Computer algebra independent integration tests

3-Logarithms/3.1.4-f-x-^m-d+e-x^r-^q-a+b-log-c-x^n-^p

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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 [456]. This is test number [57].

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. (456)	% 0. (0)
Mathematica	% 98.46 (449)	% 1.54 (7)
Maple	% 67.76 (309)	% 32.24 (147)
Maxima	% 34.65 (158)	% 65.35 (298)
Fricas	% 61.4 (280)	% 38.6 (176)
Sympy	% 42.76 (195)	% 57.24 (261)
Giac	% 43.2 (197)	% 56.8 (259)

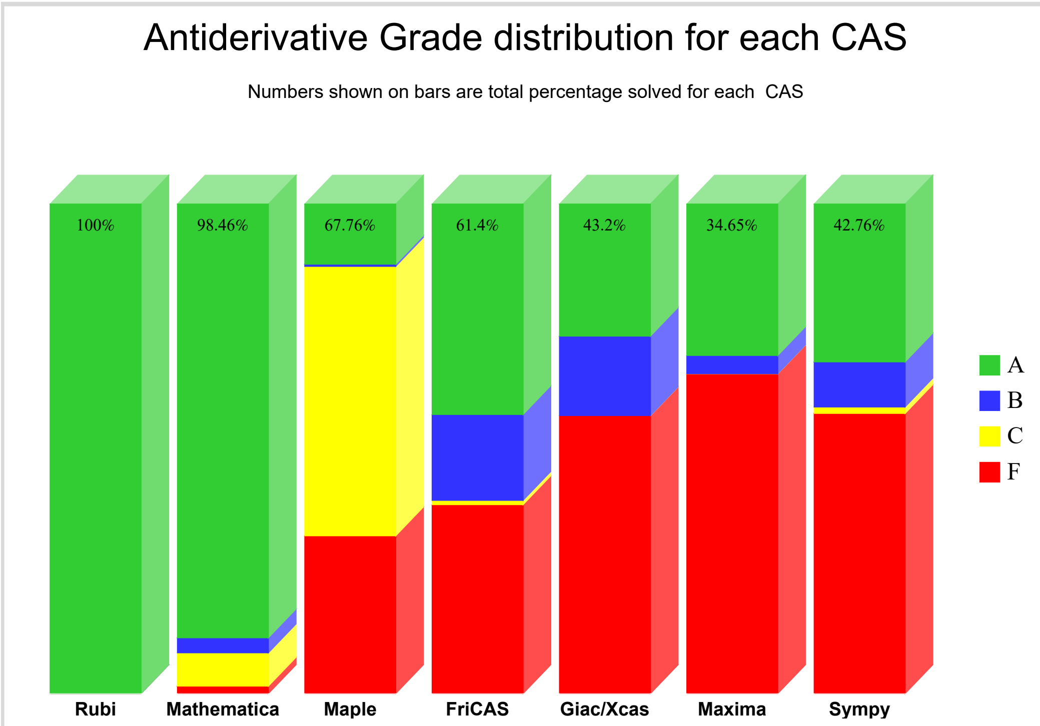
The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives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

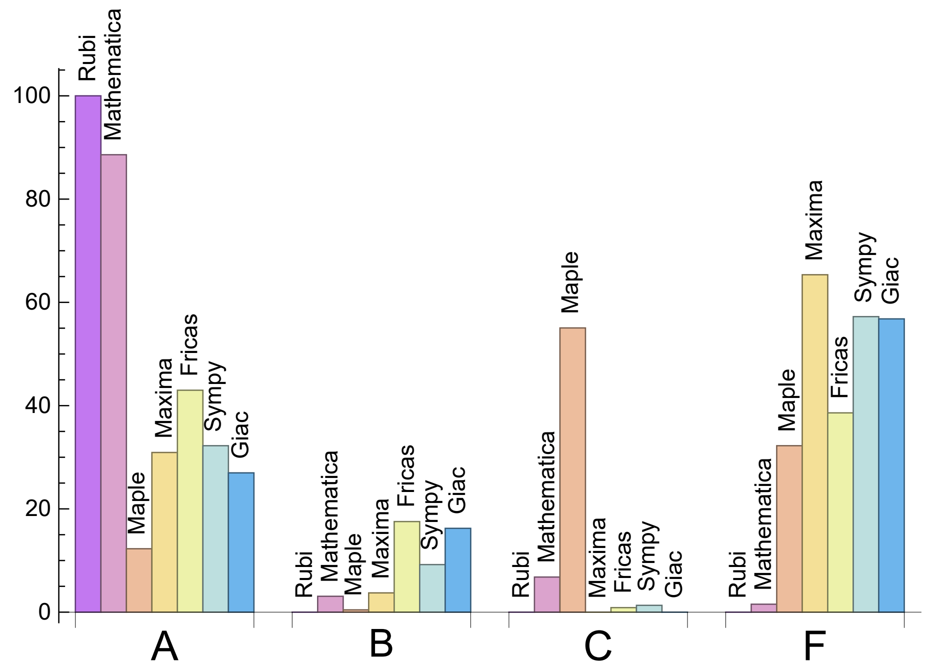
Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	100.	0.	0.	0.
Mathematica	88.6	3.07	6.8	1.54
Maple	12.28	0.44	55.04	32.24
Maxima	30.92	3.73	0.	65.35
Fricas	42.98	17.54	0.88	38.6
Sympy	32.24	9.21	1.32	57.24
Giac	26.97	16.23	0.	56.8

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	Normalized median
Rubi	0.22	148.03	0.92	119.	1.
Mathematica	0.44	167.07	1.26	125.	1.01
Maple	0.27	1024.2	7.85	587.	5.3
Maxima	0.96	131.78	1.59	128.5	1.54
Fricas	1.2	619.73	4.75	379.	4.02
Sympy	31.84	302.12	2.85	199.	1.9
Giac	1.1	298.21	2.61	189.	2.06

1.4 list of integrals that has no closed form antiderivative

{127, 128, 129, 157, 158, 159, 160, 161, 166, 167, 168, 170, 249, 250, 322, 323, 327, 328, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 444, 445, 452, 453}

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

Rubi {}

Mathematica {166, 167, 168, 170, 322, 323, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 444, 445}

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 {166, 167, 170, 282, 291, 302, 303, 313, 314, 322, 323, 324, 325, 355, 363, 364, 365, 366, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 424, 425, 426, 430, 431, 432, 444, 445}

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/X-CAS 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

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

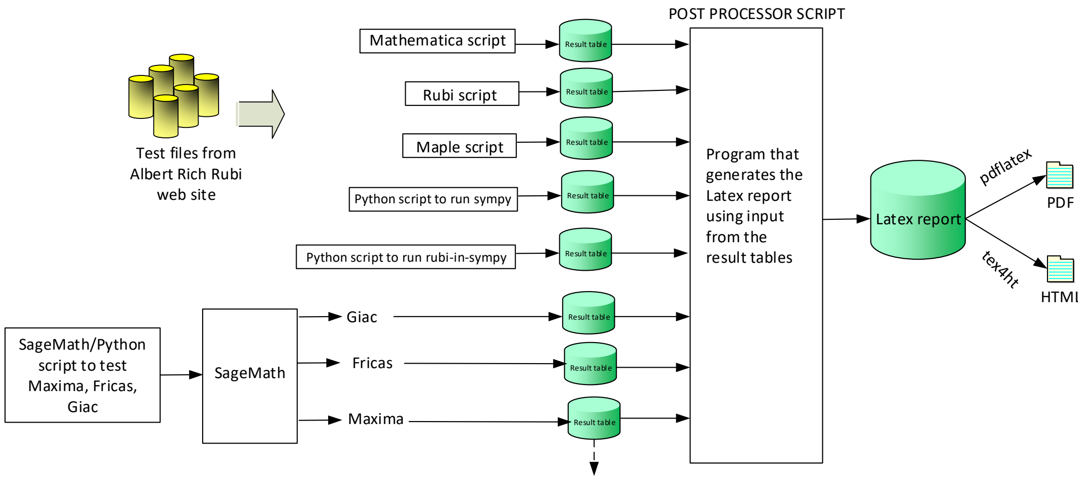
```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  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, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456 }

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, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 64, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 116, 117, 118, 119, 120, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 214, 215, 216, 217, 218, 219, 220, 223, 226, 227, 228, 229, 230, 232, 233, 241, 242, 243, 245, 246, 247, 249, 250, 251, 252, 253, 260, 261, 262, 263, 264, 265, 272, 273, 274, 275, 276, 277, 278, 282, 283, 284, 285, 286, 287, 288, 289, 293, 294, 295, 296, 297, 298, 299, 300, 305, 306, 307, 308, 309, 310, 311, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 432, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456 }

B grade: { 56, 65, 115, 121, 213, 236, 237, 238, 239, 240, 244, 363, 430, 431 }

C grade: { 221, 222, 224, 225, 231, 234, 235, 248, 254, 255, 256, 257, 258, 259, 266, 267, 268, 269, 270, 271, 279, 280, 281, 290, 291, 292, 301, 302, 303, 304, 312 }

F grade: { 433, 434, 435, 436, 437, 438, 439}

2.1.3 Maple

A grade: { 4, 5, 74, 75, 127, 128, 129, 147, 157, 158, 159, 160, 161, 166, 167, 168, 170, 241, 243, 244, 249, 250, 275, 322, 323, 327, 328, 337, 338, 339, 340, 341, 343, 344, 345, 346, 347, 348, 349, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 420, 444, 445, 452, 453 }

B grade: { 245, 342 }

C grade: { 1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 95, 96, 103, 109, 110, 115, 116, 117, 121, 162, 163, 164, 165, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 242, 246, 317, 318, 319, 320, 321, 326, 329, 330, 331, 332, 333, 334, 335, 336, 351, 352, 353, 354, 359, 360, 361, 362, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 408, 415, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 440, 441, 442, 443, 454, 455 }

F grade: { 92, 93, 94, 97, 98, 99, 100, 101, 102, 104, 105, 106, 107, 108, 111, 112, 113, 114, 118, 119, 120, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 148, 149, 150, 151, 152, 153, 154, 155, 156, 169, 247, 248, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 324, 325, 350, 355, 356, 357, 358, 363, 364, 365, 366, 431, 432, 433, 434, 435, 436, 437, 438, 439, 446, 447, 448, 449, 450, 451, 456 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 42, 49, 57, 58, 67, 68, 69, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 120, 127, 128, 129, 157, 158, 159, 160, 161, 166, 167, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 223, 233, 244, 249, 250, 275, 309, 317, 322, 323, 327, 328, 337, 338, 339, 340, 341, 342, 343, 344, 356, 357, 358, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 444, 445

B grade: { 48, 56, 65, 66, 70, 74, 75, 232, 241, 242, 243, 345, 346, 347, 348, 349, 454 }

C grade: { }

F grade: { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 71, 72, 73, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 121, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 162, 163, 164, 165, 168, 169, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 234, 235, 236, 237, 238, 239, 240, 245, 246, 247, 248, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 310, 311, 312, 313, 314, 315, 316, 318, 319, 320, 321, 324, 325, 326, 329, 330, 331, 332, 333, 334, 335, 336, 350, 351, 352, 353, 354, 355, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 408, 415, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 446, 447, 448, 449, 450, 451, 452, 453, 455, 456 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 42, 49, 57, 58, 67, 68, 74, 75, 81, 82, 83, 130, 131, 132, 133, 137, 138, 139, 140, 144, 145, 146, 147, 151, 152, 153, 154, 157, 158, 159, 160, 161, 165, 166, 167, 168, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 223, 233, 241, 242, 249, 250, 251, 252, 253, 260, 261, 262, 263, 264, 265, 272, 273, 274, 275, 276, 277, 278, 283, 284, 285, 286, 287, 288, 289, 293, 294, 295, 296, 297, 298, 299, 300, 305, 306, 307, 308, 309, 310, 315, 316, 317, 321, 322, 323, 327, 328, 348, 349, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 364, 370, 382, 395, 406, 407, 408, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 420, 421, 422, 423, 424, 443, 444, 445, 452, 453 }

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C grade: { 363, 430, 431, 432 }

F grade: { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 71, 72, 73, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 134, 135, 136, 141, 142, 143, 148, 149, 150, 155, 156, 169, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 234, 235, 236, 237, 238, 239, 240, 243, 244, 245, 246, 247, 248, 254, 255, 256, 257, 258, 259, 266, 267, 268, 269, 270, 271, 279, 280, 281, 282, 290, 291, 292, 301, 302, 303, 304, 311, 312, 313, 314, 324, 325, 326, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 433, 434, 435, 436, 437, 438, 439, 446, 447, 448, 449, 450, 451, 455, 456 }

2.1.6 Sympy

A grade: { 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 21, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 36, 37, 38, 39, 40, 42, 44, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 57, 58, 59, 60, 65, 66, 67, 68, 69, 70, 80, 89, 120, 127, 128, 129, 131, 132, 133, 140, 146, 147, 151, 152, 153, 154, 157, 158, 159, 160, 161, 166, 167, 168, 169, 170, 174, 175, 176, 179, 180, 181, 182, 186, 187, 188, 191, 192, 193, 194, 195, 197, 199, 200, 201, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 223, 242, 253, 275, 278, 288, 289, 299, 317, 322, 329, 330, 331, 332, 335, 336, 337, 338, 339, 340, 343, 344, 368, 369, 373, 374, 375, 380, 381, 387, 388, 389, 400, 401, 406, 407, 409, 410, 411, 412, 414, 444, 454 }

B grade: { 1, 2, 3, 9, 10, 11, 12, 19, 20, 22, 27, 76, 77, 78, 79, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 130, 139, 171, 172, 173, 177, 178, 183, 184, 185, 189, 190, 196, 198, 202, 203, 300 }

C grade: { 35, 241, 334, 342, 348, 349 }

F grade: { 34, 41, 43, 45, 52, 61, 62, 63, 64, 71, 72, 73, 74, 75, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 121, 122, 123, 124, 125, 126, 134, 135, 136, 137, 138, 141, 142, 143, 144, 145, 148, 149, 150, 155, 156, 162, 163, 164, 165, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 279, 280, 281, 282, 283, 284, 285, 286, 287, 290, 291, 292, 293, 294, 295, 296, 297, 298, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 318, 319, 320, 321, 323, 324, 325, 326, 327, 328, 333, 341, 345, 346, 347, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 370, 371, 372, 376, 377, 378, 379, 382, 383, 384, 385, 386, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 402, 403, 404, 405, 408, 413, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 445, 446, 447, 448, 449, 450, 451, 452, 453, 455, 456 }

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 42, 49, 57, 67, 127, 128, 129, 147, 154, 157, 158, 159, 160, 161, 166, 167, 168, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 223, 233, 249, 250, 251, 252, 253, 275, 317, 322, 323, 327, 328, 352, 353, 354, 370, 382, 395, 406, 407, 409, 410, 411, 412, 413, 414, 416, 417, 418, 419, 421, 422, 423, 444, 445, 452, 453 }

B grade: { 22, 48, 56, 58, 65, 66, 68, 69, 70, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 162, 163, 164, 165, 198, 232, 318, 319, 320, 321, 351, 356, 357, 358, 359, 360, 361, 362, 367, 368, 369, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 385, 386, 387, 392, 393, 394, 398, 399, 400, 427, 428, 429, 440, 441, 442, 443, 454 }

C grade: { }

F grade: { 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 59, 60, 61, 62, 63, 64, 71, 72, 73, 74, 75, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 148, 149, 150, 151, 152, 153, 155, 156, 169, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 224, 225, 226, 227, 228, 229, 230, 231, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 324, 325, 326, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 355, 363, 364, 365, 366, 383, 384, 388, 389, 390, 391, 396, 397, 401, 402, 403, 404, 405, 408, 415, 420, 424, 425, 426, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 446, 447, 448, 449, 450, 451, 455, 456 }

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	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	48	264	77	181	87	99
normalized size	1	1.	1.	5.5	1.6	3.77	1.81	2.06
time (sec)	N/A	0.052	0.024	0.191	1.15	0.986	9.231	1.249

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	45	264	77	180	87	99
normalized size	1	1.	0.94	5.5	1.6	3.75	1.81	2.06
time (sec)	N/A	0.05	0.024	0.234	1.166	0.958	3.34	1.258

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	48	264	77	176	87	99
normalized size	1	1.	1.	5.5	1.6	3.67	1.81	2.06
time (sec)	N/A	0.036	0.019	0.207	1.188	1.002	4.011	1.228

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	41	55	52	66	154	73	84
normalized size	1	0.85	1.15	1.08	1.38	3.21	1.52	1.75
time (sec)	N/A	0.016	0.002	0.054	1.199	0.975	0.823	1.303

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	43	46	55	123	58	66
normalized size	1	1.	0.98	1.05	1.25	2.8	1.32	1.5
time (sec)	N/A	0.049	0.002	0.06	1.081	1.001	2.857	1.282

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	43	48	250	66	136	53	76
normalized size	1	0.9	1.	5.21	1.38	2.83	1.1	1.58
time (sec)	N/A	0.05	0.025	0.139	1.151	1.021	16.615	1.26

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	41	232	77	140	75	77
normalized size	1	1.	0.68	3.87	1.28	2.33	1.25	1.28
time (sec)	N/A	0.049	0.023	0.097	1.14	0.975	1.741	1.319

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	48	47	235	77	154	88	78
normalized size	1	0.84	0.82	4.12	1.35	2.7	1.54	1.37
time (sec)	N/A	0.045	0.023	0.11	1.159	1.047	2.557	1.294

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	81	432	135	293	158	166
normalized size	1	1.	1.09	5.84	1.82	3.96	2.14	2.24
time (sec)	N/A	0.09	0.051	0.245	1.171	1.018	14.376	1.332

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	81	432	135	288	151	166
normalized size	1	1.	1.09	5.84	1.82	3.89	2.04	2.24
time (sec)	N/A	0.08	0.04	0.21	1.224	0.994	21.052	1.339

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	81	432	135	282	158	166
normalized size	1	1.	1.09	5.84	1.82	3.81	2.14	2.24
time (sec)	N/A	0.063	0.039	0.228	1.141	1.	3.137	1.344

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	70	70	77	414	122	257	133	147
normalized size	1	1.	1.1	5.91	1.74	3.67	1.9	2.1
time (sec)	N/A	0.038	0.039	0.218	1.184	0.959	1.905	1.232

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	63	83	410	113	244	128	135
normalized size	1	0.79	1.04	5.12	1.41	3.05	1.6	1.69
time (sec)	N/A	0.071	0.046	0.239	1.071	0.994	1.381	1.328

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	78	61	76	419	112	215	109	136
normalized size	1	0.78	0.97	5.37	1.44	2.76	1.4	1.74
time (sec)	N/A	0.076	0.054	0.253	1.151	1.022	5.912	1.442

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	67	84	418	122	242	99	142
normalized size	1	0.8	1.	4.98	1.45	2.88	1.18	1.69
time (sec)	N/A	0.079	0.055	0.149	1.142	1.066	20.712	1.348

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	75	75	76	401	135	246	134	146
normalized size	1	1.	1.01	5.35	1.8	3.28	1.79	1.95
time (sec)	N/A	0.071	0.039	0.121	1.161	0.97	2.583	1.285

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	74	80	403	135	261	160	146
normalized size	1	0.78	0.84	4.24	1.42	2.75	1.68	1.54
time (sec)	N/A	0.076	0.038	0.122	1.084	1.005	3.943	1.489

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	74	80	403	135	273	153	146
normalized size	1	0.78	0.84	4.24	1.42	2.87	1.61	1.54
time (sec)	N/A	0.076	0.039	0.121	1.458	1.019	8.204	1.29

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	133	600	193	402	223	234
normalized size	1	1.	1.33	6.	1.93	4.02	2.23	2.34
time (sec)	N/A	0.106	0.058	0.217	1.093	0.988	43.689	1.335

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	133	600	193	398	230	234
normalized size	1	1.	1.33	6.	1.93	3.98	2.3	2.34
time (sec)	N/A	0.102	0.049	0.223	1.172	1.017	7.322	1.293

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	122	130	598	190	394	218	230
normalized size	1	1.	1.07	4.9	1.56	3.23	1.79	1.89
time (sec)	N/A	0.091	0.119	0.225	0.984	1.021	3.671	1.207

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	85	85	110	571	180	360	204	215
normalized size	1	1.	1.29	6.72	2.12	4.24	2.4	2.53
time (sec)	N/A	0.043	0.046	0.227	1.133	0.998	3.982	1.271

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	122	94	123	579	171	355	199	203
normalized size	1	0.77	1.01	4.75	1.4	2.91	1.63	1.66
time (sec)	N/A	0.088	0.061	0.246	1.236	1.037	2.58	1.234

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	92	118	588	171	338	182	208
normalized size	1	0.77	0.99	4.94	1.44	2.84	1.53	1.75
time (sec)	N/A	0.088	0.08	0.276	1.118	1.035	4.766	1.318

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	91	115	586	169	338	182	208
normalized size	1	0.77	0.97	4.97	1.43	2.86	1.54	1.76
time (sec)	N/A	0.091	0.078	0.263	1.092	1.015	2.945	1.333

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	98	122	589	180	360	144	209
normalized size	1	0.78	0.97	4.67	1.43	2.86	1.14	1.66
time (sec)	N/A	0.108	0.079	0.166	1.085	1.043	9.138	1.363

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	90	109	569	193	352	206	213
normalized size	1	1.	1.21	6.32	2.14	3.91	2.29	2.37
time (sec)	N/A	0.082	0.052	0.14	1.139	1.045	7.809	1.352

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	133	113	571	193	378	219	213
normalized size	1	0.94	0.8	4.02	1.36	2.66	1.54	1.5
time (sec)	N/A	0.098	0.052	0.136	1.149	0.992	9.255	1.211

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	100	113	571	193	382	231	213
normalized size	1	0.75	0.85	4.29	1.45	2.87	1.74	1.6
time (sec)	N/A	0.096	0.052	0.138	1.109	1.082	17.431	1.288

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	100	113	571	193	393	224	213
normalized size	1	0.75	0.85	4.29	1.45	2.95	1.68	1.6
time (sec)	N/A	0.106	0.052	0.138	1.124	1.045	17.833	1.335

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	142	693	0	0	248	0
normalized size	1	1.	0.96	4.68	0.	0.	1.68	0.
time (sec)	N/A	0.177	0.076	0.217	0.	0.	41.488	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	105	521	0	0	199	0
normalized size	1	1.	0.98	4.87	0.	0.	1.86	0.
time (sec)	N/A	0.136	0.051	0.187	0.	0.	33.015	0.

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	66	343	0	0	144	0
normalized size	1	1.	0.96	4.97	0.	0.	2.09	0.
time (sec)	N/A	0.094	0.032	0.22	0.	0.	41.553	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	37	195	0	0	0	0
normalized size	1	1.	0.95	5.	0.	0.	0.	0.
time (sec)	N/A	0.026	0.007	0.167	0.	0.	0.	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	66	63	336	0	0	158	0
normalized size	1	1.5	1.43	7.64	0.	0.	3.59	0.
time (sec)	N/A	0.091	0.032	0.142	0.	0.	23.224	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	95	88	504	0	0	197	0
normalized size	1	1.28	1.19	6.81	0.	0.	2.66	0.
time (sec)	N/A	0.145	0.083	0.178	0.	0.	127.667	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	135	124	689	0	0	246	0
normalized size	1	1.23	1.13	6.26	0.	0.	2.24	0.
time (sec)	N/A	0.171	0.197	0.158	0.	0.	123.158	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	173	159	868	0	0	296	0
normalized size	1	1.15	1.06	5.79	0.	0.	1.97	0.
time (sec)	N/A	0.212	0.174	0.163	0.	0.	150.42	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	151	141	739	0	0	304	0
normalized size	1	0.99	0.93	4.86	0.	0.	2.	0.
time (sec)	N/A	0.181	0.116	0.205	0.	0.	131.855	0.

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	106	98	558	0	0	250	0
normalized size	1	1.08	1.	5.69	0.	0.	2.55	0.
time (sec)	N/A	0.143	0.089	0.193	0.	0.	106.449	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	65	74	71	389	0	0	0	0
normalized size	1	1.14	1.09	5.98	0.	0.	0.	0.
time (sec)	N/A	0.108	0.062	0.146	0.	0.	0.	0.

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	41	173	85	119	189	78
normalized size	1	1.	1.05	4.44	2.18	3.05	4.85	2.
time (sec)	N/A	0.019	0.029	0.1	1.141	1.049	4.01	1.296

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	80	102	96	521	0	0	0	0
normalized size	1	1.27	1.2	6.51	0.	0.	0.	0.
time (sec)	N/A	0.16	0.078	0.157	0.	0.	0.	0.

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	114	134	120	703	0	0	299	0
normalized size	1	1.18	1.05	6.17	0.	0.	2.62	0.
time (sec)	N/A	0.179	0.138	0.169	0.	0.	71.797	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	178	165	910	0	0	0	0
normalized size	1	1.16	1.07	5.91	0.	0.	0.	0.
time (sec)	N/A	0.213	0.218	0.168	0.	0.	0.	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	149	167	150	764	0	0	372	0
normalized size	1	1.12	1.01	5.13	0.	0.	2.5	0.
time (sec)	N/A	0.216	0.137	0.209	0.	0.	58.263	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	132	122	596	0	0	328	0
normalized size	1	1.23	1.14	5.57	0.	0.	3.07	0.
time (sec)	N/A	0.183	0.109	0.148	0.	0.	49.505	0.

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	75	349	154	251	425	165
normalized size	1	1.	1.21	5.63	2.48	4.05	6.85	2.66
time (sec)	N/A	0.05	0.115	0.11	1.113	1.066	23.424	1.262

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	53	235	134	238	559	162
normalized size	1	1.	0.7	3.09	1.76	3.13	7.36	2.13
time (sec)	N/A	0.034	0.054	0.101	1.086	1.067	5.937	1.265

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	156	141	703	0	0	335	0
normalized size	1	1.16	1.05	5.25	0.	0.	2.5	0.
time (sec)	N/A	0.25	0.12	0.156	0.	0.	70.218	0.

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	171	193	173	894	0	0	425	0
normalized size	1	1.13	1.01	5.23	0.	0.	2.49	0.
time (sec)	N/A	0.248	0.17	0.168	0.	0.	97.387	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	239	227	1119	0	0	0	0
normalized size	1	1.1	1.05	5.16	0.	0.	0.	0.
time (sec)	N/A	0.274	0.369	0.174	0.	0.	0.	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	229	260	249	1153	0	0	598	0
normalized size	1	1.14	1.09	5.03	0.	0.	2.61	0.
time (sec)	N/A	0.32	0.297	0.204	0.	0.	127.016	0.

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	211	207	969	0	0	544	0
normalized size	1	1.15	1.13	5.3	0.	0.	2.97	0.
time (sec)	N/A	0.281	0.245	0.198	0.	0.	73.04	0.

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	141	178	179	801	0	0	500	0
normalized size	1	1.26	1.27	5.68	0.	0.	3.55	0.
time (sec)	N/A	0.254	0.219	0.158	0.	0.	66.242	0.

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	79	172	553	242	392	646	261
normalized size	1	1.	2.18	7.	3.06	4.96	8.18	3.3
time (sec)	N/A	0.071	0.116	0.131	1.131	1.079	12.317	1.323

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	117	117	135	403	203	346	799	238
normalized size	1	1.	1.15	3.44	1.74	2.96	6.83	2.03
time (sec)	N/A	0.087	0.09	0.115	1.154	1.071	11.687	1.279

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	66	284	194	356	881	242
normalized size	1	1.	0.69	2.99	2.04	3.75	9.27	2.55
time (sec)	N/A	0.041	0.074	0.101	1.171	1.085	13.041	1.301

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	196	222	884	0	0	493	0
normalized size	1	1.13	1.28	5.08	0.	0.	2.83	0.
time (sec)	N/A	0.357	0.171	0.164	0.	0.	130.542	0.

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	231	231	1083	0	0	595	0
normalized size	1	1.09	1.09	5.13	0.	0.	2.82	0.
time (sec)	N/A	0.3	0.274	0.174	0.	0.	140.599	0.

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	285	276	1324	0	0	0	0
normalized size	1	1.08	1.05	5.03	0.	0.	0.	0.
time (sec)	N/A	0.346	0.339	0.177	0.	0.	0.	0.

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	329	394	403	1768	0	0	0	0
normalized size	1	1.2	1.22	5.37	0.	0.	0.	0.
time (sec)	N/A	0.639	0.481	0.24	0.	0.	0.	0.

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	285	351	356	1584	0	0	0	0
normalized size	1	1.23	1.25	5.56	0.	0.	0.	0.
time (sec)	N/A	0.571	0.566	0.23	0.	0.	0.	0.

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	243	316	333	1416	0	0	0	0
normalized size	1	1.3	1.37	5.83	0.	0.	0.	0.
time (sec)	N/A	0.538	0.448	0.174	0.	0.	0.	0.

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	335	1165	509	809	2018	524
normalized size	1	1.	2.46	8.57	3.74	5.95	14.84	3.85
time (sec)	N/A	0.11	0.285	0.173	1.248	1.114	125.053	1.384

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	316	1022	483	790	2179	516
normalized size	1	1.	1.94	6.27	2.96	4.85	13.37	3.17
time (sec)	N/A	0.129	0.26	0.158	1.195	1.147	118.247	1.243

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	226	226	281	867	456	748	2280	502
normalized size	1	1.	1.24	3.84	2.02	3.31	10.09	2.22
time (sec)	N/A	0.204	0.223	0.151	1.233	1.556	103.044	1.227

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	199	199	192	712	427	729	2380	489
normalized size	1	1.	0.96	3.58	2.15	3.66	11.96	2.46
time (sec)	N/A	0.165	0.193	0.133	1.243	1.452	141.94	1.242

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	174	174	160	557	397	722	2480	475
normalized size	1	1.	0.92	3.2	2.28	4.15	14.25	2.73
time (sec)	N/A	0.118	0.148	0.128	1.201	1.496	135.978	1.265

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	99	431	373	703	2519	464
normalized size	1	1.	0.65	2.84	2.45	4.62	16.57	3.05
time (sec)	N/A	0.065	0.13	0.109	1.234	1.452	154.069	1.218

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	294	316	349	1427	0	0	0	0
normalized size	1	1.07	1.19	4.85	0.	0.	0.	0.
time (sec)	N/A	0.726	0.353	0.181	0.	0.	0.	0.

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	339	361	401	1650	0	0	0	0
normalized size	1	1.06	1.18	4.87	0.	0.	0.	0.
time (sec)	N/A	0.581	0.624	0.194	0.	0.	0.	0.

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	401	423	486	1939	0	0	0	0
normalized size	1	1.05	1.21	4.84	0.	0.	0.	0.
time (sec)	N/A	0.637	0.543	0.199	0.	0.	0.	0.

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	12	12	12	9	65	26	0	0
normalized size	1	1.	1.	0.75	5.42	2.17	0.	0.
time (sec)	N/A	0.011	0.002	0.038	1.21	0.977	0.	0.

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	10	10	11	7	61	23	0	0
normalized size	1	1.	1.1	0.7	6.1	2.3	0.	0.
time (sec)	N/A	0.011	0.002	0.039	1.108	0.934	0.	0.

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1622	204	514	309	339
normalized size	1	1.	0.75	14.88	1.87	4.72	2.83	3.11
time (sec)	N/A	0.143	0.057	0.268	1.126	1.022	3.833	1.349

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1621	203	506	304	335
normalized size	1	1.	0.75	14.87	1.86	4.64	2.79	3.07
time (sec)	N/A	0.112	0.052	0.264	1.126	1.011	2.494	1.286

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	101	101	77	1548	184	459	270	304
normalized size	1	1.	0.76	15.33	1.82	4.54	2.67	3.01
time (sec)	N/A	0.072	0.048	0.268	1.013	1.022	1.942	1.483

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	70	70	59	1555	136	347	204	228
normalized size	1	1.	0.84	22.21	1.94	4.96	2.91	3.26
time (sec)	N/A	0.083	0.021	0.338	1.14	1.035	1.744	1.216

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	63	1544	154	360	182	232
normalized size	1	1.	0.88	21.44	2.14	5.	2.53	3.22
time (sec)	N/A	0.117	0.035	0.258	1.125	1.04	8.284	1.206

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	90	1483	203	420	272	277
normalized size	1	1.	0.87	14.4	1.97	4.08	2.64	2.69
time (sec)	N/A	0.134	0.048	0.198	1.062	0.992	1.399	1.342

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1486	204	454	306	278
normalized size	1	1.	0.75	13.63	1.87	4.17	2.81	2.55
time (sec)	N/A	0.133	0.057	0.208	1.106	1.039	2.288	1.254

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	109	109	82	1486	204	467	311	278
normalized size	1	1.	0.75	13.63	1.87	4.28	2.85	2.55
time (sec)	N/A	0.135	0.053	0.204	1.156	1.021	4.397	1.387

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	149	2597	338	830	517	551
normalized size	1	1.	0.84	14.59	1.9	4.66	2.9	3.1
time (sec)	N/A	0.218	0.086	0.306	1.232	1.057	7.052	1.295

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	134	2597	338	803	510	551
normalized size	1	1.	0.75	14.59	1.9	4.51	2.87	3.1
time (sec)	N/A	0.181	0.09	0.3	1.068	1.03	5.716	1.275

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	173	141	135	2565	317	757	478	520
normalized size	1	0.82	0.78	14.83	1.83	4.38	2.76	3.01
time (sec)	N/A	0.127	0.069	0.35	1.163	1.011	2.524	1.28

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	114	2543	267	660	398	433
normalized size	1	1.	0.83	18.56	1.95	4.82	2.91	3.16
time (sec)	N/A	0.231	0.038	0.369	1.203	1.071	2.833	1.302

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	133	107	2521	270	620	384	444
normalized size	1	1.	0.8	18.95	2.03	4.66	2.89	3.34
time (sec)	N/A	0.172	0.039	0.418	1.187	1.019	3.104	1.274

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	137	137	117	2520	284	652	357	439
normalized size	1	1.	0.85	18.39	2.07	4.76	2.61	3.2
time (sec)	N/A	0.192	0.082	0.331	1.199	1.019	14.059	1.369

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	168	168	131	2473	338	724	479	494
normalized size	1	1.	0.78	14.72	2.01	4.31	2.85	2.94
time (sec)	N/A	0.208	0.091	0.251	1.225	1.044	3.906	1.363

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	178	178	134	2475	339	756	512	494
normalized size	1	1.	0.75	13.9	1.9	4.25	2.88	2.78
time (sec)	N/A	0.205	0.092	0.254	1.133	1.041	5.572	1.309

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	271	271	211	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.276	0.162	0.749	0.	0.	0.	0.

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	200	200	158	0	0	0	0	0
normalized size	1	1.	0.79	0.	0.	0.	0.	0.
time (sec)	N/A	0.217	0.098	0.704	0.	0.	0.	0.

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	130	130	103	0	0	0	0	0
normalized size	1	1.	0.79	0.	0.	0.	0.	0.
time (sec)	N/A	0.155	0.065	0.718	0.	0.	0.	0.

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	72	72	68	1412	0	0	0	0
normalized size	1	1.	0.94	19.61	0.	0.	0.	0.
time (sec)	N/A	0.061	0.025	0.295	0.	0.	0.	0.

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	79	98	94	2315	0	0	0	0
normalized size	1	1.24	1.19	29.3	0.	0.	0.	0.
time (sec)	N/A	0.157	0.053	0.421	0.	0.	0.	0.

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	155	130	0	0	0	0	0
normalized size	1	1.15	0.96	0.	0.	0.	0.	0.
time (sec)	N/A	0.242	0.1	0.683	0.	0.	0.	0.

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	204	226	185	0	0	0	0	0
normalized size	1	1.11	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	0.292	0.13	0.738	0.	0.	0.	0.

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	273	295	237	0	0	0	0	0
normalized size	1	1.08	0.87	0.	0.	0.	0.	0.
time (sec)	N/A	0.357	0.129	0.79	0.	0.	0.	0.

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	281	281	240	0	0	0	0	0
normalized size	1	1.	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.31	0.203	0.688	0.	0.	0.	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	203	186	0	0	0	0	0
normalized size	1	1.	0.92	0.	0.	0.	0.	0.
time (sec)	N/A	0.261	0.158	0.726	0.	0.	0.	0.

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	143	143	142	0	0	0	0	0
normalized size	1	1.	0.99	0.	0.	0.	0.	0.
time (sec)	N/A	0.202	0.124	0.7	0.	0.	0.	0.

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	77	77	81	755	0	0	0	0
normalized size	1	1.	1.05	9.81	0.	0.	0.	0.
time (sec)	N/A	0.058	0.047	0.245	0.	0.	0.	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	151	170	166	0	0	0	0	0
normalized size	1	1.13	1.1	0.	0.	0.	0.	0.
time (sec)	N/A	0.308	0.164	0.771	0.	0.	0.	0.

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	231	223	0	0	0	0	0
normalized size	1	1.09	1.06	0.	0.	0.	0.	0.
time (sec)	N/A	0.315	0.307	0.717	0.	0.	0.	0.

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	285	304	268	0	0	0	0	0
normalized size	1	1.07	0.94	0.	0.	0.	0.	0.
time (sec)	N/A	0.377	0.181	0.875	0.	0.	0.	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	296	296	258	0	0	0	0	0
normalized size	1	1.	0.87	0.	0.	0.	0.	0.
time (sec)	N/A	0.49	0.257	0.896	0.	0.	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	232	232	212	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	0.446	0.228	0.727	0.	0.	0.	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	176	155	1199	0	0	0	0
normalized size	1	1.57	1.38	10.71	0.	0.	0.	0.
time (sec)	N/A	0.357	0.22	0.275	0.	0.	0.	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	145	146	990	0	0	0	0
normalized size	1	1.15	1.16	7.86	0.	0.	0.	0.
time (sec)	N/A	0.201	0.101	0.256	0.	0.	0.	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	257	257	232	0	0	0	0	0
normalized size	1	1.	0.9	0.	0.	0.	0.	0.
time (sec)	N/A	0.594	0.252	0.718	0.	0.	0.	0.

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	322	322	290	0	0	0	0	0
normalized size	1	1.	0.9	0.	0.	0.	0.	0.
time (sec)	N/A	0.538	0.413	0.768	0.	0.	0.	0.

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	398	398	344	0	0	0	0	0
normalized size	1	1.	0.86	0.	0.	0.	0.	0.
time (sec)	N/A	0.826	0.64	0.868	0.	0.	0.	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	333	333	298	0	0	0	0	0
normalized size	1	1.	0.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.786	0.434	0.845	0.	0.	0.	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	161	274	371	1658	0	0	0	0
normalized size	1	1.7	2.3	10.3	0.	0.	0.	0.
time (sec)	N/A	0.716	0.462	0.301	0.	0.	0.	0.

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	229	281	1400	0	0	0	0
normalized size	1	1.09	1.34	6.67	0.	0.	0.	0.
time (sec)	N/A	0.62	0.235	0.276	0.	0.	0.	0.

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	203	221	211	1227	0	0	0	0
normalized size	1	1.09	1.04	6.04	0.	0.	0.	0.
time (sec)	N/A	0.312	0.156	0.277	0.	0.	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	351	351	318	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	1.012	0.414	0.852	0.	0.	0.	0.

Problem 119	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	420	420	378	0	0	0	0	0
normalized size	1	1.	0.9	0.	0.	0.	0.	0.
time (sec)	N/A	0.893	0.658	0.846	0.	0.	0.	0.

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	157	96	0	178	0	357	0
normalized size	1	1.47	0.9	0.	1.66	0.	3.34	0.
time (sec)	N/A	0.407	0.127	0.345	1.188	0.	34.425	0.

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	130	243	9909	0	0	0	0
normalized size	1	1.15	2.15	87.69	0.	0.	0.	0.
time (sec)	N/A	0.208	0.176	0.718	0.	0.	0.	0.

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	234	432	0	0	0	0	0
normalized size	1	1.08	1.99	0.	0.	0.	0.	0.
time (sec)	N/A	0.396	0.472	0.924	0.	0.	0.	0.

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	361	361	706	0	0	0	0	0
normalized size	1	1.	1.96	0.	0.	0.	0.	0.
time (sec)	N/A	0.852	0.894	1.187	0.	0.	0.	0.

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	189	189	169	0	0	0	0	0
normalized size	1	1.	0.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.266	0.274	0.283	0.	0.	0.	0.

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	298	298	287	0	0	0	0	0
normalized size	1	1.	0.96	0.	0.	0.	0.	0.
time (sec)	N/A	0.467	0.336	0.392	0.	0.	0.	0.

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	402	402	366	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	0.615	0.49	0.389	0.	0.	0.	0.

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.048	6.104	0.499	0.	0.	0.	0.

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	60	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.101	6.422	0.5	0.	0.	0.	0.

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	F(-2)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	65	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.198	12.571	0.494	0.	0.	0.	0.

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	242	242	183	0	0	1220	518	0
normalized size	1	1.	0.76	0.	0.	5.04	2.14	0.
time (sec)	N/A	0.22	0.406	0.606	0.	1.483	26.501	0.

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	192	192	151	0	0	990	364	0
normalized size	1	1.	0.79	0.	0.	5.16	1.9	0.
time (sec)	N/A	0.176	0.196	0.593	0.	1.479	12.976	0.

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	116	0	0	722	224	0
normalized size	1	1.	0.82	0.	0.	5.08	1.58	0.
time (sec)	N/A	0.101	0.118	0.616	0.	1.428	7.373	0.

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	77	0	0	475	102	0
normalized size	1	1.	0.82	0.	0.	5.05	1.09	0.
time (sec)	N/A	0.042	0.068	0.588	0.	1.425	3.886	0.

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	331	0	0	0	0	0
normalized size	1	1.	1.57	0.	0.	0.	0.	0.
time (sec)	N/A	0.331	0.206	0.53	0.	0.	0.	0.

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	221	221	392	0	0	0	0	0
normalized size	1	1.	1.77	0.	0.	0.	0.	0.
time (sec)	N/A	0.278	0.327	0.515	0.	0.	0.	0.

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	298	298	500	0	0	0	0	0
normalized size	1	1.	1.68	0.	0.	0.	0.	0.
time (sec)	N/A	0.339	0.538	0.52	0.	0.	0.	0.

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	263	263	187	0	0	1503	0	0
normalized size	1	1.	0.71	0.	0.	5.71	0.	0.
time (sec)	N/A	0.24	0.328	0.572	0.	1.507	0.	0.

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	213	213	153	0	0	1223	0	0
normalized size	1	1.	0.72	0.	0.	5.74	0.	0.
time (sec)	N/A	0.197	0.229	0.561	0.	1.47	0.	0.

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	163	163	120	0	0	960	583	0
normalized size	1	1.	0.74	0.	0.	5.89	3.58	0.
time (sec)	N/A	0.117	0.168	0.557	0.	1.521	121.169	0.

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	87	0	0	710	333	0
normalized size	1	1.	0.76	0.	0.	6.17	2.9	0.
time (sec)	N/A	0.051	0.083	0.563	0.	1.413	51.687	0.

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	255	255	375	0	0	0	0	0
normalized size	1	1.	1.47	0.	0.	0.	0.	0.
time (sec)	N/A	0.456	0.253	0.485	0.	0.	0.	0.

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	259	259	480	0	0	0	0	0
normalized size	1	1.	1.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.324	0.333	0.504	0.	0.	0.	0.

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	293	293	501	0	0	0	0	0
normalized size	1	1.	1.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.384	0.584	0.479	0.	0.	0.	0.

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	217	217	150	0	0	990	0	0
normalized size	1	1.	0.69	0.	0.	4.56	0.	0.
time (sec)	N/A	0.204	0.219	0.605	0.	1.471	0.	0.

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	169	169	118	0	0	748	0	0
normalized size	1	1.	0.7	0.	0.	4.43	0.	0.
time (sec)	N/A	0.169	0.176	0.598	0.	1.455	0.	0.

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	119	119	80	0	0	494	473	0
normalized size	1	1.	0.67	0.	0.	4.15	3.97	0.
time (sec)	N/A	0.091	0.1	0.551	0.	1.342	123.661	0.

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	55	70	0	308	252	105
normalized size	1	1.	0.8	1.01	0.	4.46	3.65	1.52
time (sec)	N/A	0.034	0.047	0.049	0.	1.412	17.791	1.252

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	249	0	0	0	0	0
normalized size	1	1.	1.64	0.	0.	0.	0.	0.
time (sec)	N/A	0.199	0.093	0.532	0.	0.	0.	0.

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	226	226	392	0	0	0	0	0
normalized size	1	1.	1.73	0.	0.	0.	0.	0.
time (sec)	N/A	0.27	0.246	0.535	0.	0.	0.	0.

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	304	304	501	0	0	0	0	0
normalized size	1	1.	1.65	0.	0.	0.	0.	0.
time (sec)	N/A	0.336	0.342	0.513	0.	0.	0.	0.

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	194	194	159	0	0	1031	386	0
normalized size	1	1.	0.82	0.	0.	5.31	1.99	0.
time (sec)	N/A	0.195	0.118	0.502	0.	1.597	66.955	0.

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	146	146	124	0	0	784	262	0
normalized size	1	1.	0.85	0.	0.	5.37	1.79	0.
time (sec)	N/A	0.162	0.09	0.557	0.	1.457	60.854	0.

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	94	94	83	0	0	537	155	0
normalized size	1	1.	0.88	0.	0.	5.71	1.65	0.
time (sec)	N/A	0.087	0.069	0.525	0.	1.39	62.771	0.

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	53	0	0	382	66	77
normalized size	1	1.	1.	0.	0.	7.21	1.25	1.45
time (sec)	N/A	0.032	0.042	0.522	0.	1.437	13.715	1.304

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	201	201	295	0	0	0	0	0
normalized size	1	1.	1.47	0.	0.	0.	0.	0.
time (sec)	N/A	0.32	0.267	0.525	0.	0.	0.	0.

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	253	255	506	0	0	0	0	0
normalized size	1	1.01	2.	0.	0.	0.	0.	0.
time (sec)	N/A	0.517	0.478	0.573	0.	0.	0.	0.

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.086	1.229	0.513	0.	0.	0.	0.

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.061	0.709	0.51	0.	0.	0.	0.

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.03	0.023	0.484	0.	0.	0.	0.

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.082	0.26	0.505	0.	0.	0.	0.

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.089	0.614	0.516	0.	0.	0.	0.

Problem 162	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	211	211	152	5021	0	2942	0	717
normalized size	1	1.	0.72	23.8	0.	13.94	0.	3.4
time (sec)	N/A	0.228	0.225	0.482	0.	1.434	0.	1.401

Problem 163	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	153	153	108	2702	0	1474	0	505
normalized size	1	1.	0.71	17.66	0.	9.63	0.	3.3
time (sec)	N/A	0.173	0.129	0.276	0.	1.335	0.	1.344

Problem 164	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	95	95	64	1122	0	558	0	293
normalized size	1	1.	0.67	11.81	0.	5.87	0.	3.08
time (sec)	N/A	0.081	0.068	0.187	0.	1.433	0.	1.299

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	46	46	32	371	0	142	0	128
normalized size	1	1.	0.7	8.07	0.	3.09	0.	2.78
time (sec)	N/A	0.017	0.013	0.109	0.	1.29	0.	1.327

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	72	0	0	0	0	0
normalized size	1	0.	2.88	0.	0.	0.	0.	0.
time (sec)	N/A	0.055	0.102	0.869	0.	0.	0.	0.

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	72	0	0	0	0	0
normalized size	1	0.	2.88	0.	0.	0.	0.	0.
time (sec)	N/A	0.053	0.103	0.671	0.	0.	0.	0.

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	A	A
verified	N/A	N/A	Yes	TBD	TBD	TBD	TBD	TBD
size	17	0	173	0	0	0	0	0
normalized size	1	0.	10.18	0.	0.	0.	0.	0.
time (sec)	N/A	0.019	0.24	0.618	0.	0.	0.	0.

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	61	0	0	0	233	0
normalized size	1	1.	0.9	0.	0.	0.	3.43	0.
time (sec)	N/A	0.028	0.019	0.535	0.	0.	36.734	0.

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	19	0	89	0	0	0	0	0
normalized size	1	0.	4.68	0.	0.	0.	0.	0.
time (sec)	N/A	0.029	0.054	0.555	0.	0.	0.	0.

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	77	181	87	99
normalized size	1	1.	1.44	5.54	1.6	3.77	1.81	2.06
time (sec)	N/A	0.043	0.003	0.203	1.166	1.3	13.618	1.329

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	77	181	87	99
normalized size	1	1.	1.44	5.54	1.6	3.77	1.81	2.06
time (sec)	N/A	0.042	0.002	0.317	1.137	1.291	5.294	1.241

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	47	47	69	265	77	171	87	99
normalized size	1	1.	1.47	5.64	1.64	3.64	1.85	2.11
time (sec)	N/A	0.037	0.002	0.202	1.044	1.257	1.853	1.273

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	52	52	57	257	66	155	71	81
normalized size	1	1.	1.1	4.94	1.27	2.98	1.37	1.56
time (sec)	N/A	0.064	0.002	0.23	1.092	1.339	1.184	1.202

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	52	47	57	266	66	153	63	85
normalized size	1	0.9	1.1	5.12	1.27	2.94	1.21	1.63
time (sec)	N/A	0.049	0.002	0.123	1.172	1.332	5.249	1.326

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	47	69	248	77	153	88	88
normalized size	1	0.82	1.21	4.35	1.35	2.68	1.54	1.54
time (sec)	N/A	0.047	0.002	0.098	1.122	1.219	3.378	1.274

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	77	181	87	99
normalized size	1	1.	1.44	5.54	1.6	3.77	1.81	2.06
time (sec)	N/A	0.043	0.002	0.187	1.088	1.223	9.312	1.284

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	48	69	266	77	180	87	99
normalized size	1	1.	1.44	5.54	1.6	3.75	1.81	2.06
time (sec)	N/A	0.042	0.002	0.187	1.061	1.233	3.424	1.244

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	48	41	55	247	66	154	73	84
normalized size	1	0.85	1.15	5.15	1.38	3.21	1.52	1.75
time (sec)	N/A	0.018	0.001	0.187	1.046	1.232	1.145	1.344

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	37	49	249	66	124	60	84
normalized size	1	0.84	1.11	5.66	1.5	2.82	1.36	1.91
time (sec)	N/A	0.039	0.002	0.214	1.184	1.261	1.227	1.315

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	45	63	249	77	149	75	88
normalized size	1	0.85	1.19	4.7	1.45	2.81	1.42	1.66
time (sec)	N/A	0.047	0.002	0.103	1.129	1.313	2.007	1.287

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	48	69	251	77	167	88	89
normalized size	1	0.84	1.21	4.4	1.35	2.93	1.54	1.56
time (sec)	N/A	0.046	0.002	0.112	1.035	1.265	5.519	1.308

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	84	434	135	297	151	166
normalized size	1	1.	1.14	5.86	1.82	4.01	2.04	2.24
time (sec)	N/A	0.087	0.04	0.195	1.054	1.33	34.115	1.304

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	87	434	135	285	151	166
normalized size	1	1.	1.18	5.86	1.82	3.85	2.04	2.24
time (sec)	N/A	0.088	0.037	0.198	1.124	1.34	13.834	1.378

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	76	76	85	433	135	274	151	166
normalized size	1	1.	1.12	5.7	1.78	3.61	1.99	2.18
time (sec)	N/A	0.068	0.035	0.204	1.16	1.284	5.683	1.86

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	73	82	423	119	259	129	142
normalized size	1	0.82	0.92	4.75	1.34	2.91	1.45	1.6
time (sec)	N/A	0.082	0.05	0.215	1.207	1.33	3.573	1.361

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	71	83	433	123	244	136	151
normalized size	1	0.78	0.91	4.76	1.35	2.68	1.49	1.66
time (sec)	N/A	0.099	0.058	0.237	1.08	1.234	3.547	1.297

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	73	82	434	122	254	105	153
normalized size	1	0.81	0.91	4.82	1.36	2.82	1.17	1.7
time (sec)	N/A	0.089	0.054	0.134	1.093	1.334	6.643	1.316

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	95	434	135	296	158	166
normalized size	1	1.	1.28	5.86	1.82	4.	2.14	2.24
time (sec)	N/A	0.072	0.035	0.195	1.11	1.35	25.87	1.291

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	74	74	95	434	135	294	158	166
normalized size	1	1.	1.28	5.86	1.82	3.97	2.14	2.24
time (sec)	N/A	0.071	0.034	0.201	1.223	1.287	8.614	1.3

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	86	68	89	416	124	271	144	151
normalized size	1	0.79	1.03	4.84	1.44	3.15	1.67	1.76
time (sec)	N/A	0.035	0.034	0.192	1.059	1.277	3.301	1.314

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	66	86	419	127	247	131	157
normalized size	1	0.8	1.04	5.05	1.53	2.98	1.58	1.89
time (sec)	N/A	0.071	0.035	0.207	1.138	1.316	4.806	1.281

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	65	80	417	124	247	131	157
normalized size	1	0.79	0.98	5.09	1.51	3.01	1.6	1.91
time (sec)	N/A	0.073	0.04	0.213	1.075	1.32	4.259	1.512

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	72	86	419	135	273	146	157
normalized size	1	0.79	0.95	4.6	1.48	3.	1.6	1.73
time (sec)	N/A	0.083	0.039	0.109	1.122	1.177	5.875	1.287

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	74	95	419	135	292	160	157
normalized size	1	0.78	1.	4.41	1.42	3.07	1.68	1.65
time (sec)	N/A	0.083	0.045	0.109	1.153	1.328	13.308	1.35

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	120	602	193	416	230	234
normalized size	1	1.	1.2	6.02	1.93	4.16	2.3	2.34
time (sec)	N/A	0.106	0.053	0.209	1.121	1.294	65.003	1.292

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	130	130	120	602	193	404	223	234
normalized size	1	1.	0.92	4.63	1.48	3.11	1.72	1.8
time (sec)	N/A	0.152	0.052	0.208	1.131	1.355	31.257	1.325

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	91	91	118	601	193	379	223	234
normalized size	1	1.	1.3	6.6	2.12	4.16	2.45	2.57
time (sec)	N/A	0.075	0.051	0.209	1.202	1.408	13.611	1.328

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	130	100	116	595	180	378	212	213
normalized size	1	0.77	0.89	4.58	1.38	2.91	1.63	1.64
time (sec)	N/A	0.104	0.063	0.222	1.163	1.504	8.985	1.303

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	100	115	604	180	356	209	216
normalized size	1	0.76	0.88	4.61	1.37	2.72	1.6	1.65
time (sec)	N/A	0.125	0.082	0.242	1.056	1.557	9.22	1.289

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	131	99	115	602	180	356	209	219
normalized size	1	0.76	0.88	4.6	1.37	2.72	1.6	1.67
time (sec)	N/A	0.123	0.079	0.256	1.171	1.537	9.154	1.329

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	133	602	193	423	223	234
normalized size	1	1.	1.33	6.02	1.93	4.23	2.23	2.34
time (sec)	N/A	0.088	0.047	0.207	1.15	1.472	42.59	1.289

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	B	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	133	602	193	409	230	234
normalized size	1	1.	1.33	6.02	1.93	4.09	2.3	2.34
time (sec)	N/A	0.087	0.047	0.213	1.031	1.349	20.549	1.316

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	94	124	582	180	378	204	215
normalized size	1	0.78	1.02	4.81	1.49	3.12	1.69	1.78
time (sec)	N/A	0.048	0.045	0.201	1.025	1.32	8.741	1.311

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	92	123	587	182	362	190	224
normalized size	1	0.78	1.04	4.97	1.54	3.07	1.61	1.9
time (sec)	N/A	0.082	0.056	0.238	1.008	1.288	9.054	1.312

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	91	112	585	185	340	202	224
normalized size	1	0.75	0.93	4.83	1.53	2.81	1.67	1.85
time (sec)	N/A	0.091	0.054	0.23	1.026	1.312	9.097	1.273

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	118	91	115	585	182	362	190	224
normalized size	1	0.77	0.97	4.96	1.54	3.07	1.61	1.9
time (sec)	N/A	0.086	0.054	0.242	1.035	1.342	9.13	1.295

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	98	127	587	193	389	206	224
normalized size	1	0.77	1.	4.62	1.52	3.06	1.62	1.76
time (sec)	N/A	0.101	0.057	0.132	1.013	1.32	13.488	1.278

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	133	100	133	587	193	413	231	224
normalized size	1	0.75	1.	4.41	1.45	3.11	1.74	1.68
time (sec)	N/A	0.098	0.06	0.127	1.01	1.321	31.76	1.419

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	174	641	0	0	235	0
normalized size	1	1.	1.44	5.3	0.	0.	1.94	0.
time (sec)	N/A	0.173	0.11	0.188	0.	0.	114.791	0.

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	83	135	460	0	0	180	0
normalized size	1	1.	1.63	5.54	0.	0.	2.17	0.
time (sec)	N/A	0.143	0.071	0.174	0.	0.	36.34	0.

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	94	299	0	0	119	0
normalized size	1	1.	1.92	6.1	0.	0.	2.43	0.
time (sec)	N/A	0.048	0.032	0.133	0.	0.	10.192	0.

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	49	49	126	439	0	0	124	0
normalized size	1	1.	2.57	8.96	0.	0.	2.53	0.
time (sec)	N/A	0.065	0.082	0.212	0.	0.	19.832	0.

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	83	109	157	611	0	0	0	0
normalized size	1	1.31	1.89	7.36	0.	0.	0.	0.
time (sec)	N/A	0.176	0.109	0.146	0.	0.	0.	0.

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	149	196	805	0	0	0	0
normalized size	1	1.23	1.62	6.65	0.	0.	0.	0.
time (sec)	N/A	0.214	0.185	0.168	0.	0.	0.	0.

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	167	167	208	693	0	0	0	0
normalized size	1	1.	1.25	4.15	0.	0.	0.	0.
time (sec)	N/A	0.207	0.149	0.184	0.	0.	0.	0.

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	132	132	170	512	0	0	0	0
normalized size	1	1.	1.29	3.88	0.	0.	0.	0.
time (sec)	N/A	0.165	0.11	0.174	0.	0.	0.	0.

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	105	105	107	332	0	0	0	0
normalized size	1	1.	1.02	3.16	0.	0.	0.	0.
time (sec)	N/A	0.066	0.047	0.22	0.	0.	0.	0.

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	134	134	173	531	0	0	0	0
normalized size	1	1.	1.29	3.96	0.	0.	0.	0.
time (sec)	N/A	0.175	0.14	0.268	0.	0.	0.	0.

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	165	165	211	706	0	0	0	0
normalized size	1	1.	1.28	4.28	0.	0.	0.	0.
time (sec)	N/A	0.197	0.183	0.208	0.	0.	0.	0.

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	287	687	0	0	0	0
normalized size	1	1.	2.22	5.33	0.	0.	0.	0.
time (sec)	N/A	0.22	0.467	0.19	0.	0.	0.	0.

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	321	511	0	0	0	0
normalized size	1	1.	3.38	5.38	0.	0.	0.	0.
time (sec)	N/A	0.188	0.233	0.174	0.	0.	0.	0.

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	50	50	74	179	96	143	366	95
normalized size	1	1.	1.48	3.58	1.92	2.86	7.32	1.9
time (sec)	N/A	0.042	0.065	0.096	1.199	1.349	78.715	1.339

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	279	644	0	0	0	0
normalized size	1	1.	3.4	7.85	0.	0.	0.	0.
time (sec)	N/A	0.14	0.368	0.157	0.	0.	0.	0.

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	126	159	334	817	0	0	0	0
normalized size	1	1.26	2.65	6.48	0.	0.	0.	0.
time (sec)	N/A	0.289	0.502	0.161	0.	0.	0.	0.

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	191	296	913	0	0	0	0
normalized size	1	1.	1.55	4.78	0.	0.	0.	0.
time (sec)	N/A	0.297	0.59	0.273	0.	0.	0.	0.

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	258	752	0	0	0	0
normalized size	1	1.	1.57	4.59	0.	0.	0.	0.
time (sec)	N/A	0.269	0.527	0.327	0.	0.	0.	0.

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	164	164	289	685	0	0	0	0
normalized size	1	1.	1.76	4.18	0.	0.	0.	0.
time (sec)	N/A	0.099	0.537	0.301	0.	0.	0.	0.

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	183	328	933	0	0	0	0
normalized size	1	1.	1.79	5.1	0.	0.	0.	0.
time (sec)	N/A	0.284	0.783	0.35	0.	0.	0.	0.

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	224	224	361	1133	0	0	0	0
normalized size	1	1.	1.61	5.06	0.	0.	0.	0.
time (sec)	N/A	0.309	0.744	0.296	0.	0.	0.	0.

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	152	498	727	0	0	0	0
normalized size	1	1.	3.28	4.78	0.	0.	0.	0.
time (sec)	N/A	0.287	0.527	0.159	0.	0.	0.	0.

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	68	68	129	369	173	273	0	189
normalized size	1	1.	1.9	5.43	2.54	4.01	0.	2.78
time (sec)	N/A	0.08	0.144	0.117	1.193	1.34	0.	1.332

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	82	82	111	243	147	259	0	184
normalized size	1	1.	1.35	2.96	1.79	3.16	0.	2.24
time (sec)	N/A	0.066	0.069	0.102	1.187	1.398	0.	1.276

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	115	396	841	0	0	0	0
normalized size	1	1.	3.44	7.31	0.	0.	0.	0.
time (sec)	N/A	0.218	0.917	0.166	0.	0.	0.	0.

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	C	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	162	195	507	1030	0	0	0	0
normalized size	1	1.2	3.13	6.36	0.	0.	0.	0.
time (sec)	N/A	0.39	1.105	0.181	0.	0.	0.	0.

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	211	211	495	1311	0	0	0	0
normalized size	1	1.	2.35	6.21	0.	0.	0.	0.
time (sec)	N/A	0.458	1.3	0.336	0.	0.	0.	0.

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	187	187	497	1247	0	0	0	0
normalized size	1	1.	2.66	6.67	0.	0.	0.	0.
time (sec)	N/A	0.369	1.043	0.326	0.	0.	0.	0.

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	210	210	544	1047	0	0	0	0
normalized size	1	1.	2.59	4.99	0.	0.	0.	0.
time (sec)	N/A	0.146	0.99	0.306	0.	0.	0.	0.

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	219	219	552	1518	0	0	0	0
normalized size	1	1.	2.52	6.93	0.	0.	0.	0.
time (sec)	N/A	0.366	1.746	0.258	0.	0.	0.	0.

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	260	260	584	1729	0	0	0	0
normalized size	1	1.	2.25	6.65	0.	0.	0.	0.
time (sec)	N/A	0.421	1.842	0.316	0.	0.	0.	0.

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	17	12	103	34	78	0
normalized size	1	1.	1.	0.71	6.06	2.	4.59	0.
time (sec)	N/A	0.043	0.004	0.039	1.165	1.254	8.71	0.

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	17	52	78	31	102	0
normalized size	1	1.	1.06	3.25	4.88	1.94	6.38	0.
time (sec)	N/A	0.043	0.004	0.139	1.132	1.299	6.5	0.

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	22	22	31	20	65	0	0	0
normalized size	1	1.	1.41	0.91	2.95	0.	0.	0.
time (sec)	N/A	0.022	0.006	0.041	1.171	0.	0.	0.

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	32	32	65	46	35	0	0	0
normalized size	1	1.	2.03	1.44	1.09	0.	0.	0.
time (sec)	N/A	0.036	0.007	0.064	2.144	0.	0.	0.

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	62	62	68	103	0	0	0	0
normalized size	1	1.	1.1	1.66	0.	0.	0.	0.
time (sec)	N/A	0.039	0.03	0.133	0.	0.	0.	0.

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	66	66	72	200	0	0	0	0
normalized size	1	1.	1.09	3.03	0.	0.	0.	0.
time (sec)	N/A	0.039	0.025	0.145	0.	0.	0.	0.

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	509	509	432	0	0	0	0	0
normalized size	1	1.	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.612	0.776	4.638	0.	0.	0.	0.

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	711	711	1073	0	0	0	0	0
normalized size	1	1.	1.51	0.	0.	0.	0.	0.
time (sec)	N/A	0.846	2.196	7.904	0.	0.	0.	0.

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.033	2.774	0.495	0.	0.	0.	0.

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.032	12.013	2.377	0.	0.	0.	0.

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	208	208	251	0	0	1006	0	400
normalized size	1	1.	1.21	0.	0.	4.84	0.	1.92
time (sec)	N/A	0.25	0.195	0.488	0.	1.756	0.	1.469

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	154	154	204	0	0	745	0	298
normalized size	1	1.	1.32	0.	0.	4.84	0.	1.94
time (sec)	N/A	0.175	0.148	0.464	0.	1.584	0.	1.78

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	102	136	0	0	505	155	196
normalized size	1	1.	1.33	0.	0.	4.95	1.52	1.92
time (sec)	N/A	0.088	0.104	0.468	0.	1.55	20.046	1.402

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	203	0	0	0	0	0
normalized size	1	1.	0.92	0.	0.	0.	0.	0.
time (sec)	N/A	0.334	0.322	0.408	0.	0.	0.	0.

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	252	252	303	0	0	0	0	0
normalized size	1	1.	1.2	0.	0.	0.	0.	0.
time (sec)	N/A	0.376	0.487	0.449	0.	0.	0.	0.

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	469	469	276	0	0	0	0	0
normalized size	1	1.	0.59	0.	0.	0.	0.	0.
time (sec)	N/A	0.598	0.66	0.448	0.	0.	0.	0.

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	409	410	250	0	0	0	0	0
normalized size	1	1.	0.61	0.	0.	0.	0.	0.
time (sec)	N/A	0.413	0.418	0.482	0.	0.	0.	0.

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	330	330	237	0	0	0	0	0
normalized size	1	1.	0.72	0.	0.	0.	0.	0.
time (sec)	N/A	0.201	0.354	0.439	0.	0.	0.	0.

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	345	345	183	0	0	0	0	0
normalized size	1	1.	0.53	0.	0.	0.	0.	0.
time (sec)	N/A	0.394	0.559	0.443	0.	0.	0.	0.

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	112	112	99	0	0	529	0	0
normalized size	1	1.	0.88	0.	0.	4.72	0.	0.
time (sec)	N/A	0.104	0.145	0.475	0.	1.486	0.	0.

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	170	170	145	0	0	772	0	0
normalized size	1	1.	0.85	0.	0.	4.54	0.	0.
time (sec)	N/A	0.152	0.195	0.507	0.	1.626	0.	0.

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	230	230	180	0	0	1044	0	0
normalized size	1	1.	0.78	0.	0.	4.54	0.	0.
time (sec)	N/A	0.199	0.232	0.53	0.	1.838	0.	0.

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	231	231	256	0	0	1246	0	0
normalized size	1	1.	1.11	0.	0.	5.39	0.	0.
time (sec)	N/A	0.277	0.341	0.474	0.	1.961	0.	0.

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	177	177	227	0	0	983	0	0
normalized size	1	1.	1.28	0.	0.	5.55	0.	0.
time (sec)	N/A	0.205	0.193	0.441	0.	1.696	0.	0.

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	125	125	181	0	0	734	0	0
normalized size	1	1.	1.45	0.	0.	5.87	0.	0.
time (sec)	N/A	0.106	0.139	0.459	0.	1.583	0.	0.

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	260	260	301	0	0	0	0	0
normalized size	1	1.	1.16	0.	0.	0.	0.	0.
time (sec)	N/A	0.392	0.768	0.406	0.	0.	0.	0.

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	295	295	349	0	0	0	0	0
normalized size	1	1.	1.18	0.	0.	0.	0.	0.
time (sec)	N/A	0.442	0.97	0.401	0.	0.	0.	0.

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	464	464	331	0	0	0	0	0
normalized size	1	1.	0.71	0.	0.	0.	0.	0.
time (sec)	N/A	0.593	1.042	0.414	0.	0.	0.	0.

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	378	378	314	0	0	0	0	0
normalized size	1	1.	0.83	0.	0.	0.	0.	0.
time (sec)	N/A	0.269	0.899	0.478	0.	0.	0.	0.

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	400	400	329	0	0	0	0	0
normalized size	1	1.	0.82	0.	0.	0.	0.	0.
time (sec)	N/A	0.481	0.991	0.434	0.	0.	0.	0.

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	400	400	269	0	0	0	0	0
normalized size	1	1.	0.67	0.	0.	0.	0.	0.
time (sec)	N/A	0.444	0.757	0.423	0.	0.	0.	0.

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	138	138	114	0	0	761	0	0
normalized size	1	1.	0.83	0.	0.	5.51	0.	0.
time (sec)	N/A	0.122	0.182	0.48	0.	1.569	0.	0.

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	196	196	145	0	0	1013	0	0
normalized size	1	1.	0.74	0.	0.	5.17	0.	0.
time (sec)	N/A	0.172	0.222	0.499	0.	1.842	0.	0.

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	256	256	178	0	0	1287	0	0
normalized size	1	1.	0.7	0.	0.	5.03	0.	0.
time (sec)	N/A	0.221	0.268	0.51	0.	2.185	0.	0.

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	60	60	53	75	53	162	65	73
normalized size	1	1.	0.88	1.25	0.88	2.7	1.08	1.22
time (sec)	N/A	0.045	0.044	0.306	1.73	1.339	24.848	1.295

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	182	182	204	0	0	764	0	0
normalized size	1	1.	1.12	0.	0.	4.2	0.	0.
time (sec)	N/A	0.228	0.191	0.434	0.	1.578	0.	0.

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	129	129	145	0	0	516	0	0
normalized size	1	1.	1.12	0.	0.	4.	0.	0.
time (sec)	N/A	0.164	0.155	0.419	0.	1.529	0.	0.

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	73	73	91	0	0	317	126	0
normalized size	1	1.	1.25	0.	0.	4.34	1.73	0.
time (sec)	N/A	0.078	0.085	0.422	0.	1.333	4.708	0.

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	166	166	162	0	0	0	0	0
normalized size	1	1.	0.98	0.	0.	0.	0.	0.
time (sec)	N/A	0.262	0.198	0.411	0.	0.	0.	0.

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	258	258	229	0	0	0	0	0
normalized size	1	1.	0.89	0.	0.	0.	0.	0.
time (sec)	N/A	0.373	1.065	0.413	0.	0.	0.	0.

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	359	359	205	0	0	0	0	0
normalized size	1	1.	0.57	0.	0.	0.	0.	0.
time (sec)	N/A	0.41	0.784	0.406	0.	0.	0.	0.

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	250	250	186	0	0	0	0	0
normalized size	1	1.	0.74	0.	0.	0.	0.	0.
time (sec)	N/A	0.139	0.543	0.402	0.	0.	0.	0.

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	81	81	77	0	0	331	0	0
normalized size	1	1.	0.95	0.	0.	4.09	0.	0.
time (sec)	N/A	0.091	0.103	0.423	0.	1.441	0.	0.

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	144	144	110	0	0	540	0	0
normalized size	1	1.	0.76	0.	0.	3.75	0.	0.
time (sec)	N/A	0.133	0.142	0.434	0.	1.506	0.	0.

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	204	204	147	0	0	794	0	0
normalized size	1	1.	0.72	0.	0.	3.89	0.	0.
time (sec)	N/A	0.177	0.224	0.444	0.	1.623	0.	0.

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	209	209	195	0	0	1062	0	0
normalized size	1	1.	0.93	0.	0.	5.08	0.	0.
time (sec)	N/A	0.296	0.209	0.424	0.	1.807	0.	0.

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	158	158	160	0	0	818	0	0
normalized size	1	1.	1.01	0.	0.	5.18	0.	0.
time (sec)	N/A	0.218	0.178	0.408	0.	1.608	0.	0.

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	100	100	118	0	0	560	163	0
normalized size	1	1.	1.18	0.	0.	5.6	1.63	0.
time (sec)	N/A	0.16	0.143	0.407	0.	1.444	49.915	0.

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	57	77	0	0	408	80	0
normalized size	1	1.	1.35	0.	0.	7.16	1.4	0.
time (sec)	N/A	0.078	0.139	0.437	0.	1.487	10.96	0.

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	209	209	241	0	0	0	0	0
normalized size	1	1.	1.15	0.	0.	0.	0.	0.
time (sec)	N/A	0.334	0.378	0.404	0.	0.	0.	0.

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	287	286	218	0	0	0	0	0
normalized size	1	1.	0.76	0.	0.	0.	0.	0.
time (sec)	N/A	0.386	0.312	0.412	0.	0.	0.	0.

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	328	328	217	0	0	0	0	0
normalized size	1	1.	0.66	0.	0.	0.	0.	0.
time (sec)	N/A	0.474	0.483	0.405	0.	0.	0.	0.

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	58	58	70	0	0	421	0	0
normalized size	1	1.	1.21	0.	0.	7.26	0.	0.
time (sec)	N/A	0.034	0.093	0.395	0.	1.461	0.	0.

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	110	110	103	0	0	568	0	0
normalized size	1	1.	0.94	0.	0.	5.16	0.	0.
time (sec)	N/A	0.13	0.125	0.406	0.	1.563	0.	0.

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	176	176	144	0	0	840	0	0
normalized size	1	1.	0.82	0.	0.	4.77	0.	0.
time (sec)	N/A	0.166	0.158	0.418	0.	1.658	0.	0.

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	236	236	180	0	0	1084	0	0
normalized size	1	1.	0.76	0.	0.	4.59	0.	0.
time (sec)	N/A	0.27	0.19	0.407	0.	1.84	0.	0.

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	212	212	240	0	0	1134	0	0
normalized size	1	1.	1.13	0.	0.	5.35	0.	0.
time (sec)	N/A	0.324	0.249	0.406	0.	1.959	0.	0.

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	155	155	205	0	0	900	0	0
normalized size	1	1.	1.32	0.	0.	5.81	0.	0.
time (sec)	N/A	0.235	0.207	0.41	0.	1.743	0.	0.

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	108	108	137	0	0	737	333	0
normalized size	1	1.	1.27	0.	0.	6.82	3.08	0.
time (sec)	N/A	0.161	0.268	0.402	0.	1.661	80.428	0.

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	B	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	84	97	0	0	597	245	0
normalized size	1	1.	1.15	0.	0.	7.11	2.92	0.
time (sec)	N/A	0.088	0.231	0.436	0.	1.541	54.255	0.

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	251	251	273	0	0	0	0	0
normalized size	1	1.	1.09	0.	0.	0.	0.	0.
time (sec)	N/A	0.404	0.448	0.413	0.	0.	0.	0.

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	337	341	227	0	0	0	0	0
normalized size	1	1.01	0.67	0.	0.	0.	0.	0.
time (sec)	N/A	0.488	0.309	0.411	0.	0.	0.	0.

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	443	443	199	0	0	0	0	0
normalized size	1	1.	0.45	0.	0.	0.	0.	0.
time (sec)	N/A	0.539	0.288	0.408	0.	0.	0.	0.

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	383	383	244	0	0	0	0	0
normalized size	1	1.	0.64	0.	0.	0.	0.	0.
time (sec)	N/A	0.557	0.862	0.406	0.	0.	0.	0.

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	89	89	101	0	0	626	0	0
normalized size	1	1.	1.13	0.	0.	7.03	0.	0.
time (sec)	N/A	0.109	0.145	0.411	0.	1.474	0.	0.

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	113	116	0	0	756	0	0
normalized size	1	1.	1.03	0.	0.	6.69	0.	0.
time (sec)	N/A	0.069	0.133	0.407	0.	1.525	0.	0.

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	166	166	144	0	0	914	0	0
normalized size	1	1.	0.87	0.	0.	5.51	0.	0.
time (sec)	N/A	0.169	0.183	0.412	0.	1.788	0.	0.

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	230	230	182	0	0	1156	0	0
normalized size	1	1.	0.79	0.	0.	5.03	0.	0.
time (sec)	N/A	0.259	0.217	0.416	0.	2.007	0.	0.

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	251	251	163	0	269	286	0	0
normalized size	1	1.	0.65	0.	1.07	1.14	0.	0.
time (sec)	N/A	0.52	0.391	0.707	1.895	1.444	0.	0.

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	113	0	0	162	0	0
normalized size	1	1.	0.76	0.	0.	1.09	0.	0.
time (sec)	N/A	0.296	0.177	0.648	0.	1.64	0.	0.

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	301	301	310	0	0	0	0	0
normalized size	1	1.	1.03	0.	0.	0.	0.	0.
time (sec)	N/A	0.605	1.758	0.628	0.	0.	0.	0.

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	C	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	489	489	255	0	0	0	0	0
normalized size	1	1.	0.52	0.	0.	0.	0.	0.
time (sec)	N/A	0.724	0.859	0.659	0.	0.	0.	0.

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	406	406	316	0	0	0	0	0
normalized size	1	1.	0.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.612	2.72	0.643	0.	0.	0.	0.

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	248	248	217	0	0	0	0	0
normalized size	1	1.	0.88	0.	0.	0.	0.	0.
time (sec)	N/A	0.216	0.528	0.633	0.	0.	0.	0.

Problem 315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	70	0	0	182	0	0
normalized size	1	1.	0.49	0.	0.	1.28	0.	0.
time (sec)	N/A	0.4	0.214	0.657	0.	1.433	0.	0.

Problem 316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	252	252	116	0	0	311	0	0
normalized size	1	1.	0.46	0.	0.	1.23	0.	0.
time (sec)	N/A	0.475	0.295	0.67	0.	1.517	0.	0.

Problem 317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	34	34	27	119	36	80	29	38
normalized size	1	1.	0.79	3.5	1.06	2.35	0.85	1.12
time (sec)	N/A	0.04	0.022	0.264	1.813	1.335	3.355	1.278

Problem 318	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	211	211	156	5139	0	3047	0	747
normalized size	1	1.	0.74	24.36	0.	14.44	0.	3.54
time (sec)	N/A	1.684	0.228	0.423	0.	1.449	0.	1.332

Problem 319	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	153	153	112	2790	0	1519	0	535
normalized size	1	1.	0.73	18.24	0.	9.93	0.	3.5
time (sec)	N/A	0.18	0.134	0.289	0.	1.378	0.	1.431

Problem 320	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	95	95	68	1180	0	562	0	323
normalized size	1	1.	0.72	12.42	0.	5.92	0.	3.4
time (sec)	N/A	0.085	0.072	0.175	0.	1.365	0.	1.347

Problem 321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	46	46	32	371	0	142	0	128
normalized size	1	1.	0.7	8.07	0.	3.09	0.	2.78
time (sec)	N/A	0.017	0.013	0.076	0.	1.236	0.	1.34

Problem 322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	27	0	108	0	0	0	0	0
normalized size	1	0.	4.	0.	0.	0.	0.	0.
time (sec)	N/A	0.067	0.199	0.625	0.	0.	0.	0.

Problem 323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	27	0	108	0	0	0	0	0
normalized size	1	0.	4.	0.	0.	0.	0.	0.
time (sec)	N/A	0.064	0.121	0.705	0.	0.	0.	0.

Problem 324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	1198	1198	2215	0	0	0	0	0
normalized size	1	1.	1.85	0.	0.	0.	0.	0.
time (sec)	N/A	1.435	7.707	4.75	0.	0.	0.	0.

Problem 325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	860	860	1379	0	0	0	0	0
normalized size	1	1.	1.6	0.	0.	0.	0.	0.
time (sec)	N/A	0.771	6.152	4.986	0.	0.	0.	0.

Problem 326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	520	520	571	1388	0	0	0	0
normalized size	1	1.	1.1	2.67	0.	0.	0.	0.
time (sec)	N/A	0.457	2.149	0.352	0.	0.	0.	0.

Problem 327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.032	5.566	0.59	0.	0.	0.	0.

Problem 328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.03	25.577	2.035	0.	0.	0.	0.

Problem 329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	185	185	171	867	0	0	298	0
normalized size	1	1.	0.92	4.69	0.	0.	1.61	0.
time (sec)	N/A	0.2	0.102	0.183	0.	0.	135.23	0.

Problem 330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	148	148	142	693	0	0	248	0
normalized size	1	1.	0.96	4.68	0.	0.	1.68	0.
time (sec)	N/A	0.168	0.069	0.174	0.	0.	109.785	0.

Problem 331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	107	107	105	521	0	0	199	0
normalized size	1	1.	0.98	4.87	0.	0.	1.86	0.
time (sec)	N/A	0.12	0.048	0.169	0.	0.	87.386	0.

Problem 332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	66	343	0	0	144	0
normalized size	1	1.	0.96	4.97	0.	0.	2.09	0.
time (sec)	N/A	0.078	0.032	0.193	0.	0.	59.724	0.

Problem 333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	39	39	37	195	0	0	0	0
normalized size	1	1.	0.95	5.	0.	0.	0.	0.
time (sec)	N/A	0.075	0.007	0.135	0.	0.	0.	0.

Problem 334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	44	44	63	336	0	0	156	0
normalized size	1	1.	1.43	7.64	0.	0.	3.55	0.
time (sec)	N/A	0.066	0.035	0.134	0.	0.	11.296	0.

Problem 335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	95	95	88	504	0	0	197	0
normalized size	1	1.	0.93	5.31	0.	0.	2.07	0.
time (sec)	N/A	0.147	0.089	0.146	0.	0.	53.995	0.

Problem 336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	135	124	689	0	0	246	0
normalized size	1	1.	0.92	5.1	0.	0.	1.82	0.
time (sec)	N/A	0.177	0.201	0.151	0.	0.	72.153	0.

Problem 337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	170	170	156	209	284	0	280	0
normalized size	1	1.	0.92	1.23	1.67	0.	1.65	0.
time (sec)	N/A	0.181	0.081	0.08	1.404	0.	130.083	0.

Problem 338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	136	136	125	171	221	0	235	0
normalized size	1	1.	0.92	1.26	1.62	0.	1.73	0.
time (sec)	N/A	0.152	0.066	0.043	1.605	0.	108.016	0.

Problem 339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	98	98	99	129	151	0	189	0
normalized size	1	1.	1.01	1.32	1.54	0.	1.93	0.
time (sec)	N/A	0.11	0.044	0.044	1.553	0.	86.693	0.

Problem 340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	63	63	64	91	93	0	138	0
normalized size	1	1.	1.02	1.44	1.48	0.	2.19	0.
time (sec)	N/A	0.07	0.028	0.046	1.355	0.	57.93	0.

Problem 341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	36	36	34	62	58	0	0	0
normalized size	1	1.	0.94	1.72	1.61	0.	0.	0.
time (sec)	N/A	0.071	0.007	0.043	1.351	0.	0.	0.

Problem 342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	B	A	F	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	41	41	54	86	90	0	153	0
normalized size	1	1.	1.32	2.1	2.2	0.	3.73	0.
time (sec)	N/A	0.062	0.024	0.05	1.3	0.	10.539	0.

Problem 343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	84	84	77	120	130	0	187	0
normalized size	1	1.	0.92	1.43	1.55	0.	2.23	0.
time (sec)	N/A	0.131	0.088	0.076	1.366	0.	52.314	0.

Problem 344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	A	F	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	121	121	110	163	204	0	233	0
normalized size	1	1.	0.91	1.35	1.69	0.	1.93	0.
time (sec)	N/A	0.156	0.151	0.055	1.389	0.	68.683	0.

Problem 345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	B	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	17	14	70	100	0	0
normalized size	1	1.	1.	0.82	4.12	5.88	0.	0.
time (sec)	N/A	0.065	0.011	0.041	1.844	1.299	0.	0.

Problem 346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	B	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	16	16	17	13	61	112	0	0
normalized size	1	1.	1.06	0.81	3.81	7.	0.	0.
time (sec)	N/A	0.063	0.009	0.043	1.75	1.284	0.	0.

Problem 347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	B	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	20	20	21	19	86	124	0	0
normalized size	1	1.	1.05	0.95	4.3	6.2	0.	0.
time (sec)	N/A	0.069	0.01	0.042	1.822	1.261	0.	0.

Problem 348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	14	14	16	11	97	26	71	0
normalized size	1	1.	1.14	0.79	6.93	1.86	5.07	0.
time (sec)	N/A	0.077	0.004	0.04	1.165	1.254	7.585	0.

Problem 349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	B	A	C	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	17	17	21	12	109	34	78	0
normalized size	1	1.	1.24	0.71	6.41	2.	4.59	0.
time (sec)	N/A	0.087	0.004	0.044	1.143	1.271	10.516	0.

Problem 350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	26	26	23	0	0	236	0	0
normalized size	1	1.	0.88	0.	0.	9.08	0.	0.
time (sec)	N/A	0.09	0.01	0.823	0.	1.288	0.	0.

Problem 351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	171	171	140	806	0	479	0	452
normalized size	1	1.	0.82	4.71	0.	2.8	0.	2.64
time (sec)	N/A	0.215	0.156	0.242	0.	1.383	0.	1.478

Problem 352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	142	142	101	616	0	342	0	325
normalized size	1	1.	0.71	4.34	0.	2.41	0.	2.29
time (sec)	N/A	0.195	0.112	0.184	0.	1.32	0.	1.463

Problem 353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	90	113	61	426	0	201	0	203
normalized size	1	1.26	0.68	4.73	0.	2.23	0.	2.26
time (sec)	N/A	0.117	0.064	0.165	0.	1.33	0.	1.338

Problem 354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	38	38	29	281	0	120	0	86
normalized size	1	1.	0.76	7.39	0.	3.16	0.	2.26
time (sec)	N/A	0.017	0.009	0.102	0.	1.272	0.	1.312

Problem 355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	77	77	141	0	0	190	0	0
normalized size	1	1.	1.83	0.	0.	2.47	0.	0.
time (sec)	N/A	0.191	0.142	0.98	0.	1.345	0.	0.

Problem 356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	89	0	131	205	0	278
normalized size	1	1.	1.29	0.	1.9	2.97	0.	4.03
time (sec)	N/A	0.107	0.121	1.158	1.198	1.361	0.	1.367

Problem 357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	150	150	137	0	205	382	0	848
normalized size	1	1.	0.91	0.	1.37	2.55	0.	5.65
time (sec)	N/A	0.215	0.147	1.147	1.232	1.62	0.	1.313

Problem 358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	188	188	178	0	284	559	0	1458
normalized size	1	1.	0.95	0.	1.51	2.97	0.	7.76
time (sec)	N/A	0.234	0.154	0.951	1.229	1.63	0.	1.425

Problem 359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	372	294	285	4156	0	1318	0	1330
normalized size	1	0.79	0.77	11.17	0.	3.54	0.	3.58
time (sec)	N/A	0.481	0.253	0.493	0.	1.639	0.	1.538

Problem 360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	298	245	207	3038	0	944	0	965
normalized size	1	0.82	0.69	10.19	0.	3.17	0.	3.24
time (sec)	N/A	0.44	0.201	0.387	0.	1.674	0.	1.605

Problem 361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	226	195	125	1920	0	566	0	601
normalized size	1	0.86	0.55	8.5	0.	2.5	0.	2.66
time (sec)	N/A	0.303	0.131	0.291	0.	1.458	0.	1.424

Problem 362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	69	69	67	1008	0	294	0	267
normalized size	1	1.	0.97	14.61	0.	4.26	0.	3.87
time (sec)	N/A	0.05	0.022	0.148	0.	1.366	0.	1.403

Problem 363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	C	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	129	129	502	0	0	419	0	0
normalized size	1	1.	3.89	0.	0.	3.25	0.	0.
time (sec)	N/A	0.301	0.25	1.033	0.	1.39	0.	0.

Problem 364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	A	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	138	138	157	0	0	618	0	0
normalized size	1	1.	1.14	0.	0.	4.48	0.	0.
time (sec)	N/A	0.34	0.445	0.911	0.	1.356	0.	0.

Problem 365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	214	214	207	0	0	1204	0	0
normalized size	1	1.	0.97	0.	0.	5.63	0.	0.
time (sec)	N/A	0.512	0.359	0.922	0.	1.387	0.	0.

Problem 366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	346	346	240	0	0	1823	0	0
normalized size	1	1.	0.69	0.	0.	5.27	0.	0.
time (sec)	N/A	0.714	0.537	0.921	0.	1.466	0.	0.

Problem 367	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	59	59	73	613	0	396	0	185
normalized size	1	1.	1.24	10.39	0.	6.71	0.	3.14
time (sec)	N/A	0.079	0.099	0.24	0.	1.324	0.	1.313

Problem 368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	73	613	0	389	525	185
normalized size	1	1.	1.24	10.39	0.	6.59	8.9	3.14
time (sec)	N/A	0.08	0.09	0.237	0.	1.292	43.382	1.278

Problem 369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	73	613	0	379	525	185
normalized size	1	1.	1.24	10.39	0.	6.42	8.9	3.14
time (sec)	N/A	0.063	0.09	0.234	0.	1.346	7.417	1.32

Problem 370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	54	278	0	167	0	93
normalized size	1	1.	1.02	5.25	0.	3.15	0.	1.75
time (sec)	N/A	0.088	0.088	0.175	0.	1.33	0.	1.302

Problem 371	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	71	63	72	613	0	351	0	535
normalized size	1	0.89	1.01	8.63	0.	4.94	0.	7.54
time (sec)	N/A	0.074	0.109	0.158	0.	1.41	0.	1.372

Problem 372	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	71	63	72	613	0	360	0	536
normalized size	1	0.89	1.01	8.63	0.	5.07	0.	7.55
time (sec)	N/A	0.074	0.112	0.164	0.	1.334	0.	1.33

Problem 373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	73	614	0	396	525	185
normalized size	1	1.	1.24	10.41	0.	6.71	8.9	3.14
time (sec)	N/A	0.08	0.089	0.233	0.	1.363	97.225	1.31

Problem 374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	59	59	73	614	0	381	525	185
normalized size	1	1.	1.24	10.41	0.	6.46	8.9	3.14
time (sec)	N/A	0.08	0.088	0.237	0.	1.322	19.19	1.316

Problem 375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	57	49	53	606	0	325	423	155
normalized size	1	0.86	0.93	10.63	0.	5.7	7.42	2.72
time (sec)	N/A	0.034	0.122	0.236	0.	1.373	2.879	1.312

Problem 376	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	67	58	67	614	0	311	0	261
normalized size	1	0.87	1.	9.16	0.	4.64	0.	3.9
time (sec)	N/A	0.077	0.103	0.152	0.	1.284	0.	1.324

Problem 377	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	71	63	72	614	0	352	0	536
normalized size	1	0.89	1.01	8.65	0.	4.96	0.	7.55
time (sec)	N/A	0.073	0.113	0.159	0.	1.408	0.	1.255

Problem 378	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	71	63	72	614	0	367	0	536
normalized size	1	0.89	1.01	8.65	0.	5.17	0.	7.55
time (sec)	N/A	0.072	0.094	0.167	0.	1.34	0.	1.272

Problem 379	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	103	103	118	1924	0	1168	0	1004
normalized size	1	1.	1.15	18.68	0.	11.34	0.	9.75
time (sec)	N/A	0.156	0.285	0.299	0.	1.327	0.	1.307

Problem 380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	103	103	118	1924	0	1135	2162	1004
normalized size	1	1.	1.15	18.68	0.	11.02	20.99	9.75
time (sec)	N/A	0.154	0.241	0.293	0.	1.378	138.113	1.319

Problem 381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	102	102	116	1922	0	1096	2159	1004
normalized size	1	1.	1.14	18.84	0.	10.75	21.17	9.84
time (sec)	N/A	0.132	0.235	0.296	0.	1.41	21.608	1.321

Problem 382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	87	90	487	0	286	0	189
normalized size	1	0.84	0.87	4.68	0.	2.75	0.	1.82
time (sec)	N/A	0.134	0.209	0.139	0.	1.377	0.	1.316

Problem 383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	114	120	1923	0	1049	0	0
normalized size	1	0.84	0.89	14.24	0.	7.77	0.	0.
time (sec)	N/A	0.163	0.304	0.24	0.	1.436	0.	0.

Problem 384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	135	115	121	1924	0	1088	0	0
normalized size	1	0.85	0.9	14.25	0.	8.06	0.	0.
time (sec)	N/A	0.164	0.303	0.234	0.	1.409	0.	0.

Problem 385	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	105	105	124	1930	0	1202	0	1007
normalized size	1	1.	1.18	18.38	0.	11.45	0.	9.59
time (sec)	N/A	0.16	0.255	0.294	0.	1.383	0.	1.373

Problem 386	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	105	105	124	1930	0	1172	0	1007
normalized size	1	1.	1.18	18.38	0.	11.16	0.	9.59
time (sec)	N/A	0.16	0.255	0.293	0.	1.375	0.	1.25

Problem 387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	113	95	107	1921	0	1041	211	329
normalized size	1	0.84	0.95	17.	0.	9.21	1.87	2.91
time (sec)	N/A	0.076	0.159	0.288	0.	1.349	13.463	1.322

Problem 388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	123	104	121	1927	0	1015	204	0
normalized size	1	0.85	0.98	15.67	0.	8.25	1.66	0.
time (sec)	N/A	0.167	0.288	0.23	0.	1.369	32.102	0.

Problem 389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	109	127	1930	0	1125	235	0
normalized size	1	0.86	1.	15.2	0.	8.86	1.85	0.
time (sec)	N/A	0.173	0.3	0.244	0.	1.398	173.603	0.

Problem 390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	109	127	1930	0	1154	0	0
normalized size	1	0.86	1.	15.2	0.	9.09	0.	0.
time (sec)	N/A	0.173	0.299	0.237	0.	1.436	0.	0.

Problem 391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	127	109	127	1930	0	1166	0	0
normalized size	1	0.86	1.	15.2	0.	9.18	0.	0.
time (sec)	N/A	0.177	0.291	0.242	0.	1.444	0.	0.

Problem 392	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	147	147	172	4021	0	2402	0	2141
normalized size	1	1.	1.17	27.35	0.	16.34	0.	14.56
time (sec)	N/A	0.381	0.377	0.398	0.	1.398	0.	1.627

Problem 393	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	149	149	178	4027	0	2461	0	2144
normalized size	1	1.	1.19	27.03	0.	16.52	0.	14.39
time (sec)	N/A	0.385	0.343	0.389	0.	1.432	0.	1.396

Problem 394	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	149	149	178	4027	0	2353	0	2144
normalized size	1	1.	1.19	27.03	0.	15.79	0.	14.39
time (sec)	N/A	0.348	0.354	0.381	0.	1.452	0.	1.362

Problem 395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	124	132	693	0	419	0	284
normalized size	1	0.82	0.87	4.56	0.	2.76	0.	1.87
time (sec)	N/A	0.171	0.354	0.16	0.	1.397	0.	1.353

Problem 396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	161	181	4027	0	2287	0	0
normalized size	1	0.84	0.95	21.08	0.	11.97	0.	0.
time (sec)	N/A	0.408	0.392	0.339	0.	1.496	0.	0.

Problem 397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	161	181	4027	0	2395	0	0
normalized size	1	0.84	0.95	21.08	0.	12.54	0.	0.
time (sec)	N/A	0.397	0.39	0.347	0.	1.525	0.	0.

Problem 398	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	151	151	184	4031	0	2560	0	2144
normalized size	1	1.	1.22	26.7	0.	16.95	0.	14.2
time (sec)	N/A	0.381	0.353	0.403	0.	1.486	0.	1.343

Problem 399	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	148	148	176	4027	0	2376	0	2144
normalized size	1	1.	1.19	27.21	0.	16.05	0.	14.49
time (sec)	N/A	0.381	0.343	0.395	0.	1.481	0.	1.316

Problem 400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	169	141	159	4023	0	2237	325	505
normalized size	1	0.83	0.94	23.8	0.	13.24	1.92	2.99
time (sec)	N/A	0.103	0.222	0.386	0.	1.429	26.858	1.335

Problem 401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	179	150	181	4031	0	2201	314	0
normalized size	1	0.84	1.01	22.52	0.	12.3	1.75	0.
time (sec)	N/A	0.397	0.393	0.35	0.	1.41	94.674	0.

Problem 402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	160	180	4027	0	2310	0	0
normalized size	1	0.84	0.94	21.08	0.	12.09	0.	0.
time (sec)	N/A	0.393	0.376	0.352	0.	1.472	0.	0.

Problem 403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	155	187	4031	0	2493	0	0
normalized size	1	0.85	1.02	22.03	0.	13.62	0.	0.
time (sec)	N/A	0.412	0.4	0.363	0.	1.493	0.	0.

Problem 404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	183	155	188	4031	0	2554	0	0
normalized size	1	0.85	1.03	22.03	0.	13.96	0.	0.
time (sec)	N/A	0.413	0.391	0.358	0.	1.477	0.	0.

Problem 405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	191	161	182	4027	0	2476	0	0
normalized size	1	0.84	0.95	21.08	0.	12.96	0.	0.
time (sec)	N/A	0.419	0.389	0.372	0.	1.451	0.	0.

Problem 406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	87	0	0	0	0	0
normalized size	1	0.	3.48	0.	0.	0.	0.	0.
time (sec)	N/A	0.064	0.117	0.75	0.	0.	0.	0.

Problem 407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	23	0	87	0	0	0	0	0
normalized size	1	0.	3.78	0.	0.	0.	0.	0.
time (sec)	N/A	0.041	0.1	0.659	0.	0.	0.	0.

Problem 408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	A	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	54	54	108	451	0	235	0	0
normalized size	1	1.	2.	8.35	0.	4.35	0.	0.
time (sec)	N/A	0.078	0.114	0.194	0.	1.325	0.	0.

Problem 409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	86	0	0	0	0	0
normalized size	1	0.	3.44	0.	0.	0.	0.	0.
time (sec)	N/A	0.064	0.105	0.706	0.	0.	0.	0.

Problem 410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	87	0	0	0	0	0
normalized size	1	0.	3.48	0.	0.	0.	0.	0.
time (sec)	N/A	0.065	0.107	0.681	0.	0.	0.	0.

Problem 411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	22	0	69	0	0	0	0	0
normalized size	1	0.	3.14	0.	0.	0.	0.	0.
time (sec)	N/A	0.018	0.079	0.642	0.	0.	0.	0.

Problem 412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	83	0	0	0	0	0
normalized size	1	0.	3.32	0.	0.	0.	0.	0.
time (sec)	N/A	0.066	0.097	0.687	0.	0.	0.	0.

Problem 413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	140	0	0	0	0	0
normalized size	1	0.	5.6	0.	0.	0.	0.	0.
time (sec)	N/A	0.064	0.244	0.641	0.	0.	0.	0.

Problem 414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	23	0	140	0	0	0	0	0
normalized size	1	0.	6.09	0.	0.	0.	0.	0.
time (sec)	N/A	0.04	0.234	0.709	0.	0.	0.	0.

Problem 415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	102	102	132	715	0	527	0	0
normalized size	1	1.	1.29	7.01	0.	5.17	0.	0.
time (sec)	N/A	0.233	0.337	0.234	0.	1.32	0.	0.

Problem 416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	139	0	0	0	0	0
normalized size	1	0.	5.56	0.	0.	0.	0.	0.
time (sec)	N/A	0.063	0.235	0.642	0.	0.	0.	0.

Problem 417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	140	0	0	0	0	0
normalized size	1	0.	5.6	0.	0.	0.	0.	0.
time (sec)	N/A	0.063	0.239	0.744	0.	0.	0.	0.

Problem 418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	22	0	161	0	0	0	0	0
normalized size	1	0.	7.32	0.	0.	0.	0.	0.
time (sec)	N/A	0.017	2.469	0.662	0.	0.	0.	0.

Problem 419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	25	0	135	0	0	0	0	0
normalized size	1	0.	5.4	0.	0.	0.	0.	0.
time (sec)	N/A	0.062	0.201	0.75	0.	0.	0.	0.

Problem 420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	A	F	A	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	37	37	37	33	0	115	0	0
normalized size	1	1.	1.	0.89	0.	3.11	0.	0.
time (sec)	N/A	0.144	0.018	0.043	0.	1.309	0.	0.

Problem 421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	152	124	132	693	0	419	0	284
normalized size	1	0.82	0.87	4.56	0.	2.76	0.	1.87
time (sec)	N/A	0.154	0.356	0.077	0.	1.392	0.	1.333

Problem 422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	104	87	90	487	0	286	0	189
normalized size	1	0.84	0.87	4.68	0.	2.75	0.	1.82
time (sec)	N/A	0.127	0.208	0.069	0.	1.327	0.	1.344

Problem 423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	53	53	54	278	0	167	0	93
normalized size	1	1.	1.02	5.25	0.	3.15	0.	1.75
time (sec)	N/A	0.085	0.084	0.066	0.	1.353	0.	1.141

Problem 424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	A	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	54	54	108	451	0	235	0	0
normalized size	1	1.	2.	8.35	0.	4.35	0.	0.
time (sec)	N/A	0.075	0.103	0.059	0.	1.264	0.	0.

Problem 425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	102	102	132	715	0	527	0	0
normalized size	1	1.	1.29	7.01	0.	5.17	0.	0.
time (sec)	N/A	0.229	0.313	0.066	0.	1.386	0.	0.

Problem 426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	B	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	169	169	170	1012	0	959	0	0
normalized size	1	1.	1.01	5.99	0.	5.67	0.	0.
time (sec)	N/A	0.409	0.235	0.25	0.	1.607	0.	0.

Problem 427	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	245	245	262	3984	0	1172	0	856
normalized size	1	1.	1.07	16.26	0.	4.78	0.	3.49
time (sec)	N/A	0.303	0.434	0.378	0.	1.65	0.	1.331

Problem 428	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	161	161	179	2844	0	806	0	568
normalized size	1	1.	1.11	17.66	0.	5.01	0.	3.53
time (sec)	N/A	0.237	0.268	0.326	0.	1.646	0.	1.291

Problem 429	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	80	80	109	1712	0	454	0	296
normalized size	1	1.	1.36	21.4	0.	5.68	0.	3.7
time (sec)	N/A	0.139	0.143	0.279	0.	1.607	0.	1.327

Problem 430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	C	F	C	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	94	94	270	3012	0	544	0	0
normalized size	1	1.	2.87	32.04	0.	5.79	0.	0.
time (sec)	N/A	0.135	0.294	0.236	0.	1.57	0.	0.

Problem 431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	B	F	F	C	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	182	182	397	0	0	1382	0	0
normalized size	1	1.	2.18	0.	0.	7.59	0.	0.
time (sec)	N/A	0.427	0.462	0.851	0.	1.458	0.	0.

Problem 432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	C	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD
size	267	267	459	0	0	2619	0	0
normalized size	1	1.	1.72	0.	0.	9.81	0.	0.
time (sec)	N/A	0.892	0.592	0.714	0.	1.441	0.	0.

Problem 433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	327	327	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.48	0.538	0.769	0.	0.	0.	0.

Problem 434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	284	284	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.391	0.433	0.636	0.	0.	0.	0.

Problem 435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	240	240	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.317	0.339	0.662	0.	0.	0.	0.

Problem 436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	174	174	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.269	0.116	0.487	0.	0.	0.	0.

Problem 437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	225	225	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.343	0.294	0.477	0.	0.	0.	0.

Problem 438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	271	271	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.416	0.351	0.48	0.	0.	0.	0.

Problem 439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	F	F	F(-2)	F(-2)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD
size	314	314	0	0	0	0	0	0
normalized size	1	1.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.471	0.421	0.48	0.	0.	0.	0.

Problem 440	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	233	233	178	22706	0	10967	0	1034
normalized size	1	1.	0.76	97.45	0.	47.07	0.	4.44
time (sec)	N/A	1.987	0.476	1.512	0.	2.004	0.	1.406

Problem 441	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	165	165	124	8737	0	4199	0	713
normalized size	1	1.	0.75	52.95	0.	25.45	0.	4.32
time (sec)	N/A	0.185	0.244	0.727	0.	1.587	0.	1.372

Problem 442	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	97	97	70	2152	0	1035	0	393
normalized size	1	1.	0.72	22.19	0.	10.67	0.	4.05
time (sec)	N/A	0.103	0.111	0.362	0.	1.396	0.	1.321

Problem 443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F(-2)	A	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	46	46	32	371	0	142	0	128
normalized size	1	1.	0.7	8.07	0.	3.09	0.	2.78
time (sec)	N/A	0.017	0.015	0.073	0.	1.284	0.	1.176

Problem 444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	A	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	27	0	111	0	0	0	0	0
normalized size	1	0.	4.11	0.	0.	0.	0.	0.
time (sec)	N/A	0.07	0.154	0.987	0.	0.	0.	0.

Problem 445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	NO	TBD	TBD	TBD	TBD	TBD
size	27	0	177	0	0	0	0	0
normalized size	1	0.	6.56	0.	0.	0.	0.	0.
time (sec)	N/A	0.069	0.388	1.058	0.	0.	0.	0.

Problem 446	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	102	102	143	0	0	0	0	0
normalized size	1	1.	1.4	0.	0.	0.	0.	0.
time (sec)	N/A	0.044	0.571	0.829	0.	0.	0.	0.

Problem 447	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	119	119	98	0	0	0	0	0
normalized size	1	1.	0.82	0.	0.	0.	0.	0.
time (sec)	N/A	0.133	0.341	0.779	0.	0.	0.	0.

Problem 448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	480	480	408	0	0	0	0	0
normalized size	1	1.	0.85	0.	0.	0.	0.	0.
time (sec)	N/A	0.66	1.873	0.853	0.	0.	0.	0.

Problem 449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	350	350	304	0	0	0	0	0
normalized size	1	1.	0.87	0.	0.	0.	0.	0.
time (sec)	N/A	0.413	0.97	1.22	0.	0.	0.	0.

Problem 450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	220	220	200	0	0	0	0	0
normalized size	1	1.	0.91	0.	0.	0.	0.	0.
time (sec)	N/A	0.256	0.429	1.322	0.	0.	0.	0.

Problem 451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	106	106	107	0	0	0	0	0
normalized size	1	1.	1.01	0.	0.	0.	0.	0.
time (sec)	N/A	0.067	0.067	0.597	0.	0.	0.	0.

Problem 452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.1	2.765	1.244	0.	0.	0.	0.

Problem 453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	N/A	A	A	A	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0
normalized size	1	0.	0.	0.	0.	0.	0.	0.
time (sec)	N/A	0.102	2.972	0.881	0.	0.	0.	0.

Problem 454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	B	B	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	115	151	108	624	294	466	1103	340
normalized size	1	1.31	0.94	5.43	2.56	4.05	9.59	2.96
time (sec)	N/A	0.146	0.171	0.147	1.206	1.329	5.418	1.322

Problem 455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	C	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	202	278	244	2163	0	0	0	0
normalized size	1	1.38	1.21	10.71	0.	0.	0.	0.
time (sec)	N/A	0.405	0.274	0.305	0.	0.	0.	0.

Problem 456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac
grade	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD
size	295	408	339	0	0	0	0	0
normalized size	1	1.38	1.15	0.	0.	0.	0.	0.
time (sec)	N/A	0.624	0.38	1.284	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 [120] had the largest ratio of [0.7692]

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	4	3	1.	19	0.158
2	A	4	3	1.	19	0.158
3	A	4	3	1.	17	0.176
4	A	2	1	0.85	16	0.062
5	A	4	3	1.	19	0.158
6	A	4	4	0.9	19	0.21
7	A	4	4	1.	19	0.21
8	A	4	3	0.84	19	0.158

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
9	A	4	4	1.	21	0.19
10	A	4	4	1.	21	0.19
11	A	4	4	1.	19	0.21
12	A	4	4	1.	18	0.222
13	A	3	3	0.79	21	0.143
14	A	3	3	0.78	21	0.143
15	A	4	4	0.8	21	0.19
16	A	4	4	1.	21	0.19
17	A	4	4	0.78	21	0.19
18	A	4	4	0.78	21	0.19
19	A	4	4	1.	21	0.19
20	A	4	4	1.	21	0.19
21	A	5	4	1.	19	0.21
22	A	4	4	1.	18	0.222
23	A	4	3	0.77	21	0.143
24	A	3	3	0.77	21	0.143
25	A	3	3	0.77	21	0.143
26	A	5	4	0.78	21	0.19
27	A	4	4	1.	21	0.19
28	A	5	6	0.94	21	0.286
29	A	4	4	0.75	21	0.19
30	A	4	4	0.75	21	0.19
31	A	8	6	1.	21	0.286
32	A	7	6	1.	21	0.286
33	A	6	5	1.	19	0.263
34	A	2	2	1.	18	0.111
35	A	4	4	1.5	21	0.19
36	A	6	6	1.28	21	0.286
37	A	7	6	1.23	21	0.286
38	A	8	6	1.15	21	0.286
39	A	9	8	0.99	21	0.381
40	A	8	7	1.08	21	0.333

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
41	A	6	6	1.14	19	0.316
42	A	2	2	1.	18	0.111
43	A	7	7	1.27	21	0.333
44	A	8	8	1.18	21	0.381
45	A	9	8	1.16	21	0.381
46	A	11	9	1.12	21	0.429
47	A	9	8	1.23	21	0.381
48	A	3	2	1.	19	0.105
49	A	3	2	1.	18	0.111
50	A	11	9	1.16	21	0.429
51	A	11	9	1.13	21	0.429
52	A	12	9	1.1	21	0.429
53	A	15	10	1.14	21	0.476
54	A	14	9	1.15	21	0.429
55	A	12	8	1.26	21	0.381
56	A	3	2	1.	21	0.095
57	A	4	4	1.	19	0.21
58	A	3	2	1.	18	0.111
59	A	15	9	1.13	21	0.429
60	A	14	9	1.09	21	0.429
61	A	15	9	1.08	21	0.429
62	A	24	10	1.2	21	0.476
63	A	23	9	1.23	21	0.429
64	A	21	8	1.3	21	0.381
65	A	3	2	1.	21	0.095
66	A	5	6	1.	21	0.286
67	A	4	4	1.	21	0.19
68	A	4	4	1.	21	0.19
69	A	4	4	1.	19	0.21
70	A	3	2	1.	18	0.111
71	A	27	9	1.07	21	0.429
72	A	23	9	1.06	21	0.429

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
73	A	24	9	1.05	21	0.429
74	A	1	1	1.	13	0.077
75	A	1	1	1.	14	0.071
76	A	6	3	1.	21	0.143
77	A	6	3	1.	19	0.158
78	A	7	5	1.	18	0.278
79	A	6	5	1.	21	0.238
80	A	6	5	1.	21	0.238
81	A	6	3	1.	21	0.143
82	A	6	3	1.	21	0.143
83	A	6	3	1.	21	0.143
84	A	8	3	1.	23	0.13
85	A	8	3	1.	21	0.143
86	A	5	4	0.82	20	0.2
87	A	14	8	1.	23	0.348
88	A	9	7	1.	23	0.304
89	A	8	5	1.	23	0.217
90	A	8	3	1.	23	0.13
91	A	8	3	1.	23	0.13
92	A	12	8	1.	23	0.348
93	A	10	8	1.	23	0.348
94	A	8	6	1.	21	0.286
95	A	3	3	1.	20	0.15
96	A	6	6	1.24	23	0.261
97	A	9	8	1.15	23	0.348
98	A	11	8	1.11	23	0.348
99	A	13	8	1.08	23	0.348
100	A	13	10	1.	23	0.435
101	A	11	8	1.	23	0.348
102	A	8	6	1.	21	0.286
103	A	3	3	1.	20	0.15
104	A	10	9	1.13	23	0.391

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
105	A	12	10	1.09	23	0.435
106	A	14	10	1.07	23	0.435
107	A	19	14	1.	23	0.609
108	A	16	12	1.	23	0.522
109	A	13	10	1.57	21	0.476
110	A	8	8	1.15	20	0.4
111	A	19	13	1.	23	0.565
112	A	20	16	1.	23	0.696
113	A	31	15	1.	23	0.652
114	A	28	13	1.	23	0.565
115	A	25	11	1.7	23	0.478
116	A	22	10	1.09	21	0.476
117	A	12	9	1.09	20	0.45
118	A	32	14	1.	23	0.609
119	A	32	17	1.	23	0.739
120	A	22	10	1.47	13	0.769
121	A	7	7	1.15	23	0.304
122	A	12	9	1.08	23	0.391
123	A	24	11	1.	23	0.478
124	A	10	7	1.	20	0.35
125	A	14	7	1.	22	0.318
126	A	18	7	1.	22	0.318
127	A	0	0	0.	0	0.
128	A	0	0	0.	0	0.
129	A	0	0	0.	0	0.
130	A	8	7	1.	23	0.304
131	A	6	6	1.	23	0.261
132	A	7	7	1.	21	0.333
133	A	5	4	1.	20	0.2
134	A	12	11	1.	23	0.478
135	A	11	9	1.	23	0.391
136	A	16	11	1.	23	0.478

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	number of rules / integrand leaf size
137	A	9	7	1.	23	0.304
138	A	6	6	1.	23	0.261
139	A	8	7	1.	21	0.333
140	A	6	4	1.	20	0.2
141	A	18	11	1.	23	0.478
142	A	14	10	1.	23	0.435
143	A	16	11	1.	23	0.478
144	A	7	7	1.	23	0.304
145	A	6	6	1.	23	0.261
146	A	6	7	1.	21	0.333
147	A	4	4	1.	20	0.2
148	A	7	8	1.	23	0.348
149	A	11	10	1.	23	0.435
150	A	16	11	1.	23	0.478
151	A	6	6	1.	23	0.261
152	A	6	6	1.	23	0.261
153	A	5	6	1.	21	0.286
154	A	3	3	1.	20	0.15
155	A	11	10	1.	23	0.435
156	A	15	12	1.01	23	0.522
157	A	0	0	0.	0	0.
158	A	0	0	0.	0	0.
159	A	0	0	0.	0	0.
160	A	0	0	0.	0	0.
161	A	0	0	0.	0	0.
162	A	3	3	1.	23	0.13
163	A	4	4	1.	23	0.174
164	A	3	2	1.	21	0.095
165	A	1	1	1.	16	0.062
166	A	0	0	0.	0	0.
167	A	0	0	0.	0	0.
168	A	0	0	0.	0	0.

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	number of rules / integrand leaf size
169	A	2	2	1.	14	0.143
170	A	0	0	0.	0	0.
171	A	2	2	1.	21	0.095
172	A	2	2	1.	21	0.095
173	A	4	3	1.	19	0.158
174	A	4	4	1.	21	0.19
175	A	3	3	0.9	21	0.143
176	A	4	3	0.82	21	0.143
177	A	2	2	1.	21	0.095
178	A	2	2	1.	21	0.095
179	A	2	1	0.85	18	0.056
180	A	2	2	0.84	21	0.095
181	A	4	3	0.85	21	0.143
182	A	4	3	0.84	21	0.143
183	A	4	5	1.	23	0.217
184	A	4	5	1.	23	0.217
185	A	5	5	1.	21	0.238
186	A	3	4	0.82	23	0.174
187	A	7	6	0.78	23	0.261
188	A	5	5	0.81	23	0.217
189	A	2	2	1.	23	0.087
190	A	2	2	1.	23	0.087
191	A	2	2	0.79	20	0.1
192	A	2	2	0.8	23	0.087
193	A	2	2	0.79	23	0.087
194	A	4	4	0.79	23	0.174
195	A	4	4	0.78	23	0.174
196	A	4	5	1.	23	0.217
197	A	6	6	1.	23	0.261
198	A	5	5	1.	21	0.238
199	A	5	5	0.77	23	0.217
200	A	7	6	0.76	23	0.261

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
201	A	7	6	0.76	23	0.261
202	A	2	2	1.	23	0.087
203	A	2	2	1.	23	0.087
204	A	2	2	0.78	20	0.1
205	A	2	2	0.78	23	0.087
206	A	3	3	0.75	23	0.13
207	A	2	2	0.77	23	0.087
208	A	4	4	0.77	23	0.174
209	A	4	4	0.75	23	0.174
210	A	6	6	1.	23	0.261
211	A	5	6	1.	23	0.261
212	A	2	2	1.	21	0.095
213	A	2	2	1.	23	0.087
214	A	6	7	1.31	23	0.304
215	A	7	7	1.23	23	0.304
216	A	10	9	1.	23	0.391
217	A	9	8	1.	23	0.348
218	A	5	5	1.	20	0.25
219	A	8	8	1.	23	0.348
220	A	9	8	1.	23	0.348
221	A	7	8	1.	23	0.348
222	A	6	7	1.	23	0.304
223	A	2	2	1.	21	0.095
224	A	3	3	1.	23	0.13
225	A	7	8	1.26	23	0.348
226	A	16	10	1.	23	0.435
227	A	14	8	1.	23	0.348
228	A	7	6	1.	20	0.3
229	A	9	9	1.	23	0.391
230	A	10	9	1.	23	0.391
231	A	10	9	1.	23	0.391
232	A	4	3	1.	23	0.13

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
233	A	4	3	1.	21	0.143
234	A	4	3	1.	23	0.13
235	A	8	8	1.2	23	0.348
236	A	24	9	1.	23	0.391
237	A	19	9	1.	23	0.391
238	A	10	7	1.	20	0.35
239	A	10	9	1.	23	0.391
240	A	11	9	1.	23	0.391
241	A	2	2	1.	18	0.111
242	A	2	2	1.	19	0.105
243	A	2	3	1.	12	0.25
244	A	4	4	1.	10	0.4
245	A	3	4	1.	19	0.21
246	A	3	4	1.	21	0.19
247	A	16	6	1.	22	0.273
248	A	20	6	1.	22	0.273
249	A	0	0	0.	0	0.
250	A	0	0	0.	0	0.
251	A	7	8	1.	25	0.32
252	A	8	9	1.	25	0.36
253	A	6	5	1.	23	0.217
254	A	12	9	1.	25	0.36
255	A	14	11	1.	25	0.44
256	A	19	13	1.	25	0.52
257	A	11	12	1.	25	0.48
258	A	11	11	1.	22	0.5
259	A	11	10	1.	25	0.4
260	A	5	4	1.	25	0.16
261	A	7	8	1.	25	0.32
262	A	8	9	1.	25	0.36
263	A	7	8	1.	25	0.32
264	A	9	9	1.	25	0.36

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
265	A	7	5	1.	23	0.217
266	A	17	9	1.	25	0.36
267	A	18	12	1.	25	0.48
268	A	19	13	1.	25	0.52
269	A	16	11	1.	22	0.5
270	A	14	12	1.	25	0.48
271	A	11	10	1.	25	0.4
272	A	6	4	1.	25	0.16
273	A	8	8	1.	25	0.32
274	A	9	9	1.	25	0.36
275	A	6	5	1.	13	0.385
276	A	7	8	1.	25	0.32
277	A	7	9	1.	25	0.36
278	A	5	5	1.	23	0.217
279	A	8	9	1.	25	0.36
280	A	14	12	1.	25	0.48
281	A	12	12	1.	25	0.48
282	A	7	7	1.	22	0.318
283	A	4	4	1.	25	0.16
284	A	6	8	1.	25	0.32
285	A	7	9	1.	25	0.36
286	A	7	8	1.	25	0.32
287	A	7	8	1.	25	0.32
288	A	6	8	1.	25	0.32
289	A	4	4	1.	23	0.174
290	A	11	9	1.	25	0.36
291	A	12	11	1.	25	0.44
292	A	11	11	1.	25	0.44
293	A	3	3	1.	22	0.136
294	A	5	7	1.	25	0.28
295	A	6	8	1.	25	0.32
296	A	8	10	1.	25	0.4

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
297	A	9	8	1.	25	0.32
298	A	7	8	1.	25	0.32
299	A	6	8	1.	25	0.32
300	A	5	5	1.	23	0.217
301	A	15	9	1.	25	0.36
302	A	13	13	1.01	25	0.52
303	A	12	13	1.	25	0.52
304	A	11	11	1.	25	0.44
305	A	4	4	1.	25	0.16
306	A	5	5	1.	22	0.227
307	A	6	9	1.	25	0.36
308	A	7	10	1.	25	0.4
309	A	8	10	1.	33	0.303
310	A	6	6	1.	31	0.194
311	A	8	9	1.	33	0.273
312	A	13	11	1.	33	0.333
313	A	12	12	1.	33	0.364
314	A	7	7	1.	30	0.233
315	A	4	4	1.	33	0.121
316	A	6	8	1.	33	0.242
317	A	5	5	1.	13	0.385
318	A	3	3	1.	25	0.12
319	A	4	4	1.	25	0.16
320	A	3	2	1.	23	0.087
321	A	1	1	1.	16	0.062
322	A	0	0	0.	0	0.
323	A	0	0	0.	0	0.
324	A	26	6	1.	22	0.273
325	A	20	6	1.	22	0.273
326	A	14	11	1.	20	0.55
327	A	0	0	0.	0	0.
328	A	0	0	0.	0	0.

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
329	A	9	7	1.	23	0.304
330	A	8	7	1.	23	0.304
331	A	7	7	1.	21	0.333
332	A	6	6	1.	20	0.3
333	A	3	3	1.	23	0.13
334	A	2	2	1.	23	0.087
335	A	6	7	1.	23	0.304
336	A	7	7	1.	23	0.304
337	A	9	7	1.	21	0.333
338	A	8	7	1.	21	0.333
339	A	7	7	1.	19	0.368
340	A	6	6	1.	18	0.333
341	A	3	3	1.	21	0.143
342	A	2	2	1.	21	0.095
343	A	6	7	1.	21	0.333
344	A	7	7	1.	21	0.333
345	A	2	2	1.	22	0.091
346	A	2	2	1.	23	0.087
347	A	2	2	1.	25	0.08
348	A	4	4	1.	18	0.222
349	A	4	4	1.	18	0.222
350	A	3	3	1.	22	0.136
351	A	5	4	1.	27	0.148
352	A	5	4	1.	27	0.148
353	A	5	4	1.26	25	0.16
354	A	1	1	1.	18	0.056
355	A	3	3	1.	27	0.111
356	A	3	3	1.	27	0.111
357	A	5	4	1.	27	0.148
358	A	5	4	1.	27	0.148
359	A	7	7	0.79	29	0.241
360	A	7	8	0.82	29	0.276

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
361	A	7	8	0.86	27	0.296
362	A	2	2	1.	20	0.1
363	A	4	4	1.	29	0.138
364	A	4	4	1.	29	0.138
365	A	7	7	1.	29	0.241
366	A	12	9	1.	29	0.31
367	A	4	3	1.	21	0.143
368	A	4	3	1.	21	0.143
369	A	4	3	1.	19	0.158
370	A	4	4	1.	21	0.19
371	A	2	2	0.89	21	0.095
372	A	2	2	0.89	21	0.095
373	A	4	3	1.	21	0.143
374	A	4	3	1.	21	0.143
375	A	3	2	0.86	18	0.111
376	A	4	3	0.87	21	0.143
377	A	2	2	0.89	21	0.095
378	A	2	2	0.89	21	0.095
379	A	4	4	1.	23	0.174
380	A	4	4	1.	23	0.174
381	A	4	4	1.	21	0.19
382	A	5	6	0.84	23	0.261
383	A	4	4	0.84	23	0.174
384	A	4	4	0.85	23	0.174
385	A	4	4	1.	23	0.174
386	A	4	4	1.	23	0.174
387	A	2	2	0.84	20	0.1
388	A	3	3	0.85	23	0.13
389	A	4	4	0.86	23	0.174
390	A	4	4	0.86	23	0.174
391	A	4	4	0.86	23	0.174
392	A	4	4	1.	23	0.174

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
393	A	4	4	1.	23	0.174
394	A	4	4	1.	21	0.19
395	A	5	6	0.82	23	0.261
396	A	4	4	0.84	23	0.174
397	A	4	4	0.84	23	0.174
398	A	4	4	1.	23	0.174
399	A	4	4	1.	23	0.174
400	A	2	2	0.83	20	0.1
401	A	3	3	0.84	23	0.13
402	A	4	4	0.84	23	0.174
403	A	4	4	0.85	23	0.174
404	A	4	4	0.85	23	0.174
405	A	4	4	0.84	23	0.174
406	A	0	0	0.	0	0.
407	A	0	0	0.	0	0.
408	A	2	2	1.	23	0.087
409	A	0	0	0.	0	0.
410	A	0	0	0.	0	0.
411	A	0	0	0.	0	0.
412	A	0	0	0.	0	0.
413	A	0	0	0.	0	0.
414	A	0	0	0.	0	0.
415	A	5	5	1.	23	0.217
416	A	0	0	0.	0	0.
417	A	0	0	0.	0	0.
418	A	0	0	0.	0	0.
419	A	0	0	0.	0	0.
420	A	4	4	1.	25	0.16
421	A	5	6	0.82	23	0.261
422	A	5	6	0.84	23	0.261
423	A	4	4	1.	21	0.19
424	A	2	2	1.	23	0.087

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
425	A	5	5	1.	23	0.217
426	A	10	8	1.	23	0.348
427	A	10	5	1.	25	0.2
428	A	8	5	1.	25	0.2
429	A	6	5	1.	23	0.217
430	A	3	3	1.	25	0.12
431	A	7	6	1.	25	0.24
432	A	14	8	1.	25	0.32
433	A	23	9	1.	25	0.36
434	A	17	9	1.	25	0.36
435	A	12	9	1.	25	0.36
436	A	8	9	1.	25	0.36
437	A	11	9	1.	25	0.36
438	A	15	9	1.	25	0.36
439	A	20	9	1.	25	0.36
440	A	9	5	1.	25	0.2
441	A	7	5	1.	25	0.2
442	A	5	4	1.	23	0.174
443	A	1	1	1.	16	0.062
444	A	0	0	0.	0	0.
445	A	0	0	0.	0	0.
446	A	3	3	1.	26	0.115
447	A	3	3	1.	32	0.094
448	A	13	4	1.	27	0.148
449	A	10	4	1.	27	0.148
450	A	7	4	1.	25	0.16
451	A	2	2	1.	18	0.111
452	A	0	0	0.	0	0.
453	A	0	0	0.	0	0.
454	A	7	5	1.31	23	0.217
455	A	13	10	1.38	25	0.4
456	A	17	11	1.38	25	0.44

Chapter 3

Listing of integrals

3.1 $\int x^3(d+ex)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=48

$$\frac{1}{20}\left(5dx^4+4ex^5\right)(a+b\log(cx^n))-\frac{1}{16}bdnx^4-\frac{1}{25}benx^5$$

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^5)/25 + ((5*d*x^4 + 4*e*x^5)*(a + b*Log[c*x^n]))
/20
```

