n)^4+21*A*b*d^2*m*n*
```

```
(x^n)^3+9*B*a*c^2*m^3*n*x^n+26*B*a*c^2*m^2*n^2*x^n+24*B*a*c^2*m*n^3*x^n+8*B
*a*c*d*m^3*(x^n)^2+24*B*a*c*d*n^3*(x^n)^2+21*B*a*d^2*m*n*(x^n)^3+24*B*b*c^2
*m^2*n*(x^n)^2+38*B*b*c^2*m*n^2*(x^n)^2+12*B*b*c*d*m^2*(x^n)^3+28*B*b*c*d*n
^2*(x^n)^3+4*A*b*d^2*(x^n)^3*m+7*A*b*d^2*(x^n)^3*n+4*B*a*c^2*m^3*x^n+24*B*a
*c^2*n^3*x^n+4*B*a*d^2*(x^n)^3*m+7*B*a*d^2*(x^n)^3*n+8*A*a*c*d*m^3*x^n+48*A
*a*c*d*n^3*x^n+24*A*a*d^2*m*n*(x^n)^2+27*A*b*c^2*m^2*n*x^n+52*A*b*c^2*m*n^2
*x^n+12*A*b*c*d*m^2*(x^n)^2+38*A*b*c*d*n^2*(x^n)^2+27*B*a*c^2*m^2*n*x^n+16*
A*b*c*d*(x^n)^2*n+27*B*a*c^2*m*n*x^n+8*B*a*c*d*(x^n)^2*m+16*B*a*c*d*(x^n)^2
*n+8*A*a*c*d*x^n*m+18*A*a*c*d*x^n*n+28*B*a*d^2*m*n^2*(x^n)^3+6*A*b*d^2*m^2*
(x^n)^3+14*A*b*d^2*n^2*(x^n)^3+B*a*c^2*m^4*x^n+2*A*a*c*d*x^n+10*A*a*c^2*m^3
*n+35*A*a*c^2*m^2*n^2+B*b*d^2*m^4*(x^n)^4+A*b*d^2*m^4*(x^n)^3+6*A*a*d^2*m^2
*(x^n)^2+19*A*a*d^2*n^2*(x^n)^2+4*A*b*c^2*m^3*x^n+4*m*b*B*d^2*(x^n)^4+6*b*B
*d^2*(x^n)^4*n+2*(x^n)^3*b*B*c*d+2*(x^n)^2*A*b*c*d+2*B*a*c*d*(x^n)^2+B*b*c^
2*(x^n)^2+A*b*c^2*x^n+B*a*c^2*x^n+6*B*b*d^2*n^3*(x^n)^4+24*A*b*c^2*n^3*x^n+
21*B*a*d^2*m^2*n*(x^n)^3+42*B*b*c*d*m*n*(x^n)^3+54*A*a*c*d*m^2*n*x^n+104*A*
a*c*d*m*n^2*x^n+48*A*b*c*d*m*n*(x^n)^2+42*B*b*c*d*m^2*n*(x^n)^3+56*B*b*c*d*
m*n^2*(x^n)^3+18*A*a*c*d*m^3*n*x^n+52*A*a*c*d*m^2*n^2*x^n+48*A*a*c*d*m*n^3*
x^n+48*A*b*c*d*m^2*n*(x^n)^2+76*A*b*c*d*m*n^2*(x^n)^2+48*B*a*c*d*m^2*n*(x^n
)^2+76*B*a*c*d*m*n^2*(x^n)^2+52*B*a*c^2*m*n^2*x^n+12*B*a*c*d*m^2*(x^n)^2+38
*B*a*c*d*n^2*(x^n)^2+24*B*b*c^2*m*n*(x^n)^2+8*B*b*c*d*(x^n)^3*m+30*A*a*c^2*
m^2*n+70*A*a*c^2*m*n^2+8*A*b*d^2*m*n^3*(x^n)^3+6*B*b*d^2*m*n^3*(x^n)^4+7*A*
b*d^2*m^3*n*(x^n)^3+6*B*b*d^2*m^3*n*(x^n)^4+11*B*b*d^2*m^2*n^2*(x^n)^4+19*A
*a*d^2*m^2*n^2*(x^n)^2+8*A*a*d^2*m^3*n*(x^n)^2+7*B*a*d^2*m^3*n*(x^n)^3+14*B
*a*d^2*m^2*n^2*(x^n)^3+8*B*a*d^2*m*n^3*(x^n)^3+2*B*b*c*d*m^4*(x^n)^3+18*B*b
*d^2*m^2*n*(x^n)^4+22*B*b*d^2*m*n^2*(x^n)^4+2*B*a*c*d*m^4*(x^n)^2+14*A*b*d^
2*m^2*n^2*(x^n)^3)/(1+m)/(m+n+1)/(1+m+2*n)/(1+m+3*n)/(1+m+4*n)*exp(1/2*m*(-
I*Pi*csgn(I*e*x)^3+I*Pi*csgn(I*e*x)^2*csgn(I*e)+I*Pi*csgn(I*e*x)^2*csgn(I*x
)-I*Pi*csgn(I*e*x)*csgn(I*e)*csgn(I*x)+2*ln(e)+2*ln(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.24824, size = 3268, normalized size = 20.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b*d^2*m^4 + 4*B*b*d^2*m^3 + 6*B*b*d^2*m^2 + 4*B*b*d^2*m + B*b*d^2 + 6*(
B*b*d^2*m + B*b*d^2)*n^3 + 11*(B*b*d^2*m^2 + 2*B*b*d^2*m + B*b*d^2)*n^2 + 6
*(B*b*d^2*m^3 + 3*B*b*d^2*m^2 + 3*B*b*d^2*m + B*b*d^2)*n)*x*x^(4*n)*e^(m*lo
g(e) + m*log(x)) + ((2*B*b*c*d + (B*a + A*b)*d^2)*m^4 + 2*B*b*c*d + 4*(2*B*
b*c*d + (B*a + A*b)*d^2)*m^3 + 8*(2*B*b*c*d + (B*a + A*b)*d^2 + (2*B*b*c*d
+ (B*a + A*b)*d^2)*m)*n^3 + (B*a + A*b)*d^2 + 6*(2*B*b*c*d + (B*a + A*b)*d^
2)*m^2 + 14*(2*B*b*c*d + (B*a + A*b)*d^2 + (2*B*b*c*d + (B*a + A*b)*d^2)*m^
2 + 2*(2*B*b*c*d + (B*a + A*b)*d^2)*m)*n^2 + 4*(2*B*b*c*d + (B*a + A*b)*d^2
```

```
)*m + 7*(2*B*b*c*d + (2*B*b*c*d + (B*a + A*b)*d^2)*m^3 + (B*a + A*b)*d^2 +
3*(2*B*b*c*d + (B*a + A*b)*d^2)*m^2 + 3*(2*B*b*c*d + (B*a + A*b)*d^2)*m)*n)
*x*x^(3*n)*e^(m*log(e) + m*log(x)) + ((B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*
d)*m^4 + B*b*c^2 + A*a*d^2 + 4*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d)*m^3
+ 12*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d + (B*b*c^2 + A*a*d^2 + 2*(B*a +
 A*b)*c*d)*m)*n^3 + 2*(B*a + A*b)*c*d + 6*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b
)*c*d)*m^2 + 19*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d + (B*b*c^2 + A*a*d^2
 + 2*(B*a + A*b)*c*d)*m^2 + 2*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d)*m)*n^
2 + 4*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d)*m + 8*(B*b*c^2 + A*a*d^2 + (B
*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c*d)*m^3 + 2*(B*a + A*b)*c*d + 3*(B*b*c^2
+ A*a*d^2 + 2*(B*a + A*b)*c*d)*m^2 + 3*(B*b*c^2 + A*a*d^2 + 2*(B*a + A*b)*c
*d)*m)*n)*x*x^(2*n)*e^(m*log(e) + m*log(x)) + ((2*A*a*c*d + (B*a + A*b)*c^2
)*m^4 + 2*A*a*c*d + 4*(2*A*a*c*d + (B*a + A*b)*c^2)*m^3 + 24*(2*A*a*c*d + (
B*a + A*b)*c^2 + (2*A*a*c*d + (B*a + A*b)*c^2)*m)*n^3 + (B*a + A*b)*c^2 + 6
*(2*A*a*c*d + (B*a + A*b)*c^2)*m^2 + 26*(2*A*a*c*d + (B*a + A*b)*c^2 + (2*A
*a*c*d + (B*a + A*b)*c^2)*m^2 + 2*(2*A*a*c*d + (B*a + A*b)*c^2)*m)*n^2 + 4*
(2*A*a*c*d + (B*a + A*b)*c^2)*m + 9*(2*A*a*c*d + (2*A*a*c*d + (B*a + A*b)*c
^2)*m^3 + (B*a + A*b)*c^2 + 3*(2*A*a*c*d + (B*a + A*b)*c^2)*m^2 + 3*(2*A*a*
c*d + (B*a + A*b)*c^2)*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) + (A*a*c^2*m^4 +
 24*A*a*c^2*n^4 + 4*A*a*c^2*m^3 + 6*A*a*c^2*m^2 + 4*A*a*c^2*m + A*a*c^2 + 5
0*(A*a*c^2*m + A*a*c^2)*n^3 + 35*(A*a*c^2*m^2 + 2*A*a*c^2*m + A*a*c^2)*n^2
+ 10*(A*a*c^2*m^3 + 3*A*a*c^2*m^2 + 3*A*a*c^2*m + A*a*c^2)*n)*x*e^(m*log(e)
 + m*log(x)))/(m^5 + 24*(m + 1)*n^4 + 5*m^4 + 50*(m^2 + 2*m + 1)*n^3 + 10*m
^3 + 35*(m^3 + 3*m^2 + 3*m + 1)*n^2 + 10*m^2 + 10*(m^4 + 4*m^3 + 6*m^2 + 4*
m + 1)*n + 5*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.18954, size = 4610, normalized size = 28.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b*d^2*m^4*x*x^m*x^(4*n)*e^m + 6*B*b*d^2*m^3*n*x*x^m*x^(4*n)*e^m + 11*B*b
*d^2*m^2*n^2*x*x^m*x^(4*n)*e^m + 6*B*b*d^2*m*n^3*x*x^m*x^(4*n)*e^m + 2*B*b*
c*d*m^4*x*x^m*x^(3*n)*e^m + B*a*d^2*m^4*x*x^m*x^(3*n)*e^m + A*b*d^2*m^4*x*x
^m*x^(3*n)*e^m + 14*B*b*c*d*m^3*n*x*x^m*x^(3*n)*e^m + 7*B*a*d^2*m^3*n*x*x^m
*x^(3*n)*e^m + 7*A*b*d^2*m^3*n*x*x^m*x^(3*n)*e^m + 28*B*b*c*d*m^2*n^2*x*x^m
*x^(3*n)*e^m + 14*B*a*d^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 14*A*b*d^2*m^2*n^2*x*
x^m*x^(3*n)*e^m + 16*B*b*c*d*m*n^3*x*x^m*x^(3*n)*e^m + 8*B*a*d^2*m*n^3*x*x^
m*x^(3*n)*e^m + 8*A*b*d^2*m*n^3*x*x^m*x^(3*n)*e^m + B*b*c^2*m^4*x*x^m*x^(2*
n)*e^m + 2*B*a*c*d*m^4*x*x^m*x^(2*n)*e^m + 2*A*b*c*d*m^4*x*x^m*x^(2*n)*e^m
+ A*a*d^2*m^4*x*x^m*x^(2*n)*e^m + 8*B*b*c^2*m^3*n*x*x^m*x^(2*n)*e^m + 16*B*
```

```
a*c*d*m^3*n*x*x^m*x^(2*n)*e^m + 16*A*b*c*d*m^3*n*x*x^m*x^(2*n)*e^m + 8*A*a*
d^2*m^3*n*x*x^m*x^(2*n)*e^m + 19*B*b*c^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 38*B*a
*c*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 38*A*b*c*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 19*
A*a*d^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 12*B*b*c^2*m*n^3*x*x^m*x^(2*n)*e^m + 24
*B*a*c*d*m*n^3*x*x^m*x^(2*n)*e^m + 24*A*b*c*d*m*n^3*x*x^m*x^(2*n)*e^m + 12*
A*a*d^2*m*n^3*x*x^m*x^(2*n)*e^m + B*a*c^2*m^4*x*x^m*x^n*e^m + A*b*c^2*m^4*x
*x^m*x^n*e^m + 2*A*a*c*d*m^4*x*x^m*x^n*e^m + 9*B*a*c^2*m^3*n*x*x^m*x^n*e^m
+ 9*A*b*c^2*m^3*n*x*x^m*x^n*e^m + 18*A*a*c*d*m^3*n*x*x^m*x^n*e^m + 26*B*a*c
^2*m^2*n^2*x*x^m*x^n*e^m + 26*A*b*c^2*m^2*n^2*x*x^m*x^n*e^m + 52*A*a*c*d*m^
2*n^2*x*x^m*x^n*e^m + 24*B*a*c^2*m*n^3*x*x^m*x^n*e^m + 24*A*b*c^2*m*n^3*x*x
^m*x^n*e^m + 48*A*a*c*d*m*n^3*x*x^m*x^n*e^m + A*a*c^2*m^4*x*x^m*e^m + 10*A*
a*c^2*m^3*n*x*x^m*e^m + 35*A*a*c^2*m^2*n^2*x*x^m*e^m + 50*A*a*c^2*m*n^3*x*x
^m*e^m + 24*A*a*c^2*n^4*x*x^m*e^m + 4*B*b*d^2*m^3*x*x^m*x^(4*n)*e^m + 18*B*
b*d^2*m^2*n*x*x^m*x^(4*n)*e^m + 22*B*b*d^2*m*n^2*x*x^m*x^(4*n)*e^m + 6*B*b*
d^2*n^3*x*x^m*x^(4*n)*e^m + 8*B*b*c*d*m^3*x*x^m*x^(3*n)*e^m + 4*B*a*d^2*m^3
*x*x^m*x^(3*n)*e^m + 4*A*b*d^2*m^3*x*x^m*x^(3*n)*e^m + 42*B*b*c*d*m^2*n*x*x
^m*x^(3*n)*e^m + 21*B*a*d^2*m^2*n*x*x^m*x^(3*n)*e^m + 21*A*b*d^2*m^2*n*x*x^
m*x^(3*n)*e^m + 56*B*b*c*d*m*n^2*x*x^m*x^(3*n)*e^m + 28*B*a*d^2*m*n^2*x*x^m
*x^(3*n)*e^m + 28*A*b*d^2*m*n^2*x*x^m*x^(3*n)*e^m + 16*B*b*c*d*n^3*x*x^m*x^
(3*n)*e^m + 8*B*a*d^2*n^3*x*x^m*x^(3*n)*e^m + 8*A*b*d^2*n^3*x*x^m*x^(3*n)*e
^m + 4*B*b*c^2*m^3*x*x^m*x^(2*n)*e^m + 8*B*a*c*d*m^3*x*x^m*x^(2*n)*e^m + 8*
A*b*c*d*m^3*x*x^m*x^(2*n)*e^m + 4*A*a*d^2*m^3*x*x^m*x^(2*n)*e^m + 24*B*b*c^
2*m^2*n*x*x^m*x^(2*n)*e^m + 48*B*a*c*d*m^2*n*x*x^m*x^(2*n)*e^m + 48*A*b*c*d
*m^2*n*x*x^m*x^(2*n)*e^m + 24*A*a*d^2*m^2*n*x*x^m*x^(2*n)*e^m + 38*B*b*c^2*
m*n^2*x*x^m*x^(2*n)*e^m + 76*B*a*c*d*m*n^2*x*x^m*x^(2*n)*e^m + 76*A*b*c*d*m
*n^2*x*x^m*x^(2*n)*e^m + 38*A*a*d^2*m*n^2*x*x^m*x^(2*n)*e^m + 12*B*b*c^2*n^
3*x*x^m*x^(2*n)*e^m + 24*B*a*c*d*n^3*x*x^m*x^(2*n)*e^m + 24*A*b*c*d*n^3*x*x
^m*x^(2*n)*e^m + 12*A*a*d^2*n^3*x*x^m*x^(2*n)*e^m + 4*B*a*c^2*m^3*x*x^m*x^n
*e^m + 4*A*b*c^2*m^3*x*x^m*x^n*e^m + 8*A*a*c*d*m^3*x*x^m*x^n*e^m + 27*B*a*c
^2*m^2*n*x*x^m*x^n*e^m + 27*A*b*c^2*m^2*n*x*x^m*x^n*e^m + 54*A*a*c*d*m^2*n*
x*x^m*x^n*e^m + 52*B*a*c^2*m*n^2*x*x^m*x^n*e^m + 52*A*b*c^2*m*n^2*x*x^m*x^n
*e^m + 104*A*a*c*d*m*n^2*x*x^m*x^n*e^m + 24*B*a*c^2*n^3*x*x^m*x^n*e^m + 24*
A*b*c^2*n^3*x*x^m*x^n*e^m + 48*A*a*c*d*n^3*x*x^m*x^n*e^m + 4*A*a*c^2*m^3*x*
x^m*e^m + 30*A*a*c^2*m^2*n*x*x^m*e^m + 70*A*a*c^2*m*n^2*x*x^m*e^m + 50*A*a*
c^2*n^3*x*x^m*e^m + 6*B*b*d^2*m^2*x*x^m*x^(4*n)*e^m + 18*B*b*d^2*m*n*x*x^m*
x^(4*n)*e^m + 11*B*b*d^2*n^2*x*x^m*x^(4*n)*e^m + 12*B*b*c*d*m^2*x*x^m*x^(3*
n)*e^m + 6*B*a*d^2*m^2*x*x^m*x^(3*n)*e^m + 6*A*b*d^2*m^2*x*x^m*x^(3*n)*e^m
+ 42*B*b*c*d*m*n*x*x^m*x^(3*n)*e^m + 21*B*a*d^2*m*n*x*x^m*x^(3*n)*e^m + 21*
A*b*d^2*m*n*x*x^m*x^(3*n)*e^m + 28*B*b*c*d*n^2*x*x^m*x^(3*n)*e^m + 14*B*a*d
^2*n^2*x*x^m*x^(3*n)*e^m + 14*A*b*d^2*n^2*x*x^m*x^(3*n)*e^m + 6*B*b*c^2*m^2
*x*x^m*x^(2*n)*e^m + 12*B*a*c*d*m^2*x*x^m*x^(2*n)*e^m + 12*A*b*c*d*m^2*x*x^
m*x^(2*n)*e^m + 6*A*a*d^2*m^2*x*x^m*x^(2*n)*e^m + 24*B*b*c^2*m*n*x*x^m*x^(2
*n)*e^m + 48*B*a*c*d*m*n*x*x^m*x^(2*n)*e^m + 48*A*b*c*d*m*n*x*x^m*x^(2*n)*e
^m + 24*A*a*d^2*m*n*x*x^m*x^(2*n)*e^m + 19*B*b*c^2*n^2*x*x^m*x^(2*n)*e^m +
38*B*a*c*d*n^2*x*x^m*x^(2*n)*e^m + 38*A*b*c*d*n^2*x*x^m*x^(2*n)*e^m + 19*A*
a*d^2*n^2*x*x^m*x^(2*n)*e^m + 6*B*a*c^2*m^2*x*x^m*x^n*e^m + 6*A*b*c^2*m^2*x
*x^m*x^n*e^m + 12*A*a*c*d*m^2*x*x^m*x^n*e^m + 27*B*a*c^2*m*n*x*x^m*x^n*e^m
+ 27*A*b*c^2*m*n*x*x^m*x^n*e^m + 54*A*a*c*d*m*n*x*x^m*x^n*e^m + 26*B*a*c^2*
n^2*x*x^m*x^n*e^m + 26*A*b*c^2*n^2*x*x^m*x^n*e^m + 52*A*a*c*d*n^2*x*x^m*x^n
*e^m + 6*A*a*c^2*m^2*x*x^m*e^m + 30*A*a*c^2*m*n*x*x^m*e^m + 35*A*a*c^2*n^2*
x*x^m*e^m + 4*B*b*d^2*m*x*x^m*x^(4*n)*e^m + 6*B*b*d^2*n*x*x^m*x^(4*n)*e^m +
 8*B*b*c*d*m*x*x^m*x^(3*n)*e^m + 4*B*a*d^2*m*x*x^m*x^(3*n)*e^m + 4*A*b*d^2*
m*x*x^m*x^(3*n)*e^m + 14*B*b*c*d*n*x*x^m*x^(3*n)*e^m + 7*B*a*d^2*n*x*x^m*x^
(3*n)*e^m + 7*A*b*d^2*n*x*x^m*x^(3*n)*e^m + 4*B*b*c^2*m*x*x^m*x^(2*n)*e^m +
 8*B*a*c*d*m*x*x^m*x^(2*n)*e^m + 8*A*b*c*d*m*x*x^m*x^(2*n)*e^m + 4*A*a*d^2*
m*x*x^m*x^(2*n)*e^m + 8*B*b*c^2*n*x*x^m*x^(2*n)*e^m + 16*B*a*c*d*n*x*x^m*x^
(2*n)*e^m + 16*A*b*c*d*n*x*x^m*x^(2*n)*e^m + 8*A*a*d^2*n*x*x^m*x^(2*n)*e^m
+ 4*B*a*c^2*m*x*x^m*x^n*e^m + 4*A*b*c^2*m*x*x^m*x^n*e^m + 8*A*a*c*d*m*x*x^m
*x^n*e^m + 9*B*a*c^2*n*x*x^m*x^n*e^m + 9*A*b*c^2*n*x*x^m*x^n*e^m + 18*A*a*c
```

```
*d*n*x*x^m*x^n*e^m + 4*A*a*c^2*m*x*x^m*e^m + 10*A*a*c^2*n*x*x^m*e^m + B*b*d
^2*x*x^m*x^(4*n)*e^m + 2*B*b*c*d*x*x^m*x^(3*n)*e^m + B*a*d^2*x*x^m*x^(3*n)*
e^m + A*b*d^2*x*x^m*x^(3*n)*e^m + B*b*c^2*x*x^m*x^(2*n)*e^m + 2*B*a*c*d*x*x
^m*x^(2*n)*e^m + 2*A*b*c*d*x*x^m*x^(2*n)*e^m + A*a*d^2*x*x^m*x^(2*n)*e^m +
B*a*c^2*x*x^m*x^n*e^m + A*b*c^2*x*x^m*x^n*e^m + 2*A*a*c*d*x*x^m*x^n*e^m + A
*a*c^2*x*x^m*e^m)/(m^5 + 10*m^4*n + 35*m^3*n^2 + 50*m^2*n^3 + 24*m*n^4 + 5*
m^4 + 40*m^3*n + 105*m^2*n^2 + 100*m*n^3 + 24*n^4 + 10*m^3 + 60*m^2*n + 105
*m*n^2 + 50*n^3 + 10*m^2 + 40*m*n + 35*n^2 + 5*m + 10*n + 1)
```

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

Optimal. Leaf size=102

$$\frac{cx^{n+1}(ex)^m(2Ad+Bc)}{m+n+1}+\frac{dx^{2n+1}(ex)^m(Ad+2Bc)}{m+2n+1}+\frac{Ac^2(ex)^{m+1}}{e(m+1)}+\frac{Bd^2x^{3n+1}(ex)^m}{m+3n+1}$$

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

Rubi [A] time = 0.0759361, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {448, 20, 30}

$$\frac{cx^{n+1}(ex)^m(2Ad+Bc)}{m+n+1}+\frac{dx^{2n+1}(ex)^m(Ad+2Bc)}{m+2n+1}+\frac{Ac^2(ex)^{m+1}}{e(m+1)}+\frac{Bd^2x^{3n+1}(ex)^m}{m+3n+1}$$

Antiderivative was successfully verified.

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

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

Rule 448

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(e*x)^m*(a + b*x^n)^p*(c + d*x^
n)^q, x], x] /; FreeQ[{a, b, c, d, e, m, n}, x] && NeQ[b*c - a*d, 0] && IGt
Q[p, 0] && IGtQ[q, 0]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int (ex)^m (A+Bx^n)(c+dx^n)^2\,dx &= \int \left(Ac^2(ex)^m+c(Bc+2Ad)x^n(ex)^m+d(2Bc+Ad)x^{2n}(ex)^m+Bd^2x^{3n}(ex)^m\right)dx\\
&=\frac{Ac^2(ex)^{1+m}}{e(1+m)}+\left(Bd^2\right)\int x^{3n}(ex)^m\,dx+(d(2Bc+Ad))\int x^{2n}(ex)^m\,dx+(c(Bc+2Ad))\\
&=\frac{Ac^2(ex)^{1+m}}{e(1+m)}+\left(Bd^2x^{-m}(ex)^m\right)\int x^{m+3n}\,dx+\left(d(2Bc+Ad)x^{-m}(ex)^m\right)\int x^{m+2n}\,dx+(c(\\
&=\frac{c(Bc+2Ad)x^{1+n}(ex)^m}{1+m+n}+\frac{d(2Bc+Ad)x^{1+2n}(ex)^m}{1+m+2n}+\frac{Bd^2x^{1+3n}(ex)^m}{1+m+3n}+\frac{Ac^2(ex)^{1+m}}{e(1+m)}\end{aligned}$$

Mathematica [A] time = 0.110322, size = 78, normalized size = 0.76

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

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.052, size = 732, normalized size = 7.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(12*A*c*d*m*n^2*x^n+16*B*c*d*m*n*(x^n)^2+20*A*c*d*m*n*x^n+A*c^2+2*(x^n)^2
*B*c*d+3*B*c^2*m^2*x^n+6*B*c^2*n^2*x^n+3*B*c^2*x^n*m+5*B*c^2*x^n*n+6*A*c^2*
n^3+3*A*c^2*m^2+11*A*c^2*n^2+A*c^2*m^3+B*c^2*m^3*x^n+3*m*B*d^2*(x^n)^3+3*B*
d^2*(x^n)^3*n+3*A*d^2*(x^n)^2*m+4*A*d^2*(x^n)^2*n+2*B*d^2*n^2*(x^n)^3+3*A*d
^2*m^2*(x^n)^2+3*A*d^2*n^2*(x^n)^2+B*d^2*m^3*(x^n)^3+A*d^2*m^3*(x^n)^2+3*B*
d^2*m^2*(x^n)^3+10*A*c*d*m^2*n*x^n+8*B*c*d*m^2*n*(x^n)^2+6*B*c*d*m*n^2*(x^n
)^2+6*A*c*d*x^n*m+10*A*c*d*x^n*n+3*B*d^2*m^2*n*(x^n)^3+2*B*d^2*m*n^2*(x^n)^
3+4*A*d^2*m^2*n*(x^n)^2+3*A*d^2*m*n^2*(x^n)^2+2*B*c*d*m^3*(x^n)^2+6*B*d^2*m
*n*(x^n)^3+2*A*c*d*m^3*x^n+8*A*d^2*m*n*(x^n)^2+5*B*c^2*m^2*n*x^n+6*B*c^2*m*
n^2*x^n+6*B*c*d*m^2*(x^n)^2+6*B*c*d*n^2*(x^n)^2+6*A*c*d*m^2*x^n+12*A*c*d*n^
2*x^n+10*B*c^2*m*n*x^n+6*B*c*d*(x^n)^2*m+8*B*c*d*(x^n)^2*n+3*A*c^2*m+6*A*c^
2*n+B*c^2*x^n+B*d^2*(x^n)^3+A*d^2*(x^n)^2+6*A*c^2*m^2*n+11*A*c^2*m*n^2+12*A
*c^2*m*n+2*x^n*A*c*d)/(1+m)/(m+n+1)/(1+m+2*n)/(1+m+3*n)*exp(1/2*m*(-I*Pi*cs
gn(I*e*x)^3+I*Pi*csgn(I*e*x)^2*csgn(I*e)+I*Pi*csgn(I*e*x)^2*csgn(I*x)-I*Pi*
csgn(I*e*x)*csgn(I*e)*csgn(I*x)+2*ln(e)+2*ln(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.11974, size = 1208, normalized size = 11.84

$$\frac{\left(Bd^2m^3+3\,Bd^2m^2+3\,Bd^2m+Bd^2+2\left(Bd^2m+Bd^2\right)n^2+3\left(Bd^2m^2+2\,Bd^2m+Bd^2\right)n\right)xx^{3\,n}e^{(m\log(e)+m\log(x))}+\left(\left(2\,B\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*d^2*m^3 + 3*B*d^2*m^2 + 3*B*d^2*m + B*d^2 + 2*(B*d^2*m + B*d^2)*n^2 + 3
*(B*d^2*m^2 + 2*B*d^2*m + B*d^2)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + ((2
*B*c*d + A*d^2)*m^3 + 2*B*c*d + A*d^2 + 3*(2*B*c*d + A*d^2)*m^2 + 3*(2*B*c*
d + A*d^2 + (2*B*c*d + A*d^2)*m)*n^2 + 3*(2*B*c*d + A*d^2)*m + 4*(2*B*c*d +
 A*d^2 + (2*B*c*d + A*d^2)*m^2 + 2*(2*B*c*d + A*d^2)*m)*n)*x*x^(2*n)*e^(m*l
og(e) + m*log(x)) + ((B*c^2 + 2*A*c*d)*m^3 + B*c^2 + 2*A*c*d + 3*(B*c^2 + 2
*A*c*d)*m^2 + 6*(B*c^2 + 2*A*c*d + (B*c^2 + 2*A*c*d)*m)*n^2 + 3*(B*c^2 + 2*
A*c*d)*m + 5*(B*c^2 + 2*A*c*d + (B*c^2 + 2*A*c*d)*m^2 + 2*(B*c^2 + 2*A*c*d)
*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) + (A*c^2*m^3 + 6*A*c^2*n^3 + 3*A*c^2*m
^2 + 3*A*c^2*m + A*c^2 + 11*(A*c^2*m + A*c^2)*n^2 + 6*(A*c^2*m^2 + 2*A*c^2*
m + A*c^2)*n)*x*e^(m*log(e) + m*log(x)))/(m^4 + 6*(m + 1)*n^3 + 4*m^3 + 11*
(m^2 + 2*m + 1)*n^2 + 6*m^2 + 6*(m^3 + 3*m^2 + 3*m + 1)*n + 4*m + 1)
```

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

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.09045, size = 1381, normalized size = 13.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*d^2*m^3*x*x^m*x^(3*n)*e^m + 3*B*d^2*m^2*n*x*x^m*x^(3*n)*e^m + 2*B*d^2*m*
n^2*x*x^m*x^(3*n)*e^m + 2*B*c*d*m^3*x*x^m*x^(2*n)*e^m + A*d^2*m^3*x*x^m*x^(
2*n)*e^m + 8*B*c*d*m^2*n*x*x^m*x^(2*n)*e^m + 4*A*d^2*m^2*n*x*x^m*x^(2*n)*e^
m + 6*B*c*d*m*n^2*x*x^m*x^(2*n)*e^m + 3*A*d^2*m*n^2*x*x^m*x^(2*n)*e^m + B*c
^2*m^3*x*x^m*x^n*e^m + 2*A*c*d*m^3*x*x^m*x^n*e^m + 5*B*c^2*m^2*n*x*x^m*x^n*
e^m + 10*A*c*d*m^2*n*x*x^m*x^n*e^m + 6*B*c^2*m*n^2*x*x^m*x^n*e^m + 12*A*c*d
*m*n^2*x*x^m*x^n*e^m + A*c^2*m^3*x*x^m*e^m + 6*A*c^2*m^2*n*x*x^m*e^m + 11*A
*c^2*m*n^2*x*x^m*e^m + 6*A*c^2*n^3*x*x^m*e^m + 3*B*d^2*m^2*x*x^m*x^(3*n)*e^
m + 6*B*d^2*m*n*x*x^m*x^(3*n)*e^m + 2*B*d^2*n^2*x*x^m*x^(3*n)*e^m + 6*B*c*d
*m^2*x*x^m*x^(2*n)*e^m + 3*A*d^2*m^2*x*x^m*x^(2*n)*e^m + 16*B*c*d*m*n*x*x^m
*x^(2*n)*e^m + 8*A*d^2*m*n*x*x^m*x^(2*n)*e^m + 6*B*c*d*n^2*x*x^m*x^(2*n)*e^
m + 3*A*d^2*n^2*x*x^m*x^(2*n)*e^m + 3*B*c^2*m^2*x*x^m*x^n*e^m + 6*A*c*d*m^2
*x*x^m*x^n*e^m + 10*B*c^2*m*n*x*x^m*x^n*e^m + 20*A*c*d*m*n*x*x^m*x^n*e^m +
6*B*c^2*n^2*x*x^m*x^n*e^m + 12*A*c*d*n^2*x*x^m*x^n*e^m + 3*A*c^2*m^2*x*x^m*
e^m + 12*A*c^2*m*n*x*x^m*e^m + 11*A*c^2*n^2*x*x^m*e^m + 3*B*d^2*m*x*x^m*x^(
3*n)*e^m + 3*B*d^2*n*x*x^m*x^(3*n)*e^m + 6*B*c*d*m*x*x^m*x^(2*n)*e^m + 3*A*
d^2*m*x*x^m*x^(2*n)*e^m + 8*B*c*d*n*x*x^m*x^(2*n)*e^m + 4*A*d^2*n*x*x^m*x^(
2*n)*e^m + 3*B*c^2*m*x*x^m*x^n*e^m + 6*A*c*d*m*x*x^m*x^n*e^m + 5*B*c^2*n*x*
x^m*x^n*e^m + 10*A*c*d*n*x*x^m*x^n*e^m + 3*A*c^2*m*x*x^m*e^m + 6*A*c^2*n*x*
x^m*e^m + B*d^2*x*x^m*x^(3*n)*e^m + 2*B*c*d*x*x^m*x^(2*n)*e^m + A*d^2*x*x^m
*x^(2*n)*e^m + B*c^2*x*x^m*x^n*e^m + 2*A*c*d*x*x^m*x^n*e^m + A*c^2*x*x^m*e^
```

```
m)/(m^4 + 6*m^3*n + 11*m^2*n^2 + 6*m*n^3 + 4*m^3 + 18*m^2*n + 22*m*n^2 + 6*
n^3 + 6*m^2 + 18*m*n + 11*n^2 + 4*m + 6*n + 1)
```

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

Optimal. Leaf size=185

$$\frac{(ex)^{m+1}\left(a^2Bd^2-abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{b^3e(m+1)}+\frac{(ex)^{m+1}(Ab-aB)(bc-ad)^2\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{ab^3e(m+1)}+\frac{dx^{n+1}(ex)^{m}\ldots}{b\ldots}$$

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

Rubi [A] time = 0.2257, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {570, 20, 30, 364}

$$\frac{(ex)^{m+1}\left(a^2Bd^2-abd(Ad+2Bc)+b^2c(2Ad+Bc)\right)}{b^3e(m+1)}+\frac{(ex)^{m+1}(Ab-aB)(bc-ad)^2\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{ab^3e(m+1)}+\frac{dx^{n+1}(ex)^{m}\ldots}{b\ldots}$$

Antiderivative was successfully verified.

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


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


Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
```

```
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)(c+dx^n)^2}{a+bx^n}\,dx = \int \left(\frac{\left(a^2Bd^2-abd(2Bc+Ad)+b^2c(Bc+2Ad)\right)(ex)^m}{b^3}+\frac{d(2bBc+Abd-aBd)x^n(e$$

$$= \frac{\left(a^2Bd^2-abd(2Bc+Ad)+b^2c(Bc+2Ad)\right)(ex)^{1+m}}{b^3e(1+m)}+\frac{\left(Bd^2\right)\int x^{2n}(ex)^m\,dx}{b}+\frac{((Ab$$

$$= \frac{\left(a^2Bd^2-abd(2Bc+Ad)+b^2c(Bc+2Ad)\right)(ex)^{1+m}}{b^3e(1+m)}+\frac{(Ab-aB)(bc-ad)^2(ex)^{1+m}}{ab^3e(1$$

$$= \frac{d(2bBc+Abd-aBd)x^{1+n}(ex)^m}{b^2(1+m+n)}+\frac{Bd^2x^{1+2n}(ex)^m}{b(1+m+2n)}+\frac{\left(a^2Bd^2-abd(2Bc+Ad)+b^2\right.}{b^3e(1+m}$$

Mathematica [A] time = 0.259551, size = 153, normalized size = 0.83

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

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.505, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\left(\left(b^3c^2e^m-2\,ab^2cde^m+a^2bd^2e^m\right)A-\left(ab^2c^2e^m-2\,a^2bcde^m+a^3d^2e^m\right)B\right)\int \frac{x^m}{b^4x^n+ab^3}\,dx+\frac{\left(m^2+m(n+2)+n+1\right)I}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((b^3*c^2*e^m - 2*a*b^2*c*d*e^m + a^2*b*d^2*e^m)*A - (a*b^2*c^2*e^m - 2*a^2
*b*c*d*e^m + a^3*d^2*e^m)*B)*integrate(x^m/(b^4*x^n + a*b^3), x) + ((m^2 +
m*(n + 2) + n + 1)*B*b^2*d^2*e^m*x*e^(m*log(x) + 2*n*log(x)) + ((2*(m^2 + m
*(3*n + 2) + 2*n^2 + 3*n + 1)*b^2*c*d*e^m - (m^2 + m*(3*n + 2) + 2*n^2 + 3*
n + 1)*a*b*d^2*e^m)*A + ((m^2 + m*(3*n + 2) + 2*n^2 + 3*n + 1)*b^2*c^2*e^m
- 2*(m^2 + m*(3*n + 2) + 2*n^2 + 3*n + 1)*a*b*c*d*e^m + (m^2 + m*(3*n + 2)
+ 2*n^2 + 3*n + 1)*a^2*d^2*e^m)*B)*x*x^m + ((m^2 + 2*m*(n + 1) + 2*n + 1)*A
*b^2*d^2*e^m + (2*(m^2 + 2*m*(n + 1) + 2*n + 1)*b^2*c*d*e^m - (m^2 + 2*m*(n
 + 1) + 2*n + 1)*a*b*d^2*e^m)*B)*x*e^(m*log(x) + n*log(x)))/((m^3 + 3*m^2*(
n + 1) + (2*n^2 + 6*n + 3)*m + 2*n^2 + 3*n + 1)*b^3)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 27.2062, size = 1085, normalized size = 5.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*c**2*e**m*m*x*x**m*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*gamma
(m/n + 1/n)/(a*n**2*gamma(m/n + 1 + 1/n)) + A*c**2*e**m*x*x**m*lerchphi(b*x
**n*exp_polar(I*pi)/a, 1, m/n + 1/n)*gamma(m/n + 1/n)/(a*n**2*gamma(m/n + 1
 + 1/n)) + 2*A*c*d*e**m*m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1,
 m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n**2*gamma(m/n + 2 + 1/n)) + 2*A*c*
d*e**m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gam
ma(m/n + 1 + 1/n)/(a*n*gamma(m/n + 2 + 1/n)) + 2*A*c*d*e**m*x*x**m*x**n*ler
chphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n
**2*gamma(m/n + 2 + 1/n)) + A*d**2*e**m*m*x*x**m*x**(2*n)*lerchphi(b*x**n*e
xp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n**2*gamma(m/n
+ 3 + 1/n)) + 2*A*d**2*e**m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)
/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n*gamma(m/n + 3 + 1/n)) + A*d
**2*e**m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/
n)*gamma(m/n + 2 + 1/n)/(a*n**2*gamma(m/n + 3 + 1/n)) + B*c**2*e**m*m*x*x**
m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 +
 1/n)/(a*n**2*gamma(m/n + 2 + 1/n)) + B*c**2*e**m*x*x**m*x**n*lerchphi(b*x*
*n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n*gamma(m/n
 + 2 + 1/n)) + B*c**2*e**m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1
, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n**2*gamma(m/n + 2 + 1/n)) + 2*B*c
*d*e**m*m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1
/n)*gamma(m/n + 2 + 1/n)/(a*n**2*gamma(m/n + 3 + 1/n)) + 4*B*c*d*e**m*x*x**
m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n +
 2 + 1/n)/(a*n*gamma(m/n + 3 + 1/n)) + 2*B*c*d*e**m*x*x**m*x**(2*n)*lerchph
```

```
i(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n**2*
gamma(m/n + 3 + 1/n)) + B*d**2*e**m*m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_p
olar(I*pi)/a, 1, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(a*n**2*gamma(m/n + 4
+ 1/n)) + 3*B*d**2*e**m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a,
1, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(a*n*gamma(m/n + 4 + 1/n)) + B*d**2*
e**m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 3 + 1/n)*g
amma(m/n + 3 + 1/n)/(a*n**2*gamma(m/n + 4 + 1/n))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=268

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

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

Rubi [A] time = 0.668707, antiderivative size = 268, 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, Rules used = {594, 570, 20, 30, 364}

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

Antiderivative was successfully verified.

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


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


Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
```

```
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)(c+dx^n)^2}{(a+bx^n)^2}\,dx = \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)^2}{aben(a+bx^n)} - \frac{\int \frac{(ex)^m(c+dx^n)(-c(aB(1+m)-Ab(1+m-n))+d(Ab(1+m+n)-aB(1+}{a+bx^n}}{abn}$$

$$= \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)^2}{aben(a+bx^n)} - \frac{\int \left(\frac{d(Ab(2bc(1+m)-ad(1+m+n))-aB(2bc(1+m+n)-ad(1+m+2n))}{b^2}\right.}{}$$

$$= -\frac{d(Ab(2bc(1+m)-ad(1+m+n))-aB(2bc(1+m+n)-ad(1+m+2n)))(ex)^1}{ab^3e(1+m)n}$$

$$= -\frac{d(Ab(2bc(1+m)-ad(1+m+n))-aB(2bc(1+m+n)-ad(1+m+2n)))(ex)^1}{ab^3e(1+m)n}$$

$$= -\frac{d^2(Ab(1+m+n)-aB(1+m+2n))x^{1+n}(ex)^m}{ab^2n(1+m+n)} - \frac{d(Ab(2bc(1+m)-ad(1+m+}{}$$

Mathematica [A] time = 0.245594, size = 159, normalized size = 0.59

$$\frac{x(ex)^m\left(\frac{(Ab-aB)(bc-ad)^2\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^2(m+1)}+\frac{(bc-ad)(-3aBd+2Abd+bBc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a(m+1)}+\frac{d(-2aBd+Abd+2bBc)}{m+1}+\frac{bBd^2x^n}{m+n+1}\right)}{b^3}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.5, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(a^2bd^2e^m(m+n+1)+b^3c^2e^m(m-n+1)-2\,ab^2cde^m(m+1)\right)A-\left(a^3d^2e^m(m+2\,n+1)-2\,a^2bcde^m(m+n+1)+ab^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=322

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)(bc(aB(m+1)-Ab(m-2n+1))(ad(m+1)-bc(m-n+1))-ad(Ab(m+1)-aB(m+\cdots}{2a^3b^3e(m+1)n^2}$$

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

Rubi [A] time = 0.543598, antiderivative size = 322, 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, Rules used = {594, 459, 364}

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)(bc(aB(m+1)-Ab(m-2n+1))(ad(m+1)-bc(m-n+1))-ad(Ab(m+1)-aB(m+\cdots}{2a^3b^3e(m+1)n^2}$$

Antiderivative was successfully verified.

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


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


Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)(c+dx^n)^2}{(a+bx^n)^3}\,dx = \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)^2}{2aben(a+bx^n)^2} - \frac{\int \frac{(ex)^m(c+dx^n)(-c(aB(1+m)-Ab(1+m-2n))+d(Ab(1+m)-aB(1+m}{(a+bx^n)^2}}{2abn}$$

$$= \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)^2}{2aben(a+bx^n)^2} + \frac{(bc-ad)(ex)^{1+m}(c(aB(1+m)-Ab(1+m-2n))}{2a^2b^2en^2(a+bx}$$

$$= \frac{d(bc(1+m)-ad(1+m+n))(Ab(1+m)-aB(1+m+2n))(ex)^{1+m}}{2a^2b^3e(1+m)n^2} + \frac{(Ab-aB)(}{2aben}$$

$$= \frac{d(bc(1+m)-ad(1+m+n))(Ab(1+m)-aB(1+m+2n))(ex)^{1+m}}{2a^2b^3e(1+m)n^2} + \frac{(Ab-aB)(}{2aben}$$

Mathematica [A] time = 0.239841, size = 168, normalized size = 0.52

$$\frac{x(ex)^m\left(\frac{(bc-ad)(-3aBd+2Abd+bBc)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^2}+\frac{(Ab-aB)(bc-ad)^2\,{}_2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^3}+\frac{d(-3aBd+Abd+2bBc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+}{n}\right.}{a}\right.}{b^3(m+1)}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.498, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=410

$$\frac{3acx^{2n+1}(ex)^m\left(A\left(a^2d^2+3abcd+b^2c^2\right)+aBc(ad+bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m\left(A\left(9a^2bcd^2+a^3d^3+9ab^2c^2d+b^3c^3\right)+3aBc\right.}{m+3n+1}$$

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

Rubi [A] time = 0.62446, antiderivative size = 410, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {570, 20, 30}

$$\frac{3acx^{2n+1}(ex)^m\left(A\left(a^2d^2+3abcd+b^2c^2\right)+aBc(ad+bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m\left(A\left(9a^2bcd^2+a^3d^3+9ab^2c^2d+b^3c^3\right)+3aBc\right.}{m+3n+1}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int (ex)^m (a+bx^n)^3 (A+Bx^n) (c+dx^n)^3\, dx = \int \left(a^3Ac^3(ex)^m + a^2c^2(aBc+3A(bc+ad))x^n(ex)^m + 3ac\left(aBc(bc+ad)+A\right.\right.$$
$$= \frac{a^3Ac^3(ex)^{1+m}}{e(1+m)} + \left(b^3Bd^3\right)\int x^{7n}(ex)^m\, dx + \left(b^2d^2(3bBc+Abd+3aBd)\right)\int x$$
$$= \frac{a^3Ac^3(ex)^{1+m}}{e(1+m)} + \left(b^3Bd^3x^{-m}(ex)^m\right)\int x^{m+7n}\, dx + \left(b^2d^2(3bBc+Abd+3aBd\right.$$
$$= \frac{a^2c^2(aBc+3A(bc+ad))x^{1+n}(ex)^m}{1+m+n} + \frac{3ac\left(aBc(bc+ad)+A\left(b^2c^2+3abcd\right.\right.}{1+m+2n}$$

Mathematica [A] time = 0.943295, size = 358, normalized size = 0.87

$$x(ex)^m\left(\frac{3acx^{2n}\left(A\left(a^2d^2+3abcd+b^2c^2\right)+aBc(ad+bc)\right)}{m+2n+1}+\frac{x^{3n}\left(A\left(9a^2bcd^2+a^3d^3+9ab^2c^2d+b^3c^3\right)+3aBc\left(a^2d^2+3a\right.\right.}{m+3n+1}\right.$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.266, size = 20937, normalized size = 51.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] result too large to display
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 2.3906, size = 24423, normalized size = 59.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^3*d^3*m^7 + 7*B*b^3*d^3*m^6 + 21*B*b^3*d^3*m^5 + 35*B*b^3*d^3*m^4 + 3
5*B*b^3*d^3*m^3 + 21*B*b^3*d^3*m^2 + 7*B*b^3*d^3*m + B*b^3*d^3 + 720*(B*b^3
*d^3*m + B*b^3*d^3)*n^6 + 1764*(B*b^3*d^3*m^2 + 2*B*b^3*d^3*m + B*b^3*d^3)*
n^5 + 1624*(B*b^3*d^3*m^3 + 3*B*b^3*d^3*m^2 + 3*B*b^3*d^3*m + B*b^3*d^3)*n^
4 + 735*(B*b^3*d^3*m^4 + 4*B*b^3*d^3*m^3 + 6*B*b^3*d^3*m^2 + 4*B*b^3*d^3*m
+ B*b^3*d^3)*n^3 + 175*(B*b^3*d^3*m^5 + 5*B*b^3*d^3*m^4 + 10*B*b^3*d^3*m^3
+ 10*B*b^3*d^3*m^2 + 5*B*b^3*d^3*m + B*b^3*d^3)*n^2 + 21*(B*b^3*d^3*m^6 + 6
*B*b^3*d^3*m^5 + 15*B*b^3*d^3*m^4 + 20*B*b^3*d^3*m^3 + 15*B*b^3*d^3*m^2 + 6
*B*b^3*d^3*m + B*b^3*d^3)*n)*x*x^(7*n)*e^(m*log(e) + m*log(x)) + ((3*B*b^3*
c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^7 + 3*B*b^3*c*d^2 + 7*(3*B*b^3*c*d^2 + (
3*B*a*b^2 + A*b^3)*d^3)*m^6 + 840*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3
+ (3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m)*n^6 + 21*(3*B*b^3*c*d^2 + (3
*B*a*b^2 + A*b^3)*d^3)*m^5 + 2038*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3
+ (3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^2 + 2*(3*B*b^3*c*d^2 + (3*B*a
*b^2 + A*b^3)*d^3)*m)*n^5 + 35*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^
4 + 1849*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3 + (3*B*b^3*c*d^2 + (3*B*a
*b^2 + A*b^3)*d^3)*m^3 + 3*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^2 +
3*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m)*n^4 + (3*B*a*b^2 + A*b^3)*d^
3 + 35*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^3 + 820*(3*B*b^3*c*d^2 +
 (3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^4 + (3*B*a*b^2 + A*b^3)*d^3 +
4*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^3 + 6*(3*B*b^3*c*d^2 + (3*B*a
*b^2 + A*b^3)*d^3)*m^2 + 4*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m)*n^3
 + 21*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^2 + 190*(3*B*b^3*c*d^2 +
(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^5 + 5*(3*B*b^3*c*d^2 + (3*B*a*b
^2 + A*b^3)*d^3)*m^4 + (3*B*a*b^2 + A*b^3)*d^3 + 10*(3*B*b^3*c*d^2 + (3*B*a
*b^2 + A*b^3)*d^3)*m^3 + 10*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^2 +
 5*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m)*n^2 + 7*(3*B*b^3*c*d^2 + (3
*B*a*b^2 + A*b^3)*d^3)*m + 22*(3*B*b^3*c*d^2 + (3*B*b^3*c*d^2 + (3*B*a*b^2
+ A*b^3)*d^3)*m^6 + 6*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^5 + 15*(3
*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^4 + (3*B*a*b^2 + A*b^3)*d^3 + 20*
(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m^3 + 15*(3*B*b^3*c*d^2 + (3*B*a*
b^2 + A*b^3)*d^3)*m^2 + 6*(3*B*b^3*c*d^2 + (3*B*a*b^2 + A*b^3)*d^3)*m)*n)*x
*x^(6*n)*e^(m*log(e) + m*log(x)) + 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 + B*b^3*c^2*d + 7*(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 + 1008*(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 + (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)*n^6 + 21*(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 + 2412*(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 + (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 + 2*(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)*n^5 + 35*(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 + 2144*(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 + (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 + 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^2 + 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)*n^4 + (3*B*a*b^2 +
A*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3 + 35*(B*b^3*c^2*d + (3*B*a*b^2 + A*b
```