Rubi [A] time = 0.0516624, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {43, 2334, 12}

$$\frac{1}{20}\left(5dx^4+4ex^5\right)(a+b\log(cx^n))-\frac{1}{16}bdnx^4-\frac{1}{25}benx^5$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^5)/25 + ((5*d*x^4 + 4*e*x^5)*(a + b*Log[c*x^n]))
/20
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}
\int x^3(d+ex)(a+b\log(cx^n))\,dx &= \frac{1}{20}\left(5dx^4+4ex^5\right)(a+b\log(cx^n))-(bn)\int \frac{1}{20}x^3(5d+4ex)\,dx\\
&= \frac{1}{20}\left(5dx^4+4ex^5\right)(a+b\log(cx^n))-\frac{1}{20}(bn)\int x^3(5d+4ex)\,dx\\
&= \frac{1}{20}\left(5dx^4+4ex^5\right)(a+b\log(cx^n))-\frac{1}{20}(bn)\int \left(5dx^3+4ex^4\right)\,dx\\
&= -\frac{1}{16}bdnx^4-\frac{1}{25}benx^5+\frac{1}{20}\left(5dx^4+4ex^5\right)(a+b\log(cx^n))
\end{aligned}$$

Mathematica [A] time = 0.0244789, size = 48, normalized size = 1.

$$\frac{1}{400}x^4\left(20a(5d+4ex)+20b(5d+4ex)\log(cx^n)-bn(25d+16ex)\right)$$

Antiderivative was successfully verified.

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

```
[Out] (x^4*(20*a*(5*d + 4*e*x) - b*n*(25*d + 16*e*x) + 20*b*(5*d + 4*e*x)*Log[c*x
^n]))/400
```

Maple [C] time = 0.191, size = 264, normalized size = 5.5

$$\frac{bx^4(4ex+5d)\ln(x^n)}{20}+\frac{i}{10}\pi bex^5\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-\frac{i}{10}\pi bex^5\mathrm{csgn}(ix^n)\mathrm{csgn}(icx^n)\mathrm{csgn}(ic)-\frac{i}{10}\pi bex^5(\mathrm{csgn}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/20*b*x^4*(4*e*x+5*d)*ln(x^n)+1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*e*x^5*c
sgn(I*c*x^n)^3+1/10*I*Pi*b*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*ln(c)*b*e*x^
5-1/25*b*e*n*x^5+1/5*a*e*x^5+1/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-1
/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*d*x^4*csgn(I
*c*x^n)^3+1/8*I*Pi*b*d*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*ln(c)*b*d*x^4-1/16
*b*d*n*x^4+1/4*a*d*x^4
```

Maxima [A] time = 1.15044, size = 77, normalized size = 1.6

$$-\frac{1}{25}benx^5+\frac{1}{5}bex^5\log(cx^n)-\frac{1}{16}bdnx^4+\frac{1}{5}aex^5+\frac{1}{4}bdx^4\log(cx^n)+\frac{1}{4}adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*b*e*n*x^5 + 1/5*b*e*x^5*log(c*x^n) - 1/16*b*d*n*x^4 + 1/5*a*e*x^5 + 1
/4*b*d*x^4*log(c*x^n) + 1/4*a*d*x^4
```

Fricas [A] time = 0.985886, size = 181, normalized size = 3.77

$$-\frac{1}{25}(ben-5ae)x^5-\frac{1}{16}(bdn-4ad)x^4+\frac{1}{20}\left(4bex^5+5bdx^4\right)\log(c)+\frac{1}{20}\left(4benx^5+5bdnx^4\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*(b*e*n - 5*a*e)*x^5 - 1/16*(b*d*n - 4*a*d)*x^4 + 1/20*(4*b*e*x^5 + 5*
b*d*x^4)*log(c) + 1/20*(4*b*e*n*x^5 + 5*b*d*n*x^4)*log(x)
```

Sympy [B] time = 9.23149, size = 87, normalized size = 1.81

$$\frac{adx^4}{4} + \frac{aex^5}{5} + \frac{bdnx^4\log(x)}{4} - \frac{bdnx^4}{16} + \frac{bdx^4\log(c)}{4} + \frac{benx^5\log(x)}{5} - \frac{benx^5}{25} + \frac{bex^5\log(c)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d*x**4/4 + a*e*x**5/5 + b*d*n*x**4*log(x)/4 - b*d*n*x**4/16 + b*d*x**4*lo
g(c)/4 + b*e*n*x**5*log(x)/5 - b*e*n*x**5/25 + b*e*x**5*log(c)/5
```

Giac [A] time = 1.24925, size = 99, normalized size = 2.06

$$\frac{1}{5}\,bnx^5e\log(x) - \frac{1}{25}\,bnx^5e + \frac{1}{5}\,bx^5e\log(c) + \frac{1}{4}\,bdnx^4\log(x) - \frac{1}{16}\,bdnx^4 + \frac{1}{5}\,ax^5e + \frac{1}{4}\,bdx^4\log(c) + \frac{1}{4}\,adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*n*x^5*e*log(x) - 1/25*b*n*x^5*e + 1/5*b*x^5*e*log(c) + 1/4*b*d*n*x^4*
log(x) - 1/16*b*d*n*x^4 + 1/5*a*x^5*e + 1/4*b*d*x^4*log(c) + 1/4*a*d*x^4
```

3.2 $\int x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bdnx^3-\frac{1}{16}benx^4$$

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^4)/16 + ((4*d*x^3 + 3*e*x^4)*(a + b*Log[c*x^n]))/
12
```

Rubi [A] time = 0.0501997, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {43, 2334, 12}

$$\frac{1}{12}\left(4dx^3+3ex^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bdnx^3-\frac{1}{16}benx^4$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^4)/16 + ((4*d*x^3 + 3*e*x^4)*(a + b*Log[c*x^n]))/
12
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$
\begin{aligned}
\int x^2(d+ex)(a+b\log(cx^n))\,dx &= \frac{1}{12}\left(4dx^3+3ex^4\right)(a+b\log(cx^n))-(bn)\int \frac{1}{12}x^2(4d+3ex)\,dx\\
&= \frac{1}{12}\left(4dx^3+3ex^4\right)(a+b\log(cx^n))-\frac{1}{12}(bn)\int x^2(4d+3ex)\,dx\\
&= \frac{1}{12}\left(4dx^3+3ex^4\right)(a+b\log(cx^n))-\frac{1}{12}(bn)\int \left(4dx^2+3ex^3\right)\,dx\\
&= -\frac{1}{9}bdnx^3-\frac{1}{16}benx^4+\frac{1}{12}\left(4dx^3+3ex^4\right)(a+b\log(cx^n))
\end{aligned}
$$

Mathematica [A] time = 0.0237083, size = 45, normalized size = 0.94

$$\frac{1}{144}x^3(48ad+36aex+12b(4d+3ex)\log(cx^n)-16bdn-9benx)$$

Antiderivative was successfully verified.

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

```
[Out] (x^3*(48*a*d - 16*b*d*n + 36*a*e*x - 9*b*e*n*x + 12*b*(4*d + 3*e*x)*Log[c*x
^n]))/144
```

Maple [C] time = 0.234, size = 264, normalized size = 5.5

$$\frac{bx^3(3ex+4d)\ln(x^n)}{12}+\frac{i}{8}\pi bex^4\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-\frac{i}{8}\pi bex^4\mathrm{csgn}(ix^n)\mathrm{csgn}(icx^n)\mathrm{csgn}(ic)-\frac{i}{8}\pi bex^4(\mathrm{csgn}(icx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/12*b*x^3*(3*e*x+4*d)*ln(x^n)+1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*e*x^4*csgn
(I*c*x^n)^3+1/8*I*Pi*b*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*ln(c)*b*e*x^4-1/
16*b*e*n*x^4+1/4*a*e*x^4+1/6*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I
*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*d*x^3*csgn(I*c*x
^n)^3+1/6*I*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*ln(c)*b*d*x^3-1/9*b*d*
n*x^3+1/3*a*d*x^3
```

Maxima [A] time = 1.16551, size = 77, normalized size = 1.6

$$-\frac{1}{16}\,benx^4+\frac{1}{4}\,bex^4\log\left(cx^n\right)-\frac{1}{9}\,bdnx^3+\frac{1}{4}\,aex^4+\frac{1}{3}\,bdx^3\log\left(cx^n\right)+\frac{1}{3}\,adx^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*b*e*n*x^4 + 1/4*b*e*x^4*log(c*x^n) - 1/9*b*d*n*x^3 + 1/4*a*e*x^4 + 1/
3*b*d*x^3*log(c*x^n) + 1/3*a*d*x^3
```

Fricas [A] time = 0.957587, size = 180, normalized size = 3.75

$$-\frac{1}{16}\,(ben-4\,ae)x^4-\frac{1}{9}\,(bdn-3\,ad)x^3+\frac{1}{12}\left(3\,bex^4+4\,bdx^3\right)\log\left(c\right)+\frac{1}{12}\left(3\,benx^4+4\,bdnx^3\right)\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*(b*e*n - 4*a*e)*x^4 - 1/9*(b*d*n - 3*a*d)*x^3 + 1/12*(3*b*e*x^4 + 4*b
*d*x^3)*log(c) + 1/12*(3*b*e*n*x^4 + 4*b*d*n*x^3)*log(x)
```

Sympy [B] time = 3.34002, size = 87, normalized size = 1.81

$$\frac{adx^3}{3}+\frac{aex^4}{4}+\frac{bdnx^3\log\left(x\right)}{3}-\frac{bdnx^3}{9}+\frac{bdx^3\log\left(c\right)}{3}+\frac{benx^4\log\left(x\right)}{4}-\frac{benx^4}{16}+\frac{bex^4\log\left(c\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d*x**3/3 + a*e*x**4/4 + b*d*n*x**3*log(x)/3 - b*d*n*x**3/9 + b*d*x**3*log
(c)/3 + b*e*n*x**4*log(x)/4 - b*e*n*x**4/16 + b*e*x**4*log(c)/4
```

<u>Giac</u> [A] time = 1.25848, size = 99, normalized size = 2.06

$$\frac{1}{4}\,bnx^{4}e\log\left(x\right)-\frac{1}{16}\,bnx^{4}e+\frac{1}{4}\,bx^{4}e\log\left(c\right)+\frac{1}{3}\,bdnx^{3}\log\left(x\right)-\frac{1}{9}\,bdnx^{3}+\frac{1}{4}\,ax^{4}e+\frac{1}{3}\,bdx^{3}\log\left(c\right)+\frac{1}{3}\,adx^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*n*x^4*e*log(x) - 1/16*b*n*x^4*e + 1/4*b*x^4*e*log(c) + 1/3*b*d*n*x^3*
log(x) - 1/9*b*d*n*x^3 + 1/4*a*x^4*e + 1/3*b*d*x^3*log(c) + 1/3*a*d*x^3
```

3.3 $\int x(d+ex)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=48

$$\frac{1}{6}\left(3dx^2+2ex^3\right)(a+b\log(cx^n))-\frac{1}{4}bdnx^2-\frac{1}{9}benx^3$$

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^3)/9 + ((3*d*x^2 + 2*e*x^3)*(a + b*Log[c*x^n]))/6
```

Rubi [A] time = 0.0361271, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {43, 2334, 12}

$$\frac{1}{6}\left(3dx^2+2ex^3\right)(a+b\log(cx^n))-\frac{1}{4}bdnx^2-\frac{1}{9}benx^3$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^3)/9 + ((3*d*x^2 + 2*e*x^3)*(a + b*Log[c*x^n]))/6
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$
\begin{aligned}
\int x(d+ex)\,(a+b\log(cx^n))\,dx &= \frac{1}{6}\left(3dx^2+2ex^3\right)(a+b\log(cx^n)) - (bn)\int \frac{1}{6}x(3d+2ex)\,dx \\
&= \frac{1}{6}\left(3dx^2+2ex^3\right)(a+b\log(cx^n)) - \frac{1}{6}(bn)\int x(3d+2ex)\,dx \\
&= \frac{1}{6}\left(3dx^2+2ex^3\right)(a+b\log(cx^n)) - \frac{1}{6}(bn)\int \left(3dx+2ex^2\right)\,dx \\
&= -\frac{1}{4}bdnx^2 - \frac{1}{9}benx^3 + \frac{1}{6}\left(3dx^2+2ex^3\right)(a+b\log(cx^n))
\end{aligned}
$$

Mathematica [A] time = 0.0193183, size = 48, normalized size = 1.

$$\frac{1}{36}x^2\left(6a(3d+2ex)+6b(3d+2ex)\log(cx^n)-bn(9d+4ex)\right)$$

Antiderivative was successfully verified.

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

```
[Out] (x^2*(6*a*(3*d + 2*e*x) - b*n*(9*d + 4*e*x) + 6*b*(3*d + 2*e*x)*Log[c*x^n])
)/36
```

Maple [C] time = 0.207, size = 264, normalized size = 5.5

$$\frac{bx^2\left(2\,ex+3\,d\right)\ln(x^n)}{6}+\frac{i}{6}\pi\,bex^3\mathrm{csgn}(ix^n)\left(\mathrm{csgn}(icx^n)\right)^2-\frac{i}{6}\pi\,bex^3\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-\frac{i}{6}\pi\,bex^3\left(\mathrm{csgn}(icx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*b*x^2*(2*e*x+3*d)*ln(x^n)+1/6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-
1/6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*e*x^3*csgn(
I*c*x^n)^3+1/6*I*Pi*b*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*ln(c)*b*e*x^3-1/9
*b*e*n*x^3+1/3*a*e*x^3+1/4*I*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*P
i*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d*x^2*csgn(I*c*x^n
)^3+1/4*I*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*ln(c)*b*d*x^2-1/4*b*d*n*
x^2+1/2*a*d*x^2
```

Maxima [A] time = 1.18804, size = 77, normalized size = 1.6

$$-\frac{1}{9}\,benx^3+\frac{1}{3}\,bex^3\log\left(cx^n\right)-\frac{1}{4}\,bdnx^2+\frac{1}{3}\,aex^3+\frac{1}{2}\,bdx^2\log\left(cx^n\right)+\frac{1}{2}\,adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*b*e*n*x^3 + 1/3*b*e*x^3*log(c*x^n) - 1/4*b*d*n*x^2 + 1/3*a*e*x^3 + 1/2
*b*d*x^2*log(c*x^n) + 1/2*a*d*x^2
```

Fricas [A] time = 1.00222, size = 176, normalized size = 3.67

$$-\frac{1}{9}\,(ben-3\,ae)x^3-\frac{1}{4}\,(bdn-2\,ad)x^2+\frac{1}{6}\left(2\,bex^3+3\,bdx^2\right)\log\left(c\right)+\frac{1}{6}\left(2\,benx^3+3\,bdnx^2\right)\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*(b*e*n - 3*a*e)*x^3 - 1/4*(b*d*n - 2*a*d)*x^2 + 1/6*(2*b*e*x^3 + 3*b*d
*x^2)*log(c) + 1/6*(2*b*e*n*x^3 + 3*b*d*n*x^2)*log(x)
```

Sympy [B] time = 4.01117, size = 87, normalized size = 1.81

$$\frac{adx^2}{2}+\frac{aex^3}{3}+\frac{bdnx^2\log\left(x\right)}{2}-\frac{bdnx^2}{4}+\frac{bdx^2\log\left(c\right)}{2}+\frac{benx^3\log\left(x\right)}{3}-\frac{benx^3}{9}+\frac{bex^3\log\left(c\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d*x**2/2 + a*e*x**3/3 + b*d*n*x**2*log(x)/2 - b*d*n*x**2/4 + b*d*x**2*log
(c)/2 + b*e*n*x**3*log(x)/3 - b*e*n*x**3/9 + b*e*x**3*log(c)/3
```

Giac [A] time = 1.22798, size = 99, normalized size = 2.06

$$\frac{1}{3}\,bnx^3e\log\left(x\right) - \frac{1}{9}\,bnx^3e + \frac{1}{3}\,bx^3e\log\left(c\right) + \frac{1}{2}\,bdnx^2\log\left(x\right) - \frac{1}{4}\,bdnx^2 + \frac{1}{3}\,ax^3e + \frac{1}{2}\,bdx^2\log\left(c\right) + \frac{1}{2}\,adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b*n*x^3*e*log(x) - 1/9*b*n*x^3*e + 1/3*b*x^3*e*log(c) + 1/2*b*d*n*x^2*l
og(x) - 1/4*b*d*n*x^2 + 1/3*a*x^3*e + 1/2*b*d*x^2*log(c) + 1/2*a*d*x^2
```

3.4 $\int (d+ex)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=48

$$dx(a+b\log(cx^n))+\frac{1}{2}ex^2(a+b\log(cx^n))-bdnx-\frac{1}{4}benx^2$$

```
[Out] -(b*d*n*x) - (b*e*n*x^2)/4 + d*x*(a + b*Log[c*x^n]) + (e*x^2*(a + b*Log[c*x
^n]))/2
```

Rubi [A] time = 0.0163162, antiderivative size = 41, normalized size of antiderivative = 0.85, number of steps used = 2, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2313}

$$\frac{1}{2}\left(2dx+ex^2\right)(a+b\log(cx^n))-bdnx-\frac{1}{4}benx^2$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d*n*x) - (b*e*n*x^2)/4 + ((2*d*x + e*x^2)*(a + b*Log[c*x^n]))/2
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\begin{aligned}\int (d+ex)(a+b\log(cx^n))\,dx &= \frac{1}{2}\left(2dx+ex^2\right)(a+b\log(cx^n))-(bn)\int\left(d+\frac{ex}{2}\right)dx\\ &= -bdnx-\frac{1}{4}benx^2+\frac{1}{2}\left(2dx+ex^2\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0017839, size = 55, normalized size = 1.15

$$adx+\frac{1}{2}aex^2+bdx\log(cx^n)+\frac{1}{2}bex^2\log(cx^n)-bdnx-\frac{1}{4}benx^2$$

Antiderivative was successfully verified.

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

```
[Out] a*d*x - b*d*n*x + (a*e*x^2)/2 - (b*e*n*x^2)/4 + b*d*x*Log[c*x^n] + (b*e*x^2
*Log[c*x^n])/2
```

Maple [A] time = 0.054, size = 52, normalized size = 1.1

$$axd + \frac{aex^2}{2} + xb\ln(cx^n)\,d - bdnx + \frac{bex^2\ln\left(ce^{n\ln(x)}\right)}{2} - \frac{benx^2}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*x*d+1/2*a*e*x^2+x*b*ln(c*x^n)*d-b*d*n*x+1/2*b*e*x^2*ln(c*exp(n*ln(x)))-1/
4*b*e*n*x^2
```

Maxima [A] time = 1.19946, size = 66, normalized size = 1.38

$$-\frac{1}{4}\,benx^2 + \frac{1}{2}\,bex^2\log(cx^n) - bdnx + \frac{1}{2}\,aex^2 + bdx\log(cx^n) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*b*e*n*x^2 + 1/2*b*e*x^2*log(c*x^n) - b*d*n*x + 1/2*a*e*x^2 + b*d*x*log
(c*x^n) + a*d*x
```

Fricas [A] time = 0.9753, size = 154, normalized size = 3.21

$$-\frac{1}{4}\,(ben - 2\,ae)x^2 - (bdn - ad)x + \frac{1}{2}\left(bex^2 + 2\,bdx\right)\log(c) + \frac{1}{2}\left(benx^2 + 2\,bdnx\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*(b*e*n - 2*a*e)*x^2 - (b*d*n - a*d)*x + 1/2*(b*e*x^2 + 2*b*d*x)*log(c)
 + 1/2*(b*e*n*x^2 + 2*b*d*n*x)*log(x)
```

Sympy [A] time = 0.823084, size = 73, normalized size = 1.52

$$adx + \frac{aex^2}{2} + bdnx\log(x) - bdnx + bdx\log(c) + \frac{benx^2\log(x)}{2} - \frac{benx^2}{4} + \frac{bex^2\log(c)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d*x + a*e*x**2/2 + b*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + b*e*n*x**2*l
og(x)/2 - b*e*n*x**2/4 + b*e*x**2*log(c)/2
```

Giac [A] time = 1.30296, size = 84, normalized size = 1.75

$$\frac{1}{2}bnx^2e\log(x) - \frac{1}{4}bnx^2e + \frac{1}{2}bx^2e\log(c) + bdnx\log(x) - bdnx + \frac{1}{2}ax^2e + bdx\log(c) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*n*x^2*e*log(x) - 1/4*b*n*x^2*e + 1/2*b*x^2*e*log(c) + b*d*n*x*log(x)
- b*d*n*x + 1/2*a*x^2*e + b*d*x*log(c) + a*d*x
```

3.5 $\int \frac{(d+ex)(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=44

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+aex+bex\log\left(cx^n\right)-benx$$

```
[Out] a*e*x - b*e*n*x + b*e*x*Log[c*x^n] + (d*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Rubi [A] time = 0.0489701, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2346, 2301, 2295}

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2bn}+aex+bex\log\left(cx^n\right)-benx$$

Antiderivative was successfully verified.

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

```
[Out] a*e*x - b*e*n*x + b*e*x*Log[c*x^n] + (d*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex)(a+b\log(cx^n))}{x}\,dx = d\int \frac{a+b\log(cx^n)}{x}\,dx + e\int (a+b\log(cx^n))\,dx$$
$$= aex + \frac{d(a+b\log(cx^n))^2}{2bn} + (be)\int \log(cx^n)\,dx$$
$$= aex - benx + bex\log(cx^n) + \frac{d(a+b\log(cx^n))^2}{2bn}$$

Mathematica [A] time = 0.001957, size = 43, normalized size = 0.98

$$ad\log(x) + aex + \frac{bd\log^2(cx^n)}{2n} + bex\log(cx^n) - benx$$

Antiderivative was successfully verified.

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

```
[Out] a*e*x - b*e*n*x + a*d*Log[x] + b*e*x*Log[c*x^n] + (b*d*Log[c*x^n]^2)/(2*n)
```

Maple [A] time = 0.06, size = 46, normalized size = 1.1

$$\ln(x)\,ad + aex + bex\ln\left(ce^{n\ln(x)}\right) + \frac{bd\left(\ln\left(ce^{n\ln(x)}\right)\right)^2}{2n} - benx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ln(x)*a*d+a*e*x+b*e*x*ln(c*exp(n*ln(x)))+1/2*b*d/n*ln(c*exp(n*ln(x)))^2-b*e
*n*x
```

Maxima [A] time = 1.08083, size = 55, normalized size = 1.25

$$-benx + bex\log(cx^n) + aex + \frac{bd\log(cx^n)^2}{2n} + ad\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*e*n*x + b*e*x*log(c*x^n) + a*e*x + 1/2*b*d*log(c*x^n)^2/n + a*d*log(x)
```

Fricas [A] time = 1.00115, size = 123, normalized size = 2.8

$$\frac{1}{2}bdn\log(x)^2 + bex\log(c) - (ben - ae)x + (benx + bd\log(c) + ad)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*d*n*log(x)^2 + b*e*x*log(c) - (b*e*n - a*e)*x + (b*e*n*x + b*d*log(c)
 + a*d)*log(x)
```

Sympy [A] time = 2.85682, size = 58, normalized size = 1.32

$$ad\log(x) + aex + \frac{bdn\log(x)^2}{2} + bd\log(c)\log(x) + benx\log(x) - benx + bex\log(c)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d*log(x) + a*e*x + b*d*n*log(x)**2/2 + b*d*log(c)*log(x) + b*e*n*x*log(x)
 - b*e*n*x + b*e*x*log(c)
```

Giac [A] time = 1.28203, size = 66, normalized size = 1.5

$$bnxe\log(x) + \frac{1}{2}bdn\log(x)^2 - bnxe + bxe\log(c) + bd\log(c)\log(x) + axe + ad\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*n*x*e*log(x) + 1/2*b*d*n*log(x)^2 - b*n*x*e + b*x*e*log(c) + b*d*log(c)*l
og(x) + a*x*e + a*d*log(x)
```

3.6 $\int \frac{(d+ex)(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=48

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2bn}-\frac{bdn}{x}$$

```
[Out] -((b*d*n)/x) - (d*(a + b*Log[c*x^n]))/x + (e*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Rubi [A] time = 0.0497989, antiderivative size = 43, normalized size of antiderivative = 0.9, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {43, 2334, 14, 2301}

$$-\left(\frac{d}{x}-e\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{x}-\frac{1}{2}ben\log^2(x)$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d*n)/x) - (b*e*n*Log[x]^2)/2 - (d/x - e*Log[x])*(a + b*Log[c*x^n])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
```

```
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)(a+b\log(cx^n))}{x^2}\,dx &= -\left(\frac{d}{x}-e\log(x)\right)(a+b\log(cx^n))-(bn)\int \frac{-d+ex\log(x)}{x^2}\,dx\\ &= -\left(\frac{d}{x}-e\log(x)\right)(a+b\log(cx^n))-(bn)\int \left(-\frac{d}{x^2}+\frac{e\log(x)}{x}\right)dx\\ &= -\frac{bdn}{x}-\left(\frac{d}{x}-e\log(x)\right)(a+b\log(cx^n))-(ben)\int \frac{\log(x)}{x}\,dx\\ &= -\frac{bdn}{x}-\frac{1}{2}ben\log^2(x)-\left(\frac{d}{x}-e\log(x)\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0254346, size = 48, normalized size = 1.

$$-\frac{d(a+b\log(cx^n))}{x}+\frac{e(a+b\log(cx^n))^2}{2bn}-\frac{bdn}{x}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d*n)/x) - (d*(a + b*Log[c*x^n]))/x + (e*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Maple [C] time = 0.139, size = 250, normalized size = 5.2

$$-\frac{b(-ex\ln(x)+d)\ln(x^n)}{x}-\frac{-i\ln(x)\pi be\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2x+i\ln(x)\pi be\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)\,x+i\ln(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*(-e*x*ln(x)+d)/x*ln(x^n)-1/2*(-I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^
2*x+I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+I*ln(x)*Pi*b*e*csg
n(I*c*x^n)^3*x-I*ln(x)*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x+I*Pi*b*d*csgn(I*x
^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*c
sgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+e*n*b*ln(x)^2*x-2*ln(x)*l
n(c)*b*e*x-2*ln(x)*a*e*x+2*ln(c)*b*d+2*b*d*n+2*a*d)/x
```

Maxima [A] time = 1.15116, size = 66, normalized size = 1.38

$$\frac{be\log\left(cx^{n}\right)^{2}}{2\,n}+ae\log\left(x\right)-\frac{bdn}{x}-\frac{bd\log\left(cx^{n}\right)}{x}-\frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*e*log(c*x^n)^2/n + a*e*log(x) - b*d*n/x - b*d*log(c*x^n)/x - a*d/x
```

Fricas [A] time = 1.02131, size = 136, normalized size = 2.83

$$\frac{benx\log\left(x\right)^{2}-2\,bdn-2\,bd\log\left(c\right)-2\,ad+2\,\left(bex\log\left(c\right)-bdn+aex\right)\log\left(x\right)}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(b*e*n*x*log(x)^2 - 2*b*d*n - 2*b*d*log(c) - 2*a*d + 2*(b*e*x*log(c) -
b*d*n + a*e*x)*log(x))/x
```

Sympy [A] time = 16.6151, size = 53, normalized size = 1.1

$$-\frac{ad}{x}+ae\log\left(x\right)+bd\left(-\frac{n}{x}-\frac{\log\left(cx^{n}\right)}{x}\right)-be\left(\begin{cases}-\log\left(c\right)\log\left(x\right) & \text{for}\: n=0\\-\frac{\log\left(cx^{n}\right)^{2}}{2n} & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d/x + a*e*log(x) + b*d*(-n/x - log(c*x**n)/x) - b*e*Piecewise((-log(c)*l
og(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

Giac [A] time = 1.26003, size = 76, normalized size = 1.58

$$\frac{bnxe\log{(x)}^2 + 2\,bxe\log{(c)}\log{(x)} - 2\,bdn\log{(x)} + 2\,axe\log{(x)} - 2\,bdn - 2\,bd\log{(c)} - 2\,ad}{2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(b*n*x*e*log(x)^2 + 2*b*x*e*log(c)*log(x) - 2*b*d*n*log(x) + 2*a*x*e*lo
g(x) - 2*b*d*n - 2*b*d*log(c) - 2*a*d)/x
```

3.7 $\int \frac{(d+ex)(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=60

$$-\frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2}+\frac{be^2n\log(x)}{2d}-\frac{bdn}{4x^2}-\frac{ben}{x}$$

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n)/x + (b*e^2*n*Log[x])/(2*d) - ((d + e*x)^2*(a + b
*Log[c*x^n]))/(2*d*x^2)
```

Rubi [A] time = 0.0492517, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {37, 2334, 12, 43}

$$-\frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)}{2dx^2}+\frac{be^2n\log(x)}{2d}-\frac{bdn}{4x^2}-\frac{ben}{x}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n)/x + (b*e^2*n*Log[x])/(2*d) - ((d + e*x)^2*(a + b
*Log[c*x^n]))/(2*d*x^2)
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)(a+b\log(cx^n))}{x^3}\,dx &= -\frac{(d+ex)^2(a+b\log(cx^n))}{2dx^2}-(bn)\int -\frac{(d+ex)^2}{2dx^3}\,dx\\ &= -\frac{(d+ex)^2(a+b\log(cx^n))}{2dx^2}+\frac{(bn)\int \frac{(d+ex)^2}{x^3}\,dx}{2d}\\ &= -\frac{(d+ex)^2(a+b\log(cx^n))}{2dx^2}+\frac{(bn)\int\left(\frac{d^2}{x^3}+\frac{2de}{x^2}+\frac{e^2}{x}\right)dx}{2d}\\ &= -\frac{bdn}{4x^2}-\frac{ben}{x}+\frac{be^2n\log(x)}{2d}-\frac{(d+ex)^2(a+b\log(cx^n))}{2dx^2}\end{aligned}$$

Mathematica [A] time = 0.0227524, size = 41, normalized size = 0.68

$$-\frac{2a(d+2ex)+2b(d+2ex)\log(cx^n)+bn(d+4ex)}{4x^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(2*a*(d + 2*e*x) + b*n*(d + 4*e*x) + 2*b*(d + 2*e*x)*Log[c*x^n])/(4*x^2)
```

Maple [C] time = 0.097, size = 232, normalized size = 3.9

$$-\frac{b(2ex+d)\ln(x^n)}{2x^2}-\frac{2i\pi bex\operatorname{csgn}(ix^n)(\operatorname{csgn}(icx^n))^2-2i\pi bex\operatorname{csgn}(ix^n)\operatorname{csgn}(icx^n)\operatorname{csgn}(ic)-2i\pi bex(\operatorname{csgn}(icx^n))^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(2*e*x+d)/x^2*ln(x^n)-1/4*(2*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-
2*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*e*x*csgn(I*c*x^n)
^3+2*I*Pi*b*e*x*csgn(I*c*x^n)^2*csgn(I*c)+4*ln(c)*b*e*x+4*b*e*n*x+4*a*e*x+I
*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+2*ln(c)*b
*d+b*d*n+2*a*d)/x^2
```

Maxima [A] time = 1.1398, size = 77, normalized size = 1.28

$$-\frac{ben}{x} - \frac{be\log\left(cx^{n}\right)}{x} - \frac{bdn}{4\,x^{2}} - \frac{ae}{x} - \frac{bd\log\left(cx^{n}\right)}{2\,x^{2}} - \frac{ad}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*e*n/x - b*e*log(c*x^n)/x - 1/4*b*d*n/x^2 - a*e/x - 1/2*b*d*log(c*x^n)/x^
2 - 1/2*a*d/x^2
```

Fricas [A] time = 0.975369, size = 140, normalized size = 2.33

$$-\frac{bdn + 2\,ad + 4\,(ben + ae)x + 2\,(2\,bex + bd)\log\left(c\right) + 2\,(2\,benx + bdn)\log\left(x\right)}{4\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*(b*d*n + 2*a*d + 4*(b*e*n + a*e)*x + 2*(2*b*e*x + b*d)*log(c) + 2*(2*b
*e*n*x + b*d*n)*log(x))/x^2
```

Sympy [A] time = 1.74062, size = 75, normalized size = 1.25

$$-\frac{ad}{2x^{2}} - \frac{ae}{x} - \frac{bdn\log\left(x\right)}{2x^{2}} - \frac{bdn}{4x^{2}} - \frac{bd\log\left(c\right)}{2x^{2}} - \frac{ben\log\left(x\right)}{x} - \frac{ben}{x} - \frac{be\log\left(c\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d/(2*x**2) - a*e/x - b*d*n*log(x)/(2*x**2) - b*d*n/(4*x**2) - b*d*log(c)
/(2*x**2) - b*e*n*log(x)/x - b*e*n/x - b*e*log(c)/x
```

Giac [A] time = 1.31876, size = 77, normalized size = 1.28

$$-\frac{4\,bnxe\log\left(x\right)+4\,bnxe+4\,bxe\log\left(c\right)+2\,bdn\log\left(x\right)+bdn+4\,axe+2\,bd\log\left(c\right)+2\,ad}{4\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*(4*b*n*x*e*log(x) + 4*b*n*x*e + 4*b*x*e*log(c) + 2*b*d*n*log(x) + b*d*
n + 4*a*x*e + 2*b*d*log(c) + 2*a*d)/x^2
```

3.8 $\int \frac{(d+ex)(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=57

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{bdn}{9x^3}-\frac{ben}{4x^2}$$

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n)/(4*x^2) - (d*(a + b*Log[c*x^n]))/(3*x^3) - (e*(a
 + b*Log[c*x^n]))/(2*x^2)
```

Rubi [A] time = 0.0447902, antiderivative size = 48, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {43, 2334, 12}

$$-\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{9x^3}-\frac{ben}{4x^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n)/(4*x^2) - (((2*d)/x^3 + (3*e)/x^2)*(a + b*Log[c*
x^n]))/6
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)}{x^4}\,dx &= -\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{-2d-3ex}{6x^4}\,dx\\ &= -\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int \frac{-2d-3ex}{x^4}\,dx\\ &= -\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{6}(bn)\int \left(-\frac{2d}{x^4}-\frac{3e}{x^3}\right)dx\\ &= -\frac{bdn}{9x^3}-\frac{ben}{4x^2}-\frac{1}{6}\left(\frac{2d}{x^3}+\frac{3e}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.0229789, size = 47, normalized size = 0.82

$$-\frac{6a(2d+3ex)+6b(2d+3ex)\log\left(cx^n\right)+bn(4d+9ex)}{36x^3}$$

Antiderivative was successfully verified.

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

```
[Out] -(6*a*(2*d + 3*e*x) + b*n*(4*d + 9*e*x) + 6*b*(2*d + 3*e*x)*Log[c*x^n])/(36
*x^3)
```

Maple [C] time = 0.11, size = 235, normalized size = 4.1

$$-\frac{b\,(3\,ex+2\,d)\ln\left(x^n\right)}{6\,x^3}-\frac{9\,i\pi\,bex\mathrm{csgn}\left(ix^n\right)\left(\mathrm{csgn}\left(icx^n\right)\right)^2-9\,i\pi\,bex\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(icx^n\right)\mathrm{csgn}\left(ic\right)-9\,i\pi\,bex\left(\mathrm{csgn}\left(icx^n\right)\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*b*(3*e*x+2*d)/x^3*ln(x^n)-1/36*(9*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)
^2-9*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*e*x*csgn(I*c*x
^n)^3+9*I*Pi*b*e*x*csgn(I*c*x^n)^2*csgn(I*c)+18*ln(c)*b*e*x+9*b*e*n*x+18*a*
```

```
e*x+6*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-6*I*Pi*b*d*csgn(I*c*x^n)^3+6*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I
*c)+12*ln(c)*b*d+4*b*d*n+12*a*d)/x^3
```

Maxima [A] time = 1.15926, size = 77, normalized size = 1.35

$$-\frac{ben}{4\,x^2}-\frac{be\log\left(cx^n\right)}{2\,x^2}-\frac{bdn}{9\,x^3}-\frac{ae}{2\,x^2}-\frac{bd\log\left(cx^n\right)}{3\,x^3}-\frac{ad}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*b*e*n/x^2 - 1/2*b*e*log(c*x^n)/x^2 - 1/9*b*d*n/x^3 - 1/2*a*e/x^2 - 1/3
*b*d*log(c*x^n)/x^3 - 1/3*a*d/x^3
```

Fricas [A] time = 1.04731, size = 154, normalized size = 2.7

$$-\frac{4\,bdn+12\,ad+9\,(ben+2\,ae)x+6\,(3\,bex+2\,bd)\log\left(c\right)+6\,(3\,benx+2\,bdn)\log\left(x\right)}{36\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(4*b*d*n + 12*a*d + 9*(b*e*n + 2*a*e)*x + 6*(3*b*e*x + 2*b*d)*log(c)
+ 6*(3*b*e*n*x + 2*b*d*n)*log(x))/x^3
```

Sympy [A] time = 2.55703, size = 88, normalized size = 1.54

$$-\frac{ad}{3x^3}-\frac{ae}{2x^2}-\frac{bdn\log\left(x\right)}{3x^3}-\frac{bdn}{9x^3}-\frac{bd\log\left(c\right)}{3x^3}-\frac{ben\log\left(x\right)}{2x^2}-\frac{ben}{4x^2}-\frac{be\log\left(c\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d/(3*x**3) - a*e/(2*x**2) - b*d*n*log(x)/(3*x**3) - b*d*n/(9*x**3) - b*d
*log(c)/(3*x**3) - b*e*n*log(x)/(2*x**2) - b*e*n/(4*x**2) - b*e*log(c)/(2*x
```

```
**2)
```

Giac [A] time = 1.2936, size = 78, normalized size = 1.37

$$-\frac{18\,bnxe\log\left(x\right)+9\,bnxe+18\,bxe\log\left(c\right)+12\,bdn\log\left(x\right)+4\,bdn+18\,axe+12\,bd\log\left(c\right)+12\,ad}{36\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(18*b*n*x*e*log(x) + 9*b*n*x*e + 18*b*x*e*log(c) + 12*b*d*n*log(x) +
4*b*d*n + 18*a*x*e + 12*b*d*log(c) + 12*a*d)/x^3
```

3.9 $\int x^3(d+ex)^2\,(a+b\log\left(cx^n\right))\,dx$

Optimal. Leaf size=74

$$\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)(a+b\log\left(cx^n\right))-\frac{1}{16}bd^2nx^4-\frac{2}{25}bdenx^5-\frac{1}{36}be^2nx^6$$

```
[Out] -(b*d^2*n*x^4)/16 - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^6)/36 + ((15*d^2*x^4 +
24*d*e*x^5 + 10*e^2*x^6)*(a + b*Log[c*x^n]))/60
```

Rubi [A] time = 0.0897376, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)(a+b\log\left(cx^n\right))-\frac{1}{16}bd^2nx^4-\frac{2}{25}bdenx^5-\frac{1}{36}be^2nx^6$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^2*n*x^4)/16 - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^6)/36 + ((15*d^2*x^4 +
24*d*e*x^5 + 10*e^2*x^6)*(a + b*Log[c*x^n]))/60
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^3(d+ex)^2\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{60}x^3\left(15d^2+24dex+10e\right.$$
$$=\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int x^3\left(15d^2+24dex+10e\right.$$
$$=\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int\left(15d^2x^3+24dex^4+10\right.$$
$$=-\frac{1}{16}bd^2nx^4-\frac{2}{25}bdenx^5-\frac{1}{36}be^2nx^6+\frac{1}{60}\left(15d^2x^4+24dex^5+10e^2x^6\right)\left(a+b\log\left(cx\right.\right.$$

Mathematica [A] time = 0.0507269, size = 81, normalized size = 1.09

$$\frac{x^4\left(60a\left(15d^2+24dex+10e^2x^2\right)+60b\left(15d^2+24dex+10e^2x^2\right)\log\left(cx^n\right)-bn\left(225d^2+288dex+100e^2x^2\right)\right)}{3600}$$

Antiderivative was successfully verified.

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

```
[Out] (x^4*(60*a*(15*d^2 + 24*d*e*x + 10*e^2*x^2) - b*n*(225*d^2 + 288*d*e*x + 10
0*e^2*x^2) + 60*b*(15*d^2 + 24*d*e*x + 10*e^2*x^2)*Log[c*x^n]))/3600
```

Maple [C] time = 0.245, size = 432, normalized size = 5.8

$$\frac{bx^4\left(10\,e^2x^2+24\,dex+15\,d^2\right)\ln\left(x^n\right)}{60}-\frac{i}{5}\pi\,bdex^5\left(\operatorname{csgn}\left(icx^n\right)\right)^3-\frac{i}{8}\pi\,bd^2x^4\left(\operatorname{csgn}\left(icx^n\right)\right)^3+\frac{i}{12}\pi\,be^2x^6\left(\operatorname{csgn}\left(icx^n\right)\right)^2\operatorname{csg}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/60*b*x^4*(10*e^2*x^2+24*d*e*x+15*d^2)*ln(x^n)-1/5*I*Pi*b*d*e*x^5*csgn(I*c
*x^n)^3-1/8*I*Pi*b*d^2*x^4*csgn(I*c*x^n)^3+1/12*I*Pi*b*e^2*x^6*csgn(I*c*x^n
```

```
)^2*csgn(I*c)+1/5*I*Pi*b*d*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*ln(c)*b*e^
2*x^6-1/36*b*e^2*n*x^6+1/6*a*e^2*x^6+1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)*csgn(I
*c*x^n)^2-1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/5*I*Pi*
b*d*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/8*I*Pi*b*d^2*x^4*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)+2/5*ln(c)*b*d*e*x^5-2/25*b*d*e*n*x^5+2/5*a*d*e*x^5-1/5*I*Pi
*b*d*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/8*I*Pi*b*d^2*x^4*csgn(I*c*
x^n)^2*csgn(I*c)-1/12*I*Pi*b*e^2*x^6*csgn(I*c*x^n)^3+1/8*I*Pi*b*d^2*x^4*csg
n(I*x^n)*csgn(I*c*x^n)^2+1/4*ln(c)*b*d^2*x^4-1/16*b*d^2*n*x^4+1/4*a*d^2*x^4
```

Maxima [A] time = 1.17073, size = 135, normalized size = 1.82

$$-\frac{1}{36}be^2nx^6+\frac{1}{6}be^2x^6\log(cx^n)-\frac{2}{25}bdenx^5+\frac{1}{6}ae^2x^6+\frac{2}{5}bdex^5\log(cx^n)-\frac{1}{16}bd^2nx^4+\frac{2}{5}adex^5+\frac{1}{4}bd^2x^4\log(cx^n)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*b*e^2*n*x^6 + 1/6*b*e^2*x^6*log(c*x^n) - 2/25*b*d*e*n*x^5 + 1/6*a*e^2
*x^6 + 2/5*b*d*e*x^5*log(c*x^n) - 1/16*b*d^2*n*x^4 + 2/5*a*d*e*x^5 + 1/4*b*
d^2*x^4*log(c*x^n) + 1/4*a*d^2*x^4
```

Fricas [A] time = 1.01816, size = 293, normalized size = 3.96

$$-\frac{1}{36}\left(be^2n-6\,ae^2\right)x^6-\frac{2}{25}\left(bden-5\,ade\right)x^5-\frac{1}{16}\left(bd^2n-4\,ad^2\right)x^4+\frac{1}{60}\left(10\,be^2x^6+24\,bdex^5+15\,bd^2x^4\right)\log(c)+\frac{1}{60}\Big($$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(b*e^2*n - 6*a*e^2)*x^6 - 2/25*(b*d*e*n - 5*a*d*e)*x^5 - 1/16*(b*d^2*
n - 4*a*d^2)*x^4 + 1/60*(10*b*e^2*x^6 + 24*b*d*e*x^5 + 15*b*d^2*x^4)*log(c)
 + 1/60*(10*b*e^2*n*x^6 + 24*b*d*e*n*x^5 + 15*b*d^2*n*x^4)*log(x)
```

Sympy [B] time = 14.3758, size = 158, normalized size = 2.14

$$\frac{ad^2x^4}{4}+\frac{2adex^5}{5}+\frac{ae^2x^6}{6}+\frac{bd^2nx^4\log(x)}{4}-\frac{bd^2nx^4}{16}+\frac{bd^2x^4\log(c)}{4}+\frac{2bdenx^5\log(x)}{5}-\frac{2bdenx^5}{25}+\frac{2bdex^5\log(c)}{5}+$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*x**4/4 + 2*a*d*e*x**5/5 + a*e**2*x**6/6 + b*d**2*n*x**4*log(x)/4 - b
*d**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + 2*b*d*e*n*x**5*log(x)/5 - 2*b*d*e*
n*x**5/25 + 2*b*d*e*x**5*log(c)/5 + b*e**2*n*x**6*log(x)/6 - b*e**2*n*x**6/
36 + b*e**2*x**6*log(c)/6
```

Giac [A] time = 1.33211, size = 166, normalized size = 2.24

$$\frac{1}{6}bnx^6e^2\log(x) + \frac{2}{5}bdnx^5e\log(x) - \frac{1}{36}bnx^6e^2 - \frac{2}{25}bdnx^5e + \frac{1}{6}bx^6e^2\log(c) + \frac{2}{5}bdx^5e\log(c) + \frac{1}{4}bd^2nx^4\log(x) - \frac{1}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*b*n*x^6*e^2*log(x) + 2/5*b*d*n*x^5*e*log(x) - 1/36*b*n*x^6*e^2 - 2/25*b
*d*n*x^5*e + 1/6*b*x^6*e^2*log(c) + 2/5*b*d*x^5*e*log(c) + 1/4*b*d^2*n*x^4*
log(x) - 1/16*b*d^2*n*x^4 + 1/6*a*x^6*e^2 + 2/5*a*d*x^5*e + 1/4*b*d^2*x^4*l
og(c) + 1/4*a*d^2*x^4
```

3.10 $\int x^2(d+ex)^2\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=74

$$\frac{1}{30}\left(10d^2x^3+15dex^4+6e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bd^2nx^3-\frac{1}{8}bdenx^4-\frac{1}{25}be^2nx^5$$

```
[Out] -(b*d^2*n*x^3)/9 - (b*d*e*n*x^4)/8 - (b*e^2*n*x^5)/25 + ((10*d^2*x^3 + 15*d
*e*x^4 + 6*e^2*x^5)*(a + b*Log[c*x^n]))/30
```

Rubi [A] time = 0.079526, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$\frac{1}{30}\left(10d^2x^3+15dex^4+6e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{9}bd^2nx^3-\frac{1}{8}bdenx^4-\frac{1}{25}be^2nx^5$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^2*n*x^3)/9 - (b*d*e*n*x^4)/8 - (b*e^2*n*x^5)/25 + ((10*d^2*x^3 + 15*d
*e*x^4 + 6*e^2*x^5)*(a + b*Log[c*x^n]))/30
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^2(d+ex)^2\left(a+b\log\left(cx^n\right)\right)dx &= \frac{1}{30}\left(10d^2x^3+15dex^4+6e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{30}x^2\left(10d^2+15dex+6e^2x\right.\\ &= \frac{1}{30}\left(10d^2x^3+15dex^4+6e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{30}(bn)\int x^2\left(10d^2+15dex+6e^2x\right.\\ &= \frac{1}{30}\left(10d^2x^3+15dex^4+6e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{30}(bn)\int\left(10d^2x^2+15dex^3+6e^2x\right.\\ &= -\frac{1}{9}bd^2nx^3-\frac{1}{8}bdenx^4-\frac{1}{25}be^2nx^5+\frac{1}{30}\left(10d^2x^3+15dex^4+6e^2x^5\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.039512, size = 81, normalized size = 1.09

$$\frac{x^3\left(60a\left(10d^2+15dex+6e^2x^2\right)+60b\left(10d^2+15dex+6e^2x^2\right)\log\left(cx^n\right)-bn\left(200d^2+225dex+72e^2x^2\right)\right)}{1800}$$

Antiderivative was successfully verified.

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

```
[Out] (x^3*(60*a*(10*d^2 + 15*d*e*x + 6*e^2*x^2) - b*n*(200*d^2 + 225*d*e*x + 72*
e^2*x^2) + 60*b*(10*d^2 + 15*d*e*x + 6*e^2*x^2)*Log[c*x^n]))/1800
```

Maple [C] time = 0.21, size = 432, normalized size = 5.8

$$\frac{bx^3\left(6e^2x^2+15dex+10d^2\right)\ln\left(x^n\right)}{30}-\frac{i}{6}\pi bd^2x^3\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(icx^n\right)\mathrm{csgn}\left(ic\right)+\frac{i}{6}\pi bd^2x^3\mathrm{csgn}\left(ix^n\right)\left(\mathrm{csgn}\left(icx^n\right)\right)^2-\frac{i}{6}\pi$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/30*b*x^3*(6*e^2*x^2+15*d*e*x+10*d^2)*ln(x^n)-1/6*I*Pi*b*d^2*x^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+1/6*I*Pi*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1
```

```
/6*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^3+1/10*I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*
x^n)^2+1/5*ln(c)*b*e^2*x^5-1/25*b*e^2*n*x^5+1/5*a*e^2*x^5+1/10*I*Pi*b*e^2*x
^5*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1
/6*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/10*I*Pi*b*e^2*x^5*csgn(I*c*x^
n)^3+1/2*ln(c)*b*d*e*x^4-1/8*b*d*e*n*x^4+1/2*a*d*e*x^4-1/4*I*Pi*b*d*e*x^4*c
sgn(I*c*x^n)^3-1/4*I*Pi*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*
I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b*d*e*x^4*csgn(
I*x^n)*csgn(I*c*x^n)^2+1/3*ln(c)*b*d^2*x^3-1/9*b*d^2*n*x^3+1/3*a*d^2*x^3
```

Maxima [A] time = 1.22446, size = 135, normalized size = 1.82

$$-\frac{1}{25}\,be^2nx^5+\frac{1}{5}\,be^2x^5\log\left(cx^n\right)-\frac{1}{8}\,bdenx^4+\frac{1}{5}\,ae^2x^5+\frac{1}{2}\,bdex^4\log\left(cx^n\right)-\frac{1}{9}\,bd^2nx^3+\frac{1}{2}\,adex^4+\frac{1}{3}\,bd^2x^3\log\left(cx^n\right)+\frac{1}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*b*e^2*n*x^5 + 1/5*b*e^2*x^5*log(c*x^n) - 1/8*b*d*e*n*x^4 + 1/5*a*e^2*
x^5 + 1/2*b*d*e*x^4*log(c*x^n) - 1/9*b*d^2*n*x^3 + 1/2*a*d*e*x^4 + 1/3*b*d^
2*x^3*log(c*x^n) + 1/3*a*d^2*x^3
```

Fricas [A] time = 0.993726, size = 288, normalized size = 3.89

$$-\frac{1}{25}\left(be^2n-5\,ae^2\right)x^5-\frac{1}{8}\left(bden-4\,ade\right)x^4-\frac{1}{9}\left(bd^2n-3\,ad^2\right)x^3+\frac{1}{30}\left(6\,be^2x^5+15\,bdex^4+10\,bd^2x^3\right)\log\left(c\right)+\frac{1}{30}\left(6\,be\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*(b*e^2*n - 5*a*e^2)*x^5 - 1/8*(b*d*e*n - 4*a*d*e)*x^4 - 1/9*(b*d^2*n
- 3*a*d^2)*x^3 + 1/30*(6*b*e^2*x^5 + 15*b*d*e*x^4 + 10*b*d^2*x^3)*log(c) +
1/30*(6*b*e^2*n*x^5 + 15*b*d*e*n*x^4 + 10*b*d^2*n*x^3)*log(x)
```

Sympy [B] time = 21.0525, size = 151, normalized size = 2.04

$$\frac{ad^2x^3}{3}+\frac{adex^4}{2}+\frac{ae^2x^5}{5}+\frac{bd^2nx^3\log\left(x\right)}{3}-\frac{bd^2nx^3}{9}+\frac{bd^2x^3\log\left(c\right)}{3}+\frac{bdenx^4\log\left(x\right)}{2}-\frac{bdenx^4}{8}+\frac{bdex^4\log\left(c\right)}{2}+\frac{be^2nx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*x**3/3 + a*d*e*x**4/2 + a*e**2*x**5/5 + b*d**2*n*x**3*log(x)/3 - b*d
**2*n*x**3/9 + b*d**2*x**3*log(c)/3 + b*d*e*n*x**4*log(x)/2 - b*d*e*n*x**4/
8 + b*d*e*x**4*log(c)/2 + b*e**2*n*x**5*log(x)/5 - b*e**2*n*x**5/25 + b*e**
2*x**5*log(c)/5
```

Giac [A] time = 1.33896, size = 166, normalized size = 2.24

$$\frac{1}{5}bnx^5e^2\log(x) + \frac{1}{2}bdnx^4e\log(x) - \frac{1}{25}bnx^5e^2 - \frac{1}{8}bdnx^4e + \frac{1}{5}bx^5e^2\log(c) + \frac{1}{2}bdx^4e\log(c) + \frac{1}{3}bd^2nx^3\log(x) - \frac{1}{9}bd$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*n*x^5*e^2*log(x) + 1/2*b*d*n*x^4*e*log(x) - 1/25*b*n*x^5*e^2 - 1/8*b*
d*n*x^4*e + 1/5*b*x^5*e^2*log(c) + 1/2*b*d*x^4*e*log(c) + 1/3*b*d^2*n*x^3*l
og(x) - 1/9*b*d^2*n*x^3 + 1/5*a*x^5*e^2 + 1/2*a*d*x^4*e + 1/3*b*d^2*x^3*log
(c) + 1/3*a*d^2*x^3
```

3.11 $\int x(d+ex)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=74

$$\frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)(a+b\log(cx^n))-\frac{1}{4}bd^2nx^2-\frac{2}{9}bdenx^3-\frac{1}{16}be^2nx^4$$

```
[Out] -(b*d^2*n*x^2)/4 - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^4)/16 + ((6*d^2*x^2 + 8*d
*e*x^3 + 3*e^2*x^4)*(a + b*Log[c*x^n]))/12
```

Rubi [A] time = 0.0628877, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {43, 2334, 12, 14}

$$\frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)(a+b\log(cx^n))-\frac{1}{4}bd^2nx^2-\frac{2}{9}bdenx^3-\frac{1}{16}be^2nx^4$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^2*n*x^2)/4 - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^4)/16 + ((6*d^2*x^2 + 8*d
*e*x^3 + 3*e^2*x^4)*(a + b*Log[c*x^n]))/12
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x(d+ex)^2(a+b\log(cx^n))\,dx &= \frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)(a+b\log(cx^n))-(bn)\int\frac{1}{12}x\left(6d^2+8dex+3e^2x^2\right)dx\\ &= \frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)(a+b\log(cx^n))-\frac{1}{12}(bn)\int x\left(6d^2+8dex+3e^2x^2\right)dx\\ &= \frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)(a+b\log(cx^n))-\frac{1}{12}(bn)\int\left(6d^2x+8dex^2+3e^2x^3\right)dx\\ &= -\frac{1}{4}bd^2nx^2-\frac{2}{9}bdenx^3-\frac{1}{16}be^2nx^4+\frac{1}{12}\left(6d^2x^2+8dex^3+3e^2x^4\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0386814, size = 81, normalized size = 1.09

$$\frac{1}{144}x^2\left(12a\left(6d^2+8dex+3e^2x^2\right)+12b\left(6d^2+8dex+3e^2x^2\right)\log(cx^n)-bn\left(36d^2+32dex+9e^2x^2\right)\right)$$

Antiderivative was successfully verified.

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

```
[Out] (x^2*(12*a*(6*d^2 + 8*d*e*x + 3*e^2*x^2) - b*n*(36*d^2 + 32*d*e*x + 9*e^2*x
^2) + 12*b*(6*d^2 + 8*d*e*x + 3*e^2*x^2)*Log[c*x^n]))/144
```

Maple [C] time = 0.228, size = 432, normalized size = 5.8

$$\frac{bx^2\left(3e^2x^2+8dex+6d^2\right)\ln(x^n)}{12}+\frac{i}{4}\pi bd^2x^2\left(\mathrm{csgn}(icx^n)\right)^2\mathrm{csgn}(ic)-\frac{i}{8}\pi be^2x^4\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)+\frac{i}{3}\pi bd$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/12*b*x^2*(3*e^2*x^2+8*d*e*x+6*d^2)*ln(x^n)+1/4*I*Pi*b*d^2*x^2*csgn(I*c*x^
n)^2*csgn(I*c)-1/8*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*I
```

```
*Pi*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^
2*csgn(I*c)+1/4*ln(c)*b*e^2*x^4-1/16*b*e^2*n*x^4+1/4*a*e^2*x^4-1/3*I*Pi*b*d
*e*x^3*csgn(I*c*x^n)^3-1/4*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^3-1/8*I*Pi*b*e^2*x^
4*csgn(I*c*x^n)^3+1/8*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+2/3*ln(c)*
b*d*e*x^3-2/9*b*d*e*n*x^3+2/3*a*d*e*x^3+1/4*I*Pi*b*d^2*x^2*csgn(I*x^n)*csgn
(I*c*x^n)^2-1/4*I*Pi*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*Pi
*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*I*Pi*b*d*e*x^3*csgn(I*c*
x^n)^2*csgn(I*c)+1/2*ln(c)*b*d^2*x^2-1/4*b*d^2*n*x^2+1/2*a*d^2*x^2
```

Maxima [A] time = 1.14139, size = 135, normalized size = 1.82

$$-\frac{1}{16}\,be^2nx^4+\frac{1}{4}\,be^2x^4\log\left(cx^n\right)-\frac{2}{9}\,bdenx^3+\frac{1}{4}\,ae^2x^4+\frac{2}{3}\,bdex^3\log\left(cx^n\right)-\frac{1}{4}\,bd^2nx^2+\frac{2}{3}\,adex^3+\frac{1}{2}\,bd^2x^2\log\left(cx^n\right)+\frac{1}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*b*e^2*n*x^4 + 1/4*b*e^2*x^4*log(c*x^n) - 2/9*b*d*e*n*x^3 + 1/4*a*e^2*
x^4 + 2/3*b*d*e*x^3*log(c*x^n) - 1/4*b*d^2*n*x^2 + 2/3*a*d*e*x^3 + 1/2*b*d^
2*x^2*log(c*x^n) + 1/2*a*d^2*x^2
```

Fricas [A] time = 0.999575, size = 282, normalized size = 3.81

$$-\frac{1}{16}\left(be^2n-4\,ae^2\right)x^4-\frac{2}{9}\left(bden-3\,ade\right)x^3-\frac{1}{4}\left(bd^2n-2\,ad^2\right)x^2+\frac{1}{12}\left(3\,be^2x^4+8\,bdex^3+6\,bd^2x^2\right)\log\left(c\right)+\frac{1}{12}\left(3\,be^2n\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*(b*e^2*n - 4*a*e^2)*x^4 - 2/9*(b*d*e*n - 3*a*d*e)*x^3 - 1/4*(b*d^2*n
- 2*a*d^2)*x^2 + 1/12*(3*b*e^2*x^4 + 8*b*d*e*x^3 + 6*b*d^2*x^2)*log(c) + 1/
12*(3*b*e^2*n*x^4 + 8*b*d*e*n*x^3 + 6*b*d^2*n*x^2)*log(x)
```

Sympy [B] time = 3.13729, size = 158, normalized size = 2.14

$$\frac{ad^2x^2}{2}+\frac{2adex^3}{3}+\frac{ae^2x^4}{4}+\frac{bd^2nx^2\log\left(x\right)}{2}-\frac{bd^2nx^2}{4}+\frac{bd^2x^2\log\left(c\right)}{2}+\frac{2bdenx^3\log\left(x\right)}{3}-\frac{2bdenx^3}{9}+\frac{2bdex^3\log\left(c\right)}{3}+$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*x**2/2 + 2*a*d*e*x**3/3 + a*e**2*x**4/4 + b*d**2*n*x**2*log(x)/2 - b
*d**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + 2*b*d*e*n*x**3*log(x)/3 - 2*b*d*e*n
*x**3/9 + 2*b*d*e*x**3*log(c)/3 + b*e**2*n*x**4*log(x)/4 - b*e**2*n*x**4/16
 + b*e**2*x**4*log(c)/4
```

Giac [A] time = 1.34418, size = 166, normalized size = 2.24

$$\frac{1}{4}\,bnx^4e^2\log\left(x\right)+\frac{2}{3}\,bdnx^3e\log\left(x\right)-\frac{1}{16}\,bnx^4e^2-\frac{2}{9}\,bdnx^3e+\frac{1}{4}\,bx^4e^2\log\left(c\right)+\frac{2}{3}\,bdx^3e\log\left(c\right)+\frac{1}{2}\,bd^2nx^2\log\left(x\right)-\frac{1}{4}\,bd^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*n*x^4*e^2*log(x) + 2/3*b*d*n*x^3*e*log(x) - 1/16*b*n*x^4*e^2 - 2/9*b*
d*n*x^3*e + 1/4*b*x^4*e^2*log(c) + 2/3*b*d*x^3*e*log(c) + 1/2*b*d^2*n*x^2*l
og(x) - 1/4*b*d^2*n*x^2 + 1/4*a*x^4*e^2 + 2/3*a*d*x^3*e + 1/2*b*d^2*x^2*log
(c) + 1/2*a*d^2*x^2
```

3.12 $\int (d+ex)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=70

$$\frac{(d+ex)^3 (a+b\log(cx^n))}{3e} - \frac{bd^3 n\log(x)}{3e} - bd^2nx - \frac{1}{2}bdenx^2 - \frac{1}{9}be^2nx^3$$

```
[Out] -(b*d^2*n*x) - (b*d*e*n*x^2)/2 - (b*e^2*n*x^3)/9 - (b*d^3*n*Log[x])/(3*e) +
 ((d + e*x)^3*(a + b*Log[c*x^n]))/(3*e)
```

Rubi [A] time = 0.037794, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {32, 2313, 12, 43}

$$\frac{(d+ex)^3 (a+b\log(cx^n))}{3e} - \frac{bd^3 n\log(x)}{3e} - bd^2nx - \frac{1}{2}bdenx^2 - \frac{1}{9}be^2nx^3$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^2*n*x) - (b*d*e*n*x^2)/2 - (b*e^2*n*x^3)/9 - (b*d^3*n*Log[x])/(3*e) +
 ((d + e*x)^3*(a + b*Log[c*x^n]))/(3*e)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int (d+ex)^2 (a+b\log(cx^n))\,dx &= \frac{(d+ex)^3 (a+b\log(cx^n))}{3e} - (bn)\int \frac{(d+ex)^3}{3ex}\,dx \\
&= \frac{(d+ex)^3 (a+b\log(cx^n))}{3e} - \frac{(bn)\int \frac{(d+ex)^3}{x}\,dx}{3e} \\
&= \frac{(d+ex)^3 (a+b\log(cx^n))}{3e} - \frac{(bn)\int \left(3d^2e+\frac{d^3}{x}+3de^2x+e^3x^2\right)dx}{3e} \\
&= -bd^2nx - \frac{1}{2}bdenx^2 - \frac{1}{9}be^2nx^3 - \frac{bd^3n\log(x)}{3e} + \frac{(d+ex)^3 (a+b\log(cx^n))}{3e}
\end{aligned}$$

Mathematica [A] time = 0.0387098, size = 77, normalized size = 1.1

$$\frac{1}{18}x\left(6a\left(3d^2+3dex+e^2x^2\right)+6b\left(3d^2+3dex+e^2x^2\right)\log(cx^n)-bn\left(18d^2+9dex+2e^2x^2\right)\right)$$

Antiderivative was successfully verified.