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^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3)*m^3 + 925*(B*b^3*c^2*d + (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 + (3*B*a*b^2 + A
*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3 + 4*(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 + 6*(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 + 4*(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)*n^3 + 21*(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 + 207*(B*b^3*c^2*d + (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 + 5*(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 + (3*B*a*b
^2 + A*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3 + 10*(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 + 10*(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 + 5*(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)*n^2 + 7*(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 + 23*(B*b^3*c^2*d + (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 + 6*(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 + 15*(
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 + (3
*B*a*b^2 + A*b^3)*c*d^2 + (B*a^2*b + A*a*b^2)*d^3 + 20*(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 + 15*(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 + 6*(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)*n)*x*x^(5*n)*e^(m*log
(e) + m*log(x)) + ((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 + B*b^3*c^3 + 7*(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 + 1260*(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 + (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)*n^6
+ 21*(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 + 2952*(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 + (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 + 2*(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)*n^5 + 35*(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 + 2545*(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 + (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 + 3*(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 + 3*(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)*n^4 + 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 + 35*(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 + 1056*(B*b^3*c^3 + (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 + 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 + 4*(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 + 6*(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 + 4*(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)*n^3 + 21*(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 + 226*(B*b^3*c^3
+ (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 + 5*(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 + 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 + 10
*(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 + 10*(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 + 5*(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*
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a^2*b)*d^3)*m)*n^2 + 7*(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 + 24*(B*b^3*c^3 + (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 + 6*(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 + 15*(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 + 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 + 20*(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 + 15*(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 + 6*(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)*n)*x*x^(4*n)*e^(m*log(e) + m*log(x)) +
((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 + A*a^3*d^3 + 7*(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 + 16
80*(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 + (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)*n^6 + 21*(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 + 3796*(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 + (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 + 2
*(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)*n^5 + 35*(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 + 3112*(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 + (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 + 3*(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 + 3*(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)*n^4 + (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 + 35*(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 + 1219*(A*a^3*d^3 + (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 + (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 + 4*(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 + 6*(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 + 4*(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)*n^3 + 21*(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 + 247*(A*a^3*d^3 + (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 + 5*(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 + (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 + 10*(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 + 10*(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 + 5*(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)*n^2
 + 7*(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 + 25*(A*a^3*d^3 + (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
+ 6*(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 + 15*(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 + (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 +
 20*(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 + 15*(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 + 6*(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)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + 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 + A*a^3*c*d^2 + 7*
(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 + 2
520*(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 + (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)*n^6 +
21*(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
+ 5274*(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 +
 (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 +
2*(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)*n^
5 + 35*(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 + 3929*(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 + (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 + 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
^2 + 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)*n^4 + (B*a^2*b + A*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b)*c^2*d + 35*(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 + 1420*(A*a^
3*c*d^2 + (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 + (B*a^2*b + A*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b)*c^2*d + 4*(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 + 6*(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 + 4*(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)*n^3 + 21*(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 + 270*
(A*a^3*c*d^2 + (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 + 5*(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 + (B*a^2*b + A*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b)*c^2*d + 10*(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 + 10*(
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 + 5*
(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)*n^2
+ 7*(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 +
 26*(A*a^3*c*d^2 + (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 + 6*(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 + 15*(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 + (B*a^2*b + A*a*b^2)*c^3 + (B*a^3 + 3*A*a^2*b)*c^2*d +
20*(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
+ 15*(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 + 6*(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
)*n)*x*x^(2*n)*e^(m*log(e) + m*log(x)) + ((3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2
*b)*c^3)*m^7 + 3*A*a^3*c^2*d + 7*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*
m^6 + 5040*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3 + (3*A*a^3*c^2*d + (B*a
^3 + 3*A*a^2*b)*c^3)*m)*n^6 + 21*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*
m^5 + 8028*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3 + (3*A*a^3*c^2*d + (B*a
^3 + 3*A*a^2*b)*c^3)*m^2 + 2*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m)*n
^5 + 35*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^4 + 5104*(3*A*a^3*c^2*d
 + (B*a^3 + 3*A*a^2*b)*c^3 + (3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^3
+ 3*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^2 + 3*(3*A*a^3*c^2*d + (B*a
^3 + 3*A*a^2*b)*c^3)*m)*n^4 + (B*a^3 + 3*A*a^2*b)*c^3 + 35*(3*A*a^3*c^2*d +
 (B*a^3 + 3*A*a^2*b)*c^3)*m^3 + 1665*(3*A*a^3*c^2*d + (3*A*a^3*c^2*d + (B*a
^3 + 3*A*a^2*b)*c^3)*m^4 + (B*a^3 + 3*A*a^2*b)*c^3 + 4*(3*A*a^3*c^2*d + (B*
a^3 + 3*A*a^2*b)*c^3)*m^3 + 6*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^2
 + 4*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m)*n^3 + 21*(3*A*a^3*c^2*d +
 (B*a^3 + 3*A*a^2*b)*c^3)*m^2 + 295*(3*A*a^3*c^2*d + (3*A*a^3*c^2*d + (B*a^
3 + 3*A*a^2*b)*c^3)*m^5 + 5*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^4 +
 (B*a^3 + 3*A*a^2*b)*c^3 + 10*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^3
 + 10*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^2 + 5*(3*A*a^3*c^2*d + (B
*a^3 + 3*A*a^2*b)*c^3)*m)*n^2 + 7*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)
*m + 27*(3*A*a^3*c^2*d + (3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^6 + 6*
(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^5 + 15*(3*A*a^3*c^2*d + (B*a^3
```

```
+ 3*A*a^2*b)*c^3)*m^4 + (B*a^3 + 3*A*a^2*b)*c^3 + 20*(3*A*a^3*c^2*d + (B*a^
3 + 3*A*a^2*b)*c^3)*m^3 + 15*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m^2
+ 6*(3*A*a^3*c^2*d + (B*a^3 + 3*A*a^2*b)*c^3)*m)*n)*x*x^n*e^(m*log(e) + m*l
og(x)) + (A*a^3*c^3*m^7 + 5040*A*a^3*c^3*n^7 + 7*A*a^3*c^3*m^6 + 21*A*a^3*c
^3*m^5 + 35*A*a^3*c^3*m^4 + 35*A*a^3*c^3*m^3 + 21*A*a^3*c^3*m^2 + 7*A*a^3*c
^3*m + A*a^3*c^3 + 13068*(A*a^3*c^3*m + A*a^3*c^3)*n^6 + 13132*(A*a^3*c^3*m
^2 + 2*A*a^3*c^3*m + A*a^3*c^3)*n^5 + 6769*(A*a^3*c^3*m^3 + 3*A*a^3*c^3*m^2
 + 3*A*a^3*c^3*m + A*a^3*c^3)*n^4 + 1960*(A*a^3*c^3*m^4 + 4*A*a^3*c^3*m^3 +
 6*A*a^3*c^3*m^2 + 4*A*a^3*c^3*m + A*a^3*c^3)*n^3 + 322*(A*a^3*c^3*m^5 + 5*
A*a^3*c^3*m^4 + 10*A*a^3*c^3*m^3 + 10*A*a^3*c^3*m^2 + 5*A*a^3*c^3*m + A*a^3
*c^3)*n^2 + 28*(A*a^3*c^3*m^6 + 6*A*a^3*c^3*m^5 + 15*A*a^3*c^3*m^4 + 20*A*a
^3*c^3*m^3 + 15*A*a^3*c^3*m^2 + 6*A*a^3*c^3*m + A*a^3*c^3)*n)*x*e^(m*log(e)
 + m*log(x)))/(m^8 + 5040*(m + 1)*n^7 + 8*m^7 + 13068*(m^2 + 2*m + 1)*n^6 +
 28*m^6 + 13132*(m^3 + 3*m^2 + 3*m + 1)*n^5 + 56*m^5 + 6769*(m^4 + 4*m^3 +
6*m^2 + 4*m + 1)*n^4 + 70*m^4 + 1960*(m^5 + 5*m^4 + 10*m^3 + 10*m^2 + 5*m +
 1)*n^3 + 56*m^3 + 322*(m^6 + 6*m^5 + 15*m^4 + 20*m^3 + 15*m^2 + 6*m + 1)*n
^2 + 28*m^2 + 28*(m^7 + 7*m^6 + 21*m^5 + 35*m^4 + 35*m^3 + 21*m^2 + 7*m + 1
)*n + 8*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out
```

Giac [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*(a+b*x^n)^3*(A+B*x^n)*(c+d*x^n)^3,x, algorithm="giac")

[Out] Timed out
```

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

Optimal. Leaf size=310

$$\frac{cx^{2n+1}(ex)^m\left(A\left(3a^2d^2+6abcd+b^2c^2\right)+aBc(3ad+2bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m\left(a^2d^2(Ad+3Bc)+6abcd(Ad+Bc)+b^2c^2(3Ad\right.}{m+3n+1}$$

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

Rubi [A] time = 0.413903, antiderivative size = 310, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 3, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.097, Rules used = {570, 20, 30}

$$\frac{cx^{2n+1}(ex)^m\left(A\left(3a^2d^2+6abcd+b^2c^2\right)+aBc(3ad+2bc)\right)}{m+2n+1}+\frac{x^{3n+1}(ex)^m\left(a^2d^2(Ad+3Bc)+6abcd(Ad+Bc)+b^2c^2(3Ad\right.}{m+3n+1}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int (ex)^m (a+bx^n)^2 (A+Bx^n) (c+dx^n)^3 \, dx = \int \left(a^2Ac^3(ex)^m + ac^2(2Abc+aBc+3aAd)x^n(ex)^m + c\left(aBc(2bc+3ad)\right.\right.$$
$$= \frac{a^2Ac^3(ex)^{1+m}}{e(1+m)} + \left(b^2Bd^3\right) \int x^{6n}(ex)^m \, dx + \left(ac^2(2Abc+aBc+3aAd)\right) \int$$
$$= \frac{a^2Ac^3(ex)^{1+m}}{e(1+m)} + \left(b^2Bd^3x^{-m}(ex)^m\right) \int x^{m+6n} \, dx + \left(ac^2(2Abc+aBc+3a\right.$$
$$= \frac{ac^2(2Abc+aBc+3aAd)x^{1+n}(ex)^m}{1+m+n} + \frac{c\left(aBc(2bc+3ad)+A\left(b^2c^2+6a\right.\right.}{1+m+2}$$

Mathematica [A] time = 1.13626, size = 265, normalized size = 0.85

$$x(ex)^m \left(\frac{cx^{2n}\left(A\left(3a^2d^2+6abcd+b^2c^2\right)+aBc(3ad+2bc)\right)}{m+2n+1} + \frac{x^{3n}\left(a^2d^2(Ad+3Bc)+6abcd(Ad+Bc)+b^2c^2(3Ad+B\right.}{m+3n+1}\right.$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.179, size = 11389, normalized size = 36.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] result too large to display
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.7799, size = 14151, normalized size = 45.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*b^2*d^3*m^6 + 6*B*b^2*d^3*m^5 + 15*B*b^2*d^3*m^4 + 20*B*b^2*d^3*m^3 + 1
5*B*b^2*d^3*m^2 + 6*B*b^2*d^3*m + B*b^2*d^3 + 120*(B*b^2*d^3*m + B*b^2*d^3)
*n^5 + 274*(B*b^2*d^3*m^2 + 2*B*b^2*d^3*m + B*b^2*d^3)*n^4 + 225*(B*b^2*d^3
*m^3 + 3*B*b^2*d^3*m^2 + 3*B*b^2*d^3*m + B*b^2*d^3)*n^3 + 85*(B*b^2*d^3*m^4
 + 4*B*b^2*d^3*m^3 + 6*B*b^2*d^3*m^2 + 4*B*b^2*d^3*m + B*b^2*d^3)*n^2 + 15*
(B*b^2*d^3*m^5 + 5*B*b^2*d^3*m^4 + 10*B*b^2*d^3*m^3 + 10*B*b^2*d^3*m^2 + 5*
B*b^2*d^3*m + B*b^2*d^3)*n)*x*x^(6*n)*e^(m*log(e) + m*log(x)) + ((3*B*b^2*c
*d^2 + (2*B*a*b + A*b^2)*d^3)*m^6 + 3*B*b^2*c*d^2 + 6*(3*B*b^2*c*d^2 + (2*B
*a*b + A*b^2)*d^3)*m^5 + 144*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3 + (3*B*
b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m)*n^5 + 15*(3*B*b^2*c*d^2 + (2*B*a*b +
A*b^2)*d^3)*m^4 + 324*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3 + (3*B*b^2*c*d
^2 + (2*B*a*b + A*b^2)*d^3)*m^2 + 2*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)
*m)*n^4 + (2*B*a*b + A*b^2)*d^3 + 20*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3
)*m^3 + 260*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3 + (3*B*b^2*c*d^2 + (2*B*
a*b + A*b^2)*d^3)*m^3 + 3*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^2 + 3*(
3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m)*n^3 + 15*(3*B*b^2*c*d^2 + (2*B*a*
b + A*b^2)*d^3)*m^2 + 95*(3*B*b^2*c*d^2 + (3*B*b^2*c*d^2 + (2*B*a*b + A*b^2
)*d^3)*m^4 + (2*B*a*b + A*b^2)*d^3 + 4*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d
^3)*m^3 + 6*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^2 + 4*(3*B*b^2*c*d^2
+ (2*B*a*b + A*b^2)*d^3)*m)*n^2 + 6*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)
*m + 16*(3*B*b^2*c*d^2 + (3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^5 + 5*(3
*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^4 + (2*B*a*b + A*b^2)*d^3 + 10*(3*B
*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m^3 + 10*(3*B*b^2*c*d^2 + (2*B*a*b + A*
b^2)*d^3)*m^2 + 5*(3*B*b^2*c*d^2 + (2*B*a*b + A*b^2)*d^3)*m)*n)*x*x^(5*n)*e
^(m*log(e) + m*log(x)) + ((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 + 3*B*b^2*c^2*d + 6*(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 + 180*(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 + (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)*n^5 + 15*(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 + 396*(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 + (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 + 2*(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)*n^4 + 3*(2*B*a*b + A*b^2)*c*d^2 + (B
*a^2 + 2*A*a*b)*d^3 + 20*(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 + 307*(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 + (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 + 3*(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 + 3*(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)*n^3 + 15*(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 + 107*(3*B*b^2*c^2*d + (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 + 3*(2*B*a*b + A*b^2)*c*d^2 +
 (B*a^2 + 2*A*a*b)*d^3 + 4*(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 + 6*(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 + 4*(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)*n^2 + 6*(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 + 17*(3*B*b^2*c^2*d + (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 + 5*(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 + 3*(2*B*a*b + A*b^2)*c*d^2
 + (B*a^2 + 2*A*a*b)*d^3 + 10*(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 + 10*(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 + 5*(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)*n)*x*x^(4*n)*e^(m*log(e) + m*log(x)) + ((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 + B*b^2*c^3 + A*a^2*d^3 + 6*(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 + 240*(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 + (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)*n^5 + 15*(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 + 508*(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 + (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 + 2*(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)*n^4 + 3*(2*B*a*b + A*b^2)*c^2*d + 3*(B*
a^2 + 2*A*a*b)*c*d^2 + 20*(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 + 372*(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 + (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 + 3*(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 + 3*(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)*n^3 + 15*(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 + 121*(B*b^2*c^3 + A*a^2*d^3 + (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 + 3*(2*B*a*
b + A*b^2)*c^2*d + 3*(B*a^2 + 2*A*a*b)*c*d^2 + 4*(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 + 6*(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 + 4*
(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)*n^2 + 6*(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 + 18*(B*b^2*c^3 + A*a^2*d^3 + (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 + 5*(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
+ 3*(2*B*a*b + A*b^2)*c^2*d + 3*(B*a^2 + 2*A*a*b)*c*d^2 + 10*(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 + 10*
(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 + 5*(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)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + ((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 + 3*A*a^2*c*d^2 +
 6*(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
+ 360*(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 +
(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)*n^5
+ 15*(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 + 702*(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
+ (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 +
 2*(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)*n
^4 + (2*B*a*b + A*b^2)*c^3 + 3*(B*a^2 + 2*A*a*b)*c^2*d + 20*(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 + 461*(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 + (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 + 3*(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 + 3*(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)*n^3 + 15*(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 + 137*(3*A*a^2
*c*d^2 + (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 + (2*B*a*b + A*b^2)*c^3 + 3*(B*a^2 + 2*A*a*b)*c^2*d + 4*(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 + 6*(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 + 4*(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)*n^2 + 6*(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 + 19*(3*A*a^
2*c*d^2 + (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 + 5*(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 + (2*B*a*b + A*b^2)*c^3 + 3*(B*a^2 + 2*A*a*b)*c^2*d + 10*(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 + 10*(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 + 5*(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)*n)*x*x^(2*n
)*e^(m*log(e) + m*log(x)) + ((3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^6 +
3*A*a^2*c^2*d + 6*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^5 + 720*(3*A*a^
2*c^2*d + (B*a^2 + 2*A*a*b)*c^3 + (3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m
```

```
)*n^5 + 15*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^4 + 1044*(3*A*a^2*c^2*
d + (B*a^2 + 2*A*a*b)*c^3 + (3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^2 + 2
*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m)*n^4 + (B*a^2 + 2*A*a*b)*c^3 + 2
0*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^3 + 580*(3*A*a^2*c^2*d + (B*a^2
 + 2*A*a*b)*c^3 + (3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^3 + 3*(3*A*a^2*
c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^2 + 3*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c
^3)*m)*n^3 + 15*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^2 + 155*(3*A*a^2*
c^2*d + (3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^4 + (B*a^2 + 2*A*a*b)*c^3
 + 4*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^3 + 6*(3*A*a^2*c^2*d + (B*a^
2 + 2*A*a*b)*c^3)*m^2 + 4*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m)*n^2 +
6*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m + 20*(3*A*a^2*c^2*d + (3*A*a^2*
c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^5 + 5*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c
^3)*m^4 + (B*a^2 + 2*A*a*b)*c^3 + 10*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3
)*m^3 + 10*(3*A*a^2*c^2*d + (B*a^2 + 2*A*a*b)*c^3)*m^2 + 5*(3*A*a^2*c^2*d +
 (B*a^2 + 2*A*a*b)*c^3)*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) + (A*a^2*c^3*m^
6 + 720*A*a^2*c^3*n^6 + 6*A*a^2*c^3*m^5 + 15*A*a^2*c^3*m^4 + 20*A*a^2*c^3*m
^3 + 15*A*a^2*c^3*m^2 + 6*A*a^2*c^3*m + A*a^2*c^3 + 1764*(A*a^2*c^3*m + A*a
^2*c^3)*n^5 + 1624*(A*a^2*c^3*m^2 + 2*A*a^2*c^3*m + A*a^2*c^3)*n^4 + 735*(A
*a^2*c^3*m^3 + 3*A*a^2*c^3*m^2 + 3*A*a^2*c^3*m + A*a^2*c^3)*n^3 + 175*(A*a^
2*c^3*m^4 + 4*A*a^2*c^3*m^3 + 6*A*a^2*c^3*m^2 + 4*A*a^2*c^3*m + A*a^2*c^3)*
n^2 + 21*(A*a^2*c^3*m^5 + 5*A*a^2*c^3*m^4 + 10*A*a^2*c^3*m^3 + 10*A*a^2*c^3
*m^2 + 5*A*a^2*c^3*m + A*a^2*c^3)*n)*x*e^(m*log(e) + m*log(x)))/(m^7 + 720*
(m + 1)*n^6 + 7*m^6 + 1764*(m^2 + 2*m + 1)*n^5 + 21*m^5 + 1624*(m^3 + 3*m^2
 + 3*m + 1)*n^4 + 35*m^4 + 735*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*n^3 + 35*m^3
 + 175*(m^5 + 5*m^4 + 10*m^3 + 10*m^2 + 5*m + 1)*n^2 + 21*m^2 + 21*(m^6 + 6
*m^5 + 15*m^4 + 20*m^3 + 15*m^2 + 6*m + 1)*n + 7*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.46325, size = 20733, normalized size = 66.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b^2*d^3*m^6*x*x^m*x^(6*n)*e^m + 15*B*b^2*d^3*m^5*n*x*x^m*x^(6*n)*e^m + 8
5*B*b^2*d^3*m^4*n^2*x*x^m*x^(6*n)*e^m + 225*B*b^2*d^3*m^3*n^3*x*x^m*x^(6*n)
*e^m + 274*B*b^2*d^3*m^2*n^4*x*x^m*x^(6*n)*e^m + 120*B*b^2*d^3*m*n^5*x*x^m*
x^(6*n)*e^m + 3*B*b^2*c*d^2*m^6*x*x^m*x^(5*n)*e^m + 2*B*a*b*d^3*m^6*x*x^m*x
^(5*n)*e^m + A*b^2*d^3*m^6*x*x^m*x^(5*n)*e^m + 48*B*b^2*c*d^2*m^5*n*x*x^m*x
^(5*n)*e^m + 32*B*a*b*d^3*m^5*n*x*x^m*x^(5*n)*e^m + 16*A*b^2*d^3*m^5*n*x*x^
m*x^(5*n)*e^m + 285*B*b^2*c*d^2*m^4*n^2*x*x^m*x^(5*n)*e^m + 190*B*a*b*d^3*m
^4*n^2*x*x^m*x^(5*n)*e^m + 95*A*b^2*d^3*m^4*n^2*x*x^m*x^(5*n)*e^m + 780*B*b
^2*c*d^2*m^3*n^3*x*x^m*x^(5*n)*e^m + 520*B*a*b*d^3*m^3*n^3*x*x^m*x^(5*n)*e^
```

m + 260*A*b^2*d^3*m^3*n^3*x*x^m*x^(5*n)*e^m + 972*B*b^2*c*d^2*m^2*n^4*x*x^m
*x^(5*n)*e^m + 648*B*a*b*d^3*m^2*n^4*x*x^m*x^(5*n)*e^m + 324*A*b^2*d^3*m^2*
n^4*x*x^m*x^(5*n)*e^m + 432*B*b^2*c*d^2*m*n^5*x*x^m*x^(5*n)*e^m + 288*B*a*b
*d^3*m*n^5*x*x^m*x^(5*n)*e^m + 144*A*b^2*d^3*m*n^5*x*x^m*x^(5*n)*e^m + 3*B*
b^2*c^2*d*m^6*x*x^m*x^(4*n)*e^m + 6*B*a*b*c*d^2*m^6*x*x^m*x^(4*n)*e^m + 3*A
*b^2*c*d^2*m^6*x*x^m*x^(4*n)*e^m + B*a^2*d^3*m^6*x*x^m*x^(4*n)*e^m + 2*A*a*
b*d^3*m^6*x*x^m*x^(4*n)*e^m + 51*B*b^2*c^2*d*m^5*n*x*x^m*x^(4*n)*e^m + 102*
B*a*b*c*d^2*m^5*n*x*x^m*x^(4*n)*e^m + 51*A*b^2*c*d^2*m^5*n*x*x^m*x^(4*n)*e^
m + 17*B*a^2*d^3*m^5*n*x*x^m*x^(4*n)*e^m + 34*A*a*b*d^3*m^5*n*x*x^m*x^(4*n)
*e^m + 321*B*b^2*c^2*d*m^4*n^2*x*x^m*x^(4*n)*e^m + 642*B*a*b*c*d^2*m^4*n^2*
x*x^m*x^(4*n)*e^m + 321*A*b^2*c*d^2*m^4*n^2*x*x^m*x^(4*n)*e^m + 107*B*a^2*d
^3*m^4*n^2*x*x^m*x^(4*n)*e^m + 214*A*a*b*d^3*m^4*n^2*x*x^m*x^(4*n)*e^m + 92
1*B*b^2*c^2*d*m^3*n^3*x*x^m*x^(4*n)*e^m + 1842*B*a*b*c*d^2*m^3*n^3*x*x^m*x^
(4*n)*e^m + 921*A*b^2*c*d^2*m^3*n^3*x*x^m*x^(4*n)*e^m + 307*B*a^2*d^3*m^3*n
^3*x*x^m*x^(4*n)*e^m + 614*A*a*b*d^3*m^3*n^3*x*x^m*x^(4*n)*e^m + 1188*B*b^2
*c^2*d*m^2*n^4*x*x^m*x^(4*n)*e^m + 2376*B*a*b*c*d^2*m^2*n^4*x*x^m*x^(4*n)*e
^m + 1188*A*b^2*c*d^2*m^2*n^4*x*x^m*x^(4*n)*e^m + 396*B*a^2*d^3*m^2*n^4*x*x
^m*x^(4*n)*e^m + 792*A*a*b*d^3*m^2*n^4*x*x^m*x^(4*n)*e^m + 540*B*b^2*c^2*d*
m*n^5*x*x^m*x^(4*n)*e^m + 1080*B*a*b*c*d^2*m*n^5*x*x^m*x^(4*n)*e^m + 540*A*
b^2*c*d^2*m*n^5*x*x^m*x^(4*n)*e^m + 180*B*a^2*d^3*m*n^5*x*x^m*x^(4*n)*e^m +
360*A*a*b*d^3*m*n^5*x*x^m*x^(4*n)*e^m + B*b^2*c^3*m^6*x*x^m*x^(3*n)*e^m +
6*B*a*b*c^2*d*m^6*x*x^m*x^(3*n)*e^m + 3*A*b^2*c^2*d*m^6*x*x^m*x^(3*n)*e^m +
3*B*a^2*c*d^2*m^6*x*x^m*x^(3*n)*e^m + 6*A*a*b*c*d^2*m^6*x*x^m*x^(3*n)*e^m
+ A*a^2*d^3*m^6*x*x^m*x^(3*n)*e^m + 18*B*b^2*c^3*m^5*n*x*x^m*x^(3*n)*e^m +
108*B*a*b*c^2*d*m^5*n*x*x^m*x^(3*n)*e^m + 54*A*b^2*c^2*d*m^5*n*x*x^m*x^(3*n
)*e^m + 54*B*a^2*c*d^2*m^5*n*x*x^m*x^(3*n)*e^m + 108*A*a*b*c*d^2*m^5*n*x*x^
m*x^(3*n)*e^m + 18*A*a^2*d^3*m^5*n*x*x^m*x^(3*n)*e^m + 121*B*b^2*c^3*m^4*n^
2*x*x^m*x^(3*n)*e^m + 726*B*a*b*c^2*d*m^4*n^2*x*x^m*x^(3*n)*e^m + 363*A*b^2
*c^2*d*m^4*n^2*x*x^m*x^(3*n)*e^m + 363*B*a^2*c*d^2*m^4*n^2*x*x^m*x^(3*n)*e^
m + 726*A*a*b*c*d^2*m^4*n^2*x*x^m*x^(3*n)*e^m + 121*A*a^2*d^3*m^4*n^2*x*x^m
*x^(3*n)*e^m + 372*B*b^2*c^3*m^3*n^3*x*x^m*x^(3*n)*e^m + 2232*B*a*b*c^2*d*m
^3*n^3*x*x^m*x^(3*n)*e^m + 1116*A*b^2*c^2*d*m^3*n^3*x*x^m*x^(3*n)*e^m + 111
6*B*a^2*c*d^2*m^3*n^3*x*x^m*x^(3*n)*e^m + 2232*A*a*b*c*d^2*m^3*n^3*x*x^m*x^
(3*n)*e^m + 372*A*a^2*d^3*m^3*n^3*x*x^m*x^(3*n)*e^m + 508*B*b^2*c^3*m^2*n^4
*x*x^m*x^(3*n)*e^m + 3048*B*a*b*c^2*d*m^2*n^4*x*x^m*x^(3*n)*e^m + 1524*A*b^
2*c^2*d*m^2*n^4*x*x^m*x^(3*n)*e^m + 1524*B*a^2*c*d^2*m^2*n^4*x*x^m*x^(3*n)*
e^m + 3048*A*a*b*c*d^2*m^2*n^4*x*x^m*x^(3*n)*e^m + 508*A*a^2*d^3*m^2*n^4*x*
x^m*x^(3*n)*e^m + 240*B*b^2*c^3*m*n^5*x*x^m*x^(3*n)*e^m + 1440*B*a*b*c^2*d*
m*n^5*x*x^m*x^(3*n)*e^m + 720*A*b^2*c^2*d*m*n^5*x*x^m*x^(3*n)*e^m + 720*B*a
^2*c*d^2*m*n^5*x*x^m*x^(3*n)*e^m + 1440*A*a*b*c*d^2*m*n^5*x*x^m*x^(3*n)*e^m
+ 240*A*a^2*d^3*m*n^5*x*x^m*x^(3*n)*e^m + 2*B*a*b*c^3*m^6*x*x^m*x^(2*n)*e^
m + A*b^2*c^3*m^6*x*x^m*x^(2*n)*e^m + 3*B*a^2*c^2*d*m^6*x*x^m*x^(2*n)*e^m +
6*A*a*b*c^2*d*m^6*x*x^m*x^(2*n)*e^m + 3*A*a^2*c*d^2*m^6*x*x^m*x^(2*n)*e^m
+ 38*B*a*b*c^3*m^5*n*x*x^m*x^(2*n)*e^m + 19*A*b^2*c^3*m^5*n*x*x^m*x^(2*n)*e
^m + 57*B*a^2*c^2*d*m^5*n*x*x^m*x^(2*n)*e^m + 114*A*a*b*c^2*d*m^5*n*x*x^m*x
^(2*n)*e^m + 57*A*a^2*c*d^2*m^5*n*x*x^m*x^(2*n)*e^m + 274*B*a*b*c^3*m^4*n^2
*x*x^m*x^(2*n)*e^m + 137*A*b^2*c^3*m^4*n^2*x*x^m*x^(2*n)*e^m + 411*B*a^2*c^
2*d*m^4*n^2*x*x^m*x^(2*n)*e^m + 822*A*a*b*c^2*d*m^4*n^2*x*x^m*x^(2*n)*e^m +
411*A*a^2*c*d^2*m^4*n^2*x*x^m*x^(2*n)*e^m + 922*B*a*b*c^3*m^3*n^3*x*x^m*x^
(2*n)*e^m + 461*A*b^2*c^3*m^3*n^3*x*x^m*x^(2*n)*e^m + 1383*B*a^2*c^2*d*m^3*
n^3*x*x^m*x^(2*n)*e^m + 2766*A*a*b*c^2*d*m^3*n^3*x*x^m*x^(2*n)*e^m + 1383*A
*a^2*c*d^2*m^3*n^3*x*x^m*x^(2*n)*e^m + 1404*B*a*b*c^3*m^2*n^4*x*x^m*x^(2*n)
*e^m + 702*A*b^2*c^3*m^2*n^4*x*x^m*x^(2*n)*e^m + 2106*B*a^2*c^2*d*m^2*n^4*x
*x^m*x^(2*n)*e^m + 4212*A*a*b*c^2*d*m^2*n^4*x*x^m*x^(2*n)*e^m + 2106*A*a^2*
c*d^2*m^2*n^4*x*x^m*x^(2*n)*e^m + 720*B*a*b*c^3*m*n^5*x*x^m*x^(2*n)*e^m + 3
60*A*b^2*c^3*m*n^5*x*x^m*x^(2*n)*e^m + 1080*B*a^2*c^2*d*m*n^5*x*x^m*x^(2*n)
*e^m + 2160*A*a*b*c^2*d*m*n^5*x*x^m*x^(2*n)*e^m + 1080*A*a^2*c*d^2*m*n^5*x*
x^m*x^(2*n)*e^m + B*a^2*c^3*m^6*x*x^m*x^n*e^m + 2*A*a*b*c^3*m^6*x*x^m*x^n*e
^m + 3*A*a^2*c^2*d*m^6*x*x^m*x^n*e^m + 20*B*a^2*c^3*m^5*n*x*x^m*x^n*e^m + 4