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

```
[Out] (x*(6*a*(3*d^2 + 3*d*e*x + e^2*x^2) - b*n*(18*d^2 + 9*d*e*x + 2*e^2*x^2) +
6*b*(3*d^2 + 3*d*e*x + e^2*x^2)*Log[c*x^n]))/18
```

Maple [C] time = 0.218, size = 414, normalized size = 5.9

$$\frac{b(ex+d)^3\ln(x^n)}{3e} - \frac{i}{2}e\pi bdx^2(\operatorname{csgn}(icx^n))^3 + \frac{i}{2}e\pi bdx^2\operatorname{csgn}(ix^n)(\operatorname{csgn}(icx^n))^2 + \frac{i}{6}e^2\pi bx^3(\operatorname{csgn}(icx^n))^2\operatorname{csgn}(ic) + \frac{i}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b*(e*x+d)^3/e*ln(x^n)-1/2*I*e*Pi*b*d*x^2*csgn(I*c*x^n)^3+1/2*I*e*Pi*b*d
*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I*e^2*Pi*b*x^3*csgn(I*c*x^n)^2*csgn(I*
c)+1/2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x+1/2*I*Pi*b*d^2*csgn(I*c*x^n
)^2*csgn(I*c)*x+1/2*I*e*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*Pi*b*d^2
*csgn(I*c*x^n)^3*x+1/6*I*e^2*Pi*b*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*e*P
i*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*e^2*Pi*b*x^3*csgn(I*c*x
^n)^3-1/2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-1/6*I*e^2*Pi*b*x
^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*ln(c)*b*e^2*x^3-1/9*b*e^2*n*x^3+
ln(c)*b*d*e*x^2+1/3*a*e^2*x^3-1/2*b*d*e*n*x^2-1/3*b*d^3*n*ln(x)/e+ln(c)*b*d
^2*x+a*d*e*x^2-b*d^2*n*x+a*d^2*x
```

Maxima [A] time = 1.18355, size = 122, normalized size = 1.74

$$-\frac{1}{9}be^2nx^3+\frac{1}{3}be^2x^3\log\left(cx^n\right)-\frac{1}{2}bdenx^2+\frac{1}{3}ae^2x^3+bdex^2\log\left(cx^n\right)-bd^2nx+adex^2+bd^2x\log\left(cx^n\right)+ad^2x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*b*e^2*n*x^3 + 1/3*b*e^2*x^3*log(c*x^n) - 1/2*b*d*e*n*x^2 + 1/3*a*e^2*x
^3 + b*d*e*x^2*log(c*x^n) - b*d^2*n*x + a*d*e*x^2 + b*d^2*x*log(c*x^n) + a*
d^2*x
```

Fricas [A] time = 0.958527, size = 257, normalized size = 3.67

$$-\frac{1}{9}\left(be^2n-3\,ae^2\right)x^3-\frac{1}{2}\left(bden-2\,ade\right)x^2-\left(bd^2n-ad^2\right)x+\frac{1}{3}\left(be^2x^3+3\,bdex^2+3\,bd^2x\right)\log\left(c\right)+\frac{1}{3}\left(be^2nx^3+3\,bdenx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*(b*e^2*n - 3*a*e^2)*x^3 - 1/2*(b*d*e*n - 2*a*d*e)*x^2 - (b*d^2*n - a*d
^2)*x + 1/3*(b*e^2*x^3 + 3*b*d*e*x^2 + 3*b*d^2*x)*log(c) + 1/3*(b*e^2*n*x^3
 + 3*b*d*e*n*x^2 + 3*b*d^2*n*x)*log(x)
```

Sympy [B] time = 1.90513, size = 133, normalized size = 1.9

$$ad^2x + adex^2 + \frac{ae^2x^3}{3} + bd^2nx\log(x) - bd^2nx + bd^2x\log(c) + bdenx^2\log(x) - \frac{bdenx^2}{2} + bdex^2\log(c) + \frac{be^2nx^3\log(x)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*x + a*d*e*x**2 + a*e**2*x**3/3 + b*d**2*n*x*log(x) - b*d**2*n*x + b*
d**2*x*log(c) + b*d*e*n*x**2*log(x) - b*d*e*n*x**2/2 + b*d*e*x**2*log(c) +
b*e**2*n*x**3*log(x)/3 - b*e**2*n*x**3/9 + b*e**2*x**3*log(c)/3
```

Giac [A] time = 1.2323, size = 147, normalized size = 2.1

$$\frac{1}{3}bnx^3e^2\log(x) + bdnx^2e\log(x) - \frac{1}{9}bnx^3e^2 - \frac{1}{2}bdnx^2e + \frac{1}{3}bx^3e^2\log(c) + bdx^2e\log(c) + bd^2nx\log(x) - bd^2nx + \frac{1}{3}ax$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b*n*x^3*e^2*log(x) + b*d*n*x^2*e*log(x) - 1/9*b*n*x^3*e^2 - 1/2*b*d*n*x
^2*e + 1/3*b*x^3*e^2*log(c) + b*d*x^2*e*log(c) + b*d^2*n*x*log(x) - b*d^2*n
*x + 1/3*a*x^3*e^2 + a*d*x^2*e + b*d^2*x*log(c) + a*d^2*x
```

3.13 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=80

$$d^2\log(x)\left(a+b\log\left(cx^n\right)\right)+2dex\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{4}bn(4d+ex)^2$$

```
[Out] -(b*n*(4*d + e*x)^2)/4 - (b*d^2*n*Log[x]^2)/2 + 2*d*e*x*(a + b*Log[c*x^n])
+ (e^2*x^2*(a + b*Log[c*x^n]))/2 + d^2*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0714581, antiderivative size = 63, normalized size of antiderivative = 0.79, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$\frac{1}{2}\left(2d^2\log(x)+4dex+e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{4}bn(4d+ex)^2$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n*(4*d + e*x)^2)/4 - (b*d^2*n*Log[x]^2)/2 + ((4*d*e*x + e^2*x^2 + 2*d^2
*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex)^2 (a+b\log(cx^n))}{x}\,dx = \frac{1}{2}\left(4dex+e^2x^2+2d^2\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(\frac{1}{2}e(4d+ex)+\frac{d^2\log(x)}{x}\right)dx$$
$$= -\frac{1}{4}bn(4d+ex)^2+\frac{1}{2}\left(4dex+e^2x^2+2d^2\log(x)\right)(a+b\log(cx^n))-\left(bd^2n\right)\int\frac{\log(x)}{x}\,dx$$
$$= -\frac{1}{4}bn(4d+ex)^2-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{2}\left(4dex+e^2x^2+2d^2\log(x)\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0457333, size = 83, normalized size = 1.04

$$\frac{d^2(a+b\log(cx^n))^2}{2bn}+\frac{1}{2}e^2x^2(a+b\log(cx^n))+2adex+2bdex\log(cx^n)-2bdenx-\frac{1}{4}be^2nx^2$$

Antiderivative was successfully verified.

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

```
[Out] 2*a*d*e*x - 2*b*d*e*n*x - (b*e^2*n*x^2)/4 + 2*b*d*e*x*Log[c*x^n] + (e^2*x^2
*(a + b*Log[c*x^n]))/2 + (d^2*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Maple [C] time = 0.239, size = 410, normalized size = 5.1

$$\left(\frac{be^2x^2}{2}+2\,bdex+bd^2\ln(x)\right)\ln(x^n)-\frac{bd^2n(\ln(x))^2}{2}-\frac{i}{4}\pi\,be^2x^2(\mathrm{csgn}(icx^n))^3-\frac{i}{2}\ln(x)\,\pi\,bd^2(\mathrm{csgn}(icx^n))^3-i\pi\,bdex\,($$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (1/2*b*e^2*x^2+2*b*d*e*x+b*d^2*ln(x))*ln(x^n)-1/2*b*d^2*n*ln(x)^2-1/4*I*Pi*
b*e^2*x^2*csgn(I*c*x^n)^3-1/2*I*ln(x)*Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*d*e*x
*csgn(I*c*x^n)^3-1/2*I*ln(x)*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1
/2*I*ln(x)*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*e*x*csgn(I*x^n)*csgn
(I*c*x^n)^2-I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*d*e*x*c
```

```
sgn(I*c*x^n)^2*csgn(I*c)+1/2*ln(c)*b*e^2*x^2-1/4*b*e^2*n*x^2+2*ln(c)*b*d*e*
x+1/2*a*e^2*x^2-2*b*d*e*n*x+2*a*d*e*x+1/2*I*ln(x)*Pi*b*d^2*csgn(I*x^n)*csgn
(I*c*x^n)^2-1/4*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi
*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*
c*x^n)^2+ln(x)*ln(c)*b*d^2+ln(x)*a*d^2
```

Maxima [A] time = 1.07129, size = 113, normalized size = 1.41

$$-\frac{1}{4}\,be^2nx^2 + \frac{1}{2}\,be^2x^2\log\left(cx^n\right) - 2\,bdenx + \frac{1}{2}\,ae^2x^2 + 2\,bdex\log\left(cx^n\right) + 2\,adex + \frac{bd^2\log\left(cx^n\right)^2}{2\,n} + ad^2\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*b*e^2*n*x^2 + 1/2*b*e^2*x^2*log(c*x^n) - 2*b*d*e*n*x + 1/2*a*e^2*x^2 +
 2*b*d*e*x*log(c*x^n) + 2*a*d*e*x + 1/2*b*d^2*log(c*x^n)^2/n + a*d^2*log(x)
```

Fricas [A] time = 0.994326, size = 244, normalized size = 3.05

$$\frac{1}{2}\,bd^2n\log\left(x\right)^2 - \frac{1}{4}\left(be^2n - 2\,ae^2\right)x^2 - 2\left(bden - ade\right)x + \frac{1}{2}\left(be^2x^2 + 4\,bdex\right)\log\left(c\right) + \frac{1}{2}\left(be^2nx^2 + 4\,bdenx + 2\,bd^2\log\left(c\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*d^2*n*log(x)^2 - 1/4*(b*e^2*n - 2*a*e^2)*x^2 - 2*(b*d*e*n - a*d*e)*x
+ 1/2*(b*e^2*x^2 + 4*b*d*e*x)*log(c) + 1/2*(b*e^2*n*x^2 + 4*b*d*e*n*x + 2*b
*d^2*log(c) + 2*a*d^2)*log(x)
```

Sympy [A] time = 1.38067, size = 128, normalized size = 1.6

$$ad^2\log\left(x\right) + 2adex + \frac{ae^2x^2}{2} + \frac{bd^2n\log\left(x\right)^2}{2} + bd^2\log\left(c\right)\log\left(x\right) + 2bdenx\log\left(x\right) - 2bdenx + 2bdex\log\left(c\right) + \frac{be^2nx^2\log}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*log(x) + 2*a*d*e*x + a*e**2*x**2/2 + b*d**2*n*log(x)**2/2 + b*d**2*l
og(c)*log(x) + 2*b*d*e*n*x*log(x) - 2*b*d*e*n*x + 2*b*d*e*x*log(c) + b*e**2
*n*x**2*log(x)/2 - b*e**2*n*x**2/4 + b*e**2*x**2*log(c)/2
```

Giac [A] time = 1.32801, size = 135, normalized size = 1.69

$$\frac{1}{2}bnx^2e^2\log(x) + 2\,bdnxe\log(x) + \frac{1}{2}bd^2n\log(x)^2 - \frac{1}{4}bnx^2e^2 - 2\,bdnxe + \frac{1}{2}bx^2e^2\log(c) + 2\,bdxe\log(c) + bd^2\log(c)\,\mathrm{l}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*n*x^2*e^2*log(x) + 2*b*d*n*x*e*log(x) + 1/2*b*d^2*n*log(x)^2 - 1/4*b*
n*x^2*e^2 - 2*b*d*n*x*e + 1/2*b*x^2*e^2*log(c) + 2*b*d*x*e*log(c) + b*d^2*l
og(c)*log(x) + 1/2*a*x^2*e^2 + 2*a*d*x*e + a*d^2*log(x)
```

3.14 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=78

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{x}+2de\log(x)\left(a+b\log\left(cx^n\right)\right)+e^2x\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x}-bden\log^2(x)-be^2nx$$

```
[Out] -((b*d^2*n)/x) - b*e^2*n*x - b*d*e*n*Log[x]^2 - (d^2*(a + b*Log[c*x^n]))/x
+ e^2*x*(a + b*Log[c*x^n]) + 2*d*e*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0759305, antiderivative size = 61, normalized size of antiderivative = 0.78, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$-\left(\frac{d^2}{x}-2de\log(x)-e^2x\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x}-bden\log^2(x)-be^2nx$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^2*n)/x) - b*e^2*n*x - b*d*e*n*Log[x]^2 - (d^2/x - e^2*x - 2*d*e*Log[
x])*(a + b*Log[c*x^n])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^2\,(a+b\log(cx^n))}{x^2}\,dx &= -\left(\frac{d^2}{x}-e^2x-2de\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(e^2-\frac{d^2}{x^2}+\frac{2de\log(x)}{x}\right)dx\\ &= -\frac{bd^2n}{x}-be^2nx-\left(\frac{d^2}{x}-e^2x-2de\log(x)\right)(a+b\log(cx^n))-(2bden)\int\frac{\log(x)}{x}\,dx\\ &= -\frac{bd^2n}{x}-be^2nx-bden\log^2(x)-\left(\frac{d^2}{x}-e^2x-2de\log(x)\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0537332, size = 76, normalized size = 0.97

$$-\frac{d^2\,(a+b\log(cx^n))}{x}+\frac{de\,(a+b\log(cx^n))^2}{bn}+ae^2x+be^2x\log(cx^n)-\frac{bd^2n}{x}-be^2nx$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^2*n)/x) + a*e^2*x - b*e^2*n*x + b*e^2*x*Log[c*x^n] - (d^2*(a + b*Log
[c*x^n]))/x + (d*e*(a + b*Log[c*x^n])^2)/(b*n)
```

Maple [C] time = 0.253, size = 419, normalized size = 5.4

$$-\frac{b\left(-2\,dex\ln(x)-e^2x^2+d^2\right)\ln(x^n)}{x}-\frac{2\,i\ln(x)\,\pi\,bde\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)\,x-2\,i\ln(x)\,\pi\,bde\,(\mathrm{csgn}(icx^n))^2\,\mathrm{csg}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*(-2*d*e*x*ln(x)-e^2*x^2+d^2)/x*ln(x^n)-1/2*(2*I*ln(x)*Pi*b*d*e*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*x-2*I*ln(x)*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x
-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*d^2*csgn(I*c*x^n)^2*
csgn(I*c)+I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*d^2*csg
n(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*e^
```

```
2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3-I*Pi*b*d^2
*csgn(I*c*x^n)^3-2*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x+2*I*ln(x)
*Pi*b*d*e*csgn(I*c*x^n)^3*x+2*b*d*e*n*ln(x)^2*x-4*ln(x)*ln(c)*b*d*e*x-2*ln(
c)*b*e^2*x^2+2*b*e^2*n*x^2-4*ln(x)*a*d*e*x-2*a*e^2*x^2+2*ln(c)*b*d^2+2*b*d^
2*n+2*a*d^2)/x
```

Maxima [A] time = 1.15123, size = 112, normalized size = 1.44

$$-be^2nx + be^2x\log(cx^n) + ae^2x + \frac{bde\log(cx^n)^2}{n} + 2\,ade\log(x) - \frac{bd^2n}{x} - \frac{bd^2\log(cx^n)}{x} - \frac{ad^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*e^2*n*x + b*e^2*x*log(c*x^n) + a*e^2*x + b*d*e*log(c*x^n)^2/n + 2*a*d*e*
log(x) - b*d^2*n/x - b*d^2*log(c*x^n)/x - a*d^2/x
```

Fricas [A] time = 1.02175, size = 215, normalized size = 2.76

$$\frac{bdenx\log(x)^2 - bd^2n - ad^2 - \left(be^2n - ae^2\right)x^2 + \left(be^2x^2 - bd^2\right)\log(c) + \left(be^2nx^2 + 2\,bdex\log(c) - bd^2n + 2\,adex\right)\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*d*e*n*x*log(x)^2 - b*d^2*n - a*d^2 - (b*e^2*n - a*e^2)*x^2 + (b*e^2*x^2
- b*d^2)*log(c) + (b*e^2*n*x^2 + 2*b*d*e*x*log(c) - b*d^2*n + 2*a*d*e*x)*lo
g(x))/x
```

Sympy [A] time = 5.91223, size = 109, normalized size = 1.4

$$-\frac{ad^2}{x} + 2ade\log(x) + ae^2x - \frac{bd^2n\log(x)}{x} - \frac{bd^2n}{x} - \frac{bd^2\log(c)}{x} + bden\log(x)^2 + 2bde\log(c)\log(x) + be^2nx\log(x) - b$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**2/x + 2*a*d*e*log(x) + a*e**2*x - b*d**2*n*log(x)/x - b*d**2*n/x - b*
d**2*log(c)/x + b*d*e*n*log(x)**2 + 2*b*d*e*log(c)*log(x) + b*e**2*n*x*log(
x) - b*e**2*n*x + b*e**2*x*log(c)
```

Giac [A] time = 1.44243, size = 136, normalized size = 1.74

$$\frac{bdnxe\log(x)^2 + bnx^2e^2\log(x) + 2\,bdxe\log(c)\log(x) - bnx^2e^2 + bx^2e^2\log(c) - bd^2n\log(x) + 2\,adxe\log(x) - bd^2n + ax}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*d*n*x*e*log(x)^2 + b*n*x^2*e^2*log(x) + 2*b*d*x*e*log(c)*log(x) - b*n*x^
2*e^2 + b*x^2*e^2*log(c) - b*d^2*n*log(x) + 2*a*d*x*e*log(x) - b*d^2*n + a*
x^2*e^2 - b*d^2*log(c) - a*d^2)/x
```

3.15 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=84

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{x}+e^2\log(x)\left(a+b\log\left(cx^n\right)\right)-\frac{bn(d+4ex)^2}{4x^2}-\frac{1}{2}be^2n\log^2(x)$$

```
[Out] -(b*n*(d + 4*e*x)^2)/(4*x^2) - (b*e^2*n*Log[x]^2)/2 - (d^2*(a + b*Log[c*x^n
]))/(2*x^2) - (2*d*e*(a + b*Log[c*x^n]))/x + e^2*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0788719, antiderivative size = 67, normalized size of antiderivative = 0.8, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 37, 2301}

$$-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bn(d+4ex)^2}{4x^2}-\frac{1}{2}be^2n\log^2(x)$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n*(d + 4*e*x)^2)/(4*x^2) - (b*e^2*n*Log[x]^2)/2 - ((d^2/x^2 + (4*d*e)/x
 - 2*e^2*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^2 (a+b\log(cx^n))}{x^3}\,dx &= -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(-\frac{d(d+4ex)}{2x^3}+\frac{e^2\log(x)}{x}\right)dx\\ &= -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)(a+b\log(cx^n))+\frac{1}{2}(bdn)\int\frac{d+4ex}{x^3}\,dx-\left(be^2n\right)\int\frac{\log(x}{x}\\ &= -\frac{bn(d+4ex)^2}{4x^2}-\frac{1}{2}be^2n\log^2(x)-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4de}{x}-2e^2\log(x)\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0547216, size = 84, normalized size = 1.

$$-\frac{d^2(a+b\log(cx^n))}{2x^2}-\frac{2de(a+b\log(cx^n))}{x}+\frac{e^2(a+b\log(cx^n))^2}{2bn}-\frac{bd^2n}{4x^2}-\frac{2bden}{x}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^2*n)/(4*x^2) - (2*b*d*e*n)/x - (d^2*(a + b*Log[c*x^n]))/(2*x^2) - (2*
d*e*(a + b*Log[c*x^n]))/x + (e^2*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Maple [C] time = 0.149, size = 418, normalized size = 5.

$$-\frac{b\left(-2e^2\ln(x)x^2+4dex+d^2\right)\ln(x^n)}{2x^2}-\frac{-2i\ln(x)\pi be^2(\mathrm{csgn}(icx^n))^2\mathrm{csgn}(ic)x^2-i\pi bd^2(\mathrm{csgn}(icx^n))^3-4i\pi bdex(\mathrm{cs}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(-2*e^2*ln(x)*x^2+4*d*e*x+d^2)/x^2*ln(x^n)-1/4*(-2*I*ln(x)*Pi*b*e^2*
csgn(I*c*x^n)^2*csgn(I*c)*x^2-I*Pi*b*d^2*csgn(I*c*x^n)^3-4*I*Pi*b*d*e*x*csg
n(I*c*x^n)^3+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*d*e*x*csgn(I*x^n
)*csgn(I*c*x^n)^2+4*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-2*I*ln(x)*Pi*b*e
^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+2*I*ln(x)*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^2+2*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^3*x^2+I*Pi*b*d^2*csgn(I
*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi
*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*b*e^2*n*ln(x)^2*x^2-4*ln(x)*
ln(c)*b*e^2*x^2-4*ln(x)*a*e^2*x^2+8*ln(c)*b*d*e*x+8*b*d*e*n*x+2*ln(c)*b*d^2
+8*a*d*e*x+b*d^2*n+2*a*d^2)/x^2
```

Maxima [A] time = 1.1419, size = 122, normalized size = 1.45

$$\frac{be^2\log(cx^n)^2}{2n} + ae^2\log(x) - \frac{2bden}{x} - \frac{2bde\log(cx^n)}{x} - \frac{bd^2n}{4x^2} - \frac{2ade}{x} - \frac{bd^2\log(cx^n)}{2x^2} - \frac{ad^2}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*e^2*log(c*x^n)^2/n + a*e^2*log(x) - 2*b*d*e*n/x - 2*b*d*e*log(c*x^n)/
x - 1/4*b*d^2*n/x^2 - 2*a*d*e/x - 1/2*b*d^2*log(c*x^n)/x^2 - 1/2*a*d^2/x^2
```

Fricas [A] time = 1.06644, size = 242, normalized size = 2.88

$$\frac{2be^2nx^2\log(x)^2 - bd^2n - 2ad^2 - 8(bden + ade)x - 2\left(4bdex + bd^2\right)\log(c) + 2\left(2be^2x^2\log(c) - 4bdenx + 2ae^2x^2 - b\right.}{4x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*e^2*n*x^2*log(x)^2 - b*d^2*n - 2*a*d^2 - 8*(b*d*e*n + a*d*e)*x - 2
*(4*b*d*e*x + b*d^2)*log(c) + 2*(2*b*e^2*x^2*log(c) - 4*b*d*e*n*x + 2*a*e^2
*x^2 - b*d^2*n)*log(x))/x^2
```

Sympy [A] time = 20.7117, size = 99, normalized size = 1.18

$$-\frac{ad^2}{2x^2} - \frac{2ade}{x} + ae^2\log(x) + bd^2\left(-\frac{n}{4x^2} - \frac{\log(cx^n)}{2x^2}\right) + 2bde\left(-\frac{n}{x} - \frac{\log(cx^n)}{x}\right) - be^2\left(\begin{cases} -\log(c)\log(x) & \text{for } n = 0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise} \end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d**2/(2*x**2) - 2*a*d*e/x + a*e**2*log(x) + b*d**2*(-n/(4*x**2) - log(c*
x**n)/(2*x**2)) + 2*b*d*e*(-n/x - log(c*x**n)/x) - b*e**2*Piecewise((-log(c
)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

Giac [A] time = 1.34803, size = 142, normalized size = 1.69

$$\frac{2\,bnx^2e^2\log(x)^2 - 8\,bdnxe\log(x) + 4\,bx^2e^2\log(c)\log(x) - 8\,bdnxe - 8\,bdxe\log(c) - 2\,bd^2n\log(x) + 4\,ax^2e^2\log(x) - b}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(2*b*n*x^2*e^2*log(x)^2 - 8*b*d*n*x*e*log(x) + 4*b*x^2*e^2*log(c)*log(x
) - 8*b*d*n*x*e - 8*b*d*x*e*log(c) - 2*b*d^2*n*log(x) + 4*a*x^2*e^2*log(x)
- b*d^2*n - 8*a*d*x*e - 2*b*d^2*log(c) - 2*a*d^2)/x^2
```

3.16 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=75

$$-\frac{(d+ex)^3(a+b\log(cx^n))}{3dx^3}-\frac{bd^2n}{9x^3}+\frac{be^3n\log(x)}{3d}-\frac{bden}{2x^2}-\frac{be^2n}{x}$$

```
[Out] -(b*d^2*n)/(9*x^3) - (b*d*e*n)/(2*x^2) - (b*e^2*n)/x + (b*e^3*n*Log[x])/(3*
d) - ((d + e*x)^3*(a + b*Log[c*x^n]))/(3*d*x^3)
```

Rubi [A] time = 0.0709689, antiderivative size = 75, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {37, 2334, 12, 43}

$$-\frac{(d+ex)^3(a+b\log(cx^n))}{3dx^3}-\frac{bd^2n}{9x^3}+\frac{be^3n\log(x)}{3d}-\frac{bden}{2x^2}-\frac{be^2n}{x}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^2*n)/(9*x^3) - (b*d*e*n)/(2*x^2) - (b*e^2*n)/x + (b*e^3*n*Log[x])/(3*
d) - ((d + e*x)^3*(a + b*Log[c*x^n]))/(3*d*x^3)
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^4}\,dx &= -\frac{(d+ex)^3(a+b\log(cx^n))}{3dx^3}-(bn)\int -\frac{(d+ex)^3}{3dx^4}\,dx\\ &= -\frac{(d+ex)^3(a+b\log(cx^n))}{3dx^3}+\frac{(bn)\int\frac{(d+ex)^3}{x^4}\,dx}{3d}\\ &= -\frac{(d+ex)^3(a+b\log(cx^n))}{3dx^3}+\frac{(bn)\int\left(\frac{d^3}{x^4}+\frac{3d^2e}{x^3}+\frac{3de^2}{x^2}+\frac{e^3}{x}\right)dx}{3d}\\ &= -\frac{bd^2n}{9x^3}-\frac{bden}{2x^2}-\frac{be^2n}{x}+\frac{be^3n\log(x)}{3d}-\frac{(d+ex)^3(a+b\log(cx^n))}{3dx^3}\end{aligned}$$

Mathematica [A] time = 0.0385964, size = 76, normalized size = 1.01

$$-\frac{6a\left(d^2+3dex+3e^2x^2\right)+6b\left(d^2+3dex+3e^2x^2\right)\log(cx^n)+bn\left(2d^2+9dex+18e^2x^2\right)}{18x^3}$$

Antiderivative was successfully verified.

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

```
[Out] -(6*a*(d^2 + 3*d*e*x + 3*e^2*x^2) + b*n*(2*d^2 + 9*d*e*x + 18*e^2*x^2) + 6*
b*(d^2 + 3*d*e*x + 3*e^2*x^2)*Log[c*x^n])/(18*x^3)
```

Maple [C] time = 0.121, size = 401, normalized size = 5.4

$$-\frac{b\left(3e^2x^2+3dex+d^2\right)\ln(x^n)}{3x^3}-\frac{-3i\pi bd^2(\mathrm{csgn}(icx^n))^3-9i\pi be^2x^2(\mathrm{csgn}(icx^n))^3+9i\pi be^2x^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*b*(3*e^2*x^2+3*d*e*x+d^2)/x^3*ln(x^n)-1/18*(-3*I*Pi*b*d^2*csgn(I*c*x^n
)^3-9*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3+9*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*
x^n)^2-9*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18*ln(c)*b*e^2*x^
2+18*b*e^2*n*x^2+18*a*e^2*x^2+9*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-9*I*
Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3*I*Pi*b*d^2*csgn(I*c*x^n)
^2*csgn(I*c)+9*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+18*ln(c)*b*d*e*x+9*
b*d*e*n*x+18*a*d*e*x-9*I*Pi*b*d*e*x*csgn(I*c*x^n)^3+3*I*Pi*b*d^2*csgn(I*x^n
)*csgn(I*c*x^n)^2-3*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+9*I*Pi*b
*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+6*ln(c)*b*d^2+2*b*d^2*n+6*a*d^2)/x^3
```

Maxima [A] time = 1.16077, size = 135, normalized size = 1.8

$$-\frac{be^2n}{x} - \frac{be^2\log(cx^n)}{x} - \frac{bden}{2x^2} - \frac{ae^2}{x} - \frac{bde\log(cx^n)}{x^2} - \frac{bd^2n}{9x^3} - \frac{ade}{x^2} - \frac{bd^2\log(cx^n)}{3x^3} - \frac{ad^2}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*e^2*n/x - b*e^2*log(c*x^n)/x - 1/2*b*d*e*n/x^2 - a*e^2/x - b*d*e*log(c*x
^n)/x^2 - 1/9*b*d^2*n/x^3 - a*d*e/x^2 - 1/3*b*d^2*log(c*x^n)/x^3 - 1/3*a*d^
2/x^3
```

Fricas [A] time = 0.97004, size = 246, normalized size = 3.28

$$-\frac{2\,bd^2n + 6\,ad^2 + 18\left(be^2n + ae^2\right)x^2 + 9\,(bden + 2\,ade)x + 6\left(3\,be^2x^2 + 3\,bdex + bd^2\right)\log(c) + 6\left(3\,be^2nx^2 + 3\,bdenx + \right.}{18\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/18*(2*b*d^2*n + 6*a*d^2 + 18*(b*e^2*n + a*e^2)*x^2 + 9*(b*d*e*n + 2*a*d*
e)*x + 6*(3*b*e^2*x^2 + 3*b*d*e*x + b*d^2)*log(c) + 6*(3*b*e^2*n*x^2 + 3*b*
d*e*n*x + b*d^2*n)*log(x))/x^3
```

Sympy [A] time = 2.58323, size = 134, normalized size = 1.79

$$-\frac{ad^2}{3x^3}-\frac{ade}{x^2}-\frac{ae^2}{x}-\frac{bd^2n\log{(x)}}{3x^3}-\frac{bd^2n}{9x^3}-\frac{bd^2\log{(c)}}{3x^3}-\frac{bden\log{(x)}}{x^2}-\frac{bden}{2x^2}-\frac{bde\log{(c)}}{x^2}-\frac{be^2n\log{(x)}}{x}-\frac{be^2n}{x}-be^2\,\mathrm{l}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) - a*d*e/x**2 - a*e**2/x - b*d**2*n*log(x)/(3*x**3) - b*d**
2*n/(9*x**3) - b*d**2*log(c)/(3*x**3) - b*d*e*n*log(x)/x**2 - b*d*e*n/(2*x*
*2) - b*d*e*log(c)/x**2 - b*e**2*n*log(x)/x - b*e**2*n/x - b*e**2*log(c)/x
```

Giac [A] time = 1.28461, size = 146, normalized size = 1.95

$$-\frac{18\,bnx^2e^2\log{(x)}+18\,bdnxe\log{(x)}+18\,bnx^2e^2+9\,bdnxe+18\,bx^2e^2\log{(c)}+18\,bdxe\log{(c)}+6\,bd^2n\log{(x)}+2\,bd^2n}{18\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/18*(18*b*n*x^2*e^2*log(x) + 18*b*d*n*x*e*log(x) + 18*b*n*x^2*e^2 + 9*b*d
*n*x*e + 18*b*x^2*e^2*log(c) + 18*b*d*x*e*log(c) + 6*b*d^2*n*log(x) + 2*b*d
^2*n + 18*a*x^2*e^2 + 18*a*d*x*e + 6*b*d^2*log(c) + 6*a*d^2)/x^3
```

3.17 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^5} dx$

Optimal. Leaf size=95

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{bd^2n}{16x^4}-\frac{2bden}{9x^3}-\frac{be^2n}{4x^2}$$

```
[Out] -(b*d^2*n)/(16*x^4) - (2*b*d*e*n)/(9*x^3) - (b*e^2*n)/(4*x^2) - (d^2*(a + b
*Log[c*x^n]))/(4*x^4) - (2*d*e*(a + b*Log[c*x^n]))/(3*x^3) - (e^2*(a + b*Lo
g[c*x^n]))/(2*x^2)
```

Rubi [A] time = 0.0762334, antiderivative size = 74, normalized size of antiderivative = 0.78, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{16x^4}-\frac{2bden}{9x^3}-\frac{be^2n}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^2*n)/(16*x^4) - (2*b*d*e*n)/(9*x^3) - (b*e^2*n)/(4*x^2) - (((3*d^2)/x
^4 + (8*d*e)/x^3 + (6*e^2)/x^2)*(a + b*Log[c*x^n]))/12
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex)^2 (a+b\log(cx^n))}{x^5}\,dx &= -\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)(a+b\log(cx^n))-(bn)\int \frac{-3d^2-8dex-6e^2x^2}{12x^5}\,dx\\
&= -\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)(a+b\log(cx^n))-\frac{1}{12}(bn)\int \frac{-3d^2-8dex-6e^2x^2}{x^5}\,dx\\
&= -\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)(a+b\log(cx^n))-\frac{1}{12}(bn)\int \left(-\frac{3d^2}{x^5}-\frac{8de}{x^4}-\frac{6e^2}{x^3}\right)dx\\
&= -\frac{bd^2n}{16x^4}-\frac{2bden}{9x^3}-\frac{be^2n}{4x^2}-\frac{1}{12}\left(\frac{3d^2}{x^4}+\frac{8de}{x^3}+\frac{6e^2}{x^2}\right)(a+b\log(cx^n))
\end{aligned}$$

Mathematica [A] time = 0.038227, size = 80, normalized size = 0.84

$$-\frac{12a\left(3d^2+8dex+6e^2x^2\right)+12b\left(3d^2+8dex+6e^2x^2\right)\log(cx^n)+bn\left(9d^2+32dex+36e^2x^2\right)}{144x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(12*a*(3*d^2 + 8*d*e*x + 6*e^2*x^2) + b*n*(9*d^2 + 32*d*e*x + 36*e^2*x^2)
+ 12*b*(3*d^2 + 8*d*e*x + 6*e^2*x^2)*Log[c*x^n])/(144*x^4)
```

Maple [C] time = 0.122, size = 403, normalized size = 4.2

$$-\frac{b\left(6e^2x^2+8dex+3d^2\right)\ln(x^n)}{12x^4}-\frac{48i\pi bdex\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-18i\pi bd^2(\mathrm{csgn}(icx^n))^3+18i\pi bd^2(\mathrm{csgn}(icx^n))}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/12*b*(6*e^2*x^2+8*d*e*x+3*d^2)/x^4*ln(x^n)-1/144*(48*I*Pi*b*d*e*x*csgn(I
*x^n)*csgn(I*c*x^n)^2-18*I*Pi*b*d^2*csgn(I*c*x^n)^3+18*I*Pi*b*d^2*csgn(I*c*
x^n)^2*csgn(I*c)+18*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+72*ln(c)*b*e^2*x
^2+36*b*e^2*n*x^2+72*a*e^2*x^2-48*I*Pi*b*d*e*x*csgn(I*c*x^n)^3+36*I*Pi*b*e^
2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-48*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-36*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+96*ln(c)*b
*d*e*x+32*b*d*e*n*x+96*a*d*e*x+36*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+
48*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-36*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3
-18*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*ln(c)*b*d^2+9*b*d^2*n
+36*a*d^2)/x^4
```

Maxima [A] time = 1.08416, size = 135, normalized size = 1.42

$$-\frac{be^2n}{4\,x^2}-\frac{be^2\log\left(cx^n\right)}{2\,x^2}-\frac{2\,bden}{9\,x^3}-\frac{ae^2}{2\,x^2}-\frac{2\,bde\log\left(cx^n\right)}{3\,x^3}-\frac{bd^2n}{16\,x^4}-\frac{2\,ade}{3\,x^3}-\frac{bd^2\log\left(cx^n\right)}{4\,x^4}-\frac{ad^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^2*n/x^2 - 1/2*b*e^2*log(c*x^n)/x^2 - 2/9*b*d*e*n/x^3 - 1/2*a*e^2/x
^2 - 2/3*b*d*e*log(c*x^n)/x^3 - 1/16*b*d^2*n/x^4 - 2/3*a*d*e/x^3 - 1/4*b*d^
2*log(c*x^n)/x^4 - 1/4*a*d^2/x^4
```

Fricas [A] time = 1.00472, size = 261, normalized size = 2.75

$$-\frac{9\,bd^2n+36\,ad^2+36\left(be^2n+2\,ae^2\right)x^2+32\,(bden+3\,ade)x+12\left(6\,be^2x^2+8\,bdex+3\,bd^2\right)\log\left(c\right)+12\left(6\,be^2nx^2+8\,b\right.}{144\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/144*(9*b*d^2*n + 36*a*d^2 + 36*(b*e^2*n + 2*a*e^2)*x^2 + 32*(b*d*e*n + 3
*a*d*e)*x + 12*(6*b*e^2*x^2 + 8*b*d*e*x + 3*b*d^2)*log(c) + 12*(6*b*e^2*n*x
^2 + 8*b*d*e*n*x + 3*b*d^2*n)*log(x))/x^4
```

Sympy [A] time = 3.94306, size = 160, normalized size = 1.68

$$-\frac{ad^2}{4x^4}-\frac{2ade}{3x^3}-\frac{ae^2}{2x^2}-\frac{bd^2n\log(x)}{4x^4}-\frac{bd^2n}{16x^4}-\frac{bd^2\log(c)}{4x^4}-\frac{2bden\log(x)}{3x^3}-\frac{2bden}{9x^3}-\frac{2bde\log(c)}{3x^3}-\frac{be^2n\log(x)}{2x^2}-\frac{be^2n}{4x^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d**2/(4*x**4) - 2*a*d*e/(3*x**3) - a*e**2/(2*x**2) - b*d**2*n*log(x)/(4*
x**4) - b*d**2*n/(16*x**4) - b*d**2*log(c)/(4*x**4) - 2*b*d*e*n*log(x)/(3*x
**3) - 2*b*d*e*n/(9*x**3) - 2*b*d*e*log(c)/(3*x**3) - b*e**2*n*log(x)/(2*x*
*2) - b*e**2*n/(4*x**2) - b*e**2*log(c)/(2*x**2)
```

Giac [A] time = 1.489, size = 146, normalized size = 1.54

$$-\frac{72\,bnx^2e^2\log(x)+96\,bdnxe\log(x)+36\,bnx^2e^2+32\,bdnxe+72\,bx^2e^2\log(c)+96\,bdxe\log(c)+36\,bd^2n\log(x)+9\,bd}{144\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] -1/144*(72*b*n*x^2*e^2*log(x) + 96*b*d*n*x*e*log(x) + 36*b*n*x^2*e^2 + 32*b
*d*n*x*e + 72*b*x^2*e^2*log(c) + 96*b*d*x*e*log(c) + 36*b*d^2*n*log(x) + 9*
b*d^2*n + 72*a*x^2*e^2 + 96*a*d*x*e + 36*b*d^2*log(c) + 36*a*d^2)/x^4
```

3.18 $\int \frac{(d+ex)^2(a+b\log(cx^n))}{x^6} dx$

Optimal. Leaf size=95

$$-\frac{d^2(a+b\log(cx^n))}{5x^5}-\frac{de(a+b\log(cx^n))}{2x^4}-\frac{e^2(a+b\log(cx^n))}{3x^3}-\frac{bd^2n}{25x^5}-\frac{bden}{8x^4}-\frac{be^2n}{9x^3}$$

```
[Out] -(b*d^2*n)/(25*x^5) - (b*d*e*n)/(8*x^4) - (b*e^2*n)/(9*x^3) - (d^2*(a + b*L
og[c*x^n]))/(5*x^5) - (d*e*(a + b*Log[c*x^n]))/(2*x^4) - (e^2*(a + b*Log[c*
x^n]))/(3*x^3)
```

Rubi [A] time = 0.075784, antiderivative size = 74, normalized size of antiderivative = 0.78, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)(a+b\log(cx^n))-\frac{bd^2n}{25x^5}-\frac{bden}{8x^4}-\frac{be^2n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^2*n)/(25*x^5) - (b*d*e*n)/(8*x^4) - (b*e^2*n)/(9*x^3) - (((6*d^2)/x^5
 + (15*d*e)/x^4 + (10*e^2)/x^3)*(a + b*Log[c*x^n]))/30
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)^2 (a+b\log(cx^n))}{x^6}\,dx &= -\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)(a+b\log(cx^n))-(bn)\int\frac{-6d^2-15dex-10e^2x^2}{30x^6}\,dx\\ &= -\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)(a+b\log(cx^n))-\frac{1}{30}(bn)\int\frac{-6d^2-15dex-10e^2x^2}{x^6}\,dx\\ &= -\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)(a+b\log(cx^n))-\frac{1}{30}(bn)\int\left(-\frac{6d^2}{x^6}-\frac{15de}{x^5}-\frac{10e^2}{x^4}\right)dx\\ &= -\frac{bd^2n}{25x^5}-\frac{bden}{8x^4}-\frac{be^2n}{9x^3}-\frac{1}{30}\left(\frac{6d^2}{x^5}+\frac{15de}{x^4}+\frac{10e^2}{x^3}\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0386351, size = 80, normalized size = 0.84

$$-\frac{60a\left(6d^2+15dex+10e^2x^2\right)+60b\left(6d^2+15dex+10e^2x^2\right)\log(cx^n)+bn\left(72d^2+225dex+200e^2x^2\right)}{1800x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(60*a*(6*d^2 + 15*d*e*x + 10*e^2*x^2) + b*n*(72*d^2 + 225*d*e*x + 200*e^2*
x^2) + 60*b*(6*d^2 + 15*d*e*x + 10*e^2*x^2)*Log[c*x^n])/(1800*x^5)
```

Maple [C] time = 0.121, size = 403, normalized size = 4.2

$$-\frac{b\left(10\,e^2x^2+15\,dex+6\,d^2\right)\ln(x^n)}{30\,x^5}-\frac{-180\,i\pi\,bd^2\left(\mathrm{csgn}(icx^n)\right)^3-300\,i\pi\,be^2x^2\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-300\,i\pi\,be\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/30*b*(10*e^2*x^2+15*d*e*x+6*d^2)/x^5*ln(x^n)-1/1800*(-180*I*Pi*b*d^2*csg
n(I*c*x^n)^3-300*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-300*I*P
i*b*e^2*x^2*csgn(I*c*x^n)^3-180*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+600*ln(c)*b*e^2*x^2+200*b*e^2*n*x^2+600*a*e^2*x^2+180*I*Pi*b*d^2*csgn(I
*x^n)*csgn(I*c*x^n)^2+450*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+300*I*Pi*b
*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+180*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)
+900*ln(c)*b*d*e*x+225*b*d*e*n*x+900*a*d*e*x-450*I*Pi*b*d*e*x*csgn(I*c*x^n)
^3+450*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+300*I*Pi*b*e^2*x^2*csgn(I*x
^n)*csgn(I*c*x^n)^2-450*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36
0*ln(c)*b*d^2+72*b*d^2*n+360*a*d^2)/x^5
```

Maxima [A] time = 1.4579, size = 135, normalized size = 1.42

$$-\frac{be^2n}{9\,x^3}-\frac{be^2\log\left(cx^n\right)}{3\,x^3}-\frac{bden}{8\,x^4}-\frac{ae^2}{3\,x^3}-\frac{bde\log\left(cx^n\right)}{2\,x^4}-\frac{bd^2n}{25\,x^5}-\frac{ade}{2\,x^4}-\frac{bd^2\log\left(cx^n\right)}{5\,x^5}-\frac{ad^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^2*n/x^3 - 1/3*b*e^2*log(c*x^n)/x^3 - 1/8*b*d*e*n/x^4 - 1/3*a*e^2/x
^3 - 1/2*b*d*e*log(c*x^n)/x^4 - 1/25*b*d^2*n/x^5 - 1/2*a*d*e/x^4 - 1/5*b*d^
2*log(c*x^n)/x^5 - 1/5*a*d^2/x^5
```

Fricas [A] time = 1.01916, size = 273, normalized size = 2.87

$$-\frac{72\,bd^2n+360\,ad^2+200\left(be^2n+3\,ae^2\right)x^2+225\left(bden+4\,ade\right)x+60\left(10\,be^2x^2+15\,bdex+6\,bd^2\right)\log\left(c\right)+60\left(10\,be^2n\right.}{1800\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/1800*(72*b*d^2*n + 360*a*d^2 + 200*(b*e^2*n + 3*a*e^2)*x^2 + 225*(b*d*e*
n + 4*a*d*e)*x + 60*(10*b*e^2*x^2 + 15*b*d*e*x + 6*b*d^2)*log(c) + 60*(10*b
*e^2*n*x^2 + 15*b*d*e*n*x + 6*b*d^2*n)*log(x))/x^5
```

Sympy [A] time = 8.20365, size = 153, normalized size = 1.61

$$-\frac{ad^2}{5x^5} - \frac{ade}{2x^4} - \frac{ae^2}{3x^3} - \frac{bd^2n\log(x)}{5x^5} - \frac{bd^2n}{25x^5} - \frac{bd^2\log(c)}{5x^5} - \frac{bden\log(x)}{2x^4} - \frac{bden}{8x^4} - \frac{bde\log(c)}{2x^4} - \frac{be^2n\log(x)}{3x^3} - \frac{be^2n}{9x^3} - \frac{be^2 l}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**2/(5*x**5) - a*d*e/(2*x**4) - a*e**2/(3*x**3) - b*d**2*n*log(x)/(5*x*
*5) - b*d**2*n/(25*x**5) - b*d**2*log(c)/(5*x**5) - b*d*e*n*log(x)/(2*x**4)
 - b*d*e*n/(8*x**4) - b*d*e*log(c)/(2*x**4) - b*e**2*n*log(x)/(3*x**3) - b*
e**2*n/(9*x**3) - b*e**2*log(c)/(3*x**3)
```

Giac [A] time = 1.28953, size = 146, normalized size = 1.54

$$-\frac{600\,bnx^2e^2\log(x) + 900\,bdnxe\log(x) + 200\,bnx^2e^2 + 225\,bdnxe + 600\,bx^2e^2\log(c) + 900\,bdxe\log(c) + 360\,bd^2n\log(}{1800\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/1800*(600*b*n*x^2*e^2*log(x) + 900*b*d*n*x*e*log(x) + 200*b*n*x^2*e^2 +
225*b*d*n*x*e + 600*b*x^2*e^2*log(c) + 900*b*d*x*e*log(c) + 360*b*d^2*n*log
(x) + 72*b*d^2*n + 600*a*x^2*e^2 + 900*a*d*x*e + 360*b*d^2*log(c) + 360*a*d
^2)/x^5
```

3.19 $\int x^3(d+ex)^3\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=100

$$\frac{1}{140}\left(84d^2ex^5+35d^3x^4+70de^2x^6+20e^3x^7\right)(a+b\log(cx^n))-\frac{3}{25}bd^2enx^5-\frac{1}{16}bd^3nx^4-\frac{1}{12}bde^2nx^6-\frac{1}{49}be^3nx^7$$

```
[Out] -(b*d^3*n*x^4)/16 - (3*b*d^2*e*n*x^5)/25 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*x^
7)/49 + ((35*d^3*x^4 + 84*d^2*e*x^5 + 70*d*e^2*x^6 + 20*e^3*x^7)*(a + b*Log
[c*x^n]))/140
```

Rubi [A] time = 0.105569, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$\frac{1}{140}\left(84d^2ex^5+35d^3x^4+70de^2x^6+20e^3x^7\right)(a+b\log(cx^n))-\frac{3}{25}bd^2enx^5-\frac{1}{16}bd^3nx^4-\frac{1}{12}bde^2nx^6-\frac{1}{49}be^3nx^7$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n*x^4)/16 - (3*b*d^2*e*n*x^5)/25 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*x^
7)/49 + ((35*d^3*x^4 + 84*d^2*e*x^5 + 70*d*e^2*x^6 + 20*e^3*x^7)*(a + b*Log
[c*x^n]))/140
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^3(d+ex)^3\left(a+b\log\left(cx^n\right)\right)dx &= \frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{140}x^3\left(35d^3\right.\\ &= \frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{140}(bn)\int x^3\left(35d^3\right.\\ &= \frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de^2x^6+20e^3x^7\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{140}(bn)\int\left(35d^3x^3\right.\\ &= -\frac{1}{16}bd^3nx^4-\frac{3}{25}bd^2enx^5-\frac{1}{12}bde^2nx^6-\frac{1}{49}be^3nx^7+\frac{1}{140}\left(35d^3x^4+84d^2ex^5+70de\right.\end{aligned}$$

Mathematica [A] time = 0.0582264, size = 133, normalized size = 1.33

$$\frac{3}{5}d^2ex^5\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}d^3x^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}de^2x^6\left(a+b\log\left(cx^n\right)\right)+\frac{1}{7}e^3x^7\left(a+b\log\left(cx^n\right)\right)-\frac{3}{25}bd^2enx^5-\frac{1}{16}b$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n*x^4)/16 - (3*b*d^2*e*n*x^5)/25 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*x^
7)/49 + (d^3*x^4*(a + b*Log[c*x^n]))/4 + (3*d^2*e*x^5*(a + b*Log[c*x^n]))/5
 + (d*e^2*x^6*(a + b*Log[c*x^n]))/2 + (e^3*x^7*(a + b*Log[c*x^n]))/7
```

Maple [C] time = 0.217, size = 600, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/5*a*d^2*e*x^5+1/2*a*d*e^2*x^6-1/14*I*Pi*b*e^3*x^7*csgn(I*c*x^n)^3-1/8*I*P
i*b*d^3*x^4*csgn(I*c*x^n)^3+1/140*b*x^4*(20*e^3*x^3+70*d*e^2*x^2+84*d^2*e*x
+35*d^3)*ln(x^n)+1/2*ln(c)*b*d*e^2*x^6+3/5*ln(c)*b*d^2*e*x^5+3/10*I*Pi*b*d^
2*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/8*I*Pi*b*d^3*x^4*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+3/10*I*Pi*b*d^2*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2-1/14*I*Pi*b
*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b*d*e^2*x^6*csgn(I*x^
n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d*e^2*x^6*csgn(I*c*x^n)^2*csgn(I*c)-3/10*I*Pi
*b*d^2*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/7*a*e^3*x^7+1/4*ln(c)*b*
d^3*x^4+1/7*ln(c)*b*e^3*x^7-1/4*I*Pi*b*d*e^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+1/4*a*d^3*x^4+1/8*I*Pi*b*d^3*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/14*I
*Pi*b*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2+1/14*I*Pi*b*e^3*x^7*csgn(I*c*x^n)
^2*csgn(I*c)+1/8*I*Pi*b*d^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-3/10*I*Pi*b*d^2
*e*x^5*csgn(I*c*x^n)^3-1/4*I*Pi*b*d*e^2*x^6*csgn(I*c*x^n)^3-1/16*b*d^3*n*x^
4-1/49*b*e^3*n*x^7-3/25*b*d^2*e*n*x^5-1/12*b*d*e^2*n*x^6
```

Maxima [A] time = 1.09337, size = 193, normalized size = 1.93

$$-\frac{1}{49}\,be^3nx^7+\frac{1}{7}\,be^3x^7\log\left(cx^n\right)-\frac{1}{12}\,bde^2nx^6+\frac{1}{7}\,ae^3x^7+\frac{1}{2}\,bde^2x^6\log\left(cx^n\right)-\frac{3}{25}\,bd^2enx^5+\frac{1}{2}\,ade^2x^6+\frac{3}{5}\,bd^2ex^5\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/49*b*e^3*n*x^7 + 1/7*b*e^3*x^7*log(c*x^n) - 1/12*b*d*e^2*n*x^6 + 1/7*a*e
^3*x^7 + 1/2*b*d*e^2*x^6*log(c*x^n) - 3/25*b*d^2*e*n*x^5 + 1/2*a*d*e^2*x^6
+ 3/5*b*d^2*e*x^5*log(c*x^n) - 1/16*b*d^3*n*x^4 + 3/5*a*d^2*e*x^5 + 1/4*b*d
^3*x^4*log(c*x^n) + 1/4*a*d^3*x^4
```

Fricas [A] time = 0.987537, size = 402, normalized size = 4.02

$$-\frac{1}{49}\left(be^3n-7\,ae^3\right)x^7-\frac{1}{12}\left(bde^2n-6\,ade^2\right)x^6-\frac{3}{25}\left(bd^2en-5\,ad^2e\right)x^5-\frac{1}{16}\left(bd^3n-4\,ad^3\right)x^4+\frac{1}{140}\left(20\,be^3x^7+70\,bde\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/49*(b*e^3*n - 7*a*e^3)*x^7 - 1/12*(b*d*e^2*n - 6*a*d*e^2)*x^6 - 3/25*(b*
d^2*e*n - 5*a*d^2*e)*x^5 - 1/16*(b*d^3*n - 4*a*d^3)*x^4 + 1/140*(20*b*e^3*x
```

```
^7 + 70*b*d*e^2*x^6 + 84*b*d^2*e*x^5 + 35*b*d^3*x^4)*log(c) + 1/140*(20*b*e
^3*n*x^7 + 70*b*d*e^2*n*x^6 + 84*b*d^2*e*n*x^5 + 35*b*d^3*n*x^4)*log(x)
```

Sympy [B] time = 43.6895, size = 223, normalized size = 2.23

$$\frac{ad^3x^4}{4} + \frac{3ad^2ex^5}{5} + \frac{ade^2x^6}{2} + \frac{ae^3x^7}{7} + \frac{bd^3nx^4\log(x)}{4} - \frac{bd^3nx^4}{16} + \frac{bd^3x^4\log(c)}{4} + \frac{3bd^2enx^5\log(x)}{5} - \frac{3bd^2enx^5}{25} + \frac{3bd^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**3*x**4/4 + 3*a*d**2*e*x**5/5 + a*d*e**2*x**6/2 + a*e**3*x**7/7 + b*d**
3*n*x**4*log(x)/4 - b*d**3*n*x**4/16 + b*d**3*x**4*log(c)/4 + 3*b*d**2*e*n*
x**5*log(x)/5 - 3*b*d**2*e*n*x**5/25 + 3*b*d**2*e*x**5*log(c)/5 + b*d*e**2*
n*x**6*log(x)/2 - b*d*e**2*n*x**6/12 + b*d*e**2*x**6*log(c)/2 + b*e**3*n*x*
*7*log(x)/7 - b*e**3*n*x**7/49 + b*e**3*x**7*log(c)/7
```

Giac [A] time = 1.33537, size = 234, normalized size = 2.34

$$\frac{1}{7}bnx^7e^3\log(x) + \frac{1}{2}bdnx^6e^2\log(x) + \frac{3}{5}bd^2nx^5e\log(x) - \frac{1}{49}bnx^7e^3 - \frac{1}{12}bdnx^6e^2 - \frac{3}{25}bd^2nx^5e + \frac{1}{7}bx^7e^3\log(c) + \frac{1}{2}b$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7*b*n*x^7*e^3*log(x) + 1/2*b*d*n*x^6*e^2*log(x) + 3/5*b*d^2*n*x^5*e*log(x
) - 1/49*b*n*x^7*e^3 - 1/12*b*d*n*x^6*e^2 - 3/25*b*d^2*n*x^5*e + 1/7*b*x^7*
e^3*log(c) + 1/2*b*d*x^6*e^2*log(c) + 3/5*b*d^2*x^5*e*log(c) + 1/4*b*d^3*n*
x^4*log(x) - 1/16*b*d^3*n*x^4 + 1/7*a*x^7*e^3 + 1/2*a*d*x^6*e^2 + 3/5*a*d^2
*x^5*e + 1/4*b*d^3*x^4*log(c) + 1/4*a*d^3*x^4
```

3.20 $\int x^2(d+ex)^3 (a+b\log(cx^n))\, dx$

Optimal. Leaf size=100

$$\frac{1}{60}\left(45d^2ex^4+20d^3x^3+36de^2x^5+10e^3x^6\right)(a+b\log(cx^n))-\frac{3}{16}bd^2enx^4-\frac{1}{9}bd^3nx^3-\frac{3}{25}bde^2nx^5-\frac{1}{36}be^3nx^6$$

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^4)/16 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x
^6)/36 + ((20*d^3*x^3 + 45*d^2*e*x^4 + 36*d*e^2*x^5 + 10*e^3*x^6)*(a + b*Lo
g[c*x^n]))/60
```

Rubi [A] time = 0.102275, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$\frac{1}{60}\left(45d^2ex^4+20d^3x^3+36de^2x^5+10e^3x^6\right)(a+b\log(cx^n))-\frac{3}{16}bd^2enx^4-\frac{1}{9}bd^3nx^3-\frac{3}{25}bde^2nx^5-\frac{1}{36}be^3nx^6$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^4)/16 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x
^6)/36 + ((20*d^3*x^3 + 45*d^2*e*x^4 + 36*d*e^2*x^5 + 10*e^3*x^6)*(a + b*Lo
g[c*x^n]))/60
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^2(d+ex)^3\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{60}x^2\left(20d^3+\right.\\ &= \frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int x^2\left(20d^3+\right.\\ &= \frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2x^5+10e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{60}(bn)\int\left(20d^3x^2+\right.\\ &= -\frac{1}{9}bd^3nx^3-\frac{3}{16}bd^2enx^4-\frac{3}{25}bde^2nx^5-\frac{1}{36}be^3nx^6+\frac{1}{60}\left(20d^3x^3+45d^2ex^4+36de^2\right.\end{aligned}$$

Mathematica [A] time = 0.0493882, size = 133, normalized size = 1.33

$$\frac{3}{4}d^2ex^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}d^3x^3\left(a+b\log\left(cx^n\right)\right)+\frac{3}{5}de^2x^5\left(a+b\log\left(cx^n\right)\right)+\frac{1}{6}e^3x^6\left(a+b\log\left(cx^n\right)\right)-\frac{3}{16}bd^2enx^4-\frac{1}{9}bd$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^4)/16 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x
^6)/36 + (d^3*x^3*(a + b*Log[c*x^n]))/3 + (3*d^2*e*x^4*(a + b*Log[c*x^n]))/
4 + (3*d*e^2*x^5*(a + b*Log[c*x^n]))/5 + (e^3*x^6*(a + b*Log[c*x^n]))/6
```

Maple [C] time = 0.223, size = 600, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/5*a*d*e^2*x^5+3/4*a*d^2*e*x^4-1/6*I*Pi*b*d^3*x^3*csgn(I*c*x^n)^3-1/12*I*P
i*b*e^3*x^6*csgn(I*c*x^n)^3+3/4*ln(c)*b*d^2*e*x^4+3/5*ln(c)*b*d*e^2*x^5+3/1
0*I*Pi*b*d*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+3/8*I*Pi*b*d^2*e*x^4*csgn(I*
x^n)*csgn(I*c*x^n)^2-1/6*I*Pi*b*d^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+3/8*I*Pi*b*d^2*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+3/10*I*Pi*b*d*e^2*x^5*csgn(
I*c*x^n)^2*csgn(I*c)-1/12*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+1/3*ln(c)*b*d^3*x^3+1/6*ln(c)*b*e^3*x^6-3/10*I*Pi*b*d*e^2*x^5*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-3/8*I*Pi*b*d^2*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+1/60*b*x^3*(10*e^3*x^3+36*d*e^2*x^2+45*d^2*e*x+20*d^3)*ln(x^n)+1/12*
I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/12*I*Pi*b*e^3*x^6*csgn(I*c*x^n
)^2*csgn(I*c)+1/6*a*e^3*x^6+1/3*a*d^3*x^3-3/8*I*Pi*b*d^2*e*x^4*csgn(I*c*x^n
)^3-3/10*I*Pi*b*d*e^2*x^5*csgn(I*c*x^n)^3+1/6*I*Pi*b*d^3*x^3*csgn(I*x^n)*cs
gn(I*c*x^n)^2+1/6*I*Pi*b*d^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/9*b*d^3*n*x^3-
1/36*b*e^3*n*x^6-3/16*b*d^2*e*n*x^4-3/25*b*d*e^2*n*x^5
```

Maxima [A] time = 1.17195, size = 193, normalized size = 1.93

$$-\frac{1}{36}\,be^3nx^6+\frac{1}{6}\,be^3x^6\log\left(cx^n\right)-\frac{3}{25}\,bde^2nx^5+\frac{1}{6}\,ae^3x^6+\frac{3}{5}\,bde^2x^5\log\left(cx^n\right)-\frac{3}{16}\,bd^2enx^4+\frac{3}{5}\,ade^2x^5+\frac{3}{4}\,bd^2ex^4\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*b*e^3*n*x^6 + 1/6*b*e^3*x^6*log(c*x^n) - 3/25*b*d*e^2*n*x^5 + 1/6*a*e
^3*x^6 + 3/5*b*d*e^2*x^5*log(c*x^n) - 3/16*b*d^2*e*n*x^4 + 3/5*a*d*e^2*x^5
+ 3/4*b*d^2*e*x^4*log(c*x^n) - 1/9*b*d^3*n*x^3 + 3/4*a*d^2*e*x^4 + 1/3*b*d^
3*x^3*log(c*x^n) + 1/3*a*d^3*x^3
```

Fricas [A] time = 1.01714, size = 398, normalized size = 3.98

$$-\frac{1}{36}\left(be^3n-6\,ae^3\right)x^6-\frac{3}{25}\left(bde^2n-5\,ade^2\right)x^5-\frac{3}{16}\left(bd^2en-4\,ad^2e\right)x^4-\frac{1}{9}\left(bd^3n-3\,ad^3\right)x^3+\frac{1}{60}\left(10\,be^3x^6+36\,bde^2x^5\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/36*(b*e^3*n - 6*a*e^3)*x^6 - 3/25*(b*d*e^2*n - 5*a*d*e^2)*x^5 - 3/16*(b*
d^2*e*n - 4*a*d^2*e)*x^4 - 1/9*(b*d^3*n - 3*a*d^3)*x^3 + 1/60*(10*b*e^3*x^6
```

```
 + 36*b*d*e^2*x^5 + 45*b*d^2*e*x^4 + 20*b*d^3*x^3)*log(c) + 1/60*(10*b*e^3*
n*x^6 + 36*b*d*e^2*n*x^5 + 45*b*d^2*e*n*x^4 + 20*b*d^3*n*x^3)*log(x)
```

Sympy [B] time = 7.322, size = 230, normalized size = 2.3

$$\frac{ad^3x^3}{3} + \frac{3ad^2ex^4}{4} + \frac{3ade^2x^5}{5} + \frac{ae^3x^6}{6} + \frac{bd^3nx^3\log(x)}{3} - \frac{bd^3nx^3}{9} + \frac{bd^3x^3\log(c)}{3} + \frac{3bd^2enx^4\log(x)}{4} - \frac{3bd^2enx^4}{16} + \frac{3bd^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**3*x**3/3 + 3*a*d**2*e*x**4/4 + 3*a*d*e**2*x**5/5 + a*e**3*x**6/6 + b*d
**3*n*x**3*log(x)/3 - b*d**3*n*x**3/9 + b*d**3*x**3*log(c)/3 + 3*b*d**2*e*n
*x**4*log(x)/4 - 3*b*d**2*e*n*x**4/16 + 3*b*d**2*e*x**4*log(c)/4 + 3*b*d*e*
*2*n*x**5*log(x)/5 - 3*b*d*e**2*n*x**5/25 + 3*b*d*e**2*x**5*log(c)/5 + b*e*
*3*n*x**6*log(x)/6 - b*e**3*n*x**6/36 + b*e**3*x**6*log(c)/6
```

Giac [A] time = 1.29318, size = 234, normalized size = 2.34

$$\frac{1}{6}bnx^6e^3\log(x) + \frac{3}{5}bdnx^5e^2\log(x) + \frac{3}{4}bd^2nx^4e\log(x) - \frac{1}{36}bnx^6e^3 - \frac{3}{25}bdnx^5e^2 - \frac{3}{16}bd^2nx^4e + \frac{1}{6}bx^6e^3\log(c) + \frac{3}{5}bd$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*b*n*x^6*e^3*log(x) + 3/5*b*d*n*x^5*e^2*log(x) + 3/4*b*d^2*n*x^4*e*log(x
) - 1/36*b*n*x^6*e^3 - 3/25*b*d*n*x^5*e^2 - 3/16*b*d^2*n*x^4*e + 1/6*b*x^6*
e^3*log(c) + 3/5*b*d*x^5*e^2*log(c) + 3/4*b*d^2*x^4*e*log(c) + 1/3*b*d^3*n*
x^3*log(x) - 1/9*b*d^3*n*x^3 + 1/6*a*x^6*e^3 + 3/5*a*d*x^5*e^2 + 3/4*a*d^2*
x^4*e + 1/3*b*d^3*x^3*log(c) + 1/3*a*d^3*x^3
```

3.21 $\int x(d+ex)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=122

$$-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)(a+b\log(cx^n))+\frac{bd^5n\log(x)}{20e^2}+\frac{1}{15}bd^2enx^3+\frac{bd^4nx}{5e}+\frac{3}{20}bd^3nx^2+\frac{1}{80}bde^2nx^4-\frac{bn(}{}$$

```
[Out] (b*d^4*n*x)/(5*e) + (3*b*d^3*n*x^2)/20 + (b*d^2*e*n*x^3)/15 + (b*d*e^2*n*x^
4)/80 - (b*n*(d + e*x)^5)/(25*e^2) + (b*d^5*n*Log[x])/(20*e^2) - (((5*d*(d
+ e*x)^4)/e^2 - (4*(d + e*x)^5)/e^2)*(a + b*Log[c*x^n]))/20
```

Rubi [A] time = 0.0911198, antiderivative size = 122, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {43, 2334, 12, 80}

$$-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)(a+b\log(cx^n))+\frac{bd^5n\log(x)}{20e^2}+\frac{1}{15}bd^2enx^3+\frac{bd^4nx}{5e}+\frac{3}{20}bd^3nx^2+\frac{1}{80}bde^2nx^4-\frac{bn(}{}$$

Antiderivative was successfully verified.

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

```
[Out] (b*d^4*n*x)/(5*e) + (3*b*d^3*n*x^2)/20 + (b*d^2*e*n*x^3)/15 + (b*d*e^2*n*x^
4)/80 - (b*n*(d + e*x)^5)/(25*e^2) + (b*d^5*n*Log[x])/(20*e^2) - (((5*d*(d
+ e*x)^4)/e^2 - (4*(d + e*x)^5)/e^2)*(a + b*Log[c*x^n]))/20
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rubi steps

$$\int x(d+ex)^3\left(a+b\log\left(cx^n\right)\right)\,dx=-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{(d+ex)^4(-d+4ex)}{20e^2x}\,dx$$

$$=-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\frac{(d+ex)^4(-d+4ex)}{x}\,dx}{20e^2}$$

$$=-\frac{bn(d+ex)^5}{25e^2}-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{(bdn)\int\frac{(d+ex)^4}{x}\,dx}{20e^2}$$

$$=-\frac{bn(d+ex)^5}{25e^2}-\frac{1}{20}\left(\frac{5d(d+ex)^4}{e^2}-\frac{4(d+ex)^5}{e^2}\right)\left(a+b\log\left(cx^n\right)\right)+\frac{(bdn)\int\left(4d^3e+\frac{d^4}{x}\right.}{}$$

$$=\frac{bd^4nx}{5e}+\frac{3}{20}bd^3nx^2+\frac{1}{15}bd^2enx^3+\frac{1}{80}bde^2nx^4-\frac{bn(d+ex)^5}{25e^2}+\frac{bd^5n\log(x)}{20e^2}-\frac{1}{20}\left(\frac{5}{}\right.$$

Mathematica [A] time = 0.118846, size = 130, normalized size = 1.07

$$d^2ex^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}d^3x^2\left(a+b\log\left(cx^n\right)\right)+\frac{3}{4}de^2x^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{5}e^3x^5\left(a+b\log\left(cx^n\right)\right)-\frac{1}{3}bd^2enx^3-\frac{1}{4}bd^3n$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n*x^2)/4 - (b*d^2*e*n*x^3)/3 - (3*b*d*e^2*n*x^4)/16 - (b*e^3*n*x^5)
/25 + (d^3*x^2*(a + b*Log[c*x^n]))/2 + d^2*e*x^3*(a + b*Log[c*x^n]) + (3*d*
e^2*x^4*(a + b*Log[c*x^n]))/4 + (e^3*x^5*(a + b*Log[c*x^n]))/5
```

Maple [C] time = 0.225, size = 598, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] ln(c)*b*d^2*e*x^3+3/4*ln(c)*b*d*e^2*x^4+1/2*a*d^3*x^2+1/4*I*Pi*b*d^3*x^2*cs
gn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d^3*x^2*csgn(I*c*x^n)^2*csgn(I*c)+3/4*
a*d*e^2*x^4+a*d^2*e*x^3-1/4*I*Pi*b*d^3*x^2*csgn(I*c*x^n)^3-1/10*I*Pi*b*e^3*
x^5*csgn(I*c*x^n)^3+1/2*I*Pi*b*d^2*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi
*b*d^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/10*I*Pi*b*e^3*x^5*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+3/8*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+3/8*I*Pi*b*d*e^2*x^4*csg
n(I*c*x^n)^2*csgn(I*c)-3/8*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)-1/2*I*Pi*b*d^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b*d^
2*e*x^3*csgn(I*c*x^n)^3+1/10*I*Pi*b*e^3*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/1
0*I*Pi*b*e^3*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*a*e^3*x^5-3/8*I*Pi*b*d*e^2*x
^4*csgn(I*c*x^n)^3+1/5*ln(c)*b*e^3*x^5+1/2*ln(c)*b*d^3*x^2+1/20*b*x^2*(4*e^
3*x^3+15*d*e^2*x^2+20*d^2*e*x+10*d^3)*ln(x^n)-1/4*b*d^3*n*x^2-1/3*b*d^2*e*n
*x^3-3/16*b*d*e^2*n*x^4-1/25*b*e^3*n*x^5
```

Maxima [A] time = 0.984495, size = 190, normalized size = 1.56

$$-\frac{1}{25}\,be^3nx^5+\frac{1}{5}\,be^3x^5\log\left(cx^n\right)-\frac{3}{16}\,bde^2nx^4+\frac{1}{5}\,ae^3x^5+\frac{3}{4}\,bde^2x^4\log\left(cx^n\right)-\frac{1}{3}\,bd^2enx^3+\frac{3}{4}\,ade^2x^4+bd^2ex^3\log\left(cx^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*b*e^3*n*x^5 + 1/5*b*e^3*x^5*log(c*x^n) - 3/16*b*d*e^2*n*x^4 + 1/5*a*e
^3*x^5 + 3/4*b*d*e^2*x^4*log(c*x^n) - 1/3*b*d^2*e*n*x^3 + 3/4*a*d*e^2*x^4 +
 b*d^2*e*x^3*log(c*x^n) - 1/4*b*d^3*n*x^2 + a*d^2*e*x^3 + 1/2*b*d*3*x^2*log
(c*x^n) + 1/2*a*d^3*x^2
```

Fricas [A] time = 1.02135, size = 394, normalized size = 3.23

$$-\frac{1}{25}\left(be^3n-5\,ae^3\right)x^5-\frac{3}{16}\left(bde^2n-4\,ade^2\right)x^4-\frac{1}{3}\left(bd^2en-3\,ad^2e\right)x^3-\frac{1}{4}\left(bd^3n-2\,ad^3\right)x^2+\frac{1}{20}\left(4\,be^3x^5+15\,bde^2x^4+2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/25*(b*e^3*n - 5*a*e^3)*x^5 - 3/16*(b*d*e^2*n - 4*a*d*e^2)*x^4 - 1/3*(b*d
^2*e*n - 3*a*d^2*e)*x^3 - 1/4*(b*d^3*n - 2*a*d^3)*x^2 + 1/20*(4*b*e^3*x^5 +
 15*b*d*e^2*x^4 + 20*b*d^2*e*x^3 + 10*b*d^3*x^2)*log(c) + 1/20*(4*b*e^3*n*x
^5 + 15*b*d*e^2*n*x^4 + 20*b*d^2*e*n*x^3 + 10*b*d^3*n*x^2)*log(x)
```

Sympy [A] time = 3.67076, size = 218, normalized size = 1.79

$$\frac{ad^3x^2}{2}+ad^2ex^3+\frac{3ade^2x^4}{4}+\frac{ae^3x^5}{5}+\frac{bd^3nx^2\log\left(x\right)}{2}-\frac{bd^3nx^2}{4}+\frac{bd^3x^2\log\left(c\right)}{2}+bd^2enx^3\log\left(x\right)-\frac{bd^2enx^3}{3}+bd^2ex^3\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**3*x**2/2 + a*d**2*e*x**3 + 3*a*d*e**2*x**4/4 + a*e**3*x**5/5 + b*d**3*
n*x**2*log(x)/2 - b*d**3*n*x**2/4 + b*d**3*x**2*log(c)/2 + b*d**2*e*n*x**3*
log(x) - b*d**2*e*n*x**3/3 + b*d**2*e*x**3*log(c) + 3*b*d*e**2*n*x**4*log(x
)/4 - 3*b*d*e**2*n*x**4/16 + 3*b*d*e**2*x**4*log(c)/4 + b*e**3*n*x**5*log(x
)/5 - b*e**3*n*x**5/25 + b*e**3*x**5*log(c)/5
```

Giac [A] time = 1.20664, size = 230, normalized size = 1.89

$$\frac{1}{5}\,bnx^5e^3\log\left(x\right)+\frac{3}{4}\,bdnx^4e^2\log\left(x\right)+bd^2nx^3e\log\left(x\right)-\frac{1}{25}\,bnx^5e^3-\frac{3}{16}\,bdnx^4e^2-\frac{1}{3}\,bd^2nx^3e+\frac{1}{5}\,bx^5e^3\log\left(c\right)+\frac{3}{4}\,bdx^4e$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b*n*x^5*e^3*log(x) + 3/4*b*d*n*x^4*e^2*log(x) + b*d^2*n*x^3*e*log(x) -
1/25*b*n*x^5*e^3 - 3/16*b*d*n*x^4*e^2 - 1/3*b*d^2*n*x^3*e + 1/5*b*x^5*e^3*l
```

```
og(c) + 3/4*b*d*x^4*e^2*log(c) + b*d^2*x^3*e*log(c) + 1/2*b*d^3*n*x^2*log(x
) - 1/4*b*d^3*n*x^2 + 1/5*a*x^5*e^3 + 3/4*a*d*x^4*e^2 + a*d^2*x^3*e + 1/2*b
*d^3*x^2*log(c) + 1/2*a*d^3*x^2
```

3.22 $\int (d+ex)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=85

$$\frac{(d+ex)^4 (a+b\log(cx^n))}{4e} - \frac{3}{4}bd^2enx^2 - \frac{bd^4n\log(x)}{4e} - bd^3nx - \frac{1}{3}bde^2nx^3 - \frac{1}{16}be^3nx^4$$

```
[Out] -(b*d^3*n*x) - (3*b*d^2*e*n*x^2)/4 - (b*d*e^2*n*x^3)/3 - (b*e^3*n*x^4)/16 -
 (b*d^4*n*Log[x])/(4*e) + ((d + e*x)^4*(a + b*Log[c*x^n]))/(4*e)
```

Rubi [A] time = 0.0434278, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {32, 2313, 12, 43}

$$\frac{(d+ex)^4 (a+b\log(cx^n))}{4e} - \frac{3}{4}bd^2enx^2 - \frac{bd^4n\log(x)}{4e} - bd^3nx - \frac{1}{3}bde^2nx^3 - \frac{1}{16}be^3nx^4$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n*x) - (3*b*d^2*e*n*x^2)/4 - (b*d*e^2*n*x^3)/3 - (b*e^3*n*x^4)/16 -
 (b*d^4*n*Log[x])/(4*e) + ((d + e*x)^4*(a + b*Log[c*x^n]))/(4*e)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (d+ex)^3 (a+b\log(cx^n))\,dx = \frac{(d+ex)^4(a+b\log(cx^n))}{4e} - (bn)\int \frac{(d+ex)^4}{4ex}\,dx$$
$$= \frac{(d+ex)^4(a+b\log(cx^n))}{4e} - \frac{(bn)\int \frac{(d+ex)^4}{x}\,dx}{4e}$$
$$= \frac{(d+ex)^4(a+b\log(cx^n))}{4e} - \frac{(bn)\int \left(4d^3e + \frac{d^4}{x} + 6d^2e^2x + 4de^3x^2 + e^4x^3\right)dx}{4e}$$
$$= -bd^3nx - \frac{3}{4}bd^2enx^2 - \frac{1}{3}bde^2nx^3 - \frac{1}{16}be^3nx^4 - \frac{bd^4n\log(x)}{4e} + \frac{(d+ex)^4(a+b\log(cx$$

Mathematica [A] time = 0.046026, size = 110, normalized size = 1.29

$$\frac{1}{48}x\left(12a\left(6d^2ex+4d^3+4de^2x^2+e^3x^3\right)+12b\left(6d^2ex+4d^3+4de^2x^2+e^3x^3\right)\log(cx^n)-bn\left(36d^2ex+48d^3+16de^2x^2\right.\right.$$

Antiderivative was successfully verified.

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

```
[Out] (x*(12*a*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^3*x^3) - b*n*(48*d^3 + 36*d^2
*e*x + 16*d*e^2*x^2 + 3*e^3*x^3) + 12*b*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 +
e^3*x^3)*Log[c*x^n]))/48
```

Maple [C] time = 0.227, size = 571, normalized size = 6.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/2*a*d^2*e*x^2+a*d*e^2*x^3+1/8*I*e^3*Pi*b*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/
8*I*e^3*Pi*b*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*e^2*Pi*b*d*x^3*csgn(I*c*
x^n)^3-3/4*I*e*Pi*b*d^2*x^2*csgn(I*c*x^n)^3+1/2*I*Pi*b*d^3*csgn(I*c*x^n)^2*
csgn(I*c)*x+1/2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x+3/2*ln(c)*b*d^2*e*
x^2+ln(c)*b*d*e^2*x^3+ln(c)*b*d^3*x+1/4*ln(c)*b*e^3*x^4-1/2*I*Pi*b*d^3*csgn
(I*c*x^n)^3*x-1/8*I*e^3*Pi*b*x^4*csgn(I*c*x^n)^3+1/4*a*e^3*x^4+a*d^3*x+1/4*
b*(e*x+d)^4/e*ln(x^n)-1/8*I*e^3*Pi*b*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+1/2*I*e^2*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*e^2*Pi*b*d*x^3*csgn(
I*x^n)*csgn(I*c*x^n)^2+3/4*I*e*Pi*b*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+3/4*I
*e*Pi*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*b*d^3*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*x-b*d^3*n*x-1/2*I*e^2*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-3/4*I*e*Pi*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*
b*d^4*n*ln(x)/e-1/16*b*e^3*n*x^4-3/4*b*d^2*e*n*x^2-1/3*b*d*e^2*n*x^3
```

Maxima [A] time = 1.13255, size = 180, normalized size = 2.12

$$-\frac{1}{16}\,be^3nx^4 + \frac{1}{4}\,be^3x^4\log\left(cx^n\right) - \frac{1}{3}\,bde^2nx^3 + \frac{1}{4}\,ae^3x^4 + bde^2x^3\log\left(cx^n\right) - \frac{3}{4}\,bd^2enx^2 + ade^2x^3 + \frac{3}{2}\,bd^2ex^2\log\left(cx^n\right) - bd$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*b*e^3*n*x^4 + 1/4*b*e^3*x^4*log(c*x^n) - 1/3*b*d*e^2*n*x^3 + 1/4*a*e^
3*x^4 + b*d*e^2*x^3*log(c*x^n) - 3/4*b*d^2*e*n*x^2 + a*d*e^2*x^3 + 3/2*b*d^
2*e*x^2*log(c*x^n) - b*d^3*n*x + 3/2*a*d^2*e*x^2 + b*d^3*x*log(c*x^n) + a*d
^3*x
```

Fricas [B] time = 0.998267, size = 360, normalized size = 4.24

$$-\frac{1}{16}\left(be^3n - 4\,ae^3\right)x^4 - \frac{1}{3}\left(bde^2n - 3\,ade^2\right)x^3 - \frac{3}{4}\left(bd^2en - 2\,ad^2e\right)x^2 - \left(bd^3n - ad^3\right)x + \frac{1}{4}\left(be^3x^4 + 4\,bde^2x^3 + 6\,bd^2ex^2 +$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*(b*e^3*n - 4*a*e^3)*x^4 - 1/3*(b*d*e^2*n - 3*a*d*e^2)*x^3 - 3/4*(b*d^
2*e*n - 2*a*d^2*e)*x^2 - (b*d^3*n - a*d^3)*x + 1/4*(b*e^3*x^4 + 4*b*d*e^2*x
^3 + 6*b*d^2*e*x^2 + 4*b*d^3*x)*log(c) + 1/4*(b*e^3*n*x^4 + 4*b*d*e^2*n*x^3
```

```
+ 6*b*d^2*e*n*x^2 + 4*b*d^3*n*x)*log(x)
```

Sympy [B] time = 3.98225, size = 204, normalized size = 2.4

$$ad^3x + \frac{3ad^2ex^2}{2} + ade^2x^3 + \frac{ae^3x^4}{4} + bd^3nx\log(x) - bd^3nx + bd^3x\log(c) + \frac{3bd^2enx^2\log(x)}{2} - \frac{3bd^2enx^2}{4} + \frac{3bd^2ex^2\log}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**3*x + 3*a*d**2*e*x**2/2 + a*d*e**2*x**3 + a*e**3*x**4/4 + b*d**3*n*x*l
og(x) - b*d**3*n*x + b*d**3*x*log(c) + 3*b*d**2*e*n*x**2*log(x)/2 - 3*b*d**
2*e*n*x**2/4 + 3*b*d**2*e*x**2*log(c)/2 + b*d*e**2*n*x**3*log(x) - b*d*e**2
*n*x**3/3 + b*d*e**2*x**3*log(c) + b*e**3*n*x**4*log(x)/4 - b*e**3*n*x**4/1
6 + b*e**3*x**4*log(c)/4
```

Giac [B] time = 1.27096, size = 215, normalized size = 2.53

$$\frac{1}{4}bnx^4e^3\log(x) + bdnx^3e^2\log(x) + \frac{3}{2}bd^2nx^2e\log(x) - \frac{1}{16}bnx^4e^3 - \frac{1}{3}bdnx^3e^2 - \frac{3}{4}bd^2nx^2e + \frac{1}{4}bx^4e^3\log(c) + bdx^3e^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b*n*x^4*e^3*log(x) + b*d*n*x^3*e^2*log(x) + 3/2*b*d^2*n*x^2*e*log(x) -
1/16*b*n*x^4*e^3 - 1/3*b*d*n*x^3*e^2 - 3/4*b*d^2*n*x^2*e + 1/4*b*x^4*e^3*lo
g(c) + b*d*x^3*e^2*log(c) + 3/2*b*d^2*x^2*e*log(c) + b*d^3*n*x*log(x) - b*d
^3*n*x + 1/4*a*x^4*e^3 + a*d*x^3*e^2 + 3/2*a*d^2*x^2*e + b*d^3*x*log(c) + a
*d^3*x
```

3.23 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=122

$$3d^2ex\left(a+b\log\left(cx^n\right)\right)+d^3\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{3}{2}de^2x^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}e^3x^3\left(a+b\log\left(cx^n\right)\right)-3bd^2enx-\frac{1}{2}bd^3$$

```
[Out] -3*b*d^2*e*n*x - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^3)/9 - (b*d^3*n*Log[x]^2)
/2 + 3*d^2*e*x*(a + b*Log[c*x^n]) + (3*d*e^2*x^2*(a + b*Log[c*x^n]))/2 + (e
^3*x^3*(a + b*Log[c*x^n]))/3 + d^3*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0882038, antiderivative size = 94, normalized size of antiderivative = 0.77, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$\frac{1}{6}\left(18d^2ex+6d^3\log(x)+9de^2x^2+2e^3x^3\right)\left(a+b\log\left(cx^n\right)\right)-3bd^2enx-\frac{1}{2}bd^3n\log^2(x)-\frac{3}{4}bde^2nx^2-\frac{1}{9}be^3nx^3$$

Antiderivative was successfully verified.

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

```
[Out] -3*b*d^2*e*n*x - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^3)/9 - (b*d^3*n*Log[x]^2)
/2 + ((18*d^2*e*x + 9*d*e^2*x^2 + 2*e^3*x^3 + 6*d^3*Log[x])*(a + b*Log[c*x^
n]))/6
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex)^3 (a+b\log(cx^n))}{x}\,dx = \frac{1}{6}\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(\frac{1}{6}e\left(18d^2+9de\right.\right.$$
$$= \frac{1}{6}\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)(a+b\log(cx^n))-\left(bd^3n\right)\int\frac{\log(x)}{x}\,dx-\frac{1}{6}$$
$$= -3bd^2enx-\frac{3}{4}bde^2nx^2-\frac{1}{9}be^3nx^3-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{6}\left(18d^2ex+9de^2x^2+2e^3x^3+6\right.$$

Mathematica [A] time = 0.0612481, size = 123, normalized size = 1.01

$$\frac{d^3(a+b\log(cx^n))^2}{2bn}+\frac{3}{2}de^2x^2(a+b\log(cx^n))+\frac{1}{3}e^3x^3(a+b\log(cx^n))+3ad^2ex+3bd^2ex\log(cx^n)-3bd^2enx-\frac{3}{4}bde^2$$

Antiderivative was successfully verified.

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

```
[Out] 3*a*d^2*e*x - 3*b*d^2*e*n*x - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^3)/9 + 3*b*d
^2*e*x*Log[c*x^n] + (3*d*e^2*x^2*(a + b*Log[c*x^n]))/2 + (e^3*x^3*(a + b*Lo
g[c*x^n]))/3 + (d^3*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Maple [C] time = 0.246, size = 579, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (1/3*b*e^3*x^3+3/2*b*d*e^2*x^2+3*b*d^2*e*x+b*d^3*ln(x))*ln(x^n)+1/3*ln(c)*b
*e^3*x^3+3/2*a*d*e^2*x^2+3*a*d^2*e*x-1/6*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+1/6*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I*Pi*b*
e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+3/2*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I
*c)+3/4*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+3/2*I*Pi*b*d^2*e*x*csgn(
I*x^n)*csgn(I*c*x^n)^2-3/4*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
```

```
I*c)-3/2*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+ln(x)*ln(c)*b*d
^3-1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/4*I*Pi*b*d*e^
2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3-1/2*I*
ln(x)*Pi*b*d^3*csgn(I*c*x^n)^3+3/2*ln(c)*b*d*e^2*x^2+3*ln(c)*b*d^2*e*x+1/3*
a*e^3*x^3+ln(x)*a*d^3-3/4*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3-3/2*I*Pi*b*d^2*e
*x*csgn(I*c*x^n)^3+1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*l
n(x)*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-1/9*b*e^3*n*x^3-3*b*d^2*e*n*x-3/4*b
*d*e^2*n*x^2-1/2*b*d^3*n*ln(x)^2
```

Maxima [A] time = 1.23623, size = 171, normalized size = 1.4

$$-\frac{1}{9}\,be^3nx^3+\frac{1}{3}\,be^3x^3\log\left(cx^n\right)-\frac{3}{4}\,bde^2nx^2+\frac{1}{3}\,ae^3x^3+\frac{3}{2}\,bde^2x^2\log\left(cx^n\right)-3\,bd^2enx+\frac{3}{2}\,ade^2x^2+3\,bd^2ex\log\left(cx^n\right)+3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/9*b*e^3*n*x^3 + 1/3*b*e^3*x^3*log(c*x^n) - 3/4*b*d*e^2*n*x^2 + 1/3*a*e^3
*x^3 + 3/2*b*d*e^2*x^2*log(c*x^n) - 3*b*d^2*e*n*x + 3/2*a*d*e^2*x^2 + 3*b*d
^2*e*x*log(c*x^n) + 3*a*d^2*e*x + 1/2*b*d^3*log(c*x^n)^2/n + a*d^3*log(x)
```

Fricas [A] time = 1.03711, size = 355, normalized size = 2.91

$$\frac{1}{2}\,bd^3n\log\left(x\right)^2-\frac{1}{9}\left(be^3n-3\,ae^3\right)x^3-\frac{3}{4}\left(bde^2n-2\,ade^2\right)x^2-3\left(bd^2en-ad^2e\right)x+\frac{1}{6}\left(2\,be^3x^3+9\,bde^2x^2+18\,bd^2ex\right)\log($$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b*d^3*n*log(x)^2 - 1/9*(b*e^3*n - 3*a*e^3)*x^3 - 3/4*(b*d*e^2*n - 2*a*d
*e^2)*x^2 - 3*(b*d^2*e*n - a*d^2*e)*x + 1/6*(2*b*e^3*x^3 + 9*b*d*e^2*x^2 +
18*b*d^2*e*x)*log(c) + 1/6*(2*b*e^3*n*x^3 + 9*b*d*e^2*n*x^2 + 18*b*d^2*e*n*
x + 6*b*d^3*log(c) + 6*a*d^3)*log(x)
```

Sympy [A] time = 2.57997, size = 199, normalized size = 1.63

$$ad^3\log\left(x\right)+3ad^2ex+\frac{3ade^2x^2}{2}+\frac{ae^3x^3}{3}+\frac{bd^3n\log\left(x\right)^2}{2}+bd^3\log\left(c\right)\log\left(x\right)+3bd^2enx\log\left(x\right)-3bd^2enx+3bd^2ex\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**3*log(x) + 3*a*d**2*e*x + 3*a*d*e**2*x**2/2 + a*e**3*x**3/3 + b*d**3*n
*log(x)**2/2 + b*d**3*log(c)*log(x) + 3*b*d**2*e*n*x*log(x) - 3*b*d**2*e*n*
x + 3*b*d**2*e*x*log(c) + 3*b*d*e**2*n*x**2*log(x)/2 - 3*b*d*e**2*n*x**2/4
+ 3*b*d*e**2*x**2*log(c)/2 + b*e**3*n*x**3*log(x)/3 - b*e**3*n*x**3/9 + b*e
**3*x**3*log(c)/3
```

Giac [A] time = 1.23394, size = 203, normalized size = 1.66

$$\frac{1}{3}\,bnx^3e^3\log\left(x\right)+\frac{3}{2}\,bdnx^2e^2\log\left(x\right)+3\,bd^2nxe\log\left(x\right)+\frac{1}{2}\,bd^3n\log\left(x\right)^2-\frac{1}{9}\,bnx^3e^3-\frac{3}{4}\,bdnx^2e^2-3\,bd^2nxe+\frac{1}{3}\,bx^3e^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b*n*x^3*e^3*log(x) + 3/2*b*d*n*x^2*e^2*log(x) + 3*b*d^2*n*x*e*log(x) +
1/2*b*d^3*n*log(x)^2 - 1/9*b*n*x^3*e^3 - 3/4*b*d*n*x^2*e^2 - 3*b*d^2*n*x*e
+ 1/3*b*x^3*e^3*log(c) + 3/2*b*d*x^2*e^2*log(c) + 3*b*d^2*x*e*log(c) + b*d^
3*log(c)*log(x) + 1/3*a*x^3*e^3 + 3/2*a*d*x^2*e^2 + 3*a*d^2*x*e + a*d^3*log
(x)
```

3.24 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=119

$$3d^2e\log(x)\left(a+b\log\left(cx^n\right)\right)-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{x}+3de^2x\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}e^3x^2\left(a+b\log\left(cx^n\right)\right)-\frac{3}{2}bd^2en\log^2(x)-\frac{b}{\cdots}$$

```
[Out] -((b*d^3*n)/x) - 3*b*d*e^2*n*x - (b*e^3*n*x^2)/4 - (3*b*d^2*e*n*Log[x]^2)/2
 - (d^3*(a + b*Log[c*x^n]))/x + 3*d*e^2*x*(a + b*Log[c*x^n]) + (e^3*x^2*(a
+ b*Log[c*x^n]))/2 + 3*d^2*e*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0877142, antiderivative size = 92, normalized size of antiderivative = 0.77, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$-\frac{1}{2}\left(-6d^2e\log(x)+\frac{2d^3}{x}-6de^2x-e^3x^2\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{2}bd^2en\log^2(x)-\frac{bd^3n}{x}-3bde^2nx-\frac{1}{4}be^3nx^2$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^3*n)/x) - 3*b*d*e^2*n*x - (b*e^3*n*x^2)/4 - (3*b*d^2*e*n*Log[x]^2)/2
 - (((2*d^3)/x - 6*d*e^2*x - e^3*x^2 - 6*d^2*e*Log[x])*(a + b*Log[c*x^n]))/
2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex)^3\,(a+b\log(cx^n))}{x^2}\,dx = -\frac{1}{2}\left(\frac{2d^3}{x}-6de^2x-e^3x^2-6d^2e\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(3de^2-\frac{d^3}{x^2}+\frac{e^3x}{2}+\right.$$
$$= -\frac{bd^3n}{x}-3bde^2nx-\frac{1}{4}be^3nx^2-\frac{1}{2}\left(\frac{2d^3}{x}-6de^2x-e^3x^2-6d^2e\log(x)\right)(a+b\log(cx^n)$$
$$= -\frac{bd^3n}{x}-3bde^2nx-\frac{1}{4}be^3nx^2-\frac{3}{2}bd^2en\log^2(x)-\frac{1}{2}\left(\frac{2d^3}{x}-6de^2x-e^3x^2-6d^2e\log(x\right.$$

Mathematica [A] time = 0.0802664, size = 118, normalized size = 0.99

$$\frac{3d^2e\,(a+b\log(cx^n))^2}{2bn}-\frac{d^3\,(a+b\log(cx^n))}{x}+\frac{1}{2}e^3x^2\,(a+b\log(cx^n))+3ade^2x+3bde^2x\log(cx^n)-\frac{bd^3n}{x}-3bde^2nx-$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^3*n)/x) + 3*a*d*e^2*x - 3*b*d*e^2*n*x - (b*e^3*n*x^2)/4 + 3*b*d*e^2*
x*Log[c*x^n] - (d^3*(a + b*Log[c*x^n]))/x + (e^3*x^2*(a + b*Log[c*x^n]))/2
+ (3*d^2*e*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Maple [C] time = 0.276, size = 588, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(-e^3*x^3-6*d^2*e*ln(x)*x-6*d*e^2*x^2+2*d^3)/x*ln(x^n)-1/4*(4*a*d^3-
2*ln(c)*b*e^3*x^3-12*a*d*e^2*x^2+4*ln(c)*b*d^3-12*ln(x)*ln(c)*b*d^2*e*x+6*b
*d^2*e*n*ln(x)^2*x+I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+6*I*ln(x)*Pi*b*d^2*e*csgn
```

```
(I*c*x^n)^3*x+6*I*ln(x)*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-6*
I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*e^3*x^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)-6*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*
d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+6*I*
Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6*I*ln(x)*Pi*b*d^2*e*csg
n(I*x^n)*csgn(I*c*x^n)^2*x-12*ln(c)*b*d*e^2*x^2-2*a*e^3*x^3+4*b*d^3*n-2*I*P
i*b*d^3*csgn(I*c*x^n)^3-6*I*ln(x)*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x-12
*ln(x)*a*d^2*e*x+6*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3+b*e^3*n*x^3+12*b*d*e^2*
n*x^2-I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*e^3*x^3*csgn(I*x^n)*c
sgn(I*c*x^n)^2-2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))/x
```

Maxima [A] time = 1.11752, size = 171, normalized size = 1.44

$$-\frac{1}{4}\,be^3nx^2+\frac{1}{2}\,be^3x^2\log\left(cx^n\right)-3\,bde^2nx+\frac{1}{2}\,ae^3x^2+3\,bde^2x\log\left(cx^n\right)+3\,ade^2x+\frac{3\,bd^2e\log\left(cx^n\right)^2}{2\,n}+3\,ad^2e\log\left(x\right)-\frac{b\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.03515, size = 338, normalized size = 2.84

$$\frac{6\,bd^2enx\log\left(x\right)^2-4\,bd^3n-4\,ad^3-\left(be^3n-2\,ae^3\right)x^3-12\left(bde^2n-ade^2\right)x^2+2\left(be^3x^3+6\,bde^2x^2-2\,bd^3\right)\log\left(c\right)+2\left(be^3\ldots\right.}{4\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(6*b*d^2*e*n*x*log(x)^2 - 4*b*d^3*n - 4*a*d^3 - (b*e^3*n - 2*a*e^3)*x^3
 - 12*(b*d*e^2*n - a*d*e^2)*x^2 + 2*(b*e^3*x^3 + 6*b*d*e^2*x^2 - 2*b*d^3)*l
og(c) + 2*(b*e^3*n*x^3 + 6*b*d*e^2*n*x^2 + 6*b*d^2*e*x*log(c) - 2*b*d^3*n +
 6*a*d^2*e*x)*log(x))/x
```

Sympy [A] time = 4.76585, size = 182, normalized size = 1.53

$$-\frac{ad^3}{x} + 3ad^2e\log(x) + 3ade^2x + \frac{ae^3x^2}{2} - \frac{bd^3n\log(x)}{x} - \frac{bd^3n}{x} - \frac{bd^3\log(c)}{x} + \frac{3bd^2en\log(x)^2}{2} + 3bd^2e\log(c)\log(x) +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*log(x) + 3*a*d*e**2*x + a*e**3*x**2/2 - b*d**3*n*log
(x)/x - b*d**3*n/x - b*d**3*log(c)/x + 3*b*d**2*e*n*log(x)**2/2 + 3*b*d**2*
e*log(c)*log(x) + 3*b*d*e**2*n*x*log(x) - 3*b*d*e**2*n*x + 3*b*d*e**2*x*log
(c) + b*e**3*n*x**2*log(x)/2 - b*e**3*n*x**2/4 + b*e**3*x**2*log(c)/2
```

Giac [A] time = 1.31787, size = 208, normalized size = 1.75

$$\frac{6\,bd^2nxe\log(x)^2 + 2\,bnx^3e^3\log(x) + 12\,bdnx^2e^2\log(x) + 12\,bd^2xe\log(c)\log(x) - bnx^3e^3 - 12\,bdnx^2e^2 + 2\,bx^3e^3\log(c}{4\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(6*b*d^2*n*x*e*log(x)^2 + 2*b*n*x^3*e^3*log(x) + 12*b*d*n*x^2*e^2*log(x
) + 12*b*d^2*x*e*log(c)*log(x) - b*n*x^3*e^3 - 12*b*d*n*x^2*e^2 + 2*b*x^3*e
^3*log(c) + 12*b*d*x^2*e^2*log(c) - 4*b*d^3*n*log(x) + 12*a*d^2*x*e*log(x)
- 4*b*d^3*n + 2*a*x^3*e^3 + 12*a*d*x^2*e^2 - 4*b*d^3*log(c) - 4*a*d^3)/x
```

3.25 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=118

$$-\frac{3d^2e\,(a+b\log(cx^n))}{x}-\frac{d^3\,(a+b\log(cx^n))}{2x^2}+3de^2\log(x)\,(a+b\log(cx^n))+e^3x\,(a+b\log(cx^n))-\frac{3bd^2en}{x}-\frac{bd^3n}{4x^2}-\frac{3}{2}b$$

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d^2*e*n)/x - b*e^3*n*x - (3*b*d*e^2*n*Log[x]^2)/2
 - (d^3*(a + b*Log[c*x^n]))/(2*x^2) - (3*d^2*e*(a + b*Log[c*x^n]))/x + e^3*
x*(a + b*Log[c*x^n]) + 3*d*e^2*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0909902, antiderivative size = 91, normalized size of antiderivative = 0.77, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {43, 2334, 2301}

$$-\frac{1}{2}\left(\frac{6d^2e}{x}+\frac{d^3}{x^2}-6de^2\log(x)-2e^3x\right)(a+b\log(cx^n))-\frac{3bd^2en}{x}-\frac{bd^3n}{4x^2}-\frac{3}{2}bde^2n\log^2(x)-be^3nx$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d^2*e*n)/x - b*e^3*n*x - (3*b*d*e^2*n*Log[x]^2)/2
 - ((d^3/x^2 + (6*d^2*e)/x - 2*e^3*x - 6*d*e^2*Log[x])*(a + b*Log[c*x^n]))/
2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex)^3 (a+b\log(cx^n))}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{6d^2e}{x}-2e^3x-6de^2\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(e^3-\frac{d^3}{2x^3}-\frac{3d^2e}{x^2}+\right.$$

$$=-\frac{bd^3n}{4x^2}-\frac{3bd^2en}{x}-be^3nx-\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{6d^2e}{x}-2e^3x-6de^2\log(x)\right)(a+b\log(cx^n))-\left(\right.$$

$$=-\frac{bd^3n}{4x^2}-\frac{3bd^2en}{x}-be^3nx-\frac{3}{2}bde^2n\log^2(x)-\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{6d^2e}{x}-2e^3x-6de^2\log(x)\right)(a$$

Mathematica [A] time = 0.0778604, size = 115, normalized size = 0.97

$$-\frac{3d^2e(a+b\log(cx^n))}{x}-\frac{d^3(a+b\log(cx^n))}{2x^2}+\frac{3de^2(a+b\log(cx^n))^2}{2bn}+ae^3x+be^3x\log(cx^n)-\frac{3bd^2en}{x}-\frac{bd^3n}{4x^2}-be^3n$$

Antiderivative was successfully verified.

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

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d^2*e*n)/x + a*e^3*x - b*e^3*n*x + b*e^3*x*Log[c*
x^n] - (d^3*(a + b*Log[c*x^n]))/(2*x^2) - (3*d^2*e*(a + b*Log[c*x^n]))/x +
(3*d*e^2*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Maple [C] time = 0.263, size = 586, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(-6*d*e^2*ln(x)*x^2-2*e^3*x^3+6*d^2*e*x+d^3)/x^2*ln(x^n)-1/4*(2*a*d^
3+6*I*ln(x)*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2-6*I*Pi*b*d^2
*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6*I*ln(x)*Pi*b*d*e^2*csgn(I*x^n)*c
```

```
sgn(I*c*x^n)^2*x^2-6*I*ln(x)*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^2+I*Pi*
b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+I*Pi*b*d^3
*csgn(I*x^n)*csgn(I*c*x^n)^2-4*ln(c)*b*e^3*x^3+12*a*d^2*e*x+2*ln(c)*b*d^3-1
2*ln(x)*ln(c)*b*d*e^2*x^2+6*b*d*e^2*n*ln(x)^2*x^2+6*I*ln(x)*Pi*b*d*e^2*csgn
(I*c*x^n)^3*x^2+12*ln(c)*b*d^2*e*x+6*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^
n)^2+2*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6*I*Pi*b*d^2*e*x*
csgn(I*c*x^n)^2*csgn(I*c)-4*a*e^3*x^3+b*d^3*n-2*I*Pi*b*e^3*x^3*csgn(I*x^n)*
csgn(I*c*x^n)^2-2*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d^3*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^3*csgn(I*c*x^n)^3-6*I*Pi*b*d^2*e*x*
csgn(I*c*x^n)^3-12*ln(x)*a*d*e^2*x^2+4*b*e^3*n*x^3+12*b*d^2*e*n*x)/x^2
```

Maxima [A] time = 1.09208, size = 169, normalized size = 1.43

$$-be^3nx + be^3x\log(cx^n) + ae^3x + \frac{3\,bde^2\log(cx^n)^2}{2\,n} + 3\,ade^2\log(x) - \frac{3\,bd^2en}{x} - \frac{3\,bd^2e\log(cx^n)}{x} - \frac{bd^3n}{4\,x^2} - \frac{3\,ad^2e}{x} - \frac{bd^3\,\mathrm{lo}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.01498, size = 338, normalized size = 2.86

$$\frac{6\,bde^2nx^2\log(x)^2 - bd^3n - 2\,ad^3 - 4\left(be^3n - ae^3\right)x^3 - 12\left(bd^2en + ad^2e\right)x + 2\left(2\,be^3x^3 - 6\,bd^2ex - bd^3\right)\log(c) + 2\left(2\,be^3n\right.}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 2.94532, size = 182, normalized size = 1.54

$$-\frac{ad^3}{2x^2}-\frac{3ad^2e}{x}+3ade^2\log(x)+ae^3x-\frac{bd^3n\log(x)}{2x^2}-\frac{bd^3n}{4x^2}-\frac{bd^3\log(c)}{2x^2}-\frac{3bd^2en\log(x)}{x}-\frac{3bd^2en}{x}-\frac{3bd^2e\log(c)}{x}+$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3/(2*x**2) - 3*a*d**2*e/x + 3*a*d*e**2*log(x) + a*e**3*x - b*d**3*n*l
og(x)/(2*x**2) - b*d**3*n/(4*x**2) - b*d**3*log(c)/(2*x**2) - 3*b*d**2*e*n*
log(x)/x - 3*b*d**2*e*n/x - 3*b*d**2*e*log(c)/x + 3*b*d*e**2*n*log(x)**2/2
+ 3*b*d*e**2*log(c)*log(x) + b*e**3*n*x*log(x) - b*e**3*n*x + b*e**3*x*log(
c)
```

Giac [A] time = 1.33339, size = 208, normalized size = 1.76

$$\frac{6\,bdnx^2e^2\log(x)^2+4\,bnx^3e^3\log(x)-12\,bd^2nxe\log(x)+12\,bdx^2e^2\log(c)\log(x)-4\,bnx^3e^3-12\,bd^2nxe+4\,bx^3e^3\log}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(6*b*d*n*x^2*e^2*log(x)^2 + 4*b*n*x^3*e^3*log(x) - 12*b*d^2*n*x*e*log(x
) + 12*b*d*x^2*e^2*log(c)*log(x) - 4*b*n*x^3*e^3 - 12*b*d^2*n*x*e + 4*b*x^3
*e^3*log(c) - 12*b*d^2*x*e*log(c) - 2*b*d^3*n*log(x) + 12*a*d*x^2*e^2*log(x
) - b*d^3*n + 4*a*x^3*e^3 - 12*a*d^2*x*e - 2*b*d^3*log(c) - 2*a*d^3)/x^2
```

3.26 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=126

$$-\frac{3d^2e\,(a+b\log(cx^n))}{2x^2}-\frac{d^3\,(a+b\log(cx^n))}{3x^3}-\frac{3de^2\,(a+b\log(cx^n))}{x}+e^3\log(x)\,(a+b\log(cx^n))-\frac{3bd^2en}{4x^2}-\frac{bd^3n}{9x^3}-\frac{3bd\ldots}{\ldots}$$

```
[Out] -(b*d^3*n)/(9*x^3) - (3*b*d^2*e*n)/(4*x^2) - (3*b*d*e^2*n)/x - (b*e^3*n*Log
[x]^2)/2 - (d^3*(a + b*Log[c*x^n]))/(3*x^3) - (3*d^2*e*(a + b*Log[c*x^n]))/
(2*x^2) - (3*d*e^2*(a + b*Log[c*x^n]))/x + e^3*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.107818, antiderivative size = 98, normalized size of antiderivative = 0.78, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 14, 2301}

$$-\frac{1}{6}\left(\frac{9d^2e}{x^2}+\frac{2d^3}{x^3}+\frac{18de^2}{x}-6e^3\log(x)\right)(a+b\log(cx^n))-\frac{3bd^2en}{4x^2}-\frac{bd^3n}{9x^3}-\frac{3bde^2n}{x}-\frac{1}{2}be^3n\log^2(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^3*n)/(9*x^3) - (3*b*d^2*e*n)/(4*x^2) - (3*b*d*e^2*n)/x - (b*e^3*n*Log
[x]^2)/2 - (((2*d^3)/x^3 + (9*d^2*e)/x^2 + (18*d*e^2)/x - 6*e^3*Log[x])*(a
+ b*Log[c*x^n]))/6
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex)^3 (a+b\log(cx^n))}{x^4} dx = -\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\log(x)\right)(a+b\log(cx^n))-(bn)\int \left(-\frac{d\left(2d^2+9dex+\right.}{6x^4}\right.$$

$$= -\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\log(x)\right)(a+b\log(cx^n))+\frac{1}{6}(bdn)\int \frac{2d^2+9dex+18}{x^4}$$

$$= -\frac{1}{2}be^3n\log^2(x)-\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\log(x)\right)(a+b\log(cx^n))+\frac{1}{6}(bdn)\int$$

$$= -\frac{bd^3n}{9x^3}-\frac{3bd^2en}{4x^2}-\frac{3bde^2n}{x}-\frac{1}{2}be^3n\log^2(x)-\frac{1}{6}\left(\frac{2d^3}{x^3}+\frac{9d^2e}{x^2}+\frac{18de^2}{x}-6e^3\log(x)\right)$$

Mathematica [A] time = 0.0794775, size = 122, normalized size = 0.97

$$-\frac{3d^2e(a+b\log(cx^n))}{2x^2}-\frac{d^3(a+b\log(cx^n))}{3x^3}-\frac{3de^2(a+b\log(cx^n))}{x}+\frac{e^3(a+b\log(cx^n))^2}{2bn}-\frac{3bd^2en}{4x^2}-\frac{bd^3n}{9x^3}-\frac{3bde^2n}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^3*n)/(9*x^3) - (3*b*d^2*e*n)/(4*x^2) - (3*b*d*e^2*n)/x - (d^3*(a + b*
Log[c*x^n]))/(3*x^3) - (3*d^2*e*(a + b*Log[c*x^n]))/(2*x^2) - (3*d*e^2*(a +
 b*Log[c*x^n]))/x + (e^3*(a + b*Log[c*x^n])^2)/(2*b*n)
```

Maple [C] time = 0.166, size = 589, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(a+b*ln(c*x^n))/x^4,x)
```

```
[Out] -1/6*b*(-6*e^3*ln(x)*x^3+18*d*e^2*x^2+9*d^2*e*x+2*d^3)/x^3*ln(x^n)-1/36*(12
*a*d^3+54*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-18*I*ln(x)*Pi*b*e^3*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x^3-18*I*ln(x)*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)
*x^3+27*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+27*I*Pi*b*d^2*e*x*csgn(I
*c*x^n)^2*csgn(I*c)-36*ln(x)*a*e^3*x^3+108*a*d*e^2*x^2+54*a*d^2*e*x+12*ln(c
)*b*d^3+54*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-54*I*Pi*b*d*e^2*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+108*ln(c)*b*d*e^2*x^2+54*ln(c)*b*d^2*e
*x+4*b*d^3*n-36*ln(x)*ln(c)*b*e^3*x^3+18*b*e^3*n*ln(x)^2*x^3-27*I*Pi*b*d^2*
e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18*I*ln(x)*Pi*b*e^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^3+27*b*d^2*e*n*x+108*b*d*e^2*n*x^2-6*I*Pi*b*d^3*csgn
(I*c*x^n)^3-6*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-54*I*Pi*b*d*e^
2*x^2*csgn(I*c*x^n)^3-27*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+18*I*ln(x)*Pi*b*e^3
*csgn(I*c*x^n)^3*x^3+6*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+6*I*Pi*b*d^3*
csgn(I*c*x^n)^2*csgn(I*c))/x^3
```

Maxima [A] time = 1.08524, size = 180, normalized size = 1.43

$$\frac{be^3\log\left(cx^n\right)^2}{2n} + ae^3\log\left(x\right) - \frac{3\,bde^2n}{x} - \frac{3\,bde^2\log\left(cx^n\right)}{x} - \frac{3\,bd^2en}{4\,x^2} - \frac{3\,ade^2}{x} - \frac{3\,bd^2e\log\left(cx^n\right)}{2\,x^2} - \frac{bd^3n}{9\,x^3} - \frac{3\,ad^2e}{2\,x^2} - \frac{bd^3\log}{3\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] 1/2*b*e^3*log(c*x^n)^2/n + a*e^3*log(x) - 3*b*d*e^2*n/x - 3*b*d*e^2*log(c*x
^n)/x - 3/4*b*d^2*e*n/x^2 - 3*a*d*e^2/x - 3/2*b*d^2*e*log(c*x^n)/x^2 - 1/9*
b*d^3*n/x^3 - 3/2*a*d^2*e/x^2 - 1/3*b*d^3*log(c*x^n)/x^3 - 1/3*a*d^3/x^3
```

Fricas [A] time = 1.04344, size = 360, normalized size = 2.86

$$\frac{18\,be^3nx^3\log\left(x\right)^2 - 4\,bd^3n - 12\,ad^3 - 108\left(bde^2n + ade^2\right)x^2 - 27\left(bd^2en + 2\,ad^2e\right)x - 6\left(18\,bde^2x^2 + 9\,bd^2ex + 2\,bd^3\right)\log}{36\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] 1/36*(18*b*e^3*n*x^3*log(x)^2 - 4*b*d^3*n - 12*a*d^3 - 108*(b*d*e^2*n + a*d
*e^2)*x^2 - 27*(b*d^2*e*n + 2*a*d^2*e)*x - 6*(18*b*d*e^2*x^2 + 9*b*d^2*e*x
+ 2*b*d^3)*log(c) + 6*(6*b*e^3*x^3*log(c) - 18*b*d*e^2*n*x^2 + 6*a*e^3*x^3
- 9*b*d^2*e*n*x - 2*b*d^3*n)*log(x))/x^3
```

Sympy [A] time = 9.13817, size = 144, normalized size = 1.14

$$-\frac{ad^3}{3x^3} - \frac{3ad^2e}{2x^2} - \frac{3ade^2}{x} + ae^3\log(x) + bd^3\left(-\frac{n}{9x^3} - \frac{\log(cx^n)}{3x^3}\right) + 3bd^2e\left(-\frac{n}{4x^2} - \frac{\log(cx^n)}{2x^2}\right) + 3bde^2\left(-\frac{n}{x} - \frac{\log(cx^n)}{x}\right) -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) - 3*a*d**2*e/(2*x**2) - 3*a*d*e**2/x + a*e**3*log(x) + b*d
**3*(-n/(9*x**3) - log(c*x**n)/(3*x**3)) + 3*b*d**2*e*(-n/(4*x**2) - log(c*
x**n)/(2*x**2)) + 3*b*d*e**2*(-n/x - log(c*x**n)/x) - b*e**3*Piecewise((-lo
g(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

Giac [A] time = 1.36309, size = 209, normalized size = 1.66

$$\frac{18\,bnx^3e^3\log(x)^2 - 108\,bdnx^2e^2\log(x) - 54\,bd^2nxe\log(x) + 36\,bx^3e^3\log(c)\log(x) - 108\,bdnx^2e^2 - 27\,bd^2nxe - 108\,b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] 1/36*(18*b*n*x^3*e^3*log(x)^2 - 108*b*d*n*x^2*e^2*log(x) - 54*b*d^2*n*x*e*l
og(x) + 36*b*x^3*e^3*log(c)*log(x) - 108*b*d*n*x^2*e^2 - 27*b*d^2*n*x*e - 1
08*b*d*x^2*e^2*log(c) - 54*b*d^2*x*e*log(c) - 12*b*d^3*n*log(x) + 36*a*x^3*
e^3*log(x) - 4*b*d^3*n - 108*a*d*x^2*e^2 - 54*a*d^2*x*e - 12*b*d^3*log(c) -
 12*a*d^3)/x^3
```

3.27 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=90

$$-\frac{(d+ex)^4\,(a+b\log\left(cx^n\right))}{4dx^4}-\frac{bd^2en}{3x^3}-\frac{bd^3n}{16x^4}-\frac{3bde^2n}{4x^2}+\frac{be^4n\log(x)}{4d}-\frac{be^3n}{x}$$

```
[Out] -(b*d^3*n)/(16*x^4) - (b*d^2*e*n)/(3*x^3) - (3*b*d*e^2*n)/(4*x^2) - (b*e^3*
n)/x + (b*e^4*n*Log[x])/(4*d) - ((d + e*x)^4*(a + b*Log[c*x^n]))/(4*d*x^4)
```

Rubi [A] time = 0.082418, antiderivative size = 90, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {37, 2334, 12, 43}

$$-\frac{(d+ex)^4\,(a+b\log\left(cx^n\right))}{4dx^4}-\frac{bd^2en}{3x^3}-\frac{bd^3n}{16x^4}-\frac{3bde^2n}{4x^2}+\frac{be^4n\log(x)}{4d}-\frac{be^3n}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^3*n)/(16*x^4) - (b*d^2*e*n)/(3*x^3) - (3*b*d*e^2*n)/(4*x^2) - (b*e^3*
n)/x + (b*e^4*n*Log[x])/(4*d) - ((d + e*x)^4*(a + b*Log[c*x^n]))/(4*d*x^4)
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{(d+ex)^3 (a+b\log(cx^n))}{x^5}\,dx &= -\frac{(d+ex)^4 (a+b\log(cx^n))}{4dx^4} - (bn)\int -\frac{(d+ex)^4}{4dx^5}\,dx \\
&= -\frac{(d+ex)^4 (a+b\log(cx^n))}{4dx^4} + \frac{(bn)\int \frac{(d+ex)^4}{x^5}\,dx}{4d} \\
&= -\frac{(d+ex)^4 (a+b\log(cx^n))}{4dx^4} + \frac{(bn)\int \left(\frac{d^4}{x^5} + \frac{4d^3e}{x^4} + \frac{6d^2e^2}{x^3} + \frac{4de^3}{x^2} + \frac{e^4}{x}\right)dx}{4d} \\
&= -\frac{bd^3n}{16x^4} - \frac{bd^2en}{3x^3} - \frac{3bde^2n}{4x^2} - \frac{be^3n}{x} + \frac{be^4n\log(x)}{4d} - \frac{(d+ex)^4 (a+b\log(cx^n))}{4dx^4}
\end{aligned}
$$

Mathematica [A] time = 0.0519544, size = 109, normalized size = 1.21

$$
-\frac{12a\left(4d^2ex+d^3+6de^2x^2+4e^3x^3\right)+12b\left(4d^2ex+d^3+6de^2x^2+4e^3x^3\right)\log\left(cx^n\right)+bn\left(16d^2ex+3d^3+36de^2x^2+48e\right.}{48x^4}
$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(12*a*(d^3 + 4*d^2*e*x + 6*d*e^2*x^2 + 4*e^3*x^3) + b*n*(3*d^3 + 16*d^2*e*
x + 36*d*e^2*x^2 + 48*e^3*x^3) + 12*b*(d^3 + 4*d^2*e*x + 6*d*e^2*x^2 + 4*e^
3*x^3)*Log[c*x^n])/(48*x^4)
```

Maple [C] time = 0.14, size = 569, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/4*b*(4*e^3*x^3+6*d*e^2*x^2+4*d^2*e*x+d^3)/x^4*ln(x^n)-1/48*(12*a*d^3+48*
ln(c)*b*e^3*x^3+72*a*d*e^2*x^2+48*a*d^2*e*x+12*ln(c)*b*d^3+24*I*Pi*b*e^3*x^
3*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)
-36*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*Pi*b*d^2*e*x*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*
c*x^n)^2+24*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)-24*I*Pi*b*e^3*x^3*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+24*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)
^2+72*ln(c)*b*d*e^2*x^2+48*ln(c)*b*d^2*e*x+48*a*e^3*x^3+3*b*d^3*n-24*I*Pi*b
*e^3*x^3*csgn(I*c*x^n)^3+24*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-36*I*P
i*b*d*e^2*x^2*csgn(I*c*x^n)^3-24*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+48*b*e^3*n*
x^3+16*b*d^2*e*n*x+36*b*d*e^2*n*x^2-6*I*Pi*b*d^3*csgn(I*c*x^n)^3-6*I*Pi*b*d
^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^
n)^2+6*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c))/x^4
```

Maxima [A] time = 1.13851, size = 193, normalized size = 2.14

$$-\frac{be^3n}{x}-\frac{be^3\log\left(cx^n\right)}{x}-\frac{3\,bde^2n}{4\,x^2}-\frac{ae^3}{x}-\frac{3\,bde^2\log\left(cx^n\right)}{2\,x^2}-\frac{bd^2en}{3\,x^3}-\frac{3\,ade^2}{2\,x^2}-\frac{bd^2e\log\left(cx^n\right)}{x^3}-\frac{bd^3n}{16\,x^4}-\frac{ad^2e}{x^3}-\frac{bd^3\log\left(c\right.}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] -b*e^3*n/x - b*e^3*log(c*x^n)/x - 3/4*b*d*e^2*n/x^2 - a*e^3/x - 3/2*b*d*e^2
*log(c*x^n)/x^2 - 1/3*b*d^2*e*n/x^3 - 3/2*a*d*e^2/x^2 - b*d^2*e*log(c*x^n)/
x^3 - 1/16*b*d^3*n/x^4 - a*d^2*e/x^3 - 1/4*b*d^3*log(c*x^n)/x^4 - 1/4*a*d^3
/x^4
```

Fricas [A] time = 1.0451, size = 352, normalized size = 3.91

$$-\frac{3\,bd^3n+12\,ad^3+48\left(be^3n+ae^3\right)x^3+36\left(bde^2n+2\,ade^2\right)x^2+16\left(bd^2en+3\,ad^2e\right)x+12\left(4\,be^3x^3+6\,bde^2x^2+4\,bd^2ex\right.}{48\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/48*(3*b*d^3*n + 12*a*d^3 + 48*(b*e^3*n + a*e^3)*x^3 + 36*(b*d*e^2*n + 2*
a*d*e^2)*x^2 + 16*(b*d^2*e*n + 3*a*d^2*e)*x + 12*(4*b*e^3*x^3 + 6*b*d*e^2*x
^2 + 4*b*d^2*e*x + b*d^3)*log(c) + 12*(4*b*e^3*n*x^3 + 6*b*d*e^2*n*x^2 + 4*
b*d^2*e*n*x + b*d^3*n)*log(x))/x^4
```

Sympy [B] time = 7.80881, size = 206, normalized size = 2.29

$$-\frac{ad^3}{4x^4} - \frac{ad^2e}{x^3} - \frac{3ade^2}{2x^2} - \frac{ae^3}{x} - \frac{bd^3n\log(x)}{4x^4} - \frac{bd^3n}{16x^4} - \frac{bd^3\log(c)}{4x^4} - \frac{bd^2en\log(x)}{x^3} - \frac{bd^2en}{3x^3} - \frac{bd^2e\log(c)}{x^3} - \frac{3bde^2n\log(}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d**3/(4*x**4) - a*d**2*e/x**3 - 3*a*d*e**2/(2*x**2) - a*e**3/x - b*d**3*
n*log(x)/(4*x**4) - b*d**3*n/(16*x**4) - b*d**3*log(c)/(4*x**4) - b*d**2*e*
n*log(x)/x**3 - b*d**2*e*n/(3*x**3) - b*d**2*e*log(c)/x**3 - 3*b*d*e**2*n*l
og(x)/(2*x**2) - 3*b*d*e**2*n/(4*x**2) - 3*b*d*e**2*log(c)/(2*x**2) - b*e**
3*n*log(x)/x - b*e**3*n/x - b*e**3*log(c)/x
```

Giac [A] time = 1.35221, size = 213, normalized size = 2.37

$$-\frac{48\,bnx^3e^3\log(x) + 72\,bdnx^2e^2\log(x) + 48\,bd^2nxe\log(x) + 48\,bnx^3e^3 + 36\,bdnx^2e^2 + 16\,bd^2nxe + 48\,bx^3e^3\log(c) + 7}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] -1/48*(48*b*n*x^3*e^3*log(x) + 72*b*d*n*x^2*e^2*log(x) + 48*b*d^2*n*x*e*log
(x) + 48*b*n*x^3*e^3 + 36*b*d*n*x^2*e^2 + 16*b*d^2*n*x*e + 48*b*x^3*e^3*log
(c) + 72*b*d*x^2*e^2*log(c) + 48*b*d^2*x*e*log(c) + 12*b*d^3*n*log(x) + 3*b
*d^3*n + 48*a*x^3*e^3 + 72*a*d*x^2*e^2 + 48*a*d^2*x*e + 12*b*d^3*log(c) + 1
2*a*d^3)/x^4
```

3.28 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=142

$$\frac{e(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{20d^2x^4}-\frac{(d+ex)^4\left(a+b\log\left(cx^n\right)\right)}{5dx^5}-\frac{be^5n\log(x)}{20d^2}+\frac{bd^2en}{80x^4}-\frac{bn(d+ex)^5}{25d^2x^5}+\frac{bde^2n}{15x^3}+\frac{be^4n}{5dx}+\frac{3be^3n}{20x^2}$$

```
[Out] (b*d^2*e*n)/(80*x^4) + (b*d*e^2*n)/(15*x^3) + (3*b*e^3*n)/(20*x^2) + (b*e^4
*n)/(5*d*x) - (b*n*(d + e*x)^5)/(25*d^2*x^5) - (b*e^5*n*Log[x])/(20*d^2) -
((d + e*x)^4*(a + b*Log[c*x^n]))/(5*d*x^5) + (e*(d + e*x)^4*(a + b*Log[c*x^
n]))/(20*d^2*x^4)
```

Rubi [A] time = 0.0983751, antiderivative size = 133, normalized size of antiderivative = 0.94, number of steps used = 5, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {45, 37, 2334, 12, 78, 43}

$$-\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{be^5n\log(x)}{20d^2}+\frac{bd^2en}{80x^4}-\frac{bn(d+ex)^5}{25d^2x^5}+\frac{bde^2n}{15x^3}+\frac{be^4n}{5dx}+\frac{3be^3n}{20x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] (b*d^2*e*n)/(80*x^4) + (b*d*e^2*n)/(15*x^3) + (3*b*e^3*n)/(20*x^2) + (b*e^4
*n)/(5*d*x) - (b*n*(d + e*x)^5)/(25*d^2*x^5) - (b*e^5*n*Log[x])/(20*d^2) -
(((4*(d + e*x)^4)/(d*x^5) - (e*(d + e*x)^4)/(d^2*x^4))*(a + b*Log[c*x^n]))/
20
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
```

```
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{(d+ex)^3 (a+b\log(cx^n))}{x^6}\,dx = -\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)(a+b\log(cx^n))-(bn)\int\frac{(-4d+ex)(d+ex)^4}{20d^2x^6}\,dx$$

$$= -\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)(a+b\log(cx^n))-\frac{(bn)\int\frac{(-4d+ex)(d+ex)^4}{x^6}\,dx}{20d^2}$$

$$= -\frac{bn(d+ex)^5}{25d^2x^5}-\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)(a+b\log(cx^n))-\frac{(ben)\int\frac{(d+ex)^4}{x^5}\,dx}{20d^2}$$

$$= -\frac{bn(d+ex)^5}{25d^2x^5}-\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d+ex)^4}{d^2x^4}\right)(a+b\log(cx^n))-\frac{(ben)\int\left(\frac{d^4}{x^5}+\frac{4d^3e}{x^4}+\cdots\right.}{20d\cdots}$$

$$= \frac{bd^2en}{80x^4}+\frac{bde^2n}{15x^3}+\frac{3be^3n}{20x^2}+\frac{be^4n}{5dx}-\frac{bn(d+ex)^5}{25d^2x^5}-\frac{be^5n\log(x)}{20d^2}-\frac{1}{20}\left(\frac{4(d+ex)^4}{dx^5}-\frac{e(d\cdots}{d\cdots}\right.$$

Mathematica [A] time = 0.0524181, size = 113, normalized size = 0.8

$$-\frac{60a\left(15d^2ex+4d^3+20de^2x^2+10e^3x^3\right)+60b\left(15d^2ex+4d^3+20de^2x^2+10e^3x^3\right)\log(cx^n)+bn\left(225d^2ex+48d^3+400\cdots\right.}{1200x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(60*a*(4*d^3 + 15*d^2*e*x + 20*d*e^2*x^2 + 10*e^3*x^3) + b*n*(48*d^3 + 225
*d^2*e*x + 400*d*e^2*x^2 + 300*e^3*x^3) + 60*b*(4*d^3 + 15*d^2*e*x + 20*d*e
^2*x^2 + 10*e^3*x^3)*Log[c*x^n])/(1200*x^5)
```

Maple [C] time = 0.136, size = 571, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/20*b*(10*e^3*x^3+20*d*e^2*x^2+15*d^2*e*x+4*d^3)/x^5*ln(x^n)-1/1200*(240*
a*d^3-300*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+600*ln(c)*b*e^3*x^3+1200*a*d*e^2*x
^2+900*a*d^2*e*x+240*ln(c)*b*d^3+450*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^
n)^2+450*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+600*I*Pi*b*d*e^2*x^2*csgn
```

```
(I*x^n)*csgn(I*c*x^n)^2+600*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-600*
I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-450*I*Pi*b*d^2*e*x*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-300*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+120*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+120*I*Pi*b*d^3*csgn
(I*c*x^n)^2*csgn(I*c)+1200*ln(c)*b*d*e^2*x^2+900*ln(c)*b*d^2*e*x+600*a*e^3*
x^3+48*b*d^3*n-450*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3+300*I*Pi*b*e^3*x^3*csgn(I
*x^n)*csgn(I*c*x^n)^2-120*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12
0*I*Pi*b*d^3*csgn(I*c*x^n)^3+300*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-6
00*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3+300*b*e^3*n*x^3+225*b*d^2*e*n*x+400*b*d
*e^2*n*x^2)/x^5
```

Maxima [A] time = 1.14936, size = 193, normalized size = 1.36

$$-\frac{be^3n}{4\,x^2}-\frac{be^3\log\left(cx^n\right)}{2\,x^2}-\frac{bde^2n}{3\,x^3}-\frac{ae^3}{2\,x^2}-\frac{bde^2\log\left(cx^n\right)}{x^3}-\frac{3\,bd^2en}{16\,x^4}-\frac{ade^2}{x^3}-\frac{3\,bd^2e\log\left(cx^n\right)}{4\,x^4}-\frac{bd^3n}{25\,x^5}-\frac{3\,ad^2e}{4\,x^4}-\frac{bd^3\log}{5\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^3*n/x^2 - 1/2*b*e^3*log(c*x^n)/x^2 - 1/3*b*d*e^2*n/x^3 - 1/2*a*e^3
/x^2 - b*d*e^2*log(c*x^n)/x^3 - 3/16*b*d^2*e*n/x^4 - a*d*e^2/x^3 - 3/4*b*d^
2*e*log(c*x^n)/x^4 - 1/25*b*d^3*n/x^5 - 3/4*a*d^2*e/x^4 - 1/5*b*d^3*log(c*x
^n)/x^5 - 1/5*a*d^3/x^5
```

Fricas [A] time = 0.992106, size = 378, normalized size = 2.66

$$-\frac{48\,bd^3n+240\,ad^3+300\left(be^3n+2\,ae^3\right)x^3+400\left(bde^2n+3\,ade^2\right)x^2+225\left(bd^2en+4\,ad^2e\right)x+60\left(10\,be^3x^3+20\,bde^2x\right.}{1200\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/1200*(48*b*d^3*n + 240*a*d^3 + 300*(b*e^3*n + 2*a*e^3)*x^3 + 400*(b*d*e^
2*n + 3*a*d*e^2)*x^2 + 225*(b*d^2*e*n + 4*a*d^2*e)*x + 60*(10*b*e^3*x^3 + 2
0*b*d*e^2*x^2 + 15*b*d^2*e*x + 4*b*d^3)*log(c) + 60*(10*b*e^3*n*x^3 + 20*b*
d*e^2*n*x^2 + 15*b*d^2*e*n*x + 4*b*d^3*n)*log(x))/x^5
```

Sympy [A] time = 9.25503, size = 219, normalized size = 1.54

$$-\frac{ad^3}{5x^5}-\frac{3ad^2e}{4x^4}-\frac{ade^2}{x^3}-\frac{ae^3}{2x^2}-\frac{bd^3n\log(x)}{5x^5}-\frac{bd^3n}{25x^5}-\frac{bd^3\log(c)}{5x^5}-\frac{3bd^2en\log(x)}{4x^4}-\frac{3bd^2en}{16x^4}-\frac{3bd^2e\log(c)}{4x^4}-\frac{bde^2n\log}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**3/(5*x**5) - 3*a*d**2*e/(4*x**4) - a*d*e**2/x**3 - a*e**3/(2*x**2) -
b*d**3*n*log(x)/(5*x**5) - b*d**3*n/(25*x**5) - b*d**3*log(c)/(5*x**5) - 3*
b*d**2*e*n*log(x)/(4*x**4) - 3*b*d**2*e*n/(16*x**4) - 3*b*d**2*e*log(c)/(4*
x**4) - b*d*e**2*n*log(x)/x**3 - b*d*e**2*n/(3*x**3) - b*d*e**2*log(c)/x**3
 - b*e**3*n*log(x)/(2*x**2) - b*e**3*n/(4*x**2) - b*e**3*log(c)/(2*x**2)
```

Giac [A] time = 1.21088, size = 213, normalized size = 1.5

$$-\frac{600\,bnx^3e^3\log(x)+1200\,bdnx^2e^2\log(x)+900\,bd^2nxe\log(x)+300\,bnx^3e^3+400\,bdnx^2e^2+225\,bd^2nxe+600\,bx^3e^3\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/1200*(600*b*n*x^3*e^3*log(x) + 1200*b*d*n*x^2*e^2*log(x) + 900*b*d^2*n*x
*e*log(x) + 300*b*n*x^3*e^3 + 400*b*d*n*x^2*e^2 + 225*b*d^2*n*x*e + 600*b*x
^3*e^3*log(c) + 1200*b*d*x^2*e^2*log(c) + 900*b*d^2*x*e*log(c) + 240*b*d^3*
n*log(x) + 48*b*d^3*n + 600*a*x^3*e^3 + 1200*a*d*x^2*e^2 + 900*a*d^2*x*e +
240*b*d^3*log(c) + 240*a*d^3)/x^5
```

3.29 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^7}\,dx$

Optimal. Leaf size=133

$$-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6x^6}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{3bd^2en}{25x^5}-\frac{bd^3n}{36x^6}-\frac{3bde^2n}{16x^4}$$

```
[Out] -(b*d^3*n)/(36*x^6) - (3*b*d^2*e*n)/(25*x^5) - (3*b*d*e^2*n)/(16*x^4) - (b*
e^3*n)/(9*x^3) - (d^3*(a + b*Log[c*x^n]))/(6*x^6) - (3*d^2*e*(a + b*Log[c*x
^n]))/(5*x^5) - (3*d*e^2*(a + b*Log[c*x^n]))/(4*x^4) - (e^3*(a + b*Log[c*x^
n]))/(3*x^3)
```

Rubi [A] time = 0.0959554, antiderivative size = 100, normalized size of antiderivative = 0.75, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{60}\left(\frac{36d^2e}{x^5}+\frac{10d^3}{x^6}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{25x^5}-\frac{bd^3n}{36x^6}-\frac{3bde^2n}{16x^4}-\frac{be^3n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^7,x]
```

```
[Out] -(b*d^3*n)/(36*x^6) - (3*b*d^2*e*n)/(25*x^5) - (3*b*d*e^2*n)/(16*x^4) - (b*
e^3*n)/(9*x^3) - (((10*d^3)/x^6 + (36*d^2*e)/x^5 + (45*d*e^2)/x^4 + (20*e^3
)/x^3)*(a + b*Log[c*x^n]))/60
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex)^3 (a+b\log(cx^n))}{x^7} dx = -\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)(a+b\log(cx^n))-(bn)\int \frac{-10d^3-36d^2ex-45d}{60x^7}$$

$$= -\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)(a+b\log(cx^n))-\frac{1}{60}(bn)\int \frac{-10d^3-36d^2ex-}{x}$$

$$= -\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)(a+b\log(cx^n))-\frac{1}{60}(bn)\int\left(-\frac{10d^3}{x^7}-\frac{36d^2e}{x^6}-\right.$$

$$= -\frac{bd^3n}{36x^6}-\frac{3bd^2en}{25x^5}-\frac{3bde^2n}{16x^4}-\frac{be^3n}{9x^3}-\frac{1}{60}\left(\frac{10d^3}{x^6}+\frac{36d^2e}{x^5}+\frac{45de^2}{x^4}+\frac{20e^3}{x^3}\right)(a+b\log(c$$

Mathematica [A] time = 0.0515982, size = 113, normalized size = 0.85

$$-\frac{60a\left(36d^2ex+10d^3+45de^2x^2+20e^3x^3\right)+60b\left(36d^2ex+10d^3+45de^2x^2+20e^3x^3\right)\log(cx^n)+bn\left(432d^2ex+100d^3+\right.}{3600x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^7,x]
```

```
[Out] -(60*a*(10*d^3 + 36*d^2*e*x + 45*d*e^2*x^2 + 20*e^3*x^3) + b*n*(100*d^3 + 4
32*d^2*e*x + 675*d*e^2*x^2 + 400*e^3*x^3) + 60*b*(10*d^3 + 36*d^2*e*x + 45*
d*e^2*x^2 + 20*e^3*x^3)*Log[c*x^n])/(3600*x^6)
```

Maple [C] time = 0.138, size = 571, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(a+b*ln(c*x^n))/x^7,x)
```

```
[Out] -1/60*b*(20*e^3*x^3+45*d*e^2*x^2+36*d^2*e*x+10*d^3)/x^6*ln(x^n)-1/3600*(600
*a*d^3+300*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-600*I*Pi*b*e^3*x^3*csgn(I*c
*x^n)^3+1200*ln(c)*b*e^3*x^3+2700*a*d*e^2*x^2+2160*a*d^2*e*x+600*ln(c)*b*d^
3-300*I*Pi*b*d^3*csgn(I*c*x^n)^3-600*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+1350*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1080*I*Pi*b*
d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+1350*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csg
n(I*c)+1080*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-1080*I*Pi*b*d^2*e*x*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1350*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3-1
080*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3-1350*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+300*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+2700*ln(c)*b*d
*e^2*x^2+2160*ln(c)*b*d^2*e*x+1200*a*e^3*x^3+100*b*d^3*n+600*I*Pi*b*e^3*x^3
*csgn(I*x^n)*csgn(I*c*x^n)^2-300*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+600*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+400*b*e^3*n*x^3+432*b*d^2
*e*n*x+675*b*d*e^2*n*x^2)/x^6
```

Maxima [A] time = 1.10918, size = 193, normalized size = 1.45

$$-\frac{be^3n}{9x^3}-\frac{be^3\log\left(cx^n\right)}{3x^3}-\frac{3bde^2n}{16x^4}-\frac{ae^3}{3x^3}-\frac{3bde^2\log\left(cx^n\right)}{4x^4}-\frac{3bd^2en}{25x^5}-\frac{3ade^2}{4x^4}-\frac{3bd^2e\log\left(cx^n\right)}{5x^5}-\frac{bd^3n}{36x^6}-\frac{3ad^2e}{5x^5}-\frac{bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^7,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^3*n/x^3 - 1/3*b*e^3*log(c*x^n)/x^3 - 3/16*b*d*e^2*n/x^4 - 1/3*a*e^
3/x^3 - 3/4*b*d*e^2*log(c*x^n)/x^4 - 3/25*b*d^2*e*n/x^5 - 3/4*a*d*e^2/x^4 -
 3/5*b*d^2*e*log(c*x^n)/x^5 - 1/36*b*d^3*n/x^6 - 3/5*a*d^2*e/x^5 - 1/6*b*d^
3*log(c*x^n)/x^6 - 1/6*a*d^3/x^6
```

Fricas [A] time = 1.082, size = 382, normalized size = 2.87

$$-\frac{100\,bd^3n+600\,ad^3+400\left(be^3n+3\,ae^3\right)x^3+675\left(bde^2n+4\,ade^2\right)x^2+432\left(bd^2en+5\,ad^2e\right)x+60\left(20\,be^3x^3+45\,bde^2\right.}{3600\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^7,x, algorithm="fricas")
```

```
[Out] -1/3600*(100*b*d^3*n + 600*a*d^3 + 400*(b*e^3*n + 3*a*e^3)*x^3 + 675*(b*d*e
^2*n + 4*a*d*e^2)*x^2 + 432*(b*d^2*e*n + 5*a*d^2*e)*x + 60*(20*b*e^3*x^3 +
45*b*d*e^2*x^2 + 36*b*d^2*e*x + 10*b*d^3)*log(c) + 60*(20*b*e^3*n*x^3 + 45*
b*d*e^2*n*x^2 + 36*b*d^2*e*n*x + 10*b*d^3*n)*log(x))/x^6
```

Sympy [A] time = 17.4311, size = 231, normalized size = 1.74

$$-\frac{ad^3}{6x^6}-\frac{3ad^2e}{5x^5}-\frac{3ade^2}{4x^4}-\frac{ae^3}{3x^3}-\frac{bd^3n\log(x)}{6x^6}-\frac{bd^3n}{36x^6}-\frac{bd^3\log(c)}{6x^6}-\frac{3bd^2en\log(x)}{5x^5}-\frac{3bd^2en}{25x^5}-\frac{3bd^2e\log(c)}{5x^5}-\frac{3bde^2n\log}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**7,x)
```

```
[Out] -a*d**3/(6*x**6) - 3*a*d**2*e/(5*x**5) - 3*a*d*e**2/(4*x**4) - a*e**3/(3*x*
*3) - b*d**3*n*log(x)/(6*x**6) - b*d**3*n/(36*x**6) - b*d**3*log(c)/(6*x**6
) - 3*b*d**2*e*n*log(x)/(5*x**5) - 3*b*d**2*e*n/(25*x**5) - 3*b*d**2*e*log(
c)/(5*x**5) - 3*b*d*e**2*n*log(x)/(4*x**4) - 3*b*d*e**2*n/(16*x**4) - 3*b*d
*e**2*log(c)/(4*x**4) - b*e**3*n*log(x)/(3*x**3) - b*e**3*n/(9*x**3) - b*e*
*3*log(c)/(3*x**3)
```

Giac [A] time = 1.28759, size = 213, normalized size = 1.6

$$-\frac{1200\,bnx^3e^3\log(x)+2700\,bdnx^2e^2\log(x)+2160\,bd^2nxe\log(x)+400\,bnx^3e^3+675\,bdnx^2e^2+432\,bd^2nxe+1200\,bx^3e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^7,x, algorithm="giac")
```

```
[Out] -1/3600*(1200*b*n*x^3*e^3*log(x) + 2700*b*d*n*x^2*e^2*log(x) + 2160*b*d^2*n
*x*e*log(x) + 400*b*n*x^3*e^3 + 675*b*d*n*x^2*e^2 + 432*b*d^2*n*x*e + 1200*
b*x^3*e^3*log(c) + 2700*b*d*x^2*e^2*log(c) + 2160*b*d^2*x*e*log(c) + 600*b*
d^3*n*log(x) + 100*b*d^3*n + 1200*a*x^3*e^3 + 2700*a*d*x^2*e^2 + 2160*a*d^2
*x*e + 600*b*d^3*log(c) + 600*a*d^3)/x^6
```

3.30 $\int \frac{(d+ex)^3(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=133

$$-\frac{d^2e\left(a+b\log\left(cx^n\right)\right)}{2x^6}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{bd^2en}{12x^6}-\frac{bd^3n}{49x^7}-\frac{3bde^2n}{25x^5}-$$

```
[Out] -(b*d^3*n)/(49*x^7) - (b*d^2*e*n)/(12*x^6) - (3*b*d*e^2*n)/(25*x^5) - (b*e^
3*n)/(16*x^4) - (d^3*(a + b*Log[c*x^n]))/(7*x^7) - (d^2*e*(a + b*Log[c*x^n]
))/(2*x^6) - (3*d*e^2*(a + b*Log[c*x^n]))/(5*x^5) - (e^3*(a + b*Log[c*x^n])
)/(4*x^4)
```

Rubi [A] time = 0.106254, antiderivative size = 100, normalized size of antiderivative = 0.75, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2334, 12, 14}

$$-\frac{1}{140}\left(\frac{70d^2e}{x^6}+\frac{20d^3}{x^7}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2en}{12x^6}-\frac{bd^3n}{49x^7}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{16x^4}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^3*n)/(49*x^7) - (b*d^2*e*n)/(12*x^6) - (3*b*d*e^2*n)/(25*x^5) - (b*e^
3*n)/(16*x^4) - (((20*d^3)/x^7 + (70*d^2*e)/x^6 + (84*d*e^2)/x^5 + (35*e^3)
/x^4)*(a + b*Log[c*x^n]))/140
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex)^3 (a+b\log(cx^n))}{x^8}\,dx = -\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)(a+b\log(cx^n)) - (bn)\int \frac{-20d^3-70d^2ex-8}{140x}$$
$$= -\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)(a+b\log(cx^n)) - \frac{1}{140}(bn)\int \frac{-20d^3-70d^2ex}{}$$
$$= -\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)(a+b\log(cx^n)) - \frac{1}{140}(bn)\int\left(-\frac{20d^3}{x^8}-\frac{70d^2e}{x^7}\right.$$
$$= -\frac{bd^3n}{49x^7}-\frac{bd^2en}{12x^6}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{16x^4}-\frac{1}{140}\left(\frac{20d^3}{x^7}+\frac{70d^2e}{x^6}+\frac{84de^2}{x^5}+\frac{35e^3}{x^4}\right)(a+b\log(c$$

Mathematica [A] time = 0.0520666, size = 113, normalized size = 0.85

$$-\frac{420a\left(70d^2ex+20d^3+84de^2x^2+35e^3x^3\right)+420b\left(70d^2ex+20d^3+84de^2x^2+35e^3x^3\right)\log(cx^n)+bn\left(4900d^2ex+120\right.}{58800x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(420*a*(20*d^3 + 70*d^2*e*x + 84*d*e^2*x^2 + 35*e^3*x^3) + b*n*(1200*d^3 +
 4900*d^2*e*x + 7056*d*e^2*x^2 + 3675*e^3*x^3) + 420*b*(20*d^3 + 70*d^2*e*x
 + 84*d*e^2*x^2 + 35*e^3*x^3)*Log[c*x^n])/(58800*x^7)
```

Maple [C] time = 0.138, size = 571, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(a+b*ln(c*x^n))/x^8,x)
```

```
[Out] -1/140*b*(35*e^3*x^3+84*d*e^2*x^2+70*d^2*e*x+20*d^3)/x^7*ln(x^n)-1/58800*(8
400*a*d^3-7350*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3+4200*I*Pi*b*d^3*csgn(I*x^n)*c
sgn(I*c*x^n)^2+14700*ln(c)*b*e^3*x^3+35280*a*d*e^2*x^2+29400*a*d^2*e*x+8400
*ln(c)*b*d^3+14700*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-17640*I*Pi*b*
d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-14700*I*Pi*b*d^2*e*x*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-17640*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3-14700*I*
Pi*b*d^2*e*x*csgn(I*c*x^n)^3+14700*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)
-7350*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+7350*I*Pi*b*e^3*x^
3*csgn(I*x^n)*csgn(I*c*x^n)^2-4200*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+7350*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)+4200*I*Pi*b*d^3*csgn(I
*c*x^n)^2*csgn(I*c)+35280*ln(c)*b*d*e^2*x^2+29400*ln(c)*b*d^2*e*x+14700*a*e
^3*x^3+17640*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+17640*I*Pi*b*d*e^
2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1200*b*d^3*n-4200*I*Pi*b*d^3*csgn(I*c*x^n)^
3+3675*b*e^3*n*x^3+4900*b*d^2*e*n*x+7056*b*d*e^2*n*x^2)/x^7
```

Maxima [A] time = 1.12394, size = 193, normalized size = 1.45

$$-\frac{be^3n}{16\,x^4}-\frac{be^3\log\left(cx^n\right)}{4\,x^4}-\frac{3\,bde^2n}{25\,x^5}-\frac{ae^3}{4\,x^4}-\frac{3\,bde^2\log\left(cx^n\right)}{5\,x^5}-\frac{bd^2en}{12\,x^6}-\frac{3\,ade^2}{5\,x^5}-\frac{bd^2e\log\left(cx^n\right)}{2\,x^6}-\frac{bd^3n}{49\,x^7}-\frac{ad^2e}{2\,x^6}-\frac{bd^3\log}{7\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] -1/16*b*e^3*n/x^4 - 1/4*b*e^3*log(c*x^n)/x^4 - 3/25*b*d*e^2*n/x^5 - 1/4*a*e
^3/x^4 - 3/5*b*d*e^2*log(c*x^n)/x^5 - 1/12*b*d^2*e*n/x^6 - 3/5*a*d*e^2/x^5
- 1/2*b*d^2*e*log(c*x^n)/x^6 - 1/49*b*d^3*n/x^7 - 1/2*a*d^2*e/x^6 - 1/7*b*d
^3*log(c*x^n)/x^7 - 1/7*a*d^3/x^7
```

Fricas [A] time = 1.04453, size = 393, normalized size = 2.95

$$-\frac{1200\,bd^3n+8400\,ad^3+3675\left(be^3n+4\,ae^3\right)x^3+7056\left(bde^2n+5\,ade^2\right)x^2+4900\left(bd^2en+6\,ad^2e\right)x+420\left(35\,be^3x^3+\right.}{58800\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/58800*(1200*b*d^3*n + 8400*a*d^3 + 3675*(b*e^3*n + 4*a*e^3)*x^3 + 7056*(
b*d*e^2*n + 5*a*d*e^2)*x^2 + 4900*(b*d^2*e*n + 6*a*d^2*e)*x + 420*(35*b*e^3
*x^3 + 84*b*d*e^2*x^2 + 70*b*d^2*e*x + 20*b*d^3)*log(c) + 420*(35*b*e^3*n*x
^3 + 84*b*d*e^2*n*x^2 + 70*b*d^2*e*n*x + 20*b*d^3*n)*log(x))/x^7
```

Sympy [A] time = 17.8332, size = 224, normalized size = 1.68

$$-\frac{ad^3}{7x^7}-\frac{ad^2e}{2x^6}-\frac{3ade^2}{5x^5}-\frac{ae^3}{4x^4}-\frac{bd^3n\log(x)}{7x^7}-\frac{bd^3n}{49x^7}-\frac{bd^3\log(c)}{7x^7}-\frac{bd^2en\log(x)}{2x^6}-\frac{bd^2en}{12x^6}-\frac{bd^2e\log(c)}{2x^6}-\frac{3bde^2n\log(x)}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] -a*d**3/(7*x**7) - a*d**2*e/(2*x**6) - 3*a*d*e**2/(5*x**5) - a*e**3/(4*x**4
) - b*d**3*n*log(x)/(7*x**7) - b*d**3*n/(49*x**7) - b*d**3*log(c)/(7*x**7)
- b*d**2*e*n*log(x)/(2*x**6) - b*d**2*e*n/(12*x**6) - b*d**2*e*log(c)/(2*x*
*6) - 3*b*d*e**2*n*log(x)/(5*x**5) - 3*b*d*e**2*n/(25*x**5) - 3*b*d*e**2*lo
g(c)/(5*x**5) - b*e**3*n*log(x)/(4*x**4) - b*e**3*n/(16*x**4) - b*e**3*log(
c)/(4*x**4)
```

Giac [A] time = 1.33508, size = 213, normalized size = 1.6

$$-\frac{14700\,bnx^3e^3\log(x)+35280\,bdnx^2e^2\log(x)+29400\,bd^2nxe\log(x)+3675\,bnx^3e^3+7056\,bdnx^2e^2+4900\,bd^2nxe+14}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] -1/58800*(14700*b*n*x^3*e^3*log(x) + 35280*b*d*n*x^2*e^2*log(x) + 29400*b*d
^2*n*x*e*log(x) + 3675*b*n*x^3*e^3 + 7056*b*d*n*x^2*e^2 + 4900*b*d^2*n*x*e
+ 14700*b*x^3*e^3*log(c) + 35280*b*d*x^2*e^2*log(c) + 29400*b*d^2*x*e*log(c
) + 8400*b*d^3*n*log(x) + 1200*b*d^3*n + 14700*a*x^3*e^3 + 35280*a*d*x^2*e^
2 + 29400*a*d^2*x*e + 8400*b*d^3*log(c) + 8400*a*d^3)/x^7
```

3.31 $\int \frac{x^3(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=148

$$-\frac{bd^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{d^3\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^4}-\frac{dx^2(a+b\log(cx^n))}{2e^2}+\frac{x^3(a+b\log(cx^n))}{3e}+\frac{ad^2x}{e^3}+\frac{bd^2x}{}$$

```
[Out] (a*d^2*x)/e^3 - (b*d^2*n*x)/e^3 + (b*d*n*x^2)/(4*e^2) - (b*n*x^3)/(9*e) + (
b*d^2*x*Log[c*x^n])/e^3 - (d*x^2*(a + b*Log[c*x^n]))/(2*e^2) + (x^3*(a + b*
Log[c*x^n]))/(3*e) - (d^3*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4 - (b*d^3
*n*PolyLog[2, -((e*x)/d)])/e^4
```

Rubi [A] time = 0.177357, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {43, 2351, 2295, 2304, 2317, 2391}

$$-\frac{bd^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{d^3\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^4}-\frac{dx^2(a+b\log(cx^n))}{2e^2}+\frac{x^3(a+b\log(cx^n))}{3e}+\frac{ad^2x}{e^3}+\frac{bd^2x}{}$$

Antiderivative was successfully verified.

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


```
[Out] (a*d^2*x)/e^3 - (b*d^2*n*x)/e^3 + (b*d*n*x^2)/(4*e^2) - (b*n*x^3)/(9*e) + (
b*d^2*x*Log[c*x^n])/e^3 - (d*x^2*(a + b*Log[c*x^n]))/(2*e^2) + (x^3*(a + b*
Log[c*x^n]))/(3*e) - (d^3*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4 - (b*d^3
*n*PolyLog[2, -((e*x)/d)])/e^4
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3 (a + b\log(cx^n))}{d + ex}\,dx = \int \left(\frac{d^2 (a + b\log(cx^n))}{e^3} - \frac{dx (a + b\log(cx^n))}{e^2} + \frac{x^2 (a + b\log(cx^n))}{e} - \frac{d^3 (a + b\log(cx^n))}{e^3(d + ex)}\right) dx$$
$$= \frac{d^2 \int (a + b\log(cx^n))\,dx}{e^3} - \frac{d^3 \int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^3} - \frac{d\int x (a + b\log(cx^n))\,dx}{e^2} + \frac{\int x^2 (a + b\log(c$$
$$= \frac{ad^2x}{e^3} + \frac{bdnx^2}{4e^2} - \frac{bnx^3}{9e} - \frac{dx^2 (a + b\log(cx^n))}{2e^2} + \frac{x^3 (a + b\log(cx^n))}{3e} - \frac{d^3 (a + b\log(cx^n))\log}{e^4}$$
$$= \frac{ad^2x}{e^3} - \frac{bd^2nx}{e^3} + \frac{bdnx^2}{4e^2} - \frac{bnx^3}{9e} + \frac{bd^2x\log(cx^n)}{e^3} - \frac{dx^2 (a + b\log(cx^n))}{2e^2} + \frac{x^3 (a + b\log(cx^n)}{3e}$$

Mathematica [A] time = 0.0761221, size = 142, normalized size = 0.96

$$\frac{-36bd^3n\text{PolyLog}\left(2, -\frac{ex}{d}\right) + 36ad^2ex - 36ad^3\log\left(\frac{ex}{d} + 1\right) - 18ade^2x^2 + 12ae^3x^3 + 6b\log(cx^n)\left(ex\left(6d^2 - 3dex + 2e^2x^2\right)\right.}{36e^4}$$

Antiderivative was successfully verified.

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

```
[Out] (36*a*d^2*e*x - 36*b*d^2*e*n*x - 18*a*d*e^2*x^2 + 9*b*d*e^2*n*x^2 + 12*a*e^
3*x^3 - 4*b*e^3*n*x^3 - 36*a*d^3*Log[1 + (e*x)/d] + 6*b*Log[c*x^n]*(e*x*(6*
d^2 - 3*d*e*x + 2*e^2*x^2) - 6*d^3*Log[1 + (e*x)/d]) - 36*b*d^3*n*PolyLog[2
, -((e*x)/d)])/(36*e^4)
```

Maple [C] time = 0.217, size = 693, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*ln(c)/e^2*x^2*d+b*ln(c)/e^3*x*d^2-b*ln(c)*d^3/e^4*ln(e*x+d)+1/6*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
/e^3*x*d^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x^2*d-1/2*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)*d^3/e^4*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2*d^3/e^4*ln(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x^2*d+1/2*I*
b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^3*x*d^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)/e*x^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^3/e^4*l
n(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x^2*d-1/6*I*b*P
i*csgn(I*c*x^n)^3/e*x^3+1/3*b*ln(x^n)/e*x^3+1/3*b*ln(c)/e*x^3-a*d^3/e^4*ln(
e*x+d)-1/2*a/e^2*x^2*d-49/36*b*n*d^3/e^4+b*n*d^3/e^4*ln(e*x+d)*ln(-e*x/d)-1
/2*b*ln(x^n)/e^2*x^2*d+b*ln(x^n)/e^3*x*d^2-b*ln(x^n)*d^3/e^4*ln(e*x+d)+1/6*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x^3+1/4*I*b*Pi*csgn(I*c*x^n)^3/e^2*x^2*d
+1/3*a/e*x^3-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^3*x*d^2+1/2*I*b*Pi*csgn(I*c*x^n)^
3*d^3/e^4*ln(e*x+d)+b*n*d^3/e^4*dilog(-e*x/d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/e^3*x*d^2+a*d^2*x/e^3-b*d^2*n*x/e^3-1/9*b*n*x^3/e+1/4*b*d
*n*x^2/e^2
```

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

$$-\frac{1}{6}\,a\left(\frac{6\,d^3\log\left(ex+d\right)}{e^4}-\frac{2\,e^2x^3-3\,dex^2+6\,d^2x}{e^3}\right)+b\int\frac{x^3\log\left(c\right)+x^3\log\left(x^n\right)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx^3\log(cx^n) + ax^3}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 41.4876, size = 248, normalized size = 1.68

$$-\frac{ad^3\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^3} + \frac{ad^2x}{e^3} - \frac{adx^2}{2e^2} + \frac{ax^3}{3e} + \frac{bd^3n\left(\begin{cases}\frac{x}{d} \\ \frac{\begin{cases}\log(d)\log(x) - \mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) \\ -\log(d)\log\left(\frac{1}{x}\right) - \mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(d) + G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d)\end{cases}}{e}\end{cases}\right)}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 + a*d**2*x/
e**3 - a*d*x**2/(2*e**2) + a*x**3/(3*e) + b*d**3*n*Piecewise((x/d, Eq(e, 0)
), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) <
1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((),
 (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e
**3 - b*d**3*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)
/e**3 - b*d**2*n*x/e**3 + b*d**2*x*log(c*x**n)/e**3 + b*d*n*x**2/(4*e**2) -
```

```
b*d*x**2*log(c*x**n)/(2*e**2) - b*n*x**3/(9*e) + b*x**3*log(c*x**n)/(3*e)
```

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

$$\int \frac{(b\log(cx^n) + a)x^3}{ex + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.32 $\int \frac{x^2(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=107

$$\frac{bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{d^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^3}+\frac{x^2(a+b\log(cx^n))}{2e}-\frac{adx}{e^2}-\frac{bdx\log(cx^n)}{e^2}+\frac{bdnx}{e^2}-\frac{bnx^2}{4e}$$

```
[Out] -((a*d*x)/e^2) + (b*d*n*x)/e^2 - (b*n*x^2)/(4*e) - (b*d*x*Log[c*x^n])/e^2 +
 (x^2*(a + b*Log[c*x^n]))/(2*e) + (d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])
/e^3 + (b*d^2*n*PolyLog[2, -((e*x)/d)])/e^3
```

Rubi [A] time = 0.135808, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {43, 2351, 2295, 2304, 2317, 2391}

$$\frac{bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{d^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^3}+\frac{x^2(a+b\log(cx^n))}{2e}-\frac{adx}{e^2}-\frac{bdx\log(cx^n)}{e^2}+\frac{bdnx}{e^2}-\frac{bnx^2}{4e}$$

Antiderivative was successfully verified.

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


```
[Out] -((a*d*x)/e^2) + (b*d*n*x)/e^2 - (b*n*x^2)/(4*e) - (b*d*x*Log[c*x^n])/e^2 +
 (x^2*(a + b*Log[c*x^n]))/(2*e) + (d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])
/e^3 + (b*d^2*n*PolyLog[2, -((e*x)/d)])/e^3
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))}{d+ex}\,dx = \int \left(-\frac{d(a+b\log(cx^n))}{e^2}+\frac{x(a+b\log(cx^n))}{e}+\frac{d^2(a+b\log(cx^n))}{e^2(d+ex)}\right)dx$$

$$= -\frac{d\int (a+b\log(cx^n))\,dx}{e^2}+\frac{d^2\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^2}+\frac{\int x(a+b\log(cx^n))\,dx}{e}$$

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

$$= -\frac{adx}{e^2}+\frac{bdnx}{e^2}-\frac{bnx^2}{4e}-\frac{bdx\log(cx^n)}{e^2}+\frac{x^2(a+b\log(cx^n))}{2e}+\frac{d^2(a+b\log(cx^n))\log\left(1+\right.}{e^3}$$

Mathematica [A] time = 0.0510299, size = 105, normalized size = 0.98

$$\frac{4bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)+4ad^2\log\left(\frac{ex}{d}+1\right)-4adex+2ae^2x^2+2b\log(cx^n)\left(2d^2\log\left(\frac{ex}{d}+1\right)+ex(ex-2d)\right)+4bdenx}{4e^3}$$

Antiderivative was successfully verified.

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

```
[Out] (-4*a*d*e*x + 4*b*d*e*n*x + 2*a*e^2*x^2 - b*e^2*n*x^2 + 4*a*d^2*Log[1 + (e*
x)/d] + 2*b*Log[c*x^n]*(e*x*(-2*d + e*x) + 2*d^2*Log[1 + (e*x)/d]) + 4*b*d^
2*n*PolyLog[2, -((e*x)/d)])/(4*e^3)
```

Maple [C] time = 0.187, size = 521, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*d*x+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e
*x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x^2+b*ln(c)*d^2/e^3*l
n(e*x+d)-b*ln(c)/e^2*d*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*d*x+1/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)*d^2/e^3*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*
d*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3*ln(e*x+d)-1/4*I*
b*Pi*csgn(I*c*x^n)^3/e*x^2+1/2*b*ln(x^n)/e*x^2+5/4*b*n*d^2/e^3+a*d^2/e^3*ln
(e*x+d)+1/2*b*ln(c)/e*x^2-b*n*d^2/e^3*ln(e*x+d)*ln(-e*x/d)-1/2*I*b*Pi*csgn(
I*c*x^n)^3*d^2/e^3*ln(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x^2-b*l
n(x^n)/e^2*d*x+b*ln(x^n)*d^2/e^3*ln(e*x+d)+1/2*a/e*x^2-b*n*d^2/e^3*dilog(-e
*x/d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*d*x+b*d*n*x/e^2-1/
4*b*n*x^2/e-a*d*x/e^2
```

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

$$\frac{1}{2}\,a\left(\frac{2\,d^2\log\left(ex+d\right)}{e^3}+\frac{ex^2-2\,dx}{e^2}\right)+b\int\frac{x^2\log\left(c\right)+x^2\log\left(x^n\right)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx^2\log(cx^n)+ax^2}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 33.0149, size = 199, normalized size = 1.86

$$\frac{ad^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^2}-\frac{adx}{e^2}+\frac{ax^2}{2e}-\frac{bd^2n\left(\begin{cases}\frac{x}{d} \\ \frac{\begin{cases}\log(d)\log(x)-\text{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\\ -\log(d)\log\left(\frac{1}{x}\right)-\text{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d)-\text{Li}_2\left(\frac{exe^{i\pi}}{d}\right)\end{cases}}{e}\end{cases}\right)}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**2 - a*d*x/e**2
 + a*x**2/(2*e) - b*d**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*lo
g(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) -
polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), (
(0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - po
lylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**2 + b*d**2*Piecewise((
x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**2 + b*d*n*x/e**2 - b
*d*x*log(c*x**n)/e**2 - b*n*x**2/(4*e) + b*x**2*log(c*x**n)/(2*e)
```

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

$$\int \frac{(b\log(cx^n)+a)x^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.33 $\int \frac{x(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=69

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}-\frac{d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^2}+\frac{ax}{e}+\frac{bx\log(cx^n)}{e}-\frac{bnx}{e}$$

```
[Out] (a*x)/e - (b*n*x)/e + (b*x*Log[c*x^n])/e - (d*(a + b*Log[c*x^n])*Log[1 + (e
*x)/d])/e^2 - (b*d*n*PolyLog[2, -((e*x)/d)])/e^2
```

Rubi [A] time = 0.0939894, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {43, 2351, 2295, 2317, 2391}

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}-\frac{d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^2}+\frac{ax}{e}+\frac{bx\log(cx^n)}{e}-\frac{bnx}{e}$$

Antiderivative was successfully verified.

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

```
[Out] (a*x)/e - (b*n*x)/e + (b*x*Log[c*x^n])/e - (d*(a + b*Log[c*x^n])*Log[1 + (e
*x)/d])/e^2 - (b*d*n*PolyLog[2, -((e*x)/d)])/e^2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\,(a+b\log(cx^n))}{d+ex}\,dx &= \int \left(\frac{a+b\log(cx^n)}{e}-\frac{d\,(a+b\log(cx^n))}{e(d+ex)}\right)dx\\ &= \frac{\int (a+b\log(cx^n))\,dx}{e}-\frac{d\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e}\\ &= \frac{ax}{e}-\frac{d\,(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^2}+\frac{b\int \log(cx^n)\,dx}{e}+\frac{(bdn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e^2}\\ &= \frac{ax}{e}-\frac{bnx}{e}+\frac{bx\log(cx^n)}{e}-\frac{d\,(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^2}-\frac{bdn\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{e^2}\end{aligned}$$

Mathematica [A] time = 0.0322178, size = 66, normalized size = 0.96

$$\frac{-bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)-ad\log\left(\frac{ex}{d}+1\right)+aex+b\log(cx^n)\left(ex-d\log\left(\frac{ex}{d}+1\right)\right)-benx}{e^2}$$

Antiderivative was successfully verified.

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

```
[Out] (a*e*x - b*e*n*x - a*d*Log[1 + (e*x)/d] + b*Log[c*x^n]*(e*x - d*Log[1 + (e*
x)/d]) - b*d*n*PolyLog[2, -((e*x)/d)])/e^2
```

Maple [C] time = 0.22, size = 343, normalized size = 5.

$$\frac{bx\ln(x^n)}{e} - \frac{b\ln(x^n)d\ln(ex+d)}{e^2} - \frac{bnx}{e} - \frac{bdn}{e^2} + \frac{bdn\ln(ex+d)}{e^2}\ln\left(-\frac{ex}{d}\right) + \frac{bdn}{e^2}\text{dilog}\left(-\frac{ex}{d}\right) + \frac{\frac{i}{2}b\pi\,\text{csgn}(ix^n)\,(\text{csgn}}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(x^n)/e*x-b*ln(x^n)*d/e^2*ln(e*x+d)-b*n*x/e-b*n*d/e^2+b*n*d/e^2*ln(e*x+
d)*ln(-e*x/d)+b*n*d/e^2*dilog(-e*x/d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^
2/e*x+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)/e*x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2
*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2*d/e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e*x-1/2*I*b*Pi
*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2*ln(e*x+d)+b*ln(c)/e*x-b*ln(c)*d/e^2*ln(e*x
+d)+a*x/e-a*d/e^2*ln(e*x+d)
```

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

$$a\left(\frac{x}{e} - \frac{d\log(ex+d)}{e^2}\right) + b\int\frac{x\log(c) + x\log(x^n)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx\log(cx^n) + ax}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*x*log(c*x^n) + a*x)/(e*x + d), x)
```

Sympy [A] time = 41.5534, size = 144, normalized size = 2.09

$$-\frac{ad\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e}+\frac{ax}{e}+\frac{bdn\left(\begin{cases}\frac{x}{d}\\ \frac{\begin{cases}\log(d)\log(x)-\mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) & \text{for}\\ -\log(d)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) & \text{for}\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d)-\mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) & \text{oth}\end{cases}}{e}\end{cases}\right.}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e + a*x/e + b*d*n*P
iecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_po
lar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*p
i)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + mei
jerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)
/d), True))/e, True))/e - b*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, T
rue))*log(c*x**n)/e - b*n*x/e + b*x*log(c*x**n)/e
```

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

$$\int \frac{(b\log(cx^n)+a)x}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.34 $\int \frac{a+b\log(cx^n)}{d+ex}\,dx$

Optimal. Leaf size=39

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e}+\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e}$$

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e + (b*n*PolyLog[2, -((e*x)/d)])/e
```

Rubi [A] time = 0.0260456, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e}+\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e}$$

Antiderivative was successfully verified.

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

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e + (b*n*PolyLog[2, -((e*x)/d)])/e
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{d+ex}\,dx = \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e} - \frac{(bn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e}$$
$$= \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e} + \frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{e}$$

Mathematica [A] time = 0.0066954, size = 37, normalized size = 0.95

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)+\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e}$$

Antiderivative was successfully verified.

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

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (e*x)/d] + b*n*PolyLog[2, -((e*x)/d)])/e
```

Maple [C] time = 0.167, size = 195, normalized size = 5.

$$\frac{b\ln(ex+d)\ln(x^n)}{e} - \frac{bn\ln(ex+d)}{e}\ln\left(-\frac{ex}{d}\right) - \frac{bn}{e}\text{dilog}\left(-\frac{ex}{d}\right) + \frac{\frac{i}{2}\ln(ex+d)\,b\pi\,\text{csgn}(ix^n)(\text{csgn}(icx^n))^2}{e} - \frac{\frac{i}{2}\ln(ex+d}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(e*x+d)/e*ln(x^n)-b/e*n*ln(e*x+d)*ln(-e*x/d)-b/e*n*dilog(-e*x/d)+1/2*I*
ln(e*x+d)/e*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(e*x+d)/e*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*ln(e*x+d)/e*b*Pi*csgn(I*c*x^n)^3+1/2*I*l
n(e*x+d)/e*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+ln(e*x+d)/e*b*ln(c)+a*ln(e*x+d)/e
```

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

$$b\int \frac{\log(c)+\log(x^n)}{ex+d}\,dx + \frac{a\log(ex+d)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e*x + d), x)
```

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

$$\int\frac{a+b\log\left(cx^n\right)}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x), x)
```

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

$$\int\frac{b\log\left(cx^n\right)+a}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.35 $\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx$

Optimal. Leaf size=44

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d}-\frac{\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d}$$

```
[Out] -((Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/d) + (b*n*PolyLog[2, -(d/(e*x))])/d
```

Rubi [A] time = 0.0908774, antiderivative size = 66, normalized size of antiderivative = 1.5, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {2344, 2301, 2317, 2391}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d}+\frac{(a+b\log(cx^n))^2}{2bdn}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*Log[c*x^n])^2/(2*b*d*n) - ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d -
(b*n*PolyLog[2, -((e*x)/d)])/d
```

Rule 2344

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d}$$
$$= \frac{(a+b\log(cx^n))^2}{2bdn} - \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d} + \frac{(bn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{d}$$
$$= \frac{(a+b\log(cx^n))^2}{2bdn} - \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d} - \frac{bn\text{Li}_2\left(-\frac{ex}{d}\right)}{d}$$

Mathematica [A] time = 0.03245, size = 63, normalized size = 1.43

$$\frac{(a+b\log(cx^n))\left(a+b\log(cx^n)-2bn\log\left(\frac{ex}{d}+1\right)\right)}{2bdn} - \frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d}$$

Antiderivative was successfully verified.

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

```
[Out] ((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 + (e*x)/d]))/(2*b*d*n)
- (b*n*PolyLog[2, -((e*x)/d)])/d
```

Maple [C] time = 0.142, size = 336, normalized size = 7.6

$$-\frac{b\ln(x^n)\ln(ex+d)}{d} + \frac{b\ln(x^n)\ln(x)}{d} - \frac{bn(\ln(x))^2}{2d} + \frac{bn\ln(ex+d)}{d}\ln\left(-\frac{ex}{d}\right) + \frac{bn}{d}\text{dilog}\left(-\frac{ex}{d}\right) + \frac{\frac{i}{2}b\pi\,\text{csgn}(ix^n)\,(\text{csg}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*ln(x^n)/d*ln(e*x+d)+b*ln(x^n)/d*ln(x)-1/2*b*n/d*ln(x)^2+b*n/d*ln(e*x+d)*
ln(-e*x/d)+b*n/d*dilog(-e*x/d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*ln(
x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)/d*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)/d*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d*ln(x)-1/2*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)/d*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d*ln(e*x+d)+1/2*I*b*P
i*csgn(I*c*x^n)^2*csgn(I*c)/d*ln(x)-b*ln(c)/d*ln(e*x+d)+b*ln(c)/d*ln(x)-a/d
*ln(e*x+d)+a/d*ln(x)
```

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

$$-a\left(\frac{\log\left(ex+d\right)}{d}-\frac{\log\left(x\right)}{d}\right)+b\int\frac{\log\left(c\right)+\log\left(x^{n}\right)}{ex^{2}+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{ex^{2}+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [C] time = 23.2241, size = 158, normalized size = 3.59

$$-\frac{2ae\left(\begin{cases}\frac{1}{2e}+\frac{x}{d} & \text{for } e=0\\ -\frac{\log(-2ex)}{2e} & \text{otherwise}\end{cases}\right)}{d}-\frac{2ae\left(\begin{cases}\frac{1}{2e}+\frac{x}{d} & \text{for } e=0\\ \frac{\log(2d+2ex)}{2e} & \text{otherwise}\end{cases}\right)}{d}+bn\left(\left(\left(-\frac{1}{ex} \quad \frac{\begin{cases}\log(e)\log(x)+\operatorname{Li}_2\left(\frac{de^{i\pi}}{ex}\right)\\ -\log(e)\log\left(\frac{1}{x}\right)+\operatorname{Li}_2\left(\frac{de^{i\pi}}{ex}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,\end{matrix}\right.\end{cases}}{d}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*a*e*Piecewise((1/(2*e) + x/d, Eq(e, 0)), (-log(-2*e*x)/(2*e), True))/d -
 2*a*e*Piecewise((1/(2*e) + x/d, Eq(e, 0)), (log(2*d + 2*e*x)/(2*e), True))
/d + b*n*Piecewise((-1/(e*x), Eq(d, 0)), (Piecewise((log(e)*log(x) + polylo
g(2, d*exp_polar(I*pi)/(e*x)), Abs(x) < 1), (-log(e)*log(1/x) + polylog(2,
d*exp_polar(I*pi)/(e*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), (
)), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) + polylog(2,
d*exp_polar(I*pi)/(e*x)), True))/d, True)) - b*Piecewise((1/(e*x), Eq(d, 0)
), (log(d/x + e)/d, True))*log(c*x**n)
```

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

$$\int \frac{b\log(cx^n)+a}{(ex+d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.36 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)}\,dx$

Optimal. Leaf size=74

$$-\frac{ben\mathrm{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^2}+\frac{e\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^2}-\frac{a+b\log(cx^n)}{dx}-\frac{bn}{dx}$$

```
[Out] -((b*n)/(d*x)) - (a + b*Log[c*x^n])/(d*x) + (e*Log[1 + d/(e*x)]*(a + b*Log[
c*x^n]))/d^2 - (b*e*n*PolyLog[2, -(d/(e*x))])/d^2
```

Rubi [A] time = 0.14466, antiderivative size = 95, normalized size of antiderivative = 1.28, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {44, 2351, 2304, 2301, 2317, 2391}

$$\frac{ben\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2}-\frac{e(a+b\log(cx^n))^2}{2bd^2n}+\frac{e\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^2}-\frac{a+b\log(cx^n)}{dx}-\frac{bn}{dx}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*n)/(d*x)) - (a + b*Log[c*x^n])/(d*x) - (e*(a + b*Log[c*x^n])^2)/(2*b*d
^2*n) + (e*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^2 + (b*e*n*PolyLog[2, -((
e*x)/d)])/d^2
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{x^2(d+ex)}\,dx &= \int \left(\frac{a+b\log(cx^n)}{dx^2}-\frac{e\,(a+b\log(cx^n))}{d^2x}+\frac{e^2\,(a+b\log(cx^n))}{d^2(d+ex)}\right)dx\\
&= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d}-\frac{e\int \frac{a+b\log(cx^n)}{x}\,dx}{d^2}+\frac{e^2\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^2}\\
&= -\frac{bn}{dx}-\frac{a+b\log(cx^n)}{dx}-\frac{e\,(a+b\log(cx^n))^2}{2bd^2n}+\frac{e\,(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d^2}-\frac{(ben)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}}{d^2}\\
&= -\frac{bn}{dx}-\frac{a+b\log(cx^n)}{dx}-\frac{e\,(a+b\log(cx^n))^2}{2bd^2n}+\frac{e\,(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d^2}+\frac{ben\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{d^2}
\end{aligned}$$

Mathematica [A] time = 0.082567, size = 88, normalized size = 1.19

$$-\frac{-2ben\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)-2e\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))+\frac{2d(a+b\log(cx^n))}{x}+\frac{e(a+b\log(cx^n))^2}{bn}+\frac{2bdn}{x}}{2d^2}$$

Antiderivative was successfully verified.