```
0*A*a*b*c^3*m^5*n*x*x^m*x^n*e^m + 60*A*a^2*c^2*d*m^5*n*x*x^m*x^n*e^m + 155*
B*a^2*c^3*m^4*n^2*x*x^m*x^n*e^m + 310*A*a*b*c^3*m^4*n^2*x*x^m*x^n*e^m + 465
*A*a^2*c^2*d*m^4*n^2*x*x^m*x^n*e^m + 580*B*a^2*c^3*m^3*n^3*x*x^m*x^n*e^m +
1160*A*a*b*c^3*m^3*n^3*x*x^m*x^n*e^m + 1740*A*a^2*c^2*d*m^3*n^3*x*x^m*x^n*e
^m + 1044*B*a^2*c^3*m^2*n^4*x*x^m*x^n*e^m + 2088*A*a*b*c^3*m^2*n^4*x*x^m*x^
n*e^m + 3132*A*a^2*c^2*d*m^2*n^4*x*x^m*x^n*e^m + 720*B*a^2*c^3*m*n^5*x*x^m*
x^n*e^m + 1440*A*a*b*c^3*m*n^5*x*x^m*x^n*e^m + 2160*A*a^2*c^2*d*m*n^5*x*x^m
*x^n*e^m + A*a^2*c^3*m^6*x*x^m*e^m + 21*A*a^2*c^3*m^5*n*x*x^m*e^m + 175*A*a
^2*c^3*m^4*n^2*x*x^m*e^m + 735*A*a^2*c^3*m^3*n^3*x*x^m*e^m + 1624*A*a^2*c^3
*m^2*n^4*x*x^m*e^m + 1764*A*a^2*c^3*m*n^5*x*x^m*e^m + 720*A*a^2*c^3*n^6*x*x
^m*e^m + 6*B*b^2*d^3*m^5*x*x^m*x^(6*n)*e^m + 75*B*b^2*d^3*m^4*n*x*x^m*x^(6*
n)*e^m + 340*B*b^2*d^3*m^3*n^2*x*x^m*x^(6*n)*e^m + 675*B*b^2*d^3*m^2*n^3*x*
x^m*x^(6*n)*e^m + 548*B*b^2*d^3*m*n^4*x*x^m*x^(6*n)*e^m + 120*B*b^2*d^3*n^5
*x*x^m*x^(6*n)*e^m + 18*B*b^2*c*d^2*m^5*x*x^m*x^(5*n)*e^m + 12*B*a*b*d^3*m^
5*x*x^m*x^(5*n)*e^m + 6*A*b^2*d^3*m^5*x*x^m*x^(5*n)*e^m + 240*B*b^2*c*d^2*m
^4*n*x*x^m*x^(5*n)*e^m + 160*B*a*b*d^3*m^4*n*x*x^m*x^(5*n)*e^m + 80*A*b^2*d
^3*m^4*n*x*x^m*x^(5*n)*e^m + 1140*B*b^2*c*d^2*m^3*n^2*x*x^m*x^(5*n)*e^m + 7
60*B*a*b*d^3*m^3*n^2*x*x^m*x^(5*n)*e^m + 380*A*b^2*d^3*m^3*n^2*x*x^m*x^(5*n
)*e^m + 2340*B*b^2*c*d^2*m^2*n^3*x*x^m*x^(5*n)*e^m + 1560*B*a*b*d^3*m^2*n^3
*x*x^m*x^(5*n)*e^m + 780*A*b^2*d^3*m^2*n^3*x*x^m*x^(5*n)*e^m + 1944*B*b^2*c
*d^2*m*n^4*x*x^m*x^(5*n)*e^m + 1296*B*a*b*d^3*m*n^4*x*x^m*x^(5*n)*e^m + 648
*A*b^2*d^3*m*n^4*x*x^m*x^(5*n)*e^m + 432*B*b^2*c*d^2*n^5*x*x^m*x^(5*n)*e^m
+ 288*B*a*b*d^3*n^5*x*x^m*x^(5*n)*e^m + 144*A*b^2*d^3*n^5*x*x^m*x^(5*n)*e^m
 + 18*B*b^2*c^2*d*m^5*x*x^m*x^(4*n)*e^m + 36*B*a*b*c*d^2*m^5*x*x^m*x^(4*n)*
e^m + 18*A*b^2*c*d^2*m^5*x*x^m*x^(4*n)*e^m + 6*B*a^2*d^3*m^5*x*x^m*x^(4*n)*
e^m + 12*A*a*b*d^3*m^5*x*x^m*x^(4*n)*e^m + 255*B*b^2*c^2*d*m^4*n*x*x^m*x^(4
*n)*e^m + 510*B*a*b*c*d^2*m^4*n*x*x^m*x^(4*n)*e^m + 255*A*b^2*c*d^2*m^4*n*x
*x^m*x^(4*n)*e^m + 85*B*a^2*d^3*m^4*n*x*x^m*x^(4*n)*e^m + 170*A*a*b*d^3*m^4
*n*x*x^m*x^(4*n)*e^m + 1284*B*b^2*c^2*d*m^3*n^2*x*x^m*x^(4*n)*e^m + 2568*B*
a*b*c*d^2*m^3*n^2*x*x^m*x^(4*n)*e^m + 1284*A*b^2*c*d^2*m^3*n^2*x*x^m*x^(4*n
)*e^m + 428*B*a^2*d^3*m^3*n^2*x*x^m*x^(4*n)*e^m + 856*A*a*b*d^3*m^3*n^2*x*x
^m*x^(4*n)*e^m + 2763*B*b^2*c^2*d*m^2*n^3*x*x^m*x^(4*n)*e^m + 5526*B*a*b*c*
d^2*m^2*n^3*x*x^m*x^(4*n)*e^m + 2763*A*b^2*c*d^2*m^2*n^3*x*x^m*x^(4*n)*e^m
+ 921*B*a^2*d^3*m^2*n^3*x*x^m*x^(4*n)*e^m + 1842*A*a*b*d^3*m^2*n^3*x*x^m*x^
(4*n)*e^m + 2376*B*b^2*c^2*d*m*n^4*x*x^m*x^(4*n)*e^m + 4752*B*a*b*c*d^2*m*n
^4*x*x^m*x^(4*n)*e^m + 2376*A*b^2*c*d^2*m*n^4*x*x^m*x^(4*n)*e^m + 792*B*a^2
*d^3*m*n^4*x*x^m*x^(4*n)*e^m + 1584*A*a*b*d^3*m*n^4*x*x^m*x^(4*n)*e^m + 540
*B*b^2*c^2*d*n^5*x*x^m*x^(4*n)*e^m + 1080*B*a*b*c*d^2*n^5*x*x^m*x^(4*n)*e^m
 + 540*A*b^2*c*d^2*n^5*x*x^m*x^(4*n)*e^m + 180*B*a^2*d^3*n^5*x*x^m*x^(4*n)*
e^m + 360*A*a*b*d^3*n^5*x*x^m*x^(4*n)*e^m + 6*B*b^2*c^3*m^5*x*x^m*x^(3*n)*e
^m + 36*B*a*b*c^2*d*m^5*x*x^m*x^(3*n)*e^m + 18*A*b^2*c^2*d*m^5*x*x^m*x^(3*n
)*e^m + 18*B*a^2*c*d^2*m^5*x*x^m*x^(3*n)*e^m + 36*A*a*b*c*d^2*m^5*x*x^m*x^(
3*n)*e^m + 6*A*a^2*d^3*m^5*x*x^m*x^(3*n)*e^m + 90*B*b^2*c^3*m^4*n*x*x^m*x^(
3*n)*e^m + 540*B*a*b*c^2*d*m^4*n*x*x^m*x^(3*n)*e^m + 270*A*b^2*c^2*d*m^4*n*
x*x^m*x^(3*n)*e^m + 270*B*a^2*c*d^2*m^4*n*x*x^m*x^(3*n)*e^m + 540*A*a*b*c*d
^2*m^4*n*x*x^m*x^(3*n)*e^m + 90*A*a^2*d^3*m^4*n*x*x^m*x^(3*n)*e^m + 484*B*b
^2*c^3*m^3*n^2*x*x^m*x^(3*n)*e^m + 2904*B*a*b*c^2*d*m^3*n^2*x*x^m*x^(3*n)*e
^m + 1452*A*b^2*c^2*d*m^3*n^2*x*x^m*x^(3*n)*e^m + 1452*B*a^2*c*d^2*m^3*n^2*
x*x^m*x^(3*n)*e^m + 2904*A*a*b*c*d^2*m^3*n^2*x*x^m*x^(3*n)*e^m + 484*A*a^2*
d^3*m^3*n^2*x*x^m*x^(3*n)*e^m + 1116*B*b^2*c^3*m^2*n^3*x*x^m*x^(3*n)*e^m +
6696*B*a*b*c^2*d*m^2*n^3*x*x^m*x^(3*n)*e^m + 3348*A*b^2*c^2*d*m^2*n^3*x*x^m
*x^(3*n)*e^m + 3348*B*a^2*c*d^2*m^2*n^3*x*x^m*x^(3*n)*e^m + 6696*A*a*b*c*d^
2*m^2*n^3*x*x^m*x^(3*n)*e^m + 1116*A*a^2*d^3*m^2*n^3*x*x^m*x^(3*n)*e^m + 10
16*B*b^2*c^3*m*n^4*x*x^m*x^(3*n)*e^m + 6096*B*a*b*c^2*d*m*n^4*x*x^m*x^(3*n)
*e^m + 3048*A*b^2*c^2*d*m*n^4*x*x^m*x^(3*n)*e^m + 3048*B*a^2*c*d^2*m*n^4*x*
x^m*x^(3*n)*e^m + 6096*A*a*b*c*d^2*m*n^4*x*x^m*x^(3*n)*e^m + 1016*A*a^2*d^3
*m*n^4*x*x^m*x^(3*n)*e^m + 240*B*b^2*c^3*n^5*x*x^m*x^(3*n)*e^m + 1440*B*a*b
*c^2*d*n^5*x*x^m*x^(3*n)*e^m + 720*A*b^2*c^2*d*n^5*x*x^m*x^(3*n)*e^m + 720*
B*a^2*c*d^2*n^5*x*x^m*x^(3*n)*e^m + 1440*A*a*b*c*d^2*n^5*x*x^m*x^(3*n)*e^m
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+ 240*A*a^2*d^3*n^5*x*x^m*x^(3*n)*e^m + 12*B*a*b*c^3*m^5*x*x^m*x^(2*n)*e^m
+ 6*A*b^2*c^3*m^5*x*x^m*x^(2*n)*e^m + 18*B*a^2*c^2*d*m^5*x*x^m*x^(2*n)*e^m
+ 36*A*a*b*c^2*d*m^5*x*x^m*x^(2*n)*e^m + 18*A*a^2*c*d^2*m^5*x*x^m*x^(2*n)*e
^m + 190*B*a*b*c^3*m^4*n*x*x^m*x^(2*n)*e^m + 95*A*b^2*c^3*m^4*n*x*x^m*x^(2*
n)*e^m + 285*B*a^2*c^2*d*m^4*n*x*x^m*x^(2*n)*e^m + 570*A*a*b*c^2*d*m^4*n*x*
x^m*x^(2*n)*e^m + 285*A*a^2*c*d^2*m^4*n*x*x^m*x^(2*n)*e^m + 1096*B*a*b*c^3*
m^3*n^2*x*x^m*x^(2*n)*e^m + 548*A*b^2*c^3*m^3*n^2*x*x^m*x^(2*n)*e^m + 1644*
B*a^2*c^2*d*m^3*n^2*x*x^m*x^(2*n)*e^m + 3288*A*a*b*c^2*d*m^3*n^2*x*x^m*x^(2
*n)*e^m + 1644*A*a^2*c*d^2*m^3*n^2*x*x^m*x^(2*n)*e^m + 2766*B*a*b*c^3*m^2*n
^3*x*x^m*x^(2*n)*e^m + 1383*A*b^2*c^3*m^2*n^3*x*x^m*x^(2*n)*e^m + 4149*B*a^
2*c^2*d*m^2*n^3*x*x^m*x^(2*n)*e^m + 8298*A*a*b*c^2*d*m^2*n^3*x*x^m*x^(2*n)*
e^m + 4149*A*a^2*c*d^2*m^2*n^3*x*x^m*x^(2*n)*e^m + 2808*B*a*b*c^3*m*n^4*x*x
^m*x^(2*n)*e^m + 1404*A*b^2*c^3*m*n^4*x*x^m*x^(2*n)*e^m + 4212*B*a^2*c^2*d*
m*n^4*x*x^m*x^(2*n)*e^m + 8424*A*a*b*c^2*d*m*n^4*x*x^m*x^(2*n)*e^m + 4212*A
*a^2*c*d^2*m*n^4*x*x^m*x^(2*n)*e^m + 720*B*a*b*c^3*n^5*x*x^m*x^(2*n)*e^m +
360*A*b^2*c^3*n^5*x*x^m*x^(2*n)*e^m + 1080*B*a^2*c^2*d*n^5*x*x^m*x^(2*n)*e^
m + 2160*A*a*b*c^2*d*n^5*x*x^m*x^(2*n)*e^m + 1080*A*a^2*c*d^2*n^5*x*x^m*x^(
2*n)*e^m + 6*B*a^2*c^3*m^5*x*x^m*x^n*e^m + 12*A*a*b*c^3*m^5*x*x^m*x^n*e^m +
 18*A*a^2*c^2*d*m^5*x*x^m*x^n*e^m + 100*B*a^2*c^3*m^4*n*x*x^m*x^n*e^m + 200
*A*a*b*c^3*m^4*n*x*x^m*x^n*e^m + 300*A*a^2*c^2*d*m^4*n*x*x^m*x^n*e^m + 620*
B*a^2*c^3*m^3*n^2*x*x^m*x^n*e^m + 1240*A*a*b*c^3*m^3*n^2*x*x^m*x^n*e^m + 18
60*A*a^2*c^2*d*m^3*n^2*x*x^m*x^n*e^m + 1740*B*a^2*c^3*m^2*n^3*x*x^m*x^n*e^m
 + 3480*A*a*b*c^3*m^2*n^3*x*x^m*x^n*e^m + 5220*A*a^2*c^2*d*m^2*n^3*x*x^m*x^
n*e^m + 2088*B*a^2*c^3*m*n^4*x*x^m*x^n*e^m + 4176*A*a*b*c^3*m*n^4*x*x^m*x^n
*e^m + 6264*A*a^2*c^2*d*m*n^4*x*x^m*x^n*e^m + 720*B*a^2*c^3*n^5*x*x^m*x^n*e
^m + 1440*A*a*b*c^3*n^5*x*x^m*x^n*e^m + 2160*A*a^2*c^2*d*n^5*x*x^m*x^n*e^m
+ 6*A*a^2*c^3*m^5*x*x^m*e^m + 105*A*a^2*c^3*m^4*n*x*x^m*e^m + 700*A*a^2*c^3
*m^3*n^2*x*x^m*e^m + 2205*A*a^2*c^3*m^2*n^3*x*x^m*e^m + 3248*A*a^2*c^3*m*n^
4*x*x^m*e^m + 1764*A*a^2*c^3*n^5*x*x^m*e^m + 15*B*b^2*d^3*m^4*x*x^m*x^(6*n)
*e^m + 150*B*b^2*d^3*m^3*n*x*x^m*x^(6*n)*e^m + 510*B*b^2*d^3*m^2*n^2*x*x^m*
x^(6*n)*e^m + 675*B*b^2*d^3*m*n^3*x*x^m*x^(6*n)*e^m + 274*B*b^2*d^3*n^4*x*x
^m*x^(6*n)*e^m + 45*B*b^2*c*d^2*m^4*x*x^m*x^(5*n)*e^m + 30*B*a*b*d^3*m^4*x*
x^m*x^(5*n)*e^m + 15*A*b^2*d^3*m^4*x*x^m*x^(5*n)*e^m + 480*B*b^2*c*d^2*m^3*
n*x*x^m*x^(5*n)*e^m + 320*B*a*b*d^3*m^3*n*x*x^m*x^(5*n)*e^m + 160*A*b^2*d^3
*m^3*n*x*x^m*x^(5*n)*e^m + 1710*B*b^2*c*d^2*m^2*n^2*x*x^m*x^(5*n)*e^m + 114
0*B*a*b*d^3*m^2*n^2*x*x^m*x^(5*n)*e^m + 570*A*b^2*d^3*m^2*n^2*x*x^m*x^(5*n)
*e^m + 2340*B*b^2*c*d^2*m*n^3*x*x^m*x^(5*n)*e^m + 1560*B*a*b*d^3*m*n^3*x*x^
m*x^(5*n)*e^m + 780*A*b^2*d^3*m*n^3*x*x^m*x^(5*n)*e^m + 972*B*b^2*c*d^2*n^4
*x*x^m*x^(5*n)*e^m + 648*B*a*b*d^3*n^4*x*x^m*x^(5*n)*e^m + 324*A*b^2*d^3*n^
4*x*x^m*x^(5*n)*e^m + 45*B*b^2*c^2*d*m^4*x*x^m*x^(4*n)*e^m + 90*B*a*b*c*d^2
*m^4*x*x^m*x^(4*n)*e^m + 45*A*b^2*c*d^2*m^4*x*x^m*x^(4*n)*e^m + 15*B*a^2*d^
3*m^4*x*x^m*x^(4*n)*e^m + 30*A*a*b*d^3*m^4*x*x^m*x^(4*n)*e^m + 510*B*b^2*c^
2*d*m^3*n*x*x^m*x^(4*n)*e^m + 1020*B*a*b*c*d^2*m^3*n*x*x^m*x^(4*n)*e^m + 51
0*A*b^2*c*d^2*m^3*n*x*x^m*x^(4*n)*e^m + 170*B*a^2*d^3*m^3*n*x*x^m*x^(4*n)*e
^m + 340*A*a*b*d^3*m^3*n*x*x^m*x^(4*n)*e^m + 1926*B*b^2*c^2*d*m^2*n^2*x*x^m
*x^(4*n)*e^m + 3852*B*a*b*c*d^2*m^2*n^2*x*x^m*x^(4*n)*e^m + 1926*A*b^2*c*d^
2*m^2*n^2*x*x^m*x^(4*n)*e^m + 642*B*a^2*d^3*m^2*n^2*x*x^m*x^(4*n)*e^m + 128
4*A*a*b*d^3*m^2*n^2*x*x^m*x^(4*n)*e^m + 2763*B*b^2*c^2*d*m*n^3*x*x^m*x^(4*n
)*e^m + 5526*B*a*b*c*d^2*m*n^3*x*x^m*x^(4*n)*e^m + 2763*A*b^2*c*d^2*m*n^3*x
*x^m*x^(4*n)*e^m + 921*B*a^2*d^3*m*n^3*x*x^m*x^(4*n)*e^m + 1842*A*a*b*d^3*m
*n^3*x*x^m*x^(4*n)*e^m + 1188*B*b^2*c^2*d*n^4*x*x^m*x^(4*n)*e^m + 2376*B*a*
b*c*d^2*n^4*x*x^m*x^(4*n)*e^m + 1188*A*b^2*c*d^2*n^4*x*x^m*x^(4*n)*e^m + 39
6*B*a^2*d^3*n^4*x*x^m*x^(4*n)*e^m + 792*A*a*b*d^3*n^4*x*x^m*x^(4*n)*e^m + 1
5*B*b^2*c^3*m^4*x*x^m*x^(3*n)*e^m + 90*B*a*b*c^2*d*m^4*x*x^m*x^(3*n)*e^m +
45*A*b^2*c^2*d*m^4*x*x^m*x^(3*n)*e^m + 45*B*a^2*c*d^2*m^4*x*x^m*x^(3*n)*e^m
 + 90*A*a*b*c*d^2*m^4*x*x^m*x^(3*n)*e^m + 15*A*a^2*d^3*m^4*x*x^m*x^(3*n)*e^
m + 180*B*b^2*c^3*m^3*n*x*x^m*x^(3*n)*e^m + 1080*B*a*b*c^2*d*m^3*n*x*x^m*x^
(3*n)*e^m + 540*A*b^2*c^2*d*m^3*n*x*x^m*x^(3*n)*e^m + 540*B*a^2*c*d^2*m^3*n
*x*x^m*x^(3*n)*e^m + 1080*A*a*b*c*d^2*m^3*n*x*x^m*x^(3*n)*e^m + 180*A*a^2*d
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^3*m^3*n*x*x^m*x^(3*n)*e^m + 726*B*b^2*c^3*m^2*n^2*x*x^m*x^(3*n)*e^m + 4356
*B*a*b*c^2*d*m^2*n^2*x*x^m*x^(3*n)*e^m + 2178*A*b^2*c^2*d*m^2*n^2*x*x^m*x^(
3*n)*e^m + 2178*B*a^2*c*d^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 4356*A*a*b*c*d^2*m^
2*n^2*x*x^m*x^(3*n)*e^m + 726*A*a^2*d^3*m^2*n^2*x*x^m*x^(3*n)*e^m + 1116*B*
b^2*c^3*m*n^3*x*x^m*x^(3*n)*e^m + 6696*B*a*b*c^2*d*m*n^3*x*x^m*x^(3*n)*e^m
+ 3348*A*b^2*c^2*d*m*n^3*x*x^m*x^(3*n)*e^m + 3348*B*a^2*c*d^2*m*n^3*x*x^m*x
^(3*n)*e^m + 6696*A*a*b*c*d^2*m*n^3*x*x^m*x^(3*n)*e^m + 1116*A*a^2*d^3*m*n^
3*x*x^m*x^(3*n)*e^m + 508*B*b^2*c^3*n^4*x*x^m*x^(3*n)*e^m + 3048*B*a*b*c^2*
d*n^4*x*x^m*x^(3*n)*e^m + 1524*A*b^2*c^2*d*n^4*x*x^m*x^(3*n)*e^m + 1524*B*a
^2*c*d^2*n^4*x*x^m*x^(3*n)*e^m + 3048*A*a*b*c*d^2*n^4*x*x^m*x^(3*n)*e^m + 5
08*A*a^2*d^3*n^4*x*x^m*x^(3*n)*e^m + 30*B*a*b*c^3*m^4*x*x^m*x^(2*n)*e^m + 1
5*A*b^2*c^3*m^4*x*x^m*x^(2*n)*e^m + 45*B*a^2*c^2*d*m^4*x*x^m*x^(2*n)*e^m +
90*A*a*b*c^2*d*m^4*x*x^m*x^(2*n)*e^m + 45*A*a^2*c*d^2*m^4*x*x^m*x^(2*n)*e^m
 + 380*B*a*b*c^3*m^3*n*x*x^m*x^(2*n)*e^m + 190*A*b^2*c^3*m^3*n*x*x^m*x^(2*n
)*e^m + 570*B*a^2*c^2*d*m^3*n*x*x^m*x^(2*n)*e^m + 1140*A*a*b*c^2*d*m^3*n*x*
x^m*x^(2*n)*e^m + 570*A*a^2*c*d^2*m^3*n*x*x^m*x^(2*n)*e^m + 1644*B*a*b*c^3*
m^2*n^2*x*x^m*x^(2*n)*e^m + 822*A*b^2*c^3*m^2*n^2*x*x^m*x^(2*n)*e^m + 2466*
B*a^2*c^2*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 4932*A*a*b*c^2*d*m^2*n^2*x*x^m*x^(2
*n)*e^m + 2466*A*a^2*c*d^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 2766*B*a*b*c^3*m*n^3
*x*x^m*x^(2*n)*e^m + 1383*A*b^2*c^3*m*n^3*x*x^m*x^(2*n)*e^m + 4149*B*a^2*c^
2*d*m*n^3*x*x^m*x^(2*n)*e^m + 8298*A*a*b*c^2*d*m*n^3*x*x^m*x^(2*n)*e^m + 41
49*A*a^2*c*d^2*m*n^3*x*x^m*x^(2*n)*e^m + 1404*B*a*b*c^3*n^4*x*x^m*x^(2*n)*e
^m + 702*A*b^2*c^3*n^4*x*x^m*x^(2*n)*e^m + 2106*B*a^2*c^2*d*n^4*x*x^m*x^(2*
n)*e^m + 4212*A*a*b*c^2*d*n^4*x*x^m*x^(2*n)*e^m + 2106*A*a^2*c*d^2*n^4*x*x^
m*x^(2*n)*e^m + 15*B*a^2*c^3*m^4*x*x^m*x^n*e^m + 30*A*a*b*c^3*m^4*x*x^m*x^n
*e^m + 45*A*a^2*c^2*d*m^4*x*x^m*x^n*e^m + 200*B*a^2*c^3*m^3*n*x*x^m*x^n*e^m
 + 400*A*a*b*c^3*m^3*n*x*x^m*x^n*e^m + 600*A*a^2*c^2*d*m^3*n*x*x^m*x^n*e^m
+ 930*B*a^2*c^3*m^2*n^2*x*x^m*x^n*e^m + 1860*A*a*b*c^3*m^2*n^2*x*x^m*x^n*e^
m + 2790*A*a^2*c^2*d*m^2*n^2*x*x^m*x^n*e^m + 1740*B*a^2*c^3*m*n^3*x*x^m*x^n
*e^m + 3480*A*a*b*c^3*m*n^3*x*x^m*x^n*e^m + 5220*A*a^2*c^2*d*m*n^3*x*x^m*x^
n*e^m + 1044*B*a^2*c^3*n^4*x*x^m*x^n*e^m + 2088*A*a*b*c^3*n^4*x*x^m*x^n*e^m
 + 3132*A*a^2*c^2*d*n^4*x*x^m*x^n*e^m + 15*A*a^2*c^3*m^4*x*x^m*e^m + 210*A*
a^2*c^3*m^3*n*x*x^m*e^m + 1050*A*a^2*c^3*m^2*n^2*x*x^m*e^m + 2205*A*a^2*c^3
*m*n^3*x*x^m*e^m + 1624*A*a^2*c^3*n^4*x*x^m*e^m + 20*B*b^2*d^3*m^3*x*x^m*x^
(6*n)*e^m + 150*B*b^2*d^3*m^2*n*x*x^m*x^(6*n)*e^m + 340*B*b^2*d^3*m*n^2*x*x
^m*x^(6*n)*e^m + 225*B*b^2*d^3*n^3*x*x^m*x^(6*n)*e^m + 60*B*b^2*c*d^2*m^3*x
*x^m*x^(5*n)*e^m + 40*B*a*b*d^3*m^3*x*x^m*x^(5*n)*e^m + 20*A*b^2*d^3*m^3*x*
x^m*x^(5*n)*e^m + 480*B*b^2*c*d^2*m^2*n*x*x^m*x^(5*n)*e^m + 320*B*a*b*d^3*m
^2*n*x*x^m*x^(5*n)*e^m + 160*A*b^2*d^3*m^2*n*x*x^m*x^(5*n)*e^m + 1140*B*b^2
*c*d^2*m*n^2*x*x^m*x^(5*n)*e^m + 760*B*a*b*d^3*m*n^2*x*x^m*x^(5*n)*e^m + 38
0*A*b^2*d^3*m*n^2*x*x^m*x^(5*n)*e^m + 780*B*b^2*c*d^2*n^3*x*x^m*x^(5*n)*e^m
 + 520*B*a*b*d^3*n^3*x*x^m*x^(5*n)*e^m + 260*A*b^2*d^3*n^3*x*x^m*x^(5*n)*e^
m + 60*B*b^2*c^2*d*m^3*x*x^m*x^(4*n)*e^m + 120*B*a*b*c*d^2*m^3*x*x^m*x^(4*n
)*e^m + 60*A*b^2*c*d^2*m^3*x*x^m*x^(4*n)*e^m + 20*B*a^2*d^3*m^3*x*x^m*x^(4*
n)*e^m + 40*A*a*b*d^3*m^3*x*x^m*x^(4*n)*e^m + 510*B*b^2*c^2*d*m^2*n*x*x^m*x
^(4*n)*e^m + 1020*B*a*b*c*d^2*m^2*n*x*x^m*x^(4*n)*e^m + 510*A*b^2*c*d^2*m^2
*n*x*x^m*x^(4*n)*e^m + 170*B*a^2*d^3*m^2*n*x*x^m*x^(4*n)*e^m + 340*A*a*b*d^
3*m^2*n*x*x^m*x^(4*n)*e^m + 1284*B*b^2*c^2*d*m*n^2*x*x^m*x^(4*n)*e^m + 2568
*B*a*b*c*d^2*m*n^2*x*x^m*x^(4*n)*e^m + 1284*A*b^2*c*d^2*m*n^2*x*x^m*x^(4*n)
*e^m + 428*B*a^2*d^3*m*n^2*x*x^m*x^(4*n)*e^m + 856*A*a*b*d^3*m*n^2*x*x^m*x^
(4*n)*e^m + 921*B*b^2*c^2*d*n^3*x*x^m*x^(4*n)*e^m + 1842*B*a*b*c*d^2*n^3*x*
x^m*x^(4*n)*e^m + 921*A*b^2*c*d^2*n^3*x*x^m*x^(4*n)*e^m + 307*B*a^2*d^3*n^3
*x*x^m*x^(4*n)*e^m + 614*A*a*b*d^3*n^3*x*x^m*x^(4*n)*e^m + 20*B*b^2*c^3*m^3
*x*x^m*x^(3*n)*e^m + 120*B*a*b*c^2*d*m^3*x*x^m*x^(3*n)*e^m + 60*A*b^2*c^2*d
*m^3*x*x^m*x^(3*n)*e^m + 60*B*a^2*c*d^2*m^3*x*x^m*x^(3*n)*e^m + 120*A*a*b*c
*d^2*m^3*x*x^m*x^(3*n)*e^m + 20*A*a^2*d^3*m^3*x*x^m*x^(3*n)*e^m + 180*B*b^2
*c^3*m^2*n*x*x^m*x^(3*n)*e^m + 1080*B*a*b*c^2*d*m^2*n*x*x^m*x^(3*n)*e^m + 5
40*A*b^2*c^2*d*m^2*n*x*x^m*x^(3*n)*e^m + 540*B*a^2*c*d^2*m^2*n*x*x^m*x^(3*n
)*e^m + 1080*A*a*b*c*d^2*m^2*n*x*x^m*x^(3*n)*e^m + 180*A*a^2*d^3*m^2*n*x*x^
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m*x^(3*n)*e^m + 484*B*b^2*c^3*m*n^2*x*x^m*x^(3*n)*e^m + 2904*B*a*b*c^2*d*m*
n^2*x*x^m*x^(3*n)*e^m + 1452*A*b^2*c^2*d*m*n^2*x*x^m*x^(3*n)*e^m + 1452*B*a
^2*c*d^2*m*n^2*x*x^m*x^(3*n)*e^m + 2904*A*a*b*c*d^2*m*n^2*x*x^m*x^(3*n)*e^m
 + 484*A*a^2*d^3*m*n^2*x*x^m*x^(3*n)*e^m + 372*B*b^2*c^3*n^3*x*x^m*x^(3*n)*
e^m + 2232*B*a*b*c^2*d*n^3*x*x^m*x^(3*n)*e^m + 1116*A*b^2*c^2*d*n^3*x*x^m*x
^(3*n)*e^m + 1116*B*a^2*c*d^2*n^3*x*x^m*x^(3*n)*e^m + 2232*A*a*b*c*d^2*n^3*
x*x^m*x^(3*n)*e^m + 372*A*a^2*d^3*n^3*x*x^m*x^(3*n)*e^m + 40*B*a*b*c^3*m^3*
x*x^m*x^(2*n)*e^m + 20*A*b^2*c^3*m^3*x*x^m*x^(2*n)*e^m + 60*B*a^2*c^2*d*m^3
*x*x^m*x^(2*n)*e^m + 120*A*a*b*c^2*d*m^3*x*x^m*x^(2*n)*e^m + 60*A*a^2*c*d^2
*m^3*x*x^m*x^(2*n)*e^m + 380*B*a*b*c^3*m^2*n*x*x^m*x^(2*n)*e^m + 190*A*b^2*
c^3*m^2*n*x*x^m*x^(2*n)*e^m + 570*B*a^2*c^2*d*m^2*n*x*x^m*x^(2*n)*e^m + 114
0*A*a*b*c^2*d*m^2*n*x*x^m*x^(2*n)*e^m + 570*A*a^2*c*d^2*m^2*n*x*x^m*x^(2*n)
*e^m + 1096*B*a*b*c^3*m*n^2*x*x^m*x^(2*n)*e^m + 548*A*b^2*c^3*m*n^2*x*x^m*x
^(2*n)*e^m + 1644*B*a^2*c^2*d*m*n^2*x*x^m*x^(2*n)*e^m + 3288*A*a*b*c^2*d*m*
n^2*x*x^m*x^(2*n)*e^m + 1644*A*a^2*c*d^2*m*n^2*x*x^m*x^(2*n)*e^m + 922*B*a*
b*c^3*n^3*x*x^m*x^(2*n)*e^m + 461*A*b^2*c^3*n^3*x*x^m*x^(2*n)*e^m + 1383*B*
a^2*c^2*d*n^3*x*x^m*x^(2*n)*e^m + 2766*A*a*b*c^2*d*n^3*x*x^m*x^(2*n)*e^m +
1383*A*a^2*c*d^2*n^3*x*x^m*x^(2*n)*e^m + 20*B*a^2*c^3*m^3*x*x^m*x^n*e^m + 4
0*A*a*b*c^3*m^3*x*x^m*x^n*e^m + 60*A*a^2*c^2*d*m^3*x*x^m*x^n*e^m + 200*B*a^
2*c^3*m^2*n*x*x^m*x^n*e^m + 400*A*a*b*c^3*m^2*n*x*x^m*x^n*e^m + 600*A*a^2*c
^2*d*m^2*n*x*x^m*x^n*e^m + 620*B*a^2*c^3*m*n^2*x*x^m*x^n*e^m + 1240*A*a*b*c
^3*m*n^2*x*x^m*x^n*e^m + 1860*A*a^2*c^2*d*m*n^2*x*x^m*x^n*e^m + 580*B*a^2*c
^3*n^3*x*x^m*x^n*e^m + 1160*A*a*b*c^3*n^3*x*x^m*x^n*e^m + 1740*A*a^2*c^2*d*
n^3*x*x^m*x^n*e^m + 20*A*a^2*c^3*m^3*x*x^m*e^m + 210*A*a^2*c^3*m^2*n*x*x^m*
e^m + 700*A*a^2*c^3*m*n^2*x*x^m*e^m + 735*A*a^2*c^3*n^3*x*x^m*e^m + 15*B*b^
2*d^3*m^2*x*x^m*x^(6*n)*e^m + 75*B*b^2*d^3*m*n*x*x^m*x^(6*n)*e^m + 85*B*b^2
*d^3*n^2*x*x^m*x^(6*n)*e^m + 45*B*b^2*c*d^2*m^2*x*x^m*x^(5*n)*e^m + 30*B*a*
b*d^3*m^2*x*x^m*x^(5*n)*e^m + 15*A*b^2*d^3*m^2*x*x^m*x^(5*n)*e^m + 240*B*b^
2*c*d^2*m*n*x*x^m*x^(5*n)*e^m + 160*B*a*b*d^3*m*n*x*x^m*x^(5*n)*e^m + 80*A*
b^2*d^3*m*n*x*x^m*x^(5*n)*e^m + 285*B*b^2*c*d^2*n^2*x*x^m*x^(5*n)*e^m + 190
*B*a*b*d^3*n^2*x*x^m*x^(5*n)*e^m + 95*A*b^2*d^3*n^2*x*x^m*x^(5*n)*e^m + 45*
B*b^2*c^2*d*m^2*x*x^m*x^(4*n)*e^m + 90*B*a*b*c*d^2*m^2*x*x^m*x^(4*n)*e^m +
45*A*b^2*c*d^2*m^2*x*x^m*x^(4*n)*e^m + 15*B*a^2*d^3*m^2*x*x^m*x^(4*n)*e^m +
 30*A*a*b*d^3*m^2*x*x^m*x^(4*n)*e^m + 255*B*b^2*c^2*d*m*n*x*x^m*x^(4*n)*e^m
 + 510*B*a*b*c*d^2*m*n*x*x^m*x^(4*n)*e^m + 255*A*b^2*c*d^2*m*n*x*x^m*x^(4*n
)*e^m + 85*B*a^2*d^3*m*n*x*x^m*x^(4*n)*e^m + 170*A*a*b*d^3*m*n*x*x^m*x^(4*n
)*e^m + 321*B*b^2*c^2*d*n^2*x*x^m*x^(4*n)*e^m + 642*B*a*b*c*d^2*n^2*x*x^m*x
^(4*n)*e^m + 321*A*b^2*c*d^2*n^2*x*x^m*x^(4*n)*e^m + 107*B*a^2*d^3*n^2*x*x^
m*x^(4*n)*e^m + 214*A*a*b*d^3*n^2*x*x^m*x^(4*n)*e^m + 15*B*b^2*c^3*m^2*x*x^
m*x^(3*n)*e^m + 90*B*a*b*c^2*d*m^2*x*x^m*x^(3*n)*e^m + 45*A*b^2*c^2*d*m^2*x
*x^m*x^(3*n)*e^m + 45*B*a^2*c*d^2*m^2*x*x^m*x^(3*n)*e^m + 90*A*a*b*c*d^2*m^
2*x*x^m*x^(3*n)*e^m + 15*A*a^2*d^3*m^2*x*x^m*x^(3*n)*e^m + 90*B*b^2*c^3*m*n
*x*x^m*x^(3*n)*e^m + 540*B*a*b*c^2*d*m*n*x*x^m*x^(3*n)*e^m + 270*A*b^2*c^2*
d*m*n*x*x^m*x^(3*n)*e^m + 270*B*a^2*c*d^2*m*n*x*x^m*x^(3*n)*e^m + 540*A*a*b
*c*d^2*m*n*x*x^m*x^(3*n)*e^m + 90*A*a^2*d^3*m*n*x*x^m*x^(3*n)*e^m + 121*B*b
^2*c^3*n^2*x*x^m*x^(3*n)*e^m + 726*B*a*b*c^2*d*n^2*x*x^m*x^(3*n)*e^m + 363*
A*b^2*c^2*d*n^2*x*x^m*x^(3*n)*e^m + 363*B*a^2*c*d^2*n^2*x*x^m*x^(3*n)*e^m +
 726*A*a*b*c*d^2*n^2*x*x^m*x^(3*n)*e^m + 121*A*a^2*d^3*n^2*x*x^m*x^(3*n)*e^
m + 30*B*a*b*c^3*m^2*x*x^m*x^(2*n)*e^m + 15*A*b^2*c^3*m^2*x*x^m*x^(2*n)*e^m
 + 45*B*a^2*c^2*d*m^2*x*x^m*x^(2*n)*e^m + 90*A*a*b*c^2*d*m^2*x*x^m*x^(2*n)*
e^m + 45*A*a^2*c*d^2*m^2*x*x^m*x^(2*n)*e^m + 190*B*a*b*c^3*m*n*x*x^m*x^(2*n
)*e^m + 95*A*b^2*c^3*m*n*x*x^m*x^(2*n)*e^m + 285*B*a^2*c^2*d*m*n*x*x^m*x^(2
*n)*e^m + 570*A*a*b*c^2*d*m*n*x*x^m*x^(2*n)*e^m + 285*A*a^2*c*d^2*m*n*x*x^m
*x^(2*n)*e^m + 274*B*a*b*c^3*n^2*x*x^m*x^(2*n)*e^m + 137*A*b^2*c^3*n^2*x*x^
m*x^(2*n)*e^m + 411*B*a^2*c^2*d*n^2*x*x^m*x^(2*n)*e^m + 822*A*a*b*c^2*d*n^2
*x*x^m*x^(2*n)*e^m + 411*A*a^2*c*d^2*n^2*x*x^m*x^(2*n)*e^m + 15*B*a^2*c^3*m
^2*x*x^m*x^n*e^m + 30*A*a*b*c^3*m^2*x*x^m*x^n*e^m + 45*A*a^2*c^2*d*m^2*x*x^
m*x^n*e^m + 100*B*a^2*c^3*m*n*x*x^m*x^n*e^m + 200*A*a*b*c^3*m*n*x*x^m*x^n*e
^m + 300*A*a^2*c^2*d*m*n*x*x^m*x^n*e^m + 155*B*a^2*c^3*n^2*x*x^m*x^n*e^m +

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310*A*a*b*c^3*n^2*x*x^m*x^n*e^m + 465*A*a^2*c^2*d*n^2*x*x^m*x^n*e^m + 15*A*
a^2*c^3*m^2*x*x^m*e^m + 105*A*a^2*c^3*m*n*x*x^m*e^m + 175*A*a^2*c^3*n^2*x*x
^m*e^m + 6*B*b^2*d^3*m*x*x^m*x^(6*n)*e^m + 15*B*b^2*d^3*n*x*x^m*x^(6*n)*e^m
 + 18*B*b^2*c*d^2*m*x*x^m*x^(5*n)*e^m + 12*B*a*b*d^3*m*x*x^m*x^(5*n)*e^m +
6*A*b^2*d^3*m*x*x^m*x^(5*n)*e^m + 48*B*b^2*c*d^2*n*x*x^m*x^(5*n)*e^m + 32*B
*a*b*d^3*n*x*x^m*x^(5*n)*e^m + 16*A*b^2*d^3*n*x*x^m*x^(5*n)*e^m + 18*B*b^2*
c^2*d*m*x*x^m*x^(4*n)*e^m + 36*B*a*b*c*d^2*m*x*x^m*x^(4*n)*e^m + 18*A*b^2*c
*d^2*m*x*x^m*x^(4*n)*e^m + 6*B*a^2*d^3*m*x*x^m*x^(4*n)*e^m + 12*A*a*b*d^3*m
*x*x^m*x^(4*n)*e^m + 51*B*b^2*c^2*d*n*x*x^m*x^(4*n)*e^m + 102*B*a*b*c*d^2*n
*x*x^m*x^(4*n)*e^m + 51*A*b^2*c*d^2*n*x*x^m*x^(4*n)*e^m + 17*B*a^2*d^3*n*x*
x^m*x^(4*n)*e^m + 34*A*a*b*d^3*n*x*x^m*x^(4*n)*e^m + 6*B*b^2*c^3*m*x*x^m*x^
(3*n)*e^m + 36*B*a*b*c^2*d*m*x*x^m*x^(3*n)*e^m + 18*A*b^2*c^2*d*m*x*x^m*x^(
3*n)*e^m + 18*B*a^2*c*d^2*m*x*x^m*x^(3*n)*e^m + 36*A*a*b*c*d^2*m*x*x^m*x^(3
*n)*e^m + 6*A*a^2*d^3*m*x*x^m*x^(3*n)*e^m + 18*B*b^2*c^3*n*x*x^m*x^(3*n)*e^
m + 108*B*a*b*c^2*d*n*x*x^m*x^(3*n)*e^m + 54*A*b^2*c^2*d*n*x*x^m*x^(3*n)*e^
m + 54*B*a^2*c*d^2*n*x*x^m*x^(3*n)*e^m + 108*A*a*b*c*d^2*n*x*x^m*x^(3*n)*e^
m + 18*A*a^2*d^3*n*x*x^m*x^(3*n)*e^m + 12*B*a*b*c^3*m*x*x^m*x^(2*n)*e^m + 6
*A*b^2*c^3*m*x*x^m*x^(2*n)*e^m + 18*B*a^2*c^2*d*m*x*x^m*x^(2*n)*e^m + 36*A*
a*b*c^2*d*m*x*x^m*x^(2*n)*e^m + 18*A*a^2*c*d^2*m*x*x^m*x^(2*n)*e^m + 38*B*a
*b*c^3*n*x*x^m*x^(2*n)*e^m + 19*A*b^2*c^3*n*x*x^m*x^(2*n)*e^m + 57*B*a^2*c^
2*d*n*x*x^m*x^(2*n)*e^m + 114*A*a*b*c^2*d*n*x*x^m*x^(2*n)*e^m + 57*A*a^2*c*
d^2*n*x*x^m*x^(2*n)*e^m + 6*B*a^2*c^3*m*x*x^m*x^n*e^m + 12*A*a*b*c^3*m*x*x^
m*x^n*e^m + 18*A*a^2*c^2*d*m*x*x^m*x^n*e^m + 20*B*a^2*c^3*n*x*x^m*x^n*e^m +
 40*A*a*b*c^3*n*x*x^m*x^n*e^m + 60*A*a^2*c^2*d*n*x*x^m*x^n*e^m + 6*A*a^2*c^
3*m*x*x^m*e^m + 21*A*a^2*c^3*n*x*x^m*e^m + B*b^2*d^3*x*x^m*x^(6*n)*e^m + 3*
B*b^2*c*d^2*x*x^m*x^(5*n)*e^m + 2*B*a*b*d^3*x*x^m*x^(5*n)*e^m + A*b^2*d^3*x
*x^m*x^(5*n)*e^m + 3*B*b^2*c^2*d*x*x^m*x^(4*n)*e^m + 6*B*a*b*c*d^2*x*x^m*x^
(4*n)*e^m + 3*A*b^2*c*d^2*x*x^m*x^(4*n)*e^m + B*a^2*d^3*x*x^m*x^(4*n)*e^m +
 2*A*a*b*d^3*x*x^m*x^(4*n)*e^m + B*b^2*c^3*x*x^m*x^(3*n)*e^m + 6*B*a*b*c^2*
d*x*x^m*x^(3*n)*e^m + 3*A*b^2*c^2*d*x*x^m*x^(3*n)*e^m + 3*B*a^2*c*d^2*x*x^m
*x^(3*n)*e^m + 6*A*a*b*c*d^2*x*x^m*x^(3*n)*e^m + A*a^2*d^3*x*x^m*x^(3*n)*e^
m + 2*B*a*b*c^3*x*x^m*x^(2*n)*e^m + A*b^2*c^3*x*x^m*x^(2*n)*e^m + 3*B*a^2*c
^2*d*x*x^m*x^(2*n)*e^m + 6*A*a*b*c^2*d*x*x^m*x^(2*n)*e^m + 3*A*a^2*c*d^2*x*
x^m*x^(2*n)*e^m + B*a^2*c^3*x*x^m*x^n*e^m + 2*A*a*b*c^3*x*x^m*x^n*e^m + 3*A
*a^2*c^2*d*x*x^m*x^n*e^m + A*a^2*c^3*x*x^m*e^m)/(m^7 + 21*m^6*n + 175*m^5*n
^2 + 735*m^4*n^3 + 1624*m^3*n^4 + 1764*m^2*n^5 + 720*m*n^6 + 7*m^6 + 126*m^
5*n + 875*m^4*n^2 + 2940*m^3*n^3 + 4872*m^2*n^4 + 3528*m*n^5 + 720*n^6 + 21
*m^5 + 315*m^4*n + 1750*m^3*n^2 + 4410*m^2*n^3 + 4872*m*n^4 + 1764*n^5 + 35
*m^4 + 420*m^3*n + 1750*m^2*n^2 + 2940*m*n^3 + 1624*n^4 + 35*m^3 + 315*m^2*
n + 875*m*n^2 + 735*n^3 + 21*m^2 + 126*m*n + 175*n^2 + 7*m + 21*n + 1)
```

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

Optimal. Leaf size=210

$$\frac{c^2x^{n+1}(ex)^m(3aAd+aBc+Abc)}{m+n+1}+\frac{d^2x^{4n+1}(ex)^m(aBd+Abd+3bBc)}{m+4n+1}+\frac{cx^{2n+1}(ex)^m(3ad(Ad+Bc)+bc(3Ad+Bc))}{m+2n+1}$$

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

Rubi [A] time = 0.258128, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103, Rules used = {570, 20, 30}

$$\frac{c^2x^{n+1}(ex)^m(3aAd+aBc+Abc)}{m+n+1}+\frac{d^2x^{4n+1}(ex)^m(aBd+Abd+3bBc)}{m+4n+1}+\frac{cx^{2n+1}(ex)^m(3ad(Ad+Bc)+bc(3Ad+Bc))}{m+2n+1}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int (ex)^m (a+bx^n)(A+Bx^n)(c+dx^n)^3\,dx = \int \left(aAc^3(ex)^m + c^2(Abc+aBc+3aAd)x^n(ex)^m + c(3ad(Bc+Ad)+bc(Bc+\right.$$
$$= \frac{aAc^3(ex)^{1+m}}{e(1+m)} + \left(bBd^3\right)\int x^{5n}(ex)^m\,dx + \left(c^2(Abc+aBc+3aAd)\right)\int x^n(ex)^m$$
$$= \frac{aAc^3(ex)^{1+m}}{e(1+m)} + \left(bBd^3x^{-m}(ex)^m\right)\int x^{m+5n}\,dx + \left(c^2(Abc+aBc+3aAd)x^{-m}(e\right.$$
$$= \frac{c^2(Abc+aBc+3aAd)x^{1+n}(ex)^m}{1+m+n} + \frac{c(3ad(Bc+Ad)+bc(Bc+3Ad))x^{1+2n}(e}{1+m+2n}$$

Mathematica [A] time = 0.518446, size = 172, normalized size = 0.82

$$x(ex)^m\left(\frac{c^2x^n(3aAd+aBc+Abc)}{m+n+1} + \frac{d^2x^{4n}(aBd+Abd+3bBc)}{m+4n+1} + \frac{cx^{2n}(3ad(Ad+Bc)+bc(3Ad+Bc))}{m+2n+1} + \frac{dx^{3n}(ad(Ad+3}{m\ -}\right.$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.111, size = 4972, normalized size = 23.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(60*A*a*c^3*m^3*n+255*A*a*c^3*m^2*n^2+450*A*a*c^3*m*n^3+144*A*b*c*d^2*m*n
*(x^n)^3+234*B*a*c^2*d*m^2*n*(x^n)^2+531*B*a*c^2*d*m*n^2*(x^n)^2+144*B*a*c*
d^2*m*n*(x^n)^3+144*B*b*c^2*d*m*n*(x^n)^3+531*A*a*c*d^2*m^2*n^2*(x^n)^2+642
*A*a*c*d^2*m*n^3*(x^n)^2+156*A*b*c^2*d*m^3*n*(x^n)^2+531*A*b*c^2*d*m^2*n^2*
(x^n)^2+168*A*a*c^2*d*m^3*n*x^n+639*A*a*c^2*d*m^2*n^2*x^n+B*b*d^3*m^5*(x^n)
^5+90*A*a*c^3*m^2*n+255*A*a*c^3*m*n^2+60*A*a*c^3*m*n+10*B*a*d^3*m^3*(x^n)^4
+61*B*a*d^3*n^3*(x^n)^4+B*b*c^3*m^5*(x^n)^2+10*B*b*d^3*m^2*(x^n)^5+35*B*b*d
^3*n^2*(x^n)^5+924*A*a*c^2*d*m*n^3*x^n+234*A*a*c*d^2*m^2*n*(x^n)^2+531*A*a*
c*d^2*m*n^2*(x^n)^2+234*A*b*c^2*d*m^2*n*(x^n)^2+531*A*b*c^2*d*m*n^2*(x^n)^2
+15*A*a*c^3*m^4*n+85*A*a*c^3*m^3*n^2+225*A*a*c^3*m^2*n^3+274*A*a*c^3*m*n^4+
(x^n)^4*A*b*d^3+(x^n)^4*B*a*d^3+(x^n)^3*a*A*d^3+x^n*c^3*A*b+x^n*c^3*B*a+(x^
n)^2*b*B*c^3+11*A*b*d^3*m^4*n*(x^n)^4+41*A*b*d^3*m^3*n^2*(x^n)^4+61*A*b*d^3
*m^2*n^3*(x^n)^4+30*A*b*d^3*m*n^4*(x^n)^4+11*B*a*d^3*m^4*n*(x^n)^4+41*B*a*d
^3*m^3*n^2*(x^n)^4+61*B*a*d^3*m^2*n^3*(x^n)^4+30*B*a*d^3*m*n^4*(x^n)^4+a*A*
c^3+252*A*a*c^2*d*m^2*n*x^n+639*A*a*c^2*d*m*n^2*x^n+156*A*a*c*d^2*m*n*(x^n)
^2+156*A*b*c^2*d*m*n*(x^n)^2+156*B*a*c^2*d*m*n*(x^n)^2+154*B*a*c^3*n^3*x^n+
10*B*b*c^3*m^2*(x^n)^2+59*B*b*c^3*n^2*(x^n)^2+3*B*b*c*d^2*(x^n)^4+147*B*b*c
^2*d*m^3*n^2*(x^n)^3+234*B*b*c^2*d*m^2*n^3*(x^n)^3+120*B*b*c^2*d*m*n^4*(x^n
)^3+132*B*b*c*d^2*m^3*n*(x^n)^4+369*B*b*c*d^2*m^2*n^2*(x^n)^4+366*B*b*c*d^2
*m*n^3*(x^n)^4+39*A*a*c*d^2*m^4*n*(x^n)^2+177*A*a*c*d^2*m^3*n^2*(x^n)^2+33*
B*b*c*d^2*m^4*n*(x^n)^4+123*B*b*c*d^2*m^3*n^2*(x^n)^4+642*A*b*c^2*d*m*n^3*(
```

x^n)^2+216*A*b*c*d^2*m^2*n*(x^n)^3+441*A*b*c*d^2*m*n^2*(x^n)^3+156*B*a*c^2*
d*m^3*n*(x^n)^2+531*B*a*c^2*d*m^2*n^2*(x^n)^2+642*B*a*c^2*d*m*n^3*(x^n)^2+1
83*B*b*c*d^2*m^2*n^3*(x^n)^4+90*B*b*c*d^2*m*n^4*(x^n)^4+36*A*b*c*d^2*m^4*n*
(x^n)^3+147*A*b*c*d^2*m^3*n^2*(x^n)^3+234*A*b*c*d^2*m^2*n^3*(x^n)^3+120*A*b
*c*d^2*m*n^4*(x^n)^3+36*B*a*c*d^2*m^4*n*(x^n)^3+147*B*a*c*d^2*m^3*n^2*(x^n)
^3+234*B*a*c*d^2*m^2*n^3*(x^n)^3+120*B*a*c*d^2*m*n^4*(x^n)^3+10*A*b*c^3*m^2
*x^n+71*A*b*c^3*n^2*x^n+5*a*A*c^3*m+15*a*A*c^3*n+216*B*a*c*d^2*m^2*n*(x^n)^
3+441*B*a*c*d^2*m*n^2*(x^n)^3+180*A*a*c*d^2*m*n^4*(x^n)^2+39*A*b*c^2*d*m^4*
n*(x^n)^2+177*A*b*c^2*d*m^3*n^2*(x^n)^2+321*A*b*c^2*d*m^2*n^3*(x^n)^2+180*A
*b*c^2*d*m*n^4*(x^n)^2+144*A*b*c*d^2*m^3*n*(x^n)^3+441*A*b*c*d^2*m^2*n^2*(x
^n)^3+321*A*a*c*d^2*m^2*n^3*(x^n)^2+36*B*b*c^2*d*m^4*n*(x^n)^3+468*A*b*c*d^
2*m*n^3*(x^n)^3+39*B*a*c^2*d*m^4*n*(x^n)^2+177*B*a*c^2*d*m^3*n^2*(x^n)^2+32
1*B*a*c^2*d*m^2*n^3*(x^n)^2+180*B*a*c^2*d*m*n^4*(x^n)^2+144*B*a*c*d^2*m^3*n
*(x^n)^3+441*B*a*c*d^2*m^2*n^2*(x^n)^3+468*B*a*c*d^2*m*n^3*(x^n)^3+144*B*b*
c^2*d*m^3*n*(x^n)^3+441*B*b*c^2*d*m^2*n^2*(x^n)^3+468*B*b*c^2*d*m*n^3*(x^n)
^3+168*A*a*c^2*d*m*n*x^n+216*B*b*c^2*d*m^2*n*(x^n)^3+441*B*b*c^2*d*m*n^2*(x
^n)^3+132*B*b*c*d^2*m*n*(x^n)^4+(x^n)^5*b*B*d^3+120*A*a*c^3*n^5+A*a*c^3*m^5
+5*A*a*c^3*m^4+274*A*a*c^3*n^4+10*A*a*c^3*m^3+225*A*a*c^3*n^3+10*A*a*c^3*m^
2+85*A*a*c^3*n^2+198*B*b*c*d^2*m^2*n*(x^n)^4+369*B*b*c*d^2*m*n^2*(x^n)^4+42
*A*a*c^2*d*m^4*n*x^n+213*A*a*c^2*d*m^3*n^2*x^n+462*A*a*c^2*d*m^2*n^3*x^n+36
0*A*a*c^2*d*m*n^4*x^n+156*A*a*c*d^2*m^3*n*(x^n)^2+78*A*a*d^3*n^3*(x^n)^3+10
*A*a*d^3*m^3*(x^n)^3+3*A*b*c*d^2*(x^n)^3+10*B*a*c^3*m^2*x^n+71*B*a*c^3*n^2*
x^n+3*B*a*c*d^2*(x^n)^3+5*B*b*c^3*(x^n)^2*m+13*B*b*c^3*(x^n)^2*n+154*A*b*c^
3*n^3*x^n+10*B*a*c^3*m^3*x^n+3*B*a*c^2*d*(x^n)^2+3*A*a*c^2*d*x^n+12*A*a*d^3
*(x^n)^3*n+10*A*b*c^3*m^3*x^n+14*B*a*c^3*x^n*n+3*B*b*c^2*d*(x^n)^3+3*A*a*c*
d^2*(x^n)^2+5*A*b*c^3*x^n*m+14*A*b*c^3*x^n*n+3*A*b*c^2*d*(x^n)^2+5*B*a*c^3*
x^n*m+3*B*b*c*d^2*m^5*(x^n)^4+40*B*b*d^3*m^3*n*(x^n)^5+105*B*b*d^3*m^2*n^2*
(x^n)^5+100*B*b*d^3*m*n^3*(x^n)^5+12*A*a*d^3*m^4*n*(x^n)^3+49*A*a*d^3*m^3*n
^2*(x^n)^3+78*A*a*d^3*m^2*n^3*(x^n)^3+40*A*a*d^3*m*n^4*(x^n)^3+3*A*b*c*d^2*
m^5*(x^n)^3+A*b*d^3*m^5*(x^n)^4+5*B*a*d^3*m^4*(x^n)^4+30*B*a*d^3*n^4*(x^n)^
4+10*B*b*d^3*m^3*(x^n)^5+50*B*b*d^3*n^3*(x^n)^5+5*A*a*d^3*m^4*(x^n)^3+40*A*
a*d^3*n^4*(x^n)^3+10*A*b*d^3*m^3*(x^n)^4+61*A*b*d^3*n^3*(x^n)^4+A*b*c^3*m^5
*x^n+10*A*b*d^3*m^2*(x^n)^4+41*A*b*d^3*n^2*(x^n)^4+B*a*c^3*m^5*x^n+B*a*d^3*
m^5*(x^n)^4+5*m*b*B*d^3*(x^n)^5+10*B*a*d^3*m^2*(x^n)^4+41*B*a*d^3*n^2*(x^n)
^4+5*B*b*c^3*m^4*(x^n)^2+60*B*b*c^3*n^4*(x^n)^2+44*A*b*d^3*m^3*n*(x^n)^4+12
3*A*b*d^3*m^2*n^2*(x^n)^4+122*A*b*d^3*m*n^3*(x^n)^4+3*B*a*c*d^2*m^5*(x^n)^3
+44*B*a*d^3*m^3*n*(x^n)^4+123*B*a*d^3*m^2*n^2*(x^n)^4+122*B*a*d^3*m*n^3*(x^
n)^4+3*B*b*c^2*d*m^5*(x^n)^3+10*b*B*d^3*(x^n)^5*n+10*A*a*d^3*m^2*(x^n)^3+49
*A*a*d^3*n^2*(x^n)^3+5*B*b*d^3*m^4*(x^n)^5+24*B*b*d^3*n^4*(x^n)^5+A*a*d^3*m
^5*(x^n)^3+5*A*b*d^3*m^4*(x^n)^4+30*A*b*d^3*n^4*(x^n)^4+5*A*b*c^3*m^4*x^n+1
20*A*b*c^3*n^4*x^n+5*A*b*d^3*(x^n)^4*m+11*A*b*d^3*(x^n)^4*n+5*B*a*c^3*m^4*x
^n+120*B*a*c^3*n^4*x^n+5*B*a*d^3*(x^n)^4*m+11*B*a*d^3*(x^n)^4*n+10*B*b*c^3*
m^3*(x^n)^2+107*B*b*c^3*n^3*(x^n)^2+5*A*a*d^3*(x^n)^3*m+44*B*a*d^3*m*n*(x^n
)^4+52*B*b*c^3*m^3*n*(x^n)^2+177*B*b*c^3*m^2*n^2*(x^n)^2+214*B*b*c^3*m*n^3*
(x^n)^2+30*B*b*c^2*d*m^3*(x^n)^3+234*B*b*c^2*d*n^3*(x^n)^3+30*B*b*c*d^2*m^2
*(x^n)^4+123*B*b*c*d^2*n^2*(x^n)^4+15*A*a*c^2*d*m^4*x^n+154*B*a*c^3*m^2*n^3
*x^n+120*B*a*c^3*m*n^4*x^n+15*B*a*c^2*d*m^4*(x^n)^2+180*B*a*c^2*d*n^4*(x^n)
^2+30*B*a*c*d^2*m^3*(x^n)^3+234*B*a*c*d^2*n^3*(x^n)^3+15*A*b*c^2*d*m^4*(x^n
)^2+180*A*b*c^2*d*n^4*(x^n)^2+30*A*b*c*d^2*m^3*(x^n)^3+234*A*b*c*d^2*n^3*(x
^n)^3+44*A*b*d^3*m*n*(x^n)^4+14*B*a*c^3*m^4*n*x^n+71*B*a*c^3*m^3*n^2*x^n+3*
A*a*c^2*d*m^5*x^n+15*A*a*c*d^2*m^4*(x^n)^2+180*A*a*c*d^2*n^4*(x^n)^2+72*A*a
*d^3*m^2*n*(x^n)^3+147*A*a*d^3*m*n^2*(x^n)^3+14*A*b*c^3*m^4*n*x^n+71*A*b*c^
3*m^3*n^2*x^n+154*A*b*c^3*m^2*n^3*x^n+120*A*b*c^3*m*n^4*x^n+177*A*a*c*d^2*n
^2*(x^n)^2+84*A*b*c^3*m^2*n*x^n+213*A*b*c^3*m*n^2*x^n+30*A*b*c^2*d*m^2*(x^n
)^2+177*A*b*c^2*d*n^2*(x^n)^2+15*A*b*c*d^2*(x^n)^3*m+36*A*b*c*d^2*(x^n)^3*n
+84*B*a*c^3*m^2*n*x^n+40*B*b*d^3*m*n*(x^n)^5+177*B*b*c^3*m*n^2*(x^n)^2+30*B
*b*c^2*d*m^2*(x^n)^3+147*B*b*c^2*d*n^2*(x^n)^3+15*B*b*c*d^2*(x^n)^4*m+33*B*
b*c*d^2*(x^n)^4*n+30*A*a*c^2*d*m^3*x^n+462*A*a*c^2*d*n^3*x^n+30*A*a*c*d^2*m
^2*(x^n)^2+56*B*a*c^3*m^3*n*x^n+213*B*a*c^3*m^2*n^2*x^n+308*B*a*c^3*m*n^3*x

```
^n+30*B*a*c^2*d*m^3*(x^n)^2+321*B*a*c^2*d*n^3*(x^n)^2+30*B*a*c*d^2*m^2*(x^n
)^3+147*B*a*c*d^2*n^2*(x^n)^3+78*B*b*c^3*m^2*n*(x^n)^2+56*A*b*c^3*m^3*n*x^n
+213*A*b*c^3*m^2*n^2*x^n+308*A*b*c^3*m*n^3*x^n+30*A*b*c^2*d*m^3*(x^n)^2+321
*A*b*c^2*d*n^3*(x^n)^2+30*A*b*c*d^2*m^2*(x^n)^3+147*A*b*c*d^2*n^2*(x^n)^3+1
5*A*a*c^2*d*x^n*m+42*A*a*c^2*d*x^n*n+360*A*a*c^2*d*n^4*x^n+30*A*a*c*d^2*m^3
*(x^n)^2+321*A*a*c*d^2*n^3*(x^n)^2+48*A*a*d^3*m*n*(x^n)^3+15*A*b*c^2*d*(x^n
)^2*m+39*A*b*c^2*d*(x^n)^2*n+56*B*a*c^3*m*n*x^n+15*B*a*c^2*d*(x^n)^2*m+39*B
*a*c^2*d*(x^n)^2*n+36*B*b*c^2*d*(x^n)^3*n+30*A*a*c^2*d*m^2*x^n+213*A*a*c^2*
d*n^2*x^n+15*A*a*c*d^2*(x^n)^2*m+39*A*a*c*d^2*(x^n)^2*n+56*A*b*c^3*m*n*x^n+
24*B*b*d^3*m*n^4*(x^n)^5+213*B*a*c^3*m*n^2*x^n+30*B*a*c^2*d*m^2*(x^n)^2+177
*B*a*c^2*d*n^2*(x^n)^2+15*B*a*c*d^2*(x^n)^3*m+36*B*a*c*d^2*(x^n)^3*n+52*B*b
*c^3*m*n*(x^n)^2+15*B*b*c^2*d*(x^n)^3*m+10*B*b*d^3*m^4*n*(x^n)^5+35*B*b*d^3
*m^3*n^2*(x^n)^5+50*B*b*d^3*m^2*n^3*(x^n)^5+60*B*b*c^3*m*n^4*(x^n)^2+15*B*b
*c^2*d*m^4*(x^n)^3+120*B*b*c^2*d*n^4*(x^n)^3+30*B*b*c*d^2*m^3*(x^n)^4+183*B
*b*c*d^2*n^3*(x^n)^4+15*A*b*c*d^2*m^4*(x^n)^3+120*A*b*c*d^2*n^4*(x^n)^3+66*
A*b*d^3*m^2*n*(x^n)^4+123*A*b*d^3*m*n^2*(x^n)^4+3*B*a*c^2*d*m^5*(x^n)^2+15*
B*a*c*d^2*m^4*(x^n)^3+120*B*a*c*d^2*n^4*(x^n)^3+66*B*a*d^3*m^2*n*(x^n)^4+12
3*B*a*d^3*m*n^2*(x^n)^4+13*B*b*c^3*m^4*n*(x^n)^2+59*B*b*c^3*m^3*n^2*(x^n)^2
+107*B*b*c^3*m^2*n^3*(x^n)^2+15*B*b*c*d^2*m^4*(x^n)^4+90*B*b*c*d^2*n^4*(x^n
)^4+60*B*b*d^3*m^2*n*(x^n)^5+105*B*b*d^3*m*n^2*(x^n)^5+3*A*a*c*d^2*m^5*(x^n
)^2+48*A*a*d^3*m^3*n*(x^n)^3+147*A*a*d^3*m^2*n^2*(x^n)^3+156*A*a*d^3*m*n^3*
(x^n)^3+3*A*b*c^2*d*m^5*(x^n)^2)/(1+m)/(m+n+1)/(1+m+2*n)/(1+m+3*n)/(1+m+4*n
)/(1+m+5*n)*exp(1/2*m*(-I*Pi*csgn(I*e*x)^3+I*Pi*csgn(I*e*x)^2*csgn(I*e)+I*P
i*csgn(I*e*x)^2*csgn(I*x)-I*Pi*csgn(I*e*x)*csgn(I*e)*csgn(I*x)+2*ln(e)+2*ln
(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError
```