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

```
[Out] -((2*b*d*n)/x + (2*d*(a + b*Log[c*x^n]))/x + (e*(a + b*Log[c*x^n])^2)/(b*n)
 - 2*e*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 2*b*e*n*PolyLog[2, -((e*x)/d)]
)/(2*d^2)
```

Maple [C] time = 0.178, size = 504, normalized size = 6.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2*ln(x)+1/2*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)^2*e/d^2*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)/d/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2*ln(x)+1/2*I*b*Pi*csgn(I*
c*x^n)^2*csgn(I*c)*e/d^2*ln(e*x+d)-b*ln(x^n)/d/x+a*e/d^2*ln(e*x+d)-a*e/d^2*
ln(x)-b*ln(c)/d/x+1/2*I*b*Pi*csgn(I*c*x^n)^3/d/x-1/2*I*b*Pi*csgn(I*c*x^n)^2
*csgn(I*c)/d/x-b*n*e/d^2*ln(e*x+d)*ln(-e*x/d)-1/2*I*b*Pi*csgn(I*c*x^n)^3*e/
d^2*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^2*ln(x)-b*ln(c)*e/d^2*ln(x)+b*
ln(c)*e/d^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/x+1/2*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2*ln(x)+b*ln(x^n)*e/d^2*ln(e*x+d)-
b*ln(x^n)*e/d^2*ln(x)-b*n*e/d^2*dilog(-e*x/d)+1/2*b*n*e/d^2*ln(x)^2-1/2*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2*ln(e*x+d)-a/d/x-b*n/d/x
```

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

$$a\left(\frac{e\log\left(ex+d\right)}{d^2}-\frac{e\log\left(x\right)}{d^2}-\frac{1}{dx}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{ex^3+dx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^3+dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 127.667, size = 197, normalized size = 2.66

$$-\frac{a}{dx}+\frac{ae^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{ae\log(x)}{d^2}-\frac{bn}{dx}-\frac{b\log(cx^n)}{dx}-\frac{be^2n\left(\begin{cases}\frac{x}{d} & \\ \begin{cases}\log(d)\log(x)-\mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) & \\ -\log(d)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{exe^{i\pi}}{d}\right) & \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ \end{matrix}\right.\end{cases}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a/(d*x) + a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**2 -
 a*e*log(x)/d**2 - b*n/(d*x) - b*log(c*x**n)/(d*x) - b*e**2*n*Piecewise((x/
d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d)
, Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs
(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1)
, ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/
e, True))/d**2 + b*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*
log(c*x**n)/d**2 + b*e*n*log(x)**2/(2*d**2) - b*e*log(x)*log(c*x**n)/d**2
```

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

$$\int \frac{b\log(cx^n)+a}{(ex+d)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.37 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)}\,dx$

Optimal. Leaf size=110

$$\frac{be^2n\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^3}-\frac{e^2\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^3}+\frac{e(a+b\log(cx^n))}{d^2x}-\frac{a+b\log(cx^n)}{2dx^2}+\frac{ben}{d^2x}-\frac{bn}{4dx^2}$$

```
[Out] -(b*n)/(4*d*x^2) + (b*e*n)/(d^2*x) - (a + b*Log[c*x^n])/(2*d*x^2) + (e*(a +
 b*Log[c*x^n]))/(d^2*x) - (e^2*Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/d^3 + (
b*e^2*n*PolyLog[2, -(d/(e*x))])/d^3
```

Rubi [A] time = 0.170924, antiderivative size = 135, normalized size of antiderivative = 1.23, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {44, 2351, 2304, 2301, 2317, 2391}

$$-\frac{be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}+\frac{e^2(a+b\log(cx^n))^2}{2bd^3n}-\frac{e^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^3}+\frac{e(a+b\log(cx^n))}{d^2x}-\frac{a+b\log(cx^n)}{2dx^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(4*d*x^2) + (b*e*n)/(d^2*x) - (a + b*Log[c*x^n])/(2*d*x^2) + (e*(a +
 b*Log[c*x^n]))/(d^2*x) + (e^2*(a + b*Log[c*x^n])^2)/(2*b*d^3*n) - (e^2*(a
+ b*Log[c*x^n])*Log[1 + (e*x)/d])/d^3 - (b*e^2*n*PolyLog[2, -((e*x)/d)])/d^
3
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx^n)}{x^3(d+ex)}\,dx &= \int \left(\frac{a+b\log(cx^n)}{dx^3} - \frac{e(a+b\log(cx^n))}{d^2x^2} + \frac{e^2(a+b\log(cx^n))}{d^3x} - \frac{e^3(a+b\log(cx^n))}{d^3(d+ex)}\right)dx\\ &= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{x}\,dx}{d^3} - \frac{e^3\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^3}\\ &= -\frac{bn}{4dx^2} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{2dx^2} + \frac{e(a+b\log(cx^n))}{d^2x} + \frac{e^2(a+b\log(cx^n))^2}{2bd^3n} - \frac{e^2(a+b\log(cx^n))\,\mathrm{l}}{d^3}\\ &= -\frac{bn}{4dx^2} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{2dx^2} + \frac{e(a+b\log(cx^n))}{d^2x} + \frac{e^2(a+b\log(cx^n))^2}{2bd^3n} - \frac{e^2(a+b\log(cx^n))\,\mathrm{l}}{d^3}\end{aligned}$$

Mathematica [A] time = 0.197236, size = 124, normalized size = 1.13

$$-\frac{4be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)+\frac{2d^2(a+b\log(cx^n))}{x^2}+4e^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))-\frac{4de(a+b\log(cx^n))}{x}-\frac{2e^2(a+b\log(cx^n))^2}{bn}+\frac{bd^2n}{x^2}-4}{4d^3}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^2*n)/x^2 - (4*b*d*e*n)/x + (2*d^2*(a + b*Log[c*x^n]))/x^2 - (4*d*e*(
a + b*Log[c*x^n]))/x - (2*e^2*(a + b*Log[c*x^n])^2)/(b*n) + 4*e^2*(a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d] + 4*b*e^2*n*PolyLog[2, -((e*x)/d)])/(4*d^3)
```

Maple [C] time = 0.158, size = 689, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(x^n)*e^2/d^3*ln(x)+b*ln(x^n)*e/d^2/x+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)/d/x^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*ln(e*x+d
)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3*ln(e*x+d)+1/4*I*b*Pi*csgn(I*
c*x^n)^3/d/x^2+b*n*e^2/d^3*ln(e*x+d)*ln(-e*x/d)-1/2*b*ln(x^n)/d/x^2-a*e^2/d
^3*ln(e*x+d)+a*e^2/d^3*ln(x)+a*e/d^2/x-1/2*b*ln(c)/d/x^2+1/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)^2*e/d^2/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3
*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3*ln(x)+1/2*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)*e/d^2/x+1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3*ln(e*x+d)-1/
2*a/d/x^2-b*ln(x^n)*e^2/d^3*ln(e*x+d)-b*ln(c)*e^2/d^3*ln(e*x+d)+b*ln(c)*e^2
/d^3*ln(x)+b*ln(c)*e/d^2/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e
^2/d^3*ln(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^2-1/2*b*n*e^2/d^3
*ln(x)^2+b*n*e^2/d^3*dilog(-e*x/d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d
/x^2-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^3*e/
d^2/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3*ln(x)-1/2*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/x-1/4*b*n/d/x^2+b*e*n/x/d^2
```

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

$$-\frac{1}{2}\,a\left(\frac{2\,e^{2}\log\left(ex+d\right)}{d^{3}}-\frac{2\,e^{2}\log\left(x\right)}{d^{3}}-\frac{2\,ex-d}{d^{2}x^{2}}\right)+b\int\frac{\log\left(c\right)+\log\left(x^{n}\right)}{ex^{4}+dx^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\mathrm{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{ex^{4}+dx^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 123.158, size = 246, normalized size = 2.24

$$-\frac{a}{2dx^{2}}+\frac{ae}{d^{2}x}-\frac{ae^{3}\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^{3}}+\frac{ae^{2}\log(x)}{d^{3}}-\frac{bn}{4dx^{2}}-\frac{b\log(cx^{n})}{2dx^{2}}+\frac{ben}{d^{2}x}+\frac{be\log(cx^{n})}{d^{2}x}+\frac{be^{3}n\left(\left(\begin{cases}\frac{x}{d}\\ \begin{cases}\log(d) \ldots\\ -\log(\ldots\\ -G_{2,2}^{2,0} \ldots\end{cases}\end{cases}\right)\right)}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a/(2*d*x**2) + a*e/(d**2*x) - a*e**3*Piecewise((x/d, Eq(e, 0)), (log(d + e
*x)/e, True))/d**3 + a*e**2*log(x)/d**3 - b*n/(4*d*x**2) - b*log(c*x**n)/(2
*d*x**2) + b*e*n/(d**2*x) + b*e*log(c*x**n)/(d**2*x) + b*e**3*n*Piecewise((
x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/
d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/A
bs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1,
1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True)
)/e, True))/d**3 - b*e**3*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True)
```

```
)*log(c*x**n)/d**3 - b*e**2*n*log(x)**2/(2*d**3) + b*e**2*log(x)*log(c*x**n
)/d**3
```

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

$$\int \frac{b \log(cx^n) + a}{(ex + d)x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.38 $\int \frac{a+b\log(cx^n)}{x^4(d+ex)}\,dx$

Optimal. Leaf size=150

$$-\frac{be^3n\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^4}+\frac{e^3\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^4}-\frac{e^2(a+b\log(cx^n))}{d^3x}+\frac{e(a+b\log(cx^n))}{2d^2x^2}-\frac{a+b\log(cx^n)}{3dx^3}-$$

```
[Out] -(b*n)/(9*d*x^3) + (b*e*n)/(4*d^2*x^2) - (b*e^2*n)/(d^3*x) - (a + b*Log[c*x
^n])/(3*d*x^3) + (e*(a + b*Log[c*x^n]))/(2*d^2*x^2) - (e^2*(a + b*Log[c*x^n
]))/(d^3*x) + (e^3*Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/d^4 - (b*e^3*n*Poly
Log[2, -(d/(e*x))])/d^4
```

Rubi [A] time = 0.212092, antiderivative size = 173, normalized size of antiderivative = 1.15, number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {44, 2351, 2304, 2301, 2317, 2391}

$$\frac{be^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{e^3(a+b\log(cx^n))^2}{2bd^4n}+\frac{e^3\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^4}-\frac{e^2(a+b\log(cx^n))}{d^3x}+\frac{e(a+b\log(cx^n))}{2d^2x^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(9*d*x^3) + (b*e*n)/(4*d^2*x^2) - (b*e^2*n)/(d^3*x) - (a + b*Log[c*x
^n])/(3*d*x^3) + (e*(a + b*Log[c*x^n]))/(2*d^2*x^2) - (e^2*(a + b*Log[c*x^n
]))/(d^3*x) - (e^3*(a + b*Log[c*x^n])^2)/(2*b*d^4*n) + (e^3*(a + b*Log[c*x^
n])*Log[1 + (e*x)/d])/d^4 + (b*e^3*n*PolyLog[2, -((e*x)/d)])/d^4
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4(d+ex)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^4} - \frac{e\,(a+b\log(cx^n))}{d^2x^3} + \frac{e^2\,(a+b\log(cx^n))}{d^3x^2} - \frac{e^3\,(a+b\log(cx^n))}{d^4x} + \frac{e^4\,(a+b\log(cx^n))}{d^4(d+ex)}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^4}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^3} - \frac{e^3\int \frac{a+b\log(cx^n)}{x}\,dx}{d^4} + \frac{e^4\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^4}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{4d^2x^2} - \frac{be^2n}{d^3x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\,(a+b\log(cx^n))}{2d^2x^2} - \frac{e^2\,(a+b\log(cx^n))}{d^3x} - \frac{e^3\,(a+b\log(cx^n))^2}{2bd^4n} \ldots$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{4d^2x^2} - \frac{be^2n}{d^3x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e\,(a+b\log(cx^n))}{2d^2x^2} - \frac{e^2\,(a+b\log(cx^n))}{d^3x} - \frac{e^3\,(a+b\log(cx^n))^2}{2bd^4n} \ldots$$

Mathematica [A] time = 0.17413, size = 159, normalized size = 1.06

$$\frac{36be^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{18d^2e(a+b\log(cx^n))}{x^2} - \frac{12d^3(a+b\log(cx^n))}{x^3} - \frac{36de^2(a+b\log(cx^n))}{x} + 36e^3\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) - \ldots}{36d^4}$$

Antiderivative was successfully verified.

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

```
[Out] ((-4*b*d^3*n)/x^3 + (9*b*d^2*e*n)/x^2 - (36*b*d*e^2*n)/x - (12*d^3*(a + b*L
og[c*x^n]))/x^3 + (18*d^2*e*(a + b*Log[c*x^n]))/x^2 - (36*d*e^2*(a + b*Log[
c*x^n]))/x - (18*e^3*(a + b*Log[c*x^n])^2)/(b*n) + 36*e^3*(a + b*Log[c*x^n]
)*Log[1 + (e*x)/d] + 36*b*e^3*n*PolyLog[2, -((e*x)/d)])/(36*d^4)
```

Maple [C] time = 0.163, size = 868, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^3/d^4*ln(e*x+d)+1/6*I*b*Pi*csgn(I*c*
x^n)^3/d/x^3-b*n*e^3/d^4*ln(e*x+d)*ln(-e*x/d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*e^2/d^3/x-b*ln(c)*e^2/d^3/x+1/2*b*ln(c)*e/d^2/x^2+b*ln(c)
*e^3/d^4*ln(e*x+d)-b*ln(c)*e^3/d^4*ln(x)+1/2*a*e/d^2/x^2-1/3*b*ln(c)/d/x^3-
1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^3-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(
I*c)*e^3/d^4*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/x+1/4*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/x^2+a*e^3/d^4*ln(e*x+d)-a*e^3/d^4*ln(x)
-a*e^2/d^3/x+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/x^2+1/2*b*n*e^3/d^4
*ln(x)^2-b*n*e^3/d^4*dilog(-e*x/d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*e/d^2/x^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^3/d^4*ln(
e*x+d)-1/3*a/d/x^3-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/x^3-1/2*I*b*Pi*
csgn(I*c*x^n)^3*e^3/d^4*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/x-1/4*
I*b*Pi*csgn(I*c*x^n)^3*e/d^2/x^2+1/2*I*b*Pi*csgn(I*c*x^n)^3*e^3/d^4*ln(x)+1
/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^3/d^4*ln(x)+1/6*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x^3-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^
2*e^3/d^4*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/x+1/2*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)^2*e^3/d^4*ln(e*x+d)-1/3*b*ln(x^n)/d/x^3+b*ln(x^n
)*e^3/d^4*ln(e*x+d)+1/2*b*ln(x^n)*e/d^2/x^2-b*ln(x^n)*e^3/d^4*ln(x)-b*ln(x^
n)*e^2/d^3/x-1/9*b*n/d/x^3+1/4*b*e*n/d^2/x^2-b*e^2*n/d^3/x
```

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

$$\frac{1}{6}a\left(\frac{6e^3\log(ex+d)}{d^4}-\frac{6e^3\log(x)}{d^4}-\frac{6e^2x^2-3dex+2d^2}{d^3x^3}\right)+b\int\frac{\log(c)+\log(x^n)}{ex^5+dx^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^5+dx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e*x^5 + d*x^4), x)
```

Sympy [A] time = 150.42, size = 296, normalized size = 1.97

$$-\frac{a}{3dx^3}+\frac{ae}{2d^2x^2}-\frac{ae^2}{d^3x}+\frac{ae^4\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^4}-\frac{ae^3\log(x)}{d^4}-\frac{bn}{9dx^3}-\frac{b\log(cx^n)}{3dx^3}+\frac{ben}{4d^2x^2}+\frac{be\log(cx^n)}{2d^2x^2}-\frac{be^2}{d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x+d),x)
```

```
[Out] -a/(3*d*x**3) + a*e/(2*d**2*x**2) - a*e**2/(d**3*x) + a*e**4*Piecewise((x/d
, Eq(e, 0)), (log(d + e*x)/e, True))/d**4 - a*e**3*log(x)/d**4 - b*n/(9*d*x
**3) - b*log(c*x**n)/(3*d*x**3) + b*e*n/(4*d**2*x**2) + b*e*log(c*x**n)/(2*
d**2*x**2) - b*e**2*n/(d**3*x) - b*e**2*log(c*x**n)/(d**3*x) - b*e**4*n*Pie
cewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_pola
r(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)
/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meije
rg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d
), True))/e, True))/d**4 + b*e**4*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/
e, True))*log(c*x**n)/d**4 + b*e**3*n*log(x)**2/(2*d**4) - b*e**3*log(x)*lo
g(c*x**n)/d**4
```

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

$$\int \frac{b\log(cx^n) + a}{(ex+d)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.39 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^2}\,dx$

Optimal. Leaf size=152

$$\frac{3bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{d^2\log\left(\frac{ex}{d}+1\right)(3a+3b\log(cx^n)+bn)}{e^4}-\frac{x^3(a+b\log(cx^n))}{e(d+ex)}+\frac{x^2(3a+3b\log(cx^n)+bn)}{2e^2}$$

```
[Out] (3*b*d*n*x)/e^3 - (d*(3*a + b*n)*x)/e^3 - (3*b*n*x^2)/(4*e^2) - (3*b*d*x*Lo
g[c*x^n])/e^3 - (x^3*(a + b*Log[c*x^n]))/(e*(d + e*x)) + (x^2*(3*a + b*n +
3*b*Log[c*x^n]))/(2*e^2) + (d^2*(3*a + b*n + 3*b*Log[c*x^n])*Log[1 + (e*x)/
d])/e^4 + (3*b*d^2*n*PolyLog[2, -((e*x)/d)])/e^4
```

Rubi [A] time = 0.180966, antiderivative size = 151, normalized size of antiderivative = 0.99, number of steps used = 9, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2295, 2304, 2314, 31, 2317, 2391}

$$\frac{3bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{d^2x(a+b\log(cx^n))}{e^3(d+ex)}+\frac{3d^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^4}+\frac{x^2(a+b\log(cx^n))}{2e^2}-\frac{2adx}{e^3}-\frac{2bd}{}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*a*d*x)/e^3 + (2*b*d*n*x)/e^3 - (b*n*x^2)/(4*e^2) - (2*b*d*x*Log[c*x^n])
/e^3 + (x^2*(a + b*Log[c*x^n]))/(2*e^2) - (d^2*x*(a + b*Log[c*x^n]))/(e^3*(
d + e*x)) + (b*d^2*n*Log[d + e*x])/e^4 + (3*d^2*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/e^4 + (3*b*d^2*n*PolyLog[2, -((e*x)/d)])/e^4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3 (a + b \log (cx^n))}{(d + ex)^2} dx = \int \left(-\frac{2d (a + b \log (cx^n))}{e^3} + \frac{x (a + b \log (cx^n))}{e^2} - \frac{d^3 (a + b \log (cx^n))}{e^3(d + ex)^2} + \frac{3d^2 (a + b \log (cx^n))}{e^3(d + ex)}\right.$$

$$= -\frac{(2d) \int (a + b \log (cx^n))\, dx}{e^3} + \frac{(3d^2) \int \frac{a+b \log(cx^n)}{d+ex} dx}{e^3} - \frac{d^3 \int \frac{a+b \log(cx^n)}{(d+ex)^2} dx}{e^3} + \frac{\int x (a + b \log (}{e^2}$$

$$= -\frac{2adx}{e^3} - \frac{bnx^2}{4e^2} + \frac{x^2 (a + b \log (cx^n))}{2e^2} - \frac{d^2 x (a + b \log (cx^n))}{e^3(d + ex)} + \frac{3d^2 (a + b \log (cx^n)) \log \left(1 + \right.}{e^4}$$

$$= -\frac{2adx}{e^3} + \frac{2bdnx}{e^3} - \frac{bnx^2}{4e^2} - \frac{2bdx \log (cx^n)}{e^3} + \frac{x^2 (a + b \log (cx^n))}{2e^2} - \frac{d^2 x (a + b \log (cx^n))}{e^3(d + ex)} + \frac{b}{}$$

Mathematica [A] time = 0.116074, size = 141, normalized size = 0.93

$$\frac{12bd^2 n \text{PolyLog}\left(2, -\frac{ex}{d}\right) + \frac{4d^3(a+b \log(cx^n))}{d+ex} + 12d^2 \log \left(\frac{ex}{d} + 1\right) (a + b \log (cx^n)) + 2e^2 x^2 (a + b \log (cx^n)) - 8adex - 8bdex}{4e^4}$$

Antiderivative was successfully verified.

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

```
[Out] (-8*a*d*e*x + 8*b*d*e*n*x - b*e^2*n*x^2 - 8*b*d*e*x*Log[c*x^n] + 2*e^2*x^2*
(a + b*Log[c*x^n]) + (4*d^3*(a + b*Log[c*x^n]))/(d + e*x) - 4*b*d^2*n*(Log[
x] - Log[d + e*x]) + 12*d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] + 12*b*d^2*
n*PolyLog[2, -((e*x)/d)])/(4*e^4)
```

Maple [C] time = 0.205, size = 739, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^4*d^2*ln(e*x+d)-1/4*I*b*Pi*csgn(I*c*
x^n)^3/e^2*x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x^2-3*b*n
/e^4*d^2*ln(e*x+d)*ln(-e*x/d)+b*ln(x^n)*d^3/e^4/(e*x+d)-2*b*ln(x^n)/e^3*d*x
+1/2*b*ln(x^n)/e^2*x^2+9/4*b*n/e^4*d^2-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)/e^4*d^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
```

```
*d^3/e^4/(e*x+d)+a*d^3/e^4/(e*x+d)-2*a/e^3*d*x+1/2*b*ln(c)/e^2*x^2-3/2*I*b*
Pi*csgn(I*c*x^n)^3/e^4*d^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3*d^3/e^4/(e*
x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x^2-I*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)/e^3*d*x+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*d^2*ln(e*x+d)+
I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^3*d*x+3*a/e^4*d^2*ln(e*x+d)-2*
b*ln(c)/e^3*d*x+3*b*ln(x^n)/e^4*d^2*ln(e*x+d)+I*b*Pi*csgn(I*c*x^n)^3/e^3*d*
x+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x^2-3*b*n/e^4*d^2*dilog(-e*x/d)-
b*n/e^4*d^2*ln(e*x)+b*n/e^4*d^2*ln(e*x+d)+3*b*ln(c)/e^4*d^2*ln(e*x+d)+b*ln(
c)*d^3/e^4/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^4/(e*x+d)+1/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^3/e^4/(e*x+d)-I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)^2/e^3*d*x+1/2*a/e^2*x^2-1/4*b*n*x^2/e^2+2*b*d*n*x/e^3
```

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

$$\frac{1}{2}\left(\frac{2\,d^3}{e^5x+de^4}+\frac{6\,d^2\log\left(ex+d\right)}{e^4}+\frac{ex^2-4\,dx}{e^3}\right)a+b\int\frac{x^3\log\left(c\right)+x^3\log\left(x^n\right)}{e^2x^2+2\,dex+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 131.855, size = 304, normalized size = 2.

$$-\frac{ad^3\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{3ad^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^3}-\frac{2adx}{e^3}+\frac{ax^2}{2e^2}+\frac{bd^3n\left(\begin{cases}\frac{x}{d^2} & \text{for } e=\\ -\frac{\log(x)}{de}+\frac{\log\left(\frac{d}{e}+x\right)}{de} & \text{otherw}\end{cases}\right.}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**2,x)
```

```
[Out] -a*d**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**3 + 3*a
*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 - 2*a*d*x/e**
3 + a*x**2/(2*e**2) + b*d**3*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e)
 + log(d/e + x)/(d*e), True))/e**3 - b*d**3*Piecewise((x/d**2, Eq(e, 0)), (
-1/(d*e + e**2*x), True))*log(c*x**n)/e**3 - 3*b*d**2*n*Piecewise((x/d, Eq(
e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(
x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) <
1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()),
 ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/e, Tru
e))/e**3 + 3*b*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(
c*x**n)/e**3 + 2*b*d*n*x/e**3 - 2*b*d*x*log(c*x**n)/e**3 - b*n*x**2/(4*e**2
) + b*x**2*log(c*x**n)/(2*e**2)
```

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

$$\int \frac{(b\log(cx^n)+a)x^3}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.40 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^2}\,dx$

Optimal. Leaf size=98

$$-\frac{2bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}-\frac{d\log\left(\frac{ex}{d}+1\right)(2a+2b\log(cx^n)+bn)}{e^3}-\frac{x^2(a+b\log(cx^n))}{e(d+ex)}+\frac{2x(a+b\log(cx^n))}{e^2}-\frac{bnx}{e^2}$$

```
[Out] -((b*n*x)/e^2) + (2*x*(a + b*Log[c*x^n]))/e^2 - (x^2*(a + b*Log[c*x^n]))/(e
*(d + e*x)) - (d*(2*a + b*n + 2*b*Log[c*x^n])*Log[1 + (e*x)/d])/e^3 - (2*b*
d*n*PolyLog[2, -((e*x)/d)])/e^3
```

Rubi [A] time = 0.143122, antiderivative size = 106, normalized size of antiderivative = 1.08, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2351, 2295, 2314, 31, 2317, 2391}

$$-\frac{2bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{dx(a+b\log(cx^n))}{e^2(d+ex)}-\frac{2d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^3}+\frac{ax}{e^2}+\frac{bx\log(cx^n)}{e^2}-\frac{bdn\log(d+ex)}{e^3}$$

Antiderivative was successfully verified.

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

```
[Out] (a*x)/e^2 - (b*n*x)/e^2 + (b*x*Log[c*x^n])/e^2 + (d*x*(a + b*Log[c*x^n]))/(
e^2*(d + e*x)) - (b*d*n*Log[d + e*x])/e^3 - (2*d*(a + b*Log[c*x^n])*Log[1 +
 (e*x)/d])/e^3 - (2*b*d*n*PolyLog[2, -((e*x)/d)])/e^3
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))}{(d+ex)^2}\,dx = \int \left(\frac{a+b\log(cx^n)}{e^2}+\frac{d^2(a+b\log(cx^n))}{e^2(d+ex)^2}-\frac{2d(a+b\log(cx^n))}{e^2(d+ex)}\right)dx$$

$$= \frac{\int (a+b\log(cx^n))\,dx}{e^2}-\frac{(2d)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^2}+\frac{d^2\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^2}$$

$$= \frac{ax}{e^2}+\frac{dx(a+b\log(cx^n))}{e^2(d+ex)}-\frac{2d(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^3}+\frac{b\int \log(cx^n)\,dx}{e^2}+\frac{(2bdn)\int$$

$$= \frac{ax}{e^2}-\frac{bnx}{e^2}+\frac{bx\log(cx^n)}{e^2}+\frac{dx(a+b\log(cx^n))}{e^2(d+ex)}-\frac{bdn\log(d+ex)}{e^3}-\frac{2d(a+b\log(cx^n))\log$$

Mathematica [A] time = 0.0891053, size = 98, normalized size = 1.

$$\frac{-2bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)-\frac{d^2(a+b\log(cx^n))}{d+ex}-2d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))+aex+bex\log(cx^n)+bdn(\log(x)-\log(d+e}{e^3}$$

Antiderivative was successfully verified.

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

```
[Out] (a*e*x - b*e*n*x + b*e*x*Log[c*x^n] - (d^2*(a + b*Log[c*x^n]))/(d + e*x) +
b*d*n*(Log[x] - Log[d + e*x]) - 2*d*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 2
*b*d*n*PolyLog[2, -((e*x)/d)])/e^3
```

Maple [C] time = 0.193, size = 558, normalized size = 5.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3/(e*x+d)-I*b*Pi*csgn(I*c*x^n
)^2*csgn(I*c)*d/e^3*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*x+2*b*n*d/e^3*
ln(e*x+d)*ln(-e*x/d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x+I*b*Pi*csgn
(I*c*x^n)^3*d/e^3*ln(e*x+d)-2*b*ln(x^n)*d/e^3*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2/e^2*x+1/2*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3/(e*x+d)+1/2*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3/(e*x+d)-1/2*I*b*Pi*csgn(I*
c*x^n)^2*csgn(I*c)*d^2/e^3/(e*x+d)+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*d/e^3*ln(e*x+d)-b*ln(x^n)*d^2/e^3/(e*x+d)+b*ln(x^n)/e^2*x-b*ln(c)*d^2/e^
3/(e*x+d)-2*b*ln(c)*d/e^3*ln(e*x+d)-b*n*d/e^3*ln(e*x+d)+b*n/e^3*d*ln(e*x)+2
*b*n*d/e^3*dilog(-e*x/d)-2*a*d/e^3*ln(e*x+d)-a*d^2/e^3/(e*x+d)+b*ln(c)/e^2*
x-b*n*d/e^3-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^3*ln(e*x+d)-1/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x+a*x/e^2-b*n*x/e^2
```

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

$$-a\left(\frac{d^2}{e^4x+de^3}-\frac{x}{e^2}+\frac{2\,d\log(ex+d)}{e^3}\right)+b\int\frac{x^2\log(c)+x^2\log(x^n)}{e^2x^2+2\,dex+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx^2 \log(cx^n) + ax^2}{e^2x^2 + 2\,dex + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 106.449, size = 250, normalized size = 2.55

$$\frac{ad^2\left(\begin{cases}\frac{x}{d^2} & \text{for } e = 0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{e^2} - \frac{2ad\left(\begin{cases}\frac{x}{d} & \text{for } e = 0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{e^2} + \frac{ax}{e^2} - \frac{bd^2n\left(\begin{cases}\frac{x}{d^2} & \text{for } e = 0\\ -\frac{\log(x)}{de} + \frac{\log\left(\frac{d}{e}+x\right)}{de} & \text{otherwise}\end{cases}\right)}{e^2} + \frac{bd^2}{\ }$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**2 - 2*a*
d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**2 + a*x/e**2 - b*d*
*2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), Tru
e))/e**2 + b*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*
log(c*x**n)/e**2 + 2*b*d*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*lo
g(x) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) -
polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), (
(0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - po
```

```
lylog(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**2 - 2*b*d*Piecewise((x
/d, Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**2 - b*n*x/e**2 + b*x*
log(c*x**n)/e**2
```

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

$$\int \frac{(b\log(cx^n) + a)x^2}{(ex + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.41 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^2} dx$

Optimal. Leaf size=65

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}+\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)+bn)}{e^2}-\frac{x(a+b\log(cx^n))}{e(d+ex)}$$

```
[Out] -((x*(a + b*Log[c*x^n]))/(e*(d + e*x))) + ((a + b*n + b*Log[c*x^n])*Log[1 +
 (e*x)/d])/e^2 + (b*n*PolyLog[2, -((e*x)/d)])/e^2
```

Rubi [A] time = 0.107657, antiderivative size = 74, normalized size of antiderivative = 1.14, number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {43, 2351, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}+\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{e^2}-\frac{x(a+b\log(cx^n))}{e(d+ex)}+\frac{bn\log(d+ex)}{e^2}$$

Antiderivative was successfully verified.

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

```
[Out] -((x*(a + b*Log[c*x^n]))/(e*(d + e*x))) + (b*n*Log[d + e*x])/e^2 + ((a + b*
Log[c*x^n])*Log[1 + (e*x)/d])/e^2 + (b*n*PolyLog[2, -((e*x)/d)])/e^2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^2}\,dx &= \int \left(-\frac{d\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)^2}+\frac{a+b\log\left(cx^n\right)}{e(d+ex)}\right)dx\\
&= \frac{\int \frac{a+b\log\left(cx^n\right)}{d+ex}\,dx}{e}-\frac{d\int \frac{a+b\log\left(cx^n\right)}{(d+ex)^2}\,dx}{e}\\
&= -\frac{x\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^2}-\frac{(bn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e^2}+\frac{(bn)\int \frac{1}{d+ex}\,dx}{e}\\
&= -\frac{x\left(a+b\log\left(cx^n\right)\right)}{e(d+ex)}+\frac{bn\log(d+ex)}{e^2}+\frac{\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{e^2}+\frac{bn\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{e^2}
\end{aligned}$$

Mathematica [A] time = 0.0620718, size = 71, normalized size = 1.09

$$\frac{bn\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)+\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+\frac{d\left(a+b\log\left(cx^n\right)\right)}{d+ex}-bn(\log(x)-\log(d+ex))}{e^2}$$

Antiderivative was successfully verified.

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

```
[Out] ((d*(a + b*Log[c*x^n]))/(d + e*x) - b*n*(Log[x] - Log[d + e*x]) + (a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d] + b*n*PolyLog[2, -((e*x)/d)])/e^2
```

Maple [C] time = 0.146, size = 389, normalized size = 6.

$$\frac{b\ln(x^n)\ln(ex+d)}{e^2}+\frac{b\ln(x^n)d}{e^2(ex+d)}-\frac{bn\ln(ex+d)}{e^2}\ln\left(-\frac{ex}{d}\right)-\frac{bn}{e^2}\mathrm{dilog}\left(-\frac{ex}{d}\right)-\frac{bn\ln(ex)}{e^2}+\frac{bn\ln(ex+d)}{e^2}-\frac{\frac{i}{2}b\pi\,\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b*ln(x^n)/e^2*ln(e*x+d)+b*ln(x^n)*d/e^2/(e*x+d)-b*n/e^2*ln(e*x+d)*ln(-e*x/d
)-b*n/e^2*dilog(-e*x/d)-b*n/e^2*ln(e*x)+b*n/e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)*d/e^2/(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*ln(e*x+d)-1/
2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(
I*c*x^n)^3*d/e^2/(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2/(e*x+
d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)/e^2*ln(e*x+d)+b*ln(c)/e^2*ln(e*x+d)+b*ln(c)*d/e^2/(e*x+d)+a/e^2*ln(e*
x+d)+a*d/e^2/(e*x+d)
```

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

$$a\left(\frac{d}{e^3x+de^2}+\frac{\log(ex+d)}{e^2}\right)+b\int\frac{x\log(c)+x\log(x^n)}{e^2x^2+2\,dex+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx\log\left(cx^{n}\right)+ax}{e^{2}x^{2}+2\,dex+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{x\left(a+b\log\left(cx^{n}\right)\right)}{\left(d+ex\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral(x*(a + b*log(c*x**n))/(d + e*x)**2, x)
```

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

$$\int\frac{\left(b\log\left(cx^{n}\right)+a\right)x}{\left(ex+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.42 $\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx$

Optimal. Leaf size=39

$$\frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{bn\log(d+ex)}{de}$$

```
[Out] (x*(a + b*Log[c*x^n]))/(d*(d + e*x)) - (b*n*Log[d + e*x])/(d*e)
```

Rubi [A] time = 0.0187661, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2314, 31}

$$\frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{bn\log(d+ex)}{de}$$

Antiderivative was successfully verified.

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

```
[Out] (x*(a + b*Log[c*x^n]))/(d*(d + e*x)) - (b*n*Log[d + e*x])/(d*e)
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{(d+ex)^2}\,dx &= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{(bn)\int \frac{1}{d+ex}\,dx}{d}\\ &= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d(d+ex)}-\frac{bn\log(d+ex)}{de}\end{aligned}$$

Mathematica [A] time = 0.0287581, size = 41, normalized size = 1.05

$$\frac{\frac{bn(\log(x)-\log(d+ex))}{d}-\frac{a+b\log(cx^n)}{d+ex}}{e}$$

Antiderivative was successfully verified.

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

```
[Out] (-((a + b*Log[c*x^n])/(d + e*x)) + (b*n*(Log[x] - Log[d + e*x]))/d)/e
```

Maple [C] time = 0.1, size = 173, normalized size = 4.4

$$-\frac{b\ln(x^n)}{(ex+d)e}-\frac{i\pi bd\operatorname{csgn}(ix^n)(\operatorname{csgn}(icx^n))^2-i\pi bd\operatorname{csgn}(ix^n)\operatorname{csgn}(icx^n)\operatorname{csgn}(ic)-i\pi bd(\operatorname{csgn}(icx^n))^3+i\pi bd(\operatorname{csgn}(ic}{(2ex+}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b/e/(e*x+d)*ln(x^n)-1/2*(I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c
*x^n)^2*csgn(I*c)-2*ln(-x)*b*e*n*x+2*ln(e*x+d)*b*e*n*x-2*ln(-x)*b*d*n+2*ln(
e*x+d)*b*d*n+2*ln(c)*b*d+2*a*d)/(e*x+d)/e/d
```

Maxima [A] time = 1.14125, size = 85, normalized size = 2.18

$$-bn\left(\frac{\log(ex+d)}{de}-\frac{\log(x)}{de}\right)-\frac{b\log(cx^n)}{e^2x+de}-\frac{a}{e^2x+de}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b*n*(log(e*x + d)/(d*e) - log(x)/(d*e)) - b*log(c*x^n)/(e^2*x + d*e) - a/(
e^2*x + d*e)
```

Fricas [A] time = 1.04868, size = 119, normalized size = 3.05

$$\frac{benx\log(x) - bd\log(c) - ad - (benx + bdn)\log(ex + d)}{de^2x + d^2e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (b*e*n*x*log(x) - b*d*log(c) - a*d - (b*e*n*x + b*d*n)*log(e*x + d))/(d*e^2
*x + d^2*e)
```

Sympy [A] time = 4.00992, size = 189, normalized size = 4.85

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{x} - \frac{bn\log(x)}{x} - \frac{bn}{x} - \frac{b\log(c)}{x}\right) & \text{for } d = 0 \wedge e = 0 \\ \frac{-\frac{a}{x} - \frac{bn\log(x)}{x} - \frac{bn}{x} - \frac{b\log(c)}{x}}{e^2} & \text{for } d = 0 \\ \frac{ax + bnx\log(x) - bnx + bx\log(c)}{d^2} & \text{for } e = 0 \\ \frac{aex}{d^2e + de^2x} - \frac{bdn\log\left(\frac{d}{e} + x\right)}{d^2e + de^2x} + \frac{benx\log(x)}{d^2e + de^2x} - \frac{benx\log\left(\frac{d}{e} + x\right)}{d^2e + de^2x} + \frac{bex\log(c)}{d^2e + de^2x} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((zoo*(-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x), Eq(d, 0) & Eq(e,
 0)), ((-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x)/e**2, Eq(d, 0)), ((a*x +
b*n*x*log(x) - b*n*x + b*x*log(c))/d**2, Eq(e, 0)), (a*e*x/(d**2*e + d*e**2
*x) - b*d*n*log(d/e + x)/(d**2*e + d*e**2*x) + b*e*n*x*log(x)/(d**2*e + d*e
**2*x) - b*e*n*x*log(d/e + x)/(d**2*e + d*e**2*x) + b*e*x*log(c)/(d**2*e +
d*e**2*x), True))
```

Giac [A] time = 1.29645, size = 78, normalized size = 2.

$$-\frac{bnxe\log(xe + d) - bnxe\log(x) + bdn\log(xe + d) + bd\log(c) + ad}{dxe^2 + d^2e}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(b*n*x*e*log(x*e + d) - b*n*x*e*log(x) + b*d*n*log(x*e + d) + b*d*log(c) +
 a*d)/(d*x*e^2 + d^2*e)
```

3.43 $\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx$

Optimal. Leaf size=80

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^2}-\frac{\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^2}-\frac{ex(a+b\log(cx^n))}{d^2(d+ex)}+\frac{bn\log(d+ex)}{d^2}$$

```
[Out] -((e*x*(a + b*Log[c*x^n]))/(d^2*(d + e*x))) - (Log[1 + d/(e*x)]*(a + b*Log[
c*x^n]))/d^2 + (b*n*Log[d + e*x])/d^2 + (b*n*PolyLog[2, -(d/(e*x))])/d^2
```

Rubi [A] time = 0.159738, antiderivative size = 102, normalized size of antiderivative = 1.27, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^2}-\frac{ex(a+b\log(cx^n))}{d^2(d+ex)}+\frac{(a+b\log(cx^n))^2}{2bd^2n}+\frac{bn\log(d+ex)}{d^2}$$

Antiderivative was successfully verified.

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

```
[Out] -((e*x*(a + b*Log[c*x^n]))/(d^2*(d + e*x))) + (a + b*Log[c*x^n])^2/(2*b*d^2
*n) + (b*n*Log[d + e*x])/d^2 - ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^2 -
(b*n*PolyLog[2, -((e*x)/d)])/d^2
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx &= \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d} \\
&= -\frac{ex\,(a+b\log(cx^n))}{d^2(d+ex)} + \frac{\int \frac{a+b\log(cx^n)}{x}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^2} + \frac{(ben)\int \frac{1}{d+ex}\,dx}{d^2} \\
&= -\frac{ex\,(a+b\log(cx^n))}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^2}{2bd^2n} + \frac{bn\log(d+ex)}{d^2} - \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d^2} + \frac{(bn)
\end{aligned}$$

$$= -\frac{ex\,(a+b\log(cx^n))}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^2}{2bd^2n} + \frac{bn\log(d+ex)}{d^2} - \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{bn\mathrm{L}$$

Mathematica [A] time = 0.0783692, size = 96, normalized size = 1.2

$$\frac{-2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)-2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{d+ex}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{bn}-2bn(\log(x)-\log(d+ex))}{2d^2}$$

Antiderivative was successfully verified.

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

```
[Out] ((2*d*(a + b*Log[c*x^n]))/(d + e*x) + (a + b*Log[c*x^n])^2/(b*n) - 2*b*n*(L
og[x] - Log[d + e*x]) - 2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 2*b*n*PolyL
og[2, -((e*x)/d)])/(2*d^2)
```

Maple [C] time = 0.157, size = 521, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(e*x+d)-1/2*I*b*Pi*csgn(I
*c*x^n)^3/d^2*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2*ln(e*x+d)+b*ln(x^n)/d/(e
*x+d)+b*ln(x^n)/d^2*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^
2*ln(x)+b*n/d^2*dilog(-e*x/d)-1/2*b*n/d^2*ln(x)^2-b*n/d^2*ln(x)-1/2*I*b*Pi*
csgn(I*c*x^n)^3/d/(e*x+d)+b*n/d^2*ln(e*x+d)*ln(-e*x/d)+1/2*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2/d/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x+d)
+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(e*x+d)-b*ln(x^n)/d^2
*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(e*x+d)-1/2*I*b*Pi*
csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(e*x+d)+b*ln(c)/d^2*ln(x)-b*ln(c)/d^2*ln(e*
x+d)+b*ln(c)/d/(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(x)+1/2
*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(x)+a/d^2*ln(x)-a/d^2*ln(e*x+d)+a/d
/(e*x+d)+b*n*ln(e*x+d)/d^2
```

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

$$a\left(\frac{1}{dex+d^2}-\frac{\log\left(ex+d\right)}{d^2}+\frac{\log\left(x\right)}{d^2}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^2x^3+2\,dex^2+d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^3+2\,dex^2+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{a+b\log\left(cx^n\right)}{x\left(d+ex\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((a + b*log(c*x**n))/(x*(d + e*x)**2), x)
```

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

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex+d\right)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.44 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^2}\,dx$

Optimal. Leaf size=114

$$-\frac{2ben\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^3}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)}+\frac{2e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{a+b\log\left(cx^n\right)}{d^2x}-\frac{ben\log(d+ex)}{d^3}-$$

```
[Out] -((b*n)/(d^2*x)) - (a + b*Log[c*x^n])/(d^2*x) + (e^2*x*(a + b*Log[c*x^n]))/
(d^3*(d + e*x)) + (2*e*Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/d^3 - (b*e*n*Lo
g[d + e*x])/d^3 - (2*b*e*n*PolyLog[2, -(d/(e*x))])/d^3
```

Rubi [A] time = 0.179155, antiderivative size = 134, normalized size of antiderivative = 1.18, number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {44, 2351, 2304, 2301, 2314, 31, 2317, 2391}

$$\frac{2ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}+\frac{e^2x\left(a+b\log\left(cx^n\right)\right)}{d^3(d+ex)}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{bd^3n}+\frac{2e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}-\frac{a+b\log\left(cx^n\right)}{d^2x}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*n)/(d^2*x)) - (a + b*Log[c*x^n])/(d^2*x) + (e^2*x*(a + b*Log[c*x^n]))/
(d^3*(d + e*x)) - (e*(a + b*Log[c*x^n])^2)/(b*d^3*n) - (b*e*n*Log[d + e*x])
/d^3 + (2*e*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^3 + (2*b*e*n*PolyLog[2,
-((e*x)/d)])/d^3
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^2}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^2x^2} - \frac{2e(a+b\log(cx^n))}{d^3x} + \frac{e^2(a+b\log(cx^n))}{d^2(d+ex)^2} + \frac{2e^2(a+b\log(cx^n))}{d^3(d+ex)}\right)dx$$
$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^2} - \frac{(2e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^3} + \frac{\left(2e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^3} + \frac{e^2\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^2}$$
$$= -\frac{bn}{d^2x} - \frac{a+b\log(cx^n)}{d^2x} + \frac{e^2x(a+b\log(cx^n))}{d^3(d+ex)} - \frac{e(a+b\log(cx^n))^2}{bd^3n} + \frac{2e(a+b\log(cx^n))\log\left(1\right.}{d^3}$$
$$= -\frac{bn}{d^2x} - \frac{a+b\log(cx^n)}{d^2x} + \frac{e^2x(a+b\log(cx^n))}{d^3(d+ex)} - \frac{e(a+b\log(cx^n))^2}{bd^3n} - \frac{ben\log(d+ex)}{d^3} + \frac{2e(a+}{}$$

Mathematica [A] time = 0.137759, size = 120, normalized size = 1.05

$$-\frac{-2ben\text{PolyLog}\left(2,-\frac{ex}{d}\right) - 2e\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) + \frac{de(a+b\log(cx^n))}{d+ex} + \frac{d(a+b\log(cx^n))}{x} + \frac{e(a+b\log(cx^n))^2}{bn} - ben(\log(x)}{d^3}$$

Antiderivative was successfully verified.

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

```
[Out] -(((b*d*n)/x + (d*(a + b*Log[c*x^n]))/x + (d*e*(a + b*Log[c*x^n]))/(d + e*x
) + (e*(a + b*Log[c*x^n])^2)/(b*n) - b*e*n*(Log[x] - Log[d + e*x]) - 2*e*(a
 + b*Log[c*x^n])*Log[1 + (e*x)/d] - 2*b*e*n*PolyLog[2, -((e*x)/d)])/d^3)
```

Maple [C] time = 0.169, size = 703, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*b*n/d^3*e*ln(e*x+d)*ln(-e*x/d)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2/x+2*b*ln(x
^n)/d^3*e*ln(e*x+d)-I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e*ln(x)-2*b*ln(c)/
d^3*e*ln(x)-b*ln(c)*e/d^2/(e*x+d)+2*b*ln(c)/d^3*e*ln(e*x+d)+b*n/d^3*e*ln(x)
^2-2*b*n/d^3*e*dilog(-e*x/d)+b*n/d^3*e*ln(x)-I*b*Pi*csgn(I*c*x^n)^3/d^3*e*l
n(e*x+d)+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e*ln(x)+1/2*I*b*Pi*
csgn(I*c*x^n)^3*e/d^2/(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/x-1/
```

```
2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/x+I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
/d^3*e*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(e*x+
d)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e*ln(e*x+d)-a/d^2/x+I*b*P
i*csgn(I*c*x^n)^3/d^3*e*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e
*x+d)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*e*ln(x)+1/2*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/d^2/x+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*e*ln(
e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e*x+d)-b*ln(x^n)*e/d^2
/(e*x+d)-2*b*ln(x^n)/d^3*e*ln(x)-a*e/d^2/(e*x+d)+2*a/d^3*e*ln(e*x+d)-2*a/d^
3*e*ln(x)-b*ln(c)/d^2/x-b*e*n*ln(e*x+d)/d^3-b*ln(x^n)/d^2/x-b*n/x/d^2
```

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

$$-a\left(\frac{2\,ex+d}{d^2ex^2+d^3x}-\frac{2\,e\log\left(ex+d\right)}{d^3}+\frac{2\,e\log\left(x\right)}{d^3}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^2x^4+2\,dex^3+d^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\mathrm{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^4+2\,dex^3+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 71.7971, size = 299, normalized size = 2.62

$$\frac{ae^2\left(\begin{cases}\frac{x}{d^2} & \text{for } e=0\\ -\frac{1}{de+e^2x} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{a}{d^2x}+\frac{2ae^2\left(\begin{cases}\frac{x}{d} & \text{for } e=0\\ \frac{\log(d+ex)}{e} & \text{otherwise}\end{cases}\right)}{d^3}-\frac{2ae\log(x)}{d^3}-\frac{be^2n\left(\begin{cases}\frac{x}{d^2} & \text{for } e\\ -\frac{\log(x)}{de}+\frac{\log\left(\frac{d}{e}+x\right)}{de} & \text{othe}\end{cases}\right.}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**2 - a/(d
**2*x) + 2*a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**3 -
 2*a*e*log(x)/d**3 - b*e**2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e)
+ log(d/e + x)/(d*e), True))/d**2 + b*e**2*Piecewise((x/d**2, Eq(e, 0)), (-
1/(d*e + e**2*x), True))*log(c*x**n)/d**2 - b*n/(d**2*x) - b*log(c*x**n)/(d
**2*x) - 2*b*e**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) -
polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog
(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0),
 ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2
, e*x*exp_polar(I*pi)/d), True))/e, True))/d**3 + 2*b*e**2*Piecewise((x/d,
Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**3 + b*e*n*log(x)**2/d**3
- 2*b*e*log(x)*log(c*x**n)/d**3
```

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

$$\int \frac{b\log(cx^n)+a}{(ex+d)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.45 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^2}\,dx$

Optimal. Leaf size=154

$$\frac{3be^2n\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^4}-\frac{e^3x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}-\frac{3e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{d^3x}-\frac{a+b\log\left(cx^n\right)}{2d^2x^2}$$

```
[Out] -(b*n)/(4*d^2*x^2) + (2*b*e*n)/(d^3*x) - (a + b*Log[c*x^n])/(2*d^2*x^2) + (
2*e*(a + b*Log[c*x^n]))/(d^3*x) - (e^3*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)
) - (3*e^2*Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/d^4 + (b*e^2*n*Log[d + e*x]
)/d^4 + (3*b*e^2*n*PolyLog[2, -(d/(e*x))])/d^4
```

Rubi [A] time = 0.213345, antiderivative size = 178, normalized size of antiderivative = 1.16, number of steps used = 9, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {44, 2351, 2304, 2301, 2314, 31, 2317, 2391}

$$-\frac{3be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{e^3x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)^2}{2bd^4n}-\frac{3e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}+\frac{2e\left(a+b\log\right.}{d^3x}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(4*d^2*x^2) + (2*b*e*n)/(d^3*x) - (a + b*Log[c*x^n])/(2*d^2*x^2) + (
2*e*(a + b*Log[c*x^n]))/(d^3*x) - (e^3*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)
) + (3*e^2*(a + b*Log[c*x^n])^2)/(2*b*d^4*n) + (b*e^2*n*Log[d + e*x])/d^4 -
 (3*e^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^4 - (3*b*e^2*n*PolyLog[2, -(
(e*x)/d)])/d^4
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
(f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^2}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^2x^3} - \frac{2e(a+b\log(cx^n))}{d^3x^2} + \frac{3e^2(a+b\log(cx^n))}{d^4x} - \frac{e^3(a+b\log(cx^n))}{d^3(d+ex)^2} - \frac{3e^3(a+b}{d^4(d}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^2} - \frac{(2e)\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^3} + \frac{\left(3e^2\right)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^4} - \frac{\left(3e^3\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^4} - \frac{e^3\int \frac{a+b}{(a}}{}$$

$$= -\frac{bn}{4d^2x^2} + \frac{2ben}{d^3x} - \frac{a+b\log(cx^n)}{2d^2x^2} + \frac{2e(a+b\log(cx^n))}{d^3x} - \frac{e^3x(a+b\log(cx^n))}{d^4(d+ex)} + \frac{3e^2(a+b\log(c}{2bd^4n}$$

$$= -\frac{bn}{4d^2x^2} + \frac{2ben}{d^3x} - \frac{a+b\log(cx^n)}{2d^2x^2} + \frac{2e(a+b\log(cx^n))}{d^3x} - \frac{e^3x(a+b\log(cx^n))}{d^4(d+ex)} + \frac{3e^2(a+b\log(c}{2bd^4n}$$

Mathematica [A] time = 0.218132, size = 165, normalized size = 1.07

$$-\frac{12be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{2d^2(a+b\log(cx^n))}{x^2} - \frac{4de^2(a+b\log(cx^n))}{d+ex} + 12e^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) - \frac{8de(a+b\log(cx^n))}{x} - \frac{6e^2(a+b}{}}{4d^4}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^2*n)/x^2 - (8*b*d*e*n)/x + (2*d^2*(a + b*Log[c*x^n]))/x^2 - (8*d*e*(
a + b*Log[c*x^n]))/x - (4*d*e^2*(a + b*Log[c*x^n]))/(d + e*x) - (6*e^2*(a +
 b*Log[c*x^n])^2)/(b*n) + 4*b*e^2*n*(Log[x] - Log[d + e*x]) + 12*e^2*(a + b
*Log[c*x^n])*Log[1 + (e*x)/d] + 12*b*e^2*n*PolyLog[2, -((e*x)/d)])/(4*d^4)
```

Maple [C] time = 0.168, size = 910, normalized size = 5.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2/x^2-b*n/d^4*e^2*ln(x)-3/2*b*n/d^4*e^2*ln(x)^
2+3*b*n/d^4*e^2*dilog(-e*x/d)+3*b*n/d^4*e^2*ln(e*x+d)*ln(-e*x/d)-1/2*a/d^2/
x^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x+d)-1/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x+d)+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)/d^4*e^2*ln(e*x+d)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
```

```
c)/d^3*e/x-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2*ln(x)-3/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2*ln(e*x+d)+2*b*ln(c)/d^3*e/x-3*b
*ln(c)/d^4*e^2*ln(e*x+d)+3*b*ln(c)/d^4*e^2*ln(x)+b*ln(c)*e^2/d^3/(e*x+d)-3*
a/d^4*e^2*ln(e*x+d)+3*a/d^4*e^2*ln(x)-1/2*b*ln(c)/d^2/x^2+3/2*I*b*Pi*csgn(I
*c*x^n)^3/d^4*e^2*ln(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/(e*x+d)+I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e/x+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3
*e/x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*x+d)+3/2*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2*ln(x)+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/
d^4*e^2*ln(x)-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e^2*ln(e*x+d)+1/4*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/x^2-3*b*ln(x^n)/d^4*e^2*ln(e*x
+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/x^2+b*e^2*n*ln(e*x+d)/d^4-3/
2*I*b*Pi*csgn(I*c*x^n)^3/d^4*e^2*ln(x)-I*b*Pi*csgn(I*c*x^n)^3/d^3*e/x-1/4*I
*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/x^2+a*e^2/d^3/(e*x+d)+2*a/d^3*e/x+b*ln(
x^n)*e^2/d^3/(e*x+d)+3*b*ln(x^n)/d^4*e^2*ln(x)+2*b*ln(x^n)/d^3*e/x-1/2*b*ln
(x^n)/d^2/x^2-1/4*b*n/d^2/x^2+2*b*e*n/d^3/x
```

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

$$\frac{1}{2}\,a\left(\frac{6\,e^2x^2+3\,dex-d^2}{d^3ex^3+d^4x^2}-\frac{6\,e^2\log\left(ex+d\right)}{d^4}+\frac{6\,e^2\log\left(x\right)}{d^4}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^2x^5+2\,dex^4+d^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^5+2\,dex^4+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

```
[Out] Timed out
```

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

$$\int \frac{b \log (cx^n) + a}{(ex + d)^2 x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.46 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^3}\,dx$

Optimal. Leaf size=149

$$-\frac{3bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{x^2\left(3a+3b\log\left(cx^n\right)+bn\right)}{2e^2(d+ex)}-\frac{d\log\left(\frac{ex}{d}+1\right)\left(6a+6b\log\left(cx^n\right)+5bn\right)}{2e^4}-\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{2e(d+ex)^2}$$

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

Rubi [A] time = 0.215734, antiderivative size = 167, normalized size of antiderivative = 1.12, number of steps used = 11, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {43, 2351, 2295, 2319, 44, 2314, 31, 2317, 2391}

$$-\frac{3bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2}+\frac{3dx\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}-\frac{3d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{ax}{e^3}+\frac{bx\log}{e}$$

Antiderivative was successfully verified.

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

```
[Out] (a*x)/e^3 - (b*n*x)/e^3 - (b*d^2*n)/(2*e^4*(d + e*x)) - (b*d*n*Log[x])/(2*e
^4) + (b*x*Log[c*x^n])/e^3 + (d^3*(a + b*Log[c*x^n]))/(2*e^4*(d + e*x)^2) +
 (3*d*x*(a + b*Log[c*x^n]))/(e^3*(d + e*x)) - (5*b*d*n*Log[d + e*x])/(2*e^4
) - (3*d*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4 - (3*b*d*n*PolyLog[2, -((
e*x)/d)])/e^4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
```

```
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))}{(d+ex)^3}\,dx = \int \left(\frac{a+b\log(cx^n)}{e^3} - \frac{d^3 (a+b\log(cx^n))}{e^3(d+ex)^3} + \frac{3d^2 (a+b\log(cx^n))}{e^3(d+ex)^2} - \frac{3d (a+b\log(cx^n))}{e^3(d+ex)}\right) dx$$

$$= \frac{\int (a+b\log(cx^n))\,dx}{e^3} - \frac{(3d)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^3} + \frac{\left(3d^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^3} - \frac{d^3 \int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e^3}$$

$$= \frac{ax}{e^3} + \frac{d^3 (a+b\log(cx^n))}{2e^4(d+ex)^2} + \frac{3dx (a+b\log(cx^n))}{e^3(d+ex)} - \frac{3d (a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^4} + \frac{b\int \mathrm{lo}$$

$$= \frac{ax}{e^3} - \frac{bnx}{e^3} + \frac{bx\log(cx^n)}{e^3} + \frac{d^3 (a+b\log(cx^n))}{2e^4(d+ex)^2} + \frac{3dx (a+b\log(cx^n))}{e^3(d+ex)} - \frac{3bdn\log(d+ex)}{e^4}$$

$$= \frac{ax}{e^3} - \frac{bnx}{e^3} - \frac{bd^2n}{2e^4(d+ex)} - \frac{bdn\log(x)}{2e^4} + \frac{bx\log(cx^n)}{e^3} + \frac{d^3 (a+b\log(cx^n))}{2e^4(d+ex)^2} + \frac{3dx (a+b\log}{e^3(d+e}$$

Mathematica [A] time = 0.136971, size = 150, normalized size = 1.01

$$\frac{-6bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{d^3(a+b\log(cx^n))}{(d+ex)^2} - \frac{6d^2(a+b\log(cx^n))}{d+ex} - 6d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) + 2aex + 2bex\log(cx^n) + 6b}{2e^4}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a*e*x - 2*b*e*n*x + 2*b*e*x*Log[c*x^n] + (d^3*(a + b*Log[c*x^n]))/(d + e
*x)^2 - (6*d^2*(a + b*Log[c*x^n]))/(d + e*x) + 6*b*d*n*(Log[x] - Log[d + e*
x]) - b*d*n*(d/(d + e*x) + Log[x] - Log[d + e*x]) - 6*d*(a + b*Log[c*x^n])*
Log[1 + (e*x)/d] - 6*b*d*n*PolyLog[2, -((e*x)/d)])/(2*e^4)
```

Maple [C] time = 0.209, size = 764, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*I*b*Pi*csgn(I*c*x^n)^3/e^3*x+1/2*b*ln(c)*d^3/e^4/(e*x+d)^2-3*b*ln(c)/e
^4*d^2/(e*x+d)-3*b*ln(c)/e^4*d*ln(e*x+d)+b*ln(x^n)/e^3*x-b*n/e^4*d+3*b*n/e^
4*d*ln(e*x+d)*ln(-e*x/d)-3*a/e^4*d*ln(e*x+d)+1/2*a*d^3/e^4/(e*x+d)^2-3*a/e^
4*d^2/(e*x+d)+b*ln(c)/e^3*x+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^3*x-1/4*
I*b*Pi*csgn(I*c*x^n)^3*d^3/e^4/(e*x+d)^2+3/2*I*b*Pi*csgn(I*c*x^n)^3/e^4*d^2
/(e*x+d)+3/2*I*b*Pi*csgn(I*c*x^n)^3/e^4*d*ln(e*x+d)+3/2*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)/e^4*d*ln(e*x+d)+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)/e^4*d^2/(e*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
d^3/e^4/(e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^3*x+5/2*b*n/e^4*
d*ln(e*x)-5/2*b*n/e^4*d*ln(e*x+d)-1/2*b*n/e^4*d^2/(e*x+d)+3*b*n/e^4*d*dilog
(-e*x/d)+a/e^3*x+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^4/(e*x+d)^2-3/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*d*ln(e*x+d)-3/2*I*b*Pi*csgn(I*c*x^n
)^2*csgn(I*c)/e^4*d^2/(e*x+d)-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^4*d*ln
(e*x+d)-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*d^2/(e*x+d)-1/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^3*x+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)^2*d^3/e^4/(e*x+d)^2+1/2*b*ln(x^n)*d^3/e^4/(e*x+d)^2-3*b*ln(x^n)/e^4*d^2/
(e*x+d)-3*b*ln(x^n)/e^4*d*ln(e*x+d)-b*n*x/e^3
```

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

$$-\frac{1}{2}\,a\left(\frac{6\,d^2ex+5\,d^3}{e^6x^2+2\,de^5x+d^2e^4}-\frac{2\,x}{e^3}+\frac{6\,d\log\left(ex+d\right)}{e^4}\right)+b\int\frac{x^3\log\left(c\right)+x^3\log\left(x^n\right)}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 58.2631, size = 372, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*d**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**3 +
 3*a*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**3 - 3
*a*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 + a*x/e**3 + b
*d**3*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/
(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e**3 - b*d**3*Piecewise((x/d**
3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c*x**n)/e**3 - 3*b*d**2*n*
Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e
**3 + 3*b*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log
(c*x**n)/e**3 + 3*b*d*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x
) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - pol
ylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0,
 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polyl
og(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**3 - 3*b*d*Piecewise((x/d,
 Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**3 - b*n*x/e**3 + b*x*log
(c*x**n)/e**3
```

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

$$\int \frac{(b \log(cx^n) + a)x^3}{(ex + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.47 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^3}\,dx$

Optimal. Leaf size=107

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}-\frac{x\left(2a+2b\log\left(cx^n\right)+bn\right)}{2e^2(d+ex)}+\frac{\log\left(\frac{ex}{d}+1\right)\left(2a+2b\log\left(cx^n\right)+3bn\right)}{2e^3}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e(d+ex)^2}$$

```
[Out] -(x^2*(a + b*Log[c*x^n]))/(2*e*(d + e*x)^2) - (x*(2*a + b*n + 2*b*Log[c*x^n
]))/(2*e^2*(d + e*x)) + ((2*a + 3*b*n + 2*b*Log[c*x^n])*Log[1 + (e*x)/d])/(
2*e^3) + (b*n*PolyLog[2, -((e*x)/d)])/e^3
```

Rubi [A] time = 0.182732, antiderivative size = 132, normalized size of antiderivative = 1.23, number of steps used = 9, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2e^3(d+ex)^2}-\frac{2x\left(a+b\log\left(cx^n\right)\right)}{e^2(d+ex)}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{bdn}{2e^3(d+ex)}+\frac{3bn\log}{2}$$

Antiderivative was successfully verified.

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

```
[Out] (b*d*n)/(2*e^3*(d + e*x)) + (b*n*Log[x])/(2*e^3) - (d^2*(a + b*Log[c*x^n]))
/(2*e^3*(d + e*x)^2) - (2*x*(a + b*Log[c*x^n]))/(e^2*(d + e*x)) + (3*b*n*Lo
g[d + e*x])/(2*e^3) + ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^3 + (b*n*Poly
Log[2, -((e*x)/d)])/e^3
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
```

```
Q[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))}{(d+ex)^3}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))}{e^2(d+ex)^3} - \frac{2d(a+b\log(cx^n))}{e^2(d+ex)^2} + \frac{a+b\log(cx^n)}{e^2(d+ex)}\right) dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^2} - \frac{(2d)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^2} + \frac{d^2 \int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e^2}$$

$$= -\frac{d^2 (a+b\log(cx^n))}{2e^3(d+ex)^2} - \frac{2x(a+b\log(cx^n))}{e^2(d+ex)} + \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^3} - \frac{(bn)\int \frac{\log\left(1+\frac{ex}{d}\right)}{x}}{e^3}$$

$$= -\frac{d^2 (a+b\log(cx^n))}{2e^3(d+ex)^2} - \frac{2x(a+b\log(cx^n))}{e^2(d+ex)} + \frac{2bn\log(d+ex)}{e^3} + \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^3}$$

$$= \frac{bdn}{2e^3(d+ex)} + \frac{bn\log(x)}{2e^3} - \frac{d^2 (a+b\log(cx^n))}{2e^3(d+ex)^2} - \frac{2x(a+b\log(cx^n))}{e^2(d+ex)} + \frac{3bn\log(d+ex)}{2e^3} + \frac{(a}{}$$

Mathematica [A] time = 0.109, size = 122, normalized size = 1.14

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right) - \frac{d^2(a+b\log(cx^n))}{(d+ex)^2} + \frac{4d(a+b\log(cx^n))}{d+ex} + 2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) - 4bn(\log(x)-\log(d+ex)) + bn\Big(}{2e^3}$$

Antiderivative was successfully verified.

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

```
[Out] (-((d^2*(a + b*Log[c*x^n]))/(d + e*x)^2) + (4*d*(a + b*Log[c*x^n]))/(d + e*
x) - 4*b*n*(Log[x] - Log[d + e*x]) + b*n*(d/(d + e*x) + Log[x] - Log[d + e*
x]) + 2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] + 2*b*n*PolyLog[2, -((e*x)/d)])
/(2*e^3)
```

Maple [C] time = 0.148, size = 596, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*I*b*Pi*csgn(I*c*x^n)^3/e^3*ln(e*x+d)-3/2*b*n/e^3*ln(e*x)+3/2*b*n/e^3*l
n(e*x+d)+2*b*ln(c)*d/e^3/(e*x+d)+1/2*b*n*d/e^3/(e*x+d)-b*n/e^3*ln(e*x+d)*ln
```

```
(-e*x/d)-1/2*b*ln(c)*d^2/e^3/(e*x+d)^2+b*ln(x^n)/e^3*ln(e*x+d)-b*n/e^3*dilo
g(-e*x/d)-1/2*a*d^2/e^3/(e*x+d)^2+2*a*d/e^3/(e*x+d)+b*ln(c)/e^3*ln(e*x+d)-I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^3/(e*x+d)+1/4*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3/(e*x+d)^2+I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2*d/e^3/(e*x+d)-1/2*b*ln(x^n)*d^2/e^3/(e*x+d)^2+1/4*I*b*Pi*csgn(I*c*x^n
)^3*d^2/e^3/(e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^3*ln(e*x+d)+
2*b*ln(x^n)*d/e^3/(e*x+d)-I*b*Pi*csgn(I*c*x^n)^3*d/e^3/(e*x+d)+1/2*I*b*Pi*c
sgn(I*c*x^n)^2*csgn(I*c)/e^3*ln(e*x+d)+I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e
^3/(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3/(e*x+d)^2-1/4*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3/(e*x+d)^2-1/2*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)/e^3*ln(e*x+d)+a/e^3*ln(e*x+d)
```

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

$$\frac{1}{2}a\left(\frac{4\,dex+3\,d^2}{e^5x^2+2\,de^4x+d^2e^3}+\frac{2\,\log\left(ex+d\right)}{e^3}\right)+b\int\frac{x^2\log\left(c\right)+x^2\log\left(x^n\right)}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 49.5046, size = 328, normalized size = 3.07

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**3,x)
```

```
[Out] a*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**2 -
2*a*d*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**2 + a*Pie
cewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**2 - b*d**2*n*Piecewise((
x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/
e + x)/(2*d**2*e), True))/e**2 + b*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(
2*e*(d + e*x)**2), True))*log(c*x**n)/e**2 + 2*b*d*n*Piecewise((x/d**2, Eq(
e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e**2 - 2*b*d*Piecewise(
(x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log(c*x**n)/e**2 - b*n*Piece
wise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(
I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d
), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg
(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d),
 True))/e, True))/e**2 + b*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True
))*log(c*x**n)/e**2
```

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

$$\int \frac{(b\log(cx^n) + a)x^2}{(ex + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.48 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^3}\,dx$

Optimal. Leaf size=62

$$\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d(d+ex)^2}-\frac{bn}{2e^2(d+ex)}-\frac{bn\log(d+ex)}{2de^2}$$

```
[Out] -(b*n)/(2*e^2*(d + e*x)) + (x^2*(a + b*Log[c*x^n]))/(2*d*(d + e*x)^2) - (b*
n*Log[d + e*x])/(2*d*e^2)
```

Rubi [A] time = 0.0500943, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2335, 43}

$$\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d(d+ex)^2}-\frac{bn}{2e^2(d+ex)}-\frac{bn\log(d+ex)}{2de^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(2*e^2*(d + e*x)) + (x^2*(a + b*Log[c*x^n]))/(2*d*(d + e*x)^2) - (b*
n*Log[d + e*x])/(2*d*e^2)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{x\,(a+b\log(cx^n))}{(d+ex)^3}\,dx &= \frac{x^2\,(a+b\log(cx^n))}{2d(d+ex)^2} - \frac{(bn)\int \frac{x}{(d+ex)^2}\,dx}{2d} \\
&= \frac{x^2\,(a+b\log(cx^n))}{2d(d+ex)^2} - \frac{(bn)\int \left(-\frac{d}{e(d+ex)^2} + \frac{1}{e(d+ex)}\right)dx}{2d} \\
&= -\frac{bn}{2e^2(d+ex)} + \frac{x^2\,(a+b\log(cx^n))}{2d(d+ex)^2} - \frac{bn\log(d+ex)}{2de^2}
\end{aligned}
$$

Mathematica [A] time = 0.11525, size = 75, normalized size = 1.21

$$
\frac{bn\log(x) - \frac{ad(d+2ex)+bd(d+2ex)\log(cx^n)+bdn(d+ex)+bn(d+ex)^2\log(d+ex)}{(d+ex)^2}}{2de^2}
$$

Antiderivative was successfully verified.

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

```
[Out] (b*n*Log[x] - (b*d*n*(d + e*x) + a*d*(d + 2*e*x) + b*d*(d + 2*e*x)*Log[c*x^
n] + b*n*(d + e*x)^2*Log[d + e*x])/(d + e*x)^2)/(2*d*e^2)
```

Maple [C] time = 0.11, size = 349, normalized size = 5.6

$$
-\frac{b\,(2\,ex+d)\ln(x^n)}{2\,(ex+d)^2\,e^2} - \frac{i\pi\,bd^2\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(icx^n))^2 - 2\,i\pi\,bdex\,(\mathrm{csgn}(icx^n))^3 + i\pi\,bd^2\,(\mathrm{csgn}(icx^n))^2\,\mathrm{csgn}(ic) + 2\,i\pi\,bd
$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b*(2*e*x+d)/(e*x+d)^2/e^2*ln(x^n)-1/4*(I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c
*x^n)^2-2*I*Pi*b*d*e*x*csgn(I*c*x^n)^3+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)
+2*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-I*Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+2*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+2*ln(e*x+d)*b*e
^2*n*x^2-2*ln(-x)*b*e^2*n*x^2+4*ln(e*x+d)*b*d*e*n*x-4*ln(-x)*b*d*e*n*x+4*ln
(c)*b*d*e*x+2*ln(e*x+d)*b*d^2*n-2*ln(-x)*b*d^2*n+2*b*d*e*n*x+2*ln(c)*b*d^2+
4*a*d*e*x+2*b*d^2*n+2*a*d^2)/d/e^2/(e*x+d)^2
```

Maxima [B] time = 1.11261, size = 154, normalized size = 2.48

$$-\frac{1}{2}\,bn\left(\frac{1}{e^3x+de^2}+\frac{\log\left(ex+d\right)}{de^2}-\frac{\log\left(x\right)}{de^2}\right)-\frac{(2\,ex+d)b\log\left(cx^n\right)}{2\left(e^4x^2+2\,de^3x+d^2e^2\right)}-\frac{(2\,ex+d)a}{2\left(e^4x^2+2\,de^3x+d^2e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.06569, size = 251, normalized size = 4.05

$$\frac{be^2nx^2\log\left(x\right)-bd^2n-ad^2-(bden+2\,ade)x-\left(be^2nx^2+2\,bdenx+bd^2n\right)\log\left(ex+d\right)-\left(2\,bdex+bd^2\right)\log\left(c\right)}{2\left(de^4x^2+2\,d^2e^3x+d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 23.424, size = 425, normalized size = 6.85

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{x}-\frac{bn\log\left(x\right)}{x}-\frac{bn}{x}-\frac{b\log\left(c\right)}{x}\right) \\ \frac{\frac{ax^2}{2}+\frac{bnx^2\log\left(x\right)}{2}-\frac{bnx^2}{4}+\frac{bx^2\log\left(c\right)}{2}}{d^3} \\ \frac{-\frac{a}{x}-\frac{bn\log\left(x\right)}{x}-\frac{bn}{x}-\frac{b\log\left(c\right)}{x}}{e^3} \\ \frac{ae^2x^2}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{bd^2n\log\left(\frac{d}{e}+x\right)}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{2bdenx\log\left(\frac{d}{e}+x\right)}{2d^3e^2+4d^2e^3x+2de^4x^2}+\frac{bdenx}{2d^3e^2+4d^2e^3x+2de^4x^2}+\frac{be^2nx^2\log\left(x\right)}{2d^3e^2+4d^2e^3x+2de^4x^2}-\frac{be^2nx^2\log\left(\frac{d}{e}+x\right)}{2d^3e^2+4d^2e^3x+2de^4x^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((zoo*(-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x), Eq(d, 0) & Eq(e,
 0)), ((a*x**2/2 + b*n*x**2*log(x)/2 - b*n*x**2/4 + b*x**2*log(c)/2)/d**3,
Eq(e, 0)), ((-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x)/e**3, Eq(d, 0)), (a*
e**2*x**2/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2) - b*d**2*n*log(d/e
+ x)/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2) - 2*b*d*e*n*x*log(d/e +
x)/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x**2) + b*d*e*n*x/(2*d**3*e**2 +
 4*d**2*e**3*x + 2*d*e**4*x**2) + b*e**2*n*x**2*log(x)/(2*d**3*e**2 + 4*d**
2*e**3*x + 2*d*e**4*x**2) - b*e**2*n*x**2*log(d/e + x)/(2*d**3*e**2 + 4*d**
2*e**3*x + 2*d*e**4*x**2) + b*e**2*n*x**2/(2*d**3*e**2 + 4*d**2*e**3*x + 2*
d*e**4*x**2) + b*e**2*x**2*log(c)/(2*d**3*e**2 + 4*d**2*e**3*x + 2*d*e**4*x
**2), True))
```

Giac [B] time = 1.26169, size = 165, normalized size = 2.66

$$-\frac{bnx^2e^2\log(xe+d)+2\,bdnxe\log(xe+d)-bnx^2e^2\log(x)+bdnxe+bd^2n\log(xe+d)+2\,bdxe\log(c)+bd^2n+2\,adxe}{2\left(dx^2e^4+2\,d^2xe^3+d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.49 $\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx$

Optimal. Leaf size=76

$$-\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{bn\log(x)}{2d^2e}-\frac{bn\log(d+ex)}{2d^2e}+\frac{bn}{2de(d+ex)}$$

```
[Out] (b*n)/(2*d*e*(d + e*x)) + (b*n*Log[x])/(2*d^2*e) - (a + b*Log[c*x^n])/(2*e*
(d + e*x)^2) - (b*n*Log[d + e*x])/(2*d^2*e)
```

Rubi [A] time = 0.0340487, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2319, 44}

$$-\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{bn\log(x)}{2d^2e}-\frac{bn\log(d+ex)}{2d^2e}+\frac{bn}{2de(d+ex)}$$

Antiderivative was successfully verified.

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


```
[Out] (b*n)/(2*d*e*(d + e*x)) + (b*n*Log[x])/(2*d^2*e) - (a + b*Log[c*x^n])/(2*e*
(d + e*x)^2) - (b*n*Log[d + e*x])/(2*d^2*e)
```


Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] && !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx = -\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{(bn)\int \frac{1}{x(d+ex)^2}\,dx}{2e}$$
$$= -\frac{a+b\log(cx^n)}{2e(d+ex)^2}+\frac{(bn)\int \left(\frac{1}{d^2x}-\frac{e}{d(d+ex)^2}-\frac{e}{d^2(d+ex)}\right)dx}{2e}$$
$$= \frac{bn}{2de(d+ex)}+\frac{bn\log(x)}{2d^2e}-\frac{a+b\log(cx^n)}{2e(d+ex)^2}-\frac{bn\log(d+ex)}{2d^2e}$$

Mathematica [A] time = 0.053675, size = 53, normalized size = 0.7

$$\frac{\frac{bn\left(\frac{d}{d+ex}-\log(d+ex)+\log(x)\right)}{d^2}-\frac{a+b\log(cx^n)}{(d+ex)^2}}{2e}$$

Antiderivative was successfully verified.

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

```
[Out] (-((a + b*Log[c*x^n])/(d + e*x)^2) + (b*n*(d/(d + e*x) + Log[x] - Log[d + e
*x]))/d^2)/(2*e)
```

Maple [C] time = 0.101, size = 235, normalized size = 3.1

$$-\frac{b\ln(x^n)}{2(ex+d)^2e}-\frac{i\pi bd^2\operatorname{csgn}(ix^n)(\operatorname{csgn}(icx^n))^2-i\pi bd^2\operatorname{csgn}(ix^n)\operatorname{csgn}(icx^n)\operatorname{csgn}(ic)-i\pi bd^2(\operatorname{csgn}(icx^n))^3+i\pi bd^2(\text{c}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b/e/(e*x+d)^2*ln(x^n)-1/4*(I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi
*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^2*csgn(I*c*x^n)^3+I*Pi*
b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-2*ln(-x)*b*e^2*n*x^2+2*ln(e*x+d)*b*e^2*n*x^
2-4*ln(-x)*b*d*e*n*x+4*ln(e*x+d)*b*d*e*n*x-2*ln(-x)*b*d^2*n+2*ln(e*x+d)*b*d
^2*n-2*b*d*e*n*x+2*ln(c)*b*d^2-2*b*d^2*n+2*a*d^2)/e/d^2/(e*x+d)^2
```

Maxima [A] time = 1.08569, size = 134, normalized size = 1.76

$$\frac{1}{2}\,bn\left(\frac{1}{de^2x+d^2e}-\frac{\log\left(ex+d\right)}{d^2e}+\frac{\log\left(x\right)}{d^2e}\right)-\frac{b\log\left(cx^n\right)}{2\left(e^3x^2+2\,de^2x+d^2e\right)}-\frac{a}{2\left(e^3x^2+2\,de^2x+d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.0672, size = 238, normalized size = 3.13

$$\frac{bdenx+bd^2n-bd^2\log\left(c\right)-ad^2-\left(be^2nx^2+2\,bdenx+bd^2n\right)\log\left(ex+d\right)+\left(be^2nx^2+2\,bdenx\right)\log\left(x\right)}{2\left(d^2e^3x^2+2\,d^3e^2x+d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 5.93654, size = 559, normalized size = 7.36

$$\begin{cases}\tilde{\infty}\left(-\frac{a}{2x^2}-\frac{bn\log\left(x\right)}{2x^2}-\frac{bn}{4x^2}-\frac{b\log\left(c\right)}{2x^2}\right)\\ \frac{-\frac{a}{2x^2}-\frac{bn\log\left(x\right)}{2x^2}-\frac{bn}{4x^2}-\frac{b\log\left(c\right)}{2x^2}}{e^3}\\ \frac{ax+bnx\log\left(x\right)-bnx+bx\log\left(c\right)}{d^3}\\ \frac{2adex}{2d^4e+4d^3e^2x+2d^2e^3x^2}+\frac{ae^2x^2}{2d^4e+4d^3e^2x+2d^2e^3x^2}-\frac{bd^2n\log\left(\frac{d}{e}+x\right)}{2d^4e+4d^3e^2x+2d^2e^3x^2}+\frac{2bdenx\log\left(x\right)}{2d^4e+4d^3e^2x+2d^2e^3x^2}-\frac{2bdenx\log\left(\frac{d}{e}+x\right)}{2d^4e+4d^3e^2x+2d^2e^3x^2}-\frac{bdenx}{2d^4e+4d^3e^2x+2d^2e^3x^2}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((zoo*(-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n/(4*x**2) - b*log(c)
/(2*x**2)), Eq(d, 0) & Eq(e, 0)), ((-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n
/(4*x**2) - b*log(c)/(2*x**2))/e**3, Eq(d, 0)), ((a*x + b*n*x*log(x) - b*n*
x + b*x*log(c))/d**3, Eq(e, 0)), (2*a*d*e*x/(2*d**4*e + 4*d**3*e**2*x + 2*d
**2*e**3*x**2) + a*e**2*x**2/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2)
- b*d**2*n*log(d/e + x)/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) + 2*b
*d*e*n*x*log(x)/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) - 2*b*d*e*n*x
*log(d/e + x)/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) - b*d*e*n*x/(2*
d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*x**2) + 2*b*d*e*x*log(c)/(2*d**4*e + 4
*d**3*e**2*x + 2*d**2*e**3*x**2) + b*e**2*n*x**2*log(x)/(2*d**4*e + 4*d**3*
e**2*x + 2*d**2*e**3*x**2) - b*e**2*n*x**2*log(d/e + x)/(2*d**4*e + 4*d**3*
e**2*x + 2*d**2*e**3*x**2) - b*e**2*n*x**2/(2*d**4*e + 4*d**3*e**2*x + 2*d*
*2*e**3*x**2) + b*e**2*x**2*log(c)/(2*d**4*e + 4*d**3*e**2*x + 2*d**2*e**3*
x**2), True))
```

Giac [A] time = 1.26493, size = 162, normalized size = 2.13

$$-\frac{bnx^2e^2\log(xe+d) + 2\,bdnxe\log(xe+d) - bnx^2e^2\log(x) - 2\,bdnxe\log(x) - bdnxe + bd^2n\log(xe+d) - bd^2n + bd^2\,\mathrm{lo}}{2\left(d^2x^2e^3 + 2\,d^3xe^2 + d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.50 $\int \frac{a+b\log(cx^n)}{x(d+ex)^3} dx$

Optimal. Leaf size=134

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^3}-\frac{\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^3}-\frac{ex(a+b\log(cx^n))}{d^3(d+ex)}+\frac{a+b\log(cx^n)}{2d(d+ex)^2}-\frac{bn}{2d^2(d+ex)}+\frac{3bn\log(d}{2d^3}$$

```
[Out] -(b*n)/(2*d^2*(d + e*x)) - (b*n*Log[x])/(2*d^3) + (a + b*Log[c*x^n])/(2*d*(
d + e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^3*(d + e*x)) - (Log[1 + d/(e*x)]*
(a + b*Log[c*x^n]))/d^3 + (3*b*n*Log[d + e*x])/(2*d^3) + (b*n*PolyLog[2, -(
d/(e*x))])/d^3
```

Rubi [A] time = 0.249629, antiderivative size = 156, normalized size of antiderivative = 1.16, number of steps used = 11, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31, 2319, 44}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^3}-\frac{ex(a+b\log(cx^n))}{d^3(d+ex)}+\frac{(a+b\log(cx^n))^2}{2bd^3n}+\frac{a+b\log(cx^n)}{2d(d+ex)^2}-\frac{}{2d^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(2*d^2*(d + e*x)) - (b*n*Log[x])/(2*d^3) + (a + b*Log[c*x^n])/(2*d*(
d + e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^3*(d + e*x)) + (a + b*Log[c*x^n])
^2/(2*b*d^3*n) + (3*b*n*Log[d + e*x])/(2*d^3) - ((a + b*Log[c*x^n])*Log[1 +
 (e*x)/d])/d^3 - (b*n*PolyLog[2, -((e*x)/d)])/d^3
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

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

```
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
```

```
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{2d(d+ex)^2} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex)^2}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))}{d^3(d+ex)} + \frac{\int \frac{a+b\log(cx^n)}{x}\,dx}{d^3} - \frac{e\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^3} - \frac{(bn)\int\left(\frac{1}{d^2x} - \frac{e}{d(d+\ldots}\right.}{2\ldots}$$

$$= -\frac{bn}{2d^2(d+ex)} - \frac{bn\log(x)}{2d^3} + \frac{a+b\log(cx^n)}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))}{d^3(d+ex)} + \frac{(a+b\log(cx^n))^2}{2bd^3n} + \frac{3bn\log\ldots}{2\ldots}$$

$$= -\frac{bn}{2d^2(d+ex)} - \frac{bn\log(x)}{2d^3} + \frac{a+b\log(cx^n)}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))}{d^3(d+ex)} + \frac{(a+b\log(cx^n))^2}{2bd^3n} + \frac{3bn\log\ldots}{2\ldots}$$

Mathematica [A] time = 0.119856, size = 141, normalized size = 1.05

$$\frac{-2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{d^2(a+b\log(cx^n))}{(d+ex)^2} + \frac{2d(a+b\log(cx^n))}{d+ex} - 2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) + \frac{(a+b\log(cx^n))^2}{bn} - 2bn(\log(x)-\ldots}{2d^3}$$

Antiderivative was successfully verified.

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

```
[Out] ((d^2*(a + b*Log[c*x^n]))/(d + e*x)^2 + (2*d*(a + b*Log[c*x^n]))/(d + e*x)
+ (a + b*Log[c*x^n])^2/(b*n) - 2*b*n*(Log[x] - Log[d + e*x]) + b*n*(-(d/(d
+ e*x)) - Log[x] + Log[d + e*x]) - 2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] -
2*b*n*PolyLog[2, -((e*x)/d)])/(2*d^3)
```

Maple [C] time = 0.156, size = 703, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*ln(e*x
+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2/(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/d/(e*
x+d)^2+b*ln(c)/d^2/(e*x+d)+1/2*b*ln(c)/d/(e*x+d)^2+b*ln(c)/d^3*ln(x)-b*ln(c
)/d^3*ln(e*x+d)+b*n/d^3*ln(e*x+d)*ln(-e*x/d)-1/2*b*n/d^3*ln(x)^2+b*n/d^3*di
log(-e*x/d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x+d)^2+1/2*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)/d^3*ln(x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/(
e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(x)-1/2*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)/d^3*ln(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^
2/(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/(e*x+d)-1/2*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(e*x+d)-a/d^3*ln(e*x+d)+a/d^2/(e*x+d
)+1/2*a/d/(e*x+d)^2+a/d^3*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(e
*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(e*x+d)^2-1/2*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)/d^3*ln(e*x+d)+b*ln(x^n)/d^3*ln(x)+b*ln(x^n)/d^2/(e*x+d)+
1/2*b*ln(x^n)/d/(e*x+d)^2-b*ln(x^n)/d^3*ln(e*x+d)-1/2*b*n/d^2/(e*x+d)-3/2*b
*n*ln(x)/d^3+3/2*b*n*ln(e*x+d)/d^3
```

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

$$\frac{1}{2}\,a\left(\frac{2\,ex+3\,d}{d^2e^2x^2+2\,d^3ex+d^4}-\frac{2\,\log\left(ex+d\right)}{d^3}+\frac{2\,\log\left(x\right)}{d^3}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^3x^4+3\,de^2x^3+3\,d^2ex^2+d^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^3x^4+3\,de^2x^3+3\,d^2ex^2+d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 70.2177, size = 335, normalized size = 2.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a*e*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d - a*e*P
iecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**2 - a*e*Piecewis
e((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**3 + a*log(x)/d**3 + b*e**2*n*
Piecewise((-1/(e**3*x), Eq(d, 0)), (-1/(2*d*e**2 + 2*e**3*x) - log(d + e*x)
/(2*d*e**2), True))/d**2 - b*e**2*Piecewise((1/(e**3*x), Eq(d, 0)), (-1/(2*
d*(d/x + e)**2), True))*log(c*x**n)/d**2 - 2*b*e*n*Piecewise((-1/(e**2*x),
Eq(d, 0)), (-log(d**2 + d*e*x)/(d*e), True))/d**2 + 2*b*e*Piecewise((1/(e**
2*x), Eq(d, 0)), (-1/(d**2/x + d*e), True))*log(c*x**n)/d**2 + b*n*Piecewis
e((-1/(e*x), Eq(d, 0)), (Piecewise((log(e)*log(x) + polylog(2, d*exp_polar(
I*pi)/(e*x)), Abs(x) < 1), (-log(e)*log(1/x) + polylog(2, d*exp_polar(I*pi)
/(e*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + m
eijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) + polylog(2, d*exp_polar(I*pi)
/(e*x)), True))/d, True))/d**2 - b*Piecewise((1/(e*x), Eq(d, 0)), (log(d/x
+ e)/d, True))*log(c*x**n)/d**2
```

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

$$\int \frac{b \log (cx^n) + a}{(ex + d)^3 x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.51 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^3}\,dx$

Optimal. Leaf size=171

$$-\frac{3ben\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^4}+\frac{2e^2x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}+\frac{3e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{2d^2(d+ex)^2}-\frac{a+b\log\left(cx^n\right)}{d^3x}$$

```
[Out] -((b*n)/(d^3*x)) + (b*e*n)/(2*d^3*(d + e*x)) + (b*e*n*Log[x])/(2*d^4) - (a
+ b*Log[c*x^n])/(d^3*x) - (e*(a + b*Log[c*x^n]))/(2*d^2*(d + e*x)^2) + (2*e
^2*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)) + (3*e*Log[1 + d/(e*x)]*(a + b*Log
[c*x^n]))/d^4 - (5*b*e*n*Log[d + e*x])/(2*d^4) - (3*b*e*n*PolyLog[2, -(d/(e
*x))])/d^4
```

Rubi [A] time = 0.247753, antiderivative size = 193, normalized size of antiderivative = 1.13, number of steps used = 11, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$\frac{3ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}+\frac{2e^2x\left(a+b\log\left(cx^n\right)\right)}{d^4(d+ex)}-\frac{3e\left(a+b\log\left(cx^n\right)\right)^2}{2bd^4n}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{2d^2(d+ex)^2}+\frac{3e\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^4}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*n)/(d^3*x)) + (b*e*n)/(2*d^3*(d + e*x)) + (b*e*n*Log[x])/(2*d^4) - (a
+ b*Log[c*x^n])/(d^3*x) - (e*(a + b*Log[c*x^n]))/(2*d^2*(d + e*x)^2) + (2*e
^2*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)) - (3*e*(a + b*Log[c*x^n])^2)/(2*b*
d^4*n) - (5*b*e*n*Log[d + e*x])/(2*d^4) + (3*e*(a + b*Log[c*x^n])*Log[1 + (
e*x)/d])/d^4 + (3*b*e*n*PolyLog[2, -((e*x)/d)])/d^4
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^3}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^3x^2} - \frac{3e(a+b\log(cx^n))}{d^4x} + \frac{e^2(a+b\log(cx^n))}{d^2(d+ex)^3} + \frac{2e^2(a+b\log(cx^n))}{d^3(d+ex)^2} + \frac{3e^2(a+b}{d^4(d}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^4} + \frac{\left(3e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^4} + \frac{\left(2e^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^3} + \frac{e^2\int \frac{a+b}{(}}{}$$

$$= -\frac{bn}{d^3x} - \frac{a+b\log(cx^n)}{d^3x} - \frac{e(a+b\log(cx^n))}{2d^2(d+ex)^2} + \frac{2e^2x(a+b\log(cx^n))}{d^4(d+ex)} - \frac{3e(a+b\log(cx^n))^2}{2bd^4n} + \frac{3e(}{}$$

$$= -\frac{bn}{d^3x} - \frac{a+b\log(cx^n)}{d^3x} - \frac{e(a+b\log(cx^n))}{2d^2(d+ex)^2} + \frac{2e^2x(a+b\log(cx^n))}{d^4(d+ex)} - \frac{3e(a+b\log(cx^n))^2}{2bd^4n} - \frac{2be}{}$$

$$= -\frac{bn}{d^3x} + \frac{ben}{2d^3(d+ex)} + \frac{ben\log(x)}{2d^4} - \frac{a+b\log(cx^n)}{d^3x} - \frac{e(a+b\log(cx^n))}{2d^2(d+ex)^2} + \frac{2e^2x(a+b\log(cx^n))}{d^4(d+ex)} -$$

Mathematica [A] time = 0.169734, size = 173, normalized size = 1.01

$$\frac{6ben\text{PolyLog}\left(2,-\frac{ex}{d}\right) - \frac{d^2e(a+b\log(cx^n))}{(d+ex)^2} - \frac{4de(a+b\log(cx^n))}{d+ex} + 6e\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) - \frac{2d(a+b\log(cx^n))}{x} - \frac{3e(a+b\log(cx^n))^2}{bn}}{2d^4}$$

Antiderivative was successfully verified.

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

```
[Out] ((-2*b*d*n)/x - (2*d*(a + b*Log[c*x^n]))/x - (d^2*e*(a + b*Log[c*x^n]))/(d
+ e*x)^2 - (4*d*e*(a + b*Log[c*x^n]))/(d + e*x) - (3*e*(a + b*Log[c*x^n])^2
)/(b*n) + 4*b*e*n*(Log[x] - Log[d + e*x]) + b*e*n*(d/(d + e*x) + Log[x] - L
og[d + e*x]) + 6*e*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] + 6*b*e*n*PolyLog[2,
 -((e*x)/d)])/(2*d^4)
```

Maple [C] time = 0.168, size = 894, normalized size = 5.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -3*b*n/d^4*e*ln(e*x+d)*ln(-e*x/d)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3/x-a/d^3/x+
I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e/(e*x+d)+3/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e*ln(x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*e/d^2/(e*x+d)^2-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
/d^4*e*ln(e*x+d)-2*a/d^3*e/(e*x+d)+3*a/d^4*e*ln(e*x+d)-3*a/d^4*e*ln(x)-b*ln
(c)/d^3/x-2*b*ln(c)/d^3*e/(e*x+d)+3*b*ln(c)/d^4*e*ln(e*x+d)-3*b*ln(c)/d^4*e
*ln(x)-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e*ln(x)+1/4*I*b*Pi*csgn(I
*c*x^n)^3*e/d^2/(e*x+d)^2-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*e/(e*x+d)-
3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e*ln(x)+3/2*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2/d^4*e*ln(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*
x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/x-I*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/d^3*e/(e*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^
2/(e*x+d)^2+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e*ln(e*x+d)+3/2*b*n/d^
4*e*ln(x)^2-3*b*n/d^4*e*dilog(-e*x/d)+3*b*ln(x^n)/d^4*e*ln(e*x+d)-2*b*ln(x^
n)/d^3*e/(e*x+d)-3*b*ln(x^n)/d^4*e*ln(x)-1/2*b*ln(x^n)*e/d^2/(e*x+d)^2-b*ln
(x^n)/d^3/x-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/x+3/2*I*b*Pi*csgn(I*c*
x^n)^3/d^4*e*ln(x)+5/2*b*e*n*ln(x)/d^4-5/2*b*e*n*ln(e*x+d)/d^4-3/2*I*b*Pi*c
sgn(I*c*x^n)^3/d^4*e*ln(e*x+d)+I*b*Pi*csgn(I*c*x^n)^3/d^3*e/(e*x+d)-1/2*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3/x-1/2*a*e/d^2/(e*x+d)^2-1/2*b*ln(c)*e/d
^2/(e*x+d)^2-b*n/d^3/x+1/2*b*e*n/d^3/(e*x+d)
```

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

$$-\frac{1}{2}\,a\left(\frac{6\,e^2x^2+9\,dex+2\,d^2}{d^3e^2x^3+2\,d^4ex^2+d^5x}-\frac{6\,e\log\left(ex+d\right)}{d^4}+\frac{6\,e\log\left(x\right)}{d^4}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^3x^5+3\,de^2x^4+3\,d^2ex^3+d^3x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*a*((6*e^2*x^2 + 9*d*e*x + 2*d^2)/(d^3*e^2*x^3 + 2*d^4*e*x^2 + d^5*x) -
 6*e*log(e*x + d)/d^4 + 6*e*log(x)/d^4) + b*integrate((log(c) + log(x^n))/(
e^3*x^5 + 3*d*e^2*x^4 + 3*d^2*e*x^3 + d^3*x^2), x)
```

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

$$\mathrm{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^3x^5+3\,de^2x^4+3\,d^2ex^3+d^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 97.3874, size = 425, normalized size = 2.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x+d)**3,x)
```

```
[Out] a*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**2 +
2*a*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**3 - a/
(d**3*x) + 3*a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**4
 - 3*a*e*log(x)/d**4 - b*e**2*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e
 + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/d**2 +
 b*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c*
x**n)/d**2 - 2*b*e**2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(
d/e + x)/(d*e), True))/d**3 + 2*b*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d
*e + e**2*x), True))*log(c*x**n)/d**3 - b*n/(d**3*x) - b*log(c*x**n)/(d**3*
x) - 3*b*e**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - poly
log(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2,
e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ())
, x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*
x*exp_polar(I*pi)/d), True))/e, True))/d**4 + 3*b*e**2*Piecewise((x/d, Eq(e
, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**4 + 3*b*e*n*log(x)**2/(2*d**4
) - 3*b*e*log(x)*log(c*x**n)/d**4
```

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

$$\int \frac{b\log(cx^n) + a}{(ex+d)^3 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.52 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^3}\,dx$

Optimal. Leaf size=217

$$\frac{6be^2n\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^5}-\frac{3e^3x\left(a+b\log\left(cx^n\right)\right)}{d^5(d+ex)}-\frac{6e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^5}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{2d^3(d+ex)^2}+\frac{3e\left(a+b\log\right.}{d^4x}$$

```
[Out] -(b*n)/(4*d^3*x^2) + (3*b*e*n)/(d^4*x) - (b*e^2*n)/(2*d^4*(d + e*x)) - (b*e
^2*n*Log[x])/(2*d^5) - (a + b*Log[c*x^n])/(2*d^3*x^2) + (3*e*(a + b*Log[c*x
^n]))/(d^4*x) + (e^2*(a + b*Log[c*x^n]))/(2*d^3*(d + e*x)^2) - (3*e^3*x*(a
+ b*Log[c*x^n]))/(d^5*(d + e*x)) - (6*e^2*Log[1 + d/(e*x)]*(a + b*Log[c*x^n
]))/d^5 + (7*b*e^2*n*Log[d + e*x])/(2*d^5) + (6*b*e^2*n*PolyLog[2, -(d/(e*x
))])/d^5
```

Rubi [A] time = 0.273624, antiderivative size = 239, normalized size of antiderivative = 1.1, number of steps used = 12, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$-\frac{6be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^5}-\frac{3e^3x\left(a+b\log\left(cx^n\right)\right)}{d^5(d+ex)}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)^2}{bd^5n}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{2d^3(d+ex)^2}-\frac{6e^2\log\left(\frac{ex}{d}+1\right)\left(a+b\right.}{d^5}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(4*d^3*x^2) + (3*b*e*n)/(d^4*x) - (b*e^2*n)/(2*d^4*(d + e*x)) - (b*e
^2*n*Log[x])/(2*d^5) - (a + b*Log[c*x^n])/(2*d^3*x^2) + (3*e*(a + b*Log[c*x
^n]))/(d^4*x) + (e^2*(a + b*Log[c*x^n]))/(2*d^3*(d + e*x)^2) - (3*e^3*x*(a
+ b*Log[c*x^n]))/(d^5*(d + e*x)) + (3*e^2*(a + b*Log[c*x^n])^2)/(b*d^5*n) +
 (7*b*e^2*n*Log[d + e*x])/(2*d^5) - (6*e^2*(a + b*Log[c*x^n])*Log[1 + (e*x)
/d])/d^5 - (6*b*e^2*n*PolyLog[2, -((e*x)/d)])/d^5
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^3}\,dx = \int\left(\frac{a+b\log(cx^n)}{d^3x^3} - \frac{3e(a+b\log(cx^n))}{d^4x^2} + \frac{6e^2(a+b\log(cx^n))}{d^5x} - \frac{e^3(a+b\log(cx^n))}{d^3(d+ex)^3} - \frac{3e^3(a+b}{d^4(d}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^4} + \frac{\left(6e^2\right)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^5} - \frac{\left(6e^3\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^5} - \frac{\left(3e^3\right)\int}{}$$

$$= -\frac{bn}{4d^3x^2} + \frac{3ben}{d^4x} - \frac{a+b\log(cx^n)}{2d^3x^2} + \frac{3e(a+b\log(cx^n))}{d^4x} + \frac{e^2(a+b\log(cx^n))}{2d^3(d+ex)^2} - \frac{3e^3x(a+b\log(c}{d^5(d+ex)}$$

$$= -\frac{bn}{4d^3x^2} + \frac{3ben}{d^4x} - \frac{a+b\log(cx^n)}{2d^3x^2} + \frac{3e(a+b\log(cx^n))}{d^4x} + \frac{e^2(a+b\log(cx^n))}{2d^3(d+ex)^2} - \frac{3e^3x(a+b\log(c}{d^5(d+ex)}$$

$$= -\frac{bn}{4d^3x^2} + \frac{3ben}{d^4x} - \frac{be^2n}{2d^4(d+ex)} - \frac{be^2n\log(x)}{2d^5} - \frac{a+b\log(cx^n)}{2d^3x^2} + \frac{3e(a+b\log(cx^n))}{d^4x} + \frac{e^2(a+b\log}{2d^3(d}$$

Mathematica [A] time = 0.369389, size = 227, normalized size = 1.05

$$-\frac{24be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right) - \frac{2d^2e^2(a+b\log(cx^n))}{(d+ex)^2} + \frac{2d^2(a+b\log(cx^n))}{x^2} - \frac{12de^2(a+b\log(cx^n))}{d+ex} + 24e^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) - \frac{12d}{}}{4d^5}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*d^2*n)/x^2 - (12*b*d*e*n)/x + (2*d^2*(a + b*Log[c*x^n]))/x^2 - (12*d*e
*(a + b*Log[c*x^n]))/x - (2*d^2*e^2*(a + b*Log[c*x^n]))/(d + e*x)^2 - (12*d
*e^2*(a + b*Log[c*x^n]))/(d + e*x) - (12*e^2*(a + b*Log[c*x^n])^2)/(b*n) +
12*b*e^2*n*(Log[x] - Log[d + e*x]) + (2*b*e^2*n*(d + (d + e*x)*Log[x] - (d
+ e*x)*Log[d + e*x]))/(d + e*x) + 24*e^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d
] + 24*b*e^2*n*PolyLog[2, -((e*x)/d)])/(4*d^5)
```

Maple [C] time = 0.174, size = 1119, normalized size = 5.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 6*b*n/d^5*e^2*ln(e*x+d)*ln(-e*x/d)-3*I*b*Pi*csgn(I*c*x^n)^3/d^5*e^2*ln(x)-1
/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3/x^2-1/2*a/d^3/x^2+1/4*I*b*Pi*csgn
(I*c*x^n)^3/d^3/x^2+3*b*ln(x^n)/d^4*e^2/(e*x+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x+d)^2-3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/d^5*e^2*ln(x)-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e/
x-3/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*e/x-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d
^3/x^2-3/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*e^2/(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^
3*e^2/d^3/(e*x+d)^2+3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e^2*ln
(e*x+d)-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2/(e*x+d)-3*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5*e^2*ln(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)^2*e^2/d^3/(e*x+d)^2-3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5*e^2
*ln(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/x^2+3*I*b*Pi*
csgn(I*c*x^n)^2*csgn(I*c)/d^5*e^2*ln(x)+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d^4*e^2/(e*x+d)+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e/x+1/4*I*b*Pi*c
sgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x+d)^2+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/d^4*e^2/(e*x+d)+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e/x+3*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5*e^2*ln(x)-1/2*b*ln(c)/d^3/x^2+3*I*b*Pi*
csgn(I*c*x^n)^3/d^5*e^2*ln(e*x+d)-1/2*b*ln(x^n)/d^3/x^2+3*a/d^4*e/x-6*a/d^5
*e^2*ln(e*x+d)+6*a/d^5*e^2*ln(x)+3*a/d^4*e^2/(e*x+d)+1/2*a*e^2/d^3/(e*x+d)^
2-7/2*b*e^2*n*ln(x)/d^5+7/2*b*e^2*n*ln(e*x+d)/d^5+6*b*ln(c)/d^5*e^2*ln(x)-6
*b*ln(c)/d^5*e^2*ln(e*x+d)+3*b*ln(c)/d^4*e^2/(e*x+d)+1/2*b*ln(c)*e^2/d^3/(e
*x+d)^2+3*b*ln(c)/d^4*e/x-3*b*n/d^5*e^2*ln(x)^2+6*b*n/d^5*e^2*dilog(-e*x/d)
+6*b*ln(x^n)/d^5*e^2*ln(x)+3*b*ln(x^n)/d^4*e/x+1/2*b*ln(x^n)*e^2/d^3/(e*x+d
)^2-6*b*ln(x^n)/d^5*e^2*ln(e*x+d)-1/4*b*n/d^3/x^2+3*b*e*n/d^4/x-1/2*b*e^2*n
/d^4/(e*x+d)
```

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

$$\frac{1}{2}\,a\left(\frac{12\,e^3x^3+18\,de^2x^2+4\,d^2ex-d^3}{d^4e^2x^4+2\,d^5ex^3+d^6x^2}-\frac{12\,e^2\log\left(ex+d\right)}{d^5}+\frac{12\,e^2\log\left(x\right)}{d^5}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^3x^6+3\,de^2x^5+3\,d^2ex^4+d^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*a*((12*e^3*x^3 + 18*d*e^2*x^2 + 4*d^2*e*x - d^3)/(d^4*e^2*x^4 + 2*d^5*e
*x^3 + d^6*x^2) - 12*e^2*log(e*x + d)/d^5 + 12*e^2*log(x)/d^5) + b*integrat
```

```
e((log(c) + log(x^n))/(e^3*x^6 + 3*d*e^2*x^5 + 3*d^2*e*x^4 + d^3*x^3), x)
```

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

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^3x^6+3\,de^2x^5+3\,d^2ex^4+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^6 + 3*d*e^2*x^5 + 3*d^2*e*x^4 + d^3*x^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((a+b*ln(c*x**n))/x**3/(e*x+d)**3,x)
```

```
[Out] Timed out
```

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

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex+d\right)^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.53 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=229

$$\frac{10bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^6}+\frac{d^2\log\left(\frac{ex}{d}+1\right)(60a+60b\log(cx^n)+47bn)}{6e^6}-\frac{x^4(5a+5b\log(cx^n)+bn)}{6e^2(d+ex)^2}-\frac{x^3(20a+20b\,\text{l}}{6e^3(a}$$

```
[Out] (10*b*d*n*x)/e^5 - (d*(60*a + 47*b*n)*x)/(6*e^5) - (5*b*n*x^2)/(2*e^4) - (1
0*b*d*x*Log[c*x^n])/e^5 - (x^5*(a + b*Log[c*x^n]))/(3*e*(d + e*x)^3) - (x^4
*(5*a + b*n + 5*b*Log[c*x^n]))/(6*e^2*(d + e*x)^2) - (x^3*(20*a + 9*b*n + 2
0*b*Log[c*x^n]))/(6*e^3*(d + e*x)) + (x^2*(60*a + 47*b*n + 60*b*Log[c*x^n])
)/(12*e^4) + (d^2*(60*a + 47*b*n + 60*b*Log[c*x^n])*Log[1 + (e*x)/d])/(6*e^
6) + (10*b*d^2*n*PolyLog[2, -((e*x)/d)])/e^6
```

Rubi [A] time = 0.319522, antiderivative size = 260, normalized size of antiderivative = 1.14, number of steps used = 15, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {43, 2351, 2295, 2304, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{10bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^6}+\frac{d^5(a+b\log(cx^n))}{3e^6(d+ex)^3}-\frac{5d^4(a+b\log(cx^n))}{2e^6(d+ex)^2}-\frac{10d^2x(a+b\log(cx^n))}{e^5(d+ex)}+\frac{10d^2\log\left(\frac{ex}{d}+1\right)(a\,-}{e^6}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (-4*a*d*x)/e^5 + (4*b*d*n*x)/e^5 - (b*n*x^2)/(4*e^4) - (b*d^4*n)/(6*e^6*(d
+ e*x)^2) + (13*b*d^3*n)/(6*e^6*(d + e*x)) + (13*b*d^2*n*Log[x])/(6*e^6) -
(4*b*d*x*Log[c*x^n])/e^5 + (x^2*(a + b*Log[c*x^n]))/(2*e^4) + (d^5*(a + b*L
og[c*x^n]))/(3*e^6*(d + e*x)^3) - (5*d^4*(a + b*Log[c*x^n]))/(2*e^6*(d + e*
x)^2) - (10*d^2*x*(a + b*Log[c*x^n]))/(e^5*(d + e*x)) + (47*b*d^2*n*Log[d +
 e*x])/(6*e^6) + (10*d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^6 + (10*b*d
^2*n*PolyLog[2, -((e*x)/d)])/e^6
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
```

```
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5 (a + b\log(cx^n))}{(d+ex)^4}\,dx = \int \left(-\frac{4d(a+b\log(cx^n))}{e^5} + \frac{x(a+b\log(cx^n))}{e^4} - \frac{d^5(a+b\log(cx^n))}{e^5(d+ex)^4} + \frac{5d^4(a+b\log(cx^n))}{e^5(d+ex)^3}\right.$$

$$= -\frac{(4d)\int (a+b\log(cx^n))\,dx}{e^5} + \frac{\left(10d^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^5} - \frac{\left(10d^3\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^5} + \frac{\left(5d^4\right)\int \frac{a}{}}{}$$

$$= -\frac{4adx}{e^5} - \frac{bnx^2}{4e^4} + \frac{x^2(a+b\log(cx^n))}{2e^4} + \frac{d^5(a+b\log(cx^n))}{3e^6(d+ex)^3} - \frac{5d^4(a+b\log(cx^n))}{2e^6(d+ex)^2} - \frac{10d^2x}{}$$

$$= -\frac{4adx}{e^5} + \frac{4bdnx}{e^5} - \frac{bnx^2}{4e^4} - \frac{4bdx\log(cx^n)}{e^5} + \frac{x^2(a+b\log(cx^n))}{2e^4} + \frac{d^5(a+b\log(cx^n))}{3e^6(d+ex)^3} - \frac{5d}{}$$

$$= -\frac{4adx}{e^5} + \frac{4bdnx}{e^5} - \frac{bnx^2}{4e^4} - \frac{bd^4n}{6e^6(d+ex)^2} + \frac{13bd^3n}{6e^6(d+ex)} + \frac{13bd^2n\log(x)}{6e^6} - \frac{4bdx\log(cx^n)}{e^5} +$$

Mathematica [A] time = 0.297395, size = 249, normalized size = 1.09

$$\frac{120bd^2n\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{4d^5(a+b\log(cx^n))}{(d+ex)^3} - \frac{30d^4(a+b\log(cx^n))}{(d+ex)^2} + \frac{120d^3(a+b\log(cx^n))}{d+ex} + 120d^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) + }{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] (-48*a*d*e*x + 48*b*d*e*n*x - 3*b*e^2*n*x^2 - 48*b*d*e*x*Log[c*x^n] + 6*e^2
*x^2*(a + b*Log[c*x^n]) + (4*d^5*(a + b*Log[c*x^n]))/(d + e*x)^3 - (30*d^4*
```

```
(a + b*Log[c*x^n]))/(d + e*x)^2 + (120*d^3*(a + b*Log[c*x^n]))/(d + e*x) -
2*b*d^2*n*((d*(3*d + 2*e*x))/(d + e*x)^2 + 2*Log[x] - 2*Log[d + e*x]) - 120
*b*d^2*n*(Log[x] - Log[d + e*x]) + 30*b*d^2*n*(d/(d + e*x) + Log[x] - Log[d
 + e*x]) + 120*d^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] + 120*b*d^2*n*PolyLo
g[2, -((e*x)/d)])/(12*e^6)
```

Maple [C] time = 0.204, size = 1153, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x+d)^4,x)
```

```
[Out] 5/4*I*b*Pi*csgn(I*c*x^n)^3/e^6*d^4/(e*x+d)^2-1/6*I*b*Pi*csgn(I*c*x^n)^3*d^5
/e^6/(e*x+d)^3-10*b*n/e^6*d^2*ln(e*x+d)*ln(-e*x/d)+1/2*a/e^4*x^2-5/2*b*ln(c
)/e^6*d^4/(e*x+d)^2+1/3*b*ln(c)*d^5/e^6/(e*x+d)^3+10*b*ln(c)/e^6*d^3/(e*x+d
)-4*b*ln(c)/e^5*d*x+10*b*ln(c)/e^6*d^2*ln(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3
/e^4*x^2-10*b*n/e^6*d^2*dilog(-e*x/d)+1/2*b*ln(x^n)/e^4*x^2-1/6*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^5/e^6/(e*x+d)^3-47/6*b*n/e^6*d^2*ln(e*x)+
47/6*b*n/e^6*d^2*ln(e*x+d)+13/6*b*n/e^6*d^3/(e*x+d)-1/6*b*n/e^6*d^4/(e*x+d)
^2-5*I*b*Pi*csgn(I*c*x^n)^3/e^6*d^2*ln(e*x+d)+2*I*b*Pi*csgn(I*c*x^n)^3/e^5*
d*x-5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^6*d^3/(e*x+d)+2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^5*d*x+5/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)/e^6*d^4/(e*x+d)^2-5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)/e^6*d^2*ln(e*x+d)-5/2*a/e^6*d^4/(e*x+d)^2+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/e^6*d^2*ln(e*x+d)+5*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^6*d^3/(e*x+d)
+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^6*d^3/(e*x+d)+5*I*b*Pi*csgn(I*c*x^n
)^2*csgn(I*c)/e^6*d^2*ln(e*x+d)-5/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^6*d^
4/(e*x+d)^2-2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^5*d*x-1/4*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)/e^4*x^2+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d
^5/e^6/(e*x+d)^3-2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^5*d*x-5/4*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2/e^6*d^4/(e*x+d)^2+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)*d^5/e^6/(e*x+d)^3-5*I*b*Pi*csgn(I*c*x^n)^3/e^6*d^3/(e*x+d)+1/4*I*b*Pi
*csgn(I*c*x^n)^2*csgn(I*c)/e^4*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e
^4*x^2+1/3*b*ln(x^n)*d^5/e^6/(e*x+d)^3+10*b*ln(x^n)/e^6*d^3/(e*x+d)+17/4*b*
n/e^6*d^2-4*b*ln(x^n)/e^5*d*x-5/2*b*ln(x^n)/e^6*d^4/(e*x+d)^2+1/3*a*d^5/e^6
/(e*x+d)^3+10*a/e^6*d^3/(e*x+d)-4*a/e^5*d*x+10*a/e^6*d^2*ln(e*x+d)+1/2*b*ln
(c)/e^4*x^2+10*b*ln(x^n)/e^6*d^2*ln(e*x+d)-1/4*b*n*x^2/e^4+4*b*d*n*x/e^5
```

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

$$\frac{1}{6}\,a\left(\frac{60\,d^3e^2x^2+105\,d^4ex+47\,d^5}{e^9x^3+3\,de^8x^2+3\,d^2e^7x+d^3e^6}+\frac{60\,d^2\log\left(ex+d\right)}{e^6}+\frac{3\left(ex^2-8\,dx\right)}{e^5}\right)+b\int\frac{x^5\log\left(c\right)+x^5\log\left(x^n\right)}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a*((60*d^3*e^2*x^2 + 105*d^4*e*x + 47*d^5)/(e^9*x^3 + 3*d*e^8*x^2 + 3*d
^2*e^7*x + d^3*e^6) + 60*d^2*log(e*x + d)/e^6 + 3*(e*x^2 - 8*d*x)/e^5) + b*
integrate((x^5*log(c) + x^5*log(x^n))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^
2 + 4*d^3*e*x + d^4), x)
```

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

$$\mathrm{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2
+ 4*d^3*e*x + d^4), x)
```

Sympy [A] time = 127.016, size = 598, normalized size = 2.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] -a*d**5*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/e**5 +
 5*a*d**4*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**5
 - 10*a*d**3*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**5
+ 10*a*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**5 - 4*a*d
```

```
*x/e**5 + a*x**2/(2*e**4) + b*d**5*n*Piecewise((x/d**4, Eq(e, 0)), (-3*d/(6
*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - 2*e*x/(6*d**4*e + 12*d**3*e*
*2*x + 6*d**2*e**3*x**2) - log(x)/(3*d**3*e) + log(d/e + x)/(3*d**3*e), Tru
e))/e**5 - b*d**5*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), Tru
e))*log(c*x**n)/e**5 - 5*b*d**4*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2
*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e**5
 + 5*b*d**4*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*lo
g(c*x**n)/e**5 + 10*b*d**3*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) +
 log(d/e + x)/(d*e), True))/e**5 - 10*b*d**3*Piecewise((x/d**2, Eq(e, 0)),
(-1/(d*e + e**2*x), True))*log(c*x**n)/e**5 - 10*b*d**2*n*Piecewise((x/d, E
q(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_polar(I*pi)/d), Ab
s(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x)
< 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()
), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d), True))/e, T
rue))/e**5 + 10*b*d**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))*l
og(c*x**n)/e**5 + 4*b*d*n*x/e**5 - 4*b*d*x*log(c*x**n)/e**5 - b*n*x**2/(4*e
**4) + b*x**2*log(c*x**n)/(2*e**4)
```

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

$$\int \frac{(b\log(cx^n) + a)x^5}{(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x + d)^4, x)
```

3.54 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=183

$$-\frac{4bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^5}-\frac{x^3\left(4a+4b\log\left(cx^n\right)+bn\right)}{6e^2(d+ex)^2}-\frac{x^2\left(12a+12b\log\left(cx^n\right)+7bn\right)}{6e^3(d+ex)}-\frac{d\log\left(\frac{ex}{d}+1\right)\left(12a+12b\log\right.}{3e^5}$$

```
[Out] (-4*b*n*x)/e^4 + ((12*a + 13*b*n)*x)/(3*e^4) + (4*b*x*Log[c*x^n])/e^4 - (x^
4*(a + b*Log[c*x^n]))/(3*e*(d + e*x)^3) - (x^3*(4*a + b*n + 4*b*Log[c*x^n])
)/(6*e^2*(d + e*x)^2) - (x^2*(12*a + 7*b*n + 12*b*Log[c*x^n]))/(6*e^3*(d +
e*x)) - (d*(12*a + 13*b*n + 12*b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*e^5) - (4
*b*d*n*PolyLog[2, -((e*x)/d)])/e^5
```

Rubi [A] time = 0.281067, antiderivative size = 211, normalized size of antiderivative = 1.15, number of steps used = 14, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {43, 2351, 2295, 2319, 44, 2314, 31, 2317, 2391}

$$-\frac{4bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^5}-\frac{d^4\left(a+b\log\left(cx^n\right)\right)}{3e^5(d+ex)^3}+\frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^5(d+ex)^2}+\frac{6dx\left(a+b\log\left(cx^n\right)\right)}{e^4(d+ex)}-\frac{4d\log\left(\frac{ex}{d}+1\right)\left(a+b\log\right.}{e^5}$$

Antiderivative was successfully verified.

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

```
[Out] (a*x)/e^4 - (b*n*x)/e^4 + (b*d^3*n)/(6*e^5*(d + e*x)^2) - (5*b*d^2*n)/(3*e^
5*(d + e*x)) - (5*b*d*n*Log[x])/(3*e^5) + (b*x*Log[c*x^n])/e^4 - (d^4*(a +
b*Log[c*x^n]))/(3*e^5*(d + e*x)^3) + (2*d^3*(a + b*Log[c*x^n]))/(e^5*(d + e
*x)^2) + (6*d*x*(a + b*Log[c*x^n]))/(e^4*(d + e*x)) - (13*b*d*n*Log[d + e*x
])/(3*e^5) - (4*d*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^5 - (4*b*d*n*PolyL
og[2, -((e*x)/d)])/e^5
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4 (a+b\log(cx^n))}{(d+ex)^4}\,dx = \int \left(\frac{a+b\log(cx^n)}{e^4} + \frac{d^4 (a+b\log(cx^n))}{e^4(d+ex)^4} - \frac{4d^3 (a+b\log(cx^n))}{e^4(d+ex)^3} + \frac{6d^2 (a+b\log(cx^n))}{e^4(d+ex)^2} - \right.$$
$$= \frac{\int (a+b\log(cx^n))\,dx}{e^4} - \frac{(4d)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^4} + \frac{\left(6d^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^4} - \frac{\left(4d^3\right)\int \frac{a+b\log(cx^n)}{(d+ex)^3}}{e^4}$$
$$= \frac{ax}{e^4} - \frac{d^4 (a+b\log(cx^n))}{3e^5(d+ex)^3} + \frac{2d^3 (a+b\log(cx^n))}{e^5(d+ex)^2} + \frac{6dx (a+b\log(cx^n))}{e^4(d+ex)} - \frac{4d (a+b\log(cx^n}{e^5}$$
$$= \frac{ax}{e^4} - \frac{bnx}{e^4} + \frac{bx\log(cx^n)}{e^4} - \frac{d^4 (a+b\log(cx^n))}{3e^5(d+ex)^3} + \frac{2d^3 (a+b\log(cx^n))}{e^5(d+ex)^2} + \frac{6dx (a+b\log(cx^n}{e^4(d+ex)}$$
$$= \frac{ax}{e^4} - \frac{bnx}{e^4} + \frac{bd^3n}{6e^5(d+ex)^2} - \frac{5bd^2n}{3e^5(d+ex)} - \frac{5bdn\log(x)}{3e^5} + \frac{bx\log(cx^n)}{e^4} - \frac{d^4 (a+b\log(cx^n))}{3e^5(d+ex)^3}$$

Mathematica [A] time = 0.244707, size = 207, normalized size = 1.13

$$\frac{-24bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right) - \frac{2d^4(a+b\log(cx^n))}{(d+ex)^3} + \frac{12d^3(a+b\log(cx^n))}{(d+ex)^2} - \frac{36d^2(a+b\log(cx^n))}{d+ex} - 24d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) + 6aex}{}$$

Antiderivative was successfully verified.

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

```
[Out] (6*a*e*x - 6*b*e*n*x + 6*b*e*x*Log[c*x^n] - (2*d^4*(a + b*Log[c*x^n]))/(d +
 e*x)^3 + (12*d^3*(a + b*Log[c*x^n]))/(d + e*x)^2 - (36*d^2*(a + b*Log[c*x^
n]))/(d + e*x) + b*d*n*((d*(3*d + 2*e*x))/(d + e*x)^2 + 2*Log[x] - 2*Log[d
+ e*x]) + 36*b*d*n*(Log[x] - Log[d + e*x]) - 12*b*d*n*(d/(d + e*x) + Log[x]
 - Log[d + e*x]) - 24*d*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 24*b*d*n*Poly
Log[2, -((e*x)/d)])/(6*e^5)
```

Maple [C] time = 0.198, size = 969, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 4*b*n/e^5*d*ln(e*x+d)*ln(-e*x/d)+2*b*ln(x^n)/e^5*d^3/(e*x+d)^2-1/3*b*ln(x^n
)*d^4/e^5/(e*x+d)^3-6*b*ln(x^n)/e^5*d^2/(e*x+d)-13/3*b*n/e^5*d*ln(e*x+d)-5/
3*b*n/e^5*d^2/(e*x+d)+4*b*n/e^5*d*dilog(-e*x/d)+13/3*b*n/e^5*d*ln(e*x)+1/6*
b*n/e^5*d^3/(e*x+d)^2-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^4*x+2*I*b*Pi*csgn(I*c*x^
n)^3/e^5*d*ln(e*x+d)-1/3*b*ln(c)*d^4/e^5/(e*x+d)^3-6*b*ln(c)/e^5*d^2/(e*x+d
)-4*b*ln(c)/e^5*d*ln(e*x+d)+2*b*ln(c)/e^5*d^3/(e*x+d)^2+2*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)/e^5*d*ln(e*x+d)+3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)/e^5*d^2/(e*x+d)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^5*
d^3/(e*x+d)^2+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^4/e^5/(e*x+d
)^3-I*b*Pi*csgn(I*c*x^n)^3/e^5*d^3/(e*x+d)^2-2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/e^5*d*ln(e*x+d)-3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^5*d^2/(e*x+d)
-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^4*x+I*b*Pi*csgn(I*c*x^n)^
2*csgn(I*c)/e^5*d^3/(e*x+d)^2-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^4/e^5/
(e*x+d)^3-2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^5*d*ln(e*x+d)+a/e^4*x-3*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^5*d^2/(e*x+d)+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)^2/e^5*d^3/(e*x+d)^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^4/e^5/(e*x+
d)^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*x+3*I*b*Pi*csgn(I*c*x^n)^3/
e^5*d^2/(e*x+d)-4*b*ln(x^n)/e^5*d*ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)/e^4*x+1/6*I*b*Pi*csgn(I*c*x^n)^3*d^4/e^5/(e*x+d)^3+b*ln(x^n)/e^4*x-6*
a/e^5*d^2/(e*x+d)-4*a/e^5*d*ln(e*x+d)+b*ln(c)/e^4*x+2*a/e^5*d^3/(e*x+d)^2-1
/3*a*d^4/e^5/(e*x+d)^3-b*n/e^5*d-b*n*x/e^4
```

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

$$-\frac{1}{3}\,a\left(\frac{18\,d^2e^2x^2+30\,d^3ex+13\,d^4}{e^8x^3+3\,de^7x^2+3\,d^2e^6x+d^3e^5}-\frac{3\,x}{e^4}+\frac{12\,d\log\left(ex+d\right)}{e^5}\right)+b\int\frac{x^4\log\left(c\right)+x^4\log\left(x^n\right)}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*a*((18*d^2*e^2*x^2 + 30*d^3*e*x + 13*d^4)/(e^8*x^3 + 3*d*e^7*x^2 + 3*d
^2*e^6*x + d^3*e^5) - 3*x/e^4 + 12*d*log(e*x + d)/e^5) + b*integrate((x^4*l
og(c) + x^4*log(x^n))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x +
```

```
d^4), x)
```

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

$$\text{integral}\left(\frac{bx^4\log\left(cx^n\right) + ax^4}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 73.0398, size = 544, normalized size = 2.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] a*d**4*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/e**4 -
4*a*d**3*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**4
+ 6*a*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**4 -
4*a*d*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**4 + a*x/e**4 -
b*d**4*n*Piecewise((x/d**4, Eq(e, 0)), (-3*d/(6*d**4*e + 12*d**3*e**2*x + 6
*d**2*e**3*x**2) - 2*e*x/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - l
og(x)/(3*d**3*e) + log(d/e + x)/(3*d**3*e), True))/e**4 + b*d**4*Piecewise(
(x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))*log(c*x**n)/e**4 + 4*b*d
**3*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2
*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e**4 - 4*b*d**3*Piecewise((x/d**
3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c*x**n)/e**4 - 6*b*d**2*n*
Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e
**4 + 6*b*d**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log
(c*x**n)/e**4 + 4*b*d*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x
) - polylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - pol
ylog(2, e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0,
 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polyl
og(2, e*x*exp_polar(I*pi)/d), True))/e, True))/e**4 - 4*b*d*Piecewise((x/d,
```

```
 Eq(e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/e**4 - b*n*x/e**4 + b*x*log
(c*x**n)/e**4
```

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

$$\int \frac{(b\log(cx^n) + a)x^4}{(ex + d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.55 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=141

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{x^2\left(3a+3b\log\left(cx^n\right)+bn\right)}{6e^2(d+ex)^2}-\frac{x\left(6a+6b\log\left(cx^n\right)+5bn\right)}{6e^3(d+ex)}+\frac{\log\left(\frac{ex}{d}+1\right)\left(6a+6b\log\left(cx^n\right)+11b\right.}{6e^4}$$

```
[Out] -(x^3*(a + b*Log[c*x^n]))/(3*e*(d + e*x)^3) - (x^2*(3*a + b*n + 3*b*Log[c*x
^n]))/(6*e^2*(d + e*x)^2) - (x*(6*a + 5*b*n + 6*b*Log[c*x^n]))/(6*e^3*(d +
e*x)) + ((6*a + 11*b*n + 6*b*Log[c*x^n])*Log[1 + (e*x)/d])/(6*e^4) + (b*n*P
olyLog[2, -((e*x)/d)])/e^4
```

Rubi [A] time = 0.254077, antiderivative size = 178, normalized size of antiderivative = 1.26, number of steps used = 12, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4(d+ex)^3}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{2e^4(d+ex)^2}-\frac{3x\left(a+b\log\left(cx^n\right)\right)}{e^3(d+ex)}+\frac{\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] -(b*d^2*n)/(6*e^4*(d + e*x)^2) + (7*b*d*n)/(6*e^4*(d + e*x)) + (7*b*n*Log[x
])/(6*e^4) + (d^3*(a + b*Log[c*x^n]))/(3*e^4*(d + e*x)^3) - (3*d^2*(a + b*L
og[c*x^n]))/(2*e^4*(d + e*x)^2) - (3*x*(a + b*Log[c*x^n]))/(e^3*(d + e*x))
+ (11*b*n*Log[d + e*x])/(6*e^4) + ((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4
 + (b*n*PolyLog[2, -((e*x)/d)])/e^4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
```

```
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^4}dx = \int \left(-\frac{d^3(a+b\log(cx^n))}{e^3(d+ex)^4}+\frac{3d^2(a+b\log(cx^n))}{e^3(d+ex)^3}-\frac{3d(a+b\log(cx^n))}{e^3(d+ex)^2}+\frac{a+b\log(cx^n)}{e^3(d+ex)}\right)dx$$

$$=\frac{\int \frac{a+b\log(cx^n)}{d+ex}dx}{e^3}-\frac{(3d)\int \frac{a+b\log(cx^n)}{(d+ex)^2}dx}{e^3}+\frac{(3d^2)\int \frac{a+b\log(cx^n)}{(d+ex)^3}dx}{e^3}-\frac{d^3\int \frac{a+b\log(cx^n)}{(d+ex)^4}dx}{e^3}$$

$$=\frac{d^3(a+b\log(cx^n))}{3e^4(d+ex)^3}-\frac{3d^2(a+b\log(cx^n))}{2e^4(d+ex)^2}-\frac{3x(a+b\log(cx^n))}{e^3(d+ex)}+\frac{(a+b\log(cx^n))\log(1+}{e^4}$$

$$=\frac{d^3(a+b\log(cx^n))}{3e^4(d+ex)^3}-\frac{3d^2(a+b\log(cx^n))}{2e^4(d+ex)^2}-\frac{3x(a+b\log(cx^n))}{e^3(d+ex)}+\frac{3bn\log(d+ex)}{e^4}+\frac{(a+}{}$$

$$=-\frac{bd^2n}{6e^4(d+ex)^2}+\frac{7bdn}{6e^4(d+ex)}+\frac{7bn\log(x)}{6e^4}+\frac{d^3(a+b\log(cx^n))}{3e^4(d+ex)^3}-\frac{3d^2(a+b\log(cx^n))}{2e^4(d+ex)^2}-$$

Mathematica [A] time = 0.219061, size = 179, normalized size = 1.27

$$\frac{6bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)+\frac{2d^3(a+b\log(cx^n))}{(d+ex)^3}-\frac{9d^2(a+b\log(cx^n))}{(d+ex)^2}+\frac{18d(a+b\log(cx^n))}{d+ex}+6\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))-bn\left(\frac{d(3d+2ex)}{(d+ex)^2}\right.}{6e^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^4,x]
```

```
[Out] ((2*d^3*(a + b*Log[c*x^n]))/(d + e*x)^3 - (9*d^2*(a + b*Log[c*x^n]))/(d + e
*x)^2 + (18*d*(a + b*Log[c*x^n]))/(d + e*x) - b*n*((d*(3*d + 2*e*x))/(d + e
*x)^2 + 2*Log[x] - 2*Log[d + e*x]) - 18*b*n*(Log[x] - Log[d + e*x]) + 9*b*n
*(d/(d + e*x) + Log[x] - Log[d + e*x]) + 6*(a + b*Log[c*x^n])*Log[1 + (e*x)
/d] + 6*b*n*PolyLog[2, -((e*x)/d)])/(6*e^4)
```

Maple [C] time = 0.158, size = 801, normalized size = 5.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x+d)^4,x)
```

```
[Out] -1/2*I*b*Pi*csgn(I*c*x^n)^3/e^4*ln(e*x+d)+1/3*b*ln(c)*d^3/e^4/(e*x+d)^3+3*b
*ln(c)*d/e^4/(e*x+d)-3/2*b*ln(c)*d^2/e^4/(e*x+d)^2+1/2*I*b*Pi*csgn(I*c*x^n)
```

```
^2*csgn(I*c)/e^4*ln(e*x+d)+3/4*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^4/(e*x+d)^2-3/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^4/(e*x+d)-11/6*b*n/e^4*ln(e
*x)+11/6*b*n/e^4*ln(e*x+d)-b*n/e^4*dilog(-e*x/d)+7/6*b*n*d/e^4/(e*x+d)-1/6*
b*n*d^2/e^4/(e*x+d)^2-b*n/e^4*ln(e*x+d)*ln(-e*x/d)+3/4*I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*d^2/e^4/(e*x+d)^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*d^3/e^4/(e*x+d)^3+a/e^4*ln(e*x+d)-3/2*I*b*Pi*csgn(I*c*x^n)^3*d
/e^4/(e*x+d)-1/6*I*b*Pi*csgn(I*c*x^n)^3*d^3/e^4/(e*x+d)^3+3/2*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)*d/e^4/(e*x+d)-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^
2/e^4/(e*x+d)^2+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^4/(e*x+d)+1/6*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^3/e^4/(e*x+d)^3-1/2*I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)/e^4*ln(e*x+d)-3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d
^2/e^4/(e*x+d)^2+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^4/(e*x+d)^3-3/2
*b*ln(x^n)*d^2/e^4/(e*x+d)^2+1/3*b*ln(x^n)*d^3/e^4/(e*x+d)^3+3*b*ln(x^n)*d/
e^4/(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^4*ln(e*x+d)+b*ln(x^n)/
e^4*ln(e*x+d)-3/2*a*d^2/e^4/(e*x+d)^2+1/3*a*d^3/e^4/(e*x+d)^3+3*a*d/e^4/(e*
x+d)+b*ln(c)/e^4*ln(e*x+d)
```

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

$$\frac{1}{6}\,a\left(\frac{18\,de^2x^2+27\,d^2ex+11\,d^3}{e^7x^3+3\,de^6x^2+3\,d^2e^5x+d^3e^4}+\frac{6\,\log\left(ex+d\right)}{e^4}\right)+b\int\frac{x^3\log\left(c\right)+x^3\log\left(x^n\right)}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a*((18*d*e^2*x^2 + 27*d^2*e*x + 11*d^3)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d^2*
e^5*x + d^3*e^4) + 6*log(e*x + d)/e^4) + b*integrate((x^3*log(c) + x^3*log(
x^n))/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

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

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="fricas")
```

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

Sympy [A] time = 66.2421, size = 500, normalized size = 3.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] -a*d**3*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/e**3 +
 3*a*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/e**3
 - 3*a*d*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/e**3 + a*
Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/e**3 + b*d**3*n*Piecewis
e((x/d**4, Eq(e, 0)), (-3*d/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2)
- 2*e*x/(6*d**4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - log(x)/(3*d**3*e)
+ log(d/e + x)/(3*d**3*e), True))/e**3 - b*d**3*Piecewise((x/d**4, Eq(e, 0)
), (-1/(3*e*(d + e*x)**3), True))*log(c*x**n)/e**3 - 3*b*d**2*n*Piecewise((
x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/
e + x)/(2*d**2*e), True))/e**3 + 3*b*d**2*Piecewise((x/d**3, Eq(e, 0)), (-1
/(2*e*(d + e*x)**2), True))*log(c*x**n)/e**3 + 3*b*d*n*Piecewise((x/d**2, E
q(e, 0)), (-log(x)/(d*e) + log(d/e + x)/(d*e), True))/e**3 - 3*b*d*Piecewis
e((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))*log(c*x**n)/e**3 - b*n*Pie
cewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - polylog(2, e*x*exp_pola
r(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x*exp_polar(I*pi)
/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meije
rg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x*exp_polar(I*pi)/d
), True))/e, True))/e**3 + b*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, Tr
ue))*log(c*x**n)/e**3
```

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

$$\int \frac{(b\log(cx^n)+a)x^3}{(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x + d)^4, x)
```

3.56 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=79

$$\frac{x^3\,(a+b\log\left(cx^n\right))}{3d(d+ex)^3}-\frac{2bn}{3e^3(d+ex)}+\frac{bdn}{6e^3(d+ex)^2}-\frac{bn\log(d+ex)}{3de^3}$$

```
[Out] (b*d*n)/(6*e^3*(d + e*x)^2) - (2*b*n)/(3*e^3*(d + e*x)) + (x^3*(a + b*Log[c
*x^n]))/(3*d*(d + e*x)^3) - (b*n*Log[d + e*x])/(3*d*e^3)
```

Rubi [A] time = 0.070735, antiderivative size = 79, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2335, 43}

$$\frac{x^3\,(a+b\log\left(cx^n\right))}{3d(d+ex)^3}-\frac{2bn}{3e^3(d+ex)}+\frac{bdn}{6e^3(d+ex)^2}-\frac{bn\log(d+ex)}{3de^3}$$

Antiderivative was successfully verified.

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

```
[Out] (b*d*n)/(6*e^3*(d + e*x)^2) - (2*b*n)/(3*e^3*(d + e*x)) + (x^3*(a + b*Log[c
*x^n]))/(3*d*(d + e*x)^3) - (b*n*Log[d + e*x])/(3*d*e^3)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^2 (a + b \log (cx^n))}{(d + ex)^4} dx = \frac{x^3 (a + b \log (cx^n))}{3d(d + ex)^3} - \frac{(bn) \int \frac{x^2}{(d+ex)^3} dx}{3d}$$
$$= \frac{x^3 (a + b \log (cx^n))}{3d(d + ex)^3} - \frac{(bn) \int \left(\frac{d^2}{e^2(d+ex)^3} - \frac{2d}{e^2(d+ex)^2} + \frac{1}{e^2(d+ex)}\right) dx}{3d}$$
$$= \frac{bdn}{6e^3(d + ex)^2} - \frac{2bn}{3e^3(d + ex)} + \frac{x^3 (a + b \log (cx^n))}{3d(d + ex)^3} - \frac{bn \log(d + ex)}{3de^3}$$

Mathematica [B] time = 0.115571, size = 172, normalized size = 2.18

$$-\frac{ad^2}{3e^3(d + ex)^3} + \frac{ad}{e^3(d + ex)^2} - \frac{a}{e^3(d + ex)} - \frac{bd^2 \log (cx^n)}{3e^3(d + ex)^3} + \frac{bd \log (cx^n)}{e^3(d + ex)^2} - \frac{b \log (cx^n)}{e^3(d + ex)} + \frac{bdn}{6e^3(d + ex)^2} - \frac{2bn}{3e^3(d + ex)} + \frac{bn}{}$$

Antiderivative was successfully verified.

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

```
[Out] -(a*d^2)/(3*e^3*(d + e*x)^3) + (a*d)/(e^3*(d + e*x)^2) + (b*d*n)/(6*e^3*(d
+ e*x)^2) - a/(e^3*(d + e*x)) - (2*b*n)/(3*e^3*(d + e*x)) + (b*n*Log[x])/(3
*d*e^3) - (b*d^2*Log[c*x^n])/(3*e^3*(d + e*x)^3) + (b*d*Log[c*x^n])/(e^3*(d
 + e*x)^2) - (b*Log[c*x^n])/(e^3*(d + e*x)) - (b*n*Log[d + e*x])/(3*d*e^3)
```

Maple [C] time = 0.131, size = 553, normalized size = 7.

$$-\frac{b\left(3\,e^2x^2 + 3\,dex + d^2\right)\ln(x^n)}{3\,(ex+d)^3\,e^3} - \frac{2\,ad^3 - 6\,\ln(-x)\,bde^2nx^2 - 6\,\ln(-x)\,bd^2enx + 6\,\ln(ex+d)\,bde^2nx^2 + 6\,\ln(ex+d)\,bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*b*(3*e^2*x^2+3*d*e*x+d^2)/(e*x+d)^3/e^3*ln(x^n)-1/6*(2*a*d^3-6*ln(-x)*
b*d*e^2*n*x^2-6*ln(-x)*b*d^2*e*n*x+6*ln(e*x+d)*b*d*e^2*n*x^2+6*ln(e*x+d)*b*
d^2*e*n*x+6*a*d*e^2*x^2+6*a*d^2*e*x+2*ln(c)*b*d^3+3*I*Pi*b*d*e^2*x^2*csgn(I
*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I*Pi*b*d
*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^2*csgn(
I*c)-3*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d^2*e*
x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6*ln(c)*b*d*e^2*x^2+6*ln(c)*b*d^2*e*x
```

```
+I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^
2+3*b*d^3*n-I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d*e^2*x
^2*csgn(I*c*x^n)^3-3*I*Pi*b*d^2*e*x*csgn(I*c*x^n)^3-I*Pi*b*d^3*csgn(I*c*x^n
)^3-2*ln(-x)*b*d^3*n+2*ln(e*x+d)*b*d^3*n-2*ln(-x)*b*e^3*n*x^3+2*ln(e*x+d)*b
*e^3*n*x^3+7*b*d^2*e*n*x+4*b*d*e^2*n*x^2)/d/e^3/(e*x+d)^3
```

Maxima [B] time = 1.13069, size = 242, normalized size = 3.06

$$-\frac{1}{6}\,bn\left(\frac{4\,ex+3\,d}{e^5x^2+2\,de^4x+d^2e^3}+\frac{2\,\log\left(ex+d\right)}{de^3}-\frac{2\,\log\left(x\right)}{de^3}\right)-\frac{\left(3\,e^2x^2+3\,dex+d^2\right)b\log\left(cx^n\right)}{3\left(e^6x^3+3\,de^5x^2+3\,d^2e^4x+d^3e^3\right)}-\frac{\left(3\,e^2x^2+3\,de\right.}{3\left(e^6x^3+3\,de^5x^2+3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.079, size = 392, normalized size = 4.96

$$\frac{2\,be^3nx^3\log\left(x\right)-3\,bd^3n-2\,ad^3-2\left(2\,bde^2n+3\,ade^2\right)x^2-\left(7\,bd^2en+6\,ad^2e\right)x-2\left(be^3nx^3+3\,bde^2nx^2+3\,bd^2enx+b\right.}{6\left(de^6x^3+3\,d^2e^5x^2+3\,d^3e^4x+d^4e^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 12.317, size = 646, normalized size = 8.18

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{x}-\frac{bn\log(x)}{x}-\frac{bn}{x}-\frac{b\log(c)}{x}\right) \\ \frac{\frac{ax^3}{3}+\frac{bnx^3\log(x)}{3}-\frac{bnx^3}{9}+\frac{bx^3\log(c)}{3}}{d^4} \\ \frac{-\frac{a}{x}-\frac{bn\log(x)}{x}-\frac{bn}{x}-\frac{b\log(c)}{x}}{e^4} \\ \frac{6ae^3x^3}{18d^4e^3+54d^3e^4x+54d^2e^5x^2+18de^6x^3}-\frac{6bd^3n\log\left(\frac{d}{e}+x\right)}{18d^4e^3+54d^3e^4x+54d^2e^5x^2+18de^6x^3}-\frac{5bd^3n}{18d^4e^3+54d^3e^4x+54d^2e^5x^2+18de^6x^3}-\frac{18bd^2enx\log\left(\frac{d}{e}+x\right)}{18d^4e^3+54d^3e^4x+54d^2e^5x^2+18de^6x^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] Piecewise((zoo*(-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x), Eq(d, 0) & Eq(e,
 0)), ((a*x**3/3 + b*n*x**3*log(x)/3 - b*n*x**3/9 + b*x**3*log(c)/3)/d**4,
Eq(e, 0)), ((-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x)/e**4, Eq(d, 0)), (6*
a*e**3*x**3/(18*d**4*e**3 + 54*d**3*e**4*x + 54*d**2*e**5*x**2 + 18*d*e**6*
x**3) - 6*b*d**3*n*log(d/e + x)/(18*d**4*e**3 + 54*d**3*e**4*x + 54*d**2*e*
*5*x**2 + 18*d*e**6*x**3) - 5*b*d**3*n/(18*d**4*e**3 + 54*d**3*e**4*x + 54*
d**2*e**5*x**2 + 18*d*e**6*x**3) - 18*b*d**2*e*n*x*log(d/e + x)/(18*d**4*e*
*3 + 54*d**3*e**4*x + 54*d**2*e**5*x**2 + 18*d*e**6*x**3) - 9*b*d**2*e*n*x/
(18*d**4*e**3 + 54*d**3*e**4*x + 54*d**2*e**5*x**2 + 18*d*e**6*x**3) - 18*b
*d*e**2*n*x**2*log(d/e + x)/(18*d**4*e**3 + 54*d**3*e**4*x + 54*d**2*e**5*x
**2 + 18*d*e**6*x**3) + 6*b*e**3*n*x**3*log(x)/(18*d**4*e**3 + 54*d**3*e**4
*x + 54*d**2*e**5*x**2 + 18*d*e**6*x**3) - 6*b*e**3*n*x**3*log(d/e + x)/(18
*d**4*e**3 + 54*d**3*e**4*x + 54*d**2*e**5*x**2 + 18*d*e**6*x**3) + 4*b*e**
3*n*x**3/(18*d**4*e**3 + 54*d**3*e**4*x + 54*d**2*e**5*x**2 + 18*d*e**6*x**
3) + 6*b*e**3*x**3*log(c)/(18*d**4*e**3 + 54*d**3*e**4*x + 54*d**2*e**5*x**
2 + 18*d*e**6*x**3), True))
```

Giac [B] time = 1.32263, size = 261, normalized size = 3.3

$$-\frac{2\,bnx^3e^3\log(xe+d)+6\,bdnx^2e^2\log(xe+d)+6\,bd^2nxe\log(xe+d)-2\,bnx^3e^3\log(x)+4\,bdnx^2e^2+7\,bd^2nxe+2\,bd^3n}{6\left(dx^3e^6+3\,d^2x^2e^5+3\,d^3xe\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*(2*b*n*x^3*e^3*log(x*e + d) + 6*b*d*n*x^2*e^2*log(x*e + d) + 6*b*d^2*n
*x*e*log(x*e + d) - 2*b*n*x^3*e^3*log(x) + 4*b*d*n*x^2*e^2 + 7*b*d^2*n*x*e
```

```
+ 2*b*d^3*n*log(x*e + d) + 6*b*d*x^2*e^2*log(c) + 6*b*d^2*x*e*log(c) + 3*b*
d^3*n + 6*a*d*x^2*e^2 + 6*a*d^2*x*e + 2*b*d^3*log(c) + 2*a*d^3)/(d*x^3*e^6
+ 3*d^2*x^2*e^5 + 3*d^3*x*e^4 + d^4*e^3)
```

3.57 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^4}\,dx$

Optimal. Leaf size=117

$$-\frac{a+b\log(cx^n)}{2e^2(d+ex)^2}+\frac{d(a+b\log(cx^n))}{3e^2(d+ex)^3}+\frac{bn\log(x)}{6d^2e^2}-\frac{bn\log(d+ex)}{6d^2e^2}+\frac{bn}{6de^2(d+ex)}-\frac{bn}{6e^2(d+ex)^2}$$

```
[Out] -(b*n)/(6*e^2*(d + e*x)^2) + (b*n)/(6*d*e^2*(d + e*x)) + (b*n*Log[x])/(6*d^
2*e^2) + (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x)^3) - (a + b*Log[c*x^n])/(2
*e^2*(d + e*x)^2) - (b*n*Log[d + e*x])/(6*d^2*e^2)
```

Rubi [A] time = 0.0871504, antiderivative size = 117, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {43, 2350, 12, 77}

$$-\frac{a+b\log(cx^n)}{2e^2(d+ex)^2}+\frac{d(a+b\log(cx^n))}{3e^2(d+ex)^3}+\frac{bn\log(x)}{6d^2e^2}-\frac{bn\log(d+ex)}{6d^2e^2}+\frac{bn}{6de^2(d+ex)}-\frac{bn}{6e^2(d+ex)^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(6*e^2*(d + e*x)^2) + (b*n)/(6*d*e^2*(d + e*x)) + (b*n*Log[x])/(6*d^
2*e^2) + (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x)^3) - (a + b*Log[c*x^n])/(2
*e^2*(d + e*x)^2) - (b*n*Log[d + e*x])/(6*d^2*e^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rubi steps

$$
\begin{aligned}
\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{(d+ex)^4}\,dx &= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3}-\frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2}-(bn)\int\frac{-d-3ex}{6e^2x(d+ex)^3}\,dx\\
&= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3}-\frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2}-\frac{(bn)\int\frac{-d-3ex}{x(d+ex)^3}\,dx}{6e^2}\\
&= \frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3}-\frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2}-\frac{(bn)\int\left(-\frac{1}{d^2x}-\frac{2e}{(d+ex)^3}+\frac{e}{d(d+ex)^2}+\frac{e}{d^2(d+ex)}\right)dx}{6e^2}\\
&= -\frac{bn}{6e^2(d+ex)^2}+\frac{bn}{6de^2(d+ex)}+\frac{bn\log(x)}{6d^2e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3}-\frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2}-\frac{bn\log(d}{6d^2e}
\end{aligned}
$$

Mathematica [A] time = 0.0897124, size = 135, normalized size = 1.15

$$
-\frac{a+b\log\left(cx^n\right)}{2e^2(d+ex)^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^3}-\frac{bn\left(-\frac{2\log(d+ex)}{d^2}+\frac{2\log(x)}{d^2}+\frac{2}{d(d+ex)}+\frac{1}{(d+ex)^2}\right)}{6e^2}+\frac{bn\left(-\frac{\log(d+ex)}{d^2}+\frac{\log(x)}{d^2}+\frac{1}{d(d+ex)}\right)}{2e^2}
$$

Antiderivative was successfully verified.

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

```
[Out] (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x)^3) - (a + b*Log[c*x^n])/(2*e^2*(d +
 e*x)^2) - (b*n*((d + e*x)^(-2) + 2/(d*(d + e*x)) + (2*Log[x])/d^2 - (2*Log
[d + e*x])/d^2))/(6*e^2) + (b*n*(1/(d*(d + e*x)) + Log[x]/d^2 - Log[d + e*x
]/d^2))/(2*e^2)
```

Maple [C] time = 0.115, size = 403, normalized size = 3.4

$$-\frac{b(3ex+d)\ln(x^n)}{6(ex+d)^3e^2}-\frac{3i\pi bd^2ex(\mathrm{csgn}(icx^n))^2\mathrm{csgn}(ic)+i\pi bd^3\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+i\pi bd^3(\mathrm{csgn}(icx^n))^2\mathrm{csgn}(ic}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*b*(3*e*x+d)/(e*x+d)^3/e^2*ln(x^n)-1/12*(3*I*Pi*b*d^2*e*x*csgn(I*c*x^n)
^2*csgn(I*c)+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^3*csgn(I*c*x^n
)^2*csgn(I*c)+3*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d^2*e*x
*csgn(I*c*x^n)^3-I*Pi*b*d^3*csgn(I*c*x^n)^3-I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-3*I*Pi*b*d^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*ln(e
*x+d)*b*e^3*n*x^3-2*ln(-x)*b*e^3*n*x^3+6*ln(e*x+d)*b*d*e^2*n*x^2-6*ln(-x)*b
*d*e^2*n*x^2+6*ln(e*x+d)*b*d^2*e*n*x-6*ln(-x)*b*d^2*e*n*x-2*b*d*e^2*n*x^2+6
*ln(c)*b*d^2*e*x+2*ln(e*x+d)*b*d^3*n-2*ln(-x)*b*d^3*n-2*b*d^2*e*n*x+2*ln(c)
*b*d^3+6*a*d^2*e*x+2*a*d^3)/e^2/d^2/(e*x+d)^3
```

Maxima [A] time = 1.15431, size = 203, normalized size = 1.74

$$\frac{1}{6}bn\left(\frac{x}{de^3x^2+2d^2e^2x+d^3e}-\frac{\log(ex+d)}{d^2e^2}+\frac{\log(x)}{d^2e^2}\right)-\frac{(3ex+d)b\log(cx^n)}{6(e^5x^3+3de^4x^2+3d^2e^3x+d^3e^2)}-\frac{(3ex+d)a}{6(e^5x^3+3de^4x^2+3d^2e^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.07109, size = 346, normalized size = 2.96

$$\frac{bde^2nx^2-ad^3+(bd^2en-3ad^2e)x-(be^3nx^3+3bde^2nx^2+3bd^2enx+bd^3n)\log(ex+d)-(3bd^2ex+bd^3)\log(c)+(be}{6(d^2e^5x^3+3d^3e^4x^2+3d^4e^3x+d^5e^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 11.6869, size = 799, normalized size = 6.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] Piecewise((zoo*(-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n/(4*x**2) - b*log(c)
/(2*x**2)), Eq(d, 0) & Eq(e, 0)), ((a*x**2/2 + b*n*x**2*log(x)/2 - b*n*x**2
/4 + b*x**2*log(c)/2)/d**4, Eq(e, 0)), ((-a/(2*x**2) - b*n*log(x)/(2*x**2)
- b*n/(4*x**2) - b*log(c)/(2*x**2))/e**4, Eq(d, 0)), (-3*a*d**3/(18*d**5*e*
*2 + 54*d**4*e**3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x**3) - 9*a*d**2*e*x
/(18*d**5*e**2 + 54*d**4*e**3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x**3) -
3*b*d**3*n*log(d/e + x)/(18*d**5*e**2 + 54*d**4*e**3*x + 54*d**3*e**4*x**2
+ 18*d**2*e**5*x**3) - b*d**3*n/(18*d**5*e**2 + 54*d**4*e**3*x + 54*d**3*e*
*4*x**2 + 18*d**2*e**5*x**3) - 9*b*d**2*e*n*x*log(d/e + x)/(18*d**5*e**2 +
54*d**4*e**3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x**3) + 9*b*d*e**2*n*x**2
*log(x)/(18*d**5*e**2 + 54*d**4*e**3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x
**3) - 9*b*d*e**2*n*x**2*log(d/e + x)/(18*d**5*e**2 + 54*d**4*e**3*x + 54*d
**3*e**4*x**2 + 18*d**2*e**5*x**3) + 9*b*d*e**2*x**2*log(c)/(18*d**5*e**2 +
 54*d**4*e**3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x**3) + 3*b*e**3*n*x**3*
log(x)/(18*d**5*e**2 + 54*d**4*e**3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x*
*3) - 3*b*e**3*n*x**3*log(d/e + x)/(18*d**5*e**2 + 54*d**4*e**3*x + 54*d**3
*e**4*x**2 + 18*d**2*e**5*x**3) - b*e**3*n*x**3/(18*d**5*e**2 + 54*d**4*e**
3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x**3) + 3*b*e**3*x**3*log(c)/(18*d**
5*e**2 + 54*d**4*e**3*x + 54*d**3*e**4*x**2 + 18*d**2*e**5*x**3), True))
```

Giac [A] time = 1.27931, size = 238, normalized size = 2.03

$$-\frac{bnx^3e^3\log\left(xe+d\right)+3\,bdnx^2e^2\log\left(xe+d\right)+3\,bd^2nxe\log\left(xe+d\right)-bnx^3e^3\log\left(x\right)-3\,bdnx^2e^2\log\left(x\right)-bdnx^2e^2-bd^2}{6\left(d^2x^3e^5+3\,d^3x^2e^4+3\,d^4xe^3+d^5e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.58 $\int \frac{a+b\log(cx^n)}{(d+ex)^4}\,dx$

Optimal. Leaf size=95

$$-\frac{a+b\log\left(cx^n\right)}{3e(d+ex)^3}+\frac{bn}{3d^2e(d+ex)}+\frac{bn\log(x)}{3d^3e}-\frac{bn\log(d+ex)}{3d^3e}+\frac{bn}{6de(d+ex)^2}$$

```
[Out] (b*n)/(6*d*e*(d + e*x)^2) + (b*n)/(3*d^2*e*(d + e*x)) + (b*n*Log[x])/(3*d^3
*e) - (a + b*Log[c*x^n])/(3*e*(d + e*x)^3) - (b*n*Log[d + e*x])/(3*d^3*e)
```

Rubi [A] time = 0.0411906, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2319, 44}

$$-\frac{a+b\log\left(cx^n\right)}{3e(d+ex)^3}+\frac{bn}{3d^2e(d+ex)}+\frac{bn\log(x)}{3d^3e}-\frac{bn\log(d+ex)}{3d^3e}+\frac{bn}{6de(d+ex)^2}$$

Antiderivative was successfully verified.

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

```
[Out] (b*n)/(6*d*e*(d + e*x)^2) + (b*n)/(3*d^2*e*(d + e*x)) + (b*n*Log[x])/(3*d^3
*e) - (a + b*Log[c*x^n])/(3*e*(d + e*x)^3) - (b*n*Log[d + e*x])/(3*d^3*e)
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] && !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex)^4}\,dx = -\frac{a+b\log(cx^n)}{3e(d+ex)^3} + \frac{(bn)\int \frac{1}{x(d+ex)^3}\,dx}{3e}$$
$$= -\frac{a+b\log(cx^n)}{3e(d+ex)^3} + \frac{(bn)\int \left(\frac{1}{d^3x} - \frac{e}{d(d+ex)^3} - \frac{e}{d^2(d+ex)^2} - \frac{e}{d^3(d+ex)}\right)dx}{3e}$$
$$= \frac{bn}{6de(d+ex)^2} + \frac{bn}{3d^2e(d+ex)} + \frac{bn\log(x)}{3d^3e} - \frac{a+b\log(cx^n)}{3e(d+ex)^3} - \frac{bn\log(d+ex)}{3d^3e}$$

Mathematica [A] time = 0.0740458, size = 66, normalized size = 0.69

$$\frac{\frac{bn\left(\frac{d(3d+2ex)}{(d+ex)^2}-2\log(d+ex)+2\log(x)\right)}{2d^3} - \frac{a+b\log(cx^n)}{(d+ex)^3}}{3e}$$

Antiderivative was successfully verified.

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

```
[Out] (-((a + b*Log[c*x^n])/(d + e*x)^3) + (b*n*((d*(3*d + 2*e*x))/(d + e*x)^2 +
2*Log[x] - 2*Log[d + e*x]))/(2*d^3))/(3*e)
```

Maple [C] time = 0.101, size = 284, normalized size = 3.

$$-\frac{b\ln(x^n)}{3\,(ex+d)^3\,e} - \frac{-i\pi bd^3\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic) + i\pi bd^3\,(\mathrm{csgn}(icx^n))^2\,\mathrm{csgn}(ic) + i\pi bd^3\mathrm{csgn}(ix^n)\,(\mathrm{csgn}(icx^n))^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*b/e/(e*x+d)^3*ln(x^n)-1/6*(-I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x
^n)^2-I*Pi*b*d^3*csgn(I*c*x^n)^3+2*ln(e*x+d)*b*e^3*n*x^3-2*ln(-x)*b*e^3*n*x
^3+6*ln(e*x+d)*b*d*e^2*n*x^2-6*ln(-x)*b*d*e^2*n*x^2+6*ln(e*x+d)*b*d^2*e*n*x
-6*ln(-x)*b*d^2*e*n*x-2*b*d*e^2*n*x^2+2*ln(e*x+d)*b*d^3*n-2*ln(-x)*b*d^3*n-
5*b*d^2*e*n*x+2*ln(c)*b*d^3-3*b*d^3*n+2*a*d^3)/d^3/e/(e*x+d)^3
```

Maxima [A] time = 1.17066, size = 194, normalized size = 2.04

$$\frac{1}{6}\,bn\left(\frac{2\,ex+3\,d}{d^2e^3x^2+2\,d^3e^2x+d^4e}-\frac{2\,\log\left(ex+d\right)}{d^3e}+\frac{2\,\log\left(x\right)}{d^3e}\right)-\frac{b\log\left(cx^n\right)}{3\,\left(e^4x^3+3\,de^3x^2+3\,d^2e^2x+d^3e\right)}-\frac{a}{3\,\left(e^4x^3+3\,de^3x^2+3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.08493, size = 356, normalized size = 3.75

$$\frac{2\,bde^2nx^2+5\,bd^2enx+3\,bd^3n-2\,bd^3\log\left(c\right)-2\,ad^3-2\,\left(be^3nx^3+3\,bde^2nx^2+3\,bd^2enx+bd^3n\right)\log\left(ex+d\right)+2\,\left(be^3n\right.}{6\,\left(d^3e^4x^3+3\,d^4e^3x^2+3\,d^5e^2x+d^6e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [A] time = 13.0407, size = 881, normalized size = 9.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**4,x)
```

```
[Out] Piecewise((zoo*(-a/(3*x**3) - b*n*log(x)/(3*x**3) - b*n/(9*x**3) - b*log(c)
/(3*x**3)), Eq(d, 0) & Eq(e, 0)), ((a*x + b*n*x*log(x) - b*n*x + b*x*log(c)
)/d**4, Eq(e, 0)), ((-a/(3*x**3) - b*n*log(x)/(3*x**3) - b*n/(9*x**3) - b*l
```

```
og(c)/(3*x**3))/e**4, Eq(d, 0)), (-6*a*d**3/(18*d**6*e + 54*d**5*e**2*x + 5
4*d**4*e**3*x**2 + 18*d**3*e**4*x**3) - 6*b*d**3*n*log(d/e + x)/(18*d**6*e
+ 54*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e**4*x**3) + 7*b*d**3*n/(18*
d**6*e + 54*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e**4*x**3) + 18*b*d**
2*e*n*x*log(x)/(18*d**6*e + 54*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e*
*4*x**3) - 18*b*d**2*e*n*x*log(d/e + x)/(18*d**6*e + 54*d**5*e**2*x + 54*d*
*4*e**3*x**2 + 18*d**3*e**4*x**3) + 9*b*d**2*e*n*x/(18*d**6*e + 54*d**5*e**
2*x + 54*d**4*e**3*x**2 + 18*d**3*e**4*x**3) + 18*b*d**2*e*x*log(c)/(18*d**
6*e + 54*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e**4*x**3) + 18*b*d*e**2
*n*x**2*log(x)/(18*d**6*e + 54*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e*
*4*x**3) - 18*b*d*e**2*n*x**2*log(d/e + x)/(18*d**6*e + 54*d**5*e**2*x + 54
*d**4*e**3*x**2 + 18*d**3*e**4*x**3) + 18*b*d*e**2*x**2*log(c)/(18*d**6*e +
 54*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e**4*x**3) + 6*b*e**3*n*x**3*
log(x)/(18*d**6*e + 54*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e**4*x**3)
 - 6*b*e**3*n*x**3*log(d/e + x)/(18*d**6*e + 54*d**5*e**2*x + 54*d**4*e**3*
x**2 + 18*d**3*e**4*x**3) - 2*b*e**3*n*x**3/(18*d**6*e + 54*d**5*e**2*x + 5
4*d**4*e**3*x**2 + 18*d**3*e**4*x**3) + 6*b*e**3*x**3*log(c)/(18*d**6*e + 5
4*d**5*e**2*x + 54*d**4*e**3*x**2 + 18*d**3*e**4*x**3), True))
```

Giac [B] time = 1.30056, size = 242, normalized size = 2.55

$$-\frac{2\,bnx^3e^3\log\left(xe+d\right)+6\,bdnx^2e^2\log\left(xe+d\right)+6\,bd^2nxe\log\left(xe+d\right)-2\,bnx^3e^3\log\left(x\right)-6\,bdnx^2e^2\log\left(x\right)-6\,bd^2nxe\,\mathrm{lo}}{6\left(d^3x^3e^4+3\,d^4x^2e^3+3\,d^5xe^2+d^6e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.59 $\int \frac{a+b\log(cx^n)}{x(d+ex)^4}\,dx$

Optimal. Leaf size=174

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^4}-\frac{\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^4}-\frac{ex(a+b\log(cx^n))}{d^4(d+ex)}+\frac{a+b\log(cx^n)}{2d^2(d+ex)^2}+\frac{a+b\log(cx^n)}{3d(d+ex)^3}-\frac{5bn}{6d^3(d+\dots}$$

```
[Out] -(b*n)/(6*d^2*(d + e*x)^2) - (5*b*n)/(6*d^3*(d + e*x)) - (5*b*n*Log[x])/(6*
d^4) + (a + b*Log[c*x^n])/(3*d*(d + e*x)^3) + (a + b*Log[c*x^n])/(2*d^2*(d
+ e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)) - (Log[1 + d/(e*x)]*(a
 + b*Log[c*x^n]))/d^4 + (11*b*n*Log[d + e*x])/(6*d^4) + (b*n*PolyLog[2, -(d
/(e*x))])/d^4
```

Rubi [A] time = 0.357489, antiderivative size = 196, normalized size of antiderivative = 1.13, number of steps used = 15, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31, 2319, 44}

$$-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^4}-\frac{ex(a+b\log(cx^n))}{d^4(d+ex)}+\frac{a+b\log(cx^n)}{2d^2(d+ex)^2}+\frac{(a+b\log(cx^n))^2}{2bd^4n}+\frac{a+\dots}{3\dots}$$

Antiderivative was successfully verified.

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

```
[Out] -(b*n)/(6*d^2*(d + e*x)^2) - (5*b*n)/(6*d^3*(d + e*x)) - (5*b*n*Log[x])/(6*
d^4) + (a + b*Log[c*x^n])/(3*d*(d + e*x)^3) + (a + b*Log[c*x^n])/(2*d^2*(d
+ e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^4*(d + e*x)) + (a + b*Log[c*x^n])^2
/(2*b*d^4*n) + (11*b*n*Log[d + e*x])/(6*d^4) - ((a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/d^4 - (b*n*PolyLog[2, -((e*x)/d)])/d^4
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
```

```
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^4}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^4}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex)^3}\,dx}{3d}$$

$$= \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{d^3} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^3} - \frac{(bn)\int \frac{1}{x(d+ex)^2}\,dx}{2d^2} - \frac{(b}{}$$

$$= -\frac{bn}{6d^2(d+ex)^2} - \frac{bn}{3d^3(d+ex)} - \frac{bn\log(x)}{3d^4} + \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} - \frac{ex(a+b\log(cx}{d^4(d+ex)}$$

$$= -\frac{bn}{6d^2(d+ex)^2} - \frac{5bn}{6d^3(d+ex)} - \frac{5bn\log(x)}{6d^4} + \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} - \frac{ex(a+b\log(c}{d^4(d+ex)}$$

$$= -\frac{bn}{6d^2(d+ex)^2} - \frac{5bn}{6d^3(d+ex)} - \frac{5bn\log(x)}{6d^4} + \frac{a+b\log(cx^n)}{3d(d+ex)^3} + \frac{a+b\log(cx^n)}{2d^2(d+ex)^2} - \frac{ex(a+b\log(c}{d^4(d+ex)}$$

Mathematica [A] time = 0.170912, size = 222, normalized size = 1.28

$$\frac{-6bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)+\frac{3a^2}{bn}+\frac{6a\log(cx^n)}{n}+\frac{2ad^3}{(d+ex)^3}+\frac{3ad^2}{(d+ex)^2}+\frac{6ad}{d+ex}-6a\log\left(\frac{ex}{d}+1\right)+\frac{2bd^3\log(cx^n)}{(d+ex)^3}+\frac{3bd^2\log(cx^n)}{(d+ex)^2}+\frac{6bd\log(}{d+e}}{6d^4}$$

Antiderivative was successfully verified.

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

```
[Out] ((3*a^2)/(b*n) + (2*a*d^3)/(d + e*x)^3 + (3*a*d^2)/(d + e*x)^2 - (b*d^2*n)/
(d + e*x)^2 + (6*a*d)/(d + e*x) - (5*b*d*n)/(d + e*x) - 11*b*n*Log[x] + (6*
a*Log[c*x^n])/n + (2*b*d^3*Log[c*x^n])/(d + e*x)^3 + (3*b*d^2*Log[c*x^n])/(
d + e*x)^2 + (6*b*d*Log[c*x^n])/(d + e*x) + (3*b*Log[c*x^n]^2)/n + 11*b*n*L
og[d + e*x] - 6*a*Log[1 + (e*x)/d] - 6*b*Log[c*x^n]*Log[1 + (e*x)/d] - 6*b*
n*PolyLog[2, -((e*x)/d)])/(6*d^4)
```

Maple [C] time = 0.164, size = 884, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*I*b*Pi*csgn(I*c*x^n)^3/d/(e*x+d)^3-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*ln(x
)-1/2*b*n/d^4*ln(x)^2+b*n/d^4*dilog(-e*x/d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)/d^4*ln(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/(e*x+d)^2+a/
d^3/(e*x+d)+1/2*a/d^2/(e*x+d)^2+1/3*a/d/(e*x+d)^3-a/d^4*ln(e*x+d)+a/d^4*ln(
x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*ln(e*x+d)+b*n/d^4*ln(e*x+d)*ln(-e*x/d)+1/
2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)/d^4*ln(x)+1/2*b*ln(x^n)/d^2/(e*x+d)^2+1/6*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2/d/(e*x+d)^3+b*ln(x^n)/d^3/(e*x+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3
/(e*x+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2/(e*x+d)^2-1/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)/d^2/(e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/d^4*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3/(e
*x+d)-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(e*x+d)^3-1/2*I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)/d^3/(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(e*x+d)^2-1/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*ln(e*x+d)+b*ln(c)/d^4*ln(x)-b*ln(c)
/d^4*ln(e*x+d)+1/3*b*ln(x^n)/d/(e*x+d)^3+b*ln(x^n)/d^4*ln(x)+1/6*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)/d/(e*x+d)^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d
^3/(e*x+d)+b*ln(c)/d^3/(e*x+d)+1/2*b*ln(c)/d^2/(e*x+d)^2+1/3*b*ln(c)/d/(e*x
+d)^3-b*ln(x^n)/d^4*ln(e*x+d)-11/6*b*n*ln(x)/d^4+11/6*b*n*ln(e*x+d)/d^4-1/6
*b*n/d^2/(e*x+d)^2-5/6*b*n/d^3/(e*x+d)
```

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

$$\frac{1}{6}a\left(\frac{6e^2x^2+15dex+11d^2}{d^3e^3x^3+3d^4e^2x^2+3d^5ex+d^6}-\frac{6\log(ex+d)}{d^4}+\frac{6\log(x)}{d^4}\right)+b\int\frac{\log(c)+\log(x^n)}{e^4x^5+4de^3x^4+6d^2e^2x^3+4d^3ex^2+d^4x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/6*a*((6*e^2*x^2 + 15*d*e*x + 11*d^2)/(d^3*e^3*x^3 + 3*d^4*e^2*x^2 + 3*d^5
*e*x + d^6) - 6*log(e*x + d)/d^4 + 6*log(x)/d^4) + b*integrate((log(c) + lo
g(x^n))/(e^4*x^5 + 4*d*e^3*x^4 + 6*d^2*e^2*x^3 + 4*d^3*e*x^2 + d^4*x), x)
```

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

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{4}x^{5}+4\,de^{3}x^{4}+6\,d^{2}e^{2}x^{3}+4\,d^{3}ex^{2}+d^{4}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^4*x^5 + 4*d*e^3*x^4 + 6*d^2*e^2*x^3 + 4*d^3*
e*x^2 + d^4*x), x)
```

Sympy [A] time = 130.542, size = 493, normalized size = 2.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x+d)**4,x)
```

```
[Out] -a*e*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/d - a*e*P
iecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**2 - a*e*Piec
ewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**3 - a*e*Piecewise((
x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d**4 + a*log(x)/d**4 - b*e**3*n*Pie
cewise((-1/(e**4*x), Eq(d, 0)), (-3*d/(6*d**2*e**3 + 12*d*e**4*x + 6*e**5*x
**2) - 4*e*x/(6*d**2*e**3 + 12*d*e**4*x + 6*e**5*x**2) - log(d + e*x)/(3*d*
e**3), True))/d**3 + b*e**3*Piecewise((1/(e**4*x), Eq(d, 0)), (-1/(3*d*(d/x
 + e)**3), True))*log(c*x**n)/d**3 + 3*b*e**2*n*Piecewise((-1/(e**3*x), Eq(
d, 0)), (-1/(2*d*e**2 + 2*e**3*x) - log(d + e*x)/(2*d*e**2), True))/d**3 -
3*b*e**2*Piecewise((1/(e**3*x), Eq(d, 0)), (-1/(2*d*(d/x + e)**2), True))*l
og(c*x**n)/d**3 - 3*b*e*n*Piecewise((-1/(e**2*x), Eq(d, 0)), (-log(d**2 + d
*e*x)/(d*e), True))/d**3 + 3*b*e*Piecewise((1/(e**2*x), Eq(d, 0)), (-1/(d**
2/x + d*e), True))*log(c*x**n)/d**3 + b*n*Piecewise((-1/(e*x), Eq(d, 0)), (
Piecewise((log(e)*log(x) + polylog(2, d*exp_polar(I*pi)/(e*x)), Abs(x) < 1)
, (-log(e)*log(1/x) + polylog(2, d*exp_polar(I*pi)/(e*x)), 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((),
 (0, 0)), x)*log(e) + polylog(2, d*exp_polar(I*pi)/(e*x)), True))/d, True))
/d**3 - b*Piecewise((1/(e*x), Eq(d, 0)), (log(d/x + e)/d, True))*log(c*x**n
)/d**3
```

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

$$\int \frac{b\log(cx^n) + a}{(ex + d)^4 x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.60 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^4}\,dx$

Optimal. Leaf size=211

$$-\frac{4ben\,\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^5}+\frac{3e^2x\,(a+b\log(cx^n))}{d^5(d+ex)}+\frac{4e\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^5}-\frac{e\,(a+b\log(cx^n))}{d^3(d+ex)^2}-\frac{e\,(a+b\log(\ldots}{3d^2(d+ex\ldots}$$

```
[Out] -((b*n)/(d^4*x)) + (b*e*n)/(6*d^3*(d + e*x)^2) + (4*b*e*n)/(3*d^4*(d + e*x)
) + (4*b*e*n*Log[x])/(3*d^5) - (a + b*Log[c*x^n])/(d^4*x) - (e*(a + b*Log[c
*x^n]))/(3*d^2*(d + e*x)^3) - (e*(a + b*Log[c*x^n]))/(d^3*(d + e*x)^2) + (3
*e^2*x*(a + b*Log[c*x^n]))/(d^5*(d + e*x)) + (4*e*Log[1 + d/(e*x)]*(a + b*L
og[c*x^n]))/d^5 - (13*b*e*n*Log[d + e*x])/(3*d^5) - (4*b*e*n*PolyLog[2, -(d
/(e*x))])/d^5
```

Rubi [A] time = 0.299759, antiderivative size = 231, normalized size of antiderivative = 1.09, number of steps used = 14, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$\frac{4ben\,\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^5}+\frac{3e^2x\,(a+b\log(cx^n))}{d^5(d+ex)}-\frac{2e\,(a+b\log(cx^n))^2}{bd^5n}-\frac{e\,(a+b\log(cx^n))}{d^3(d+ex)^2}-\frac{e\,(a+b\log(cx^n))}{3d^2(d+ex)^3}+\frac{4e\log\ldots}{\ldots}$$

Antiderivative was successfully verified.

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

```
[Out] -((b*n)/(d^4*x)) + (b*e*n)/(6*d^3*(d + e*x)^2) + (4*b*e*n)/(3*d^4*(d + e*x)
) + (4*b*e*n*Log[x])/(3*d^5) - (a + b*Log[c*x^n])/(d^4*x) - (e*(a + b*Log[c
*x^n]))/(3*d^2*(d + e*x)^3) - (e*(a + b*Log[c*x^n]))/(d^3*(d + e*x)^2) + (3
*e^2*x*(a + b*Log[c*x^n]))/(d^5*(d + e*x)) - (2*e*(a + b*Log[c*x^n])^2)/(b*
d^5*n) - (13*b*e*n*Log[d + e*x])/(3*d^5) + (4*e*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/d^5 + (4*b*e*n*PolyLog[2, -((e*x)/d)])/d^5
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^4}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^4x^2} - \frac{4e\,(a+b\log(cx^n))}{d^5x} + \frac{e^2\,(a+b\log(cx^n))}{d^2(d+ex)^4} + \frac{2e^2\,(a+b\log(cx^n))}{d^3(d+ex)^3} + \frac{3e^2\,(a+\ldots}{d^4(\ldots}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^4} - \frac{(4e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^5} + \frac{\left(4e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^5} + \frac{\left(3e^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^4} + \frac{\left(2e^2\right)\ldots}{\ldots}$$

$$= -\frac{bn}{d^4x} - \frac{a+b\log(cx^n)}{d^4x} - \frac{e\,(a+b\log(cx^n))}{3d^2(d+ex)^3} - \frac{e\,(a+b\log(cx^n))}{d^3(d+ex)^2} + \frac{3e^2x\,(a+b\log(cx^n))}{d^5(d+ex)} - \frac{2e\,(a\ldots}{\ldots}$$

$$= -\frac{bn}{d^4x} - \frac{a+b\log(cx^n)}{d^4x} - \frac{e\,(a+b\log(cx^n))}{3d^2(d+ex)^3} - \frac{e\,(a+b\log(cx^n))}{d^3(d+ex)^2} + \frac{3e^2x\,(a+b\log(cx^n))}{d^5(d+ex)} - \frac{2e\,(a\ldots}{\ldots}$$

$$= -\frac{bn}{d^4x} + \frac{ben}{6d^3(d+ex)^2} + \frac{4ben}{3d^4(d+ex)} + \frac{4ben\log(x)}{3d^5} - \frac{a+b\log(cx^n)}{d^4x} - \frac{e\,(a+b\log(cx^n))}{3d^2(d+ex)^3} - \frac{e\,(a\ldots}{d\ldots}$$

Mathematica [A] time = 0.273646, size = 231, normalized size = 1.09

$$\frac{24ben\text{PolyLog}\left(2,-\frac{ex}{d}\right) - \frac{2d^3e(a+b\log(cx^n))}{(d+ex)^3} - \frac{6d^2e(a+b\log(cx^n))}{(d+ex)^2} - \frac{18de(a+b\log(cx^n))}{d+ex} + 24e\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)) - \frac{6d(a+b\ldots}{\ldots}}{\ldots}$$

Antiderivative was successfully verified.