Fricas [B] time = 1.40443, size = 6376, normalized size = 30.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] ((B*b*d^3*m^5 + 5*B*b*d^3*m^4 + 10*B*b*d^3*m^3 + 10*B*b*d^3*m^2 + 5*B*b*d^3
*m + B*b*d^3 + 24*(B*b*d^3*m + B*b*d^3)*n^4 + 50*(B*b*d^3*m^2 + 2*B*b*d^3*m
 + B*b*d^3)*n^3 + 35*(B*b*d^3*m^3 + 3*B*b*d^3*m^2 + 3*B*b*d^3*m + B*b*d^3)*
n^2 + 10*(B*b*d^3*m^4 + 4*B*b*d^3*m^3 + 6*B*b*d^3*m^2 + 4*B*b*d^3*m + B*b*d
^3)*n)*x*x^(5*n)*e^(m*log(e) + m*log(x)) + ((3*B*b*c*d^2 + (B*a + A*b)*d^3)
*m^5 + 3*B*b*c*d^2 + 5*(3*B*b*c*d^2 + (B*a + A*b)*d^3)*m^4 + 30*(3*B*b*c*d^
2 + (B*a + A*b)*d^3 + (3*B*b*c*d^2 + (B*a + A*b)*d^3)*m)*n^4 + (B*a + A*b)*
d^3 + 10*(3*B*b*c*d^2 + (B*a + A*b)*d^3)*m^3 + 61*(3*B*b*c*d^2 + (B*a + A*b
)*d^3 + (3*B*b*c*d^2 + (B*a + A*b)*d^3)*m^2 + 2*(3*B*b*c*d^2 + (B*a + A*b)*
d^3)*m)*n^3 + 10*(3*B*b*c*d^2 + (B*a + A*b)*d^3)*m^2 + 41*(3*B*b*c*d^2 + (B
*a + A*b)*d^3 + (3*B*b*c*d^2 + (B*a + A*b)*d^3)*m^3 + 3*(3*B*b*c*d^2 + (B*a
```

```
 + A*b)*d^3)*m^2 + 3*(3*B*b*c*d^2 + (B*a + A*b)*d^3)*m)*n^2 + 5*(3*B*b*c*d^
2 + (B*a + A*b)*d^3)*m + 11*(3*B*b*c*d^2 + (3*B*b*c*d^2 + (B*a + A*b)*d^3)*
m^4 + (B*a + A*b)*d^3 + 4*(3*B*b*c*d^2 + (B*a + A*b)*d^3)*m^3 + 6*(3*B*b*c*
d^2 + (B*a + A*b)*d^3)*m^2 + 4*(3*B*b*c*d^2 + (B*a + A*b)*d^3)*m)*n)*x*x^(4
*n)*e^(m*log(e) + m*log(x)) + ((3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2
)*m^5 + 3*B*b*c^2*d + A*a*d^3 + 5*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*
d^2)*m^4 + 40*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2 + (3*B*b*c^2*d +
 A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m)*n^4 + 3*(B*a + A*b)*c*d^2 + 10*(3*B*b*c^
2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^3 + 78*(3*B*b*c^2*d + A*a*d^3 + 3*(B
*a + A*b)*c*d^2 + (3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^2 + 2*(3*
B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m)*n^3 + 10*(3*B*b*c^2*d + A*a*d
^3 + 3*(B*a + A*b)*c*d^2)*m^2 + 49*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c
*d^2 + (3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^3 + 3*(3*B*b*c^2*d +
 A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^2 + 3*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A
*b)*c*d^2)*m)*n^2 + 5*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m + 12*
(3*B*b*c^2*d + A*a*d^3 + (3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^4
+ 3*(B*a + A*b)*c*d^2 + 4*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^3
 + 6*(3*B*b*c^2*d + A*a*d^3 + 3*(B*a + A*b)*c*d^2)*m^2 + 4*(3*B*b*c^2*d + A
*a*d^3 + 3*(B*a + A*b)*c*d^2)*m)*n)*x*x^(3*n)*e^(m*log(e) + m*log(x)) + ((B
*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^5 + B*b*c^3 + 3*A*a*c*d^2 + 5
*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^4 + 60*(B*b*c^3 + 3*A*a*c*
d^2 + 3*(B*a + A*b)*c^2*d + (B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m
)*n^4 + 3*(B*a + A*b)*c^2*d + 10*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2
*d)*m^3 + 107*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d + (B*b*c^3 + 3*A
*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^2 + 2*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A
*b)*c^2*d)*m)*n^3 + 10*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^2 +
59*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d + (B*b*c^3 + 3*A*a*c*d^2 +
3*(B*a + A*b)*c^2*d)*m^3 + 3*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*
m^2 + 3*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m)*n^2 + 5*(B*b*c^3 +
 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m + 13*(B*b*c^3 + 3*A*a*c*d^2 + (B*b*c^
3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^4 + 3*(B*a + A*b)*c^2*d + 4*(B*b*c
^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m^3 + 6*(B*b*c^3 + 3*A*a*c*d^2 + 3*
(B*a + A*b)*c^2*d)*m^2 + 4*(B*b*c^3 + 3*A*a*c*d^2 + 3*(B*a + A*b)*c^2*d)*m)
*n)*x*x^(2*n)*e^(m*log(e) + m*log(x)) + ((3*A*a*c^2*d + (B*a + A*b)*c^3)*m^
5 + 3*A*a*c^2*d + 5*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m^4 + 120*(3*A*a*c^2*d
+ (B*a + A*b)*c^3 + (3*A*a*c^2*d + (B*a + A*b)*c^3)*m)*n^4 + (B*a + A*b)*c^
3 + 10*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m^3 + 154*(3*A*a*c^2*d + (B*a + A*b)
*c^3 + (3*A*a*c^2*d + (B*a + A*b)*c^3)*m^2 + 2*(3*A*a*c^2*d + (B*a + A*b)*c
^3)*m)*n^3 + 10*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m^2 + 71*(3*A*a*c^2*d + (B*
a + A*b)*c^3 + (3*A*a*c^2*d + (B*a + A*b)*c^3)*m^3 + 3*(3*A*a*c^2*d + (B*a
+ A*b)*c^3)*m^2 + 3*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m)*n^2 + 5*(3*A*a*c^2*d
 + (B*a + A*b)*c^3)*m + 14*(3*A*a*c^2*d + (3*A*a*c^2*d + (B*a + A*b)*c^3)*m
^4 + (B*a + A*b)*c^3 + 4*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m^3 + 6*(3*A*a*c^2
*d + (B*a + A*b)*c^3)*m^2 + 4*(3*A*a*c^2*d + (B*a + A*b)*c^3)*m)*n)*x*x^n*e
^(m*log(e) + m*log(x)) + (A*a*c^3*m^5 + 120*A*a*c^3*n^5 + 5*A*a*c^3*m^4 + 1
0*A*a*c^3*m^3 + 10*A*a*c^3*m^2 + 5*A*a*c^3*m + A*a*c^3 + 274*(A*a*c^3*m + A
*a*c^3)*n^4 + 225*(A*a*c^3*m^2 + 2*A*a*c^3*m + A*a*c^3)*n^3 + 85*(A*a*c^3*m
^3 + 3*A*a*c^3*m^2 + 3*A*a*c^3*m + A*a*c^3)*n^2 + 15*(A*a*c^3*m^4 + 4*A*a*c
^3*m^3 + 6*A*a*c^3*m^2 + 4*A*a*c^3*m + A*a*c^3)*n)*x*e^(m*log(e) + m*log(x)
))/(m^6 + 120*(m + 1)*n^5 + 6*m^5 + 274*(m^2 + 2*m + 1)*n^4 + 15*m^4 + 225*
(m^3 + 3*m^2 + 3*m + 1)*n^3 + 20*m^3 + 85*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*n
^2 + 15*m^2 + 15*(m^5 + 5*m^4 + 10*m^3 + 10*m^2 + 5*m + 1)*n + 6*m + 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.26713, size = 9351, normalized size = 44.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*b*d^3*m^5*x*x^m*x^(5*n)*e^m + 10*B*b*d^3*m^4*n*x*x^m*x^(5*n)*e^m + 35*B*
b*d^3*m^3*n^2*x*x^m*x^(5*n)*e^m + 50*B*b*d^3*m^2*n^3*x*x^m*x^(5*n)*e^m + 24
*B*b*d^3*m*n^4*x*x^m*x^(5*n)*e^m + 3*B*b*c*d^2*m^5*x*x^m*x^(4*n)*e^m + B*a*
d^3*m^5*x*x^m*x^(4*n)*e^m + A*b*d^3*m^5*x*x^m*x^(4*n)*e^m + 33*B*b*c*d^2*m^
4*n*x*x^m*x^(4*n)*e^m + 11*B*a*d^3*m^4*n*x*x^m*x^(4*n)*e^m + 11*A*b*d^3*m^4
*n*x*x^m*x^(4*n)*e^m + 123*B*b*c*d^2*m^3*n^2*x*x^m*x^(4*n)*e^m + 41*B*a*d^3
*m^3*n^2*x*x^m*x^(4*n)*e^m + 41*A*b*d^3*m^3*n^2*x*x^m*x^(4*n)*e^m + 183*B*b
*c*d^2*m^2*n^3*x*x^m*x^(4*n)*e^m + 61*B*a*d^3*m^2*n^3*x*x^m*x^(4*n)*e^m + 6
1*A*b*d^3*m^2*n^3*x*x^m*x^(4*n)*e^m + 90*B*b*c*d^2*m*n^4*x*x^m*x^(4*n)*e^m
+ 30*B*a*d^3*m*n^4*x*x^m*x^(4*n)*e^m + 30*A*b*d^3*m*n^4*x*x^m*x^(4*n)*e^m +
 3*B*b*c^2*d*m^5*x*x^m*x^(3*n)*e^m + 3*B*a*c*d^2*m^5*x*x^m*x^(3*n)*e^m + 3*
A*b*c*d^2*m^5*x*x^m*x^(3*n)*e^m + A*a*d^3*m^5*x*x^m*x^(3*n)*e^m + 36*B*b*c^
2*d*m^4*n*x*x^m*x^(3*n)*e^m + 36*B*a*c*d^2*m^4*n*x*x^m*x^(3*n)*e^m + 36*A*b
*c*d^2*m^4*n*x*x^m*x^(3*n)*e^m + 12*A*a*d^3*m^4*n*x*x^m*x^(3*n)*e^m + 147*B
*b*c^2*d*m^3*n^2*x*x^m*x^(3*n)*e^m + 147*B*a*c*d^2*m^3*n^2*x*x^m*x^(3*n)*e^
m + 147*A*b*c*d^2*m^3*n^2*x*x^m*x^(3*n)*e^m + 49*A*a*d^3*m^3*n^2*x*x^m*x^(3
*n)*e^m + 234*B*b*c^2*d*m^2*n^3*x*x^m*x^(3*n)*e^m + 234*B*a*c*d^2*m^2*n^3*x
*x^m*x^(3*n)*e^m + 234*A*b*c*d^2*m^2*n^3*x*x^m*x^(3*n)*e^m + 78*A*a*d^3*m^2
*n^3*x*x^m*x^(3*n)*e^m + 120*B*b*c^2*d*m*n^4*x*x^m*x^(3*n)*e^m + 120*B*a*c*
d^2*m*n^4*x*x^m*x^(3*n)*e^m + 120*A*b*c*d^2*m*n^4*x*x^m*x^(3*n)*e^m + 40*A*
a*d^3*m*n^4*x*x^m*x^(3*n)*e^m + B*b*c^3*m^5*x*x^m*x^(2*n)*e^m + 3*B*a*c^2*d
*m^5*x*x^m*x^(2*n)*e^m + 3*A*b*c^2*d*m^5*x*x^m*x^(2*n)*e^m + 3*A*a*c*d^2*m^
5*x*x^m*x^(2*n)*e^m + 13*B*b*c^3*m^4*n*x*x^m*x^(2*n)*e^m + 39*B*a*c^2*d*m^4
*n*x*x^m*x^(2*n)*e^m + 39*A*b*c^2*d*m^4*n*x*x^m*x^(2*n)*e^m + 39*A*a*c*d^2*
m^4*n*x*x^m*x^(2*n)*e^m + 59*B*b*c^3*m^3*n^2*x*x^m*x^(2*n)*e^m + 177*B*a*c^
2*d*m^3*n^2*x*x^m*x^(2*n)*e^m + 177*A*b*c^2*d*m^3*n^2*x*x^m*x^(2*n)*e^m + 1
77*A*a*c*d^2*m^3*n^2*x*x^m*x^(2*n)*e^m + 107*B*b*c^3*m^2*n^3*x*x^m*x^(2*n)*
e^m + 321*B*a*c^2*d*m^2*n^3*x*x^m*x^(2*n)*e^m + 321*A*b*c^2*d*m^2*n^3*x*x^m
*x^(2*n)*e^m + 321*A*a*c*d^2*m^2*n^3*x*x^m*x^(2*n)*e^m + 60*B*b*c^3*m*n^4*x
*x^m*x^(2*n)*e^m + 180*B*a*c^2*d*m*n^4*x*x^m*x^(2*n)*e^m + 180*A*b*c^2*d*m*
n^4*x*x^m*x^(2*n)*e^m + 180*A*a*c*d^2*m*n^4*x*x^m*x^(2*n)*e^m + B*a*c^3*m^5
*x*x^m*x^n*e^m + A*b*c^3*m^5*x*x^m*x^n*e^m + 3*A*a*c^2*d*m^5*x*x^m*x^n*e^m
+ 14*B*a*c^3*m^4*n*x*x^m*x^n*e^m + 14*A*b*c^3*m^4*n*x*x^m*x^n*e^m + 42*A*a*
c^2*d*m^4*n*x*x^m*x^n*e^m + 71*B*a*c^3*m^3*n^2*x*x^m*x^n*e^m + 71*A*b*c^3*m
^3*n^2*x*x^m*x^n*e^m + 213*A*a*c^2*d*m^3*n^2*x*x^m*x^n*e^m + 154*B*a*c^3*m^
2*n^3*x*x^m*x^n*e^m + 154*A*b*c^3*m^2*n^3*x*x^m*x^n*e^m + 462*A*a*c^2*d*m^2
*n^3*x*x^m*x^n*e^m + 120*B*a*c^3*m*n^4*x*x^m*x^n*e^m + 120*A*b*c^3*m*n^4*x*
x^m*x^n*e^m + 360*A*a*c^2*d*m*n^4*x*x^m*x^n*e^m + A*a*c^3*m^5*x*x^m*e^m + 1
5*A*a*c^3*m^4*n*x*x^m*e^m + 85*A*a*c^3*m^3*n^2*x*x^m*e^m + 225*A*a*c^3*m^2*
n^3*x*x^m*e^m + 274*A*a*c^3*m*n^4*x*x^m*e^m + 120*A*a*c^3*n^5*x*x^m*e^m + 5
*B*b*d^3*m^4*x*x^m*x^(5*n)*e^m + 40*B*b*d^3*m^3*n*x*x^m*x^(5*n)*e^m + 105*B
*b*d^3*m^2*n^2*x*x^m*x^(5*n)*e^m + 100*B*b*d^3*m*n^3*x*x^m*x^(5*n)*e^m + 24
*B*b*d^3*n^4*x*x^m*x^(5*n)*e^m + 15*B*b*c*d^2*m^4*x*x^m*x^(4*n)*e^m + 5*B*a
*d^3*m^4*x*x^m*x^(4*n)*e^m + 5*A*b*d^3*m^4*x*x^m*x^(4*n)*e^m + 132*B*b*c*d^
2*m^3*n*x*x^m*x^(4*n)*e^m + 44*B*a*d^3*m^3*n*x*x^m*x^(4*n)*e^m + 44*A*b*d^3
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*m^3*n*x*x^m*x^(4*n)*e^m + 369*B*b*c*d^2*m^2*n^2*x*x^m*x^(4*n)*e^m + 123*B*
a*d^3*m^2*n^2*x*x^m*x^(4*n)*e^m + 123*A*b*d^3*m^2*n^2*x*x^m*x^(4*n)*e^m + 3
66*B*b*c*d^2*m*n^3*x*x^m*x^(4*n)*e^m + 122*B*a*d^3*m*n^3*x*x^m*x^(4*n)*e^m
+ 122*A*b*d^3*m*n^3*x*x^m*x^(4*n)*e^m + 90*B*b*c*d^2*n^4*x*x^m*x^(4*n)*e^m
+ 30*B*a*d^3*n^4*x*x^m*x^(4*n)*e^m + 30*A*b*d^3*n^4*x*x^m*x^(4*n)*e^m + 15*
B*b*c^2*d*m^4*x*x^m*x^(3*n)*e^m + 15*B*a*c*d^2*m^4*x*x^m*x^(3*n)*e^m + 15*A
*b*c*d^2*m^4*x*x^m*x^(3*n)*e^m + 5*A*a*d^3*m^4*x*x^m*x^(3*n)*e^m + 144*B*b*
c^2*d*m^3*n*x*x^m*x^(3*n)*e^m + 144*B*a*c*d^2*m^3*n*x*x^m*x^(3*n)*e^m + 144
*A*b*c*d^2*m^3*n*x*x^m*x^(3*n)*e^m + 48*A*a*d^3*m^3*n*x*x^m*x^(3*n)*e^m + 4
41*B*b*c^2*d*m^2*n^2*x*x^m*x^(3*n)*e^m + 441*B*a*c*d^2*m^2*n^2*x*x^m*x^(3*n
)*e^m + 441*A*b*c*d^2*m^2*n^2*x*x^m*x^(3*n)*e^m + 147*A*a*d^3*m^2*n^2*x*x^m
*x^(3*n)*e^m + 468*B*b*c^2*d*m*n^3*x*x^m*x^(3*n)*e^m + 468*B*a*c*d^2*m*n^3*
x*x^m*x^(3*n)*e^m + 468*A*b*c*d^2*m*n^3*x*x^m*x^(3*n)*e^m + 156*A*a*d^3*m*n
^3*x*x^m*x^(3*n)*e^m + 120*B*b*c^2*d*n^4*x*x^m*x^(3*n)*e^m + 120*B*a*c*d^2*
n^4*x*x^m*x^(3*n)*e^m + 120*A*b*c*d^2*n^4*x*x^m*x^(3*n)*e^m + 40*A*a*d^3*n^
4*x*x^m*x^(3*n)*e^m + 5*B*b*c^3*m^4*x*x^m*x^(2*n)*e^m + 15*B*a*c^2*d*m^4*x*
x^m*x^(2*n)*e^m + 15*A*b*c^2*d*m^4*x*x^m*x^(2*n)*e^m + 15*A*a*c*d^2*m^4*x*x
^m*x^(2*n)*e^m + 52*B*b*c^3*m^3*n*x*x^m*x^(2*n)*e^m + 156*B*a*c^2*d*m^3*n*x
*x^m*x^(2*n)*e^m + 156*A*b*c^2*d*m^3*n*x*x^m*x^(2*n)*e^m + 156*A*a*c*d^2*m^
3*n*x*x^m*x^(2*n)*e^m + 177*B*b*c^3*m^2*n^2*x*x^m*x^(2*n)*e^m + 531*B*a*c^2
*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 531*A*b*c^2*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 53
1*A*a*c*d^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 214*B*b*c^3*m*n^3*x*x^m*x^(2*n)*e^m
 + 642*B*a*c^2*d*m*n^3*x*x^m*x^(2*n)*e^m + 642*A*b*c^2*d*m*n^3*x*x^m*x^(2*n
)*e^m + 642*A*a*c*d^2*m*n^3*x*x^m*x^(2*n)*e^m + 60*B*b*c^3*n^4*x*x^m*x^(2*n
)*e^m + 180*B*a*c^2*d*n^4*x*x^m*x^(2*n)*e^m + 180*A*b*c^2*d*n^4*x*x^m*x^(2*
n)*e^m + 180*A*a*c*d^2*n^4*x*x^m*x^(2*n)*e^m + 5*B*a*c^3*m^4*x*x^m*x^n*e^m
+ 5*A*b*c^3*m^4*x*x^m*x^n*e^m + 15*A*a*c^2*d*m^4*x*x^m*x^n*e^m + 56*B*a*c^3
*m^3*n*x*x^m*x^n*e^m + 56*A*b*c^3*m^3*n*x*x^m*x^n*e^m + 168*A*a*c^2*d*m^3*n
*x*x^m*x^n*e^m + 213*B*a*c^3*m^2*n^2*x*x^m*x^n*e^m + 213*A*b*c^3*m^2*n^2*x*
x^m*x^n*e^m + 639*A*a*c^2*d*m^2*n^2*x*x^m*x^n*e^m + 308*B*a*c^3*m*n^3*x*x^m
*x^n*e^m + 308*A*b*c^3*m*n^3*x*x^m*x^n*e^m + 924*A*a*c^2*d*m*n^3*x*x^m*x^n*
e^m + 120*B*a*c^3*n^4*x*x^m*x^n*e^m + 120*A*b*c^3*n^4*x*x^m*x^n*e^m + 360*A
*a*c^2*d*n^4*x*x^m*x^n*e^m + 5*A*a*c^3*m^4*x*x^m*e^m + 60*A*a*c^3*m^3*n*x*x
^m*e^m + 255*A*a*c^3*m^2*n^2*x*x^m*e^m + 450*A*a*c^3*m*n^3*x*x^m*e^m + 274*
A*a*c^3*n^4*x*x^m*e^m + 10*B*b*d^3*m^3*x*x^m*x^(5*n)*e^m + 60*B*b*d^3*m^2*n
*x*x^m*x^(5*n)*e^m + 105*B*b*d^3*m*n^2*x*x^m*x^(5*n)*e^m + 50*B*b*d^3*n^3*x
*x^m*x^(5*n)*e^m + 30*B*b*c*d^2*m^3*x*x^m*x^(4*n)*e^m + 10*B*a*d^3*m^3*x*x^
m*x^(4*n)*e^m + 10*A*b*d^3*m^3*x*x^m*x^(4*n)*e^m + 198*B*b*c*d^2*m^2*n*x*x^
m*x^(4*n)*e^m + 66*B*a*d^3*m^2*n*x*x^m*x^(4*n)*e^m + 66*A*b*d^3*m^2*n*x*x^m
*x^(4*n)*e^m + 369*B*b*c*d^2*m*n^2*x*x^m*x^(4*n)*e^m + 123*B*a*d^3*m*n^2*x*
x^m*x^(4*n)*e^m + 123*A*b*d^3*m*n^2*x*x^m*x^(4*n)*e^m + 183*B*b*c*d^2*n^3*x
*x^m*x^(4*n)*e^m + 61*B*a*d^3*n^3*x*x^m*x^(4*n)*e^m + 61*A*b*d^3*n^3*x*x^m*
x^(4*n)*e^m + 30*B*b*c^2*d*m^3*x*x^m*x^(3*n)*e^m + 30*B*a*c*d^2*m^3*x*x^m*x
^(3*n)*e^m + 30*A*b*c*d^2*m^3*x*x^m*x^(3*n)*e^m + 10*A*a*d^3*m^3*x*x^m*x^(3
*n)*e^m + 216*B*b*c^2*d*m^2*n*x*x^m*x^(3*n)*e^m + 216*B*a*c*d^2*m^2*n*x*x^m
*x^(3*n)*e^m + 216*A*b*c*d^2*m^2*n*x*x^m*x^(3*n)*e^m + 72*A*a*d^3*m^2*n*x*x
^m*x^(3*n)*e^m + 441*B*b*c^2*d*m*n^2*x*x^m*x^(3*n)*e^m + 441*B*a*c*d^2*m*n^
2*x*x^m*x^(3*n)*e^m + 441*A*b*c*d^2*m*n^2*x*x^m*x^(3*n)*e^m + 147*A*a*d^3*m
*n^2*x*x^m*x^(3*n)*e^m + 234*B*b*c^2*d*n^3*x*x^m*x^(3*n)*e^m + 234*B*a*c*d^
2*n^3*x*x^m*x^(3*n)*e^m + 234*A*b*c*d^2*n^3*x*x^m*x^(3*n)*e^m + 78*A*a*d^3*
n^3*x*x^m*x^(3*n)*e^m + 10*B*b*c^3*m^3*x*x^m*x^(2*n)*e^m + 30*B*a*c^2*d*m^3
*x*x^m*x^(2*n)*e^m + 30*A*b*c^2*d*m^3*x*x^m*x^(2*n)*e^m + 30*A*a*c*d^2*m^3*
x*x^m*x^(2*n)*e^m + 78*B*b*c^3*m^2*n*x*x^m*x^(2*n)*e^m + 234*B*a*c^2*d*m^2*
n*x*x^m*x^(2*n)*e^m + 234*A*b*c^2*d*m^2*n*x*x^m*x^(2*n)*e^m + 234*A*a*c*d^2
*m^2*n*x*x^m*x^(2*n)*e^m + 177*B*b*c^3*m*n^2*x*x^m*x^(2*n)*e^m + 531*B*a*c^
2*d*m*n^2*x*x^m*x^(2*n)*e^m + 531*A*b*c^2*d*m*n^2*x*x^m*x^(2*n)*e^m + 531*A
*a*c*d^2*m*n^2*x*x^m*x^(2*n)*e^m + 107*B*b*c^3*n^3*x*x^m*x^(2*n)*e^m + 321*
B*a*c^2*d*n^3*x*x^m*x^(2*n)*e^m + 321*A*b*c^2*d*n^3*x*x^m*x^(2*n)*e^m + 321
*A*a*c*d^2*n^3*x*x^m*x^(2*n)*e^m + 10*B*a*c^3*m^3*x*x^m*x^n*e^m + 10*A*b*c^
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3*m^3*x*x^m*x^n*e^m + 30*A*a*c^2*d*m^3*x*x^m*x^n*e^m + 84*B*a*c^3*m^2*n*x*x
^m*x^n*e^m + 84*A*b*c^3*m^2*n*x*x^m*x^n*e^m + 252*A*a*c^2*d*m^2*n*x*x^m*x^n
*e^m + 213*B*a*c^3*m*n^2*x*x^m*x^n*e^m + 213*A*b*c^3*m*n^2*x*x^m*x^n*e^m +
639*A*a*c^2*d*m*n^2*x*x^m*x^n*e^m + 154*B*a*c^3*n^3*x*x^m*x^n*e^m + 154*A*b
*c^3*n^3*x*x^m*x^n*e^m + 462*A*a*c^2*d*n^3*x*x^m*x^n*e^m + 10*A*a*c^3*m^3*x
*x^m*e^m + 90*A*a*c^3*m^2*n*x*x^m*e^m + 255*A*a*c^3*m*n^2*x*x^m*e^m + 225*A
*a*c^3*n^3*x*x^m*e^m + 10*B*b*d^3*m^2*x*x^m*x^(5*n)*e^m + 40*B*b*d^3*m*n*x*
x^m*x^(5*n)*e^m + 35*B*b*d^3*n^2*x*x^m*x^(5*n)*e^m + 30*B*b*c*d^2*m^2*x*x^m
*x^(4*n)*e^m + 10*B*a*d^3*m^2*x*x^m*x^(4*n)*e^m + 10*A*b*d^3*m^2*x*x^m*x^(4
*n)*e^m + 132*B*b*c*d^2*m*n*x*x^m*x^(4*n)*e^m + 44*B*a*d^3*m*n*x*x^m*x^(4*n
)*e^m + 44*A*b*d^3*m*n*x*x^m*x^(4*n)*e^m + 123*B*b*c*d^2*n^2*x*x^m*x^(4*n)*
e^m + 41*B*a*d^3*n^2*x*x^m*x^(4*n)*e^m + 41*A*b*d^3*n^2*x*x^m*x^(4*n)*e^m +
 30*B*b*c^2*d*m^2*x*x^m*x^(3*n)*e^m + 30*B*a*c*d^2*m^2*x*x^m*x^(3*n)*e^m +
30*A*b*c*d^2*m^2*x*x^m*x^(3*n)*e^m + 10*A*a*d^3*m^2*x*x^m*x^(3*n)*e^m + 144
*B*b*c^2*d*m*n*x*x^m*x^(3*n)*e^m + 144*B*a*c*d^2*m*n*x*x^m*x^(3*n)*e^m + 14
4*A*b*c*d^2*m*n*x*x^m*x^(3*n)*e^m + 48*A*a*d^3*m*n*x*x^m*x^(3*n)*e^m + 147*
B*b*c^2*d*n^2*x*x^m*x^(3*n)*e^m + 147*B*a*c*d^2*n^2*x*x^m*x^(3*n)*e^m + 147
*A*b*c*d^2*n^2*x*x^m*x^(3*n)*e^m + 49*A*a*d^3*n^2*x*x^m*x^(3*n)*e^m + 10*B*
b*c^3*m^2*x*x^m*x^(2*n)*e^m + 30*B*a*c^2*d*m^2*x*x^m*x^(2*n)*e^m + 30*A*b*c
^2*d*m^2*x*x^m*x^(2*n)*e^m + 30*A*a*c*d^2*m^2*x*x^m*x^(2*n)*e^m + 52*B*b*c^
3*m*n*x*x^m*x^(2*n)*e^m + 156*B*a*c^2*d*m*n*x*x^m*x^(2*n)*e^m + 156*A*b*c^2
*d*m*n*x*x^m*x^(2*n)*e^m + 156*A*a*c*d^2*m*n*x*x^m*x^(2*n)*e^m + 59*B*b*c^3
*n^2*x*x^m*x^(2*n)*e^m + 177*B*a*c^2*d*n^2*x*x^m*x^(2*n)*e^m + 177*A*b*c^2*
d*n^2*x*x^m*x^(2*n)*e^m + 177*A*a*c*d^2*n^2*x*x^m*x^(2*n)*e^m + 10*B*a*c^3*
m^2*x*x^m*x^n*e^m + 10*A*b*c^3*m^2*x*x^m*x^n*e^m + 30*A*a*c^2*d*m^2*x*x^m*x
^n*e^m + 56*B*a*c^3*m*n*x*x^m*x^n*e^m + 56*A*b*c^3*m*n*x*x^m*x^n*e^m + 168*
A*a*c^2*d*m*n*x*x^m*x^n*e^m + 71*B*a*c^3*n^2*x*x^m*x^n*e^m + 71*A*b*c^3*n^2
*x*x^m*x^n*e^m + 213*A*a*c^2*d*n^2*x*x^m*x^n*e^m + 10*A*a*c^3*m^2*x*x^m*e^m
 + 60*A*a*c^3*m*n*x*x^m*e^m + 85*A*a*c^3*n^2*x*x^m*e^m + 5*B*b*d^3*m*x*x^m*
x^(5*n)*e^m + 10*B*b*d^3*n*x*x^m*x^(5*n)*e^m + 15*B*b*c*d^2*m*x*x^m*x^(4*n)
*e^m + 5*B*a*d^3*m*x*x^m*x^(4*n)*e^m + 5*A*b*d^3*m*x*x^m*x^(4*n)*e^m + 33*B
*b*c*d^2*n*x*x^m*x^(4*n)*e^m + 11*B*a*d^3*n*x*x^m*x^(4*n)*e^m + 11*A*b*d^3*
n*x*x^m*x^(4*n)*e^m + 15*B*b*c^2*d*m*x*x^m*x^(3*n)*e^m + 15*B*a*c*d^2*m*x*x
^m*x^(3*n)*e^m + 15*A*b*c*d^2*m*x*x^m*x^(3*n)*e^m + 5*A*a*d^3*m*x*x^m*x^(3*
n)*e^m + 36*B*b*c^2*d*n*x*x^m*x^(3*n)*e^m + 36*B*a*c*d^2*n*x*x^m*x^(3*n)*e^
m + 36*A*b*c*d^2*n*x*x^m*x^(3*n)*e^m + 12*A*a*d^3*n*x*x^m*x^(3*n)*e^m + 5*B
*b*c^3*m*x*x^m*x^(2*n)*e^m + 15*B*a*c^2*d*m*x*x^m*x^(2*n)*e^m + 15*A*b*c^2*
d*m*x*x^m*x^(2*n)*e^m + 15*A*a*c*d^2*m*x*x^m*x^(2*n)*e^m + 13*B*b*c^3*n*x*x
^m*x^(2*n)*e^m + 39*B*a*c^2*d*n*x*x^m*x^(2*n)*e^m + 39*A*b*c^2*d*n*x*x^m*x^
(2*n)*e^m + 39*A*a*c*d^2*n*x*x^m*x^(2*n)*e^m + 5*B*a*c^3*m*x*x^m*x^n*e^m +
5*A*b*c^3*m*x*x^m*x^n*e^m + 15*A*a*c^2*d*m*x*x^m*x^n*e^m + 14*B*a*c^3*n*x*x
^m*x^n*e^m + 14*A*b*c^3*n*x*x^m*x^n*e^m + 42*A*a*c^2*d*n*x*x^m*x^n*e^m + 5*
A*a*c^3*m*x*x^m*e^m + 15*A*a*c^3*n*x*x^m*e^m + B*b*d^3*x*x^m*x^(5*n)*e^m +
3*B*b*c*d^2*x*x^m*x^(4*n)*e^m + B*a*d^3*x*x^m*x^(4*n)*e^m + A*b*d^3*x*x^m*x
^(4*n)*e^m + 3*B*b*c^2*d*x*x^m*x^(3*n)*e^m + 3*B*a*c*d^2*x*x^m*x^(3*n)*e^m
+ 3*A*b*c*d^2*x*x^m*x^(3*n)*e^m + A*a*d^3*x*x^m*x^(3*n)*e^m + B*b*c^3*x*x^m
*x^(2*n)*e^m + 3*B*a*c^2*d*x*x^m*x^(2*n)*e^m + 3*A*b*c^2*d*x*x^m*x^(2*n)*e^
m + 3*A*a*c*d^2*x*x^m*x^(2*n)*e^m + B*a*c^3*x*x^m*x^n*e^m + A*b*c^3*x*x^m*x
^n*e^m + 3*A*a*c^2*d*x*x^m*x^n*e^m + A*a*c^3*x*x^m*e^m)/(m^6 + 15*m^5*n + 8
5*m^4*n^2 + 225*m^3*n^3 + 274*m^2*n^4 + 120*m*n^5 + 6*m^5 + 75*m^4*n + 340*
m^3*n^2 + 675*m^2*n^3 + 548*m*n^4 + 120*n^5 + 15*m^4 + 150*m^3*n + 510*m^2*
n^2 + 675*m*n^3 + 274*n^4 + 20*m^3 + 150*m^2*n + 340*m*n^2 + 225*n^3 + 15*m
^2 + 75*m*n + 85*n^2 + 6*m + 15*n + 1)
```

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

Optimal. Leaf size=137

$$\frac{c^2x^{n+1}(ex)^m(3Ad+Bc)}{m+n+1}+\frac{d^2x^{3n+1}(ex)^m(Ad+3Bc)}{m+3n+1}+\frac{3cdx^{2n+1}(ex)^m(Ad+Bc)}{m+2n+1}+\frac{Ac^3(ex)^{m+1}}{e(m+1)}+\frac{Bd^3x^{4n+1}(ex)^m}{m+4n+1}$$

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

Rubi [A] time = 0.110753, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {448, 20, 30}

$$\frac{c^2x^{n+1}(ex)^m(3Ad+Bc)}{m+n+1}+\frac{d^2x^{3n+1}(ex)^m(Ad+3Bc)}{m+3n+1}+\frac{3cdx^{2n+1}(ex)^m(Ad+Bc)}{m+2n+1}+\frac{Ac^3(ex)^{m+1}}{e(m+1)}+\frac{Bd^3x^{4n+1}(ex)^m}{m+4n+1}$$

Antiderivative was successfully verified.

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


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


Rule 448

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(e*x)^m*(a + b*x^n)^p*(c + d*x^
n)^q, x], x] /; FreeQ[{a, b, c, d, e, m, n}, x] && NeQ[b*c - a*d, 0] && IGt
Q[p, 0] && IGtQ[q, 0]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rubi steps

$$\int (ex)^m (A + Bx^n) (c + dx^n)^3 \, dx = \int \left(Ac^3(ex)^m + c^2(Bc + 3Ad)x^n(ex)^m + 3cd(Bc + Ad)x^{2n}(ex)^m + d^2(3Bc + Ad)x^{3n}(ex)\right.$$
$$= \frac{Ac^3(ex)^{1+m}}{e(1+m)} + \left(Bd^3\right) \int x^{4n}(ex)^m \, dx + (3cd(Bc + Ad)) \int x^{2n}(ex)^m \, dx + \left(d^2(3Bc + Ad)\right.$$
$$= \frac{Ac^3(ex)^{1+m}}{e(1+m)} + \left(Bd^3x^{-m}(ex)^m\right) \int x^{m+4n} \, dx + \left(3cd(Bc + Ad)x^{-m}(ex)^m\right) \int x^{m+2n} \, dx + (\ldots$$
$$= \frac{c^2(Bc + 3Ad)x^{1+n}(ex)^m}{1 + m + n} + \frac{3cd(Bc + Ad)x^{1+2n}(ex)^m}{1 + m + 2n} + \frac{d^2(3Bc + Ad)x^{1+3n}(ex)^m}{1 + m + 3n} + \frac{Bd^3\ldots}{1\ldots}$$

Mathematica [A] time = 0.14954, size = 106, normalized size = 0.77

$$x(ex)^m \left(\frac{c^2x^n(3Ad + Bc)}{m + n + 1} + \frac{d^2x^{3n}(Ad + 3Bc)}{m + 3n + 1} + \frac{3cdx^{2n}(Ad + Bc)}{m + 2n + 1} + \frac{Ac^3}{m + 1} + \frac{Bd^3x^{4n}}{m + 4n + 1}\right)$$

Antiderivative was successfully verified.

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

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

Maple [C] time = 0.067, size = 1609, normalized size = 11.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] x*(42*B*c*d^2*n^2*(x^n)^3+12*A*c^2*d*m^3*x^n+72*A*c^2*d*n^3*x^n+18*A*c*d^2*
m^2*(x^n)^2+7*A*d^3*m^3*n*(x^n)^3+14*A*d^3*m^2*n^2*(x^n)^3+22*B*d^3*m*n^2*(
x^n)^4+21*B*c*d^2*m^3*n*(x^n)^3+42*B*c*d^2*m^2*n^2*(x^n)^3+24*B*c*d^2*m*n^3
*(x^n)^3+24*A*c*d^2*m^3*n*(x^n)^2+57*A*c*d^2*m^2*n^2*(x^n)^2+A*c^3+12*A*c*d
^2*(x^n)^2*m+24*A*c*d^2*(x^n)^2*n+27*B*c^3*m*n*x^n+12*B*c^2*d*(x^n)^2*m+10*
A*c^3*m^3*n+35*A*c^3*m^2*n^2+50*A*c^3*m*n^3+30*A*c^3*m^2*n+70*A*c^3*m*n^2+3
0*A*c^3*m*n+8*A*d^3*m*n^3*(x^n)^3+3*B*c*d^2*m^4*(x^n)^3+18*B*d^3*m^2*n*(x^n
)^4+6*B*d^3*m^3*n*(x^n)^4+11*B*d^3*m^2*n^2*(x^n)^4+6*B*d^3*m*n^3*(x^n)^4+18
*B*d^3*m*n*(x^n)^4+57*A*c*d^2*n^2*(x^n)^2+12*B*c*d^2*m^3*(x^n)^3+24*B*c*d^2
*n^3*(x^n)^3+3*A*c*d^2*m^4*(x^n)^2+21*A*d^3*m^2*n*(x^n)^3+28*A*d^3*m*n^2*(x
^n)^3+3*B*c^2*d*m^4*(x^n)^2+4*A*c^3*m+10*A*c^3*n+3*A*c^2*d*m^4*x^n+12*A*c*d
^2*m^3*(x^n)^2+36*A*c*d^2*n^3*(x^n)^2+21*A*d^3*m*n*(x^n)^3+(x^n)^4*B*d^3+x^
n*B*c^3+(x^n)^3*A*d^3+A*c^3*m^4+24*A*c^3*n^4+4*A*c^3*m^3+50*A*c^3*n^3+6*A*c
^3*m^2+35*A*c^3*n^2+24*B*c^3*m*n^3*x^n+12*B*c*d^2*(x^n)^3*m+21*B*c*d^2*(x^n
)^3*n+18*A*c^2*d*m^2*x^n+78*A*c^2*d*n^2*x^n+12*B*c^2*d*m^3*(x^n)^2+27*B*c^3
*m^2*n*x^n+52*B*c^3*m*n^2*x^n+18*B*c^2*d*m^2*(x^n)^2+57*B*c^2*d*n^2*(x^n)^2
+4*A*d^3*(x^n)^3*m+7*A*d^3*(x^n)^3*n+4*B*c^3*m^3*x^n+24*B*c^3*n^3*x^n+6*B*c
^3*m^2*x^n+9*B*c^3*m^3*n*x^n+26*B*c^3*m^2*n^2*x^n+4*B*d^3*m^3*(x^n)^4+6*B*d
^3*n^3*(x^n)^4+4*A*d^3*m^3*(x^n)^3+8*A*d^3*n^3*(x^n)^3+6*B*d^3*m^2*(x^n)^4+
B*c^3*m^4*x^n+4*m*B*d^3*(x^n)^4+6*B*d^3*(x^n)^4*n+B*d^3*m^4*(x^n)^4+A*d^3*m
^4*(x^n)^3+24*B*c^2*d*(x^n)^2*n+12*A*c^2*d*x^n*m+27*A*c^2*d*x^n*n+72*A*c^2*
d*m*n^3*x^n+72*A*c*d^2*m^2*n*(x^n)^2+114*A*c*d^2*m*n^2*(x^n)^2+72*B*c^2*d*m
^2*n*(x^n)^2+114*B*c^2*d*m*n^2*(x^n)^2+81*A*c^2*d*m*n*x^n+63*B*c*d^2*m*n*(x
```

```
^n)^3+81*A*c^2*d*m^2*n*x^n+26*B*c^3*n^2*x^n+3*B*c*d^2*(x^n)^3+3*A*c*d^2*(x^
n)^2+4*B*c^3*x^n*m+9*B*c^3*x^n*n+3*B*c^2*d*(x^n)^2+3*A*c^2*d*x^n+11*B*d^3*n
^2*(x^n)^4+6*A*d^3*m^2*(x^n)^3+14*A*d^3*n^2*(x^n)^3+36*B*c^2*d*n^3*(x^n)^2+
18*B*c*d^2*m^2*(x^n)^3+72*B*c^2*d*m*n*(x^n)^2+36*A*c*d^2*m*n^3*(x^n)^2+24*B
*c^2*d*m^3*n*(x^n)^2+57*B*c^2*d*m^2*n^2*(x^n)^2+36*B*c^2*d*m*n^3*(x^n)^2+63
*B*c*d^2*m^2*n*(x^n)^3+84*B*c*d^2*m*n^2*(x^n)^3+27*A*c^2*d*m^3*n*x^n+78*A*c
^2*d*m^2*n^2*x^n+156*A*c^2*d*m*n^2*x^n+72*A*c*d^2*m*n*(x^n)^2)/(1+m)/(m+n+1
)/(1+m+2*n)/(1+m+3*n)/(1+m+4*n)*exp(1/2*m*(-I*Pi*csgn(I*e*x)^3+I*Pi*csgn(I*
e*x)^2*csgn(I*e)+I*Pi*csgn(I*e*x)^2*csgn(I*x)-I*Pi*csgn(I*e*x)*csgn(I*e)*cs
gn(I*x)+2*ln(e)+2*ln(x)))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.16382, size = 2437, normalized size = 17.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((B*d^3*m^4 + 4*B*d^3*m^3 + 6*B*d^3*m^2 + 4*B*d^3*m + B*d^3 + 6*(B*d^3*m +
B*d^3)*n^3 + 11*(B*d^3*m^2 + 2*B*d^3*m + B*d^3)*n^2 + 6*(B*d^3*m^3 + 3*B*d^
3*m^2 + 3*B*d^3*m + B*d^3)*n)*x*x^(4*n)*e^(m*log(e) + m*log(x)) + ((3*B*c*d
^2 + A*d^3)*m^4 + 3*B*c*d^2 + A*d^3 + 4*(3*B*c*d^2 + A*d^3)*m^3 + 8*(3*B*c*
d^2 + A*d^3 + (3*B*c*d^2 + A*d^3)*m)*n^3 + 6*(3*B*c*d^2 + A*d^3)*m^2 + 14*(
3*B*c*d^2 + A*d^3 + (3*B*c*d^2 + A*d^3)*m^2 + 2*(3*B*c*d^2 + A*d^3)*m)*n^2
+ 4*(3*B*c*d^2 + A*d^3)*m + 7*(3*B*c*d^2 + A*d^3 + (3*B*c*d^2 + A*d^3)*m^3
+ 3*(3*B*c*d^2 + A*d^3)*m^2 + 3*(3*B*c*d^2 + A*d^3)*m)*n)*x*x^(3*n)*e^(m*lo
g(e) + m*log(x)) + 3*((B*c^2*d + A*c*d^2)*m^4 + B*c^2*d + A*c*d^2 + 4*(B*c^
2*d + A*c*d^2)*m^3 + 12*(B*c^2*d + A*c*d^2 + (B*c^2*d + A*c*d^2)*m)*n^3 + 6
*(B*c^2*d + A*c*d^2)*m^2 + 19*(B*c^2*d + A*c*d^2 + (B*c^2*d + A*c*d^2)*m^2
+ 2*(B*c^2*d + A*c*d^2)*m)*n^2 + 4*(B*c^2*d + A*c*d^2)*m + 8*(B*c^2*d + A*c
*d^2 + (B*c^2*d + A*c*d^2)*m^3 + 3*(B*c^2*d + A*c*d^2)*m^2 + 3*(B*c^2*d + A
*c*d^2)*m)*n)*x*x^(2*n)*e^(m*log(e) + m*log(x)) + ((B*c^3 + 3*A*c^2*d)*m^4
+ B*c^3 + 3*A*c^2*d + 4*(B*c^3 + 3*A*c^2*d)*m^3 + 24*(B*c^3 + 3*A*c^2*d + (
B*c^3 + 3*A*c^2*d)*m)*n^3 + 6*(B*c^3 + 3*A*c^2*d)*m^2 + 26*(B*c^3 + 3*A*c^2
*d + (B*c^3 + 3*A*c^2*d)*m^2 + 2*(B*c^3 + 3*A*c^2*d)*m)*n^2 + 4*(B*c^3 + 3*
A*c^2*d)*m + 9*(B*c^3 + 3*A*c^2*d + (B*c^3 + 3*A*c^2*d)*m^3 + 3*(B*c^3 + 3*
A*c^2*d)*m^2 + 3*(B*c^3 + 3*A*c^2*d)*m)*n)*x*x^n*e^(m*log(e) + m*log(x)) +
(A*c^3*m^4 + 24*A*c^3*n^4 + 4*A*c^3*m^3 + 6*A*c^3*m^2 + 4*A*c^3*m + A*c^3 +
 50*(A*c^3*m + A*c^3)*n^3 + 35*(A*c^3*m^2 + 2*A*c^3*m + A*c^3)*n^2 + 10*(A*
c^3*m^3 + 3*A*c^3*m^2 + 3*A*c^3*m + A*c^3)*n)*x*e^(m*log(e) + m*log(x)))/(m
^5 + 24*(m + 1)*n^4 + 5*m^4 + 50*(m^2 + 2*m + 1)*n^3 + 10*m^3 + 35*(m^3 + 3
*m^2 + 3*m + 1)*n^2 + 10*m^2 + 10*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*n + 5*m +
 1)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Giac [B] time = 1.15775, size = 3075, normalized size = 22.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (B*d^3*m^4*x*x^m*x^(4*n)*e^m + 6*B*d^3*m^3*n*x*x^m*x^(4*n)*e^m + 11*B*d^3*m
^2*n^2*x*x^m*x^(4*n)*e^m + 6*B*d^3*m*n^3*x*x^m*x^(4*n)*e^m + 3*B*c*d^2*m^4*
x*x^m*x^(3*n)*e^m + A*d^3*m^4*x*x^m*x^(3*n)*e^m + 21*B*c*d^2*m^3*n*x*x^m*x^
(3*n)*e^m + 7*A*d^3*m^3*n*x*x^m*x^(3*n)*e^m + 42*B*c*d^2*m^2*n^2*x*x^m*x^(3
*n)*e^m + 14*A*d^3*m^2*n^2*x*x^m*x^(3*n)*e^m + 24*B*c*d^2*m*n^3*x*x^m*x^(3*
n)*e^m + 8*A*d^3*m*n^3*x*x^m*x^(3*n)*e^m + 3*B*c^2*d*m^4*x*x^m*x^(2*n)*e^m
+ 3*A*c*d^2*m^4*x*x^m*x^(2*n)*e^m + 24*B*c^2*d*m^3*n*x*x^m*x^(2*n)*e^m + 24
*A*c*d^2*m^3*n*x*x^m*x^(2*n)*e^m + 57*B*c^2*d*m^2*n^2*x*x^m*x^(2*n)*e^m + 5
7*A*c*d^2*m^2*n^2*x*x^m*x^(2*n)*e^m + 36*B*c^2*d*m*n^3*x*x^m*x^(2*n)*e^m +
36*A*c*d^2*m*n^3*x*x^m*x^(2*n)*e^m + B*c^3*m^4*x*x^m*x^n*e^m + 3*A*c^2*d*m^
4*x*x^m*x^n*e^m + 9*B*c^3*m^3*n*x*x^m*x^n*e^m + 27*A*c^2*d*m^3*n*x*x^m*x^n*
e^m + 26*B*c^3*m^2*n^2*x*x^m*x^n*e^m + 78*A*c^2*d*m^2*n^2*x*x^m*x^n*e^m + 2
4*B*c^3*m*n^3*x*x^m*x^n*e^m + 72*A*c^2*d*m*n^3*x*x^m*x^n*e^m + A*c^3*m^4*x*
x^m*e^m + 10*A*c^3*m^3*n*x*x^m*e^m + 35*A*c^3*m^2*n^2*x*x^m*e^m + 50*A*c^3*
m*n^3*x*x^m*e^m + 24*A*c^3*n^4*x*x^m*e^m + 4*B*d^3*m^3*x*x^m*x^(4*n)*e^m +
18*B*d^3*m^2*n*x*x^m*x^(4*n)*e^m + 22*B*d^3*m*n^2*x*x^m*x^(4*n)*e^m + 6*B*d
^3*n^3*x*x^m*x^(4*n)*e^m + 12*B*c*d^2*m^3*x*x^m*x^(3*n)*e^m + 4*A*d^3*m^3*x
*x^m*x^(3*n)*e^m + 63*B*c*d^2*m^2*n*x*x^m*x^(3*n)*e^m + 21*A*d^3*m^2*n*x*x^
m*x^(3*n)*e^m + 84*B*c*d^2*m*n^2*x*x^m*x^(3*n)*e^m + 28*A*d^3*m*n^2*x*x^m*x
^(3*n)*e^m + 24*B*c*d^2*n^3*x*x^m*x^(3*n)*e^m + 8*A*d^3*n^3*x*x^m*x^(3*n)*e
^m + 12*B*c^2*d*m^3*x*x^m*x^(2*n)*e^m + 12*A*c*d^2*m^3*x*x^m*x^(2*n)*e^m +
72*B*c^2*d*m^2*n*x*x^m*x^(2*n)*e^m + 72*A*c*d^2*m^2*n*x*x^m*x^(2*n)*e^m + 1
14*B*c^2*d*m*n^2*x*x^m*x^(2*n)*e^m + 114*A*c*d^2*m*n^2*x*x^m*x^(2*n)*e^m +
36*B*c^2*d*n^3*x*x^m*x^(2*n)*e^m + 36*A*c*d^2*n^3*x*x^m*x^(2*n)*e^m + 4*B*c
^3*m^3*x*x^m*x^n*e^m + 12*A*c^2*d*m^3*x*x^m*x^n*e^m + 27*B*c^3*m^2*n*x*x^m*
x^n*e^m + 81*A*c^2*d*m^2*n*x*x^m*x^n*e^m + 52*B*c^3*m*n^2*x*x^m*x^n*e^m + 1
56*A*c^2*d*m*n^2*x*x^m*x^n*e^m + 24*B*c^3*n^3*x*x^m*x^n*e^m + 72*A*c^2*d*n^
3*x*x^m*x^n*e^m + 4*A*c^3*m^3*x*x^m*e^m + 30*A*c^3*m^2*n*x*x^m*e^m + 70*A*c
^3*m*n^2*x*x^m*e^m + 50*A*c^3*n^3*x*x^m*e^m + 6*B*d^3*m^2*x*x^m*x^(4*n)*e^m
 + 18*B*d^3*m*n*x*x^m*x^(4*n)*e^m + 11*B*d^3*n^2*x*x^m*x^(4*n)*e^m + 18*B*c
*d^2*m^2*x*x^m*x^(3*n)*e^m + 6*A*d^3*m^2*x*x^m*x^(3*n)*e^m + 63*B*c*d^2*m*n
*x*x^m*x^(3*n)*e^m + 21*A*d^3*m*n*x*x^m*x^(3*n)*e^m + 42*B*c*d^2*n^2*x*x^m*
x^(3*n)*e^m + 14*A*d^3*n^2*x*x^m*x^(3*n)*e^m + 18*B*c^2*d*m^2*x*x^m*x^(2*n)
*e^m + 18*A*c*d^2*m^2*x*x^m*x^(2*n)*e^m + 72*B*c^2*d*m*n*x*x^m*x^(2*n)*e^m
+ 72*A*c*d^2*m*n*x*x^m*x^(2*n)*e^m + 57*B*c^2*d*n^2*x*x^m*x^(2*n)*e^m + 57*
A*c*d^2*n^2*x*x^m*x^(2*n)*e^m + 6*B*c^3*m^2*x*x^m*x^n*e^m + 18*A*c^2*d*m^2*
x*x^m*x^n*e^m + 27*B*c^3*m*n*x*x^m*x^n*e^m + 81*A*c^2*d*m*n*x*x^m*x^n*e^m +
```

```
 26*B*c^3*n^2*x*x^m*x^n*e^m + 78*A*c^2*d*n^2*x*x^m*x^n*e^m + 6*A*c^3*m^2*x*
x^m*e^m + 30*A*c^3*m*n*x*x^m*e^m + 35*A*c^3*n^2*x*x^m*e^m + 4*B*d^3*m*x*x^m
*x^(4*n)*e^m + 6*B*d^3*n*x*x^m*x^(4*n)*e^m + 12*B*c*d^2*m*x*x^m*x^(3*n)*e^m
 + 4*A*d^3*m*x*x^m*x^(3*n)*e^m + 21*B*c*d^2*n*x*x^m*x^(3*n)*e^m + 7*A*d^3*n
*x*x^m*x^(3*n)*e^m + 12*B*c^2*d*m*x*x^m*x^(2*n)*e^m + 12*A*c*d^2*m*x*x^m*x^
(2*n)*e^m + 24*B*c^2*d*n*x*x^m*x^(2*n)*e^m + 24*A*c*d^2*n*x*x^m*x^(2*n)*e^m
 + 4*B*c^3*m*x*x^m*x^n*e^m + 12*A*c^2*d*m*x*x^m*x^n*e^m + 9*B*c^3*n*x*x^m*x
^n*e^m + 27*A*c^2*d*n*x*x^m*x^n*e^m + 4*A*c^3*m*x*x^m*e^m + 10*A*c^3*n*x*x^
m*e^m + B*d^3*x*x^m*x^(4*n)*e^m + 3*B*c*d^2*x*x^m*x^(3*n)*e^m + A*d^3*x*x^m
*x^(3*n)*e^m + 3*B*c^2*d*x*x^m*x^(2*n)*e^m + 3*A*c*d^2*x*x^m*x^(2*n)*e^m +
B*c^3*x*x^m*x^n*e^m + 3*A*c^2*d*x*x^m*x^n*e^m + A*c^3*x*x^m*e^m)/(m^5 + 10*
m^4*n + 35*m^3*n^2 + 50*m^2*n^3 + 24*m*n^4 + 5*m^4 + 40*m^3*n + 105*m^2*n^2
 + 100*m*n^3 + 24*n^4 + 10*m^3 + 60*m^2*n + 105*m*n^2 + 50*n^3 + 10*m^2 + 4
0*m*n + 35*n^2 + 5*m + 10*n + 1)
```