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

```
[Out] ((-6*b*d*n)/x - (6*d*(a + b*Log[c*x^n]))/x - (2*d^3*e*(a + b*Log[c*x^n]))/(
d + e*x)^3 - (6*d^2*e*(a + b*Log[c*x^n]))/(d + e*x)^2 - (18*d*e*(a + b*Log[
c*x^n]))/(d + e*x) - (12*e*(a + b*Log[c*x^n])^2)/(b*n) + b*e*n*((d*(3*d + 2
*e*x))/(d + e*x)^2 + 2*Log[x] - 2*Log[d + e*x]) + 18*b*e*n*(Log[x] - Log[d
+ e*x]) + 6*b*e*n*(d/(d + e*x) + Log[x] - Log[d + e*x]) + 24*e*(a + b*Log[c
*x^n])*Log[1 + (e*x)/d] + 24*b*e*n*PolyLog[2, -((e*x)/d)])/(6*d^5)
```

Maple [C] time = 0.174, size = 1083, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -4*b*n/d^5*e*ln(e*x+d)*ln(-e*x/d)+2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5*e*
ln(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^4/x+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*e/d^4/(e*x+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
/d^4/x-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*x+d)^3-2*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)/d^5*e*ln(x)+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*e/d^2/(e*x+d)^3-2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e*ln(e
*x+d)+2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e*ln(x)-b*ln(c)/d^3*
e/(e*x+d)^2+4*b*ln(c)/d^5*e*ln(e*x+d)-4*b*ln(c)/d^5*e*ln(x)-1/3*b*ln(c)*e/d
^2/(e*x+d)^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e/(e*x+d)^2
-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^4/(e*x+d)-1/6*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2*e/d^2/(e*x+d)^3-2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5*
e*ln(x)-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^4/(e*x+d)+2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)^2/d^5*e*ln(e*x+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
/d^3*e/(e*x+d)^2-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e/(e*x+d)^2-3*b*l
n(c)*e/d^4/(e*x+d)-2*I*b*Pi*csgn(I*c*x^n)^3/d^5*e*ln(e*x+d)+3/2*I*b*Pi*csgn
(I*c*x^n)^3*e/d^4/(e*x+d)+4*b*ln(x^n)/d^5*e*ln(e*x+d)-3*b*ln(x^n)*e/d^4/(e*
x+d)-b*ln(x^n)/d^3*e/(e*x+d)^2-4*b*ln(x^n)/d^5*e*ln(x)-1/3*b*ln(x^n)*e/d^2/
(e*x+d)^3-a/d^4/x-b*ln(x^n)/d^4/x+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*e/(e*x+d)^
2+2*I*b*Pi*csgn(I*c*x^n)^3/d^5*e*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
/d^4/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4/x+1/6*I*b*Pi*csgn(I*c*x^n
)^3*e/d^2/(e*x+d)^3-4*b*n/d^5*e*dilog(-e*x/d)+2*b*n/d^5*e*ln(x)^2-4*a/d^5*e
*ln(x)-a/d^3*e/(e*x+d)^2+4*a/d^5*e*ln(e*x+d)-1/3*a*e/d^2/(e*x+d)^3-3*a*e/d^
4/(e*x+d)-b*ln(c)/d^4/x+1/6*b*e*n/d^3/(e*x+d)^2+4/3*b*e*n/d^4/(e*x+d)+13/3*
b*e*n*ln(x)/d^5-13/3*b*e*n*ln(e*x+d)/d^5-b*n/d^4/x
```

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

$$-\frac{1}{3}\,a\left(\frac{12\,e^{3}x^{3}+30\,de^{2}x^{2}+22\,d^{2}ex+3\,d^{3}}{d^{4}e^{3}x^{4}+3\,d^{5}e^{2}x^{3}+3\,d^{6}ex^{2}+d^{7}x}-\frac{12\,e\log\left(ex+d\right)}{d^{5}}+\frac{12\,e\log\left(x\right)}{d^{5}}\right)+b\int\frac{\log\left(c\right)+\log\left(x^{n}\right)}{e^{4}x^{6}+4\,de^{3}x^{5}+6\,d^{2}e^{2}x^{4}+4\,d^{3}ex^{3}+$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/3*a*((12*e^3*x^3 + 30*d*e^2*x^2 + 22*d^2*e*x + 3*d^3)/(d^4*e^3*x^4 + 3*d
^5*e^2*x^3 + 3*d^6*e*x^2 + d^7*x) - 12*e*log(e*x + d)/d^5 + 12*e*log(x)/d^5
) + b*integrate((log(c) + log(x^n))/(e^4*x^6 + 4*d*e^3*x^5 + 6*d^2*e^2*x^4
```

```
+ 4*d^3*e*x^3 + d^4*x^2), x)
```

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

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^4x^6+4\,de^3x^5+6\,d^2e^2x^4+4\,d^3ex^3+d^4x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integral((b*log(c*x^n) + a)/(e^4*x^6 + 4*d*e^3*x^5 + 6*d^2*e^2*x^4 + 4*d^3*
e*x^3 + d^4*x^2), x)
```

Sympy [A] time = 140.599, size = 595, normalized size = 2.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x+d)**4,x)
```

```
[Out] a*e**2*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))/d**2 +
2*a*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))/d**3
+ 3*a*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(d*e + e**2*x), True))/d**4 -
a/(d**4*x) + 4*a*e**2*Piecewise((x/d, Eq(e, 0)), (log(d + e*x)/e, True))/d*
*5 - 4*a*e*log(x)/d**5 - b*e**2*n*Piecewise((x/d**4, Eq(e, 0)), (-3*d/(6*d*
*4*e + 12*d**3*e**2*x + 6*d**2*e**3*x**2) - 2*e*x/(6*d**4*e + 12*d**3*e**2*
x + 6*d**2*e**3*x**2) - log(x)/(3*d**3*e) + log(d/e + x)/(3*d**3*e), True))
/d**2 + b*e**2*Piecewise((x/d**4, Eq(e, 0)), (-1/(3*e*(d + e*x)**3), True))
*log(c*x**n)/d**2 - 2*b*e**2*n*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e
+ 2*d*e**2*x) - log(x)/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/d**3 +
2*b*e**2*Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*log(c
*x**n)/d**3 - 3*b*e**2*n*Piecewise((x/d**2, Eq(e, 0)), (-log(x)/(d*e) + log
(d/e + x)/(d*e), True))/d**4 + 3*b*e**2*Piecewise((x/d**2, Eq(e, 0)), (-1/(
d*e + e**2*x), True))*log(c*x**n)/d**4 - b*n/(d**4*x) - b*log(c*x**n)/(d**4
*x) - 4*b*e**2*n*Piecewise((x/d, Eq(e, 0)), (Piecewise((log(d)*log(x) - pol
ylog(2, e*x*exp_polar(I*pi)/d), Abs(x) < 1), (-log(d)*log(1/x) - polylog(2,
 e*x*exp_polar(I*pi)/d), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()
), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e
```

```
*x*exp_polar(I*pi)/d), True))/e, True))/d**5 + 4*b*e**2*Piecewise((x/d, Eq(
e, 0)), (log(d + e*x)/e, True))*log(c*x**n)/d**5 + 2*b*e*n*log(x)**2/d**5 -
 4*b*e*log(x)*log(c*x**n)/d**5
```

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

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex+d\right)^4x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.61 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^4}\,dx$

Optimal. Leaf size=263

$$\frac{10be^2n\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^6}-\frac{6e^3x\left(a+b\log\left(cx^n\right)\right)}{d^6(d+ex)}-\frac{10e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^6}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)}{2d^4(d+ex)^2}+\frac{e^2\left(a+b\right.}{3d^3(}$$

```
[Out] -(b*n)/(4*d^4*x^2) + (4*b*e*n)/(d^5*x) - (b*e^2*n)/(6*d^4*(d + e*x)^2) - (1
1*b*e^2*n)/(6*d^5*(d + e*x)) - (11*b*e^2*n*Log[x])/(6*d^6) - (a + b*Log[c*x
^n])/(2*d^4*x^2) + (4*e*(a + b*Log[c*x^n]))/(d^5*x) + (e^2*(a + b*Log[c*x^n
]))/(3*d^3*(d + e*x)^3) + (3*e^2*(a + b*Log[c*x^n]))/(2*d^4*(d + e*x)^2) -
(6*e^3*x*(a + b*Log[c*x^n]))/(d^6*(d + e*x)) - (10*e^2*Log[1 + d/(e*x)]*(a
+ b*Log[c*x^n]))/d^6 + (47*b*e^2*n*Log[d + e*x])/(6*d^6) + (10*b*e^2*n*Poly
Log[2, -(d/(e*x))])/d^6
```

Rubi [A] time = 0.346497, antiderivative size = 285, normalized size of antiderivative = 1.08, number of steps used = 15, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$-\frac{10be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^6}-\frac{6e^3x\left(a+b\log\left(cx^n\right)\right)}{d^6(d+ex)}+\frac{5e^2\left(a+b\log\left(cx^n\right)\right)^2}{bd^6n}+\frac{3e^2\left(a+b\log\left(cx^n\right)\right)}{2d^4(d+ex)^2}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)}{3d^3(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x)^4),x]
```

```
[Out] -(b*n)/(4*d^4*x^2) + (4*b*e*n)/(d^5*x) - (b*e^2*n)/(6*d^4*(d + e*x)^2) - (1
1*b*e^2*n)/(6*d^5*(d + e*x)) - (11*b*e^2*n*Log[x])/(6*d^6) - (a + b*Log[c*x
^n])/(2*d^4*x^2) + (4*e*(a + b*Log[c*x^n]))/(d^5*x) + (e^2*(a + b*Log[c*x^n
]))/(3*d^3*(d + e*x)^3) + (3*e^2*(a + b*Log[c*x^n]))/(2*d^4*(d + e*x)^2) -
(6*e^3*x*(a + b*Log[c*x^n]))/(d^6*(d + e*x)) + (5*e^2*(a + b*Log[c*x^n])^2)
/(b*d^6*n) + (47*b*e^2*n*Log[d + e*x])/(6*d^6) - (10*e^2*(a + b*Log[c*x^n])
*Log[1 + (e*x)/d])/d^6 - (10*b*e^2*n*PolyLog[2, -((e*x)/d)])/d^6
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
```

```
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^4}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^4x^3} - \frac{4e(a+b\log(cx^n))}{d^5x^2} + \frac{10e^2(a+b\log(cx^n))}{d^6x} - \frac{e^3(a+b\log(cx^n))}{d^3(d+ex)^4} - \frac{3e^3(a}{d^4}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d^4} - \frac{(4e)\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^5} + \frac{\left(10e^2\right)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^6} - \frac{\left(10e^3\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^6} - \frac{\left(6e^3\right.}{}$$

$$= -\frac{bn}{4d^4x^2} + \frac{4ben}{d^5x} - \frac{a+b\log(cx^n)}{2d^4x^2} + \frac{4e(a+b\log(cx^n))}{d^5x} + \frac{e^2(a+b\log(cx^n))}{3d^3(d+ex)^3} + \frac{3e^2(a+b\log(c}{2d^4(d+ex)^2}$$

$$= -\frac{bn}{4d^4x^2} + \frac{4ben}{d^5x} - \frac{a+b\log(cx^n)}{2d^4x^2} + \frac{4e(a+b\log(cx^n))}{d^5x} + \frac{e^2(a+b\log(cx^n))}{3d^3(d+ex)^3} + \frac{3e^2(a+b\log(c}{2d^4(d+ex)^2}$$

$$= -\frac{bn}{4d^4x^2} + \frac{4ben}{d^5x} - \frac{be^2n}{6d^4(d+ex)^2} - \frac{11be^2n}{6d^5(d+ex)} - \frac{11be^2n\log(x)}{6d^6} - \frac{a+b\log(cx^n)}{2d^4x^2} + \frac{4e(a+b\log}{d^5x}$$

Mathematica [A] time = 0.339154, size = 276, normalized size = 1.05

$$\frac{-120be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{4d^3e^2(a+b\log(cx^n))}{(d+ex)^3} + \frac{18d^2e^2(a+b\log(cx^n))}{(d+ex)^2} - \frac{6d^2(a+b\log(cx^n))}{x^2} + \frac{72de^2(a+b\log(cx^n))}{d+ex} - 120e^2\log\left(\frac{ex}{d}+1\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x)^4),x]
```

```
[Out] ((-3*b*d^2*n)/x^2 + (48*b*d*e*n)/x - (18*b*d*e^2*n)/(d + e*x) - (2*b*d*e^2*
n*(3*d + 2*e*x))/(d + e*x)^2 - 22*b*e^2*n*Log[x] - (6*d^2*(a + b*Log[c*x^n]
))/x^2 + (48*d*e*(a + b*Log[c*x^n]))/x + (4*d^3*e^2*(a + b*Log[c*x^n]))/(d
+ e*x)^3 + (18*d^2*e^2*(a + b*Log[c*x^n]))/(d + e*x)^2 + (72*d*e^2*(a + b*L
og[c*x^n]))/(d + e*x) + (60*e^2*(a + b*Log[c*x^n])^2)/(b*n) - 72*b*e^2*n*(L
og[x] - Log[d + e*x]) + 22*b*e^2*n*Log[d + e*x] - 120*e^2*(a + b*Log[c*x^n]
)*Log[1 + (e*x)/d] - 120*b*e^2*n*PolyLog[2, -((e*x)/d)])/(12*d^6)
```

Maple [C] time = 0.177, size = 1324, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x+d)^4,x)
```

```
[Out] 10*b*n/d^6*e^2*ln(e*x+d)*ln(-e*x/d)-10*b*ln(c)/d^6*e^2*ln(e*x+d)+6*b*ln(c)*
e^2/d^5/(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^4/x^2+5*I*b*Pi*csgn(I*c*x^n)^2
*csgn(I*c)/d^6*e^2*ln(x)+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*x+
d)^3+3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e^2/(e*x+d)^2+2*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2/d^5*e/x+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^6*e^2*
ln(x)+3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^5/(e*x+d)+1/4*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4/x^2+3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e
^2/d^5/(e*x+d)+3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2/(e*x+d)^2+1/6
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*x+d)^3-5*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)^2/d^6*e^2*ln(e*x+d)+2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5*e/
x-5*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^6*e^2*ln(e*x+d)-3*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*e^2/d^5/(e*x+d)+5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)/d^6*e^2*ln(e*x+d)-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*e^2/d^3/(e*x+d)^3-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2/(
e*x+d)^2-5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^6*e^2*ln(x)-2*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e/x-5*I*b*Pi*csgn(I*c*x^n)^3/d^6*
e^2*ln(x)-1/6*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3/(e*x+d)^3-2*I*b*Pi*csgn(I*c*x^
n)^3/d^5*e/x-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4/x^2-1/2*a/d^4/x^2-1/4
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4/x^2+5*I*b*Pi*csgn(I*c*x^n)^3/d^6*e^
2*ln(e*x+d)-3*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^5/(e*x+d)-3/4*I*b*Pi*csgn(I*c*x^
n)^3/d^4*e^2/(e*x+d)^2+3/2*b*ln(c)/d^4*e^2/(e*x+d)^2+1/3*b*ln(c)*e^2/d^3/(e
*x+d)^3+4*b*ln(c)/d^5*e/x+10*b*ln(c)/d^6*e^2*ln(x)-1/2*b*ln(x^n)/d^4/x^2+4*
a/d^5*e/x-10*a/d^6*e^2*ln(e*x+d)+10*a/d^6*e^2*ln(x)+6*a*e^2/d^5/(e*x+d)-5*b
*n/d^6*e^2*ln(x)^2+10*b*n/d^6*e^2*dilog(-e*x/d)+3/2*a/d^4*e^2/(e*x+d)^2+1/3
*a*e^2/d^3/(e*x+d)^3-1/2*b*ln(c)/d^4/x^2-10*b*ln(x^n)/d^6*e^2*ln(e*x+d)-47/
6*b*e^2*n*ln(x)/d^6+47/6*b*e^2*n*ln(e*x+d)/d^6+6*b*ln(x^n)*e^2/d^5/(e*x+d)+
3/2*b*ln(x^n)/d^4*e^2/(e*x+d)^2+1/3*b*ln(x^n)*e^2/d^3/(e*x+d)^3+10*b*ln(x^n
)/d^6*e^2*ln(x)+4*b*ln(x^n)/d^5*e/x-1/4*b*n/d^4/x^2+4*b*e*n/d^5/x-1/6*b*e^2
*n/d^4/(e*x+d)^2-11/6*b*e^2*n/d^5/(e*x+d)
```

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

$$\frac{1}{6}a\left(\frac{60\,e^4x^4+150\,de^3x^3+110\,d^2e^2x^2+15\,d^3ex-3\,d^4}{d^5e^3x^5+3\,d^6e^2x^4+3\,d^7ex^3+d^8x^2}-\frac{60\,e^2\log\left(ex+d\right)}{d^6}+\frac{60\,e^2\log\left(x\right)}{d^6}\right)+b\int\frac{\log\left(c\right)+\mathrm{l}}{e^4x^7+4\,de^3x^6+6\,d^2e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a*((60*e^4*x^4 + 150*d*e^3*x^3 + 110*d^2*e^2*x^2 + 15*d^3*e*x - 3*d^4)/
(d^5*e^3*x^5 + 3*d^6*e^2*x^4 + 3*d^7*e*x^3 + d^8*x^2) - 60*e^2*log(e*x + d)
/d^6 + 60*e^2*log(x)/d^6) + b*integrate((log(c) + log(x^n))/(e^4*x^7 + 4*d*
e^3*x^6 + 6*d^2*e^2*x^5 + 4*d^3*e*x^4 + d^4*x^3), x)
```

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

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{4}x^{7}+4\,de^{3}x^{6}+6\,d^{2}e^{2}x^{5}+4\,d^{3}ex^{4}+d^{4}x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^4*x^7 + 4*d*e^3*x^6 + 6*d^2*e^2*x^5 + 4*d^3*
e*x^4 + d^4*x^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((a+b*ln(c*x**n))/x**3/(e*x+d)**4,x)
```

```
[Out] Timed out
```

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

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex+d\right)^{4}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^4*x^3), x)
```

3.62 $\int \frac{x^8(a+b\log(cx^n))}{(d+ex)^7} dx$

Optimal. Leaf size=329

$$\frac{28bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^9}+\frac{d^2\log\left(\frac{ex}{d}+1\right)(280a+280b\log(cx^n)+341bn)}{10e^9}-\frac{x^7(8a+8b\log(cx^n)+bn)}{30e^2(d+ex)^5}-\frac{x^6(56a+5}{12}$$

```
[Out] (28*b*d*n*x)/e^8 - (d*(280*a + 341*b*n)*x)/(10*e^8) - (7*b*n*x^2)/e^7 - (28
*b*d*x*Log[c*x^n])/e^8 - (x^8*(a + b*Log[c*x^n]))/(6*e*(d + e*x)^6) - (x^7*
(8*a + b*n + 8*b*Log[c*x^n]))/(30*e^2*(d + e*x)^5) - (x^6*(56*a + 15*b*n +
56*b*Log[c*x^n]))/(120*e^3*(d + e*x)^4) - (x^5*(168*a + 73*b*n + 168*b*Log[
c*x^n]))/(180*e^4*(d + e*x)^3) + (x^2*(280*a + 341*b*n + 280*b*Log[c*x^n]))
/(20*e^7) - (x^4*(840*a + 533*b*n + 840*b*Log[c*x^n]))/(360*e^5*(d + e*x)^2
) - (x^3*(840*a + 743*b*n + 840*b*Log[c*x^n]))/(90*e^6*(d + e*x)) + (d^2*(2
80*a + 341*b*n + 280*b*Log[c*x^n])*Log[1 + (e*x)/d])/(10*e^9) + (28*b*d^2*n
*PolyLog[2, -((e*x)/d)])/e^9
```

Rubi [A] time = 0.639185, antiderivative size = 394, normalized size of antiderivative = 1.2, number of steps used = 24, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {43, 2351, 2295, 2304, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{28bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^9}-\frac{d^8(a+b\log(cx^n))}{6e^9(d+ex)^6}+\frac{8d^7(a+b\log(cx^n))}{5e^9(d+ex)^5}-\frac{7d^6(a+b\log(cx^n))}{e^9(d+ex)^4}+\frac{56d^5(a+b\log(cx^n))}{3e^9(d+ex)^3}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^8*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (-7*a*d*x)/e^8 + (7*b*d*n*x)/e^8 - (b*n*x^2)/(4*e^7) + (b*d^7*n)/(30*e^9*(d
 + e*x)^5) - (43*b*d^6*n)/(120*e^9*(d + e*x)^4) + (167*b*d^5*n)/(90*e^9*(d
+ e*x)^3) - (131*b*d^4*n)/(20*e^9*(d + e*x)^2) + (219*b*d^3*n)/(10*e^9*(d +
 e*x)) + (219*b*d^2*n*Log[x])/(10*e^9) - (7*b*d*x*Log[c*x^n])/e^8 + (x^2*(a
 + b*Log[c*x^n]))/(2*e^7) - (d^8*(a + b*Log[c*x^n]))/(6*e^9*(d + e*x)^6) +
(8*d^7*(a + b*Log[c*x^n]))/(5*e^9*(d + e*x)^5) - (7*d^6*(a + b*Log[c*x^n]))
/(e^9*(d + e*x)^4) + (56*d^5*(a + b*Log[c*x^n]))/(3*e^9*(d + e*x)^3) - (35*
d^4*(a + b*Log[c*x^n]))/(e^9*(d + e*x)^2) - (56*d^2*x*(a + b*Log[c*x^n]))/(
e^8*(d + e*x)) + (341*b*d^2*n*Log[d + e*x])/(10*e^9) + (28*d^2*(a + b*Log[c
*x^n])*Log[1 + (e*x)/d])/e^9 + (28*b*d^2*n*PolyLog[2, -((e*x)/d)])/e^9
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
```

```
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^8 (a+b\log(cx^n))}{(d+ex)^7}\,dx = \int \left(-\frac{7d(a+b\log(cx^n))}{e^8} + \frac{x(a+b\log(cx^n))}{e^7} + \frac{d^8(a+b\log(cx^n))}{e^8(d+ex)^7} - \frac{8d^7(a+b\log(cx^n))}{e^8(d+ex)^6}\right.$$

$$= -\frac{(7d)\int (a+b\log(cx^n))\,dx}{e^8} + \frac{\left(28d^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^8} - \frac{\left(56d^3\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^8} + \frac{\left(70d^4\right)\int}{}$$

$$= -\frac{7adx}{e^8} - \frac{bnx^2}{4e^7} + \frac{x^2(a+b\log(cx^n))}{2e^7} - \frac{d^8(a+b\log(cx^n))}{6e^9(d+ex)^6} + \frac{8d^7(a+b\log(cx^n))}{5e^9(d+ex)^5} - \frac{7d^6(a}{e^9}$$

$$= -\frac{7adx}{e^8} + \frac{7bdnx}{e^8} - \frac{bnx^2}{4e^7} - \frac{7bdx\log(cx^n)}{e^8} + \frac{x^2(a+b\log(cx^n))}{2e^7} - \frac{d^8(a+b\log(cx^n))}{6e^9(d+ex)^6} + \frac{8d}{}$$

$$= -\frac{7adx}{e^8} + \frac{7bdnx}{e^8} - \frac{bnx^2}{4e^7} + \frac{bd^7n}{30e^9(d+ex)^5} - \frac{43bd^6n}{120e^9(d+ex)^4} + \frac{167bd^5n}{90e^9(d+ex)^3} - \frac{131bd^4n}{20e^9(d+ex)^2}$$

Mathematica [A] time = 0.481012, size = 403, normalized size = 1.22

$$10080bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right) - \frac{60ad^8}{(d+ex)^6} + \frac{576ad^7}{(d+ex)^5} - \frac{2520ad^6}{(d+ex)^4} + \frac{6720ad^5}{(d+ex)^3} - \frac{12600ad^4}{(d+ex)^2} + \frac{20160ad^3}{d+ex} + 10080ad^2\log\left(\frac{ex}{d}+1\right) - 2520a$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^8*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (-2520*a*d*e*x + 2520*b*d*e*n*x + 180*a*e^2*x^2 - 90*b*e^2*n*x^2 - (60*a*d^
8)/(d + e*x)^6 + (576*a*d^7)/(d + e*x)^5 + (12*b*d^7*n)/(d + e*x)^5 - (2520
*a*d^6)/(d + e*x)^4 - (129*b*d^6*n)/(d + e*x)^4 + (6720*a*d^5)/(d + e*x)^3
+ (668*b*d^5*n)/(d + e*x)^3 - (12600*a*d^4)/(d + e*x)^2 - (2358*b*d^4*n)/(d
 + e*x)^2 + (20160*a*d^3)/(d + e*x) + (7884*b*d^3*n)/(d + e*x) - 12276*b*d^
2*n*Log[x] - 2520*b*d*e*x*Log[c*x^n] + 180*b*e^2*x^2*Log[c*x^n] - (60*b*d^8
*Log[c*x^n])/(d + e*x)^6 + (576*b*d^7*Log[c*x^n])/(d + e*x)^5 - (2520*b*d^6
*Log[c*x^n])/(d + e*x)^4 + (6720*b*d^5*Log[c*x^n])/(d + e*x)^3 - (12600*b*d
^4*Log[c*x^n])/(d + e*x)^2 + (20160*b*d^3*Log[c*x^n])/(d + e*x) + 12276*b*d
^2*n*Log[d + e*x] + 10080*a*d^2*Log[1 + (e*x)/d] + 10080*b*d^2*Log[c*x^n]*L
og[1 + (e*x)/d] + 10080*b*d^2*n*PolyLog[2, -((e*x)/d)])/(360*e^9)
```

Maple [C] time = 0.24, size = 1768, normalized size = 5.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^8*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -28/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^9*d^5/(e*x+d)^3+7/2*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^9*d^6/(e*x+d)^4-28*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)/e^9*d^3/(e*x+d)-28*b*n/e^9*d^2*ln(e*x+d)*ln(-e*
x/d)-7*b*ln(x^n)/e^8*d*x-1/6*b*ln(x^n)*d^8/e^9/(e*x+d)^6-1/4*I*b*Pi*csgn(I*
c*x^n)^3/e^7*x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^7*x^2-1/1
2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^8/e^9/(e*x+d)^6-7/2*I*b*Pi*csgn(I*c*
x^n)^2*csgn(I*c)/e^8*d*x+4/5*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^9*d^7/(e*x+
d)^5+28*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^3/(e*x+d)+14*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)/e^9*d^2*ln(e*x+d)-1/12*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
*d^8/e^9/(e*x+d)^6-35/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^4/(e*x+d)^
2+28/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^5/(e*x+d)^3-35/2*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)/e^9*d^4/(e*x+d)^2+28/3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I
*c)/e^9*d^5/(e*x+d)^3+14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^2*ln(e*x+
d)+4/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^7/(e*x+d)^5-7/2*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2/e^8*d*x+28*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^9*d^3
/(e*x+d)-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^9*d^6/(e*x+d)^4-7/2*I*b*P
i*csgn(I*c*x^n)^2*csgn(I*c)/e^9*d^6/(e*x+d)^4-7*b*ln(c)/e^8*d*x+28*b*ln(c)/
e^9*d^2*ln(e*x+d)-1/6*b*ln(c)*d^8/e^9/(e*x+d)^6+7/2*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)/e^8*d*x-14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e
^9*d^2*ln(e*x+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^7*x^2+1/12*I*b*Pi*c
```

```
sgn(I*c*x^n)^3*d^8/e^9/(e*x+d)^6+1/2*b*ln(x^n)/e^7*x^2-341/10*b*n/e^9*d^2*l
n(e*x)+341/10*b*n/e^9*d^2*ln(e*x+d)+219/10*b*n/e^9*d^3/(e*x+d)-131/20*b*n/e
^9*d^4/(e*x+d)^2+167/90*b*n/e^9*d^5/(e*x+d)^3-43/120*b*n/e^9*d^6/(e*x+d)^4+
1/30*b*n/e^9*d^7/(e*x+d)^5-28*b*n/e^9*d^2*dilog(-e*x/d)+1/2*a/e^7*x^2-28*I*
b*Pi*csgn(I*c*x^n)^3/e^9*d^3/(e*x+d)-4/5*I*b*Pi*csgn(I*c*x^n)^3/e^9*d^7/(e*
x+d)^5-28/3*I*b*Pi*csgn(I*c*x^n)^3/e^9*d^5/(e*x+d)^3-7*b*ln(c)/e^9*d^6/(e*x
+d)^4+56*b*ln(c)/e^9*d^3/(e*x+d)+8/5*b*ln(c)/e^9*d^7/(e*x+d)^5-14*I*b*Pi*cs
gn(I*c*x^n)^3/e^9*d^2*ln(e*x+d)+7/2*I*b*Pi*csgn(I*c*x^n)^3/e^8*d*x+28*b*ln(
x^n)/e^9*d^2*ln(e*x+d)+56/3*b*ln(c)/e^9*d^5/(e*x+d)^3-35*b*ln(c)/e^9*d^4/(e
*x+d)^2+35/2*I*b*Pi*csgn(I*c*x^n)^3/e^9*d^4/(e*x+d)^2+7/2*I*b*Pi*csgn(I*c*x
^n)^3/e^9*d^6/(e*x+d)^4-4/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^9*
d^7/(e*x+d)^5+1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^8/e^9/(e*x+
d)^6+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^7*x^2+35/2*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/e^9*d^4/(e*x+d)^2+56*a/e^9*d^3/(e*x+d)+8/5*a/e^9*d
^7/(e*x+d)^5-7*a/e^8*d*x+28*a/e^9*d^2*ln(e*x+d)-1/6*a*d^8/e^9/(e*x+d)^6-35*
a/e^9*d^4/(e*x+d)^2+8/5*b*ln(x^n)/e^9*d^7/(e*x+d)^5+29/4*b*n/e^9*d^2+56/3*b
*ln(x^n)/e^9*d^5/(e*x+d)^3-7*b*ln(x^n)/e^9*d^6/(e*x+d)^4+56*b*ln(x^n)/e^9*d
^3/(e*x+d)+56/3*a/e^9*d^5/(e*x+d)^3-7*a/e^9*d^6/(e*x+d)^4+1/2*b*ln(c)/e^7*x
^2-35*b*ln(x^n)/e^9*d^4/(e*x+d)^2-1/4*b*n*x^2/e^7+7*b*d*n*x/e^8
```

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

$$\frac{1}{30}\,a\left(\frac{1680\,d^3e^5x^5+7350\,d^4e^4x^4+13160\,d^5e^3x^3+11970\,d^6e^2x^2+5508\,d^7ex+1023\,d^8}{e^{15}x^6+6\,de^{14}x^5+15\,d^2e^{13}x^4+20\,d^3e^{12}x^3+15\,d^4e^{11}x^2+6\,d^5e^{10}x+d^6e^9}+\frac{840\,d^2\log\left(ex+d\right)}{e^9}+\frac{15\left(ex^2\right.}{e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/30*a*((1680*d^3*e^5*x^5 + 7350*d^4*e^4*x^4 + 13160*d^5*e^3*x^3 + 11970*d^
6*e^2*x^2 + 5508*d^7*e*x + 1023*d^8)/(e^15*x^6 + 6*d*e^14*x^5 + 15*d^2*e^13
*x^4 + 20*d^3*e^12*x^3 + 15*d^4*e^11*x^2 + 6*d^5*e^10*x + d^6*e^9) + 840*d^
2*log(e*x + d)/e^9 + 15*(e*x^2 - 14*d*x)/e^8) + b*integrate((x^8*log(c) + x
^8*log(x^n))/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5 + 35*d^3*e^4*x^4 + 35*
d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), x)
```

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

$$\text{integral}\left(\frac{bx^8\log\left(cx^n\right)+ax^8}{e^7x^7+7\,de^6x^6+21\,d^2e^5x^5+35\,d^3e^4x^4+35\,d^4e^3x^3+21\,d^5e^2x^2+7\,d^6ex+d^7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*x^8*log(c*x^n) + a*x^8)/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5
 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), 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(x**8*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

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

$$\int \frac{(b \log (cx^n) + a)x^8}{(ex + d)^7}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^8*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^8/(e*x + d)^7, x)
```

3.63 $\int \frac{x^7(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=285

$$-\frac{7bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^8}-\frac{x^6\left(7a+7b\log\left(cx^n\right)+bn\right)}{30e^2(d+ex)^5}-\frac{x^5\left(42a+42b\log\left(cx^n\right)+13bn\right)}{120e^3(d+ex)^4}-\frac{x^4\left(210a+210b\log\left(cx^n\right)+\right.}{360e^4(d+ex)^3}$$

```
[Out] (-7*b*n*x)/e^7 + ((140*a + 223*b*n)*x)/(20*e^7) + (7*b*x*Log[c*x^n])/e^7 -
(x^7*(a + b*Log[c*x^n]))/(6*e*(d + e*x)^6) - (x^6*(7*a + b*n + 7*b*Log[c*x^
n]))/(30*e^2*(d + e*x)^5) - (x^5*(42*a + 13*b*n + 42*b*Log[c*x^n]))/(120*e^
3*(d + e*x)^4) - (x^2*(140*a + 153*b*n + 140*b*Log[c*x^n]))/(40*e^6*(d + e*
x)) - (x^4*(210*a + 107*b*n + 210*b*Log[c*x^n]))/(360*e^4*(d + e*x)^3) - (x
^3*(420*a + 319*b*n + 420*b*Log[c*x^n]))/(360*e^5*(d + e*x)^2) - (d*(140*a
+ 223*b*n + 140*b*Log[c*x^n])*Log[1 + (e*x)/d])/(20*e^8) - (7*b*d*n*PolyLog
[2, -((e*x)/d)])/e^8
```

Rubi [A] time = 0.571391, antiderivative size = 351, normalized size of antiderivative = 1.23, number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {43, 2351, 2295, 2319, 44, 2314, 31, 2317, 2391}

$$-\frac{7bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^8}+\frac{d^7\left(a+b\log\left(cx^n\right)\right)}{6e^8(d+ex)^6}-\frac{7d^6\left(a+b\log\left(cx^n\right)\right)}{5e^8(d+ex)^5}+\frac{21d^5\left(a+b\log\left(cx^n\right)\right)}{4e^8(d+ex)^4}-\frac{35d^4\left(a+b\log\left(cx^n\right)\right)}{3e^8(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^7*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (a*x)/e^7 - (b*n*x)/e^7 - (b*d^6*n)/(30*e^8*(d + e*x)^5) + (37*b*d^5*n)/(12
0*e^8*(d + e*x)^4) - (241*b*d^4*n)/(180*e^8*(d + e*x)^3) + (153*b*d^3*n)/(4
0*e^8*(d + e*x)^2) - (197*b*d^2*n)/(20*e^8*(d + e*x)) - (197*b*d*n*Log[x])/
(20*e^8) + (b*x*Log[c*x^n])/e^7 + (d^7*(a + b*Log[c*x^n]))/(6*e^8*(d + e*x)
^6) - (7*d^6*(a + b*Log[c*x^n]))/(5*e^8*(d + e*x)^5) + (21*d^5*(a + b*Log[c
*x^n]))/(4*e^8*(d + e*x)^4) - (35*d^4*(a + b*Log[c*x^n]))/(3*e^8*(d + e*x)^
3) + (35*d^3*(a + b*Log[c*x^n]))/(2*e^8*(d + e*x)^2) + (21*d*x*(a + b*Log[c
*x^n]))/(e^7*(d + e*x)) - (223*b*d*n*Log[d + e*x])/(20*e^8) - (7*d*(a + b*L
og[c*x^n])*Log[1 + (e*x)/d])/e^8 - (7*b*d*n*PolyLog[2, -((e*x)/d)])/e^8
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^7 (a+b\log(cx^n))}{(d+ex)^7}\,dx = \int \left(\frac{a+b\log(cx^n)}{e^7} - \frac{d^7(a+b\log(cx^n))}{e^7(d+ex)^7} + \frac{7d^6(a+b\log(cx^n))}{e^7(d+ex)^6} - \frac{21d^5(a+b\log(cx^n))}{e^7(d+ex)^5} + \right.$$

$$= \frac{\int (a+b\log(cx^n))\,dx}{e^7} - \frac{(7d)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^7} + \frac{\left(21d^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^7} - \frac{\left(35d^3\right)\int \frac{a+b\log(cx^n)}{(d+ex)^3}}{e^7}$$

$$= \frac{ax}{e^7} + \frac{d^7(a+b\log(cx^n))}{6e^8(d+ex)^6} - \frac{7d^6(a+b\log(cx^n))}{5e^8(d+ex)^5} + \frac{21d^5(a+b\log(cx^n))}{4e^8(d+ex)^4} - \frac{35d^4(a+b\log(}{3e^8(d+ex)^3}$$

$$= \frac{ax}{e^7} - \frac{bnx}{e^7} + \frac{bx\log(cx^n)}{e^7} + \frac{d^7(a+b\log(cx^n))}{6e^8(d+ex)^6} - \frac{7d^6(a+b\log(cx^n))}{5e^8(d+ex)^5} + \frac{21d^5(a+b\log(cx}{4e^8(d+ex)^4}$$

$$= \frac{ax}{e^7} - \frac{bnx}{e^7} - \frac{bd^6n}{30e^8(d+ex)^5} + \frac{37bd^5n}{120e^8(d+ex)^4} - \frac{241bd^4n}{180e^8(d+ex)^3} + \frac{153bd^3n}{40e^8(d+ex)^2} - \frac{197bd^2n}{20e^8(d+e}$$

Mathematica [A] time = 0.566353, size = 356, normalized size = 1.25

$$-\frac{2520bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right) - \frac{60ad^7}{(d+ex)^6} + \frac{504ad^6}{(d+ex)^5} - \frac{1890ad^5}{(d+ex)^4} + \frac{4200ad^4}{(d+ex)^3} - \frac{6300ad^3}{(d+ex)^2} + \frac{7560ad^2}{d+ex} + 2520ad\log\left(\frac{ex}{d}+1\right) - 360aex - }{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^7*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(-360*a*e*x + 360*b*e*n*x - (60*a*d^7)/(d + e*x)^6 + (504*a*d^6)/(d + e*x)
^5 + (12*b*d^6*n)/(d + e*x)^5 - (1890*a*d^5)/(d + e*x)^4 - (111*b*d^5*n)/(d
 + e*x)^4 + (4200*a*d^4)/(d + e*x)^3 + (482*b*d^4*n)/(d + e*x)^3 - (6300*a*
d^3)/(d + e*x)^2 - (1377*b*d^3*n)/(d + e*x)^2 + (7560*a*d^2)/(d + e*x) + (3
```

```
546*b*d^2*n)/(d + e*x) - 4014*b*d*n*Log[x] - 360*b*e*x*Log[c*x^n] - (60*b*d
^7*Log[c*x^n])/(d + e*x)^6 + (504*b*d^6*Log[c*x^n])/(d + e*x)^5 - (1890*b*d
^5*Log[c*x^n])/(d + e*x)^4 + (4200*b*d^4*Log[c*x^n])/(d + e*x)^3 - (6300*b*
d^3*Log[c*x^n])/(d + e*x)^2 + (7560*b*d^2*Log[c*x^n])/(d + e*x) + 4014*b*d*
n*Log[d + e*x] + 2520*a*d*Log[1 + (e*x)/d] + 2520*b*d*Log[c*x^n]*Log[1 + (e
*x)/d] + 2520*b*d*n*PolyLog[2, -((e*x)/d)])/(360*e^8)
```

Maple [C] time = 0.23, size = 1584, normalized size = 5.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -21/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^8*d^5/(e*x+d)^4-21/2*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^2/(e*x+d)-7/2*I*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)/e^8*d*ln(e*x+d)-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d
^7/e^8/(e*x+d)^6+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^8*d*ln(e*
x+d)+7*b*n/e^8*d*ln(e*x+d)*ln(-e*x/d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^7*x-7*b*
ln(x^n)/e^8*d*ln(e*x+d)-21*b*ln(x^n)/e^8*d^2/(e*x+d)-7/5*b*ln(x^n)/e^8*d^6/
(e*x+d)^5+21/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^5/(e*x+d)^4+21/8*I*
b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^5/(e*x+d)^4+7/10*I*b*Pi*csgn(I*c*x^n)^
3/e^8*d^6/(e*x+d)^5-35/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^4/(e*x+d)^3
-21/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^2/(e*x+d)+1/12*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2*d^7/e^8/(e*x+d)^6+1/12*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
*d^7/e^8/(e*x+d)^6+35/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^3/(e*x+d)^2-
7/10*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^8*d^6/(e*x+d)^5-1/2*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)/e^7*x-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^
8*d*ln(e*x+d)-b*n/e^8*d-21/8*I*b*Pi*csgn(I*c*x^n)^3/e^8*d^5/(e*x+d)^4+1/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^7*x+7/2*I*b*Pi*csgn(I*c*x^n)^3/e^8*d*ln
(e*x+d)+35/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^3/(e*x+d)^2-35/6*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^8*d^4/(e*x+d)^3+7/10*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)/e^8*d^6/(e*x+d)^5+223/20*b*n/e^8*d*ln(e*x)-223/20*b*n
/e^8*d*ln(e*x+d)-197/20*b*n/e^8*d^2/(e*x+d)+153/40*b*n/e^8*d^3/(e*x+d)^2-24
1/180*b*n/e^8*d^4/(e*x+d)^3+37/120*b*n/e^8*d^5/(e*x+d)^4-1/30*b*n/e^8*d^6/(
e*x+d)^5+7*b*n/e^8*d*dilog(-e*x/d)+21/4*a/e^8*d^5/(e*x+d)^4-21*a/e^8*d^2/(e
*x+d)-7/5*a/e^8*d^6/(e*x+d)^5-7*a/e^8*d*ln(e*x+d)+1/6*a*d^7/e^8/(e*x+d)^6+3
5/2*a/e^8*d^3/(e*x+d)^2-35/3*a/e^8*d^4/(e*x+d)^3+b*ln(c)/e^7*x+21/2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^8*d^2/(e*x+d)-7/10*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2/e^8*d^6/(e*x+d)^5+b*ln(x^n)/e^7*x-7*b*ln(c)/e^8*d*ln(e*x+d
)+1/6*b*ln(c)*d^7/e^8/(e*x+d)^6+35/2*b*ln(c)/e^8*d^3/(e*x+d)^2-35/3*b*ln(c)
```

```
/e^8*d^4/(e*x+d)^3+21/4*b*ln(c)/e^8*d^5/(e*x+d)^4-21*b*ln(c)/e^8*d^2/(e*x+d
)-7/5*b*ln(c)/e^8*d^6/(e*x+d)^5+35/6*I*b*Pi*csgn(I*c*x^n)^3/e^8*d^4/(e*x+d)
^3+21/2*I*b*Pi*csgn(I*c*x^n)^3/e^8*d^2/(e*x+d)+a/e^7*x-1/12*I*b*Pi*csgn(I*c
*x^n)^3*d^7/e^8/(e*x+d)^6+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^7*x-35/4*I
*b*Pi*csgn(I*c*x^n)^3/e^8*d^3/(e*x+d)^2-35/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)/e^8*d^3/(e*x+d)^2+35/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)/e^8*d^4/(e*x+d)^3+1/6*b*ln(x^n)*d^7/e^8/(e*x+d)^6+35/2*b*ln(x^n)/e^8*d^
3/(e*x+d)^2-35/3*b*ln(x^n)/e^8*d^4/(e*x+d)^3+21/4*b*ln(x^n)/e^8*d^5/(e*x+d)
^4-b*n*x/e^7
```

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

$$-\frac{1}{60}a\left(\frac{1260\,d^2e^5x^5+5250\,d^3e^4x^4+9100\,d^4e^3x^3+8085\,d^5e^2x^2+3654\,d^6ex+669\,d^7}{e^{14}x^6+6\,de^{13}x^5+15\,d^2e^{12}x^4+20\,d^3e^{11}x^3+15\,d^4e^{10}x^2+6\,d^5e^9x+d^6e^8}-\frac{60\,x}{e^7}+\frac{420\,d\log\left(ex+d\right)}{e^8}\right)+b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] -1/60*a*((1260*d^2*e^5*x^5 + 5250*d^3*e^4*x^4 + 9100*d^4*e^3*x^3 + 8085*d^5
*e^2*x^2 + 3654*d^6*e*x + 669*d^7)/(e^14*x^6 + 6*d*e^13*x^5 + 15*d^2*e^12*x
^4 + 20*d^3*e^11*x^3 + 15*d^4*e^10*x^2 + 6*d^5*e^9*x + d^6*e^8) - 60*x/e^7
+ 420*d*log(e*x + d)/e^8) + b*integrate((x^7*log(c) + x^7*log(x^n))/(e^7*x^
7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5
*e^2*x^2 + 7*d^6*e*x + d^7), x)
```

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

$$\text{integral}\left(\frac{bx^7\log\left(cx^n\right)+ax^7}{e^7x^7+7\,de^6x^6+21\,d^2e^5x^5+35\,d^3e^4x^4+35\,d^4e^3x^3+21\,d^5e^2x^2+7\,d^6ex+d^7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*x^7*log(c*x^n) + a*x^7)/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5
 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), 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(x**7*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

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

$$\int \frac{(b\log(cx^n) + a)x^7}{(ex + d)^7} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^7/(e*x + d)^7, x)
```

3.64 $\int \frac{x^6(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=243

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^7}-\frac{x^5\left(6a+6b\log\left(cx^n\right)+bn\right)}{30e^2(d+ex)^5}-\frac{x^4\left(30a+30b\log\left(cx^n\right)+11bn\right)}{120e^3(d+ex)^4}-\frac{x^3\left(60a+60b\log\left(cx^n\right)+37bn\right)}{180e^4(d+ex)^3}$$

```
[Out] -(x^6*(a + b*Log[c*x^n]))/(6*e*(d + e*x)^6) - (x^5*(6*a + b*n + 6*b*Log[c*x
^n]))/(30*e^2*(d + e*x)^5) - (x^2*(20*a + 19*b*n + 20*b*Log[c*x^n]))/(40*e^
5*(d + e*x)^2) - (x*(20*a + 29*b*n + 20*b*Log[c*x^n]))/(20*e^6*(d + e*x)) -
 (x^4*(30*a + 11*b*n + 30*b*Log[c*x^n]))/(120*e^3*(d + e*x)^4) - (x^3*(60*a
 + 37*b*n + 60*b*Log[c*x^n]))/(180*e^4*(d + e*x)^3) + ((20*a + 49*b*n + 20*
b*Log[c*x^n])*Log[1 + (e*x)/d])/(20*e^7) + (b*n*PolyLog[2, -((e*x)/d)])/e^7
```

Rubi [A] time = 0.538136, antiderivative size = 316, normalized size of antiderivative = 1.3, number of steps used = 21, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {43, 2351, 2319, 44, 2314, 31, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^7}-\frac{d^6\left(a+b\log\left(cx^n\right)\right)}{6e^7(d+ex)^6}+\frac{6d^5\left(a+b\log\left(cx^n\right)\right)}{5e^7(d+ex)^5}-\frac{15d^4\left(a+b\log\left(cx^n\right)\right)}{4e^7(d+ex)^4}+\frac{20d^3\left(a+b\log\left(cx^n\right)\right)}{3e^7(d+ex)^3}-15$$

Antiderivative was successfully verified.

```
[In] Int[(x^6*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (b*d^5*n)/(30*e^7*(d + e*x)^5) - (31*b*d^4*n)/(120*e^7*(d + e*x)^4) + (163*
b*d^3*n)/(180*e^7*(d + e*x)^3) - (79*b*d^2*n)/(40*e^7*(d + e*x)^2) + (71*b*
d*n)/(20*e^7*(d + e*x)) + (71*b*n*Log[x])/(20*e^7) - (d^6*(a + b*Log[c*x^n]
))/(6*e^7*(d + e*x)^6) + (6*d^5*(a + b*Log[c*x^n]))/(5*e^7*(d + e*x)^5) - (
15*d^4*(a + b*Log[c*x^n]))/(4*e^7*(d + e*x)^4) + (20*d^3*(a + b*Log[c*x^n])
)/(3*e^7*(d + e*x)^3) - (15*d^2*(a + b*Log[c*x^n]))/(2*e^7*(d + e*x)^2) - (
6*x*(a + b*Log[c*x^n]))/(e^6*(d + e*x)) + (49*b*n*Log[d + e*x])/(20*e^7) +
((a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^7 + (b*n*PolyLog[2, -((e*x)/d)])/e^
7
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^6 (a + b\log(cx^n))}{(d+ex)^7}\,dx = \int \left(\frac{d^6 (a + b\log(cx^n))}{e^6(d+ex)^7} - \frac{6d^5 (a + b\log(cx^n))}{e^6(d+ex)^6} + \frac{15d^4 (a + b\log(cx^n))}{e^6(d+ex)^5} - \frac{20d^3 (a + b\log(cx\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{e^6} - \frac{(6d)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e^6} + \frac{(15d^2)\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e^6} - \frac{(20d^3)\int \frac{a+b\log(cx^n)}{(d+ex)^4}\,dx}{e^6} +$$

$$= -\frac{d^6 (a + b\log(cx^n))}{6e^7(d+ex)^6} + \frac{6d^5 (a + b\log(cx^n))}{5e^7(d+ex)^5} - \frac{15d^4 (a + b\log(cx^n))}{4e^7(d+ex)^4} + \frac{20d^3 (a + b\log(cx^n)}{3e^7(d+ex)^3}$$

$$= -\frac{d^6 (a + b\log(cx^n))}{6e^7(d+ex)^6} + \frac{6d^5 (a + b\log(cx^n))}{5e^7(d+ex)^5} - \frac{15d^4 (a + b\log(cx^n))}{4e^7(d+ex)^4} + \frac{20d^3 (a + b\log(cx^n)}{3e^7(d+ex)^3}$$

$$= \frac{bd^5n}{30e^7(d+ex)^5} - \frac{31bd^4n}{120e^7(d+ex)^4} + \frac{163bd^3n}{180e^7(d+ex)^3} - \frac{79bd^2n}{40e^7(d+ex)^2} + \frac{71bdn}{20e^7(d+ex)} + \frac{71bn\,\mathrm{lo}}{20e}$$

Mathematica [A] time = 0.447716, size = 333, normalized size = 1.37

$$360bn\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{432ad^5(d+ex)-1350ad^4(d+ex)^2+2400ad^3(d+ex)^3-2700ad^2(d+ex)^4-60ad^6+2160ad(d+ex)^5+360a(d+ex)^6\log\left(\frac{ex}{d}+1\right)+432bd}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^6*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (-882*b*n*Log[x] + (-60*a*d^6 + 432*a*d^5*(d + e*x) + 12*b*d^5*n*(d + e*x)
- 1350*a*d^4*(d + e*x)^2 - 93*b*d^4*n*(d + e*x)^2 + 2400*a*d^3*(d + e*x)^3
+ 326*b*d^3*n*(d + e*x)^3 - 2700*a*d^2*(d + e*x)^4 - 711*b*d^2*n*(d + e*x)^
4 + 2160*a*d*(d + e*x)^5 + 1278*b*d*n*(d + e*x)^5 - 60*b*d^6*Log[c*x^n] + 4
32*b*d^5*(d + e*x)*Log[c*x^n] - 1350*b*d^4*(d + e*x)^2*Log[c*x^n] + 2400*b*
d^3*(d + e*x)^3*Log[c*x^n] - 2700*b*d^2*(d + e*x)^4*Log[c*x^n] + 2160*b*d*(
d + e*x)^5*Log[c*x^n] + 882*b*n*(d + e*x)^6*Log[d + e*x] + 360*a*(d + e*x)^
6*Log[1 + (e*x)/d] + 360*b*(d + e*x)^6*Log[c*x^n]*Log[1 + (e*x)/d])/(d + e*
x)^6 + 360*b*n*PolyLog[2, -((e*x)/d)])/(360*e^7)
```

Maple [C] time = 0.174, size = 1416, normalized size = 5.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^6/e^7/(e*x+d)^6-1/12*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)*d^6/e^7/(e*x+d)^6+15/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*d^4/e^7/(e*x+d)^4-b*n/e^7*dilog(-e*x/d)+a/e^7*ln(e*x+d)-1/2*I*
b*Pi*csgn(I*c*x^n)^3/e^7*ln(e*x+d)-15/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*
d^2/e^7/(e*x+d)^2-15/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^7/(e*x+d)^2-1
5/2*b*ln(c)*d^2/e^7/(e*x+d)^2+20/3*b*ln(c)*d^3/e^7/(e*x+d)^3+10/3*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2*d^3/e^7/(e*x+d)^3+3/5*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2*d^5/e^7/(e*x+d)^5+10/3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^3/e^7/(e*
x+d)^3+3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^7/(e*x+d)-15/8*I*b*Pi*csgn(I*
c*x^n)^2*csgn(I*c)*d^4/e^7/(e*x+d)^4-15/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^
2*d^4/e^7/(e*x+d)^4+3/5*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^5/e^7/(e*x+d)^5+
3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^7/(e*x+d)-1/6*b*ln(c)*d^6/e^7/(e*x
+d)^6+6/5*b*ln(c)*d^5/e^7/(e*x+d)^5+6*b*ln(c)*d/e^7/(e*x+d)-15/4*b*ln(c)*d^
4/e^7/(e*x+d)^4+15/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^7/(e*
x+d)^2+6/5*b*ln(x^n)*d^5/e^7/(e*x+d)^5+6*b*ln(x^n)*d/e^7/(e*x+d)-15/4*b*ln(
x^n)*d^4/e^7/(e*x+d)^4-3/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^5/e
^7/(e*x+d)^5-3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^7/(e*x+d)-10/
3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^3/e^7/(e*x+d)^3-1/2*I*b*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^7*ln(e*x+d)+71/20*b*n*d/e^7/(e*x+d)-79
/40*b*n*d^2/e^7/(e*x+d)^2+163/180*b*n*d^3/e^7/(e*x+d)^3-31/120*b*n*d^4/e^7/
(e*x+d)^4+1/30*b*n*d^5/e^7/(e*x+d)^5-b*n/e^7*ln(e*x+d)*ln(-e*x/d)+15/4*I*b*
Pi*csgn(I*c*x^n)^3*d^2/e^7/(e*x+d)^2+1/12*I*b*Pi*csgn(I*c*x^n)^3*d^6/e^7/(e
*x+d)^6-3*I*b*Pi*csgn(I*c*x^n)^3*d/e^7/(e*x+d)+15/8*I*b*Pi*csgn(I*c*x^n)^3*
d^4/e^7/(e*x+d)^4-3/5*I*b*Pi*csgn(I*c*x^n)^3*d^5/e^7/(e*x+d)^5-15/2*b*ln(x^
n)*d^2/e^7/(e*x+d)^2+20/3*b*ln(x^n)*d^3/e^7/(e*x+d)^3-10/3*I*b*Pi*csgn(I*c*
x^n)^3*d^3/e^7/(e*x+d)^3+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^7*ln(e*x+d)
+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^7*ln(e*x+d)+20/3*a*d^3/e^7/(e*x+d
)^3+6/5*a*d^5/e^7/(e*x+d)^5+6*a*d/e^7/(e*x+d)-1/6*b*ln(x^n)*d^6/e^7/(e*x+d)
^6+1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^6/e^7/(e*x+d)^6+b*ln(x
^n)/e^7*ln(e*x+d)-49/20*b*n/e^7*ln(e*x)+49/20*b*n/e^7*ln(e*x+d)-15/4*a*d^4/
e^7/(e*x+d)^4-1/6*a*d^6/e^7/(e*x+d)^6-15/2*a*d^2/e^7/(e*x+d)^2+b*ln(c)/e^7*
ln(e*x+d)
```

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

$$\frac{1}{60}a\left(\frac{360\,de^5x^5+1350\,d^2e^4x^4+2200\,d^3e^3x^3+1875\,d^4e^2x^2+822\,d^5ex+147\,d^6}{e^{13}x^6+6\,de^{12}x^5+15\,d^2e^{11}x^4+20\,d^3e^{10}x^3+15\,d^4e^9x^2+6\,d^5e^8x+d^6e^7}+\frac{60\,\log(ex+d)}{e^7}\right)+b\int\frac{}{e^7x^7+7\,de^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/60*a*((360*d*e^5*x^5 + 1350*d^2*e^4*x^4 + 2200*d^3*e^3*x^3 + 1875*d^4*e^2
*x^2 + 822*d^5*e*x + 147*d^6)/(e^13*x^6 + 6*d*e^12*x^5 + 15*d^2*e^11*x^4 +
20*d^3*e^10*x^3 + 15*d^4*e^9*x^2 + 6*d^5*e^8*x + d^6*e^7) + 60*log(e*x + d)
/e^7) + b*integrate((x^6*log(c) + x^6*log(x^n))/(e^7*x^7 + 7*d*e^6*x^6 + 21
*d^2*e^5*x^5 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x
 + d^7), x)
```

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

$$\text{integral}\left(\frac{bx^6\log(cx^n)+ax^6}{e^7x^7+7\,de^6x^6+21\,d^2e^5x^5+35\,d^3e^4x^4+35\,d^4e^3x^3+21\,d^5e^2x^2+7\,d^6ex+d^7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*x^6*log(c*x^n) + a*x^6)/(e^7*x^7 + 7*d*e^6*x^6 + 21*d^2*e^5*x^5
 + 35*d^3*e^4*x^4 + 35*d^4*e^3*x^3 + 21*d^5*e^2*x^2 + 7*d^6*e*x + d^7), 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(x**6*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Timed out
```

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

$$\int \frac{(b\log(cx^n) + a)x^6}{(ex + d)^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^6/(e*x + d)^7, x)
```

3.65 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=136

$$\frac{x^6(a+b\log(cx^n))}{6d(d+ex)^6}-\frac{5bd^2n}{9e^6(d+ex)^3}+\frac{5bd^3n}{24e^6(d+ex)^4}-\frac{bd^4n}{30e^6(d+ex)^5}-\frac{5bn}{6e^6(d+ex)}+\frac{5bdn}{6e^6(d+ex)^2}-\frac{bn\log(d+ex)}{6de^6}$$

```
[Out] -(b*d^4*n)/(30*e^6*(d + e*x)^5) + (5*b*d^3*n)/(24*e^6*(d + e*x)^4) - (5*b*d
^2*n)/(9*e^6*(d + e*x)^3) + (5*b*d*n)/(6*e^6*(d + e*x)^2) - (5*b*n)/(6*e^6*
(d + e*x)) + (x^6*(a + b*Log[c*x^n]))/(6*d*(d + e*x)^6) - (b*n*Log[d + e*x]
)/(6*d*e^6)
```

Rubi [A] time = 0.110053, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2335, 43}

$$\frac{x^6(a+b\log(cx^n))}{6d(d+ex)^6}-\frac{5bd^2n}{9e^6(d+ex)^3}+\frac{5bd^3n}{24e^6(d+ex)^4}-\frac{bd^4n}{30e^6(d+ex)^5}-\frac{5bn}{6e^6(d+ex)}+\frac{5bdn}{6e^6(d+ex)^2}-\frac{bn\log(d+ex)}{6de^6}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(b*d^4*n)/(30*e^6*(d + e*x)^5) + (5*b*d^3*n)/(24*e^6*(d + e*x)^4) - (5*b*d
^2*n)/(9*e^6*(d + e*x)^3) + (5*b*d*n)/(6*e^6*(d + e*x)^2) - (5*b*n)/(6*e^6*
(d + e*x)) + (x^6*(a + b*Log[c*x^n]))/(6*d*(d + e*x)^6) - (b*n*Log[d + e*x]
)/(6*d*e^6)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^5 (a+b\log (cx^n))}{(d+ex)^7} dx = \frac{x^6 (a+b\log (cx^n))}{6d(d+ex)^6} - \frac{(bn)\int \frac{x^5}{(d+ex)^6} dx}{6d}$$
$$= \frac{x^6 (a+b\log (cx^n))}{6d(d+ex)^6} - \frac{(bn)\int \left(-\frac{d^5}{e^5(d+ex)^6} + \frac{5d^4}{e^5(d+ex)^5} - \frac{10d^3}{e^5(d+ex)^4} + \frac{10d^2}{e^5(d+ex)^3} - \frac{5d}{e^5(d+ex)^2} + \frac{1}{e^5(d+ex)}\right)}{6d}$$
$$= -\frac{bd^4n}{30e^6(d+ex)^5} + \frac{5bd^3n}{24e^6(d+ex)^4} - \frac{5bd^2n}{9e^6(d+ex)^3} + \frac{5bdn}{6e^6(d+ex)^2} - \frac{5bn}{6e^6(d+ex)} + \frac{x^6 (a+b\log}{6d(d+ex}$$

Mathematica [B] time = 0.285324, size = 335, normalized size = 2.46

$$-\frac{900ad^4e^2x^2 + 1200ad^3e^3x^3 + 900ad^2e^4x^4 + 360ad^5ex + 60ad^6 + 360ade^5x^5 + 60bd\left(15d^3e^2x^2 + 20d^2e^3x^3 + 6d^4ex + d^5\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(60*a*d^6 + 137*b*d^6*n + 360*a*d^5*e*x + 762*b*d^5*e*n*x + 900*a*d^4*e^2*
x^2 + 1725*b*d^4*e^2*n*x^2 + 1200*a*d^3*e^3*x^3 + 2000*b*d^3*e^3*n*x^3 + 90
0*a*d^2*e^4*x^4 + 1200*b*d^2*e^4*n*x^4 + 360*a*d*e^5*x^5 + 300*b*d*e^5*n*x^
5 - 60*b*n*(d + e*x)^6*Log[x] + 60*b*d*(d^5 + 6*d^4*e*x + 15*d^3*e^2*x^2 +
20*d^2*e^3*x^3 + 15*d*e^4*x^4 + 6*e^5*x^5)*Log[c*x^n] + 60*b*d^6*n*Log[d +
e*x] + 360*b*d^5*e*n*x*Log[d + e*x] + 900*b*d^4*e^2*n*x^2*Log[d + e*x] + 12
00*b*d^3*e^3*n*x^3*Log[d + e*x] + 900*b*d^2*e^4*n*x^4*Log[d + e*x] + 360*b*
d*e^5*n*x^5*Log[d + e*x] + 60*b*e^6*n*x^6*Log[d + e*x])/(360*d*e^6*(d + e*x
)^6)
```

Maple [C] time = 0.173, size = 1165, normalized size = 8.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -1/6*b*(6*e^5*x^5+15*d*e^4*x^4+20*d^2*e^3*x^3+15*d^3*e^2*x^2+6*d^4*e*x+d^5)
/(e*x+d)^6/e^6*ln(x^n)+1/360*(-60*a*d^6-600*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*
csgn(I*c*x^n)^2-600*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-300*b*d*e^
5*n*x^5-1200*b*d^2*e^4*n*x^4-2000*b*d^3*e^3*n*x^3-1725*b*d^4*e^2*n*x^2-762*
b*d^5*e*n*x-180*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)-180*I*Pi*b*d*e^5*x
^5*csgn(I*x^n)*csgn(I*c*x^n)^2-180*I*Pi*b*d*e^5*x^5*csgn(I*c*x^n)^2*csgn(I*
c)-450*I*Pi*b*d^2*e^4*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-450*I*Pi*b*d^2*e^4*x^
4*csgn(I*c*x^n)^2*csgn(I*c)-1200*a*d^3*e^3*x^3-900*a*d^4*e^2*x^2-360*a*d^5*
e*x-450*I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-450*I*Pi*b*d^4*e^2*x
^2*csgn(I*c*x^n)^2*csgn(I*c)-180*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2
-137*b*d^6*n-360*ln(e*x+d)*b*d*e^5*n*x^5-30*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c
*x^n)^2-30*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(I*c)-900*ln(e*x+d)*b*d^2*e^4*n*x
^4-1200*ln(e*x+d)*b*d^3*e^3*n*x^3-900*ln(e*x+d)*b*d^4*e^2*n*x^2-360*ln(e*x+
d)*b*d^5*e*n*x+360*ln(-x)*b*d*e^5*n*x^5+900*ln(-x)*b*d^2*e^4*n*x^4+1200*ln(
-x)*b*d^3*e^3*n*x^3+900*ln(-x)*b*d^4*e^2*n*x^2+360*ln(-x)*b*d^5*e*n*x+450*I
*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+180*I*Pi*b*d*e^5*x^5*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+450*I*Pi*b*d^2*e^4*x^4*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+600*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+180*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-60*ln(c)*b*d^6+1
80*I*Pi*b*d*e^5*x^5*csgn(I*c*x^n)^3+450*I*Pi*b*d^2*e^4*x^4*csgn(I*c*x^n)^3+
600*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^3-360*a*d*e^5*x^5-900*a*d^2*e^4*x^4+30
*I*Pi*b*d^6*csgn(I*c*x^n)^3-60*ln(e*x+d)*b*e^6*n*x^6+60*ln(-x)*b*e^6*n*x^6-
360*ln(c)*b*d*e^5*x^5-900*ln(c)*b*d^2*e^4*x^4-1200*ln(c)*b*d^3*e^3*x^3-900*
ln(c)*b*d^4*e^2*x^2+450*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^3+180*I*Pi*b*d^5*e
*x*csgn(I*c*x^n)^3+30*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-360*ln
(c)*b*d^5*e*x-60*ln(e*x+d)*b*d^6*n+60*ln(-x)*b*d^6*n)/d/e^6/(e*x+d)^6
```

Maxima [B] time = 1.24815, size = 509, normalized size = 3.74

$$-\frac{1}{360}\,bn\left(\frac{300\,e^4x^4+900\,de^3x^3+1100\,d^2e^2x^2+625\,d^3ex+137\,d^4}{e^{11}x^5+5\,de^{10}x^4+10\,d^2e^9x^3+10\,d^3e^8x^2+5\,d^4e^7x+d^5e^6}+\frac{60\,\log\left(ex+d\right)}{de^6}-\frac{60\,\log\left(x\right)}{de^6}\right)-\frac{\left(6\,e^5x^5+15\,d\right.}{6\left(e^{12}x^6+6\,de^{11}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] -1/360*b*n*((300*e^4*x^4 + 900*d*e^3*x^3 + 1100*d^2*e^2*x^2 + 625*d^3*e*x +
 137*d^4)/(e^11*x^5 + 5*d*e^10*x^4 + 10*d^2*e^9*x^3 + 10*d^3*e^8*x^2 + 5*d^
4*e^7*x + d^5*e^6) + 60*log(e*x + d)/(d*e^6) - 60*log(x)/(d*e^6)) - 1/6*(6*
e^5*x^5 + 15*d*e^4*x^4 + 20*d^2*e^3*x^3 + 15*d^3*e^2*x^2 + 6*d^4*e*x + d^5)
*b*log(c*x^n)/(e^12*x^6 + 6*d*e^11*x^5 + 15*d^2*e^10*x^4 + 20*d^3*e^9*x^3 +
 15*d^4*e^8*x^2 + 6*d^5*e^7*x + d^6*e^6) - 1/6*(6*e^5*x^5 + 15*d*e^4*x^4 +
```

```
20*d^2*e^3*x^3 + 15*d^3*e^2*x^2 + 6*d^4*e*x + d^5)*a/(e^12*x^6 + 6*d*e^11*x
^5 + 15*d^2*e^10*x^4 + 20*d^3*e^9*x^3 + 15*d^4*e^8*x^2 + 6*d^5*e^7*x + d^6*
e^6)
```

Fricas [B] time = 1.11362, size = 809, normalized size = 5.95

$$\frac{60\,be^{6}nx^{6}\log\left(x\right) - 137\,bd^{6}n - 60\,ad^{6} - 60\left(5\,bde^{5}n + 6\,ade^{5}\right)x^{5} - 300\left(4\,bd^{2}e^{4}n + 3\,ad^{2}e^{4}\right)x^{4} - 400\left(5\,bd^{3}e^{3}n + 3\,ad^{3}e^{3}\right)x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(60*b*e^6*n*x^6*log(x) - 137*b*d^6*n - 60*a*d^6 - 60*(5*b*d*e^5*n + 6
*a*d*e^5)*x^5 - 300*(4*b*d^2*e^4*n + 3*a*d^2*e^4)*x^4 - 400*(5*b*d^3*e^3*n
+ 3*a*d^3*e^3)*x^3 - 75*(23*b*d^4*e^2*n + 12*a*d^4*e^2)*x^2 - 6*(127*b*d^5*
e*n + 60*a*d^5*e)*x - 60*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^
4 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(
e*x + d) - 60*(6*b*d*e^5*x^5 + 15*b*d^2*e^4*x^4 + 20*b*d^3*e^3*x^3 + 15*b*d
^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*log(c))/(d*e^12*x^6 + 6*d^2*e^11*x^5 + 15
*d^3*e^10*x^4 + 20*d^4*e^9*x^3 + 15*d^5*e^8*x^2 + 6*d^6*e^7*x + d^7*e^6)
```

Sympy [A] time = 125.053, size = 2018, normalized size = 14.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Piecewise((zoo*(-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x), Eq(d, 0) & Eq(e,
 0)), ((a*x**6/6 + b*n*x**6*log(x)/6 - b*n*x**6/36 + b*x**6*log(c)/6)/d**7,
 Eq(e, 0)), ((-a/x - b*n*log(x)/x - b*n/x - b*log(c)/x)/e**7, Eq(d, 0)), (-
60*a*d**6/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d*
*4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x*
*6) - 360*a*d**5*e*x/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**
2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360
*d*e**12*x**6) - 900*a*d**4*e**2*x**2/(360*d**7*e**6 + 2160*d**6*e**7*x + 5
400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2
```

```
*e**11*x**5 + 360*d*e**12*x**6) - 1200*a*d**3*e**3*x**3/(360*d**7*e**6 + 21
60*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**1
0*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6) - 900*a*d**2*e**4*x**4/(3
60*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3
 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6) - 360*a*
d*e**5*x**5/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*
d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*
x**6) - 60*b*d**6*n*log(d/e + x)/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d
**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**1
1*x**5 + 360*d*e**12*x**6) - 137*b*d**6*n/(360*d**7*e**6 + 2160*d**6*e**7*x
 + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*
d**2*e**11*x**5 + 360*d*e**12*x**6) - 360*b*d**5*e*n*x*log(d/e + x)/(360*d*
*7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 54
00*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6) - 762*b*d**5*
e*n*x/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e
**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6)
 - 900*b*d**4*e**2*n*x**2*log(d/e + x)/(360*d**7*e**6 + 2160*d**6*e**7*x + 5
400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2
*e**11*x**5 + 360*d*e**12*x**6) - 1725*b*d**4*e**2*n*x**2/(360*d**7*e**6 +
2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e*
*10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6) - 1200*b*d**3*e**3*n*x*
*3*log(d/e + x)/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7
200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e*
*12*x**6) - 2000*b*d**3*e**3*n*x**3/(360*d**7*e**6 + 2160*d**6*e**7*x + 540
0*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e
**11*x**5 + 360*d*e**12*x**6) - 900*b*d**2*e**4*n*x**4*log(d/e + x)/(360*d*
*7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 54
00*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6) - 1200*b*d**2
*e**4*n*x**4/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200
*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12
*x**6) - 360*b*d*e**5*n*x**5*log(d/e + x)/(360*d**7*e**6 + 2160*d**6*e**7*x
 + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*
d**2*e**11*x**5 + 360*d*e**12*x**6) - 300*b*d*e**5*n*x**5/(360*d**7*e**6 +
2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e*
*10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6) + 60*b*e**6*n*x**6*log(
x)/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9
*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x**5 + 360*d*e**12*x**6) - 6
0*b*e**6*n*x**6*log(d/e + x)/(360*d**7*e**6 + 2160*d**6*e**7*x + 5400*d**5*
e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 + 2160*d**2*e**11*x*
*5 + 360*d*e**12*x**6) + 60*b*e**6*x**6*log(c)/(360*d**7*e**6 + 2160*d**6*e
**7*x + 5400*d**5*e**8*x**2 + 7200*d**4*e**9*x**3 + 5400*d**3*e**10*x**4 +
2160*d**2*e**11*x**5 + 360*d*e**12*x**6), True))
```

Giac [B] time = 1.38406, size = 524, normalized size = 3.85

$$-\frac{60\,bnx^6e^6\log(xe+d)+360\,bdnx^5e^5\log(xe+d)+900\,bd^2nx^4e^4\log(xe+d)+1200\,bd^3nx^3e^3\log(xe+d)+900\,bd^4nx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(60*b*n*x^6*e^6*log(x*e + d) + 360*b*d*n*x^5*e^5*log(x*e + d) + 900*
b*d^2*n*x^4*e^4*log(x*e + d) + 1200*b*d^3*n*x^3*e^3*log(x*e + d) + 900*b*d^
4*n*x^2*e^2*log(x*e + d) + 360*b*d^5*n*x*e*log(x*e + d) - 60*b*n*x^6*e^6*lo
g(x) + 300*b*d*n*x^5*e^5 + 1200*b*d^2*n*x^4*e^4 + 2000*b*d^3*n*x^3*e^3 + 17
25*b*d^4*n*x^2*e^2 + 762*b*d^5*n*x*e + 60*b*d^6*n*log(x*e + d) + 360*b*d*x^
5*e^5*log(c) + 900*b*d^2*x^4*e^4*log(c) + 1200*b*d^3*x^3*e^3*log(c) + 900*b
*d^4*x^2*e^2*log(c) + 360*b*d^5*x*e*log(c) + 137*b*d^6*n + 360*a*d*x^5*e^5
+ 900*a*d^2*x^4*e^4 + 1200*a*d^3*x^3*e^3 + 900*a*d^4*x^2*e^2 + 360*a*d^5*x*
e + 60*b*d^6*log(c) + 60*a*d^6)/(d*x^6*e^12 + 6*d^2*x^5*e^11 + 15*d^3*x^4*e
^10 + 20*d^4*x^3*e^9 + 15*d^5*x^2*e^8 + 6*d^6*x*e^7 + d^7*e^6)
```

3.66 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=163

$$\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{bd^2n}{120e^5(d+ex)^4}-\frac{bn\log(d+ex)}{30d^2e^5}-\frac{bnx^5}{30d^2(d+ex)^5}-\frac{2bn}{15de^5(d+ex)}+\frac{b}{10e^5(d}$$

```
[Out] -(b*n*x^5)/(30*d^2*(d + e*x)^5) + (b*d^2*n)/(120*e^5*(d + e*x)^4) - (2*b*d*
n)/(45*e^5*(d + e*x)^3) + (b*n)/(10*e^5*(d + e*x)^2) - (2*b*n)/(15*d*e^5*(d
 + e*x)) + (x^5*(a + b*Log[c*x^n]))/(6*d*(d + e*x)^6) + (x^5*(a + b*Log[c*x
^n]))/(30*d^2*(d + e*x)^5) - (b*n*Log[d + e*x])/(30*d^2*e^5)
```

Rubi [A] time = 0.129124, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {45, 37, 2350, 12, 78, 43}

$$\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{30d^2(d+ex)^5}+\frac{x^5\left(a+b\log\left(cx^n\right)\right)}{6d(d+ex)^6}+\frac{bd^2n}{120e^5(d+ex)^4}-\frac{bn\log(d+ex)}{30d^2e^5}-\frac{bnx^5}{30d^2(d+ex)^5}-\frac{2bn}{15de^5(d+ex)}+\frac{b}{10e^5(d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```


```
[Out] -(b*n*x^5)/(30*d^2*(d + e*x)^5) + (b*d^2*n)/(120*e^5*(d + e*x)^4) - (2*b*d*
n)/(45*e^5*(d + e*x)^3) + (b*n)/(10*e^5*(d + e*x)^2) - (2*b*n)/(15*d*e^5*(d
 + e*x)) + (x^5*(a + b*Log[c*x^n]))/(6*d*(d + e*x)^6) + (x^5*(a + b*Log[c*x
^n]))/(30*d^2*(d + e*x)^5) - (b*n*Log[d + e*x])/(30*d^2*e^5)
```


Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
```

```
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int \frac{x^4 (a+b\log(cx^n))}{(d+ex)^7}\,dx = \frac{x^5(a+b\log(cx^n))}{6d(d+ex)^6} + \frac{x^5(a+b\log(cx^n))}{30d^2(d+ex)^5} - (bn)\int \frac{x^4(6d+ex)}{30d^2(d+ex)^6}\,dx$$

$$= \frac{x^5(a+b\log(cx^n))}{6d(d+ex)^6} + \frac{x^5(a+b\log(cx^n))}{30d^2(d+ex)^5} - \frac{(bn)\int \frac{x^4(6d+ex)}{(d+ex)^6}\,dx}{30d^2}$$

$$= -\frac{bnx^5}{30d^2(d+ex)^5} + \frac{x^5(a+b\log(cx^n))}{6d(d+ex)^6} + \frac{x^5(a+b\log(cx^n))}{30d^2(d+ex)^5} - \frac{(bn)\int \frac{x^4}{(d+ex)^5}\,dx}{30d^2}$$

$$= -\frac{bnx^5}{30d^2(d+ex)^5} + \frac{x^5(a+b\log(cx^n))}{6d(d+ex)^6} + \frac{x^5(a+b\log(cx^n))}{30d^2(d+ex)^5} - \frac{(bn)\int \left(\frac{d^4}{e^4(d+ex)^5} - \frac{4d^3}{e^4(d+ex)^4} + \right.}{}$$

$$= -\frac{bnx^5}{30d^2(d+ex)^5} + \frac{bd^2n}{120e^5(d+ex)^4} - \frac{2bdn}{45e^5(d+ex)^3} + \frac{bn}{10e^5(d+ex)^2} - \frac{2bn}{15de^5(d+ex)} + \frac{x^5(a}{6}$$

Mathematica [A] time = 0.259977, size = 316, normalized size = 1.94

$$-\frac{180ad^4e^2x^2 + 240ad^3e^3x^3 + 180ad^2e^4x^4 + 72ad^5ex + 12ad^6 + 12bd^2\left(15d^2e^2x^2 + 6d^3ex + d^4 + 20de^3x^3 + 15e^4x^4\right)\log(}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(12*a*d^6 + 13*b*d^6*n + 72*a*d^5*e*x + 66*b*d^5*e*n*x + 180*a*d^4*e^2*x^2
 + 129*b*d^4*e^2*n*x^2 + 240*a*d^3*e^3*x^3 + 112*b*d^3*e^3*n*x^3 + 180*a*d^
2*e^4*x^4 + 24*b*d^2*e^4*n*x^4 - 12*b*d*e^5*n*x^5 - 12*b*n*(d + e*x)^6*Log[
x] + 12*b*d^2*(d^4 + 6*d^3*e*x + 15*d^2*e^2*x^2 + 20*d*e^3*x^3 + 15*e^4*x^4
)*Log[c*x^n] + 12*b*d^6*n*Log[d + e*x] + 72*b*d^5*e*n*x*Log[d + e*x] + 180*
b*d^4*e^2*n*x^2*Log[d + e*x] + 240*b*d^3*e^3*n*x^3*Log[d + e*x] + 180*b*d^2
*e^4*n*x^4*Log[d + e*x] + 72*b*d*e^5*n*x^5*Log[d + e*x] + 12*b*e^6*n*x^6*Lo
g[d + e*x])/(360*d^2*e^5*(d + e*x)^6)
```

Maple [C] time = 0.158, size = 1022, normalized size = 6.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -1/30*b*(15*e^4*x^4+20*d*e^3*x^3+15*d^2*e^2*x^2+6*d^3*e*x+d^4)/(e*x+d)^6/e^
5*ln(x^n)+1/360*(-12*a*d^6-120*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)
^2+12*b*d*e^5*n*x^5-24*b*d^2*e^4*n*x^4-112*b*d^3*e^3*n*x^3-129*b*d^4*e^2*n*
x^2-66*b*d^5*e*n*x-90*I*Pi*b*d^2*e^4*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-90*I*P
i*b*d^2*e^4*x^4*csgn(I*c*x^n)^2*csgn(I*c)-240*a*d^3*e^3*x^3-180*a*d^4*e^2*x
^2-72*a*d^5*e*x-120*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^2*csgn(I*c)-90*I*Pi*b*
d^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-13*b*d^6*n-6*I*Pi*b*d^6*csgn(I*x^n)
*csgn(I*c*x^n)^2-6*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(I*c)-72*ln(e*x+d)*b*d*e^
5*n*x^5-90*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-36*I*Pi*b*d^5*e*x*c
sgn(I*x^n)*csgn(I*c*x^n)^2-36*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)-180*
ln(e*x+d)*b*d^2*e^4*n*x^4-240*ln(e*x+d)*b*d^3*e^3*n*x^3-180*ln(e*x+d)*b*d^4
*e^2*n*x^2-72*ln(e*x+d)*b*d^5*e*n*x+72*ln(-x)*b*d*e^5*n*x^5+180*ln(-x)*b*d^
2*e^4*n*x^4+240*ln(-x)*b*d^3*e^3*n*x^3+180*ln(-x)*b*d^4*e^2*n*x^2+72*ln(-x)
*b*d^5*e*n*x+90*I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I
*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+90*I*Pi*b*d^2*e^4*x^4*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+120*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)-12*ln(c)*b*d^6-180*a*d^2*e^4*x^4+90*I*Pi*b*d^4*e^2*x^2*csg
n(I*c*x^n)^3+36*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^3+6*I*Pi*b*d^6*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)-12*ln(e*x+d)*b*e^6*n*x^6+12*ln(-x)*b*e^6*n*x^6-180*ln(
c)*b*d^2*e^4*x^4-240*ln(c)*b*d^3*e^3*x^3-180*ln(c)*b*d^4*e^2*x^2+90*I*Pi*b*
d^2*e^4*x^4*csgn(I*c*x^n)^3+120*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^3-72*ln(c)
*b*d^5*e*x-12*ln(e*x+d)*b*d^6*n+12*ln(-x)*b*d^6*n+6*I*Pi*b*d^6*csgn(I*c*x^n
)^3)/d^2/e^5/(e*x+d)^6
```

<u>Maxima</u> [B] time = 1.1953, size = 483, normalized size = 2.96

$$\frac{1}{360}\,bn\left(\frac{12\,e^4x^4 - 36\,de^3x^3 - 76\,d^2e^2x^2 - 53\,d^3ex - 13\,d^4}{de^{10}x^5 + 5\,d^2e^9x^4 + 10\,d^3e^8x^3 + 10\,d^4e^7x^2 + 5\,d^5e^6x + d^6e^5} - \frac{12\,\log\left(ex+d\right)}{d^2e^5} + \frac{12\,\log\left(x\right)}{d^2e^5}\right) - \frac{\left(15\,e^4x^4 + \right.}{30\left(e^{11}x^6 + 6\,de^{10}x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/360*b*n*((12*e^4*x^4 - 36*d*e^3*x^3 - 76*d^2*e^2*x^2 - 53*d^3*e*x - 13*d^
4)/(d*e^10*x^5 + 5*d^2*e^9*x^4 + 10*d^3*e^8*x^3 + 10*d^4*e^7*x^2 + 5*d^5*e^
6*x + d^6*e^5) - 12*log(e*x + d)/(d^2*e^5) + 12*log(x)/(d^2*e^5)) - 1/30*(1
5*e^4*x^4 + 20*d*e^3*x^3 + 15*d^2*e^2*x^2 + 6*d^3*e*x + d^4)*b*log(c*x^n)/(
e^11*x^6 + 6*d*e^10*x^5 + 15*d^2*e^9*x^4 + 20*d^3*e^8*x^3 + 15*d^4*e^7*x^2
+ 6*d^5*e^6*x + d^6*e^5) - 1/30*(15*e^4*x^4 + 20*d*e^3*x^3 + 15*d^2*e^2*x^2
 + 6*d^3*e*x + d^4)*a/(e^11*x^6 + 6*d*e^10*x^5 + 15*d^2*e^9*x^4 + 20*d^3*e^
8*x^3 + 15*d^4*e^7*x^2 + 6*d^5*e^6*x + d^6*e^5)
```

Fricas [B] time = 1.1468, size = 790, normalized size = 4.85

$$12\,bde^5nx^5 - 13\,bd^6n - 12\,ad^6 - 12\left(2\,bd^2e^4n + 15\,ad^2e^4\right)x^4 - 16\left(7\,bd^3e^3n + 15\,ad^3e^3\right)x^3 - 3\left(43\,bd^4e^2n + 60\,ad^4e^2\right)x^2 -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(12*b*d*e^5*n*x^5 - 13*b*d^6*n - 12*a*d^6 - 12*(2*b*d^2*e^4*n + 15*a*
d^2*e^4)*x^4 - 16*(7*b*d^3*e^3*n + 15*a*d^3*e^3)*x^3 - 3*(43*b*d^4*e^2*n +
60*a*d^4*e^2)*x^2 - 6*(11*b*d^5*e*n + 12*a*d^5*e)*x - 12*(b*e^6*n*x^6 + 6*b
*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2
 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) - 12*(15*b*d^2*e^4*x^4 + 20*b*d^3*
e^3*x^3 + 15*b*d^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*log(c) + 12*(b*e^6*n*x^6
+ 6*b*d*e^5*n*x^5)*log(x))/(d^2*e^11*x^6 + 6*d^3*e^10*x^5 + 15*d^4*e^9*x^4
+ 20*d^5*e^8*x^3 + 15*d^6*e^7*x^2 + 6*d^7*e^6*x + d^8*e^5)
```

Sympy [A] time = 118.247, size = 2179, normalized size = 13.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Piecewise((zoo*(-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n/(4*x**2) - b*log(c)
/(2*x**2)), Eq(d, 0) & Eq(e, 0)), ((-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n
/(4*x**2) - b*log(c)/(2*x**2))/e**7, Eq(d, 0)), ((a*x**5/5 + b*n*x**5*log(x
)/5 - b*n*x**5/25 + b*x**5*log(c)/5)/d**7, Eq(e, 0)), (-12*a*d**6/(360*d**8
*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400
*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) - 72*a*d**5*e
*x/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8
*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) -
 180*a*d**4*e**2*x**2/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x*
*2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360
*d**2*e**11*x**6) - 240*a*d**3*e**3*x**3/(360*d**8*e**5 + 2160*d**7*e**6*x
+ 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d*
*3*e**10*x**5 + 360*d**2*e**11*x**6) - 180*a*d**2*e**4*x**4/(360*d**8*e**5
+ 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*
```

```
e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) - 12*b*d**6*n*log(d
/e + x)/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5
*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x*
*6) - 13*b*d**6*n/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 +
 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**
2*e**11*x**6) - 72*b*d**5*e*n*x*log(d/e + x)/(360*d**8*e**5 + 2160*d**7*e**
6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 216
0*d**3*e**10*x**5 + 360*d**2*e**11*x**6) - 66*b*d**5*e*n*x/(360*d**8*e**5 +
 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*e
**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) - 180*b*d**4*e**2*n*
x**2*log(d/e + x)/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 +
 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**
2*e**11*x**6) - 129*b*d**4*e**2*n*x**2/(360*d**8*e**5 + 2160*d**7*e**6*x +
5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3
*e**10*x**5 + 360*d**2*e**11*x**6) - 240*b*d**3*e**3*n*x**3*log(d/e + x)/(3
60*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3
 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) - 112*
b*d**3*e**3*n*x**3/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2
+ 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d*
*2*e**11*x**6) - 180*b*d**2*e**4*n*x**4*log(d/e + x)/(360*d**8*e**5 + 2160*
d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x*
*4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) - 24*b*d**2*e**4*n*x**4/(3
60*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3
 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) + 72*b
*d*e**5*n*x**5*log(x)/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x*
*2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360
*d**2*e**11*x**6) - 72*b*d*e**5*n*x**5*log(d/e + x)/(360*d**8*e**5 + 2160*d
**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**
4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) + 12*b*d*e**5*n*x**5/(360*d
**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5
400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) + 72*b*d*e
**5*x**5*log(c)/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7
200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*
e**11*x**6) + 12*b*e**6*n*x**6*log(x)/(360*d**8*e**5 + 2160*d**7*e**6*x + 5
400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*
e**10*x**5 + 360*d**2*e**11*x**6) - 12*b*e**6*n*x**6*log(d/e + x)/(360*d**8
*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d**5*e**8*x**3 + 5400
*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11*x**6) + 12*b*e**6*x
**6*log(c)/(360*d**8*e**5 + 2160*d**7*e**6*x + 5400*d**6*e**7*x**2 + 7200*d
**5*e**8*x**3 + 5400*d**4*e**9*x**4 + 2160*d**3*e**10*x**5 + 360*d**2*e**11
*x**6), True))
```

<u>Giac</u> [B] time = 1.24328, size = 516, normalized size = 3.17

$$-\frac{12\,bnx^6e^6\log\left(xe+d\right)+72\,bdnx^5e^5\log\left(xe+d\right)+180\,bd^2nx^4e^4\log\left(xe+d\right)+240\,bd^3nx^3e^3\log\left(xe+d\right)+180\,bd^4nx^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(12*b*n*x^6*e^6*log(x*e + d) + 72*b*d*n*x^5*e^5*log(x*e + d) + 180*b
*d^2*n*x^4*e^4*log(x*e + d) + 240*b*d^3*n*x^3*e^3*log(x*e + d) + 180*b*d^4*
n*x^2*e^2*log(x*e + d) + 72*b*d^5*n*x*e*log(x*e + d) - 12*b*n*x^6*e^6*log(x
) - 72*b*d*n*x^5*e^5*log(x) - 12*b*d*n*x^5*e^5 + 24*b*d^2*n*x^4*e^4 + 112*b
*d^3*n*x^3*e^3 + 129*b*d^4*n*x^2*e^2 + 66*b*d^5*n*x*e + 12*b*d^6*n*log(x*e
+ d) + 180*b*d^2*x^4*e^4*log(c) + 240*b*d^3*x^3*e^3*log(c) + 180*b*d^4*x^2*
e^2*log(c) + 72*b*d^5*x*e*log(c) + 13*b*d^6*n + 180*a*d^2*x^4*e^4 + 240*a*d
^3*x^3*e^3 + 180*a*d^4*x^2*e^2 + 72*a*d^5*x*e + 12*b*d^6*log(c) + 12*a*d^6)
/(d^2*x^6*e^11 + 6*d^3*x^5*e^10 + 15*d^4*x^4*e^9 + 20*d^5*x^3*e^8 + 15*d^6*
x^2*e^7 + 6*d^7*x*e^6 + d^8*e^5)
```

3.67 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=226

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6e^4(d+ex)^6}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{5e^4(d+ex)^5}+\frac{3d\left(a+b\log\left(cx^n\right)\right)}{4e^4(d+ex)^4}-\frac{a+b\log\left(cx^n\right)}{3e^4(d+ex)^3}-\frac{bd^2n}{30e^4(d+ex)^5}+\frac{bn}{60d^2e^4(d+ex)}+\frac{b}{}$$

```
[Out] -(b*d^2*n)/(30*e^4*(d + e*x)^5) + (13*b*d*n)/(120*e^4*(d + e*x)^4) - (19*b*
n)/(180*e^4*(d + e*x)^3) + (b*n)/(120*d*e^4*(d + e*x)^2) + (b*n)/(60*d^2*e^
4*(d + e*x)) + (b*n*Log[x])/(60*d^3*e^4) + (d^3*(a + b*Log[c*x^n]))/(6*e^4*
(d + e*x)^6) - (3*d^2*(a + b*Log[c*x^n]))/(5*e^4*(d + e*x)^5) + (3*d*(a + b
*Log[c*x^n]))/(4*e^4*(d + e*x)^4) - (a + b*Log[c*x^n])/(3*e^4*(d + e*x)^3)
- (b*n*Log[d + e*x])/(60*d^3*e^4)
```

Rubi [A] time = 0.203683, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2350, 12, 1620}

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{6e^4(d+ex)^6}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{5e^4(d+ex)^5}+\frac{3d\left(a+b\log\left(cx^n\right)\right)}{4e^4(d+ex)^4}-\frac{a+b\log\left(cx^n\right)}{3e^4(d+ex)^3}-\frac{bd^2n}{30e^4(d+ex)^5}+\frac{bn}{60d^2e^4(d+ex)}+\frac{b}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(b*d^2*n)/(30*e^4*(d + e*x)^5) + (13*b*d*n)/(120*e^4*(d + e*x)^4) - (19*b*
n)/(180*e^4*(d + e*x)^3) + (b*n)/(120*d*e^4*(d + e*x)^2) + (b*n)/(60*d^2*e^
4*(d + e*x)) + (b*n*Log[x])/(60*d^3*e^4) + (d^3*(a + b*Log[c*x^n]))/(6*e^4*
(d + e*x)^6) - (3*d^2*(a + b*Log[c*x^n]))/(5*e^4*(d + e*x)^5) + (3*d*(a + b
*Log[c*x^n]))/(4*e^4*(d + e*x)^4) - (a + b*Log[c*x^n])/(3*e^4*(d + e*x)^3)
- (b*n*Log[d + e*x])/(60*d^3*e^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))}{(d+ex)^7}\,dx = \frac{d^3 (a+b\log(cx^n))}{6e^4(d+ex)^6} - \frac{3d^2 (a+b\log(cx^n))}{5e^4(d+ex)^5} + \frac{3d (a+b\log(cx^n))}{4e^4(d+ex)^4} - \frac{a+b\log(cx^n)}{3e^4(d+ex)^3} - (bn)\int$$

$$= \frac{d^3 (a+b\log(cx^n))}{6e^4(d+ex)^6} - \frac{3d^2 (a+b\log(cx^n))}{5e^4(d+ex)^5} + \frac{3d (a+b\log(cx^n))}{4e^4(d+ex)^4} - \frac{a+b\log(cx^n)}{3e^4(d+ex)^3} - \frac{(bn)\int}{}$$

$$= \frac{d^3 (a+b\log(cx^n))}{6e^4(d+ex)^6} - \frac{3d^2 (a+b\log(cx^n))}{5e^4(d+ex)^5} + \frac{3d (a+b\log(cx^n))}{4e^4(d+ex)^4} - \frac{a+b\log(cx^n)}{3e^4(d+ex)^3} - \frac{(bn)\int}{}$$

$$= -\frac{bd^2n}{30e^4(d+ex)^5} + \frac{13bdn}{120e^4(d+ex)^4} - \frac{19bn}{180e^4(d+ex)^3} + \frac{bn}{120de^4(d+ex)^2} + \frac{bn}{60d^2e^4(d+ex)} + \cdots$$

Mathematica [A] time = 0.222935, size = 281, normalized size = 1.24

$$\frac{ad^3}{6e^4(d+ex)^6} - \frac{3ad^2}{5e^4(d+ex)^5} + \frac{3ad}{4e^4(d+ex)^4} - \frac{a}{3e^4(d+ex)^3} + \frac{bd^3\log(cx^n)}{6e^4(d+ex)^6} - \frac{3bd^2\log(cx^n)}{5e^4(d+ex)^5} + \frac{3bd\log(cx^n)}{4e^4(d+ex)^4} - \frac{b\log(c}{3e^4(d+e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (a*d^3)/(6*e^4*(d + e*x)^6) - (3*a*d^2)/(5*e^4*(d + e*x)^5) - (b*d^2*n)/(30
*e^4*(d + e*x)^5) + (3*a*d)/(4*e^4*(d + e*x)^4) + (13*b*d*n)/(120*e^4*(d +
e*x)^4) - a/(3*e^4*(d + e*x)^3) - (19*b*n)/(180*e^4*(d + e*x)^3) + (b*n)/(1
20*d*e^4*(d + e*x)^2) + (b*n)/(60*d^2*e^4*(d + e*x)) + (b*n*Log[x])/(60*d^3
*e^4) + (b*d^3*Log[c*x^n])/(6*e^4*(d + e*x)^6) - (3*b*d^2*Log[c*x^n])/(5*e^
4*(d + e*x)^5) + (3*b*d*Log[c*x^n])/(4*e^4*(d + e*x)^4) - (b*Log[c*x^n])/(3
*e^4*(d + e*x)^3) - (b*n*Log[d + e*x])/(60*d^3*e^4)
```

Maple [C] time = 0.151, size = 867, normalized size = 3.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -1/60*b*(20*e^3*x^3+15*d*e^2*x^2+6*d^2*e*x+d^3)/(e*x+d)^6/e^4*ln(x^n)+1/360
*(18*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+60*I*Pi*b*d^3*e^3*x
^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+45*I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-6*a*d^6+6*b*d*e^5*n*x^5+33*b*d^2*e^4*n*x^4+34*b*d^3*e
^3*n*x^3+3*b*d^4*e^2*n*x^2-6*b*d^5*e*n*x-18*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn
(I*c*x^n)^2-18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)-60*I*Pi*b*d^3*e^3*x
^3*csgn(I*c*x^n)^2*csgn(I*c)-45*I*Pi*b*d^4*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c
)-120*a*d^3*e^3*x^3-90*a*d^4*e^2*x^2-36*a*d^5*e*x-45*I*Pi*b*d^4*e^2*x^2*csg
n(I*x^n)*csgn(I*c*x^n)^2-60*I*Pi*b*d^3*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-
3*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(
I*c)-2*b*d^6*n+3*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-36*ln(e*x+d
)*b*d*e^5*n*x^5-90*ln(e*x+d)*b*d^2*e^4*n*x^4-120*ln(e*x+d)*b*d^3*e^3*n*x^3-
90*ln(e*x+d)*b*d^4*e^2*n*x^2-36*ln(e*x+d)*b*d^5*e*n*x+36*ln(-x)*b*d*e^5*n*x
^5+90*ln(-x)*b*d^2*e^4*n*x^4+120*ln(-x)*b*d^3*e^3*n*x^3+90*ln(-x)*b*d^4*e^2
*n*x^2+36*ln(-x)*b*d^5*e*n*x+60*I*Pi*b*d^3*e^3*x^3*csgn(I*c*x^n)^3+45*I*Pi*
b*d^4*e^2*x^2*csgn(I*c*x^n)^3+18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^3-6*ln(c)*b*d
^6+3*I*Pi*b*d^6*csgn(I*c*x^n)^3-6*ln(e*x+d)*b*e^6*n*x^6+6*ln(-x)*b*e^6*n*x^
6-120*ln(c)*b*d^3*e^3*x^3-90*ln(c)*b*d^4*e^2*x^2-36*ln(c)*b*d^5*e*x-6*ln(e*
x+d)*b*d^6*n+6*ln(-x)*b*d^6*n)/e^4/d^3/(e*x+d)^6
```

Maxima [A] time = 1.23264, size = 456, normalized size = 2.02

$$\frac{1}{360}\,bn\left(\frac{6\,e^4x^4+27\,de^3x^3+7\,d^2e^2x^2-4\,d^3ex-2\,d^4}{d^2e^9x^5+5\,d^3e^8x^4+10\,d^4e^7x^3+10\,d^5e^6x^2+5\,d^6e^5x+d^7e^4}-\frac{6\,\log\left(ex+d\right)}{d^3e^4}+\frac{6\,\log\left(x\right)}{d^3e^4}\right)-\frac{\left(20\,e^3 \cdots\right.}{60\left(e^{10}x^6+6\,de^9x^5+\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/360*b*n*((6*e^4*x^4 + 27*d*e^3*x^3 + 7*d^2*e^2*x^2 - 4*d^3*e*x - 2*d^4)/(
d^2*e^9*x^5 + 5*d^3*e^8*x^4 + 10*d^4*e^7*x^3 + 10*d^5*e^6*x^2 + 5*d^6*e^5*x
 + d^7*e^4) - 6*log(e*x + d)/(d^3*e^4) + 6*log(x)/(d^3*e^4)) - 1/60*(20*e^3
*x^3 + 15*d*e^2*x^2 + 6*d^2*e*x + d^3)*b*log(c*x^n)/(e^10*x^6 + 6*d*e^9*x^5
 + 15*d^2*e^8*x^4 + 20*d^3*e^7*x^3 + 15*d^4*e^6*x^2 + 6*d^5*e^5*x + d^6*e^4
) - 1/60*(20*e^3*x^3 + 15*d*e^2*x^2 + 6*d^2*e*x + d^3)*a/(e^10*x^6 + 6*d*e^
9*x^5 + 15*d^2*e^8*x^4 + 20*d^3*e^7*x^3 + 15*d^4*e^6*x^2 + 6*d^5*e^5*x + d^
6*e^4)
```