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

Optimal. Leaf size=270

$$-\frac{(ex)^{m+1}\left(-a^2bd^2(Ad+3Bc)+a^3Bd^3+3ab^2cd(Ad+Bc)+b^3\left(-c^2\right)(3Ad+Bc)\right)}{b^4e(m+1)}+\frac{dx^{n+1}(ex)^m\left(a^2Bd^2-abd(Ad+3Bc)\right.}{b^3(m+n+1)}$$

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

Rubi [A] time = 0.389138, antiderivative size = 270, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {570, 20, 30, 364}

$$-\frac{(ex)^{m+1}\left(-a^2bd^2(Ad+3Bc)+a^3Bd^3+3ab^2cd(Ad+Bc)+b^3\left(-c^2\right)(3Ad+Bc)\right)}{b^4e(m+1)}+\frac{dx^{n+1}(ex)^m\left(a^2Bd^2-abd(Ad+3Bc)\right.}{b^3(m+n+1)}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)(c+dx^n)^3}{a+bx^n}\,dx = \int \left(\frac{\left(-a^3Bd^3-3ab^2cd(Bc+Ad)+a^2bd^2(3Bc+Ad)+b^3c^2(Bc+3Ad)\right)(ex)^m}{b^4}+\frac{d}{\ldots}\right.$$

$$= -\frac{\left(a^3Bd^3+3ab^2cd(Bc+Ad)-a^2bd^2(3Bc+Ad)-b^3c^2(Bc+3Ad)\right)(ex)^{1+m}}{b^4e(1+m)}+\frac{(Bc\ldots}{\ldots}$$

$$= -\frac{\left(a^3Bd^3+3ab^2cd(Bc+Ad)-a^2bd^2(3Bc+Ad)-b^3c^2(Bc+3Ad)\right)(ex)^{1+m}}{b^4e(1+m)}+\frac{(Ab\ldots}{\ldots}$$

$$= \frac{d\left(a^2Bd^2+3b^2c(Bc+Ad)-abd(3Bc+Ad)\right)x^{1+n}(ex)^m}{b^3(1+m+n)}+\frac{d^2(3bBc+Abd-aBd)x\ldots}{b^2(1+m+2n\ldots}$$

Mathematica [A] time = 0.520553, size = 229, normalized size = 0.85

$$\frac{x(ex)^m\left(\frac{a^2bd^2(Ad+3Bc)-a^3Bd^3-3ab^2cd(Ad+Bc)+b^3c^2(3Ad+Bc)}{m+1}+\frac{bdx^n\left(a^2Bd^2-abd(Ad+3Bc)+3b^2c(Ad+Bc)\right)}{m+n+1}+\frac{b^2d^2x^{2n}(-aBd+Abd+3bBc)}{m+2n+1}+\frac{(aB-A\ldots}{\ldots}\right.}{b^4}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.487, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((b^4*c^3*e^m - 3*a*b^3*c^2*d*e^m + 3*a^2*b^2*c*d^2*e^m - a^3*b*d^3*e^m)*A
- (a*b^3*c^3*e^m - 3*a^2*b^2*c^2*d*e^m + 3*a^3*b*c*d^2*e^m - a^4*d^3*e^m)*B
)*integrate(x^m/(b^5*x^n + a*b^4), x) + ((m^3 + 3*m^2*(n + 1) + (2*n^2 + 6*
n + 3)*m + 2*n^2 + 3*n + 1)*B*b^3*d^3*e^m*x*e^(m*log(x) + 3*n*log(x)) + ((3
*(m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)
*b^3*c^2*d*e^m - 3*(m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m +
 11*n^2 + 6*n + 1)*a*b^2*c*d^2*e^m + (m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n
^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*a^2*b*d^3*e^m)*A + ((m^3 + 3*m^2*(2*n
+ 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*b^3*c^3*e^m - 3*(m
^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*a*
b^2*c^2*d*e^m + 3*(m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m +
11*n^2 + 6*n + 1)*a^2*b*c*d^2*e^m - (m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^
2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*a^3*d^3*e^m)*B)*x*x^m + ((m^3 + m^2*(4*
n + 3) + (3*n^2 + 8*n + 3)*m + 3*n^2 + 4*n + 1)*A*b^3*d^3*e^m + (3*(m^3 + m
^2*(4*n + 3) + (3*n^2 + 8*n + 3)*m + 3*n^2 + 4*n + 1)*b^3*c*d^2*e^m - (m^3
+ m^2*(4*n + 3) + (3*n^2 + 8*n + 3)*m + 3*n^2 + 4*n + 1)*a*b^2*d^3*e^m)*B)*
x*e^(m*log(x) + 2*n*log(x)) + ((3*(m^3 + m^2*(5*n + 3) + (6*n^2 + 10*n + 3)
*m + 6*n^2 + 5*n + 1)*b^3*c*d^2*e^m - (m^3 + m^2*(5*n + 3) + (6*n^2 + 10*n
+ 3)*m + 6*n^2 + 5*n + 1)*a*b^2*d^3*e^m)*A + (3*(m^3 + m^2*(5*n + 3) + (6*n
^2 + 10*n + 3)*m + 6*n^2 + 5*n + 1)*b^3*c^2*d*e^m - 3*(m^3 + m^2*(5*n + 3)
+ (6*n^2 + 10*n + 3)*m + 6*n^2 + 5*n + 1)*a*b^2*c*d^2*e^m + (m^3 + m^2*(5*n
 + 3) + (6*n^2 + 10*n + 3)*m + 6*n^2 + 5*n + 1)*a^2*b*d^3*e^m)*B)*x*e^(m*lo
g(x) + n*log(x)))/((m^4 + 2*m^3*(3*n + 2) + (11*n^2 + 18*n + 6)*m^2 + 6*n^3
 + 2*(3*n^3 + 11*n^2 + 9*n + 2)*m + 11*n^2 + 6*n + 1)*b^4)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 56.1332, size = 1503, normalized size = 5.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 +
1/n)/(a*n**2*gamma(m/n + 2 + 1/n)) + 3*A*c*d**2*e**m*m*x*x**m*x**(2*n)*lerc
hphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n*
*2*gamma(m/n + 3 + 1/n)) + 6*A*c*d**2*e**m*x*x**m*x**(2*n)*lerchphi(b*x**n*
exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n*gamma(m/n +
3 + 1/n)) + 3*A*c*d**2*e**m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(I*pi)
/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n**2*gamma(m/n + 3 + 1/n)) +
A*d**3*e**m*m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 3
 + 1/n)*gamma(m/n + 3 + 1/n)/(a*n**2*gamma(m/n + 4 + 1/n)) + 3*A*d**3*e**m*
x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 3 + 1/n)*gamma(
m/n + 3 + 1/n)/(a*n*gamma(m/n + 4 + 1/n)) + A*d**3*e**m*x*x**m*x**(3*n)*ler
chphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(a*n
**2*gamma(m/n + 4 + 1/n)) + B*c**3*e**m*m*x*x**m*x**n*lerchphi(b*x**n*exp_p
olar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n**2*gamma(m/n + 2
+ 1/n)) + B*c**3*e**m*x*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n
 + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(a*n*gamma(m/n + 2 + 1/n)) + B*c**3*e**m*x
*x**m*x**n*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 1 + 1/n)*gamma(m/n +
 1 + 1/n)/(a*n**2*gamma(m/n + 2 + 1/n)) + 3*B*c**2*d*e**m*m*x*x**m*x**(2*n)
*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/
(a*n**2*gamma(m/n + 3 + 1/n)) + 6*B*c**2*d*e**m*x*x**m*x**(2*n)*lerchphi(b*
x**n*exp_polar(I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n*gamma(m
/n + 3 + 1/n)) + 3*B*c**2*d*e**m*x*x**m*x**(2*n)*lerchphi(b*x**n*exp_polar(
I*pi)/a, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(a*n**2*gamma(m/n + 3 + 1/n
)) + 3*B*c*d**2*e**m*m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1
, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(a*n**2*gamma(m/n + 4 + 1/n)) + 9*B*c
*d**2*e**m*x*x**m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 3 +
1/n)*gamma(m/n + 3 + 1/n)/(a*n*gamma(m/n + 4 + 1/n)) + 3*B*c*d**2*e**m*x*x*
*m*x**(3*n)*lerchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 3 + 1/n)*gamma(m/n
+ 3 + 1/n)/(a*n**2*gamma(m/n + 4 + 1/n)) + B*d**3*e**m*m*x*x**m*x**(4*n)*le
rchphi(b*x**n*exp_polar(I*pi)/a, 1, m/n + 4 + 1/n)*gamma(m/n + 4 + 1/n)/(a*
n**2*gamma(m/n + 5 + 1/n)) + 4*B*d**3*e**m*x*x**m*x**(4*n)*lerchphi(b*x**n*
exp_polar(I*pi)/a, 1, m/n + 4 + 1/n)*gamma(m/n + 4 + 1/n)/(a*n*gamma(m/n +
5 + 1/n)) + B*d**3*e**m*x*x**m*x**(4*n)*lerchphi(b*x**n*exp_polar(I*pi)/a,
1, m/n + 4 + 1/n)*gamma(m/n + 4 + 1/n)/(a*n**2*gamma(m/n + 5 + 1/n))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=394

$$-\frac{d(ex)^{m+1}\left(Ab\left(a^2d^2(m+2n+1)-3abcd(m+n+1)+3b^2c^2(m+1)\right)-aB\left(a^2d^2(m+3n+1)-3abcd(m+2n+1)+3b\right.}{ab^4e(m+1)n}$$

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

Rubi [A] time = 1.02372, antiderivative size = 389, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 5, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {594, 570, 20, 30, 364}

$$-\frac{d(ex)^{m+1}\left(Ab\left(a^2d^2(m+2n+1)-3abcd(m+n+1)+3b^2c^2(m+1)\right)-aB\left(a^2d^2(m+3n+1)-3abcd(m+2n+1)+3b\right.}{ab^4e(m+1)n}$$

Antiderivative was successfully verified.

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

```
[Out] -((d^2*(A*b*(3*b*c*(1 + m + n) - a*d*(1 + m + 2*n)) - a*B*(3*b*c*(1 + m + 2
*n) - a*d*(1 + m + 3*n)))*x^(1 + n)*(e*x)^m)/(a*b^3*n*(1 + m + n))) - (d^3*
(A - (a*B*(1 + m + 3*n))/(b*(1 + m + 2*n)))*x^(1 + 2*n)*(e*x)^m)/(a*b*n) -
(d*(A*b*(3*b^2*c^2*(1 + m) - 3*a*b*c*d*(1 + m + n) + a^2*d^2*(1 + m + 2*n))
 - a*B*(3*b^2*c^2*(1 + m + n) - 3*a*b*c*d*(1 + m + 2*n) + a^2*d^2*(1 + m +
3*n)))*(e*x)^(1 + m))/(a*b^4*e*(1 + m)*n) + ((A*b - a*B)*(e*x)^(1 + m)*(c +
 d*x^n)^3)/(a*b*e*n*(a + b*x^n)) - ((b*c - a*d)^2*(A*b*(b*c*(1 + m - n) - a
*d*(1 + m + 2*n)) - a*B*(b*c*(1 + m) - a*d*(1 + m + 3*n)))*(e*x)^(1 + m)*Hy
pergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)])/(a^2*b^4*e*(1 +
 m)*n)
```

Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 570

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_))^(q_.)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Int[ExpandIntegrand[
```

```
(g*x)^m*(a + b*x^n)^p*(c + d*x^n)^q*(e + f*x^n)^r, x], x] /; FreeQ[{a, b, c
, d, e, f, g, m, n}, x] && IGtQ[p, -2] && IGtQ[q, 0] && IGtQ[r, 0]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)(c+dx^n)^3}{(a+bx^n)^2}\,dx = \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)^3}{aben(a+bx^n)} - \frac{\int \frac{(ex)^m(c+dx^n)^2(-c(aB(1+m)-Ab(1+m-n))+d(Ab(1+m+2n)-aB(}{a+bx^n}}{abn}$$

$$= \frac{(Ab-aB)(ex)^{1+m}(c+dx^n)^3}{aben(a+bx^n)} - \frac{\int \left(\frac{d\left(Ab\left(3b^2c^2(1+m)-3abcd(1+m+n)+a^2d^2(1+m+2n)\right)-aB\left(3b^2c^2\right.\right.}{b^3}\right.}{}$$

$$= -\frac{d\left(Ab\left(3b^2c^2(1+m)-3abcd(1+m+n)+a^2d^2(1+m+2n)\right)-aB\left(3b^2c^2(1+m\right.\right.}{ab^4e(1+m)n}$$

$$= -\frac{d\left(Ab\left(3b^2c^2(1+m)-3abcd(1+m+n)+a^2d^2(1+m+2n)\right)-aB\left(3b^2c^2(1+m\right.\right.}{ab^4e(1+m)n}$$

$$= -\frac{d^2(Ab(3bc(1+m+n)-ad(1+m+2n))-aB(3bc(1+m+2n)-ad(1+m+3n}{ab^3n(1+m+n)}$$

Mathematica [A] time = 0.442763, size = 217, normalized size = 0.55

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

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((d*(3*a^2*B*d^2 + 3*b^2*c*(B*c + A*d) - 2*a*b*d*(3*B*c + A*d)))
/(1 + m) + (b*d^2*(3*b*B*c + A*b*d - 2*a*B*d)*x^n)/(1 + m + n) + (b^2*B*d^3
*x^(2*n))/(1 + m + 2*n) + ((b*c - a*d)^2*(b*B*c + 3*A*b*d - 4*a*B*d)*Hyperg
eometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)])/(a*(1 + m)) + ((-(A
*b) + a*B)*(-(b*c) + a*d)^3*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n,
-((b*x^n)/a)])/(a^2*(1 + m))))/b^4
```

Maple [F] time = 0.492, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((a^3*b*d^3*e^m*(m + 2*n + 1) - 3*a^2*b^2*c*d^2*e^m*(m + n + 1) - b^4*c^3*e
^m*(m - n + 1) + 3*a*b^3*c^2*d*e^m*(m + 1))*A - (a^4*d^3*e^m*(m + 3*n + 1)
- 3*a^3*b*c*d^2*e^m*(m + 2*n + 1) + 3*a^2*b^2*c^2*d*e^m*(m + n + 1) - a*b^3
*c^3*e^m*(m + 1))*B)*integrate(x^m/(a*b^5*n*x^n + a^2*b^4*n), x) + ((m^2*n
+ (n^2 + 2*n)*m + n^2 + n)*B*a*b^3*d^3*e^m*x*e^(m*log(x) + 3*n*log(x)) + ((
(m^3 + 3*m^2*(n + 1) + (2*n^2 + 6*n + 3)*m + 2*n^2 + 3*n + 1)*b^4*c^3*e^m -
 3*(m^3 + 3*m^2*(n + 1) + (2*n^2 + 6*n + 3)*m + 2*n^2 + 3*n + 1)*a*b^3*c^2*
d*e^m + 3*(m^3 + m^2*(4*n + 3) + 2*n^3 + (5*n^2 + 8*n + 3)*m + 5*n^2 + 4*n
+ 1)*a^2*b^2*c*d^2*e^m - (m^3 + m^2*(5*n + 3) + 4*n^3 + (8*n^2 + 10*n + 3)*
m + 8*n^2 + 5*n + 1)*a^3*b*d^3*e^m)*A - ((m^3 + 3*m^2*(n + 1) + (2*n^2 + 6*
n + 3)*m + 2*n^2 + 3*n + 1)*a*b^3*c^3*e^m - 3*(m^3 + m^2*(4*n + 3) + 2*n^3
+ (5*n^2 + 8*n + 3)*m + 5*n^2 + 4*n + 1)*a^2*b^2*c^2*d*e^m + 3*(m^3 + m^2*(
5*n + 3) + 4*n^3 + (8*n^2 + 10*n + 3)*m + 8*n^2 + 5*n + 1)*a^3*b*c*d^2*e^m
- (m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1
)*a^4*d^3*e^m)*B)*x*x^m + ((m^2*n + 2*(n^2 + n)*m + 2*n^2 + n)*A*a*b^3*d^3*
e^m + (3*(m^2*n + 2*(n^2 + n)*m + 2*n^2 + n)*a*b^3*c*d^2*e^m - (m^2*n + (3*
n^2 + 2*n)*m + 3*n^2 + n)*a^2*b^2*d^3*e^m)*B)*x*e^(m*log(x) + 2*n*log(x)) +
 ((3*(m^2*n + 2*n^3 + (3*n^2 + 2*n)*m + 3*n^2 + n)*a*b^3*c*d^2*e^m - (m^2*n
 + 4*n^3 + 2*(2*n^2 + n)*m + 4*n^2 + n)*a^2*b^2*d^3*e^m)*A + (3*(m^2*n + 2*
n^3 + (3*n^2 + 2*n)*m + 3*n^2 + n)*a*b^3*c^2*d*e^m - 3*(m^2*n + 4*n^3 + 2*(
2*n^2 + n)*m + 4*n^2 + n)*a^2*b^2*c*d^2*e^m + (m^2*n + 6*n^3 + (5*n^2 + 2*n
)*m + 5*n^2 + n)*a^3*b*d^3*e^m)*B)*x*e^(m*log(x) + n*log(x)))/((m^3*n + 3*(
n^2 + n)*m^2 + 2*n^3 + (2*n^3 + 6*n^2 + 3*n)*m + 3*n^2 + n)*a*b^5*x^n + (m^
3*n + 3*(n^2 + n)*m^2 + 2*n^3 + (2*n^3 + 6*n^2 + 3*n)*m + 3*n^2 + n)*a^2*b^
4)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.21 $\int \frac{(ex)^m(a+bx^n)^4(A+Bx^n)}{c+dx^n} \, dx$

Optimal. Leaf size=380

$$\frac{bx^{n+1}(ex)^m\left(-6a^2bd^2(Bc-Ad)+4a^3Bd^3+4ab^2cd(Bc-Ad)+b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4(m+n+1)}+\frac{(ex)^{m+1}\left(6a^2b^2cd^2(Bc-Ad)-4a^3b\right.}{}$$

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

Rubi [A] time = 0.621051, antiderivative size = 380, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {570, 20, 30, 364}

$$\frac{bx^{n+1}(ex)^m\left(-6a^2bd^2(Bc-Ad)+4a^3Bd^3+4ab^2cd(Bc-Ad)+b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4(m+n+1)}+\frac{(ex)^{m+1}\left(6a^2b^2cd^2(Bc-Ad)-4a^3b\right.}{}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^4 (A+Bx^n)}{c+dx^n}\,dx = \int \left(\frac{\left(a^4Bd^4 + b^4c^3(Bc-Ad) - 4ab^3c^2d(Bc-Ad) + 6a^2b^2cd^2(Bc-Ad) - 4a^3bd^3(B\right.}{d^5} \right.$$

$$= \frac{\left(a^4Bd^4 + b^4c^3(Bc-Ad) - 4ab^3c^2d(Bc-Ad) + 6a^2b^2cd^2(Bc-Ad) - 4a^3bd^3(Bc-\right.}{d^5e(1+m)}$$

$$= \frac{\left(a^4Bd^4 + b^4c^3(Bc-Ad) - 4ab^3c^2d(Bc-Ad) + 6a^2b^2cd^2(Bc-Ad) - 4a^3bd^3(Bc-\right.}{d^5e(1+m)}$$

$$= \frac{b\left(4a^3Bd^3 - b^3c^2(Bc-Ad) + 4ab^2cd(Bc-Ad) - 6a^2bd^2(Bc-Ad)\right)x^{1+n}(ex)^m}{d^4(1+m+n)} + \frac{b}{-}$$

Mathematica [A] time = 0.896144, size = 332, normalized size = 0.87

$$\frac{x(ex)^m \left(\frac{bdx^n\left(6a^2bd^2(Ad-Bc)+4a^3Bd^3+4ab^2cd(Bc-Ad)+b^3c^2(Ad-Bc)\right)}{m+n+1} + \frac{6a^2b^2cd^2(Bc-Ad)+4a^3bd^3(Ad-Bc)+a^4Bd^4+4ab^3c^2d(Ad-Bc)+b^4c^3(Bc-Ad)}{m+1} + \right.}{d^5}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.492, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((b^4*c^4*d*e^m - 4*a*b^3*c^3*d^2*e^m + 6*a^2*b^2*c^2*d^3*e^m - 4*a^3*b*c*d
^4*e^m + a^4*d^5*e^m)*A - (b^4*c^5*e^m - 4*a*b^3*c^4*d*e^m + 6*a^2*b^2*c^3*
d^2*e^m - 4*a^3*b*c^2*d^3*e^m + a^4*c*d^4*e^m)*B)*integrate(x^m/(d^6*x^n +
c*d^5), x) + ((m^4 + 2*m^3*(3*n + 2) + (11*n^2 + 18*n + 6)*m^2 + 6*n^3 + 2*
(3*n^3 + 11*n^2 + 9*n + 2)*m + 11*n^2 + 6*n + 1)*B*b^4*d^4*e^m*x*e^(m*log(x
) + 4*n*log(x)) - (((m^4 + 2*m^3*(5*n + 2) + 24*n^4 + (35*n^2 + 30*n + 6)*m
^2 + 50*n^3 + 2*(25*n^3 + 35*n^2 + 15*n + 2)*m + 35*n^2 + 10*n + 1)*b^4*c^3
*d*e^m - 4*(m^4 + 2*m^3*(5*n + 2) + 24*n^4 + (35*n^2 + 30*n + 6)*m^2 + 50*n
^3 + 2*(25*n^3 + 35*n^2 + 15*n + 2)*m + 35*n^2 + 10*n + 1)*a*b^3*c^2*d^2*e^
m + 6*(m^4 + 2*m^3*(5*n + 2) + 24*n^4 + (35*n^2 + 30*n + 6)*m^2 + 50*n^3 +
2*(25*n^3 + 35*n^2 + 15*n + 2)*m + 35*n^2 + 10*n + 1)*a^2*b^2*c*d^3*e^m - 4
*(m^4 + 2*m^3*(5*n + 2) + 24*n^4 + (35*n^2 + 30*n + 6)*m^2 + 50*n^3 + 2*(25
*n^3 + 35*n^2 + 15*n + 2)*m + 35*n^2 + 10*n + 1)*a^3*b*d^4*e^m)*A - ((m^4 +
 2*m^3*(5*n + 2) + 24*n^4 + (35*n^2 + 30*n + 6)*m^2 + 50*n^3 + 2*(25*n^3 +
35*n^2 + 15*n + 2)*m + 35*n^2 + 10*n + 1)*b^4*c^4*e^m - 4*(m^4 + 2*m^3*(5*n
 + 2) + 24*n^4 + (35*n^2 + 30*n + 6)*m^2 + 50*n^3 + 2*(25*n^3 + 35*n^2 + 15
*n + 2)*m + 35*n^2 + 10*n + 1)*a*b^3*c^3*d*e^m + 6*(m^4 + 2*m^3*(5*n + 2) +
 24*n^4 + (35*n^2 + 30*n + 6)*m^2 + 50*n^3 + 2*(25*n^3 + 35*n^2 + 15*n + 2)
*m + 35*n^2 + 10*n + 1)*a^2*b^2*c^2*d^2*e^m - 4*(m^4 + 2*m^3*(5*n + 2) + 24
*n^4 + (35*n^2 + 30*n + 6)*m^2 + 50*n^3 + 2*(25*n^3 + 35*n^2 + 15*n + 2)*m
+ 35*n^2 + 10*n + 1)*a^3*b*c*d^3*e^m + (m^4 + 2*m^3*(5*n + 2) + 24*n^4 + (3
5*n^2 + 30*n + 6)*m^2 + 50*n^3 + 2*(25*n^3 + 35*n^2 + 15*n + 2)*m + 35*n^2
+ 10*n + 1)*a^4*d^4*e^m)*B)*x*x^m + ((m^4 + m^3*(7*n + 4) + (14*n^2 + 21*n
+ 6)*m^2 + 8*n^3 + (8*n^3 + 28*n^2 + 21*n + 4)*m + 14*n^2 + 7*n + 1)*A*b^4*
d^4*e^m - ((m^4 + m^3*(7*n + 4) + (14*n^2 + 21*n + 6)*m^2 + 8*n^3 + (8*n^3
+ 28*n^2 + 21*n + 4)*m + 14*n^2 + 7*n + 1)*b^4*c*d^3*e^m - 4*(m^4 + m^3*(7*
n + 4) + (14*n^2 + 21*n + 6)*m^2 + 8*n^3 + (8*n^3 + 28*n^2 + 21*n + 4)*m +
14*n^2 + 7*n + 1)*a*b^3*d^4*e^m)*B)*x*e^(m*log(x) + 3*n*log(x)) - (((m^4 +
4*m^3*(2*n + 1) + (19*n^2 + 24*n + 6)*m^2 + 12*n^3 + 2*(6*n^3 + 19*n^2 + 12
*n + 2)*m + 19*n^2 + 8*n + 1)*b^4*c*d^3*e^m - 4*(m^4 + 4*m^3*(2*n + 1) + (1
9*n^2 + 24*n + 6)*m^2 + 12*n^3 + 2*(6*n^3 + 19*n^2 + 12*n + 2)*m + 19*n^2 +
 8*n + 1)*a*b^3*d^4*e^m)*A - ((m^4 + 4*m^3*(2*n + 1) + (19*n^2 + 24*n + 6)*
m^2 + 12*n^3 + 2*(6*n^3 + 19*n^2 + 12*n + 2)*m + 19*n^2 + 8*n + 1)*b^4*c^2*
d^2*e^m - 4*(m^4 + 4*m^3*(2*n + 1) + (19*n^2 + 24*n + 6)*m^2 + 12*n^3 + 2*(
6*n^3 + 19*n^2 + 12*n + 2)*m + 19*n^2 + 8*n + 1)*a*b^3*c*d^3*e^m + 6*(m^4 +
 4*m^3*(2*n + 1) + (19*n^2 + 24*n + 6)*m^2 + 12*n^3 + 2*(6*n^3 + 19*n^2 + 1
2*n + 2)*m + 19*n^2 + 8*n + 1)*a^2*b^2*d^4*e^m)*B)*x*e^(m*log(x) + 2*n*log(
x)) + (((m^4 + m^3*(9*n + 4) + (26*n^2 + 27*n + 6)*m^2 + 24*n^3 + (24*n^3 +
 52*n^2 + 27*n + 4)*m + 26*n^2 + 9*n + 1)*b^4*c^2*d^2*e^m - 4*(m^4 + m^3*(9
*n + 4) + (26*n^2 + 27*n + 6)*m^2 + 24*n^3 + (24*n^3 + 52*n^2 + 27*n + 4)*m
 + 26*n^2 + 9*n + 1)*a*b^3*c*d^3*e^m + 6*(m^4 + m^3*(9*n + 4) + (26*n^2 + 2
7*n + 6)*m^2 + 24*n^3 + (24*n^3 + 52*n^2 + 27*n + 4)*m + 26*n^2 + 9*n + 1)*
a^2*b^2*d^4*e^m)*A - ((m^4 + m^3*(9*n + 4) + (26*n^2 + 27*n + 6)*m^2 + 24*n
^3 + (24*n^3 + 52*n^2 + 27*n + 4)*m + 26*n^2 + 9*n + 1)*b^4*c^3*d*e^m - 4*(
m^4 + m^3*(9*n + 4) + (26*n^2 + 27*n + 6)*m^2 + 24*n^3 + (24*n^3 + 52*n^2 +
 27*n + 4)*m + 26*n^2 + 9*n + 1)*a*b^3*c^2*d^2*e^m + 6*(m^4 + m^3*(9*n + 4)
 + (26*n^2 + 27*n + 6)*m^2 + 24*n^3 + (24*n^3 + 52*n^2 + 27*n + 4)*m + 26*n
^2 + 9*n + 1)*a^2*b^2*c*d^3*e^m - 4*(m^4 + m^3*(9*n + 4) + (26*n^2 + 27*n +
 6)*m^2 + 24*n^3 + (24*n^3 + 52*n^2 + 27*n + 4)*m + 26*n^2 + 9*n + 1)*a^3*b
*d^4*e^m)*B)*x*e^(m*log(x) + n*log(x)))/((m^5 + 5*m^4*(2*n + 1) + 5*(7*n^2
```

```
+ 8*n + 2)*m^3 + 24*n^4 + 5*(10*n^3 + 21*n^2 + 12*n + 2)*m^2 + 50*n^3 + (24
*n^4 + 100*n^3 + 105*n^2 + 40*n + 5)*m + 35*n^2 + 10*n + 1)*d^5)
```

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

$$\mathrm{integral}\left(\frac{\left(Bb^4x^{5\,n} + Aa^4 + \left(4\,Bab^3 + Ab^4\right)x^{4\,n} + 2\,\left(3\,Ba^2b^2 + 2\,Aab^3\right)x^{3\,n} + 2\,\left(2\,Ba^3b + 3\,Aa^2b^2\right)x^{2\,n} + \left(Ba^4 + 4\,Aa^3\right.\right.}{dx^n + c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.22 $\int \frac{(ex)^m(a+bx^n)^3(A+Bx^n)}{c+dx^n}\,dx$

Optimal. Leaf size=272

$$\frac{(ex)^{m+1}\left(-3a^2bd^2(Bc-Ad)+a^3Bd^3+3ab^2cd(Bc-Ad)+b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4e(m+1)}+\frac{bx^{n+1}(ex)^m\left(3a^2Bd^2-3abd(Bc-Ad)+\right.}{d^3(m+n+1)}$$

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

Rubi [A] time = 0.397714, antiderivative size = 272, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {570, 20, 30, 364}

$$\frac{(ex)^{m+1}\left(-3a^2bd^2(Bc-Ad)+a^3Bd^3+3ab^2cd(Bc-Ad)+b^3\left(-c^2\right)(Bc-Ad)\right)}{d^4e(m+1)}+\frac{bx^{n+1}(ex)^m\left(3a^2Bd^2-3abd(Bc-Ad)+\right.}{d^3(m+n+1)}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^3 (A+Bx^n)}{c+dx^n} dx = \int \left(\frac{\left(a^3Bd^3 - b^3c^2(Bc-Ad) + 3ab^2cd(Bc-Ad) - 3a^2bd^2(Bc-Ad)\right)(ex)^m}{d^4} + \frac{b\left(3a\right.}{} \right.$$

$$= \frac{\left(a^3Bd^3 - b^3c^2(Bc-Ad) + 3ab^2cd(Bc-Ad) - 3a^2bd^2(Bc-Ad)\right)(ex)^{1+m}}{d^4e(1+m)} + \frac{\left(b^3B\right)}{}$$

$$= \frac{\left(a^3Bd^3 - b^3c^2(Bc-Ad) + 3ab^2cd(Bc-Ad) - 3a^2bd^2(Bc-Ad)\right)(ex)^{1+m}}{d^4e(1+m)} + \frac{(bc-a}{}$$

$$= \frac{b\left(3a^2Bd^2 + b^2c(Bc-Ad) - 3abd(Bc-Ad)\right)x^{1+n}(ex)^m}{d^3(1+m+n)} - \frac{b^2(bBc - Abd - 3aBd)x^{1}}{d^2(1+m+2n)}$$

Mathematica [A] time = 0.530397, size = 231, normalized size = 0.85

$$\frac{x(ex)^m \left(\frac{3a^2bd^2(Ad-Bc)+a^3Bd^3+3ab^2cd(Bc-Ad)+b^3c^2(Ad-Bc)}{m+1} + \frac{bdx^n\left(3a^2Bd^2+3abd(Ad-Bc)+b^2c(Bc-Ad)\right)}{m+n+1} + \frac{b^2d^2x^{2n}(3aBd+Abd-bBc)}{m+2n+1} + \frac{(bc-ad)^3(}{} \right.}{d^4}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.493, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -((b^3*c^3*d*e^m - 3*a*b^2*c^2*d^2*e^m + 3*a^2*b*c*d^3*e^m - a^3*d^4*e^m)*A
 - (b^3*c^4*e^m - 3*a*b^2*c^3*d*e^m + 3*a^2*b*c^2*d^2*e^m - a^3*c*d^3*e^m)*
B)*integrate(x^m/(d^5*x^n + c*d^4), x) + ((m^3 + 3*m^2*(n + 1) + (2*n^2 + 6
*n + 3)*m + 2*n^2 + 3*n + 1)*B*b^3*d^3*e^m*x*e^(m*log(x) + 3*n*log(x)) + ((
(m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*
b^3*c^2*d*e^m - 3*(m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m +
11*n^2 + 6*n + 1)*a*b^2*c*d^2*e^m + 3*(m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*
n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*a^2*b*d^3*e^m)*A - ((m^3 + 3*m^2*(2*n
 + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*b^3*c^3*e^m - 3*(
m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*a
*b^2*c^2*d*e^m + 3*(m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n^2 + 12*n + 3)*m +
 11*n^2 + 6*n + 1)*a^2*b*c*d^2*e^m - (m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (11*n
^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*a^3*d^3*e^m)*B)*x*x^m + ((m^3 + m^2*(4
*n + 3) + (3*n^2 + 8*n + 3)*m + 3*n^2 + 4*n + 1)*A*b^3*d^3*e^m - ((m^3 + m^
2*(4*n + 3) + (3*n^2 + 8*n + 3)*m + 3*n^2 + 4*n + 1)*b^3*c*d^2*e^m - 3*(m^3
 + m^2*(4*n + 3) + (3*n^2 + 8*n + 3)*m + 3*n^2 + 4*n + 1)*a*b^2*d^3*e^m)*B)
*x*e^(m*log(x) + 2*n*log(x)) - (((m^3 + m^2*(5*n + 3) + (6*n^2 + 10*n + 3)*
m + 6*n^2 + 5*n + 1)*b^3*c*d^2*e^m - 3*(m^3 + m^2*(5*n + 3) + (6*n^2 + 10*n
 + 3)*m + 6*n^2 + 5*n + 1)*a*b^2*d^3*e^m)*A - ((m^3 + m^2*(5*n + 3) + (6*n^
2 + 10*n + 3)*m + 6*n^2 + 5*n + 1)*b^3*c^2*d*e^m - 3*(m^3 + m^2*(5*n + 3) +
 (6*n^2 + 10*n + 3)*m + 6*n^2 + 5*n + 1)*a*b^2*c*d^2*e^m + 3*(m^3 + m^2*(5*
n + 3) + (6*n^2 + 10*n + 3)*m + 6*n^2 + 5*n + 1)*a^2*b*d^3*e^m)*B)*x*e^(m*l
og(x) + n*log(x)))/((m^4 + 2*m^3*(3*n + 2) + (11*n^2 + 18*n + 6)*m^2 + 6*n^
3 + 2*(3*n^3 + 11*n^2 + 9*n + 2)*m + 11*n^2 + 6*n + 1)*d^4)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 56.4896, size = 1503, normalized size = 5.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 +
1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + 3*A*a*b**2*e**m*m*x*x**m*x**(2*n)*lerc
hphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n*
*2*gamma(m/n + 3 + 1/n)) + 6*A*a*b**2*e**m*x*x**m*x**(2*n)*lerchphi(d*x**n*
exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n*gamma(m/n +
3 + 1/n)) + 3*A*a*b**2*e**m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)
/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n**2*gamma(m/n + 3 + 1/n)) +
A*b**3*e**m*m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 3
 + 1/n)*gamma(m/n + 3 + 1/n)/(c*n**2*gamma(m/n + 4 + 1/n)) + 3*A*b**3*e**m*
x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 3 + 1/n)*gamma(
m/n + 3 + 1/n)/(c*n*gamma(m/n + 4 + 1/n)) + A*b**3*e**m*x*x**m*x**(3*n)*ler
chphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(c*n
**2*gamma(m/n + 4 + 1/n)) + B*a**3*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_p
olar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2
+ 1/n)) + B*a**3*e**m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n
 + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n*gamma(m/n + 2 + 1/n)) + B*a**3*e**m*x
*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n +
 1 + 1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + 3*B*a**2*b*e**m*m*x*x**m*x**(2*n)
*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/
(c*n**2*gamma(m/n + 3 + 1/n)) + 6*B*a**2*b*e**m*x*x**m*x**(2*n)*lerchphi(d*
x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n*gamma(m
/n + 3 + 1/n)) + 3*B*a**2*b*e**m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(
I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n**2*gamma(m/n + 3 + 1/n
)) + 3*B*a*b**2*e**m*m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1
, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(c*n**2*gamma(m/n + 4 + 1/n)) + 9*B*a
*b**2*e**m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 3 +
1/n)*gamma(m/n + 3 + 1/n)/(c*n*gamma(m/n + 4 + 1/n)) + 3*B*a*b**2*e**m*x*x*
*m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 3 + 1/n)*gamma(m/n
+ 3 + 1/n)/(c*n**2*gamma(m/n + 4 + 1/n)) + B*b**3*e**m*m*x*x**m*x**(4*n)*le
rchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 4 + 1/n)*gamma(m/n + 4 + 1/n)/(c*
n**2*gamma(m/n + 5 + 1/n)) + 4*B*b**3*e**m*x*x**m*x**(4*n)*lerchphi(d*x**n*
exp_polar(I*pi)/c, 1, m/n + 4 + 1/n)*gamma(m/n + 4 + 1/n)/(c*n*gamma(m/n +
5 + 1/n)) + B*b**3*e**m*x*x**m*x**(4*n)*lerchphi(d*x**n*exp_polar(I*pi)/c,
1, m/n + 4 + 1/n)*gamma(m/n + 4 + 1/n)/(c*n**2*gamma(m/n + 5 + 1/n))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Optimal. Leaf size=187

$$\frac{(ex)^{m+1}\left(a^2Bd^2-2abd(Bc-Ad)+b^2c(Bc-Ad)\right)}{d^3e(m+1)}-\frac{(ex)^{m+1}(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{cd^3e(m+1)}-\frac{bx^{n+1}(ex)^m(\cdots}{d^2(\cdots}$$

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

Rubi [A] time = 0.254068, antiderivative size = 187, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.129, Rules used = {570, 20, 30, 364}

$$\frac{(ex)^{m+1}\left(a^2Bd^2-2abd(Bc-Ad)+b^2c(Bc-Ad)\right)}{d^3e(m+1)}-\frac{(ex)^{m+1}(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{cd^3e(m+1)}-\frac{bx^{n+1}(ex)^m(\cdots}{d^2(\cdots}$$

Antiderivative was successfully verified.

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

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

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
```

```
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^2 (A+Bx^n)}{c+dx^n}\,dx = \int \left(\frac{\left(a^2Bd^2+b^2c(Bc-Ad)-2abd(Bc-Ad)\right)(ex)^m}{d^3}+\frac{b(-bBc+Abd+2aBd)x^n(e}{d^2}\right.$$
$$=\frac{\left(a^2Bd^2+b^2c(Bc-Ad)-2abd(Bc-Ad)\right)(ex)^{1+m}}{d^3e(1+m)}+\frac{\left(b^2B\right)\int x^{2n}(ex)^m\,dx}{d}-\frac{((bc-}{}$$
$$=\frac{\left(a^2Bd^2+b^2c(Bc-Ad)-2abd(Bc-Ad)\right)(ex)^{1+m}}{d^3e(1+m)}-\frac{(bc-ad)^2(Bc-Ad)(ex)^{1+m}\,{}_2}{cd^3e(1+}$$
$$=-\frac{b(bBc-Abd-2aBd)x^{1+n}(ex)^m}{d^2(1+m+n)}+\frac{b^2Bx^{1+2n}(ex)^m}{d(1+m+2n)}+\frac{\left(a^2Bd^2+b^2c(Bc-Ad)-2a\right.}{d^3e(1+}$$

Mathematica [A] time = 0.288652, size = 154, normalized size = 0.82

$$\frac{x(ex)^m\left(\frac{a^2Bd^2+2abd(Ad-Bc)+b^2c(Bc-Ad)}{m+1}-\frac{(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c(m+1)}+\frac{bdx^n(2aBd+Abd-bBc)}{m+n+1}+\frac{b^2Bd^2x^{2n}}{m+2n+1}\right)}{d^3}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.491, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\left(\left(b^2c^2de^m-2\,abcd^2e^m+a^2d^3e^m\right)A-\left(b^2c^3e^m-2\,abc^2de^m+a^2cd^2e^m\right)B\right)\int \frac{x^m}{d^4x^n+cd^3}\,dx+\frac{\left(m^2+m(n+2)+n+1\right)B}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((b^2*c^2*d*e^m - 2*a*b*c*d^2*e^m + a^2*d^3*e^m)*A - (b^2*c^3*e^m - 2*a*b*c
^2*d*e^m + a^2*c*d^2*e^m)*B)*integrate(x^m/(d^4*x^n + c*d^3), x) + ((m^2 +
m*(n + 2) + n + 1)*B*b^2*d^2*e^m*x*e^(m*log(x) + 2*n*log(x)) - (((m^2 + m*(
3*n + 2) + 2*n^2 + 3*n + 1)*b^2*c*d*e^m - 2*(m^2 + m*(3*n + 2) + 2*n^2 + 3*
n + 1)*a*b*d^2*e^m)*A - ((m^2 + m*(3*n + 2) + 2*n^2 + 3*n + 1)*b^2*c^2*e^m
- 2*(m^2 + m*(3*n + 2) + 2*n^2 + 3*n + 1)*a*b*c*d*e^m + (m^2 + m*(3*n + 2)
+ 2*n^2 + 3*n + 1)*a^2*d^2*e^m)*B)*x*x^m + ((m^2 + 2*m*(n + 1) + 2*n + 1)*A
*b^2*d^2*e^m - ((m^2 + 2*m*(n + 1) + 2*n + 1)*b^2*c*d*e^m - 2*(m^2 + 2*m*(n
 + 1) + 2*n + 1)*a*b*d^2*e^m)*B)*x*e^(m*log(x) + n*log(x)))/((m^3 + 3*m^2*(
n + 1) + (2*n^2 + 6*n + 3)*m + 2*n^2 + 3*n + 1)*d^3)
```

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

$$\text{integral}\left(\frac{\left(Bb^2x^{3n} + Aa^2 + \left(2\,Bab + Ab^2\right)x^{2n} + \left(Ba^2 + 2\,Aab\right)x^n\right)(ex)^m}{dx^n + c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 26.4276, size = 1085, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*a**2*e**m*m*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma
(m/n + 1/n)/(c*n**2*gamma(m/n + 1 + 1/n)) + A*a**2*e**m*x*x**m*lerchphi(d*x
**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c*n**2*gamma(m/n + 1
 + 1/n)) + 2*A*a*b*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1,
 m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + 2*A*a*
b*e**m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gam
ma(m/n + 1 + 1/n)/(c*n*gamma(m/n + 2 + 1/n)) + 2*A*a*b*e**m*x*x**m*x**n*ler
chphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n
**2*gamma(m/n + 2 + 1/n)) + A*b**2*e**m*m*x*x**m*x**(2*n)*lerchphi(d*x**n*e
xp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n**2*gamma(m/n
+ 3 + 1/n)) + 2*A*b**2*e**m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)
/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n*gamma(m/n + 3 + 1/n)) + A*b
**2*e**m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/
n)*gamma(m/n + 2 + 1/n)/(c*n**2*gamma(m/n + 3 + 1/n)) + B*a**2*e**m*m*x*x**
m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 +
 1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + B*a**2*e**m*x*x**m*x**n*lerchphi(d*x*
*n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n*gamma(m/n
 + 2 + 1/n)) + B*a**2*e**m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1
, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + 2*B*a
*b*e**m*m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1
/n)*gamma(m/n + 2 + 1/n)/(c*n**2*gamma(m/n + 3 + 1/n)) + 4*B*a*b*e**m*x*x**
m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n +
 2 + 1/n)/(c*n*gamma(m/n + 3 + 1/n)) + 2*B*a*b*e**m*x*x**m*x**(2*n)*lerchph
```

```
i(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n**2*
gamma(m/n + 3 + 1/n)) + B*b**2*e**m*m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_p
olar(I*pi)/c, 1, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(c*n**2*gamma(m/n + 4
+ 1/n)) + 3*B*b**2*e**m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c,
1, m/n + 3 + 1/n)*gamma(m/n + 3 + 1/n)/(c*n*gamma(m/n + 4 + 1/n)) + B*b**2*
e**m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 3 + 1/n)*g
amma(m/n + 3 + 1/n)/(c*n**2*gamma(m/n + 4 + 1/n))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.24 $\int \frac{(ex)^m(a+bx^n)(A+Bx^n)}{c+dx^n} dx$

Optimal. Leaf size=122

$$\frac{(ex)^{m+1}(bc-ad)(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{cd^2e(m+1)}-\frac{(ex)^{m+1}(-aBd-Abd+bBc)}{d^2e(m+1)}+\frac{bBx^{n+1}(ex)^m}{d(m+n+1)}$$

```
[Out] (b*B*x^(1 + n)*(e*x)^m)/(d*(1 + m + n)) - ((b*B*c - A*b*d - a*B*d)*(e*x)^(1
 + m))/(d^2*e*(1 + m)) + ((b*c - a*d)*(B*c - A*d)*(e*x)^(1 + m)*Hypergeomet
ric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c*d^2*e*(1 + m))
```

Rubi [A] time = 0.126177, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used = {570, 20, 30, 364}

$$\frac{(ex)^{m+1}(bc-ad)(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{cd^2e(m+1)}-\frac{(ex)^{m+1}(-aBd-Abd+bBc)}{d^2e(m+1)}+\frac{bBx^{n+1}(ex)^m}{d(m+n+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (b*B*x^(1 + n)*(e*x)^m)/(d*(1 + m + n)) - ((b*B*c - A*b*d - a*B*d)*(e*x)^(1
 + m))/(d^2*e*(1 + m)) + ((b*c - a*d)*(B*c - A*d)*(e*x)^(1 + m)*Hypergeomet
ric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c*d^2*e*(1 + m))
```

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)(A+Bx^n)}{c+dx^n} dx = \int \left(\frac{(-bBc+Abd+aBd)(ex)^m}{d^2} + \frac{bBx^n(ex)^m}{d} + \frac{(-bc+ad)(-Bc+Ad)(ex)^m}{d^2(c+dx^n)} \right) dx$$
$$= -\frac{(bBc-Abd-aBd)(ex)^{1+m}}{d^2e(1+m)} + \frac{(bB)\int x^n(ex)^m\,dx}{d} + \frac{((bc-ad)(Bc-Ad))\int \frac{(ex)^m}{c+dx^n} dx}{d^2}$$
$$= -\frac{(bBc-Abd-aBd)(ex)^{1+m}}{d^2e(1+m)} + \frac{(bc-ad)(Bc-Ad)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{cd^2e(1+m)}$$
$$= \frac{bBx^{1+n}(ex)^m}{d(1+m+n)} - \frac{(bBc-Abd-aBd)(ex)^{1+m}}{d^2e(1+m)} + \frac{(bc-ad)(Bc-Ad)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\ldots\right)}{cd^2e(1+m)}$$

Mathematica [A] time = 0.146505, size = 95, normalized size = 0.78

$$\frac{x(ex)^m\left(\frac{(bc-ad)(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c(m+1)}+\frac{aBd+Abd-bBc}{m+1}+\frac{bBdx^n}{m+n+1}\right)}{d^2}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.347, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(bcde^m - ad^2e^m\right)A - \left(bc^2e^m - acde^m\right)B\right)\int \frac{x^m}{d^3x^n + cd^2}dx + \frac{Bbde^m(m+1)xe^{(m\log(x)+n\log(x))} + (Abde^m(m+n+1) - \ldots}{\left(m^2 + m(n+2) + \ldots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\left(Bbx^{2n} + Aa + (Ba + Ab)x^n\right)(ex)^m}{dx^n + c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 9.55414, size = 666, normalized size = 5.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*a*e**m*m*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/
n + 1/n)/(c*n**2*gamma(m/n + 1 + 1/n)) + A*a*e**m*x*x**m*lerchphi(d*x**n*ex
p_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c*n**2*gamma(m/n + 1 + 1/n
)) + A*b*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 +
 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + A*b*e**m*x*x**m*
x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1
/n)/(c*n*gamma(m/n + 2 + 1/n)) + A*b*e**m*x*x**m*x**n*lerchphi(d*x**n*exp_p
olar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2
+ 1/n)) + B*a*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n
+ 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + B*a*e**m*x*
x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n +
1 + 1/n)/(c*n*gamma(m/n + 2 + 1/n)) + B*a*e**m*x*x**m*x**n*lerchphi(d*x**n*
exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n
 + 2 + 1/n)) + B*b*e**m*m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c
, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*n**2*gamma(m/n + 3 + 1/n)) + 2*
B*b*e**m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/
n)*gamma(m/n + 2 + 1/n)/(c*n*gamma(m/n + 3 + 1/n)) + B*b*e**m*x*x**m*x**(2*
n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n
)/(c*n**2*gamma(m/n + 3 + 1/n))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.25 $\int \frac{(ex)^m(A+Bx^n)}{c+dx^n}\,dx$

Optimal. Leaf size=78

$$\frac{B(ex)^{m+1}}{de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{cde(m+1)}$$

```
[Out] (B*(e*x)^(1 + m))/(d*e*(1 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*Hypergeometric
2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c*d*e*(1 + m))
```

Rubi [A] time = 0.0395393, antiderivative size = 78, 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, Rules used = {459, 364}

$$\frac{B(ex)^{m+1}}{de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{cde(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (B*(e*x)^(1 + m))/(d*e*(1 + m)) - ((B*c - A*d)*(e*x)^(1 + m)*Hypergeometric
2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c*d*e*(1 + m))
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{(ex)^m\,(A+Bx^n)}{c+dx^n}\,dx&=\frac{B(ex)^{1+m}}{de(1+m)}-\frac{(Bc(1+m)-Ad(1+m))\int \frac{(ex)^m}{c+dx^n}\,dx}{d(1+m)}\\&=\frac{B(ex)^{1+m}}{de(1+m)}-\frac{(Bc-Ad)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{cde(1+m)}\end{aligned}$$

Mathematica [A] time = 0.0645983, size = 57, normalized size = 0.73

$$\frac{x(ex)^m\left((Ad-Bc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+Bc\right)}{cd(m+1)}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.36, size = 0, normalized size = 0.

$$\int \frac{(ex)^m (A + Bx^n)}{c + dx^n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{Be^m x x^m}{d(m+1)} - (Bce^m - Ade^m) \int \frac{x^m}{d^2 x^n + cd} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] B*e^m*x*x^m/(d*(m + 1)) - (B*c*e^m - A*d*e^m)*integrate(x^m/(d^2*x^n + c*d)
, x)
```

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

$$\text{integral}\left(\frac{(Bx^n + A)(ex)^m}{dx^n + c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^n + A)*(e*x)^m/(d*x^n + c), x)
```

Sympy [C] time = 3.17009, size = 284, normalized size = 3.64

$$\frac{Ae^m mxx^m \Phi\left(\frac{dx^n e^{i\pi}}{c}, 1, \frac{m}{n} + \frac{1}{n}\right)\Gamma\left(\frac{m}{n} + \frac{1}{n}\right)}{cn^2\Gamma\left(\frac{m}{n} + 1 + \frac{1}{n}\right)} + \frac{Ae^m xx^m \Phi\left(\frac{dx^n e^{i\pi}}{c}, 1, \frac{m}{n} + \frac{1}{n}\right)\Gamma\left(\frac{m}{n} + \frac{1}{n}\right)}{cn^2\Gamma\left(\frac{m}{n} + 1 + \frac{1}{n}\right)} + \frac{Be^m mxx^m x^n \Phi\left(\frac{dx^n e^{i\pi}}{c}, 1, \frac{m}{n} + 1 + \frac{1}{n}\right)\ldots}{cn^2\Gamma\left(\frac{m}{n} + 2 + \frac{1}{n}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*e**m*m*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n
+ 1/n)/(c*n**2*gamma(m/n + 1 + 1/n)) + A*e**m*x*x**m*lerchphi(d*x**n*exp_po
lar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c*n**2*gamma(m/n + 1 + 1/n)) +
 B*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*
gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2 + 1/n)) + B*e**m*x*x**m*x**n*ler
chphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n
*gamma(m/n + 2 + 1/n)) + B*e**m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)
/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*n**2*gamma(m/n + 2 + 1/n))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.26 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)(c+dx^n)}\,dx$

Optimal. Leaf size=127

$$\frac{(ex)^{m+1}(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{ae(m+1)(bc-ad)}+\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{ce(m+1)(bc-ad)}$$

```
[Out] ((A*b - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -
((b*x^n)/a)])/(a*(b*c - a*d)*e*(1 + m)) + ((B*c - A*d)*(e*x)^(1 + m)*Hyperg
eometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c*(b*c - a*d)*e*(1
 + m))
```

Rubi [A] time = 0.144056, antiderivative size = 127, 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, Rules used = {597, 364}

$$\frac{(ex)^{m+1}(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{ae(m+1)(bc-ad)}+\frac{(ex)^{m+1}(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{ce(m+1)(bc-ad)}$$

Antiderivative was successfully verified.

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

```
[Out] ((A*b - a*B)*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -
((b*x^n)/a)])/(a*(b*c - a*d)*e*(1 + m)) + ((B*c - A*d)*(e*x)^(1 + m)*Hyperg
eometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c*(b*c - a*d)*e*(1
 + m))
```

Rule 597

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

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{(ex)^m\,(A+Bx^n)}{(a+bx^n)\,(c+dx^n)}\,dx &= \int \left(\frac{(Ab-aB)(ex)^m}{(bc-ad)\,(a+bx^n)}+\frac{(Bc-Ad)(ex)^m}{(bc-ad)\,(c+dx^n)}\right)dx\\
&= \frac{(Ab-aB)\int \frac{(ex)^m}{a+bx^n}\,dx}{bc-ad}+\frac{(Bc-Ad)\int \frac{(ex)^m}{c+dx^n}\,dx}{bc-ad}\\
&= \frac{(Ab-aB)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{bx^n}{a}\right)}{a(bc-ad)e(1+m)}+\frac{(Bc-Ad)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{c(bc-ad)e(1+m)}
\end{aligned}$$

Mathematica [A] time = 0.12826, size = 102, normalized size = 0.8

$$\frac{x(ex)^m\left((aBc-Abc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)+a(Ad-Bc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)\right)}{ac(m+1)(ad-bc)}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.676, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{(Bx^n+A)\,(ex)^m}{bdx^{2\,n}+ac+(bc+ad)x^n},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.27 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)^2(c+dx^n)}\,dx$

Optimal. Leaf size=212

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)(Ab(ad(m-2n+1)-bc(m-n+1))+aB(bc(m+1)-ad(m-n+1)))}{a^2e(m+1)n(bc-ad)^2}-\frac{d(ex)^{m+1}(}{}$$

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

Rubi [A] time = 0.528839, antiderivative size = 212, 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, Rules used = {595, 597, 364}

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)(Ab(ad(m-2n+1)-bc(m-n+1))+aB(bc(m+1)-ad(m-n+1)))}{a^2e(m+1)n(bc-ad)^2}-\frac{d(ex)^{m+1}(}{}$$

Antiderivative was successfully verified.

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

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

Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

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

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)}{(a+bx^n)^2 (c+dx^n)}\,dx = \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)} - \frac{\int \frac{(ex)^m(-aBc(1+m)+Abc(1+m-n)+aAdn+(Ab-aB)d(1+m-n)x^n)}{(a+bx^n)(c+dx^n)}\,dx}{a(bc-ad)n}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)} - \frac{\int \left(\frac{(-Ab(ad(1+m-2n)-bc(1+m-n))-aB(bc(1+m)-ad(1+m-n)))(ex)^m}{(bc-ad)(a+bx^n)} + \frac{ad(-Bc+Ad)n}{(-bc+ad)(c+}\right.}{a(bc-ad)n}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)} - \frac{(d(Bc-Ad))\int \frac{(ex)^m}{c+dx^n}\,dx}{(bc-ad)^2} + \frac{(Ab(ad(1+m-2n)-bc(1+m-n))+}{a(bc}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)} + \frac{(Ab(ad(1+m-2n)-bc(1+m-n))+aB(bc(1+m)-ad(1+m-}{a^2(bc-ad)^2e(1+m)n}$$

Mathematica [A] time = 0.201831, size = 152, normalized size = 0.72

$$-\frac{x(ex)^m \left(a^2d(Bc-Ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+abc(Ad-Bc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)-c(Ab-aB)(bc-ad)\,{}_2F_1\left(2,\right.\right.}{a^2c(m+1)(bc-ad)^2}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.671, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{(Bae^m - Abe^m)xx^m}{a^2bcn - a^3dn + \left(ab^2cn - a^2bdn\right)x^n} - \left(\left(b^2ce^m(m-n+1) - abde^m(m-2n+1)\right)A + \left(a^2de^m(m-n+1) - abce^m(m+1)\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
*n + a^4*d^2*n + (a*b^3*c^2*n - 2*a^2*b^2*c*d*n + a^3*b*d^2*n)*x^n), x) - (
B*c*d*e^m - A*d^2*e^m)*integrate(x^m/(b^2*c^3 - 2*a*b*c^2*d + a^2*c*d^2 + (
b^2*c^2*d - 2*a*b*c*d^2 + a^2*d^3)*x^n), x)
```

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

$$\mathrm{integral}\left(\frac{(Bx^n + A)(ex)^m}{b^2dx^{3n} + a^2c + \left(b^2c + 2\,abd\right)x^{2n} + \left(2\,abc + a^2d\right)x^n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.28 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)^3(c+dx^n)}\,dx$

Optimal. Leaf size=407

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)\left(Ab\left(a^2d^2\left(m^2+m(2-5n)+6n^2-5n+1\right)-2abcd\left(m^2+m(2-4n)+3n^2-4n+1\right)\right.\right.}{2}$$

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

Rubi [A] time = 1.24718, antiderivative size = 407, 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, Rules used = {595, 597, 364}

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)\left(Ab\left(a^2d^2\left(m^2+m(2-5n)+6n^2-5n+1\right)-2abcd\left(m^2+m(2-4n)+3n^2-4n+1\right)\right.\right.}{2}$$

Antiderivative was successfully verified.

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


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


Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

```
Int[(((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((e_) + (f_.)*(x_)^(n
_)))/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Int[ExpandIntegrand[((g*x)^m*(a
```

```
+ b*x^n)^p*(e + f*x^n))/(c + d*x^n), x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, p}, x]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)}{(a+bx^n)^3 (c+dx^n)} dx = \frac{(Ab-aB)(ex)^{1+m}}{2a(bc-ad)en(a+bx^n)^2} - \frac{\int \frac{(ex)^m(-aBc(1+m)+Abc(1+m-2n)+2aAdn+(Ab-aB)d(1+m-2n)x^n)}{(a+bx^n)^2(c+dx^n)} dx}{2a(bc-ad)n}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{2a(bc-ad)en(a+bx^n)^2} + \frac{(Ab(ad(1+m-4n)-bc(1+m-2n))+aB(bc(1+m)-ad(1}{2a^2(bc-ad)^2en^2(a+bx^n)}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{2a(bc-ad)en(a+bx^n)^2} + \frac{(Ab(ad(1+m-4n)-bc(1+m-2n))+aB(bc(1+m)-ad(1}{2a^2(bc-ad)^2en^2(a+bx^n)}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{2a(bc-ad)en(a+bx^n)^2} + \frac{(Ab(ad(1+m-4n)-bc(1+m-2n))+aB(bc(1+m)-ad(1}{2a^2(bc-ad)^2en^2(a+bx^n)}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{2a(bc-ad)en(a+bx^n)^2} + \frac{(Ab(ad(1+m-4n)-bc(1+m-2n))+aB(bc(1+m)-ad(1}{2a^2(bc-ad)^2en^2(a+bx^n)}$$

Mathematica [A] time = 0.264498, size = 199, normalized size = 0.49

$$\frac{x(ex)^m\left(\frac{b(bc-ad)(Bc-Ad)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^2} + \frac{(Ab-aB)(bc-ad)^2\,{}_2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^3} + \frac{bd(Ad-Bc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a} + \frac{d^2(Bc-A}{}\right.}{(m+1)(bc-ad)^3}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.677, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(\left(m^2 - m(3n-2) + 2n^2 - 3n + 1\right)b^3c^2e^m - 2\left(m^2 - 2m(2n-1) + 3n^2 - 4n + 1\right)ab^2cde^m + \left(m^2 - m(5n-2) + 6n^2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(((m^2 - m*(3*n - 2) + 2*n^2 - 3*n + 1)*b^3*c^2*e^m - 2*(m^2 - 2*m*(2*n -
1) + 3*n^2 - 4*n + 1)*a*b^2*c*d*e^m + (m^2 - m*(5*n - 2) + 6*n^2 - 5*n + 1)
*a^2*b*d^2*e^m)*A - ((m^2 - m*(n - 2) - n + 1)*a*b^2*c^2*e^m - 2*(m^2 - 2*m
*(n - 1) - 2*n + 1)*a^2*b*c*d*e^m + (m^2 - m*(3*n - 2) + 2*n^2 - 3*n + 1)*a
^3*d^2*e^m)*B)*integrate(-1/2*x^m/(a^3*b^3*c^3*n^2 - 3*a^4*b^2*c^2*d*n^2 +
3*a^5*b*c*d^2*n^2 - a^6*d^3*n^2 + (a^2*b^4*c^3*n^2 - 3*a^3*b^3*c^2*d*n^2 +
3*a^4*b^2*c*d^2*n^2 - a^5*b*d^3*n^2)*x^n), x) - (B*c*d^2*e^m - A*d^3*e^m)*i
ntegrate(-x^m/(b^3*c^4 - 3*a*b^2*c^3*d + 3*a^2*b*c^2*d^2 - a^3*c*d^3 + (b^3
*c^3*d - 3*a*b^2*c^2*d^2 + 3*a^2*b*c*d^3 - a^3*d^4)*x^n), x) - 1/2*(((a*b^2
*c*e^m*(m - 3*n + 1) - a^2*b*d*e^m*(m - 5*n + 1))*A - (a^2*b*c*e^m*(m - n +
 1) - a^3*d*e^m*(m - 3*n + 1))*B)*x*x^m + ((b^3*c*e^m*(m - 2*n + 1) - a*b^2
*d*e^m*(m - 4*n + 1))*A + (a^2*b*d*e^m*(m - 2*n + 1) - a*b^2*c*e^m*(m + 1))
*B)*x*e^(m*log(x) + n*log(x)))/(a^4*b^2*c^2*n^2 - 2*a^5*b*c*d*n^2 + a^6*d^2
*n^2 + (a^2*b^4*c^2*n^2 - 2*a^3*b^3*c*d*n^2 + a^4*b^2*d^2*n^2)*x^(2*n) + 2*
(a^3*b^3*c^2*n^2 - 2*a^4*b^2*c*d*n^2 + a^5*b*d^2*n^2)*x^n)
```

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

$$\text{integral}\left(\frac{(Bx^n + A)(ex)^m}{b^3dx^{4n} + a^3c + \left(b^3c + 3ab^2d\right)x^{3n} + 3\left(ab^2c + a^2bd\right)x^{2n} + \left(3a^2bc + a^3d\right)x^n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.29 $\int \frac{(ex)^m(a+bx^n)^3(A+Bx^n)}{(c+dx^n)^2}\,dx$

Optimal. Leaf size=386

$$-\frac{b(ex)^{m+1}\left(3a^2d^2(Ad(m+1)-Bc(m+n+1))-3abcd(Ad(m+n+1)-Bc(m+2n+1))+b^2c^2(Ad(m+2n+1)-Bc(m\right.}{cd^4e(m+1)n}$$

```
[Out] -((b^2*(3*a*d*(A*d*(1 + m + n) - B*c*(1 + m + 2*n)) - b*c*(A*d*(1 + m + 2*n
) - B*c*(1 + m + 3*n)))*x^(1 + n)*(e*x)^m)/(c*d^3*n*(1 + m + n))) - (b^3*(A
*d*(1 + m + 2*n) - B*c*(1 + m + 3*n))*x^(1 + 2*n)*(e*x)^m)/(c*d^2*n*(1 + m
+ 2*n)) - (b*(3*a^2*d^2*(A*d*(1 + m) - B*c*(1 + m + n)) - 3*a*b*c*d*(A*d*(1
 + m + n) - B*c*(1 + m + 2*n)) + b^2*c^2*(A*d*(1 + m + 2*n) - B*c*(1 + m +
3*n)))*(e*x)^(1 + m))/(c*d^4*e*(1 + m)*n) - ((B*c - A*d)*(e*x)^(1 + m)*(a +
 b*x^n)^3)/(c*d*e*n*(c + d*x^n)) + ((b*c - a*d)^2*(a*d*(B*c*(1 + m) - A*d*(
1 + m - n)) + b*c*(A*d*(1 + m + 2*n) - B*c*(1 + m + 3*n)))*(e*x)^(1 + m)*Hy
pergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c^2*d^4*e*(1 +
 m)*n)
```

Rubi [A] time = 1.13472, antiderivative size = 381, normalized size of antiderivative = 0.99, number of steps used = 8, number of rules used = 5, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.161, Rules used = {594, 570, 20, 30, 364}

$$-\frac{b(ex)^{m+1}\left(3a^2d^2(Ad(m+1)-Bc(m+n+1))-3abcd(Ad(m+n+1)-Bc(m+2n+1))+b^2c^2(Ad(m+2n+1)-Bc(m\right.}{cd^4e(m+1)n}$$

Antiderivative was successfully verified.

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

```
[Out] -((b^2*(3*a*d*(A*d*(1 + m + n) - B*c*(1 + m + 2*n)) - b*c*(A*d*(1 + m + 2*n
) - B*c*(1 + m + 3*n)))*x^(1 + n)*(e*x)^m)/(c*d^3*n*(1 + m + n))) - (b^3*(A
 - (B*c*(1 + m + 3*n))/(d*(1 + m + 2*n)))*x^(1 + 2*n)*(e*x)^m)/(c*d*n) - (b
*(3*a^2*d^2*(A*d*(1 + m) - B*c*(1 + m + n)) - 3*a*b*c*d*(A*d*(1 + m + n) -
B*c*(1 + m + 2*n)) + b^2*c^2*(A*d*(1 + m + 2*n) - B*c*(1 + m + 3*n)))*(e*x)
^(1 + m))/(c*d^4*e*(1 + m)*n) - ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^n)^3)/(
c*d*e*n*(c + d*x^n)) + ((b*c - a*d)^2*(a*d*(B*c*(1 + m) - A*d*(1 + m - n))
+ b*c*(A*d*(1 + m + 2*n) - B*c*(1 + m + 3*n)))*(e*x)^(1 + m)*Hypergeometric
2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c^2*d^4*e*(1 + m)*n)
```

Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 570

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

```
, d, e, f, g, m, n}, x] && IGtQ[p, -2] && IGtQ[q, 0] && IGtQ[r, 0]
```

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
), x], x] /; FreeQ[{a, b, m, n}, x] &&  !IntegerQ[m] &&  !IntegerQ[n] &&  !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^3 (A+Bx^n)}{(c+dx^n)^2}\,dx = -\frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^3}{cden(c+dx^n)} - \frac{\int \frac{(ex)^m(a+bx^n)^2(-a(Bc(1+m)-Ad(1+m-n))+b(Ad(1+m+2n)-B\ldots}{c+dx^n}}{cdn}$$

$$= -\frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^3}{cden(c+dx^n)} - \frac{\int \left(\frac{b\left(3a^2d^2(Ad(1+m)-Bc(1+m+n))-3abcd(Ad(1+m+n)-Bc(1+\ldots\right.}{d^3}\right.}{\ldots}$$

$$= -\frac{b\left(3a^2d^2(Ad(1+m)-Bc(1+m+n))-3abcd(Ad(1+m+n)-Bc(1+m+2n)\right)\ldots}{cd^4e(1+m)n}$$

$$= -\frac{b\left(3a^2d^2(Ad(1+m)-Bc(1+m+n))-3abcd(Ad(1+m+n)-Bc(1+m+2n)\right)\ldots}{cd^4e(1+m)n}$$

$$= -\frac{b^2(3ad(Ad(1+m+n)-Bc(1+m+2n))-bc(Ad(1+m+2n)-Bc(1+m+3n\ldots}{cd^3n(1+m+n)}$$

Mathematica [A] time = 0.52231, size = 220, normalized size = 0.57

$$\frac{x(ex)^m\left(\frac{b\left(3a^2Bd^2+3abd(Ad-2Bc)+b^2c(3Bc-2Ad)\right)}{m+1}+\frac{b^2dx^n(3aBd+Abd-2bBc)}{m+n+1}+\frac{(bc-ad)^3(Bc-Ad)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2(m+1)}-\frac{(bc-ad)^2(-aBd-3Abd\ldots}{\ldots}\right.}{d^4}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((b*(3*a^2*B*d^2 + b^2*c*(3*B*c - 2*A*d) + 3*a*b*d*(-2*B*c + A*d
)))/(1 + m) + (b^2*d*(-2*b*B*c + A*b*d + 3*a*B*d)*x^n)/(1 + m + n) + (b^3*B
*d^2*x^(2*n))/(1 + m + 2*n) - ((b*c - a*d)^2*(4*b*B*c - 3*A*b*d - a*B*d)*Hy
pergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c*(1 + m)) + (
(b*c - a*d)^3*(B*c - A*d)*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n, -(
(d*x^n)/c)])/(c^2*(1 + m))))/d^4
```

Maple [F] time = 0.509, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ((b^3*c^3*d*e^m*(m + 2*n + 1) - 3*a*b^2*c^2*d^2*e^m*(m + n + 1) - a^3*d^4*e
^m*(m - n + 1) + 3*a^2*b*c*d^3*e^m*(m + 1))*A - (b^3*c^4*e^m*(m + 3*n + 1)
- 3*a*b^2*c^3*d*e^m*(m + 2*n + 1) + 3*a^2*b*c^2*d^2*e^m*(m + n + 1) - a^3*c
*d^3*e^m*(m + 1))*B)*integrate(x^m/(c*d^5*n*x^n + c^2*d^4*n), x) + ((m^2*n
+ (n^2 + 2*n)*m + n^2 + n)*B*b^3*c*d^3*e^m*x*e^(m*log(x) + 3*n*log(x)) - ((
(m^3 + m^2*(5*n + 3) + 4*n^3 + (8*n^2 + 10*n + 3)*m + 8*n^2 + 5*n + 1)*b^3*
c^3*d*e^m - 3*(m^3 + m^2*(4*n + 3) + 2*n^3 + (5*n^2 + 8*n + 3)*m + 5*n^2 +
4*n + 1)*a*b^2*c^2*d^2*e^m + 3*(m^3 + 3*m^2*(n + 1) + (2*n^2 + 6*n + 3)*m +
 2*n^2 + 3*n + 1)*a^2*b*c*d^3*e^m - (m^3 + 3*m^2*(n + 1) + (2*n^2 + 6*n + 3
)*m + 2*n^2 + 3*n + 1)*a^3*d^4*e^m)*A - ((m^3 + 3*m^2*(2*n + 1) + 6*n^3 + (
11*n^2 + 12*n + 3)*m + 11*n^2 + 6*n + 1)*b^3*c^4*e^m - 3*(m^3 + m^2*(5*n +
3) + 4*n^3 + (8*n^2 + 10*n + 3)*m + 8*n^2 + 5*n + 1)*a*b^2*c^3*d*e^m + 3*(m
^3 + m^2*(4*n + 3) + 2*n^3 + (5*n^2 + 8*n + 3)*m + 5*n^2 + 4*n + 1)*a^2*b*c
^2*d^2*e^m - (m^3 + 3*m^2*(n + 1) + (2*n^2 + 6*n + 3)*m + 2*n^2 + 3*n + 1)*
a^3*c*d^3*e^m)*B)*x*x^m + ((m^2*n + 2*(n^2 + n)*m + 2*n^2 + n)*A*b^3*c*d^3*
e^m - ((m^2*n + (3*n^2 + 2*n)*m + 3*n^2 + n)*b^3*c^2*d^2*e^m - 3*(m^2*n + 2
*(n^2 + n)*m + 2*n^2 + n)*a*b^2*c*d^3*e^m)*B)*x*e^(m*log(x) + 2*n*log(x)) -
 (((m^2*n + 4*n^3 + 2*(2*n^2 + n)*m + 4*n^2 + n)*b^3*c^2*d^2*e^m - 3*(m^2*n
 + 2*n^3 + (3*n^2 + 2*n)*m + 3*n^2 + n)*a*b^2*c*d^3*e^m)*A - ((m^2*n + 6*n^
3 + (5*n^2 + 2*n)*m + 5*n^2 + n)*b^3*c^3*d*e^m - 3*(m^2*n + 4*n^3 + 2*(2*n^
2 + n)*m + 4*n^2 + n)*a*b^2*c^2*d^2*e^m + 3*(m^2*n + 2*n^3 + (3*n^2 + 2*n)*
m + 3*n^2 + n)*a^2*b*c*d^3*e^m)*B)*x*e^(m*log(x) + n*log(x)))/((m^3*n + 3*(
n^2 + n)*m^2 + 2*n^3 + (2*n^3 + 6*n^2 + 3*n)*m + 3*n^2 + n)*c*d^5*x^n + (m^
3*n + 3*(n^2 + n)*m^2 + 2*n^3 + (2*n^3 + 6*n^2 + 3*n)*m + 3*n^2 + n)*c^2*d^
4)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.30 $\int \frac{(ex)^m(a+bx^n)^2(A+Bx^n)}{(c+dx^n)^2}\,dx$

Optimal. Leaf size=267

$$-\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(ad(Bc(m+1)-Ad(m-n+1))+bc(Ad(m+n+1)-Bc(m+2n+1)))}{c^2d^3e(m+1)n}-b$$

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

Rubi [A] time = 0.675441, antiderivative size = 267, 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, Rules used = {594, 570, 20, 30, 364}

$$-\frac{(ex)^{m+1}(bc-ad)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(ad(Bc(m+1)-Ad(m-n+1))+bc(Ad(m+n+1)-Bc(m+2n+1)))}{c^2d^3e(m+1)n}-b$$

Antiderivative was successfully verified.

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

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

Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 570

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

Rule 20

```
Int[(u_.)*((a_.)*(v_))^(m_)*((b_.)*(v_))^(n_), x_Symbol] :> Dist[(b^IntPart
[n]*(b*v)^FracPart[n])/(a^IntPart[n]*(a*v)^FracPart[n]), Int[u*(a*v)^(m + n
```

```
), x], x] /; FreeQ[{a, b, m, n}, x] && !IntegerQ[m] && !IntegerQ[n] && !
IntegerQ[m + n]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^2 (A+Bx^n)}{(c+dx^n)^2}\,dx = -\frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^2}{cden(c+dx^n)} - \frac{\int \frac{(ex)^m(a+bx^n)(-a(Bc(1+m)-Ad(1+m-n))+b(Ad(1+m+n)-Bc(}{c+dx^n}}{cdn}$$

$$= -\frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^2}{cden(c+dx^n)} - \frac{\int \Big(\frac{b(2ad(Ad(1+m)-Bc(1+m+n))-bc(Ad(1+m+n)-Bc(1+m+2n}{d^2}}{}$$

$$= -\frac{b(2ad(Ad(1+m)-Bc(1+m+n))-bc(Ad(1+m+n)-Bc(1+m+2n)))(ex)^{1}}{cd^3e(1+m)n}$$

$$= -\frac{b(2ad(Ad(1+m)-Bc(1+m+n))-bc(Ad(1+m+n)-Bc(1+m+2n)))(ex)^{1}}{cd^3e(1+m)n}$$

$$= -\frac{b^2(Ad(1+m+n)-Bc(1+m+2n))x^{1+n}(ex)^m}{cd^2n(1+m+n)} - \frac{b(2ad(Ad(1+m)-Bc(1+m+}{}$$

Mathematica [A] time = 0.30429, size = 161, normalized size = 0.6

$$\frac{x(ex)^m\left(-\frac{(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2(m+1)}+\frac{(bc-ad)(-aBd-2Abd+3bBc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c(m+1)}+\frac{b(2aBd+Abd-2bBc)}{m+1}+\frac{b^2Bdx^n}{m+n+1}\right)}{d^3}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.54, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(b^2c^2de^m(m+n+1)+a^2d^3e^m(m-n+1)-2\,abcd^2e^m(m+1)\right)A-\left(b^2c^3e^m(m+2\,n+1)-2\,abc^2de^m(m+n+1)+a^2c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\left(Bb^2x^{3\,n}+Aa^2+\left(2\,Bab+Ab^2\right)x^{2\,n}+\left(Ba^2+2\,Aab\right)x^n\right)(ex)^m}{d^2x^{2\,n}+2\,cdx^n+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.31 $\int \frac{(ex)^m(a+bx^n)(A+Bx^n)}{(c+dx^n)^2}\,dx$

Optimal. Leaf size=178

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(Ad(bc(m+1)-ad(m-n+1))+Bc(ad(m+1)-bc(m+n+1)))}{c^2d^2e(m+1)n}-\frac{(ex)^{m+1}(bc-ad)(}{cden\,(c+d}$$

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

Rubi [A] time = 0.25265, antiderivative size = 178, 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, Rules used = {594, 459, 364}

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(Ad(bc(m+1)-ad(m-n+1))+Bc(ad(m+1)-bc(m+n+1)))}{c^2d^2e(m+1)n}-\frac{(ex)^{m+1}(bc-ad)(}{cden\,(c+d}$$

Antiderivative was successfully verified.

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

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

Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)(A+Bx^n)}{(c+dx^n)^2}\,dx = -\frac{(bc-ad)(ex)^{1+m}(A+Bx^n)}{cden(c+dx^n)} - \frac{\int \frac{(ex)^m(-A(bc(1+m)-ad(1+m-n))+B(ad(1+m)-bc(1+m+n))x^n)}{c+dx^n}\,d}{cdn}$$

$$= -\frac{B(ad(1+m)-bc(1+m+n))(ex)^{1+m}}{cd^2e(1+m)n} - \frac{(bc-ad)(ex)^{1+m}(A+Bx^n)}{cden(c+dx^n)} + \frac{(Ad(bc(1+}{}$$

$$= -\frac{B(ad(1+m)-bc(1+m+n))(ex)^{1+m}}{cd^2e(1+m)n} - \frac{(bc-ad)(ex)^{1+m}(A+Bx^n)}{cden(c+dx^n)} + \frac{(Ad(bc(1+}{}$$

Mathematica [A] time = 0.15861, size = 110, normalized size = 0.62

$$\frac{x(ex)^m\left(c(aBd+Abd-2bBc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+(bc-ad)(Bc-Ad)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+bBc^2\right)}{c^2d^2(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*(b*B*c^2 + c*(-2*b*B*c + A*b*d + a*B*d)*Hypergeometric2F1[1, (1
+ m)/n, (1 + m + n)/n, -((d*x^n)/c)] + (b*c - a*d)*(B*c - A*d)*Hypergeometr
ic2F1[2, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)]))/(c^2*d^2*(1 + m))
```

Maple [F] time = 0.349, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(ad^2e^m(m-n+1)-bcde^m(m+1)\right)A+\left(bc^2e^m(m+n+1)-acde^m(m+1)\right)B\right)\int \frac{x^m}{cd^3nx^n+c^2d^2n}\,dx + \frac{Bbcde^m nxe^{(}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\left(Bbx^{2n} + Aa + (Ba + Ab)x^{n}\right)(ex)^{m}}{d^{2}x^{2n} + 2\,cdx^{n} + c^{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 47.9481, size = 4129, normalized size = 23.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*a*(-e**m*m**2*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gam
ma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 +
 1/n))) + e**m*m*n*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*
gamma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n +
1 + 1/n))) + e**m*m*n*x*x**m*gamma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 + 1/
n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - 2*e**m*m*x*x**m*lerchphi(d*x**n*e
xp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 +
 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) + e**m*n*x*x**m*lerchphi(d*x**n*
exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1
+ 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) + e**m*n*x*x**m*gamma(m/n + 1/n
)/(c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - e*
*m*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)
/(c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - d*e
**m*m**2*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma
(m/n + 1/n)/(c**2*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1
+ 1/n))) + d*e**m*m*n*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n
 + 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*g
amma(m/n + 1 + 1/n))) - 2*d*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*
pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gamma(m/n + 1 + 1/n) +
d*n**3*x**n*gamma(m/n + 1 + 1/n))) + d*e**m*n*x*x**m*x**n*lerchphi(d*x**n*e
xp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gamma(m/n +
1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - d*e**m*x*x**m*x**n*lerchphi
(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gam
ma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n)))) + A*b*(-e**m*m**2*x
*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n +
 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n
))) - e**m*m*n*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 +
1/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gam
ma(m/n + 2 + 1/n))) + e**m*m*n*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(c*(c*n**3*
gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - 2*e**m*m*x*x**m
*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 +
1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) +
 e**m*n**2*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n)
 + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - e**m*n*x*x**m*x**n*lerchphi(d*x**n*
exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(
```

```
m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**m*n*x*x**m*x**n*ga
mma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n
+ 2 + 1/n))) - e**m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n +
 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**
n*gamma(m/n + 2 + 1/n))) - d*e**m*m**2*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_
polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m
/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*m*n*x*x**m*x**(
2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1
/n)/(c**2*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n)))
 - 2*d*e**m*m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1
 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x*
*n*gamma(m/n + 2 + 1/n))) - d*e**m*n*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_po
lar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n
 + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*x*x**m*x**(2*n)*l
erchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c
**2*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n)))) + B*
a*(-e**m*m**2*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1
/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamm
a(m/n + 2 + 1/n))) - e**m*m*n*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c
, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) +
d*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**m*m*n*x*x**m*x**n*gamma(m/n + 1 + 1
/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) -
2*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*g
amma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n
 + 2 + 1/n))) + e**m*n**2*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma
(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - e**m*n*x*x**m*x**n*l
erchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c
*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**m*n
*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*
x**n*gamma(m/n + 2 + 1/n))) - e**m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*
pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/
n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*m**2*x*x**m*x**(2*n)*lerch
phi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*
(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*
m*n*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*ga
mma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m
/n + 2 + 1/n))) - 2*d*e**m*m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi
)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n + 2 + 1
/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*n*x*x**m*x**(2*n)*lerchph
i(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*(c
*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*x*
x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/
n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2
 + 1/n)))) + B*b*(-e**m*m**2*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi
)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*(c*n**3*gamma(m/n + 3 + 1/n)
 + d*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3*e**m*m*n*x*x**m*x**(2*n)*lerchphi
(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*(c*n**
3*gamma(m/n + 3 + 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) + e**m*m*n*x*x*
*m*x**(2*n)*gamma(m/n + 2 + 1/n)/(c*(c*n**3*gamma(m/n + 3 + 1/n) + d*n**3*x
**n*gamma(m/n + 3 + 1/n))) - 2*e**m*m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_p
olar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*(c*n**3*gamma(m/n +
 3 + 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) - 2*e**m*n**2*x*x**m*x**(2*n
)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)
/(c*(c*n**3*gamma(m/n + 3 + 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) + 2*e
**m*n**2*x*x**m*x**(2*n)*gamma(m/n + 2 + 1/n)/(c*(c*n**3*gamma(m/n + 3 + 1/
n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3*e**m*n*x*x**m*x**(2*n)*lerchphi
(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*(c*n**
3*gamma(m/n + 3 + 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) + e**m*n*x*x**m
*x**(2*n)*gamma(m/n + 2 + 1/n)/(c*(c*n**3*gamma(m/n + 3 + 1/n) + d*n**3*x**
```

```
n*gamma(m/n + 3 + 1/n))) - e**m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I
*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c*(c*n**3*gamma(m/n + 3 + 1
/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) - d*e**m*m**2*x*x**m*x**(3*n)*lerc
hphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c**2
*(c*n**3*gamma(m/n + 3 + 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3*d*e*
*m*m*n*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)
*gamma(m/n + 2 + 1/n)/(c**2*(c*n**3*gamma(m/n + 3 + 1/n) + d*n**3*x**n*gamm
a(m/n + 3 + 1/n))) - 2*d*e**m*m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I
*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c**2*(c*n**3*gamma(m/n + 3
+ 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) - 2*d*e**m*n**2*x*x**m*x**(3*n)
*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/
(c**2*(c*n**3*gamma(m/n + 3 + 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))) - 3
*d*e**m*n*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 2 + 1
/n)*gamma(m/n + 2 + 1/n)/(c**2*(c*n**3*gamma(m/n + 3 + 1/n) + d*n**3*x**n*g
amma(m/n + 3 + 1/n))) - d*e**m*x*x**m*x**(3*n)*lerchphi(d*x**n*exp_polar(I*
pi)/c, 1, m/n + 2 + 1/n)*gamma(m/n + 2 + 1/n)/(c**2*(c*n**3*gamma(m/n + 3 +
 1/n) + d*n**3*x**n*gamma(m/n + 3 + 1/n))))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.32 $\int \frac{(ex)^m(A+Bx^n)}{(c+dx^n)^2} dx$

Optimal. Leaf size=107

$$\frac{(ex)^{m+1}(Bc(m+1)-Ad(m-n+1))\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2de(m+1)n}-\frac{(ex)^{m+1}(Bc-Ad)}{cden\,(c+dx^n)}$$

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

Rubi [A] time = 0.0555015, antiderivative size = 107, 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, Rules used = {457, 364}

$$\frac{(ex)^{m+1}(Bc(m+1)-Ad(m-n+1))\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2de(m+1)n}-\frac{(ex)^{m+1}(Bc-Ad)}{cden\,(c+dx^n)}$$

Antiderivative was successfully verified.

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

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

Rule 457

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> -Simp[((b*c - a*d)*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*
b*e*n*(p + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*b*n*(p
 + 1)), Int[(e*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, m,
 n}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1] && (( !IntegerQ[p + 1/2] && NeQ[
p, -5/4]) ||  !RationalQ[m] || (IGtQ[n, 0] && ILtQ[p + 1/2, 0] && LeQ[-1, m
, -(n*(p + 1))]))
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{(ex)^m(A+Bx^n)}{(c+dx^n)^2}\,dx &= -\frac{(Bc-Ad)(ex)^{1+m}}{cden\,(c+dx^n)}+\frac{(Bc(1+m)-Ad(1+m-n))\int \frac{(ex)^m}{c+dx^n}\,dx}{cdn}\\ &= -\frac{(Bc-Ad)(ex)^{1+m}}{cden\,(c+dx^n)}+\frac{(Bc(1+m)-Ad(1+m-n))(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{c^2de(1+m)n}\end{aligned}$$

Mathematica [A] time = 0.0707896, size = 83, normalized size = 0.78

$$\frac{x(ex)^m\left((Ad-Bc)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+Bc\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)\right)}{c^2d(m+1)}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.358, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{(Bce^m-Ade^m)xx^m}{cd^2nx^n+c^2dn}-(Ade^m(m-n+1)-Bce^m(m+1))\int \frac{x^m}{cd^2nx^n+c^2dn}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(B*c*e^m - A*d*e^m)*x*x^m/(c*d^2*n*x^n + c^2*d*n) - (A*d*e^m*(m - n + 1) -
 B*c*e^m*(m + 1))*integrate(x^m/(c*d^2*n*x^n + c^2*d*n), x)
```

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

$$\text{integral}\left(\frac{(Bx^n+A)(ex)^m}{d^2x^{2n}+2\,cdx^n+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 12.8347, size = 1897, normalized size = 17.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] A*(-e**m*m**2*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma
(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1
/n))) + e**m*m*n*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*ga
mma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1
+ 1/n))) + e**m*m*n*x*x**m*gamma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 + 1/n)
 + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - 2*e**m*m*x*x**m*lerchphi(d*x**n*exp
_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 + 1
/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) + e**m*n*x*x**m*lerchphi(d*x**n*ex
p_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c*(c*n**3*gamma(m/n + 1 +
1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) + e**m*n*x*x**m*gamma(m/n + 1/n)/
(c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - e**m
*x*x**m*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(
c*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - d*e**
m*m**2*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m
/n + 1/n)/(c**2*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 +
1/n))) + d*e**m*m*n*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n +
 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gamma(m/n + 1 + 1/n) + d*n**3*x**n*gam
ma(m/n + 1 + 1/n))) - 2*d*e**m*m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi
)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gamma(m/n + 1 + 1/n) + d*
n**3*x**n*gamma(m/n + 1 + 1/n))) + d*e**m*n*x*x**m*x**n*lerchphi(d*x**n*exp
_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gamma(m/n + 1
+ 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n))) - d*e**m*x*x**m*x**n*lerchphi(d
*x**n*exp_polar(I*pi)/c, 1, m/n + 1/n)*gamma(m/n + 1/n)/(c**2*(c*n**3*gamma
(m/n + 1 + 1/n) + d*n**3*x**n*gamma(m/n + 1 + 1/n)))) + B*(-e**m*m**2*x*x**
m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 +
 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n)))
- e**m*m*n*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)
*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m
/n + 2 + 1/n))) + e**m*m*n*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamm
a(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - 2*e**m*m*x*x**m*x**
n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)
/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**
m*n**2*x*x**m*x**n*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d
*n**3*x**n*gamma(m/n + 2 + 1/n))) - e**m*n*x*x**m*x**n*lerchphi(d*x**n*exp_
polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n
+ 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) + e**m*n*x*x**m*x**n*gamma(
m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2
+ 1/n))) - e**m*x*x**m*x**n*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 +
 1/n)*gamma(m/n + 1 + 1/n)/(c*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*ga
mma(m/n + 2 + 1/n))) - d*e**m*m**2*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_pola
r(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n +
 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*m*n*x*x**m*x**(2*n)
*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/
(c**2*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - 2
*d*e**m*m*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1
/n)*gamma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*g
amma(m/n + 2 + 1/n))) - d*e**m*n*x*x**m*x**(2*n)*lerchphi(d*x**n*exp_polar(
I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*(c*n**3*gamma(m/n + 2
 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))) - d*e**m*x*x**m*x**(2*n)*lerch
phi(d*x**n*exp_polar(I*pi)/c, 1, m/n + 1 + 1/n)*gamma(m/n + 1 + 1/n)/(c**2*
(c*n**3*gamma(m/n + 2 + 1/n) + d*n**3*x**n*gamma(m/n + 2 + 1/n))))
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.33 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)(c+dx^n)^2}\,dx$

Optimal. Leaf size=211

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(ad(Bc(m+1)-Ad(m-n+1))+bc(Ad(m-2n+1)-Bc(m-n+1)))}{c^2e(m+1)n(bc-ad)^2}+\frac{b(ex)^{m+1}}{}$$

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

Rubi [A] time = 0.520973, antiderivative size = 211, 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, Rules used = {595, 597, 364}

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(ad(Bc(m+1)-Ad(m-n+1))+bc(Ad(m-2n+1)-Bc(m-n+1)))}{c^2e(m+1)n(bc-ad)^2}+\frac{b(ex)^{m+1}}{}$$

Antiderivative was successfully verified.

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


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


Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

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

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)}{(a+bx^n)(c+dx^n)^2}\,dx = \frac{(Bc-Ad)(ex)^{1+m}}{c(bc-ad)en(c+dx^n)} + \frac{\int \frac{(ex)^m(-a(Bc-Ad)(1+m)+A(bc-ad)n-b(Bc-Ad)(1+m-n)x^n)}{(a+bx^n)(c+dx^n)}\,dx}{c(bc-ad)n}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}}{c(bc-ad)en(c+dx^n)} + \frac{\int \left(\frac{b(Ab-aB)cn(ex)^m}{(bc-ad)(a+bx^n)} + \frac{(bc(Ad(1+m-2n)-Bc(1+m-n))+ad(Bc(1+m)-Ad(1+m-n)))(e}{(bc-ad)(c+dx^n)}\right.}{c(bc-ad)n}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}}{c(bc-ad)en(c+dx^n)} + \frac{(b(Ab-aB))\int \frac{(ex)^m}{a+bx^n}\,dx}{(bc-ad)^2} + \frac{(bc(Ad(1+m-2n)-Bc(1+m-n))+}{c(bc}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}}{c(bc-ad)en(c+dx^n)} + \frac{b(Ab-aB)(ex)^{1+m}\,{}_2F_1\left(1,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{bx^n}{a}\right)}{a(bc-ad)^2e(1+m)} + \frac{(bc(Ad(1+m-2n}{}$$

Mathematica [A] time = 0.208247, size = 150, normalized size = 0.71

$$\frac{x(ex)^m\left(bc^2(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)+acd(aB-Ab)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+a(bc-ad)(Bc-Ad)\,{}_2F_1\left(2,\frac{n}{}\right.\right.}{ac^2(m+1)(bc-ad)^2}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.667, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{(Bce^m-Ade^m)xx^m}{bc^3n-ac^2dn+\left(bc^2dn-acd^2n\right)x^n} - \left(\left(ad^2e^m(m-n+1)-bcde^m(m-2n+1)\right)A+\left(bc^2e^m(m-n+1)-acde^m(m+1)\right)B\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

$$\text{integral}\left(\frac{(Bx^n + A)(ex)^m}{bd^2x^{3n} + ac^2 + \left(2bcd + ad^2\right)x^{2n} + \left(bc^2 + 2acd\right)x^n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.34 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)^2(c+dx^n)^2}\,dx$

Optimal. Leaf size=315

$$\frac{b(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)(Ab(ad(m-3n+1)-bc(m-n+1))+aB(bc(m+1)-ad(m-2n+1)))}{a^2e(m+1)n(bc-ad)^3}-\frac{d(ex)^{m+1}\,{}_2\cdots}{\cdots}$$

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

Rubi [A] time = 1.09656, antiderivative size = 315, 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, Rules used = {595, 597, 364}

$$\frac{b(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)(Ab(ad(m-3n+1)-bc(m-n+1))+aB(bc(m+1)-ad(m-2n+1)))}{a^2e(m+1)n(bc-ad)^3}-\frac{d(ex)^{m+1}\,{}_2\cdots}{\cdots}$$

Antiderivative was successfully verified.

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

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

Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

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

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)}{(a+bx^n)^2 (c+dx^n)^2} dx = \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)} - \frac{\int \frac{(ex)^m(-aBc(1+m)+Abc(1+m-n)+aAdn+(Ab-aB)d(1+m-2n)x^n)}{(a+bx^n)(c+dx^n)^2} d}{a(bc-ad)n}$$

$$= \frac{d(Abc-2aBc+aAd)(ex)^{1+m}}{ac(bc-ad)^2en(c+dx^n)} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)} - \frac{\int \frac{(ex)^m(-n(aBc(bc+ad)(1}{}}{}$$

$$= \frac{d(Abc-2aBc+aAd)(ex)^{1+m}}{ac(bc-ad)^2en(c+dx^n)} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)} - \frac{\int \left(\frac{bc(-aB(bc(1+m)-ad(1}{}\right.}{}$$

$$= \frac{d(Abc-2aBc+aAd)(ex)^{1+m}}{ac(bc-ad)^2en(c+dx^n)} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)} + \frac{(b(aB(bc(1+m)-a}{}$$

$$= \frac{d(Abc-2aBc+aAd)(ex)^{1+m}}{ac(bc-ad)^2en(c+dx^n)} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)} + \frac{b(aB(bc(1+m)-ad}{}$$

Mathematica [A] time = 0.316594, size = 209, normalized size = 0.66

$$\frac{x(ex)^m \left(\frac{b(aB-Ab)(ad-bc)\,_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^2} - \frac{d(bc-ad)(Bc-Ad)\,_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2} + \frac{b(aBd-2Abd+bBc)\,_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a} - \frac{d}{}\right.}{(m+1)(bc-ad)^3}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((b*(b*B*c - 2*A*b*d + a*B*d)*Hypergeometric2F1[1, (1 + m)/n, (1
 + m + n)/n, -((b*x^n)/a)])/a - (d*(b*B*c - 2*A*b*d + a*B*d)*Hypergeometric
2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/c + (b*(-(A*b) + a*B)*(-(b*
c) + a*d)*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)])/a^2
 - (d*(b*c - a*d)*(B*c - A*d)*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n
, -((d*x^n)/c)])/c^2))/((b*c - a*d)^3*(1 + m))
```

Maple [F] time = 0.716, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\left(\left(b^3ce^m(m-n+1)-ab^2de^m(m-3n+1)\right)A+\left(a^2bde^m(m-2n+1)-ab^2ce^m(m+1)\right)B\right)\int -\frac{\quad}{a^2b^3c^3n-3a^3b^2c^2dn+3a\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{(Bx^n+A)(ex)^m}{b^2d^2x^{4n}+a^2c^2+2\left(b^2cd+abd^2\right)x^{3n}+\left(b^2c^2+4abcd+a^2d^2\right)x^{2n}+2\left(abc^2+a^2cd\right)x^n},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.35 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)^3(c+dx^n)^2}\,dx$

Optimal. Leaf size=567

$$b(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)\left(Ab\left(a^2d^2\left(m^2+m(2-7n)+12n^2-7n+1\right)-2abcd\left(m^2+m(2-5n)+4n^2-5n+1\right.\right.\right.$$

```
[Out] (d*(a*B*c*(b*c*(1 + m) - a*d*(1 + m - 6*n)) + A*(a*b*c*d*(1 + m - 6*n) - b^
2*c^2*(1 + m - 2*n) - 2*a^2*d^2*n))*(e*x)^(1 + m))/(2*a^2*c*(b*c - a*d)^3*e
*n^2*(c + d*x^n)) + ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)*e*n*(a + b
*x^n)^2*(c + d*x^n)) + ((a*B*(b*c*(1 + m) - a*d*(1 + m - 3*n)) + A*b*(a*d*(
1 + m - 5*n) - b*c*(1 + m - 2*n)))*(e*x)^(1 + m))/(2*a^2*(b*c - a*d)^2*e*n^
2*(a + b*x^n)*(c + d*x^n)) + (b*(a*B*(2*a*b*c*d*(1 + m)*(1 + m - 3*n) - b^2
*c^2*(1 + m)*(1 + m - n) - a^2*d^2*(1 + m^2 + m*(2 - 5*n) - 5*n + 6*n^2)) +
 A*b*(b^2*c^2*(1 + m^2 + m*(2 - 3*n) - 3*n + 2*n^2) - 2*a*b*c*d*(1 + m^2 +
m*(2 - 5*n) - 5*n + 4*n^2) + a^2*d^2*(1 + m^2 + m*(2 - 7*n) - 7*n + 12*n^2)
))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a
)])/(2*a^3*(b*c - a*d)^4*e*(1 + m)*n^2) + (d^2*(b*c*(A*d*(1 + m - 4*n) - B*
c*(1 + m - 3*n)) + a*d*(B*c*(1 + m) - A*d*(1 + m - n)))*(e*x)^(1 + m)*Hyper
geometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c^2*(b*c - a*d)^4
*e*(1 + m)*n)
```

Rubi [A] time = 2.34061, antiderivative size = 567, 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, Rules used = {595, 597, 364}

$$b(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)\left(Ab\left(a^2d^2\left(m^2+m(2-7n)+12n^2-7n+1\right)-2abcd\left(m^2+m(2-5n)+4n^2-5n+1\right.\right.\right.$$

Antiderivative was successfully verified.

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


```
[Out] (d*(a*B*c*(b*c*(1 + m) - a*d*(1 + m - 6*n)) + A*(a*b*c*d*(1 + m - 6*n) - b^
2*c^2*(1 + m - 2*n) - 2*a^2*d^2*n))*(e*x)^(1 + m))/(2*a^2*c*(b*c - a*d)^3*e
*n^2*(c + d*x^n)) + ((A*b - a*B)*(e*x)^(1 + m))/(2*a*(b*c - a*d)*e*n*(a + b
*x^n)^2*(c + d*x^n)) + ((a*B*(b*c*(1 + m) - a*d*(1 + m - 3*n)) + A*b*(a*d*(
1 + m - 5*n) - b*c*(1 + m - 2*n)))*(e*x)^(1 + m))/(2*a^2*(b*c - a*d)^2*e*n^
2*(a + b*x^n)*(c + d*x^n)) + (b*(a*B*(2*a*b*c*d*(1 + m)*(1 + m - 3*n) - b^2
*c^2*(1 + m)*(1 + m - n) - a^2*d^2*(1 + m^2 + m*(2 - 5*n) - 5*n + 6*n^2)) +
 A*b*(b^2*c^2*(1 + m^2 + m*(2 - 3*n) - 3*n + 2*n^2) - 2*a*b*c*d*(1 + m^2 +
m*(2 - 5*n) - 5*n + 4*n^2) + a^2*d^2*(1 + m^2 + m*(2 - 7*n) - 7*n + 12*n^2)
))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a
)])/(2*a^3*(b*c - a*d)^4*e*(1 + m)*n^2) + (d^2*(b*c*(A*d*(1 + m - 4*n) - B*
c*(1 + m - 3*n)) + a*d*(B*c*(1 + m) - A*d*(1 + m - n)))*(e*x)^(1 + m)*Hyper
geometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(c^2*(b*c - a*d)^4
*e*(1 + m)*n)
```


Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
```

```
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

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

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)}{(a+bx^n)^3 (c+dx^n)^2}\,dx = \frac{(Ab-aB)(ex)^{1+m}}{2a(bc-ad)en\,(a+bx^n)^2 (c+dx^n)} - \frac{\int \frac{(ex)^m(-aBc(1+m)+Abc(1+m-2n)+2aAdn+(Ab-aB)d(1+m-3n)\cdots}{(a+bx^n)^2(c+dx^n)^2}}{2a(bc-ad)n}$$

$$= \frac{(Ab-aB)(ex)^{1+m}}{2a(bc-ad)en\,(a+bx^n)^2 (c+dx^n)} + \frac{(aB(bc(1+m)-ad(1+m-3n))+Ab(ad(1+m-\cdots}{2a^2(bc-ad)^2en^2\,(a+bx^n)\,(\cdots}$$

$$= \frac{d\left(aBc(bc(1+m)-ad(1+m-6n))+A\left(abcd(1+m-6n)-b^2c^2(1+m-2n)-2a^2d^2\cdots\right.\right.}{2a^2c(bc-ad)^3en^2\,(c+dx^n)}$$

$$= \frac{d\left(aBc(bc(1+m)-ad(1+m-6n))+A\left(abcd(1+m-6n)-b^2c^2(1+m-2n)-2a^2d^2\cdots\right.\right.}{2a^2c(bc-ad)^3en^2\,(c+dx^n)}$$

$$= \frac{d\left(aBc(bc(1+m)-ad(1+m-6n))+A\left(abcd(1+m-6n)-b^2c^2(1+m-2n)-2a^2d^2\cdots\right.\right.}{2a^2c(bc-ad)^3en^2\,(c+dx^n)}$$

$$= \frac{d\left(aBc(bc(1+m)-ad(1+m-6n))+A\left(abcd(1+m-6n)-b^2c^2(1+m-2n)-2a^2d^2\cdots\right.\right.}{2a^2c(bc-ad)^3en^2\,(c+dx^n)}$$

Mathematica [A] time = 0.45545, size = 270, normalized size = 0.48

$$\frac{x(ex)^m\left(\frac{b(bc-ad)(aBd-2Abd+bBc)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^2}+\frac{b(Ab-aB)(bc-ad)^2\,{}_2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^3}+\frac{d^2(bc-ad)(Bc-Ad)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\cdots\right.}{c^2}\cdots\right.}{(m+1)(bc-ad)^4}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*(-((b*d*(2*b*B*c - 3*A*b*d + a*B*d)*Hypergeometric2F1[1, (1 + m)
/n, (1 + m + n)/n, -((b*x^n)/a)])/a) + (d^2*(2*b*B*c - 3*A*b*d + a*B*d)*Hyp
ergeometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/c + (b*(b*c - a*
d)*(b*B*c - 2*A*b*d + a*B*d)*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n,
 -((b*x^n)/a)])/a^2 + (d^2*(b*c - a*d)*(B*c - A*d)*Hypergeometric2F1[2, (1
+ m)/n, (1 + m + n)/n, -((d*x^n)/c)])/c^2 + (b*(A*b - a*B)*(b*c - a*d)^2*Hy
pergeometric2F1[3, (1 + m)/n, (1 + m + n)/n, -((b*x^n)/a)])/a^3))/((b*c - a
```

```
*d)^4*(1 + m))
```

Maple [F] time = 0.731, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (((m^2 - m*(3*n - 2) + 2*n^2 - 3*n + 1)*b^4*c^2*e^m - 2*(m^2 - m*(5*n - 2)
+ 4*n^2 - 5*n + 1)*a*b^3*c*d*e^m + (m^2 - m*(7*n - 2) + 12*n^2 - 7*n + 1)*a
^2*b^2*d^2*e^m)*A - ((m^2 - m*(n - 2) - n + 1)*a*b^3*c^2*e^m - 2*(m^2 - m*(
3*n - 2) - 3*n + 1)*a^2*b^2*c*d*e^m + (m^2 - m*(5*n - 2) + 6*n^2 - 5*n + 1)
*a^3*b*d^2*e^m)*B)*integrate(1/2*x^m/(a^3*b^4*c^4*n^2 - 4*a^4*b^3*c^3*d*n^2
 + 6*a^5*b^2*c^2*d^2*n^2 - 4*a^6*b*c*d^3*n^2 + a^7*d^4*n^2 + (a^2*b^5*c^4*n
^2 - 4*a^3*b^4*c^3*d*n^2 + 6*a^4*b^3*c^2*d^2*n^2 - 4*a^5*b^2*c*d^3*n^2 + a^
6*b*d^4*n^2)*x^n), x) - ((a*d^4*e^m*(m - n + 1) - b*c*d^3*e^m*(m - 4*n + 1)
)*A + (b*c^2*d^2*e^m*(m - 3*n + 1) - a*c*d^3*e^m*(m + 1))*B)*integrate(x^m/
(b^4*c^6*n - 4*a*b^3*c^5*d*n + 6*a^2*b^2*c^4*d^2*n - 4*a^3*b*c^3*d^3*n + a^
4*c^2*d^4*n + (b^4*c^5*d*n - 4*a*b^3*c^4*d^2*n + 6*a^2*b^2*c^3*d^3*n - 4*a^
3*b*c^2*d^4*n + a^4*c*d^5*n)*x^n), x) - 1/2*(((a*b^3*c^3*e^m*(m - 3*n + 1)
- a^2*b^2*c^2*d*e^m*(m - 7*n + 1) + 2*a^4*d^3*e^m*n)*A - (a^2*b^2*c^3*e^m*(
m - n + 1) - a^3*b*c^2*d*e^m*(m - 5*n + 1) + 2*a^4*c*d^2*e^m*n)*B)*x*x^m +
((b^4*c^2*d*e^m*(m - 2*n + 1) - a*b^3*c*d^2*e^m*(m - 6*n + 1) + 2*a^2*b^2*d
^3*e^m*n)*A + (a^2*b^2*c*d^2*e^m*(m - 6*n + 1) - a*b^3*c^2*d*e^m*(m + 1))*B
)*x*e^(m*log(x) + 2*n*log(x)) + ((b^4*c^3*e^m*(m - 2*n + 1) - a^2*b^2*c*d^2
*e^m*(m - 7*n + 1) + 3*a*b^3*c^2*d*e^m*n + 4*a^3*b*d^3*e^m*n)*A + (a^3*b*c*
d^2*e^m*(m - 9*n + 1) - a*b^3*c^3*e^m*(m + 1) - 3*a^2*b^2*c^2*d*e^m*n)*B)*x
*e^(m*log(x) + n*log(x)))/(a^4*b^3*c^5*n^2 - 3*a^5*b^2*c^4*d*n^2 + 3*a^6*b*
c^3*d^2*n^2 - a^7*c^2*d^3*n^2 + (a^2*b^5*c^4*d*n^2 - 3*a^3*b^4*c^3*d^2*n^2
+ 3*a^4*b^3*c^2*d^3*n^2 - a^5*b^2*c*d^4*n^2)*x^(3*n) + (a^2*b^5*c^5*n^2 - a
^3*b^4*c^4*d*n^2 - 3*a^4*b^3*c^3*d^2*n^2 + 5*a^5*b^2*c^2*d^3*n^2 - 2*a^6*b*
c*d^4*n^2)*x^(2*n) + (2*a^3*b^4*c^5*n^2 - 5*a^4*b^3*c^4*d*n^2 + 3*a^5*b^2*c
^3*d^2*n^2 + a^6*b*c^2*d^3*n^2 - a^7*c*d^4*n^2)*x^n)
```

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

$$\text{integral}\left(\frac{(Bx^n + A)(ex)^m}{b^3d^2x^{5n} + a^3c^2 + (2b^3cd + 3ab^2d^2)x^{4n} + (b^3c^2 + 6ab^2cd + 3a^2bd^2)x^{3n} + (3ab^2c^2 + 6a^2bcd + a^3d^2)x^{2n} + (3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^n + A)*(e*x)^m/(b^3*d^2*x^(5*n) + a^3*c^2 + (2*b^3*c*d + 3*a*
b^2*d^2)*x^(4*n) + (b^3*c^2 + 6*a*b^2*c*d + 3*a^2*b*d^2)*x^(3*n) + (3*a*b^2
*c^2 + 6*a^2*b*c*d + a^3*d^2)*x^(2*n) + (3*a^2*b*c^2 + 2*a^3*c*d)*x^n), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.36 $\int \frac{(ex)^m(a+bx^n)^2(A+Bx^n)}{(c+dx^n)^3}\,dx$

Optimal. Leaf size=322

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(ad(bc(m+1)-ad(m-n+1))(Bc(m+1)-Ad(m-2n+1))-bc(ad(m+1)-bc(m+}{2c^3d^3e(m+1)n^2}$$

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

Rubi [A] time = 0.556817, antiderivative size = 322, 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, Rules used = {594, 459, 364}

$$\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(ad(bc(m+1)-ad(m-n+1))(Bc(m+1)-Ad(m-2n+1))-bc(ad(m+1)-bc(m+}{2c^3d^3e(m+1)n^2}$$

Antiderivative was successfully verified.

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


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


Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^2 (A+Bx^n)}{(c+dx^n)^3} dx = -\frac{(Bc-Ad)(ex)^{1+m} (a+bx^n)^2}{2cden (c+dx^n)^2} - \frac{\int \frac{(ex)^m(a+bx^n)(-a(Bc(1+m)-Ad(1+m-2n))+b(Ad(1+m)-Bc(1+}{(c+dx^n)^2}}{2cdn}$$

$$= -\frac{(Bc-Ad)(ex)^{1+m} (a+bx^n)^2}{2cden (c+dx^n)^2} - \frac{(bc-ad)(ex)^{1+m} (a(Bc(1+m)-Ad(1+m-2n))}{2c^2d^2en^2 (c+a}$$

$$= \frac{b(ad(1+m)-bc(1+m+n))(Ad(1+m)-Bc(1+m+2n))(ex)^{1+m}}{2c^2d^3e(1+m)n^2} - \frac{(Bc-Ad)(e}{2cden}$$

$$= \frac{b(ad(1+m)-bc(1+m+n))(Ad(1+m)-Bc(1+m+2n))(ex)^{1+m}}{2c^2d^3e(1+m)n^2} - \frac{(Bc-Ad)(e}{2cden}$$

Mathematica [A] time = 0.279731, size = 172, normalized size = 0.53

$$\frac{x(ex)^m \left(\frac{(bc-ad)(-aBd-2Abd+3bBc)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2} - \frac{(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^3} - \frac{b(-2aBd-Abd+3bBc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n}\right.}{c}\right.}{d^3(m+1)}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.542, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\left(Bb^2x^{3\,n} + Aa^2 + \left(2\,Bab + Ab^2\right)x^{2\,n} + \left(Ba^2 + 2\,Aab\right)x^n\right)(ex)^m}{d^3x^{3\,n} + 3\,cd^2x^{2\,n} + 3\,c^2dx^n + c^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.37 $\int \frac{(ex)^m(a+bx^n)(A+Bx^n)}{(c+dx^n)^3}\,dx$

Optimal. Leaf size=228

$$-\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(Ad(m-n+1)(bc(m+1)-ad(m-2n+1))+Bc(m+1)(ad(m-n+1)-bc(m+}{2c^3d^2e(m+1)n^2}$$

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

Rubi [A] time = 0.280592, antiderivative size = 228, 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, Rules used = {594, 457, 364}

$$-\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)(Ad(m-n+1)(bc(m+1)-ad(m-2n+1))+Bc(m+1)(ad(m-n+1)-bc(m+}{2c^3d^2e(m+1)n^2}$$

Antiderivative was successfully verified.

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

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

Rule 594

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
 + 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/(a*b*g*n*(p + 1)), x] + Dist[1/(a*
b*n*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1)*Simp[c*(b
*e*n*(p + 1) + (b*e - a*f)*(m + 1)) + d*(b*e*n*(p + 1) + (b*e - a*f)*(m + n
*q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g, m, n}, x] && LtQ[p,
 -1] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[b*c - a*d, b*e - a*f])
```

Rule 457

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> -Simp[((b*c - a*d)*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*
b*e*n*(p + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*b*n*(p
 + 1)), Int[(e*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, m,
 n}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1] && (( !IntegerQ[p + 1/2] && NeQ[
p, -5/4]) ||  !RationalQ[m] || (IGtQ[n, 0] && ILtQ[p + 1/2, 0] && LeQ[-1, m
, -(n*(p + 1))]))
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)(A+Bx^n)}{(c+dx^n)^3}\,dx = -\frac{(bc-ad)(ex)^{1+m}(A+Bx^n)}{2cden(c+dx^n)^2} - \frac{\int \frac{(ex)^m(-A(bc(1+m)-ad(1+m-2n))+B(ad(1+m-n)-bc(1+m+n))x^n)}{(c+dx^n)^2}\,d}{2cdn}$$

$$= -\frac{(bc-ad)(ex)^{1+m}(A+Bx^n)}{2cden(c+dx^n)^2} - \frac{(ad(Ad(1+m-2n)-Bc(1+m-n))-bc(Ad(1+m)}{2c^2d^2en^2(c+dx^n)}$$

$$= -\frac{(bc-ad)(ex)^{1+m}(A+Bx^n)}{2cden(c+dx^n)^2} - \frac{(ad(Ad(1+m-2n)-Bc(1+m-n))-bc(Ad(1+m)}{2c^2d^2en^2(c+dx^n)}$$

Mathematica [A] time = 0.183639, size = 136, normalized size = 0.6

$$\frac{x(ex)^m\left(c(aBd+Abd-2bBc)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+(bc-ad)(Bc-Ad)\,{}_2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+bBc^2\,{}_2F_1\left(1,\frac{m+}{n}\right.\right.}{c^3d^2(m+1)}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.347, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(\left(\left(m^2-m(n-2)-n+1\right)bcde^m-\left(m^2-m(3\,n-2)+2\,n^2-3\,n+1\right)ad^2e^m\right)A-\left(\left(m^2+m(n+2)+n+1\right)bc^2e^m-\left(m^2\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{\left(Bbx^{2n} + Aa + (Ba + Ab)x^n\right)(ex)^m}{d^3x^{3n} + 3\,cd^2x^{2n} + 3\,c^2dx^n + c^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.38 $\int \frac{(ex)^m(A+Bx^n)}{(c+dx^n)^3}\,dx$

Optimal. Leaf size=112

$$\frac{(ex)^{m+1}(Bc(m+1)-Ad(m-2n+1))\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{2c^3de(m+1)n}-\frac{(ex)^{m+1}(Bc-Ad)}{2cden\,(c+dx^n)^2}$$

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

Rubi [A] time = 0.0556258, antiderivative size = 112, 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, Rules used = {457, 364}

$$\frac{(ex)^{m+1}(Bc(m+1)-Ad(m-2n+1))\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{2c^3de(m+1)n}-\frac{(ex)^{m+1}(Bc-Ad)}{2cden\,(c+dx^n)^2}$$

Antiderivative was successfully verified.

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

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

Rule 457

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> -Simp[((b*c - a*d)*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*
b*e*n*(p + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*b*n*(p
 + 1)), Int[(e*x)^m*(a + b*x^n)^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, m,
 n}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1] && (( !IntegerQ[p + 1/2] && NeQ[
p, -5/4]) ||  !RationalQ[m] || (IGtQ[n, 0] && ILtQ[p + 1/2, 0] && LeQ[-1, m
, -(n*(p + 1))]))
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{(ex)^m\,(A+Bx^n)}{(c+dx^n)^3}\,dx &= -\frac{(Bc-Ad)(ex)^{1+m}}{2cden\,(c+dx^n)^2}+\frac{(Bc(1+m)-Ad(1+m-2n))\int \frac{(ex)^m}{(c+dx^n)^2}\,dx}{2cdn}\\ &= -\frac{(Bc-Ad)(ex)^{1+m}}{2cden\,(c+dx^n)^2}+\frac{(Bc(1+m)-Ad(1+m-2n))(ex)^{1+m}\,{}_2F_1\left(2,\frac{1+m}{n};\frac{1+m+n}{n};-\frac{dx^n}{c}\right)}{2c^3de(1+m)n}\end{aligned}$$

Mathematica [A] time = 0.0734161, size = 83, normalized size = 0.74

$$\frac{x(ex)^m \left((Ad-Bc)\,{}_2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)+Bc\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)\right)}{c^3d(m+1)}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.366, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\left(\left(m^2-m(n-2)-n+1\right)Bce^m-\left(m^2-m(3n-2)+2n^2-3n+1\right)Ade^m\right)\int \frac{x^m}{2\left(c^2d^2n^2x^n+c^3dn^2\right)}\,dx+\frac{\left(Bc^2e^m(m-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -((m^2 - m*(n - 2) - n + 1)*B*c*e^m - (m^2 - m*(3*n - 2) + 2*n^2 - 3*n + 1)
*A*d*e^m)*integrate(1/2*x^m/(c^2*d^2*n^2*x^n + c^3*d*n^2), x) + 1/2*((B*c^2
*e^m*(m - n + 1) - A*c*d*e^m*(m - 3*n + 1))*x*x^m - (A*d^2*e^m*(m - 2*n + 1
) - B*c*d*e^m*(m + 1))*x*e^(m*log(x) + n*log(x)))/(c^2*d^3*n^2*x^(2*n) + 2*
c^3*d^2*n^2*x^n + c^4*d*n^2)
```

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

$$\text{integral}\left(\frac{(Bx^n+A)(ex)^m}{d^3x^{3n}+3cd^2x^{2n}+3c^2dx^n+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.39 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)(c+dx^n)^3}\,dx$

Optimal. Leaf size=366

$$-\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)\left(-a^2d^2(m-n+1)(Bc(m+1)-Ad(m-2n+1))+2abcd\left(Bc(m+1)(m-2n+1)\right.\right.}{2c^3e(m+1)n^2(bc-ad)}$$

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

Rubi [A] time = 1.2169, antiderivative size = 366, 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, Rules used = {595, 597, 364}

$$-\frac{(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)\left(-a^2d^2(m-n+1)(Bc(m+1)-Ad(m-2n+1))+2abcd\left(Bc(m+1)(m-2n+1)\right.\right.}{2c^3e(m+1)n^2(bc-ad)}$$

Antiderivative was successfully verified.

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


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


Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

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

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)}{(a+bx^n)(c+dx^n)^3}dx = \frac{(Bc-Ad)(ex)^{1+m}}{2c(bc-ad)en(c+dx^n)^2} + \frac{\int \frac{(ex)^m(-aBc(1+m)+aAd(1+m-2n)+2Abcn-b(Bc-Ad)(1+m-2n)x^n)}{(a+bx^n)(c+dx^n)^2}dx}{2c(bc-ad)n}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}}{2c(bc-ad)en(c+dx^n)^2} + \frac{(bc(Ad(1+m-4n)-Bc(1+m-2n))+ad(Bc(1+m)-Ad(1+}{2c^2(bc-ad)^2en^2(c+dx^n)}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}}{2c(bc-ad)en(c+dx^n)^2} + \frac{(bc(Ad(1+m-4n)-Bc(1+m-2n))+ad(Bc(1+m)-Ad(1+}{2c^2(bc-ad)^2en^2(c+dx^n)}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}}{2c(bc-ad)en(c+dx^n)^2} + \frac{(bc(Ad(1+m-4n)-Bc(1+m-2n))+ad(Bc(1+m)-Ad(1+}{2c^2(bc-ad)^2en^2(c+dx^n)}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}}{2c(bc-ad)en(c+dx^n)^2} + \frac{(bc(Ad(1+m-4n)-Bc(1+m-2n))+ad(Bc(1+m)-Ad(1+}{2c^2(bc-ad)^2en^2(c+dx^n)}$$

Mathematica [A] time = 0.266575, size = 201, normalized size = 0.55

$$\frac{x(ex)^m\left(\frac{b^2(Ab-aB)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a} - \frac{d(Ab-aB)(bc-ad)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2} + \frac{(bc-ad)^2(Bc-Ad)\,{}_2F_1\left(3,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^3} - \frac{bd(Ab-aB)\,{}_2}{}\right.}{(m+1)(bc-ad)^3}$$

Antiderivative was successfully verified.

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

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

Maple [F] time = 0.698, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\left(\left(\left(m^2 - m(5n-2) + 6n^2 - 5n + 1\right)b^2c^2de^m - 2\left(m^2 - 2m(2n-1) + 3n^2 - 4n + 1\right)abcd^2e^m + \left(m^2 - m(3n-2) + 2n\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (((m^2 - m*(5*n - 2) + 6*n^2 - 5*n + 1)*b^2*c^2*d*e^m - 2*(m^2 - 2*m*(2*n -
 1) + 3*n^2 - 4*n + 1)*a*b*c*d^2*e^m + (m^2 - m*(3*n - 2) + 2*n^2 - 3*n + 1
)*a^2*d^3*e^m)*A - ((m^2 - m*(3*n - 2) + 2*n^2 - 3*n + 1)*b^2*c^3*e^m - 2*(
m^2 - 2*m*(n - 1) - 2*n + 1)*a*b*c^2*d*e^m + (m^2 - m*(n - 2) - n + 1)*a^2*
c*d^2*e^m)*B)*integrate(-1/2*x^m/(b^3*c^6*n^2 - 3*a*b^2*c^5*d*n^2 + 3*a^2*b
*c^4*d^2*n^2 - a^3*c^3*d^3*n^2 + (b^3*c^5*d*n^2 - 3*a*b^2*c^4*d^2*n^2 + 3*a
^2*b*c^3*d^3*n^2 - a^3*c^2*d^4*n^2)*x^n), x) + (B*a*b^2*e^m - A*b^3*e^m)*in
tegrate(-x^m/(a*b^3*c^3 - 3*a^2*b^2*c^2*d + 3*a^3*b*c*d^2 - a^4*d^3 + (b^4*
c^3 - 3*a*b^3*c^2*d + 3*a^2*b^2*c*d^2 - a^3*b*d^3)*x^n), x) - 1/2*(((a*c*d^
2*e^m*(m - 3*n + 1) - b*c^2*d*e^m*(m - 5*n + 1))*A - (a*c^2*d*e^m*(m - n +
1) - b*c^3*e^m*(m - 3*n + 1))*B)*x*x^m + ((a*d^3*e^m*(m - 2*n + 1) - b*c*d^
2*e^m*(m - 4*n + 1))*A + (b*c^2*d*e^m*(m - 2*n + 1) - a*c*d^2*e^m*(m + 1))*
B)*x*e^(m*log(x) + n*log(x)))/(b^2*c^6*n^2 - 2*a*b*c^5*d*n^2 + a^2*c^4*d^2*
n^2 + (b^2*c^4*d^2*n^2 - 2*a*b*c^3*d^3*n^2 + a^2*c^2*d^4*n^2)*x^(2*n) + 2*(
b^2*c^5*d*n^2 - 2*a*b*c^4*d^2*n^2 + a^2*c^3*d^3*n^2)*x^n)
```

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

$$\text{integral}\left(\frac{(Bx^n + A)(ex)^m}{bd^3x^{4n} + ac^3 + \left(3bcd^2 + ad^3\right)x^{3n} + 3\left(bc^2d + acd^2\right)x^{2n} + \left(bc^3 + 3ac^2d\right)x^n}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.40 $\int \frac{(ex)^m(A+Bx^n)}{(a+bx^n)^2(c+dx^n)^3}\,dx$

Optimal. Leaf size=482

$$\frac{d(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)\left(-a^2d^2(m-n+1)(Bc(m+1)-Ad(m-2n+1))+2abcd\left(Bc(m+1)(m-3n+1)\right.\right.}{2c^3e(m+1)n^2(bc-ad)}$$

```
[Out] (d*(2*A*b*c - 3*a*B*c + a*A*d)*(e*x)^(1 + m))/(2*a*c*(b*c - a*d)^2*e*n*(c +
 d*x^n)^2) + ((A*b - a*B)*(e*x)^(1 + m))/(a*(b*c - a*d)*e*n*(a + b*x^n)*(c
+ d*x^n)^2) - (d*(a^2*d*(B*c*(1 + m) - A*d*(1 + m - 2*n)) - a*b*c*(B*c - A*
d)*(1 + m - 6*n) - 2*A*b^2*c^2*n)*(e*x)^(1 + m))/(2*a*c^2*(b*c - a*d)^3*e*n
^2*(c + d*x^n)) + (b^2*(a*B*(b*c*(1 + m) - a*d*(1 + m - 3*n)) + A*b*(a*d*(1
 + m - 4*n) - b*c*(1 + m - n)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/
n, (1 + m + n)/n, -((b*x^n)/a)])/(a^2*(b*c - a*d)^4*e*(1 + m)*n) + (d*(b^2*
c^2*(A*d*(1 + m - 4*n) - B*c*(1 + m - 2*n))*(1 + m - 3*n) - a^2*d^2*(B*c*(1
 + m) - A*d*(1 + m - 2*n))*(1 + m - n) + 2*a*b*c*d*(B*c*(1 + m)*(1 + m - 3*
n) - A*d*(1 + m^2 + m*(2 - 5*n) - 5*n + 4*n^2)))*(e*x)^(1 + m)*Hypergeometr
ic2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(2*c^3*(b*c - a*d)^4*e*(1
 + m)*n^2)
```

Rubi [A] time = 2.07065, antiderivative size = 482, 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, Rules used = {595, 597, 364}

$$\frac{d(ex)^{m+1}\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)\left(-a^2d^2(m-n+1)(Bc(m+1)-Ad(m-2n+1))+2abcd\left(Bc(m+1)(m-3n+1)\right.\right.}{2c^3e(m+1)n^2(bc-ad)}$$

Antiderivative was successfully verified.

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


```
[Out] (d*(2*A*b*c - 3*a*B*c + a*A*d)*(e*x)^(1 + m))/(2*a*c*(b*c - a*d)^2*e*n*(c +
 d*x^n)^2) + ((A*b - a*B)*(e*x)^(1 + m))/(a*(b*c - a*d)*e*n*(a + b*x^n)*(c
+ d*x^n)^2) - (d*(a^2*d*(B*c*(1 + m) - A*d*(1 + m - 2*n)) - a*b*c*(B*c - A*
d)*(1 + m - 6*n) - 2*A*b^2*c^2*n)*(e*x)^(1 + m))/(2*a*c^2*(b*c - a*d)^3*e*n
^2*(c + d*x^n)) + (b^2*(a*B*(b*c*(1 + m) - a*d*(1 + m - 3*n)) + A*b*(a*d*(1
 + m - 4*n) - b*c*(1 + m - n)))*(e*x)^(1 + m)*Hypergeometric2F1[1, (1 + m)/
n, (1 + m + n)/n, -((b*x^n)/a)])/(a^2*(b*c - a*d)^4*e*(1 + m)*n) + (d*(b^2*
c^2*(A*d*(1 + m - 4*n) - B*c*(1 + m - 2*n))*(1 + m - 3*n) - a^2*d^2*(B*c*(1
 + m) - A*d*(1 + m - 2*n))*(1 + m - n) + 2*a*b*c*d*(B*c*(1 + m)*(1 + m - 3*
n) - A*d*(1 + m^2 + m*(2 - 5*n) - 5*n + 4*n^2)))*(e*x)^(1 + m)*Hypergeometr
ic2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/(2*c^3*(b*c - a*d)^4*e*(1
 + m)*n^2)
```


Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

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

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{(ex)^m (A+Bx^n)}{(a+bx^n)^2 (c+dx^n)^3}\,dx = \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)^2} - \frac{\int \frac{(ex)^m(-aBc(1+m)+Abc(1+m-n)+aAdn+(Ab-aB)d(1+m-3n)x^n)}{(a+bx^n)(c+dx^n)^3}\,dx}{a(bc-ad)n}$$

$$= \frac{d(2Abc-3aBc+aAd)(ex)^{1+m}}{2ac(bc-ad)^2en(c+dx^n)^2} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)^2} - \frac{\int \frac{(ex)^m\left(-n\left(aBc(2bc+ad)(1\cdots\right.\right.}{\cdots}}{\cdots}$$

$$= \frac{d(2Abc-3aBc+aAd)(ex)^{1+m}}{2ac(bc-ad)^2en(c+dx^n)^2} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)^2} - \frac{d\left(a^2d(Bc(1+m)-A\cdots\right.}{\cdots}$$

$$= \frac{d(2Abc-3aBc+aAd)(ex)^{1+m}}{2ac(bc-ad)^2en(c+dx^n)^2} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)^2} - \frac{d\left(a^2d(Bc(1+m)-A\cdots\right.}{\cdots}$$

$$= \frac{d(2Abc-3aBc+aAd)(ex)^{1+m}}{2ac(bc-ad)^2en(c+dx^n)^2} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)^2} - \frac{d\left(a^2d(Bc(1+m)-A\cdots\right.}{\cdots}$$

$$= \frac{d(2Abc-3aBc+aAd)(ex)^{1+m}}{2ac(bc-ad)^2en(c+dx^n)^2} + \frac{(Ab-aB)(ex)^{1+m}}{a(bc-ad)en(a+bx^n)(c+dx^n)^2} - \frac{d\left(a^2d(Bc(1+m)-A\cdots\right.}{\cdots}$$

Mathematica [A] time = 0.463409, size = 271, normalized size = 0.56

$$\frac{x(ex)^m\left(\frac{b^2(aB-Ab)(ad-bc)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a^2} + \frac{b^2(2aBd-3Abd+bBc)\,{}_2F_1\left(1,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{a} - \frac{d(bc-ad)(aBd-2Abd+bBc)\,{}_2F_1\left(2,\frac{m+1}{n};\frac{m+n+1}{n};-\frac{dx^n}{c}\right)}{c^2}\cdots\right.}{(m+1)(bc-ad)^4}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*((b^2*(b*B*c - 3*A*b*d + 2*a*B*d)*Hypergeometric2F1[1, (1 + m)/n
, (1 + m + n)/n, -((b*x^n)/a)])/a - (b*d*(b*B*c - 3*A*b*d + 2*a*B*d)*Hyperg
eometric2F1[1, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/c + (b^2*(-(A*b) +
a*B)*(-(b*c) + a*d)*Hypergeometric2F1[2, (1 + m)/n, (1 + m + n)/n, -((b*x^n
)/a)])/a^2 - (d*(b*c - a*d)*(b*B*c - 2*A*b*d + a*B*d)*Hypergeometric2F1[2,
(1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/c^2 + (d*(b*c - a*d)^2*(-(B*c) + A
*d)*Hypergeometric2F1[3, (1 + m)/n, (1 + m + n)/n, -((d*x^n)/c)])/c^3))/((b
*c - a*d)^4*(1 + m))
```

Maple [F] time = 0.678, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] (((m^2 - m*(7*n - 2) + 12*n^2 - 7*n + 1)*b^2*c^2*d^2*e^m - 2*(m^2 - m*(5*n
- 2) + 4*n^2 - 5*n + 1)*a*b*c*d^3*e^m + (m^2 - m*(3*n - 2) + 2*n^2 - 3*n +
1)*a^2*d^4*e^m)*A - ((m^2 - m*(5*n - 2) + 6*n^2 - 5*n + 1)*b^2*c^3*d*e^m -
2*(m^2 - m*(3*n - 2) - 3*n + 1)*a*b*c^2*d^2*e^m + (m^2 - m*(n - 2) - n + 1)
*a^2*c*d^3*e^m)*B)*integrate(1/2*x^m/(b^4*c^7*n^2 - 4*a*b^3*c^6*d*n^2 + 6*a
^2*b^2*c^5*d^2*n^2 - 4*a^3*b*c^4*d^3*n^2 + a^4*c^3*d^4*n^2 + (b^4*c^6*d*n^2
 - 4*a*b^3*c^5*d^2*n^2 + 6*a^2*b^2*c^4*d^3*n^2 - 4*a^3*b*c^3*d^4*n^2 + a^4*
c^2*d^5*n^2)*x^n), x) - ((b^4*c*e^m*(m - n + 1) - a*b^3*d*e^m*(m - 4*n + 1)
)*A + (a^2*b^2*d*e^m*(m - 3*n + 1) - a*b^3*c*e^m*(m + 1))*B)*integrate(x^m/
(a^2*b^4*c^4*n - 4*a^3*b^3*c^3*d*n + 6*a^4*b^2*c^2*d^2*n - 4*a^5*b*c*d^3*n
+ a^6*d^4*n + (a*b^5*c^4*n - 4*a^2*b^4*c^3*d*n + 6*a^3*b^3*c^2*d^2*n - 4*a^
4*b^2*c*d^3*n + a^5*b*d^4*n)*x^n), x) + 1/2*(((a^3*c*d^3*e^m*(m - 3*n + 1)
- a^2*b*c^2*d^2*e^m*(m - 7*n + 1) + 2*b^3*c^4*e^m*n)*A - (a^3*c^2*d^2*e^m*(
m - n + 1) - a^2*b*c^3*d*e^m*(m - 5*n + 1) + 2*a*b^2*c^4*e^m*n)*B)*x*x^m +
((a^2*b*d^4*e^m*(m - 2*n + 1) - a*b^2*c*d^3*e^m*(m - 6*n + 1) + 2*b^3*c^2*d
^2*e^m*n)*A + (a*b^2*c^2*d^2*e^m*(m - 6*n + 1) - a^2*b*c*d^3*e^m*(m + 1))*B
)*x*e^(m*log(x) + 2*n*log(x)) + ((a^3*d^4*e^m*(m - 2*n + 1) - a*b^2*c^2*d^2
*e^m*(m - 7*n + 1) + 4*b^3*c^3*d*e^m*n + 3*a^2*b*c*d^3*e^m*n)*A + (a*b^2*c^
3*d*e^m*(m - 9*n + 1) - a^3*c*d^3*e^m*(m + 1) - 3*a^2*b*c^2*d^2*e^m*n)*B)*x
*e^(m*log(x) + n*log(x)))/(a^2*b^3*c^7*n^2 - 3*a^3*b^2*c^6*d*n^2 + 3*a^4*b*
c^5*d^2*n^2 - a^5*c^4*d^3*n^2 + (a*b^4*c^5*d^2*n^2 - 3*a^2*b^3*c^4*d^3*n^2
+ 3*a^3*b^2*c^3*d^4*n^2 - a^4*b*c^2*d^5*n^2)*x^(3*n) + (2*a*b^4*c^6*d*n^2 -
 5*a^2*b^3*c^5*d^2*n^2 + 3*a^3*b^2*c^4*d^3*n^2 + a^4*b*c^3*d^4*n^2 - a^5*c^
2*d^5*n^2)*x^(2*n) + (a*b^4*c^7*n^2 - a^2*b^3*c^6*d*n^2 - 3*a^3*b^2*c^5*d^2
*n^2 + 5*a^4*b*c^4*d^3*n^2 - 2*a^5*c^3*d^4*n^2)*x^n)
```

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

$$\text{integral}\left(\frac{(Bx^n + A)(ex)^m}{b^2d^3x^{5n} + a^2c^3 + \left(3\,b^2cd^2 + 2\,abd^3\right)x^{4n} + \left(3\,b^2c^2d + 6\,abcd^2 + a^2d^3\right)x^{3n} + \left(b^2c^3 + 6\,abc^2d + 3\,a^2cd^2\right)x^{2n} +$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^n + A)*(e*x)^m/(b^2*d^3*x^(5*n) + a^2*c^3 + (3*b^2*c*d^2 + 2*
a*b*d^3)*x^(4*n) + (3*b^2*c^2*d + 6*a*b*c*d^2 + a^2*d^3)*x^(3*n) + (b^2*c^3
 + 6*a*b*c^2*d + 3*a^2*c*d^2)*x^(2*n) + (2*a*b*c^3 + 3*a^2*c^2*d)*x^n), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.41 $\int (ex)^m (a+bx^n)^p (A+Bx^n)(c+dx^n)^q \, dx$

Optimal. Leaf size=211

$$\frac{A(ex)^{m+1}(a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} (c+dx^n)^q \left(\frac{dx^n}{c}+1\right)^{-q} F_1\left(\frac{m+1}{n};-p,-q;\frac{m+n+1}{n};-\frac{bx^n}{a},-\frac{dx^n}{c}\right)}{e(m+1)} + \frac{Bx^{n+1}(ex)^m (a+bx^n)^p \left(\frac{b}{\cdot}\right.}{}$$

```
[Out] (A*(e*x)^(1 + m)*(a + b*x^n)^p*(c + d*x^n)^q*AppellF1[(1 + m)/n, -p, -q, (1
 + m + n)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(1 + m)*(1 + (b*x^n)/a)^p*(1 +
 (d*x^n)/c)^q) + (B*x^(1 + n)*(e*x)^m*(a + b*x^n)^p*(c + d*x^n)^q*AppellF1[
(1 + m + n)/n, -p, -q, (1 + m + 2*n)/n, -((b*x^n)/a), -((d*x^n)/c)])/((1 +
m + n)*(1 + (b*x^n)/a)^p*(1 + (d*x^n)/c)^q)
```

Rubi [A] time = 0.245998, antiderivative size = 211, 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, Rules used = {598, 511, 510}

$$\frac{A(ex)^{m+1}(a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} (c+dx^n)^q \left(\frac{dx^n}{c}+1\right)^{-q} F_1\left(\frac{m+1}{n};-p,-q;\frac{m+n+1}{n};-\frac{bx^n}{a},-\frac{dx^n}{c}\right)}{e(m+1)} + \frac{Bx^{n+1}(ex)^m (a+bx^n)^p \left(\frac{b}{\cdot}\right.}{}$$

Antiderivative was successfully verified.

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


```
[Out] (A*(e*x)^(1 + m)*(a + b*x^n)^p*(c + d*x^n)^q*AppellF1[(1 + m)/n, -p, -q, (1
 + m + n)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(1 + m)*(1 + (b*x^n)/a)^p*(1 +
 (d*x^n)/c)^q) + (B*x^(1 + n)*(e*x)^m*(a + b*x^n)^p*(c + d*x^n)^q*AppellF1[
(1 + m + n)/n, -p, -q, (1 + m + 2*n)/n, -((b*x^n)/a), -((d*x^n)/c)])/((1 +
m + n)*(1 + (b*x^n)/a)^p*(1 + (d*x^n)/c)^q)
```


Rule 598

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

Rule 511

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x
^n)/a)^FracPart[p], Int[(e*x)^m*(1 + (b*x^n)/a)^p*(c + d*x^n)^q, x], x] /;
FreeQ[{a, b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &&
 NeQ[m, n - 1] &&  !(IntegerQ[p] || GtQ[a, 0])
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[c, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rubi steps

$$\int (ex)^m (a+bx^n)^p (A+Bx^n)(c+dx^n)^q\,dx = A\int (ex)^m (a+bx^n)^p (c+dx^n)^q\,dx + (Bx^{-m}(ex)^m)\int x^{m+n}(a+bx^n)^p (c+d$$
$$= \left(A(a+bx^n)^p \left(1+\frac{bx^n}{a}\right)^{-p}\right)\int (ex)^m \left(1+\frac{bx^n}{a}\right)^p (c+dx^n)^q\,dx + \left(Bx^{-m}(ex)^n\right.$$
$$= \left(A(a+bx^n)^p \left(1+\frac{bx^n}{a}\right)^{-p} (c+dx^n)^q \left(1+\frac{dx^n}{c}\right)^{-q}\right)\int (ex)^m \left(1+\frac{bx^n}{a}\right)^p \left(1+\right.$$
$$= \frac{A(ex)^{1+m}(a+bx^n)^p \left(1+\frac{bx^n}{a}\right)^{-p} (c+dx^n)^q \left(1+\frac{dx^n}{c}\right)^{-q} F_1\left(\frac{1+m}{n}; -p, -q; \frac{1+m}{n}\right.}{e(1+m)}$$

Mathematica [A] time = 0.439774, size = 162, normalized size = 0.77

$$\frac{x(ex)^m (a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} (c+dx^n)^q \left(\frac{dx^n}{c}+1\right)^{-q} \left(A(m+n+1)F_1\left(\frac{m+1}{n}; -p, -q; \frac{m+n+1}{n}; -\frac{bx^n}{a}, -\frac{dx^n}{c}\right) + B(m+1)x^n F_1\left(\frac{n}{}\right.\right.}{(m+1)(m+n+1)}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*(a + b*x^n)^p*(c + d*x^n)^q*(A*(1 + m + n)*AppellF1[(1 + m)/n, -
p, -q, (1 + m + n)/n, -((b*x^n)/a), -((d*x^n)/c)] + B*(1 + m)*x^n*AppellF1[
(1 + m + n)/n, -p, -q, (1 + m + 2*n)/n, -((b*x^n)/a), -((d*x^n)/c)]))/((1 +
 m)*(1 + m + n)*(1 + (b*x^n)/a)^p*(1 + (d*x^n)/c)^q)
```

Maple [F] time = 1.056, size = 0, normalized size = 0.

$$\int (ex)^m (a+bx^n)^p (A+Bx^n)(c+dx^n)^q\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int (Bx^n + A)(bx^n + a)^p (dx^n + c)^q (ex)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\mathrm{integral}\left((Bx^n + A)(bx^n + a)^p (dx^n + c)^q (ex)^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*x^n + A)*(b*x^n + a)^p*(d*x^n + c)^q*(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*(a+b*x**n)**p*(A+B*x**n)*(c+d*x**n)**q,x)
```

```
[Out] Timed out
```

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

$$\int (Bx^n + A)(bx^n + a)^p (dx^n + c)^q (ex)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.42 $\int (ex)^m (a+bx^n)^p (A+Bx^n)(c+dx^n)\,dx$

Optimal. Leaf size=271

$$-\frac{(ex)^{m+1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+n+1}{n};-\frac{bx^n}{a}\right)(Ab(m+np+n+1)(ad(m+1)-bc(m+n(p+2)+1))-a(\cdots}{b^2e(m+1)(m+np+n+1)(m+n(p+2)+1)}$$

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

Rubi [A] time = 0.327428, antiderivative size = 255, 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, Rules used = {596, 459, 365, 364}

$$\frac{(ex)^{m+1}(a+bx^n)^{p+1}(-aBd(m+n+1)+Abdn+bBc(m+n(p+2)+1))}{b^2e(m+np+n+1)(m+n(p+2)+1)}-\frac{(ex)^{m+1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{n},-p;\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

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

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

Rule 596

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_))^(q_.)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*(g*x)^(m + 1)*(a +
 b*x^n)^(p + 1)*(c + d*x^n)^q)/(b*g*(m + n*(p + q + 1) + 1)), x] + Dist[1/(
b*(m + n*(p + q + 1) + 1)), Int[(g*x)^m*(a + b*x^n)^p*(c + d*x^n)^(q - 1)*S
imp[c*((b*e - a*f)*(m + 1) + b*e*n*(p + q + 1)) + (d*(b*e - a*f)*(m + 1) +
f*n*q*(b*c - a*d) + b*e*d*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{a, b, c,
 d, e, f, g, m, n, p}, x] && GtQ[q, 0] &&  !(EqQ[q, 1] && SimplerQ[e + f*x^
n, c + d*x^n])
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0]
 && !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int (ex)^m (a+bx^n)^p (A+Bx^n)(c+dx^n)\,dx = \frac{d(ex)^{1+m}(a+bx^n)^{1+p}(A+Bx^n)}{be(1+m+n(2+p))} + \frac{\int (ex)^m (a+bx^n)^p \left(-A(ad(1+m)-b\right.}{}$$

$$= \frac{(Abdn - aBd(1+m+n) + bBc(1+m+n(2+p)))(ex)^{1+m}(a+bx^n)^{1+p}}{b^2e(1+m+n+np)(1+m+n(2+p))} +$$

$$= \frac{(Abdn - aBd(1+m+n) + bBc(1+m+n(2+p)))(ex)^{1+m}(a+bx^n)^{1+p}}{b^2e(1+m+n+np)(1+m+n(2+p))} +$$

$$= \frac{(Abdn - aBd(1+m+n) + bBc(1+m+n(2+p)))(ex)^{1+m}(a+bx^n)^{1+p}}{b^2e(1+m+n+np)(1+m+n(2+p))} +$$

Mathematica [A] time = 0.207783, size = 164, normalized size = 0.61

$$x(ex)^m (a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} \left(x^n \left(\frac{(Ad+Bc)\,{}_2F_1\left(\frac{m+n+1}{n},-p;\frac{m+2n+1}{n};-\frac{bx^n}{a}\right)}{m+n+1} + \frac{Bdx^n\,{}_2F_1\left(\frac{m+2n+1}{n},-p;\frac{m+3n+1}{n};-\frac{bx^n}{a}\right)}{m+2n+1}\right)\right.$$

Antiderivative was successfully verified.

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

```
[Out] (x*(e*x)^m*(a + b*x^n)^p*((A*c*Hypergeometric2F1[(1 + m)/n, -p, (1 + m + n)
/n, -((b*x^n)/a)])/(1 + m) + x^n*(((B*c + A*d)*Hypergeometric2F1[(1 + m + n
)/n, -p, (1 + m + 2*n)/n, -((b*x^n)/a)])/(1 + m + n) + (B*d*x^n*Hypergeomet
ric2F1[(1 + m + 2*n)/n, -p, (1 + m + 3*n)/n, -((b*x^n)/a)])/(1 + m + 2*n)))
)/(1 + (b*x^n)/a)^p
```

Maple [F] time = 0.403, size = 0, normalized size = 0.

$$\int (ex)^m (a+bx^n)^p (A+Bx^n)(c+dx^n)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int (Bx^n + A)(dx^n + c)(bx^n + a)^p (ex)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((B*d*x^(2*n) + A*c + (B*c + A*d)*x^n)*(b*x^n + 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*(a+b*x**n)**p*(A+B*x**n)*(c+d*x**n),x)
```

```
[Out] Timed out
```

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

$$\int (Bx^n + A)(dx^n + c)(bx^n + a)^p (ex)^m \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.43 $\int \frac{(ex)^m(a+bx^n)^p(A+Bx^n)}{c+dx^n}\,dx$

Optimal. Leaf size=164

$$\frac{B(ex)^{m+1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}F_1\left(\frac{m+1}{n};-p,1;\right.}{cde(m+1)}$$

```
[Out] -(((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^n)^p*AppellF1[(1 + m)/n, -p, 1, (1 +
m + n)/n, -((b*x^n)/a), -((d*x^n)/c)])/(c*d*e*(1 + m)*(1 + (b*x^n)/a)^p)) +
 (B*(e*x)^(1 + m)*(a + b*x^n)^p*Hypergeometric2F1[(1 + m)/n, -p, (1 + m + n
)/n, -((b*x^n)/a)])/(d*e*(1 + m)*(1 + (b*x^n)/a)^p)
```

Rubi [A] time = 0.179496, antiderivative size = 164, 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, Rules used = {597, 365, 364, 511, 510}

$$\frac{B(ex)^{m+1}(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}{}_2F_1\left(\frac{m+1}{n},-p;\frac{m+n+1}{n};-\frac{bx^n}{a}\right)}{de(m+1)}-\frac{(ex)^{m+1}(Bc-Ad)(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}F_1\left(\frac{m+1}{n};-p,1;\right.}{cde(m+1)}$$

Antiderivative was successfully verified.

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

```
[Out] -(((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^n)^p*AppellF1[(1 + m)/n, -p, 1, (1 +
m + n)/n, -((b*x^n)/a), -((d*x^n)/c)])/(c*d*e*(1 + m)*(1 + (b*x^n)/a)^p)) +
 (B*(e*x)^(1 + m)*(a + b*x^n)^p*Hypergeometric2F1[(1 + m)/n, -p, (1 + m + n
)/n, -((b*x^n)/a)])/(d*e*(1 + m)*(1 + (b*x^n)/a)^p)
```

Rule 597

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

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0]
 && !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 511

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x
^n)/a)^FracPart[p], Int[(e*x)^m*(1 + (b*x^n)/a)^p*(c + d*x^n)^q, x], x] /;
FreeQ[{a, b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &&
```

```
NeQ[m, n - 1] &&  !(IntegerQ[p] || GtQ[a, 0])
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^p (A+Bx^n)}{c+dx^n} dx = \int \left(\frac{B(ex)^m (a+bx^n)^p}{d} + \frac{(-Bc+Ad)(ex)^m (a+bx^n)^p}{d(c+dx^n)} \right) dx$$
$$= \frac{B\int (ex)^m (a+bx^n)^p \, dx}{d} + \frac{(-Bc+Ad)\int \frac{(ex)^m (a+bx^n)^p}{c+dx^n} dx}{d}$$
$$= \frac{\left(B(a+bx^n)^p \left(1+\frac{bx^n}{a}\right)^{-p}\right)\int (ex)^m \left(1+\frac{bx^n}{a}\right)^p dx}{d} + \frac{\left((-Bc+Ad)(a+bx^n)^p \left(1+\frac{bx^n}{a}\right)\right.}{d}$$
$$= -\frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^p \left(1+\frac{bx^n}{a}\right)^{-p} F_1\left(\frac{1+m}{n};-p,1;\frac{1+m+n}{n};-\frac{bx^n}{a},-\frac{dx^n}{c}\right)}{cde(1+m)} + \frac{B(ex)}{}$$

Mathematica [A] time = 0.252439, size = 138, normalized size = 0.84

$$\frac{x(ex)^m (a+bx^n)^p \left(\frac{bx^n}{a}+1\right)^{-p} \left(A(m+n+1)F_1\left(\frac{m+1}{n};-p,1;\frac{m+n+1}{n};-\frac{bx^n}{a},-\frac{dx^n}{c}\right) + B(m+1)x^n F_1\left(\frac{m+n+1}{n};-p,1;\frac{m+2n+1}{n};-\frac{bx}{a}\right.\right.}{c(m+1)(m+n+1)}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (x*(e*x)^m*(a + b*x^n)^p*(A*(1 + m + n)*AppellF1[(1 + m)/n, -p, 1, (1 + m +
 n)/n, -((b*x^n)/a), -((d*x^n)/c)] + B*(1 + m)*x^n*AppellF1[(1 + m + n)/n,
-p, 1, (1 + m + 2*n)/n, -((b*x^n)/a), -((d*x^n)/c)]))/(c*(1 + m)*(1 + m + n
)*(1 + (b*x^n)/a)^p)
```

Maple [F] time = 0.676, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{(Bx^n + A)(bx^n + a)^p (ex)^m}{dx^n + c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.44 $\int \frac{(ex)^m(a+bx^n)^p(A+Bx^n)}{(c+dx^n)^2}\,dx$

Optimal. Leaf size=304

$$-\frac{(ex)^{m+1}\left(a+bx^n\right)^p\left(\frac{bx^n}{a}+1\right)^{-p}\left(ad(Bc(m+1)-Ad(m-n+1))+bc(Ad(m-n(1-p)+1)-Bc(m+np+1))\right)F_1\left(\frac{m+1}{n};-\right.}{c^2de(m+1)n(bc-ad)}$$

```
[Out] ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^n)^(1 + p))/(c*(b*c - a*d)*e*n*(c + d*x
^n)) - ((a*d*(B*c*(1 + m) - A*d*(1 + m - n)) + b*c*(A*d*(1 + m - n*(1 - p))
 - B*c*(1 + m + n*p)))*(e*x)^(1 + m)*(a + b*x^n)^p*AppellF1[(1 + m)/n, -p,
1, (1 + m + n)/n, -((b*x^n)/a), -((d*x^n)/c)])/(c^2*d*(b*c - a*d)*e*(1 + m)
*n*(1 + (b*x^n)/a)^p) - (b*(B*c - A*d)*(1 + m + n*p)*(e*x)^(1 + m)*(a + b*x
^n)^p*Hypergeometric2F1[(1 + m)/n, -p, (1 + m + n)/n, -((b*x^n)/a)])/(c*d*(
b*c - a*d)*e*(1 + m)*n*(1 + (b*x^n)/a)^p)
```

Rubi [A] time = 0.536458, antiderivative size = 304, 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, Rules used = {595, 597, 365, 364, 511, 510}

$$-\frac{(ex)^{m+1}\left(a+bx^n\right)^p\left(\frac{bx^n}{a}+1\right)^{-p}\left(ad(Bc(m+1)-Ad(m-n+1))+bc(Ad(m-n(1-p)+1)-Bc(m+np+1))\right)F_1\left(\frac{m+1}{n};-\right.}{c^2de(m+1)n(bc-ad)}$$

Antiderivative was successfully verified.

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


```
[Out] ((B*c - A*d)*(e*x)^(1 + m)*(a + b*x^n)^(1 + p))/(c*(b*c - a*d)*e*n*(c + d*x
^n)) - ((a*d*(B*c*(1 + m) - A*d*(1 + m - n)) + b*c*(A*d*(1 + m - n*(1 - p))
 - B*c*(1 + m + n*p)))*(e*x)^(1 + m)*(a + b*x^n)^p*AppellF1[(1 + m)/n, -p,
1, (1 + m + n)/n, -((b*x^n)/a), -((d*x^n)/c)])/(c^2*d*(b*c - a*d)*e*(1 + m)
*n*(1 + (b*x^n)/a)^p) - (b*(B*c - A*d)*(1 + m + n*p)*(e*x)^(1 + m)*(a + b*x
^n)^p*Hypergeometric2F1[(1 + m)/n, -p, (1 + m + n)/n, -((b*x^n)/a)])/(c*d*(
b*c - a*d)*e*(1 + m)*n*(1 + (b*x^n)/a)^p)
```


Rule 595

```
Int[((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_)*((e_) + (f_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*(g*x)^(m
+ 1)*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*g*n*(b*c - a*d)*(p + 1)),
x] + Dist[1/(a*n*(b*c - a*d)*(p + 1)), Int[(g*x)^m*(a + b*x^n)^(p + 1)*(c +
 d*x^n)^q*Simp[c*(b*e - a*f)*(m + 1) + e*n*(b*c - a*d)*(p + 1) + d*(b*e - a
*f)*(m + n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ[{a, b, c, d, e, f, g,
m, n, q}, x] && LtQ[p, -1]
```

Rule 597

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

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
```

```
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 511

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x
^n)/a)^FracPart[p], Int[(e*x)^m*(1 + (b*x^n)/a)^p*(c + d*x^n)^q, x], x] /;
FreeQ[{a, b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &&
 NeQ[m, n - 1] &&  !(IntegerQ[p] || GtQ[a, 0])
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rubi steps

$$\int \frac{(ex)^m (a+bx^n)^p (A+Bx^n)}{(c+dx^n)^2}\,dx = \frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^{1+p}}{c(bc-ad)en(c+dx^n)} + \frac{\int \frac{(ex)^m(a+bx^n)^p(-a(Bc-Ad)(1+m)+A(bc-ad)n-b(Bc-Ad)(1+}{c+dx^n}}{c(bc-ad)n}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^{1+p}}{c(bc-ad)en(c+dx^n)} + \frac{\int \left(-\frac{b(Bc-Ad)(1+m+np)(ex)^m(a+bx^n)^p}{d} + \frac{(d(-a(Bc-Ad)(1+}{}\right.}{c(bc-}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^{1+p}}{c(bc-ad)en(c+dx^n)} - \frac{(b(Bc-Ad)(1+m+np))\int (ex)^m (a+bx^n)^p\,dx}{cd(bc-ad)n}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^{1+p}}{c(bc-ad)en(c+dx^n)} - \frac{\left(b(Bc-Ad)(1+m+np)(a+bx^n)^p\left(1+\frac{bx^n}{a}\right)^{-p}\right)}{cd(bc-ad)n}$$

$$= \frac{(Bc-Ad)(ex)^{1+m}(a+bx^n)^{1+p}}{c(bc-ad)en(c+dx^n)} - \frac{(ad(Bc-Ad)(1+m)-Ad(bc-ad)n-bc(Bc-}{}$$

Mathematica [A] time = 0.347816, size = 138, normalized size = 0.45

$$\frac{x(ex)^m(a+bx^n)^p\left(\frac{bx^n}{a}+1\right)^{-p}\left(A(m+n+1)F_1\left(\frac{m+1}{n};-p,2;\frac{m+n+1}{n};-\frac{bx^n}{a},-\frac{dx^n}{c}\right)+B(m+1)x^nF_1\left(\frac{m+n+1}{n};-p,2;\frac{m+2n+1}{n};\right.\right.}{c^2(m+1)(m+n+1)}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (x*(e*x)^m*(a + b*x^n)^p*(A*(1 + m + n)*AppellF1[(1 + m)/n, -p, 2, (1 + m +
 n)/n, -((b*x^n)/a), -((d*x^n)/c)] + B*(1 + m)*x^n*AppellF1[(1 + m + n)/n,
```

```
-p, 2, (1 + m + 2*n)/n, -((b*x^n)/a), -((d*x^n)/c)]))/(c^2*(1 + m)*(1 + m +
 n)*(1 + (b*x^n)/a)^p)
```

Maple [F] time = 0.669, size = 0, normalized size = 0.

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{(Bx^n + A)(bx^n + a)^p (ex)^m}{d^2x^{2n} + 2cdx^n + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.45 $\int \frac{\left(-a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a+bx^{n/2}\right)^{-1+\frac{1}{n}}(c+dx^n)}{x^2}\,dx$

Optimal. Leaf size=139

$$\frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}}{x}-\frac{d\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}\left(1-\frac{b^2x^n}{a^2}\right)^{-1/n}{}_2F_1\left(-\frac{1}{n},-\frac{1}{n};-\frac{1-n}{n};\frac{b^2x^n}{a^2}\right)}{b^2x}$$

```
[Out] ((c/a^2 + d/b^2)*(-a + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1))/x - (d*(-a
 + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1)*Hypergeometric2F1[-n^(-1), -n^(
-1), -((1 - n)/n), (b^2*x^n)/a^2])/(b^2*x*(1 - (b^2*x^n)/a^2)^n^(-1))
```

Rubi [A] time = 0.114513, antiderivative size = 139, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 47, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.085, Rules used = {519, 452, 365, 364}

$$\frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}}{x}-\frac{d\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}\left(1-\frac{b^2x^n}{a^2}\right)^{-1/n}{}_2F_1\left(-\frac{1}{n},-\frac{1}{n};-\frac{1-n}{n};\frac{b^2x^n}{a^2}\right)}{b^2x}$$

Antiderivative was successfully verified.

```
[In] Int[((-a + b*x^(n/2))^(-1 + n^(-1))*(a + b*x^(n/2))^(-1 + n^(-1))*(c + d*x^
n))/x^2,x]
```

```
[Out] ((c/a^2 + d/b^2)*(-a + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1))/x - (d*(-a
 + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1)*Hypergeometric2F1[-n^(-1), -n^(
-1), -((1 - n)/n), (b^2*x^n)/a^2])/(b^2*x*(1 - (b^2*x^n)/a^2)^n^(-1))
```

Rule 519

```
Int[(u_.)*((c_) + (d_.)*(x_)^(n_.))^(q_.)*((a1_) + (b1_.)*(x_)^(non2_.))^(p
_)*((a2_) + (b2_.)*(x_)^(non2_.))^(p_), x_Symbol] :> Dist[((a1 + b1*x^(n/2)
)^FracPart[p]*(a2 + b2*x^(n/2))^FracPart[p])/(a1*a2 + b1*b2*x^n)^FracPart[p
], Int[u*(a1*a2 + b1*b2*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a1, b1, a2,
b2, c, d, n, p, q}, x] && EqQ[non2, n/2] && EqQ[a2*b1 + a1*b2, 0] &&  !(EqQ
[n, 2] && IGtQ[q, 0])
```

Rule 452

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[((b*c - a*d)*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*b
*e*(m + 1)), x] + Dist[d/b, Int[(e*x)^m*(a + b*x^n)^(p + 1), x], x] /; Free
Q[{a, b, c, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) +
1, 0] && NeQ[m, -1]
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{\left(-a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a+bx^{n/2}\right)^{-1+\frac{1}{n}}(c+dx^n)}{x^2}\,dx = \left(\left(-a+bx^{n/2}\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}\left(-a^2+b^2x^n\right)^{-1/n}\right)\int \frac{\left(-a^2+b^2x^n\right)^{-1+}}{x^2}$$

$$= \frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(-a+bx^{n/2}\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}}{x} + \frac{\left(d\left(-a+bx^{n/2}\right)^{\frac{1}{n}}\left(a+bx^{n/\right.\right.}{}$$

$$= \frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(-a+bx^{n/2}\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}}{x} + \frac{\left(d\left(-a+bx^{n/2}\right)^{\frac{1}{n}}\left(a+bx^{n/\right.\right.}{}$$

$$= \frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(-a+bx^{n/2}\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}}{x} - \frac{d\left(-a+bx^{n/2}\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right.}{}$$

Mathematica [A] time = 0.15465, size = 124, normalized size = 0.89

$$\frac{\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}\left(1-\frac{b^2x^n}{a^2}\right)^{-1/n}\left(c(n-1)\left(1-\frac{b^2x^n}{a^2}\right)^{\frac{1}{n}}-dx^n\,{}_2F_1\left(\frac{n-1}{n},\frac{n-1}{n};2-\frac{1}{n};\frac{b^2x^n}{a^2}\right)\right)}{a^2(n-1)x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((-a + b*x^(n/2))^(-1 + n^(-1))*(a + b*x^(n/2))^(-1 + n^(-1))*(c
+ d*x^n))/x^2,x]
```

```
[Out] ((-a + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1)*(c*(-1 + n)*(1 - (b^2*x^n)/
a^2)^n^(-1) - d*x^n*Hypergeometric2F1[(-1 + n)/n, (-1 + n)/n, 2 - n^(-1), (
b^2*x^n)/a^2]))/(a^2*(-1 + n)*x*(1 - (b^2*x^n)/a^2)^n^(-1))
```

Maple [F] time = 0.795, size = 0, normalized size = 0.

$$\int \frac{c+dx^n}{x^2}\left(-a+bx^{\frac{n}{2}}\right)^{-1+n^{-1}}\left(a+bx^{\frac{n}{2}}\right)^{-1+n^{-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*x^(1/2*n))^(-1+1/n)*(a+b*x^(1/2*n))^(-1+1/n)*(c+d*x^n)/x^2,x)
```

```
[Out] int((-a+b*x^(1/2*n))^(-1+1/n)*(a+b*x^(1/2*n))^(-1+1/n)*(c+d*x^n)/x^2,x)
```

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

$$\int \frac{(dx^n+c)\left(bx^{\frac{1}{2}n}+a\right)^{\frac{1}{n}-1}\left(bx^{\frac{1}{2}n}-a\right)^{\frac{1}{n}-1}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*x^(1/2*n))^(-1+1/n)*(a+b*x^(1/2*n))^(-1+1/n)*(c+d*x^n)/x^2,
x, algorithm="maxima")
```

```
[Out] integrate((d*x^n + c)*(b*x^(1/2*n) + a)^(1/n - 1)*(b*x^(1/2*n) - a)^(1/n -
1)/x^2, x)
```

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

$$\text{integral}\left(\frac{dx^n + c}{\left(bx^{\frac{1}{2}n} + a\right)^{\frac{n-1}{n}}\left(bx^{\frac{1}{2}n} - a\right)^{\frac{n-1}{n}}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*x^(1/2*n))^(-1+1/n)*(a+b*x^(1/2*n))^(-1+1/n)*(c+d*x^n)/x^2,
x, algorithm="fricas")
```

```
[Out] integral((d*x^n + c)/((b*x^(1/2*n) + a)^((n - 1)/n)*(b*x^(1/2*n) - a)^((n -
 1)/n)*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((-a+b*x**(1/2*n))**(-1+1/n)*(a+b*x**(1/2*n))**(-1+1/n)*(c+d*x**n)
/x**2,x)
```

```
[Out] Timed out
```

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

$$\int \frac{(dx^n + c)\left(bx^{\frac{1}{2}n} + a\right)^{\frac{1}{n}-1}\left(bx^{\frac{1}{2}n} - a\right)^{\frac{1}{n}-1}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*x^(1/2*n))^(-1+1/n)*(a+b*x^(1/2*n))^(-1+1/n)*(c+d*x^n)/x^2,
x, algorithm="giac")
```

```
[Out] integrate((d*x^n + c)*(b*x^(1/2*n) + a)^(1/n - 1)*(b*x^(1/2*n) - a)^(1/n -
1)/x^2, x)
```

3.46 $\int \frac{\left(-a+bx^{n/2}\right)^{\frac{1-n}{n}}\left(a+bx^{n/2}\right)^{\frac{1-n}{n}}(c+dx^n)}{x^2}\,dx$

Optimal. Leaf size=139

$$\frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}}{x}-\frac{d\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}\left(1-\frac{b^2x^n}{a^2}\right)^{-1/n}{}_2F_1\left(-\frac{1}{n},-\frac{1}{n};-\frac{1-n}{n};\frac{b^2x^n}{a^2}\right)}{b^2x}$$

```
[Out] ((c/a^2 + d/b^2)*(-a + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1))/x - (d*(-a
 + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1)*Hypergeometric2F1[-n^(-1), -n^(
-1), -((1 - n)/n), (b^2*x^n)/a^2])/(b^2*x*(1 - (b^2*x^n)/a^2)^n^(-1))
```

Rubi [A] time = 0.117721, antiderivative size = 167, normalized size of antiderivative = 1.2, number of steps used = 4, number of rules used = 4, integrand size = 55, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.073, Rules used = {519, 452, 365, 364}

$$\frac{a^2d\left(bx^{n/2}-a\right)^{\frac{1}{n}-1}\left(a+bx^{n/2}\right)^{\frac{1}{n}-1}\left(1-\frac{b^2x^n}{a^2}\right)^{-\frac{1-n}{n}}{}_2F_1\left(-\frac{1}{n},-\frac{1}{n};-\frac{1-n}{n};\frac{b^2x^n}{a^2}\right)}{b^2x}-\frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(bx^{n/2}-a\right)^{\frac{1}{n}-1}\left(a+bx^{n/2}\right)^{\frac{1}{n}-1}\left(a^2 \cdots\right.}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((-a + b*x^(n/2))^((1 - n)/n)*(a + b*x^(n/2))^((1 - n)/n)*(c + d*x^n))/
x^2,x]
```

```
[Out] -(((c/a^2 + d/b^2)*(-a + b*x^(n/2))^(-1 + n^(-1))*(a + b*x^(n/2))^(-1 + n^(
-1))*(a^2 - b^2*x^n))/x) + (a^2*d*(-a + b*x^(n/2))^(-1 + n^(-1))*(a + b*x^(
n/2))^(-1 + n^(-1))*Hypergeometric2F1[-n^(-1), -n^(-1), -((1 - n)/n), (b^2*
x^n)/a^2])/(b^2*x*(1 - (b^2*x^n)/a^2)^((1 - n)/n))
```

Rule 519

```
Int[(u_.)*((c_) + (d_.)*(x_)^(n_.))^(q_.)*((a1_) + (b1_.)*(x_)^(non2_.))^(p
_)*((a2_) + (b2_.)*(x_)^(non2_.))^(p_), x_Symbol] :> Dist[((a1 + b1*x^(n/2)
)^FracPart[p]*(a2 + b2*x^(n/2))^FracPart[p])/(a1*a2 + b1*b2*x^n)^FracPart[p
], Int[u*(a1*a2 + b1*b2*x^n)^p*(c + d*x^n)^q, x], x] /; FreeQ[{a1, b1, a2,
b2, c, d, n, p, q}, x] && EqQ[non2, n/2] && EqQ[a2*b1 + a1*b2, 0] &&  !(EqQ
[n, 2] && IGtQ[q, 0])
```

Rule 452

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[((b*c - a*d)*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*b
*e*(m + 1)), x] + Dist[d/b, Int[(e*x)^m*(a + b*x^n)^(p + 1), x], x] /; Free
Q[{a, b, c, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) +
1, 0] && NeQ[m, -1]
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rubi steps

$$\int \frac{\left(-a+bx^{n/2}\right)^{\frac{1-n}{n}}\left(a+bx^{n/2}\right)^{\frac{1-n}{n}}(c+dx^n)}{x^2}\,dx = \left(\left(-a+bx^{n/2}\right)^{\frac{1-n}{n}}\left(a+bx^{n/2}\right)^{\frac{1-n}{n}}\left(-a^2+b^2x^n\right)^{-\frac{1-n}{n}}\right)\int \frac{\left(-a^2+b^2x^n\right)^{\frac{1-n}{n}}(c}{x^2}$$

$$= -\frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(-a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a^2-b^2x^n\right)}{x} + \frac{\left(d\left(-a+bx\right.\right.}{}$$

$$= -\frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(-a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a^2-b^2x^n\right)}{x} - \frac{\left(a^2d\left(-a+b\right.\right.}{}$$

$$= -\frac{\left(\frac{c}{a^2}+\frac{d}{b^2}\right)\left(-a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a+bx^{n/2}\right)^{-1+\frac{1}{n}}\left(a^2-b^2x^n\right)}{x} + \frac{a^2d\left(-a+bx\right.}{}$$

Mathematica [A] time = 0.0521359, size = 124, normalized size = 0.89

$$\frac{\left(bx^{n/2}-a\right)^{\frac{1}{n}}\left(a+bx^{n/2}\right)^{\frac{1}{n}}\left(1-\frac{b^2x^n}{a^2}\right)^{-1/n}\left(c(n-1)\left(1-\frac{b^2x^n}{a^2}\right)^{\frac{1}{n}}-dx^n\,{}_2F_1\left(\frac{n-1}{n},\frac{n-1}{n};2-\frac{1}{n};\frac{b^2x^n}{a^2}\right)\right)}{a^2(n-1)x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((-a + b*x^(n/2))^((1 - n)/n)*(a + b*x^(n/2))^((1 - n)/n)*(c + d*
x^n))/x^2,x]
```

```
[Out] ((-a + b*x^(n/2))^n^(-1)*(a + b*x^(n/2))^n^(-1)*(c*(-1 + n)*(1 - (b^2*x^n)/
a^2)^n^(-1) - d*x^n*Hypergeometric2F1[(-1 + n)/n, (-1 + n)/n, 2 - n^(-1), (
b^2*x^n)/a^2]))/(a^2*(-1 + n)*x*(1 - (b^2*x^n)/a^2)^n^(-1))
```

Maple [F] time = 0.8, size = 0, normalized size = 0.

$$\int \frac{c+dx^n}{x^2}\left(-a+bx^{\frac{n}{2}}\right)^{\frac{1-n}{n}}\left(a+bx^{\frac{n}{2}}\right)^{\frac{1-n}{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((-a+b*x^(1/2*n))^((1-n)/n)*(a+b*x^(1/2*n))^((1-n)/n)*(c+d*x^n)/x^2,x)
```

```
[Out] int((-a+b*x^(1/2*n))^((1-n)/n)*(a+b*x^(1/2*n))^((1-n)/n)*(c+d*x^n)/x^2,x)
```

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

$$\int \frac{dx^n+c}{\left(bx^{\frac{1}{2}n}+a\right)^{\frac{n-1}{n}}\left(bx^{\frac{1}{2}n}-a\right)^{\frac{n-1}{n}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*x^(1/2*n))^((1-n)/n)*(a+b*x^(1/2*n))^((1-n)/n)*(c+d*x^n)/x^
2,x, algorithm="maxima")
```

```
[Out] integrate((d*x^n + c)/((b*x^(1/2*n) + a)^((n - 1)/n)*(b*x^(1/2*n) - a)^((n
- 1)/n)*x^2), x)
```

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

$$\text{integral}\left(\frac{dx^n + c}{\left(bx^{\frac{1}{2}n} + a\right)^{\frac{n-1}{n}}\left(bx^{\frac{1}{2}n} - a\right)^{\frac{n-1}{n}}x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*x^(1/2*n))^((1-n)/n)*(a+b*x^(1/2*n))^((1-n)/n)*(c+d*x^n)/x^
2,x, algorithm="fricas")
```

```
[Out] integral((d*x^n + c)/((b*x^(1/2*n) + a)^((n - 1)/n)*(b*x^(1/2*n) - a)^((n -
 1)/n)*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((-a+b*x**(1/2*n))**((1-n)/n)*(a+b*x**(1/2*n))**((1-n)/n)*(c+d*x**
n)/x**2,x)
```

```
[Out] Timed out
```

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

$$\int \frac{dx^n + c}{\left(bx^{\frac{1}{2}n} + a\right)^{\frac{n-1}{n}}\left(bx^{\frac{1}{2}n} - a\right)^{\frac{n-1}{n}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((-a+b*x^(1/2*n))^((1-n)/n)*(a+b*x^(1/2*n))^((1-n)/n)*(c+d*x^n)/x^
2,x, algorithm="giac")
```

```
[Out] integrate((d*x^n + c)/((b*x^(1/2*n) + a)^((n - 1)/n)*(b*x^(1/2*n) - a)^((n
- 1)/n)*x^2), x)
```

Chapter 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 Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* 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]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
    debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
    ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
```

```
                print("both result and optimal complex");
             fi;
             #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
             if debug then
                print("result contains complex but optimal is not");
             fi;
             return "C";
          end if
       else # result do not contain complex
            # this assumes optimal do not as well
            if debug then
                print("result do not contain complex, this assumes optimal do
    not as well");
            fi;
            if leaf_count_result<=2*leaf_count_optimal then
               if debug then
                  print("leaf_count_result<=2*leaf_count_optimal");
               fi;
               return "A";
            else
               if debug then
                  print("leaf_count_result>2*leaf_count_optimal");
               fi;
               return "B";
            end if
       end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
# 9 = unknown function

ExpnType := proc(expn)
```

```
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:

AppellFunctionQ := proc(func)
  member(func,[AppellF1])
```

```
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]

def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
```

```
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
```

```
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

def tree(expr):
    debug=False;
    if debug:
         print ("Enter tree(expr), expr=",expr)
         print ("expr.operator()=",expr.operator())
         print ("expr.operands()=",expr.operands())
         print ("map(tree, expr.operands()=",map(tree, expr.operands()))

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

def leaf_count(anti):
    debug=False;

    if debug: print ("Enter leaf_count, anti=", anti, " len(anti)=", len(anti))

    if len(anti) == 0: #special check for optimal being 0 for some test cases.
       if debug: print ("len(anti) == 0")
       return 1
    else:
        if debug: print ("round(1.35*len(flatten(tree(anti))))=",round(1.35*len
   (flatten(tree(anti)))))
        return round(1.35*len(flatten(tree(anti)))) #fudge factor
                     #since this estimate of leaf count is bit lower than
```

```
                      #what it should be compared to Mathematica's

def is_sqrt(expr):
    debug=False;
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug = False

    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug = False

    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in sagemath

```

```
def is_atom(expn):

    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens"):
            return expn in expn.parent().base_ring() or expn in expn.parent().gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):
    debug=False

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer)
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn.func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(expn.args)))
```

```
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): # is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):
    debug = False;

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, " leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=", expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```