Fricas [A] time = 1.55594, size = 748, normalized size = 3.31

$$\frac{6\, bde^5nx^5 + 33\, bd^2e^4nx^4 - 2\, bd^6n - 6\, ad^6 + 2\left(17\, bd^3e^3n - 60\, ad^3e^3\right)x^3 + 3\left(bd^4e^2n - 30\, ad^4e^2\right)x^2 - 6\left(bd^5en + 6\, ad^5e\right)x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(6*b*d*e^5*n*x^5 + 33*b*d^2*e^4*n*x^4 - 2*b*d^6*n - 6*a*d^6 + 2*(17*b
*d^3*e^3*n - 60*a*d^3*e^3)*x^3 + 3*(b*d^4*e^2*n - 30*a*d^4*e^2)*x^2 - 6*(b*
d^5*e*n + 6*a*d^5*e)*x - 6*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*
x^4 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*lo
g(e*x + d) - 6*(20*b*d^3*e^3*x^3 + 15*b*d^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*
log(c) + 6*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4)*log(x))/(d^
3*e^10*x^6 + 6*d^4*e^9*x^5 + 15*d^5*e^8*x^4 + 20*d^6*e^7*x^3 + 15*d^7*e^6*x
^2 + 6*d^8*e^5*x + d^9*e^4)
```

Sympy [A] time = 103.044, size = 2280, normalized size = 10.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Piecewise((zoo*(-a/(3*x**3) - b*n*log(x)/(3*x**3) - b*n/(9*x**3) - b*log(c)
/(3*x**3)), Eq(d, 0) & Eq(e, 0)), ((a*x**4/4 + b*n*x**4*log(x)/4 - b*n*x**4
/16 + b*x**4*log(c)/4)/d**7, Eq(e, 0)), ((-a/(3*x**3) - b*n*log(x)/(3*x**3)
 - b*n/(9*x**3) - b*log(c)/(3*x**3))/e**7, Eq(d, 0)), (-6*a*d**6/(360*d**9*
e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*
d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) - 36*a*d**5*e*x
/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x
**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) - 90
*a*d**4*e**2*x**2/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 +
 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3
*e**10*x**6) - 120*a*d**3*e**3*x**3/(360*d**9*e**4 + 2160*d**8*e**5*x + 540
0*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e*
*9*x**5 + 360*d**3*e**10*x**6) - 6*b*d**6*n*log(d/e + x)/(360*d**9*e**4 + 2
160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**
8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) - 2*b*d**6*n/(360*d**9*
e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*
d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) - 36*b*d**5*e*n
*x*log(d/e + x)/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7
200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e
**10*x**6) - 6*b*d**5*e*n*x/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e
**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5
+ 360*d**3*e**10*x**6) - 90*b*d**4*e**2*n*x**2*log(d/e + x)/(360*d**9*e**4
+ 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*
e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) + 3*b*d**4*e**2*n*x*
*2/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7
*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) -
120*b*d**3*e**3*n*x**3*log(d/e + x)/(360*d**9*e**4 + 2160*d**8*e**5*x + 540
0*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e*
*9*x**5 + 360*d**3*e**10*x**6) + 34*b*d**3*e**3*n*x**3/(360*d**9*e**4 + 216
0*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**8*
x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) + 90*b*d**2*e**4*n*x**4*l
og(x)/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e
**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6)
 - 90*b*d**2*e**4*n*x**4*log(d/e + x)/(360*d**9*e**4 + 2160*d**8*e**5*x + 5
400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*
e**9*x**5 + 360*d**3*e**10*x**6) + 33*b*d**2*e**4*n*x**4/(360*d**9*e**4 + 2
160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**
8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) + 90*b*d**2*e**4*x**4*l
og(c)/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e
**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6)
 + 36*b*d*e**5*n*x**5*log(x)/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*
e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5
 + 360*d**3*e**10*x**6) - 36*b*d*e**5*n*x**5*log(d/e + x)/(360*d**9*e**4 +
2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e*
*8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) + 6*b*d*e**5*n*x**5/(3
```

```
60*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3
 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) + 36*b*
d*e**5*x**5*log(c)/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2
+ 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**
3*e**10*x**6) + 6*b*e**6*n*x**6*log(x)/(360*d**9*e**4 + 2160*d**8*e**5*x +
5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4
*e**9*x**5 + 360*d**3*e**10*x**6) - 6*b*e**6*n*x**6*log(d/e + x)/(360*d**9*
e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6*e**7*x**3 + 5400*
d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**6) + 6*b*e**6*x**6
*log(c)/(360*d**9*e**4 + 2160*d**8*e**5*x + 5400*d**7*e**6*x**2 + 7200*d**6
*e**7*x**3 + 5400*d**5*e**8*x**4 + 2160*d**4*e**9*x**5 + 360*d**3*e**10*x**
6), True))
```

Giac [A] time = 1.22734, size = 502, normalized size = 2.22

$$-\frac{6\,bnx^6e^6\log\left(xe+d\right)+36\,bdnx^5e^5\log\left(xe+d\right)+90\,bd^2nx^4e^4\log\left(xe+d\right)+120\,bd^3nx^3e^3\log\left(xe+d\right)+90\,bd^4nx^2e^2\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(6*b*n*x^6*e^6*log(x*e + d) + 36*b*d*n*x^5*e^5*log(x*e + d) + 90*b*d
^2*n*x^4*e^4*log(x*e + d) + 120*b*d^3*n*x^3*e^3*log(x*e + d) + 90*b*d^4*n*x
^2*e^2*log(x*e + d) + 36*b*d^5*n*x*e*log(x*e + d) - 6*b*n*x^6*e^6*log(x) -
36*b*d*n*x^5*e^5*log(x) - 90*b*d^2*n*x^4*e^4*log(x) - 6*b*d*n*x^5*e^5 - 33*
b*d^2*n*x^4*e^4 - 34*b*d^3*n*x^3*e^3 - 3*b*d^4*n*x^2*e^2 + 6*b*d^5*n*x*e +
6*b*d^6*n*log(x*e + d) + 120*b*d^3*x^3*e^3*log(c) + 90*b*d^4*x^2*e^2*log(c)
 + 36*b*d^5*x*e*log(c) + 2*b*d^6*n + 120*a*d^3*x^3*e^3 + 90*a*d^4*x^2*e^2 +
 36*a*d^5*x*e + 6*b*d^6*log(c) + 6*a*d^6)/(d^3*x^6*e^10 + 6*d^4*x^5*e^9 + 1
5*d^5*x^4*e^8 + 20*d^6*x^3*e^7 + 15*d^7*x^2*e^6 + 6*d^8*x*e^5 + d^9*e^4)
```

3.68 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=199

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{6e^3(d+ex)^6}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{5e^3(d+ex)^5}-\frac{a+b\log\left(cx^n\right)}{4e^3(d+ex)^4}+\frac{bn}{120d^2e^3(d+ex)^2}+\frac{bn}{60d^3e^3(d+ex)}+\frac{bn\log(x)}{60d^4e^3}-\frac{bn\log(}{60d}$$

```
[Out] (b*d*n)/(30*e^3*(d + e*x)^5) - (7*b*n)/(120*e^3*(d + e*x)^4) + (b*n)/(180*d
*e^3*(d + e*x)^3) + (b*n)/(120*d^2*e^3*(d + e*x)^2) + (b*n)/(60*d^3*e^3*(d
+ e*x)) + (b*n*Log[x])/(60*d^4*e^3) - (d^2*(a + b*Log[c*x^n]))/(6*e^3*(d +
e*x)^6) + (2*d*(a + b*Log[c*x^n]))/(5*e^3*(d + e*x)^5) - (a + b*Log[c*x^n])
/(4*e^3*(d + e*x)^4) - (b*n*Log[d + e*x])/(60*d^4*e^3)
```

Rubi [A] time = 0.164803, antiderivative size = 199, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {43, 2350, 12, 893}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{6e^3(d+ex)^6}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{5e^3(d+ex)^5}-\frac{a+b\log\left(cx^n\right)}{4e^3(d+ex)^4}+\frac{bn}{120d^2e^3(d+ex)^2}+\frac{bn}{60d^3e^3(d+ex)}+\frac{bn\log(x)}{60d^4e^3}-\frac{bn\log(}{60d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (b*d*n)/(30*e^3*(d + e*x)^5) - (7*b*n)/(120*e^3*(d + e*x)^4) + (b*n)/(180*d
*e^3*(d + e*x)^3) + (b*n)/(120*d^2*e^3*(d + e*x)^2) + (b*n)/(60*d^3*e^3*(d
+ e*x)) + (b*n*Log[x])/(60*d^4*e^3) - (d^2*(a + b*Log[c*x^n]))/(6*e^3*(d +
e*x)^6) + (2*d*(a + b*Log[c*x^n]))/(5*e^3*(d + e*x)^5) - (a + b*Log[c*x^n])
/(4*e^3*(d + e*x)^4) - (b*n*Log[d + e*x])/(60*d^4*e^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rubi steps

$$\int \frac{x^2 (a + b\log(cx^n))}{(d+ex)^7}\,dx = -\frac{d^2(a+b\log(cx^n))}{6e^3(d+ex)^6} + \frac{2d(a+b\log(cx^n))}{5e^3(d+ex)^5} - \frac{a+b\log(cx^n)}{4e^3(d+ex)^4} - (bn)\int \frac{-d^2-6dex-15e^2x^2}{60e^3x(d+ex)^6}$$

$$= -\frac{d^2(a+b\log(cx^n))}{6e^3(d+ex)^6} + \frac{2d(a+b\log(cx^n))}{5e^3(d+ex)^5} - \frac{a+b\log(cx^n)}{4e^3(d+ex)^4} - \frac{(bn)\int \frac{-d^2-6dex-15e^2x^2}{x(d+ex)^6}\,dx}{60e^3}$$

$$= -\frac{d^2(a+b\log(cx^n))}{6e^3(d+ex)^6} + \frac{2d(a+b\log(cx^n))}{5e^3(d+ex)^5} - \frac{a+b\log(cx^n)}{4e^3(d+ex)^4} - \frac{(bn)\int \left(-\frac{1}{d^4x} + \frac{10de}{(d+ex)^6} - \frac{14}{(d+e}\right.}{}$$

$$= \frac{bdn}{30e^3(d+ex)^5} - \frac{7bn}{120e^3(d+ex)^4} + \frac{bn}{180de^3(d+ex)^3} + \frac{bn}{120d^2e^3(d+ex)^2} + \frac{bn}{60d^3e^3(d+ex)} +$$

Mathematica [A] time = 0.192912, size = 192, normalized size = 0.96

$$\frac{144ad^5(d+ex) - 90ad^4(d+ex)^2 - 60ad^6 + 144bd^5(d+ex)\log(cx^n) - 90bd^4(d+ex)^2\log(cx^n) - 60bd^6\log(cx^n) + 12bd}{36}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (-60*a*d^6 + 144*a*d^5*(d + e*x) + 12*b*d^5*n*(d + e*x) - 90*a*d^4*(d + e*x
)^2 - 21*b*d^4*n*(d + e*x)^2 + 2*b*d^3*n*(d + e*x)^3 + 3*b*d^2*n*(d + e*x)^
4 + 6*b*d*n*(d + e*x)^5 + 6*b*n*(d + e*x)^6*Log[x] - 60*b*d^6*Log[c*x^n] +
144*b*d^5*(d + e*x)*Log[c*x^n] - 90*b*d^4*(d + e*x)^2*Log[c*x^n] - 6*b*n*(d
 + e*x)^6*Log[d + e*x])/(360*d^4*e^3*(d + e*x)^6)
```

Maple [C] time = 0.133, size = 712, normalized size = 3.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -1/60*b*(15*e^2*x^2+6*d*e*x+d^2)/(e*x+d)^6/e^3*ln(x^n)+1/360*(18*I*Pi*b*d^5
*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+45*I*Pi*b*d^4*e^2*x^2*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)-6*a*d^6+6*b*d*e^5*n*x^5+33*b*d^2*e^4*n*x^4+74*b*d^3
*e^3*n*x^3+63*b*d^4*e^2*n*x^2+18*b*d^5*e*n*x-18*I*Pi*b*d^5*e*x*csgn(I*x^n)*
csgn(I*c*x^n)^2-18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)-45*I*Pi*b*d^4*e
^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-90*a*d^4*e^2*x^2-36*a*d^5*e*x-45*I*Pi*b*d^
4*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n
)^2-3*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(I*c)+2*b*d^6*n+3*I*Pi*b*d^6*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-36*ln(e*x+d)*b*d*e^5*n*x^5-90*ln(e*x+d)*b*d^2*e^
4*n*x^4-120*ln(e*x+d)*b*d^3*e^3*n*x^3-90*ln(e*x+d)*b*d^4*e^2*n*x^2-36*ln(e*
x+d)*b*d^5*e*n*x+36*ln(-x)*b*d*e^5*n*x^5+90*ln(-x)*b*d^2*e^4*n*x^4+120*ln(-
x)*b*d^3*e^3*n*x^3+90*ln(-x)*b*d^4*e^2*n*x^2+36*ln(-x)*b*d^5*e*n*x+45*I*Pi*
b*d^4*e^2*x^2*csgn(I*c*x^n)^3+18*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^3-6*ln(c)*b*d
^6+3*I*Pi*b*d^6*csgn(I*c*x^n)^3-6*ln(e*x+d)*b*e^6*n*x^6+6*ln(-x)*b*e^6*n*x^
6-90*ln(c)*b*d^4*e^2*x^2-36*ln(c)*b*d^5*e*x-6*ln(e*x+d)*b*d^6*n+6*ln(-x)*b*
d^6*n)/d^4/e^3/(e*x+d)^6
```

Maxima [A] time = 1.2428, size = 427, normalized size = 2.15

$$\frac{1}{360}bn\left(\frac{6e^4x^4+27de^3x^3+47d^2e^2x^2+16d^3ex+2d^4}{d^3e^8x^5+5d^4e^7x^4+10d^5e^6x^3+10d^6e^5x^2+5d^7e^4x+d^8e^3}-\frac{6\log(ex+d)}{d^4e^3}+\frac{6\log(x)}{d^4e^3}\right)-\frac{(}{60\left(e^9x^6+6de^8x^5+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/360*b*n*((6*e^4*x^4 + 27*d*e^3*x^3 + 47*d^2*e^2*x^2 + 16*d^3*e*x + 2*d^4)
/(d^3*e^8*x^5 + 5*d^4*e^7*x^4 + 10*d^5*e^6*x^3 + 10*d^6*e^5*x^2 + 5*d^7*e^4
*x + d^8*e^3) - 6*log(e*x + d)/(d^4*e^3) + 6*log(x)/(d^4*e^3)) - 1/60*(15*e
^2*x^2 + 6*d*e*x + d^2)*b*log(c*x^n)/(e^9*x^6 + 6*d*e^8*x^5 + 15*d^2*e^7*x^
4 + 20*d^3*e^6*x^3 + 15*d^4*e^5*x^2 + 6*d^5*e^4*x + d^6*e^3) - 1/60*(15*e^2
*x^2 + 6*d*e*x + d^2)*a/(e^9*x^6 + 6*d*e^8*x^5 + 15*d^2*e^7*x^4 + 20*d^3*e^
6*x^3 + 15*d^4*e^5*x^2 + 6*d^5*e^4*x + d^6*e^3)
```

Fricas [A] time = 1.45163, size = 729, normalized size = 3.66

$$\frac{6\,bde^5nx^5 + 33\,bd^2e^4nx^4 + 74\,bd^3e^3nx^3 + 2\,bd^6n - 6\,ad^6 + 9\left(7\,bd^4e^2n - 10\,ad^4e^2\right)x^2 + 18\left(bd^5en - 2\,ad^5e\right)x - 6\left(be^6nx^6\right.}{360}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(6*b*d*e^5*n*x^5 + 33*b*d^2*e^4*n*x^4 + 74*b*d^3*e^3*n*x^3 + 2*b*d^6*
n - 6*a*d^6 + 9*(7*b*d^4*e^2*n - 10*a*d^4*e^2)*x^2 + 18*(b*d^5*e*n - 2*a*d^
5*e)*x - 6*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e
^3*n*x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) - 6*(
15*b*d^4*e^2*x^2 + 6*b*d^5*e*x + b*d^6)*log(c) + 6*(b*e^6*n*x^6 + 6*b*d*e^5
*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3)*log(x))/(d^4*e^9*x^6 + 6*
d^5*e^8*x^5 + 15*d^6*e^7*x^4 + 20*d^7*e^6*x^3 + 15*d^8*e^5*x^2 + 6*d^9*e^4*
x + d^10*e^3)
```

Sympy [A] time = 141.94, size = 2380, normalized size = 11.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Piecewise((zoo*(-a/(4*x**4) - b*n*log(x)/(4*x**4) - b*n/(16*x**4) - b*log(c
)/(4*x**4)), Eq(d, 0) & Eq(e, 0)), ((-a/(4*x**4) - b*n*log(x)/(4*x**4) - b*
n/(16*x**4) - b*log(c)/(4*x**4))/e**7, Eq(d, 0)), ((a*x**3/3 + b*n*x**3*log
(x)/3 - b*n*x**3/9 + b*x**3*log(c)/3)/d**7, Eq(e, 0)), (-6*a*d**6/(360*d**1
0*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 540
```

```
0*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) - 36*a*d**5*e*
x/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6
*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) - 9
0*a*d**4*e**2*x**2/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2
 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d*
*4*e**9*x**6) - 6*b*d**6*n*log(d/e + x)/(360*d**10*e**3 + 2160*d**9*e**4*x
+ 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d*
*5*e**8*x**5 + 360*d**4*e**9*x**6) + 2*b*d**6*n/(360*d**10*e**3 + 2160*d**9
*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 +
 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) - 36*b*d**5*e*n*x*log(d/e + x)/(
360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x*
*3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 18*b
*d**5*e*n*x/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200
*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9
*x**6) - 90*b*d**4*e**2*n*x**2*log(d/e + x)/(360*d**10*e**3 + 2160*d**9*e**
4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 216
0*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 63*b*d**4*e**2*n*x**2/(360*d**10*e
**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d
**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 120*b*d**3*e**3
*n*x**3*log(x)/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7
200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e
**9*x**6) - 120*b*d**3*e**3*n*x**3*log(d/e + x)/(360*d**10*e**3 + 2160*d**9
*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 +
 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 74*b*d**3*e**3*n*x**3/(360*d**
10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 54
00*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 120*b*d**3*
e**3*x**3*log(c)/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 +
 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4
*e**9*x**6) + 90*b*d**2*e**4*n*x**4*log(x)/(360*d**10*e**3 + 2160*d**9*e**4
*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160
*d**5*e**8*x**5 + 360*d**4*e**9*x**6) - 90*b*d**2*e**4*n*x**4*log(d/e + x)/
(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x
**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 33*
b*d**2*e**4*n*x**4/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2
 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d*
*4*e**9*x**6) + 90*b*d**2*e**4*x**4*log(c)/(360*d**10*e**3 + 2160*d**9*e**4
*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160
*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 36*b*d*e**5*n*x**5*log(x)/(360*d**1
0*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 540
0*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) - 36*b*d*e**5*
n*x**5*log(d/e + x)/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**
2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d
**4*e**9*x**6) + 6*b*d*e**5*n*x**5/(360*d**10*e**3 + 2160*d**9*e**4*x + 540
0*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e*
*8*x**5 + 360*d**4*e**9*x**6) + 36*b*d*e**5*x**5*log(c)/(360*d**10*e**3 + 2
```

```
160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**
7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) + 6*b*e**6*n*x**6*log(x)
/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*
x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5 + 360*d**4*e**9*x**6) - 6*
b*e**6*n*x**6*log(d/e + x)/(360*d**10*e**3 + 2160*d**9*e**4*x + 5400*d**8*e
**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 2160*d**5*e**8*x**5
+ 360*d**4*e**9*x**6) + 6*b*e**6*x**6*log(c)/(360*d**10*e**3 + 2160*d**9*e*
*4*x + 5400*d**8*e**5*x**2 + 7200*d**7*e**6*x**3 + 5400*d**6*e**7*x**4 + 21
60*d**5*e**8*x**5 + 360*d**4*e**9*x**6), True))
```

Giac [B] time = 1.24182, size = 489, normalized size = 2.46

$$-\frac{6\,bnx^6e^6\log\left(xe+d\right)+36\,bdnx^5e^5\log\left(xe+d\right)+90\,bd^2nx^4e^4\log\left(xe+d\right)+120\,bd^3nx^3e^3\log\left(xe+d\right)+90\,bd^4nx^2e^2\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(6*b*n*x^6*e^6*log(x*e + d) + 36*b*d*n*x^5*e^5*log(x*e + d) + 90*b*d
^2*n*x^4*e^4*log(x*e + d) + 120*b*d^3*n*x^3*e^3*log(x*e + d) + 90*b*d^4*n*x
^2*e^2*log(x*e + d) + 36*b*d^5*n*x*e*log(x*e + d) - 6*b*n*x^6*e^6*log(x) -
36*b*d*n*x^5*e^5*log(x) - 90*b*d^2*n*x^4*e^4*log(x) - 120*b*d^3*n*x^3*e^3*l
og(x) - 6*b*d*n*x^5*e^5 - 33*b*d^2*n*x^4*e^4 - 74*b*d^3*n*x^3*e^3 - 63*b*d^
4*n*x^2*e^2 - 18*b*d^5*n*x*e + 6*b*d^6*n*log(x*e + d) + 90*b*d^4*x^2*e^2*lo
g(c) + 36*b*d^5*x*e*log(c) - 2*b*d^6*n + 90*a*d^4*x^2*e^2 + 36*a*d^5*x*e +
6*b*d^6*log(c) + 6*a*d^6)/(d^4*x^6*e^9 + 6*d^5*x^5*e^8 + 15*d^6*x^4*e^7 + 2
0*d^7*x^3*e^6 + 15*d^8*x^2*e^5 + 6*d^9*x*e^4 + d^10*e^3)
```

3.69 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^7}\,dx$

Optimal. Leaf size=174

$$-\frac{a+b\log(cx^n)}{5e^2(d+ex)^5}+\frac{d(a+b\log(cx^n))}{6e^2(d+ex)^6}+\frac{bn}{30d^4e^2(d+ex)}+\frac{bn}{60d^3e^2(d+ex)^2}+\frac{bn}{90d^2e^2(d+ex)^3}+\frac{bn\log(x)}{30d^5e^2}-\frac{bn\log(d+e}{30d^5e^2}$$

```
[Out] -(b*n)/(30*e^2*(d + e*x)^5) + (b*n)/(120*d*e^2*(d + e*x)^4) + (b*n)/(90*d^2
*e^2*(d + e*x)^3) + (b*n)/(60*d^3*e^2*(d + e*x)^2) + (b*n)/(30*d^4*e^2*(d +
 e*x)) + (b*n*Log[x])/(30*d^5*e^2) + (d*(a + b*Log[c*x^n]))/(6*e^2*(d + e*x
)^6) - (a + b*Log[c*x^n])/(5*e^2*(d + e*x)^5) - (b*n*Log[d + e*x])/(30*d^5*
e^2)
```

Rubi [A] time = 0.117887, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {43, 2350, 12, 77}

$$-\frac{a+b\log(cx^n)}{5e^2(d+ex)^5}+\frac{d(a+b\log(cx^n))}{6e^2(d+ex)^6}+\frac{bn}{30d^4e^2(d+ex)}+\frac{bn}{60d^3e^2(d+ex)^2}+\frac{bn}{90d^2e^2(d+ex)^3}+\frac{bn\log(x)}{30d^5e^2}-\frac{bn\log(d+e}{30d^5e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] -(b*n)/(30*e^2*(d + e*x)^5) + (b*n)/(120*d*e^2*(d + e*x)^4) + (b*n)/(90*d^2
*e^2*(d + e*x)^3) + (b*n)/(60*d^3*e^2*(d + e*x)^2) + (b*n)/(30*d^4*e^2*(d +
 e*x)) + (b*n*Log[x])/(30*d^5*e^2) + (d*(a + b*Log[c*x^n]))/(6*e^2*(d + e*x
)^6) - (a + b*Log[c*x^n])/(5*e^2*(d + e*x)^5) - (b*n*Log[d + e*x])/(30*d^5*
e^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rubi steps

$$\int \frac{x\,(a+b\log(cx^n))}{(d+ex)^7}\,dx = \frac{d\,(a+b\log(cx^n))}{6e^2(d+ex)^6} - \frac{a+b\log(cx^n)}{5e^2(d+ex)^5} - (bn)\int \frac{-d-6ex}{30e^2x(d+ex)^6}\,dx$$

$$= \frac{d\,(a+b\log(cx^n))}{6e^2(d+ex)^6} - \frac{a+b\log(cx^n)}{5e^2(d+ex)^5} - \frac{(bn)\int \frac{-d-6ex}{x(d+ex)^6}\,dx}{30e^2}$$

$$= \frac{d\,(a+b\log(cx^n))}{6e^2(d+ex)^6} - \frac{a+b\log(cx^n)}{5e^2(d+ex)^5} - \frac{(bn)\int \left(-\frac{1}{d^5x} - \frac{5e}{(d+ex)^6} + \frac{e}{d(d+ex)^5} + \frac{e}{d^2(d+ex)^4} + \frac{e}{d^3(d+ex)^3}\right.}{30e^2}$$

$$= -\frac{bn}{30e^2(d+ex)^5} + \frac{bn}{120de^2(d+ex)^4} + \frac{bn}{90d^2e^2(d+ex)^3} + \frac{bn}{60d^3e^2(d+ex)^2} + \frac{bn}{30d^4e^2(d+ex)} +$$

Mathematica [A] time = 0.14792, size = 160, normalized size = 0.92

$$\frac{-72ad^5(d+ex)+60ad^6-72bd^5(d+ex)\log(cx^n)+60bd^6\log(cx^n)-12bd^5n(d+ex)+3bd^4n(d+ex)^2+4bd^3n(d+ex}{360d^5e^2(d+ex)^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x)^7,x]
```

```
[Out] (60*a*d^6 - 72*a*d^5*(d + e*x) - 12*b*d^5*n*(d + e*x) + 3*b*d^4*n*(d + e*x)
^2 + 4*b*d^3*n*(d + e*x)^3 + 6*b*d^2*n*(d + e*x)^4 + 12*b*d*n*(d + e*x)^5 +
 12*b*n*(d + e*x)^6*Log[x] + 60*b*d^6*Log[c*x^n] - 72*b*d^5*(d + e*x)*Log[c
*x^n] - 12*b*n*(d + e*x)^6*Log[d + e*x])/(360*d^5*e^2*(d + e*x)^6)
```

Maple [C] time = 0.128, size = 557, normalized size = 3.2

$$-\frac{b\,(6\,ex+d)\ln{(x^n)}}{30\,(ex+d)^6\,e^2}-\frac{12\,ad^6-12\,bde^5nx^5-66\,bd^2e^4nx^4-148\,bd^3e^3nx^3-171\,bd^4e^2nx^2-90\,bd^5enx-36\,i\pi\,bd^5ex\,(\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -1/30*b*(6*e*x+d)/(e*x+d)^6/e^2*ln(x^n)-1/360*(12*a*d^6-12*b*d*e^5*n*x^5-66
*b*d^2*e^4*n*x^4-148*b*d^3*e^3*n*x^3-171*b*d^4*e^2*n*x^2-90*b*d^5*e*n*x-36*
I*Pi*b*d^5*e*x*csgn(I*c*x^n)^3-6*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+72*a*d^5*e*x+36*I*Pi*b*d^5*e*x*csgn(I*c*x^n)^2*csgn(I*c)-36*I*Pi*b*d^5
*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*b*d^5*e*x*csgn(I*x^n)*csgn
(I*c*x^n)^2+6*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)^2+6*I*Pi*b*d^6*csgn(I*c*
x^n)^2*csgn(I*c)-13*b*d^6*n+72*ln(e*x+d)*b*d*e^5*n*x^5+180*ln(e*x+d)*b*d^2*
e^4*n*x^4+240*ln(e*x+d)*b*d^3*e^3*n*x^3+180*ln(e*x+d)*b*d^4*e^2*n*x^2+72*ln
(e*x+d)*b*d^5*e*n*x-72*ln(-x)*b*d*e^5*n*x^5-180*ln(-x)*b*d^2*e^4*n*x^4-240*
ln(-x)*b*d^3*e^3*n*x^3-180*ln(-x)*b*d^4*e^2*n*x^2-72*ln(-x)*b*d^5*e*n*x+12*
ln(c)*b*d^6-6*I*Pi*b*d^6*csgn(I*c*x^n)^3+12*ln(e*x+d)*b*e^6*n*x^6-12*ln(-x)
*b*e^6*n*x^6+72*ln(c)*b*d^5*e*x+12*ln(e*x+d)*b*d^6*n-12*ln(-x)*b*d^6*n)/e^2
/d^5/(e*x+d)^6
```

Maxima [A] time = 1.20077, size = 397, normalized size = 2.28

$$\frac{1}{360}\,bn\left(\frac{12\,e^4x^4+54\,de^3x^3+94\,d^2e^2x^2+77\,d^3ex+13\,d^4}{d^4e^7x^5+5\,d^5e^6x^4+10\,d^6e^5x^3+10\,d^7e^4x^2+5\,d^8e^3x+d^9e^2}-\frac{12\,\log{(ex+d)}}{d^5e^2}+\frac{12\,\log{(x)}}{d^5e^2}\right)-\frac{}{30\left(e^8x^6+6\,de^7x^5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/360*b*n*((12*e^4*x^4 + 54*d*e^3*x^3 + 94*d^2*e^2*x^2 + 77*d^3*e*x + 13*d^
4)/(d^4*e^7*x^5 + 5*d^5*e^6*x^4 + 10*d^6*e^5*x^3 + 10*d^7*e^4*x^2 + 5*d^8*e
```

```
^3*x + d^9*e^2) - 12*log(e*x + d)/(d^5*e^2) + 12*log(x)/(d^5*e^2)) - 1/30*(
6*e*x + d)*b*log(c*x^n)/(e^8*x^6 + 6*d*e^7*x^5 + 15*d^2*e^6*x^4 + 20*d^3*e^
5*x^3 + 15*d^4*e^4*x^2 + 6*d^5*e^3*x + d^6*e^2) - 1/30*(6*e*x + d)*a/(e^8*x
^6 + 6*d*e^7*x^5 + 15*d^2*e^6*x^4 + 20*d^3*e^5*x^3 + 15*d^4*e^4*x^2 + 6*d^5
*e^3*x + d^6*e^2)
```

Fricas [B] time = 1.49607, size = 722, normalized size = 4.15

$$\frac{12\,bde^5nx^5 + 66\,bd^2e^4nx^4 + 148\,bd^3e^3nx^3 + 171\,bd^4e^2nx^2 + 13\,bd^6n - 12\,ad^6 + 18\left(5\,bd^5en - 4\,ad^5e\right)x - 12\left(be^6nx^6 + 6\right.}{360}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(12*b*d*e^5*n*x^5 + 66*b*d^2*e^4*n*x^4 + 148*b*d^3*e^3*n*x^3 + 171*b*
d^4*e^2*n*x^2 + 13*b*d^6*n - 12*a*d^6 + 18*(5*b*d^5*e*n - 4*a*d^5*e)*x - 12
*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3 +
 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) - 12*(6*b*d^5*e
*x + b*d^6)*log(c) + 12*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4
 + 20*b*d^3*e^3*n*x^3 + 15*b*d^4*e^2*n*x^2)*log(x))/(d^5*e^8*x^6 + 6*d^6*e^
7*x^5 + 15*d^7*e^6*x^4 + 20*d^8*e^5*x^3 + 15*d^9*e^4*x^2 + 6*d^10*e^3*x + d
^11*e^2)
```

Sympy [A] time = 135.978, size = 2480, normalized size = 14.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Piecewise((zoo*(-a/(5*x**5) - b*n*log(x)/(5*x**5) - b*n/(25*x**5) - b*log(c
)/(5*x**5)), Eq(d, 0) & Eq(e, 0)), ((a*x**2/2 + b*n*x**2*log(x)/2 - b*n*x**
2/4 + b*x**2*log(c)/2)/d**7, Eq(e, 0)), ((-a/(5*x**5) - b*n*log(x)/(5*x**5)
 - b*n/(25*x**5) - b*log(c)/(5*x**5))/e**7, Eq(d, 0)), (-12*a*d**6/(360*d**
11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5
400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) - 72*a*d**5*
e*x/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e
```

```
**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6)
- 12*b*d**6*n*log(d/e + x)/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*
e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5
 + 360*d**5*e**8*x**6) + 13*b*d**6*n/(360*d**11*e**2 + 2160*d**10*e**3*x +
5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6
*e**7*x**5 + 360*d**5*e**8*x**6) - 72*b*d**5*e*n*x*log(d/e + x)/(360*d**11*
e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400
*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) + 90*b*d**5*e*n
*x/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e*
*5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) +
 180*b*d**4*e**2*n*x**2*log(x)/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d
**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*
x**5 + 360*d**5*e**8*x**6) - 180*b*d**4*e**2*n*x**2*log(d/e + x)/(360*d**11
*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 540
0*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) + 171*b*d**4*e
**2*n*x**2/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200
*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8
*x**6) + 180*b*d**4*e**2*x**2*log(c)/(360*d**11*e**2 + 2160*d**10*e**3*x +
5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6
*e**7*x**5 + 360*d**5*e**8*x**6) + 240*b*d**3*e**3*n*x**3*log(x)/(360*d**11
*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 540
0*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) - 240*b*d**3*e
**3*n*x**3*log(d/e + x)/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**
4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 +
360*d**5*e**8*x**6) + 148*b*d**3*e**3*n*x**3/(360*d**11*e**2 + 2160*d**10*e
**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2
160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) + 240*b*d**3*e**3*x**3*log(c)/(360
*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3
 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) + 180*b*
d**2*e**4*n*x**4*log(x)/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**
4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 +
360*d**5*e**8*x**6) - 180*b*d**2*e**4*n*x**4*log(d/e + x)/(360*d**11*e**2 +
 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*
e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) + 66*b*d**2*e**4*n*x*
*4/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e*
*5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) +
 180*b*d**2*e**4*x**4*log(c)/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**
9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x*
*5 + 360*d**5*e**8*x**6) + 72*b*d*e**5*n*x**5*log(x)/(360*d**11*e**2 + 2160
*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*
x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) - 72*b*d*e**5*n*x**5*log(d
/e + x)/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d*
*8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x*
*6) + 12*b*d*e**5*n*x**5/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e*
*4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 +
```

```
 360*d**5*e**8*x**6) + 72*b*d*e**5*x**5*log(c)/(360*d**11*e**2 + 2160*d**10
*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 +
 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) + 12*b*e**6*n*x**6*log(x)/(360*d
**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 +
 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 360*d**5*e**8*x**6) - 12*b*e**
6*n*x**6*log(d/e + x)/(360*d**11*e**2 + 2160*d**10*e**3*x + 5400*d**9*e**4*
x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160*d**6*e**7*x**5 + 36
0*d**5*e**8*x**6) + 12*b*e**6*x**6*log(c)/(360*d**11*e**2 + 2160*d**10*e**3
*x + 5400*d**9*e**4*x**2 + 7200*d**8*e**5*x**3 + 5400*d**7*e**6*x**4 + 2160
*d**6*e**7*x**5 + 360*d**5*e**8*x**6), True))
```

Giac [B] time = 1.26505, size = 475, normalized size = 2.73

$$-\frac{12\,bnx^6e^6\log\left(xe+d\right)+72\,bdnx^5e^5\log\left(xe+d\right)+180\,bd^2nx^4e^4\log\left(xe+d\right)+240\,bd^3nx^3e^3\log\left(xe+d\right)+180\,bd^4nx^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(12*b*n*x^6*e^6*log(x*e + d) + 72*b*d*n*x^5*e^5*log(x*e + d) + 180*b
*d^2*n*x^4*e^4*log(x*e + d) + 240*b*d^3*n*x^3*e^3*log(x*e + d) + 180*b*d^4*
n*x^2*e^2*log(x*e + d) + 72*b*d^5*n*x*e*log(x*e + d) - 12*b*n*x^6*e^6*log(x
) - 72*b*d*n*x^5*e^5*log(x) - 180*b*d^2*n*x^4*e^4*log(x) - 240*b*d^3*n*x^3*
e^3*log(x) - 180*b*d^4*n*x^2*e^2*log(x) - 12*b*d*n*x^5*e^5 - 66*b*d^2*n*x^4
*e^4 - 148*b*d^3*n*x^3*e^3 - 171*b*d^4*n*x^2*e^2 - 90*b*d^5*n*x*e + 12*b*d^
6*n*log(x*e + d) + 72*b*d^5*x*e*log(c) - 13*b*d^6*n + 72*a*d^5*x*e + 12*b*d
^6*log(c) + 12*a*d^6)/(d^5*x^6*e^8 + 6*d^6*x^5*e^7 + 15*d^7*x^4*e^6 + 20*d^
8*x^3*e^5 + 15*d^9*x^2*e^4 + 6*d^10*x*e^3 + d^11*e^2)
```

3.70 $\int \frac{a+b\log(cx^n)}{(d+ex)^7}\,dx$

Optimal. Leaf size=152

$$-\frac{a+b\log\left(cx^n\right)}{6e(d+ex)^6}+\frac{bn}{6d^5e(d+ex)}+\frac{bn}{12d^4e(d+ex)^2}+\frac{bn}{18d^3e(d+ex)^3}+\frac{bn}{24d^2e(d+ex)^4}+\frac{bn\log(x)}{6d^6e}-\frac{bn\log(d+ex)}{6d^6e}+\frac{}{30}$$

```
[Out] (b*n)/(30*d*e*(d + e*x)^5) + (b*n)/(24*d^2*e*(d + e*x)^4) + (b*n)/(18*d^3*e
*(d + e*x)^3) + (b*n)/(12*d^4*e*(d + e*x)^2) + (b*n)/(6*d^5*e*(d + e*x)) +
(b*n*Log[x])/(6*d^6*e) - (a + b*Log[c*x^n])/(6*e*(d + e*x)^6) - (b*n*Log[d
+ e*x])/(6*d^6*e)
```

Rubi [A] time = 0.0654523, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2319, 44}

$$-\frac{a+b\log\left(cx^n\right)}{6e(d+ex)^6}+\frac{bn}{6d^5e(d+ex)}+\frac{bn}{12d^4e(d+ex)^2}+\frac{bn}{18d^3e(d+ex)^3}+\frac{bn}{24d^2e(d+ex)^4}+\frac{bn\log(x)}{6d^6e}-\frac{bn\log(d+ex)}{6d^6e}+\frac{}{30}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x)^7,x]
```

```
[Out] (b*n)/(30*d*e*(d + e*x)^5) + (b*n)/(24*d^2*e*(d + e*x)^4) + (b*n)/(18*d^3*e
*(d + e*x)^3) + (b*n)/(12*d^4*e*(d + e*x)^2) + (b*n)/(6*d^5*e*(d + e*x)) +
(b*n*Log[x])/(6*d^6*e) - (a + b*Log[c*x^n])/(6*e*(d + e*x)^6) - (b*n*Log[d
+ e*x])/(6*d^6*e)
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] && !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex)^7}\,dx = -\frac{a+b\log(cx^n)}{6e(d+ex)^6} + \frac{(bn)\int \frac{1}{x(d+ex)^6}\,dx}{6e}$$
$$= -\frac{a+b\log(cx^n)}{6e(d+ex)^6} + \frac{(bn)\int \left(\frac{1}{d^6x} - \frac{e}{d(d+ex)^6} - \frac{e}{d^2(d+ex)^5} - \frac{e}{d^3(d+ex)^4} - \frac{e}{d^4(d+ex)^3} - \frac{e}{d^5(d+ex)^2} - \frac{e}{d^6(d+ex)}\right) d}{6e}$$
$$= \frac{bn}{30de(d+ex)^5} + \frac{bn}{24d^2e(d+ex)^4} + \frac{bn}{18d^3e(d+ex)^3} + \frac{bn}{12d^4e(d+ex)^2} + \frac{bn}{6d^5e(d+ex)} + \frac{bn\log(x)}{6d^6e}$$

Mathematica [A] time = 0.130409, size = 99, normalized size = 0.65

$$\frac{\frac{bn\left(\frac{d\left(470d^2e^2x^2+385d^3ex+137d^4+270de^3x^3+60e^4x^4\right)}{(d+ex)^5}-60\log(d+ex)+60\log(x)\right)}{60d^6}-\frac{a+b\log(cx^n)}{(d+ex)^6}}{6e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x)^7,x]
```

```
[Out] (-((a + b*Log[c*x^n])/(d + e*x)^6) + (b*n*((d*(137*d^4 + 385*d^3*e*x + 470*
d^2*e^2*x^2 + 270*d*e^3*x^3 + 60*e^4*x^4))/(d + e*x)^5 + 60*Log[x] - 60*Log
[d + e*x]))/(60*d^6))/(6*e)
```

Maple [C] time = 0.109, size = 431, normalized size = 2.8

$$-\frac{b\ln(x^n)}{6(ex+d)^6e} - \frac{60\,ad^6 - 30\,i\pi\,bd^6\left(\mathrm{csgn}(icx^n)\right)^3 - 60\,bde^5nx^5 - 330\,bd^2e^4nx^4 - 740\,bd^3e^3nx^3 - 855\,bd^4e^2nx^2 - 522\,b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x+d)^7,x)
```

```
[Out] -1/6*b/e/(e*x+d)^6*ln(x^n)-1/360*(60*a*d^6-30*I*Pi*b*d^6*csgn(I*c*x^n)^3-60
*b*d*e^5*n*x^5-330*b*d^2*e^4*n*x^4-740*b*d^3*e^3*n*x^3-855*b*d^4*e^2*n*x^2-
```

```
522*b*d^5*e*n*x+30*I*Pi*b*d^6*csgn(I*c*x^n)^2*csgn(I*c)+30*I*Pi*b*d^6*csgn(
I*x^n)*csgn(I*c*x^n)^2-30*I*Pi*b*d^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-13
7*b*d^6*n+360*ln(e*x+d)*b*d*e^5*n*x^5+900*ln(e*x+d)*b*d^2*e^4*n*x^4+1200*ln
(e*x+d)*b*d^3*e^3*n*x^3+900*ln(e*x+d)*b*d^4*e^2*n*x^2+360*ln(e*x+d)*b*d^5*e
*n*x-360*ln(-x)*b*d*e^5*n*x^5-900*ln(-x)*b*d^2*e^4*n*x^4-1200*ln(-x)*b*d^3*
e^3*n*x^3-900*ln(-x)*b*d^4*e^2*n*x^2-360*ln(-x)*b*d^5*e*n*x+60*ln(c)*b*d^6+
60*ln(e*x+d)*b*e^6*n*x^6-60*ln(-x)*b*e^6*n*x^6+60*ln(e*x+d)*b*d^6*n-60*ln(-
x)*b*d^6*n)/d^6/e/(e*x+d)^6
```

Maxima [B] time = 1.23373, size = 373, normalized size = 2.45

$$\frac{1}{360}\,bn\left(\frac{60\,e^4x^4+270\,de^3x^3+470\,d^2e^2x^2+385\,d^3ex+137\,d^4}{d^5e^6x^5+5\,d^6e^5x^4+10\,d^7e^4x^3+10\,d^8e^3x^2+5\,d^9e^2x+d^{10}e}-\frac{60\,\log\left(ex+d\right)}{d^6e}+\frac{60\,\log\left(x\right)}{d^6e}\right)-\frac{}{6\left(e^7x^6+6\,de^6x^5+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/360*b*n*((60*e^4*x^4 + 270*d*e^3*x^3 + 470*d^2*e^2*x^2 + 385*d^3*e*x + 13
7*d^4)/(d^5*e^6*x^5 + 5*d^6*e^5*x^4 + 10*d^7*e^4*x^3 + 10*d^8*e^3*x^2 + 5*d
^9*e^2*x + d^10*e) - 60*log(e*x + d)/(d^6*e) + 60*log(x)/(d^6*e)) - 1/6*b*l
og(c*x^n)/(e^7*x^6 + 6*d*e^6*x^5 + 15*d^2*e^5*x^4 + 20*d^3*e^4*x^3 + 15*d^4
*e^3*x^2 + 6*d^5*e^2*x + d^6*e) - 1/6*a/(e^7*x^6 + 6*d*e^6*x^5 + 15*d^2*e^5
*x^4 + 20*d^3*e^4*x^3 + 15*d^4*e^3*x^2 + 6*d^5*e^2*x + d^6*e)
```

Fricas [B] time = 1.45231, size = 703, normalized size = 4.62

$$\frac{60\,bde^5nx^5+330\,bd^2e^4nx^4+740\,bd^3e^3nx^3+855\,bd^4e^2nx^2+522\,bd^5enx+137\,bd^6n-60\,bd^6\log\left(c\right)-60\,ad^6-60\left(be^6n\right.}{360\left(d^6e^7\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] 1/360*(60*b*d*e^5*n*x^5 + 330*b*d^2*e^4*n*x^4 + 740*b*d^3*e^3*n*x^3 + 855*b
*d^4*e^2*n*x^2 + 522*b*d^5*e*n*x + 137*b*d^6*n - 60*b*d^6*log(c) - 60*a*d^6
 - 60*(b*e^6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*
x^3 + 15*b*d^4*e^2*n*x^2 + 6*b*d^5*e*n*x + b*d^6*n)*log(e*x + d) + 60*(b*e^
6*n*x^6 + 6*b*d*e^5*n*x^5 + 15*b*d^2*e^4*n*x^4 + 20*b*d^3*e^3*n*x^3 + 15*b*
```

```
d^4*e^2*n*x^2 + 6*b*d^5*e*n*x)*log(x))/(d^6*e^7*x^6 + 6*d^7*e^6*x^5 + 15*d^
8*e^5*x^4 + 20*d^9*e^4*x^3 + 15*d^10*e^3*x^2 + 6*d^11*e^2*x + d^12*e)
```

Sympy [A] time = 154.069, size = 2519, normalized size = 16.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**7,x)
```

```
[Out] Piecewise((zoo*(-a/(6*x**6) - b*n*log(x)/(6*x**6) - b*n/(36*x**6) - b*log(c
)/(6*x**6)), Eq(d, 0) & Eq(e, 0)), ((-a/(6*x**6) - b*n*log(x)/(6*x**6) - b*
n/(36*x**6) - b*log(c)/(6*x**6))/e**7, Eq(d, 0)), ((a*x + b*n*x*log(x) - b*
n*x + b*x*log(c))/d**7, Eq(e, 0)), (-60*a*d**6/(360*d**12*e + 2160*d**11*e*
*2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2
160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) - 60*b*d**6*n*log(d/e + x)/(360*d*
*12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 54
00*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 137*b*d**6*
n/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*
x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 36
0*b*d**5*e*n*x*log(x)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x*
*2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*
d**6*e**7*x**6) - 360*b*d**5*e*n*x*log(d/e + x)/(360*d**12*e + 2160*d**11*e
**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 +
2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 522*b*d**5*e*n*x/(360*d**12*e +
 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8
*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 360*b*d**5*e*x*log
(c)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**
4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) +
900*b*d**4*e**2*n*x**2*log(x)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10
*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**
5 + 360*d**6*e**7*x**6) - 900*b*d**4*e**2*n*x**2*log(d/e + x)/(360*d**12*e
+ 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**
8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 855*b*d**4*e**2*n
*x**2/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e
**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6)
+ 900*b*d**4*e**2*x**2*log(c)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10
*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**
5 + 360*d**6*e**7*x**6) + 1200*b*d**3*e**3*n*x**3*log(x)/(360*d**12*e + 216
0*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**
5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) - 1200*b*d**3*e**3*n*x**
```

```
3*log(d/e + x)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 72
00*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e*
*7*x**6) + 740*b*d**3*e**3*n*x**3/(360*d**12*e + 2160*d**11*e**2*x + 5400*d
**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6
*x**5 + 360*d**6*e**7*x**6) + 1200*b*d**3*e**3*x**3*log(c)/(360*d**12*e + 2
160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e
**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 900*b*d**2*e**4*n*x*
*4*log(x)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d*
*9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x*
*6) - 900*b*d**2*e**4*n*x**4*log(d/e + x)/(360*d**12*e + 2160*d**11*e**2*x
+ 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d
**7*e**6*x**5 + 360*d**6*e**7*x**6) + 330*b*d**2*e**4*n*x**4/(360*d**12*e +
 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8
*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 900*b*d**2*e**4*x*
*4*log(c)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d*
*9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x*
*6) + 360*b*d*e**5*n*x**5*log(x)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d*
*10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*
x**5 + 360*d**6*e**7*x**6) - 360*b*d*e**5*n*x**5*log(d/e + x)/(360*d**12*e
+ 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**
8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 60*b*d*e**5*n*x**
5/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*
x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 36
0*b*d*e**5*x**5*log(c)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x
**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360
*d**6*e**7*x**6) + 60*b*e**6*n*x**6*log(x)/(360*d**12*e + 2160*d**11*e**2*x
 + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*
d**7*e**6*x**5 + 360*d**6*e**7*x**6) - 60*b*e**6*n*x**6*log(d/e + x)/(360*d
**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*d**9*e**4*x**3 + 5
400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*x**6) + 60*b*e**6*
x**6*log(c)/(360*d**12*e + 2160*d**11*e**2*x + 5400*d**10*e**3*x**2 + 7200*
d**9*e**4*x**3 + 5400*d**8*e**5*x**4 + 2160*d**7*e**6*x**5 + 360*d**6*e**7*
x**6), True))
```

Giac [B] time = 1.21837, size = 464, normalized size = 3.05

$$-\frac{60\,bnx^6e^6\log(xe+d)+360\,bdnx^5e^5\log(xe+d)+900\,bd^2nx^4e^4\log(xe+d)+1200\,bd^3nx^3e^3\log(xe+d)+900\,bd^4nx^{\cdots}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] -1/360*(60*b*n*x^6*e^6*log(x*e + d) + 360*b*d*n*x^5*e^5*log(x*e + d) + 900*
b*d^2*n*x^4*e^4*log(x*e + d) + 1200*b*d^3*n*x^3*e^3*log(x*e + d) + 900*b*d^
4*n*x^2*e^2*log(x*e + d) + 360*b*d^5*n*x*e*log(x*e + d) - 60*b*n*x^6*e^6*lo
g(x) - 360*b*d*n*x^5*e^5*log(x) - 900*b*d^2*n*x^4*e^4*log(x) - 1200*b*d^3*n
*x^3*e^3*log(x) - 900*b*d^4*n*x^2*e^2*log(x) - 360*b*d^5*n*x*e*log(x) - 60*
b*d*n*x^5*e^5 - 330*b*d^2*n*x^4*e^4 - 740*b*d^3*n*x^3*e^3 - 855*b*d^4*n*x^2
*e^2 - 522*b*d^5*n*x*e + 60*b*d^6*n*log(x*e + d) - 137*b*d^6*n + 60*b*d^6*l
og(c) + 60*a*d^6)/(d^6*x^6*e^7 + 6*d^7*x^5*e^6 + 15*d^8*x^4*e^5 + 20*d^9*x^
3*e^4 + 15*d^10*x^2*e^3 + 6*d^11*x*e^2 + d^12*e)
```

3.71 $\int \frac{a+b\log(cx^n)}{x(d+ex)^7}\,dx$

Optimal. Leaf size=294

$$\frac{bn\mathrm{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^7}-\frac{\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^7}-\frac{ex(a+b\log(cx^n))}{d^7(d+ex)}+\frac{a+b\log(cx^n)}{2d^5(d+ex)^2}+\frac{a+b\log(cx^n)}{3d^4(d+ex)^3}+\frac{a+b\log}{4d^3(d+}$$

```
[Out] -(b*n)/(30*d^2*(d + e*x)^5) - (11*b*n)/(120*d^3*(d + e*x)^4) - (37*b*n)/(18
0*d^4*(d + e*x)^3) - (19*b*n)/(40*d^5*(d + e*x)^2) - (29*b*n)/(20*d^6*(d +
e*x)) - (29*b*n*Log[x])/(20*d^7) + (a + b*Log[c*x^n])/(6*d*(d + e*x)^6) + (
a + b*Log[c*x^n])/(5*d^2*(d + e*x)^5) + (a + b*Log[c*x^n])/(4*d^3*(d + e*x)
^4) + (a + b*Log[c*x^n])/(3*d^4*(d + e*x)^3) + (a + b*Log[c*x^n])/(2*d^5*(d
 + e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^7*(d + e*x)) - (Log[1 + d/(e*x)]*(
a + b*Log[c*x^n]))/d^7 + (49*b*n*Log[d + e*x])/(20*d^7) + (b*n*PolyLog[2, -
(d/(e*x))])/d^7
```

Rubi [A] time = 0.726049, antiderivative size = 316, normalized size of antiderivative = 1.07, number of steps used = 27, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {2347, 2344, 2301, 2317, 2391, 2314, 31, 2319, 44}

$$-\frac{bn\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^7}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^7}-\frac{ex(a+b\log(cx^n))}{d^7(d+ex)}+\frac{a+b\log(cx^n)}{2d^5(d+ex)^2}+\frac{a+b\log(cx^n)}{3d^4(d+ex)^3}+\frac{a+b\log}{4d^3(d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x)^7),x]
```

```
[Out] -(b*n)/(30*d^2*(d + e*x)^5) - (11*b*n)/(120*d^3*(d + e*x)^4) - (37*b*n)/(18
0*d^4*(d + e*x)^3) - (19*b*n)/(40*d^5*(d + e*x)^2) - (29*b*n)/(20*d^6*(d +
e*x)) - (29*b*n*Log[x])/(20*d^7) + (a + b*Log[c*x^n])/(6*d*(d + e*x)^6) + (
a + b*Log[c*x^n])/(5*d^2*(d + e*x)^5) + (a + b*Log[c*x^n])/(4*d^3*(d + e*x)
^4) + (a + b*Log[c*x^n])/(3*d^4*(d + e*x)^3) + (a + b*Log[c*x^n])/(2*d^5*(d
 + e*x)^2) - (e*x*(a + b*Log[c*x^n]))/(d^7*(d + e*x)) + (a + b*Log[c*x^n])^
2/(2*b*d^7*n) + (49*b*n*Log[d + e*x])/(20*d^7) - ((a + b*Log[c*x^n])*Log[1
+ (e*x)/d])/d^7 - (b*n*PolyLog[2, -((e*x)/d)])/d^7
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
```

```
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

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

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2319

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

```
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^7}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^6}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^7}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{6d(d+ex)^6} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^5}\,dx}{d^2} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^6}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex)^6}\,dx}{6d}$$

$$= \frac{a+b\log(cx^n)}{6d(d+ex)^6} + \frac{a+b\log(cx^n)}{5d^2(d+ex)^5} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex)^4}\,dx}{d^3} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^5}\,dx}{d^3} - \frac{(bn)\int \frac{1}{x(d+ex)^5}\,dx}{5d^2} - \frac{(bn)}{}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{bn}{24d^3(d+ex)^4} - \frac{bn}{18d^4(d+ex)^3} - \frac{bn}{12d^5(d+ex)^2} - \frac{bn}{6d^6(d+ex)} - \frac{bn\log(x)}{6d^7} + \frac{a}{}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{11bn}{90d^4(d+ex)^3} - \frac{11bn}{60d^5(d+ex)^2} - \frac{11bn}{30d^6(d+ex)} - \frac{11bn\log(x)}{30d^7}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{37bn}{120d^5(d+ex)^2} - \frac{37bn}{60d^6(d+ex)} - \frac{37bn\log}{60d^7}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{19bn}{40d^5(d+ex)^2} - \frac{19bn}{20d^6(d+ex)} - \frac{19bn\log(}{20d^7}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{19bn}{40d^5(d+ex)^2} - \frac{29bn}{20d^6(d+ex)} - \frac{29bn\log(}{20d^7}$$

$$= -\frac{bn}{30d^2(d+ex)^5} - \frac{11bn}{120d^3(d+ex)^4} - \frac{37bn}{180d^4(d+ex)^3} - \frac{19bn}{40d^5(d+ex)^2} - \frac{29bn}{20d^6(d+ex)} - \frac{29bn\log(}{20d^7}$$

Mathematica [A] time = 0.352559, size = 349, normalized size = 1.19

$$-360bn\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{360a\log(cx^n)}{n} + \frac{60ad^6}{(d+ex)^6} + \frac{72ad^5}{(d+ex)^5} + \frac{90ad^4}{(d+ex)^4} + \frac{120ad^3}{(d+ex)^3} + \frac{180ad^2}{(d+ex)^2} + \frac{360ad}{d+ex} - 360a\log\left(\frac{ex}{d}+1\right) + \frac{60bd^6}{(d+}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x)^7),x]
```

```
[Out] ((60*a*d^6)/(d + e*x)^6 + (72*a*d^5)/(d + e*x)^5 - (12*b*d^5*n)/(d + e*x)^5
 + (90*a*d^4)/(d + e*x)^4 - (33*b*d^4*n)/(d + e*x)^4 + (120*a*d^3)/(d + e*x
)^3 - (74*b*d^3*n)/(d + e*x)^3 + (180*a*d^2)/(d + e*x)^2 - (171*b*d^2*n)/(d
 + e*x)^2 + (360*a*d)/(d + e*x) - (522*b*d*n)/(d + e*x) - 882*b*n*Log[x] +
(360*a*Log[c*x^n])/n + (60*b*d^6*Log[c*x^n])/(d + e*x)^6 + (72*b*d^5*Log[c*
x^n])/(d + e*x)^5 + (90*b*d^4*Log[c*x^n])/(d + e*x)^4 + (120*b*d^3*Log[c*x^
n])/(d + e*x)^3 + (180*b*d^2*Log[c*x^n])/(d + e*x)^2 + (360*b*d*Log[c*x^n])
/(d + e*x) + (180*b*Log[c*x^n]^2)/n + 882*b*n*Log[d + e*x] - 360*a*Log[1 +
(e*x)/d] - 360*b*Log[c*x^n]*Log[1 + (e*x)/d] - 360*b*n*PolyLog[2, -((e*x)/d
)])/(360*d^7)
```

Maple [C] time = 0.181, size = 1427, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x+d)^7,x)
```

```
[Out] -1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^7*ln(e*x+d)+1/10*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2/d^2/(e*x+d)^5+b*ln(x^n)/d^7*ln(x)+1/3*b*ln(x^n)/d^4/(e*x
+d)^3+1/4*b*ln(x^n)/d^3/(e*x+d)^4+b*ln(c)/d^6/(e*x+d)+1/5*a/d^2/(e*x+d)^5+1
/6*a/d/(e*x+d)^6-a/d^7*ln(e*x+d)+a/d^7*ln(x)-1/10*I*b*Pi*csgn(I*c*x^n)^3/d^
2/(e*x+d)^5-1/12*I*b*Pi*csgn(I*c*x^n)^3/d/(e*x+d)^6-1/6*I*b*Pi*csgn(I*c*x^n
)^3/d^4/(e*x+d)^3-1/8*I*b*Pi*csgn(I*c*x^n)^3/d^3/(e*x+d)^4-1/4*I*b*Pi*csgn(
I*c*x^n)^3/d^5/(e*x+d)^2+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^7*ln(e*x+d)-1/2*I*b*P
i*csgn(I*c*x^n)^3/d^6/(e*x+d)+1/2*b*ln(c)/d^5/(e*x+d)^2+b*ln(c)/d^7*ln(x)-b
*ln(c)/d^7*ln(e*x+d)+1/6*b*ln(x^n)/d/(e*x+d)^6-1/4*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)/d^5/(e*x+d)^2-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)/d/(e*x+d)^6+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^6/(e*x+d)+1/8*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/(e*x+d)^4-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)/d^7*ln(x)-1/10*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^
2/(e*x+d)^5+b*n/d^7*ln(e*x+d)*ln(-e*x/d)+1/10*I*b*Pi*csgn(I*c*x^n)^2*csgn(I
*c)/d^2/(e*x+d)^5+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^5/(e*x+d)^2-1/2*
I*b*Pi*csgn(I*c*x^n)^3/d^7*ln(x)+1/12*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e
*x+d)^6+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^7*ln(e*x+d)+a/d^6/
(e*x+d)+1/2*a/d^5/(e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^6/(e*x
+d)+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4/(e*x+d)^3-1/2*I*b*Pi*csgn(I*
```

```
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^6/(e*x+d)-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)/d^4/(e*x+d)^3-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d
^3/(e*x+d)^4+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5/(e*x+d)^2+1/2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)^2/d^7*ln(x)+1/3*a/d^4/(e*x+d)^3+1/4*a/d^3/(e*x+d)
^4-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^7*ln(e*x+d)+1/6*I*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)/d^4/(e*x+d)^3-1/30*b*n/d^2/(e*x+d)^5-11/120*b*n/d^3/(e*x+d)
^4-37/180*b*n/d^4/(e*x+d)^3-19/40*b*n/d^5/(e*x+d)^2-29/20*b*n/d^6/(e*x+d)+1
/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/(e*x+d)^6+1/8*I*b*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)^2/d^3/(e*x+d)^4-b*ln(x^n)/d^7*ln(e*x+d)+1/5*b*ln(x^n)/d^2/(e*x
+d)^5+1/2*b*ln(x^n)/d^5/(e*x+d)^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^7*
ln(x)-1/2*b*n/d^7*ln(x)^2+b*n/d^7*dilog(-e*x/d)+b*ln(x^n)/d^6/(e*x+d)+1/3*b
*ln(c)/d^4/(e*x+d)^3+1/4*b*ln(c)/d^3/(e*x+d)^4+1/5*b*ln(c)/d^2/(e*x+d)^5+1/
6*b*ln(c)/d/(e*x+d)^6-49/20*b*n*ln(x)/d^7+49/20*b*n*ln(e*x+d)/d^7
```

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

$$\frac{1}{60}\,a\left(\frac{60\,e^5x^5+330\,de^4x^4+740\,d^2e^3x^3+855\,d^3e^2x^2+522\,d^4ex+147\,d^5}{d^6e^6x^6+6\,d^7e^5x^5+15\,d^8e^4x^4+20\,d^9e^3x^3+15\,d^{10}e^2x^2+6\,d^{11}ex+d^{12}}-\frac{60\,\log\left(ex+d\right)}{d^7}+\frac{60\,\log\left(x\right)}{d^7}\right)+b\int\frac{}{e^7x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/60*a*((60*e^5*x^5 + 330*d*e^4*x^4 + 740*d^2*e^3*x^3 + 855*d^3*e^2*x^2 + 5
22*d^4*e*x + 147*d^5)/(d^6*e^6*x^6 + 6*d^7*e^5*x^5 + 15*d^8*e^4*x^4 + 20*d^
9*e^3*x^3 + 15*d^10*e^2*x^2 + 6*d^11*e*x + d^12) - 60*log(e*x + d)/d^7 + 60
*log(x)/d^7) + b*integrate((log(c) + log(x^n))/(e^7*x^8 + 7*d*e^6*x^7 + 21*
d^2*e^5*x^6 + 35*d^3*e^4*x^5 + 35*d^4*e^3*x^4 + 21*d^5*e^2*x^3 + 7*d^6*e*x^
2 + d^7*x), x)
```

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

$$\mathrm{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^7x^8+7\,de^6x^7+21\,d^2e^5x^6+35\,d^3e^4x^5+35\,d^4e^3x^4+21\,d^5e^2x^3+7\,d^6ex^2+d^7x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^7*x^8 + 7*d*e^6*x^7 + 21*d^2*e^5*x^6 + 35*d^
3*e^4*x^5 + 35*d^4*e^3*x^4 + 21*d^5*e^2*x^3 + 7*d^6*e*x^2 + d^7*x), 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*ln(c*x**n))/x/(e*x+d)**7,x)
```

```
[Out] Timed out
```

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

$$\int \frac{b \log(cx^n) + a}{(ex + d)^7 x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^7*x), x)
```

3.72 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^7}\,dx$

Optimal. Leaf size=339

$$-\frac{7benPolyLog\left(2,-\frac{d}{ex}\right)}{d^8}+\frac{6e^2x\left(a+b\log\left(cx^n\right)\right)}{d^8(d+ex)}+\frac{7e\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^8}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{2d^6(d+ex)^2}-\frac{4e\left(a+b\log\left(\right.\right.}{3d^5(d+ex}$$

```
[Out] -((b*n)/(d^7*x)) + (b*e*n)/(30*d^3*(d + e*x)^5) + (17*b*e*n)/(120*d^4*(d +
e*x)^4) + (79*b*e*n)/(180*d^5*(d + e*x)^3) + (53*b*e*n)/(40*d^6*(d + e*x)^2
) + (103*b*e*n)/(20*d^7*(d + e*x)) + (103*b*e*n*Log[x])/(20*d^8) - (a + b*L
og[c*x^n])/(d^7*x) - (e*(a + b*Log[c*x^n]))/(6*d^2*(d + e*x)^6) - (2*e*(a +
 b*Log[c*x^n]))/(5*d^3*(d + e*x)^5) - (3*e*(a + b*Log[c*x^n]))/(4*d^4*(d +
e*x)^4) - (4*e*(a + b*Log[c*x^n]))/(3*d^5*(d + e*x)^3) - (5*e*(a + b*Log[c*
x^n]))/(2*d^6*(d + e*x)^2) + (6*e^2*x*(a + b*Log[c*x^n]))/(d^8*(d + e*x)) +
 (7*e*Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/d^8 - (223*b*e*n*Log[d + e*x])/(
20*d^8) - (7*b*e*n*PolyLog[2, -(d/(e*x))])/d^8
```

Rubi [A] time = 0.580702, antiderivative size = 361, normalized size of antiderivative = 1.06, number of steps used = 23, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$\frac{7benPolyLog\left(2,-\frac{ex}{d}\right)}{d^8}+\frac{6e^2x\left(a+b\log\left(cx^n\right)\right)}{d^8(d+ex)}-\frac{7e\left(a+b\log\left(cx^n\right)\right)^2}{2bd^8n}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{2d^6(d+ex)^2}-\frac{4e\left(a+b\log\left(cx^n\right)\right)}{3d^5(d+ex)^3}-\frac{3e(a}{4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x)^7),x]
```

```
[Out] -((b*n)/(d^7*x)) + (b*e*n)/(30*d^3*(d + e*x)^5) + (17*b*e*n)/(120*d^4*(d +
e*x)^4) + (79*b*e*n)/(180*d^5*(d + e*x)^3) + (53*b*e*n)/(40*d^6*(d + e*x)^2
) + (103*b*e*n)/(20*d^7*(d + e*x)) + (103*b*e*n*Log[x])/(20*d^8) - (a + b*L
og[c*x^n])/(d^7*x) - (e*(a + b*Log[c*x^n]))/(6*d^2*(d + e*x)^6) - (2*e*(a +
 b*Log[c*x^n]))/(5*d^3*(d + e*x)^5) - (3*e*(a + b*Log[c*x^n]))/(4*d^4*(d +
e*x)^4) - (4*e*(a + b*Log[c*x^n]))/(3*d^5*(d + e*x)^3) - (5*e*(a + b*Log[c*
x^n]))/(2*d^6*(d + e*x)^2) + (6*e^2*x*(a + b*Log[c*x^n]))/(d^8*(d + e*x)) -
 (7*e*(a + b*Log[c*x^n])^2)/(2*b*d^8*n) - (223*b*e*n*Log[d + e*x])/(20*d^8)
 + (7*e*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^8 + (7*b*e*n*PolyLog[2, -((e
*x)/d)])/d^8
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^7}\,dx = \int \left(\frac{a+b\log(cx^n)}{d^7x^2} - \frac{7e(a+b\log(cx^n))}{d^8x} + \frac{e^2(a+b\log(cx^n))}{d^2(d+ex)^7} + \frac{2e^2(a+b\log(cx^n))}{d^3(d+ex)^6} + \frac{3e^2(a+b}{d^4(d}\right.$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^7} - \frac{(7e)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^8} + \frac{\left(7e^2\right)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^8} + \frac{\left(6e^2\right)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d^7} + \frac{\left(5e^2\right)\int}{}$$

$$= -\frac{bn}{d^7x} - \frac{a+b\log(cx^n)}{d^7x} - \frac{e(a+b\log(cx^n))}{6d^2(d+ex)^6} - \frac{2e(a+b\log(cx^n))}{5d^3(d+ex)^5} - \frac{3e(a+b\log(cx^n))}{4d^4(d+ex)^4} - \frac{4e(a+}{3d^5(}$$

$$= -\frac{bn}{d^7x} - \frac{a+b\log(cx^n)}{d^7x} - \frac{e(a+b\log(cx^n))}{6d^2(d+ex)^6} - \frac{2e(a+b\log(cx^n))}{5d^3(d+ex)^5} - \frac{3e(a+b\log(cx^n))}{4d^4(d+ex)^4} - \frac{4e(a+}{3d^5(}$$

$$= -\frac{bn}{d^7x} + \frac{ben}{30d^3(d+ex)^5} + \frac{17ben}{120d^4(d+ex)^4} + \frac{79ben}{180d^5(d+ex)^3} + \frac{53ben}{40d^6(d+ex)^2} + \frac{103ben}{20d^7(d+ex)} + \frac{10}{}$$

Mathematica [A] time = 0.624457, size = 401, normalized size = 1.18

$$-\frac{-2520ben\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \frac{2520ae\log(cx^n)}{n} + \frac{60ad^6e}{(d+ex)^6} + \frac{144ad^5e}{(d+ex)^5} + \frac{270ad^4e}{(d+ex)^4} + \frac{480ad^3e}{(d+ex)^3} + \frac{900ad^2e}{(d+ex)^2} + \frac{2160ade}{d+ex} - 2520ae\log\left(\frac{ex}{d}+1\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x)^7),x]
```

```
[Out] -((360*a*d)/x + (360*b*d*n)/x + (60*a*d^6*e)/(d + e*x)^6 + (144*a*d^5*e)/(d
 + e*x)^5 - (12*b*d^5*e*n)/(d + e*x)^5 + (270*a*d^4*e)/(d + e*x)^4 - (51*b*
d^4*e*n)/(d + e*x)^4 + (480*a*d^3*e)/(d + e*x)^3 - (158*b*d^3*e*n)/(d + e*x
)^3 + (900*a*d^2*e)/(d + e*x)^2 - (477*b*d^2*e*n)/(d + e*x)^2 + (2160*a*d*e
```

```
)/(d + e*x) - (1854*b*d*e*n)/(d + e*x) - 4014*b*e*n*Log[x] + (2520*a*e*Log[
c*x^n])/n + (360*b*d*Log[c*x^n])/x + (60*b*d^6*e*Log[c*x^n])/(d + e*x)^6 +
(144*b*d^5*e*Log[c*x^n])/(d + e*x)^5 + (270*b*d^4*e*Log[c*x^n])/(d + e*x)^4
 + (480*b*d^3*e*Log[c*x^n])/(d + e*x)^3 + (900*b*d^2*e*Log[c*x^n])/(d + e*x
)^2 + (2160*b*d*e*Log[c*x^n])/(d + e*x) + (1260*b*e*Log[c*x^n]^2)/n + 4014*
b*e*n*Log[d + e*x] - 2520*a*e*Log[1 + (e*x)/d] - 2520*b*e*Log[c*x^n]*Log[1
+ (e*x)/d] - 2520*b*e*n*PolyLog[2, -((e*x)/d)])/(360*d^8)
```

Maple [C] time = 0.194, size = 1650, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x+d)^7,x)
```

```
[Out] 7/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^8*e*ln(e*x+d)-7/2*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)/d^8*e*ln(x)+3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^7
*e/(e*x+d)-7/2*I*b*Pi*csgn(I*c*x^n)^3/d^8*e*ln(e*x+d)+1/12*I*b*Pi*csgn(I*c*
x^n)^3*e/d^2/(e*x+d)^6+2/3*I*b*Pi*csgn(I*c*x^n)^3*e/d^5/(e*x+d)^3-a/d^7/x+5
/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^6/(e*x+d)^2+7/2*I*b*Pi*csgn(I*c*x^n)^3/d^8*e*
ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^7/x+3*I*b*Pi*csgn(I*c*x^n)^3/d
^7*e/(e*x+d)-7*b*n/d^8*e*ln(e*x+d)*ln(-e*x/d)-1/6*a*e/d^2/(e*x+d)^6-6*a/d^7
*e/(e*x+d)+1/2*I*b*Pi*csgn(I*c*x^n)^3/d^7/x-3/8*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)/d^4*e/(e*x+d)^4-1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e*x+d)
^6+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^8*e*ln(e*x+d)-7/2*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2/d^8*e*ln(x)-1/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^
3*e/(e*x+d)^5-3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^7*e/(e*x+d)-3*I*b*Pi*c
sgn(I*c*x^n)^2*csgn(I*c)/d^7*e/(e*x+d)-1/5*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
/d^3*e/(e*x+d)^5-2/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^5/(e*x+d)^3-5/4
*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^6/(e*x+d)^2+1/2*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)/d^7/x+3/8*I*b*Pi*csgn(I*c*x^n)^3/d^4*e/(e*x+d)^4+1/5*
I*b*Pi*csgn(I*c*x^n)^3/d^3*e/(e*x+d)^5-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2/d^7/x-1/12*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*x+d)^6-2/3*I*b*Pi*c
sgn(I*c*x^n)^2*csgn(I*c)*e/d^5/(e*x+d)^3+3/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)/d^4*e/(e*x+d)^4+1/5*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
/d^3*e/(e*x+d)^5-5/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^6/(e*x+d)^2+7/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^8*e*ln(x)+5/4*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^6/(e*x+d)^2-3/8*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/d^4*e/(e*x+d)^4+1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d
^2/(e*x+d)^6-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^8*e*ln(e*x+d)
-b*n/d^7/x-7*a/d^8*e*ln(x)-b*ln(c)/d^7/x-5/2*a*e/d^6/(e*x+d)^2-4/3*a*e/d^5/
```

```
(e*x+d)^3-3/4*a/d^4*e/(e*x+d)^4-2/5*a/d^3*e/(e*x+d)^5+7*a/d^8*e*ln(e*x+d)+2
/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^5/(e*x+d)^3-b*ln(x^n)/d^7
/x-1/6*b*ln(c)*e/d^2/(e*x+d)^6-6*b*ln(c)/d^7*e/(e*x+d)-5/2*b*ln(c)*e/d^6/(e
*x+d)^2-4/3*b*ln(c)*e/d^5/(e*x+d)^3-4/3*b*ln(x^n)*e/d^5/(e*x+d)^3-3/4*b*ln(
x^n)/d^4*e/(e*x+d)^4-2/5*b*ln(x^n)/d^3*e/(e*x+d)^5-7*b*ln(x^n)/d^8*e*ln(x)+
7/2*b*n/d^8*e*ln(x)^2-7*b*n/d^8*e*dilog(-e*x/d)+1/30*b*e*n/d^3/(e*x+d)^5+17
/120*b*e*n/d^4/(e*x+d)^4+79/180*b*e*n/d^5/(e*x+d)^3+53/40*b*e*n/d^6/(e*x+d)
^2+103/20*b*e*n/d^7/(e*x+d)-3/4*b*ln(c)/d^4*e/(e*x+d)^4-2/5*b*ln(c)/d^3*e/(
e*x+d)^5+7*b*ln(c)/d^8*e*ln(e*x+d)-7*b*ln(c)/d^8*e*ln(x)+223/20*b*e*n*ln(x)
/d^8-223/20*b*e*n*ln(e*x+d)/d^8+7*b*ln(x^n)/d^8*e*ln(e*x+d)-6*b*ln(x^n)/d^7
*e/(e*x+d)-5/2*b*ln(x^n)*e/d^6/(e*x+d)^2-1/6*b*ln(x^n)*e/d^2/(e*x+d)^6
```

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

$$-\frac{1}{60}\,a\left(\frac{420\,e^6x^6+2310\,de^5x^5+5180\,d^2e^4x^4+5985\,d^3e^3x^3+3654\,d^4e^2x^2+1029\,d^5ex+60\,d^6}{d^7e^6x^7+6\,d^8e^5x^6+15\,d^9e^4x^5+20\,d^{10}e^3x^4+15\,d^{11}e^2x^3+6\,d^{12}ex^2+d^{13}x}-\frac{420\,e\log\left(ex+d\right)}{d^8}+\frac{420}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] -1/60*a*((420*e^6*x^6 + 2310*d*e^5*x^5 + 5180*d^2*e^4*x^4 + 5985*d^3*e^3*x^
3 + 3654*d^4*e^2*x^2 + 1029*d^5*e*x + 60*d^6)/(d^7*e^6*x^7 + 6*d^8*e^5*x^6
+ 15*d^9*e^4*x^5 + 20*d^10*e^3*x^4 + 15*d^11*e^2*x^3 + 6*d^12*e*x^2 + d^13*
x) - 420*e*log(e*x + d)/d^8 + 420*e*log(x)/d^8) + b*integrate((log(c) + log
(x^n))/(e^7*x^9 + 7*d*e^6*x^8 + 21*d^2*e^5*x^7 + 35*d^3*e^4*x^6 + 35*d^4*e^
3*x^5 + 21*d^5*e^2*x^4 + 7*d^6*e*x^3 + d^7*x^2), x)
```

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

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^7x^9+7\,de^6x^8+21\,d^2e^5x^7+35\,d^3e^4x^6+35\,d^4e^3x^5+21\,d^5e^2x^4+7\,d^6ex^3+d^7x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^7*x^9 + 7*d*e^6*x^8 + 21*d^2*e^5*x^7 + 35*d^
3*e^4*x^6 + 35*d^4*e^3*x^5 + 21*d^5*e^2*x^4 + 7*d^6*e*x^3 + d^7*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*ln(c*x**n))/x**2/(e*x+d)**7,x)
```

```
[Out] Timed out
```

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

$$\int \frac{b \log(cx^n) + a}{(ex + d)^7 x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^7*x^2), x)
```

3.73 $\int \frac{a+b\log(cx^n)}{x^3(d+ex)^7}\,dx$

Optimal. Leaf size=401

$$\frac{28be^2n\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^9}-\frac{21e^3x\left(a+b\log\left(cx^n\right)\right)}{d^9(d+ex)}-\frac{28e^2\log\left(\frac{d}{ex}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^9}+\frac{15e^2\left(a+b\log\left(cx^n\right)\right)}{2d^7(d+ex)^2}+\frac{10e^2(a}{3d}$$

```
[Out] -(b*n)/(4*d^7*x^2) + (7*b*e*n)/(d^8*x) - (b*e^2*n)/(30*d^4*(d + e*x)^5) - (
23*b*e^2*n)/(120*d^5*(d + e*x)^4) - (34*b*e^2*n)/(45*d^6*(d + e*x)^3) - (14
*b*e^2*n)/(5*d^7*(d + e*x)^2) - (131*b*e^2*n)/(10*d^8*(d + e*x)) - (131*b*e
^2*n*Log[x])/(10*d^9) - (a + b*Log[c*x^n])/(2*d^7*x^2) + (7*e*(a + b*Log[c*
x^n]))/(d^8*x) + (e^2*(a + b*Log[c*x^n]))/(6*d^3*(d + e*x)^6) + (3*e^2*(a +
 b*Log[c*x^n]))/(5*d^4*(d + e*x)^5) + (3*e^2*(a + b*Log[c*x^n]))/(2*d^5*(d
+ e*x)^4) + (10*e^2*(a + b*Log[c*x^n]))/(3*d^6*(d + e*x)^3) + (15*e^2*(a +
b*Log[c*x^n]))/(2*d^7*(d + e*x)^2) - (21*e^3*x*(a + b*Log[c*x^n]))/(d^9*(d
+ e*x)) - (28*e^2*Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/d^9 + (341*b*e^2*n*L
og[d + e*x])/(10*d^9) + (28*b*e^2*n*PolyLog[2, -(d/(e*x))])/d^9
```

Rubi [A] time = 0.636512, antiderivative size = 423, normalized size of antiderivative = 1.05, number of steps used = 24, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {44, 2351, 2304, 2301, 2319, 2314, 31, 2317, 2391}

$$-\frac{28be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^9}-\frac{21e^3x\left(a+b\log\left(cx^n\right)\right)}{d^9(d+ex)}+\frac{14e^2\left(a+b\log\left(cx^n\right)\right)^2}{bd^9n}+\frac{15e^2\left(a+b\log\left(cx^n\right)\right)}{2d^7(d+ex)^2}+\frac{10e^2\left(a+b\log\left(c\right.\right.}{3d^6(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x)^7),x]
```

```
[Out] -(b*n)/(4*d^7*x^2) + (7*b*e*n)/(d^8*x) - (b*e^2*n)/(30*d^4*(d + e*x)^5) - (
23*b*e^2*n)/(120*d^5*(d + e*x)^4) - (34*b*e^2*n)/(45*d^6*(d + e*x)^3) - (14
*b*e^2*n)/(5*d^7*(d + e*x)^2) - (131*b*e^2*n)/(10*d^8*(d + e*x)) - (131*b*e
^2*n*Log[x])/(10*d^9) - (a + b*Log[c*x^n])/(2*d^7*x^2) + (7*e*(a + b*Log[c*
x^n]))/(d^8*x) + (e^2*(a + b*Log[c*x^n]))/(6*d^3*(d + e*x)^6) + (3*e^2*(a +
 b*Log[c*x^n]))/(5*d^4*(d + e*x)^5) + (3*e^2*(a + b*Log[c*x^n]))/(2*d^5*(d
+ e*x)^4) + (10*e^2*(a + b*Log[c*x^n]))/(3*d^6*(d + e*x)^3) + (15*e^2*(a +
b*Log[c*x^n]))/(2*d^7*(d + e*x)^2) - (21*e^3*x*(a + b*Log[c*x^n]))/(d^9*(d
+ e*x)) + (14*e^2*(a + b*Log[c*x^n])^2)/(b*d^9*n) + (341*b*e^2*n*Log[d + e*
x])/(10*d^9) - (28*e^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^9 - (28*b*e^2
*n*PolyLog[2, -((e*x)/d)])/d^9
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
```

```
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2317

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

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex)^7}\,dx = \int\left(\frac{a+b\log(cx^n)}{d^7x^3}-\frac{7e(a+b\log(cx^n))}{d^8x^2}+\frac{28e^2(a+b\log(cx^n))}{d^9x}-\frac{e^3(a+b\log(cx^n))}{d^3(d+ex)^7}-\frac{3e^3(a+\cdots}{d^4(\cdots}\right.$$

$$=\frac{\int\frac{a+b\log(cx^n)}{x^3}\,dx}{d^7}-\frac{(7e)\int\frac{a+b\log(cx^n)}{x^2}\,dx}{d^8}+\frac{\left(28e^2\right)\int\frac{a+b\log(cx^n)}{x}\,dx}{d^9}-\frac{\left(28e^3\right)\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{d^9}-\frac{\left(21e^3\cdots}{\cdots}$$

$$=-\frac{bn}{4d^7x^2}+\frac{7ben}{d^8x}-\frac{a+b\log(cx^n)}{2d^7x^2}+\frac{7e(a+b\log(cx^n))}{d^8x}+\frac{e^2(a+b\log(cx^n))}{6d^3(d+ex)^6}+\frac{3e^2(a+b\log(cx^{\cdots}}{5d^4(d+ex)^5}$$

$$=-\frac{bn}{4d^7x^2}+\frac{7ben}{d^8x}-\frac{a+b\log(cx^n)}{2d^7x^2}+\frac{7e(a+b\log(cx^n))}{d^8x}+\frac{e^2(a+b\log(cx^n))}{6d^3(d+ex)^6}+\frac{3e^2(a+b\log(cx^{\cdots}}{5d^4(d+ex)^5}$$

$$=-\frac{bn}{4d^7x^2}+\frac{7ben}{d^8x}-\frac{be^2n}{30d^4(d+ex)^5}-\frac{23be^2n}{120d^5(d+ex)^4}-\frac{34be^2n}{45d^6(d+ex)^3}-\frac{14be^2n}{5d^7(d+ex)^2}-\frac{131be^2n}{10d^8(d+e\cdots}$$

Mathematica [A] time = 0.543131, size = 486, normalized size = 1.21

$$\frac{-10080be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)+\frac{10080ae^2\log(cx^n)}{n}+\frac{60ad^6e^2}{(d+ex)^6}+\frac{216ad^5e^2}{(d+ex)^5}+\frac{540ad^4e^2}{(d+ex)^4}+\frac{1200ad^3e^2}{(d+ex)^3}+\frac{2700ad^2e^2}{(d+ex)^2}-\frac{180ad^2}{x^2}+\frac{7560ade^2}{d+ex}-1\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x)^7),x]
```

```
[Out] ((-180*a*d^2)/x^2 - (90*b*d^2*n)/x^2 + (2520*a*d*e)/x + (2520*b*d*e*n)/x +
(60*a*d^6*e^2)/(d + e*x)^6 + (216*a*d^5*e^2)/(d + e*x)^5 - (12*b*d^5*e^2*n)
```

```
/(d + e*x)^5 + (540*a*d^4*e^2)/(d + e*x)^4 - (69*b*d^4*e^2*n)/(d + e*x)^4 +
 (1200*a*d^3*e^2)/(d + e*x)^3 - (272*b*d^3*e^2*n)/(d + e*x)^3 + (2700*a*d^2
*e^2)/(d + e*x)^2 - (1008*b*d^2*e^2*n)/(d + e*x)^2 + (7560*a*d*e^2)/(d + e*
x) - (4716*b*d*e^2*n)/(d + e*x) - 12276*b*e^2*n*Log[x] + (10080*a*e^2*Log[c
*x^n])/n - (180*b*d^2*Log[c*x^n])/x^2 + (2520*b*d*e*Log[c*x^n])/x + (60*b*d
^6*e^2*Log[c*x^n])/(d + e*x)^6 + (216*b*d^5*e^2*Log[c*x^n])/(d + e*x)^5 + (
540*b*d^4*e^2*Log[c*x^n])/(d + e*x)^4 + (1200*b*d^3*e^2*Log[c*x^n])/(d + e*
x)^3 + (2700*b*d^2*e^2*Log[c*x^n])/(d + e*x)^2 + (7560*b*d*e^2*Log[c*x^n])/
(d + e*x) + (5040*b*e^2*Log[c*x^n]^2)/n + 12276*b*e^2*n*Log[d + e*x] - 1008
0*a*e^2*Log[1 + (e*x)/d] - 10080*b*e^2*Log[c*x^n]*Log[1 + (e*x)/d] - 10080*
b*e^2*n*PolyLog[2, -((e*x)/d)])/(360*d^9)
```

Maple [C] time = 0.199, size = 1939, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x+d)^7,x)
```

```
[Out] -3/10*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2/(e*x+d)^5-1/12*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(e*x+d)^6+14*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^9*e^2*ln(e*x+d)-21/2*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)/d^8*e^2/(e*x+d)+5/3*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^
2/d^6/(e*x+d)^3-7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^8*e/x-14*b
*n/d^9*e^2*ln(x)^2+28*b*n/d^9*e^2*dilog(-e*x/d)+28*b*n/d^9*e^2*ln(e*x+d)*ln
(-e*x/d)+3/2*b*ln(x^n)/d^5*e^2/(e*x+d)^4+15/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2*e^2/d^7/(e*x+d)^2+1/12*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(e*
x+d)^6-14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^9*e^2*ln(e*x+d)+21/2*I*b*Pi*
csgn(I*c*x^n)^2*csgn(I*c)/d^8*e^2/(e*x+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)/d^7/x^2+5/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^6/(e*x+d
)^3-1/2*b*ln(x^n)/d^7/x^2+1/12*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(e*
x+d)^6+14*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^9*e^2*ln(x)+3/10*I*b*Pi*csgn
(I*c*x^n)^2*csgn(I*c)/d^4*e^2/(e*x+d)^5-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d^7/x^2-21/2*I*b*Pi*csgn(I*c*x^n)^3/d^8*e^2/(e*x+d)-3/4*I*b*Pi*csgn(I*c*x
^n)^3/d^5*e^2/(e*x+d)^4+3/10*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e^2/(e*
x+d)^5-3/10*I*b*Pi*csgn(I*c*x^n)^3/d^4*e^2/(e*x+d)^5-1/12*I*b*Pi*csgn(I*c*x
^n)^3*e^2/d^3/(e*x+d)^6+21/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^8*e^2/(e*
x+d)+3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^5*e^2/(e*x+d)^4+15/4*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)*e^2/d^7/(e*x+d)^2+7/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*
c)/d^8*e/x-14*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^9*e^2*ln(e*x+d)+15/2*a*e^2
/d^7/(e*x+d)^2+10/3*a*e^2/d^6/(e*x+d)^3+3/2*a/d^5*e^2/(e*x+d)^4+3/4*I*b*Pi*
```

```
csgn(I*x^n)*csgn(I*c*x^n)^2/d^5*e^2/(e*x+d)^4+14*I*b*Pi*csgn(I*c*x^n)^2*csg
n(I*c)/d^9*e^2*ln(x)+7/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^8*e/x+1/4*I*b
*Pi*csgn(I*c*x^n)^3/d^7/x^2-15/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*e^2/d^7/(e*x+d)^2-5/3*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^6/(
e*x+d)^3-15/4*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^7/(e*x+d)^2-5/3*I*b*Pi*csgn(I*c*
x^n)^3*e^2/d^6/(e*x+d)^3-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^7/x^2-1/4
*b*n/d^7/x^2+14*I*b*Pi*csgn(I*c*x^n)^3/d^9*e^2*ln(e*x+d)-7/2*I*b*Pi*csgn(I*
c*x^n)^3/d^8*e/x-14*I*b*Pi*csgn(I*c*x^n)^3/d^9*e^2*ln(x)-3/4*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^5*e^2/(e*x+d)^4-14*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/d^9*e^2*ln(x)-1/2*a/d^7/x^2+3/5*a/d^4*e^2/(e*x+d)^5+1/6*a
*e^2/d^3/(e*x+d)^6+7*a/d^8*e/x-28*a/d^9*e^2*ln(e*x+d)+28*a/d^9*e^2*ln(x)+21
*a/d^8*e^2/(e*x+d)+341/10*b*e^2*n*ln(e*x+d)/d^9-1/2*b*ln(c)/d^7/x^2+10/3*b*
ln(c)*e^2/d^6/(e*x+d)^3+3/2*b*ln(c)/d^5*e^2/(e*x+d)^4+3/5*b*ln(c)/d^4*e^2/(
e*x+d)^5+1/6*b*ln(c)*e^2/d^3/(e*x+d)^6+7*b*ln(c)/d^8*e/x-28*b*ln(c)/d^9*e^2
*ln(e*x+d)+28*b*ln(c)/d^9*e^2*ln(x)+7*b*e*n/d^8/x-1/30*b*e^2*n/d^4/(e*x+d)^
5-23/120*b*e^2*n/d^5/(e*x+d)^4-34/45*b*e^2*n/d^6/(e*x+d)^3-14/5*b*e^2*n/d^7
/(e*x+d)^2-131/10*b*e^2*n/d^8/(e*x+d)-28*b*ln(x^n)/d^9*e^2*ln(e*x+d)+21*b*l
n(x^n)/d^8*e^2/(e*x+d)+15/2*b*ln(x^n)*e^2/d^7/(e*x+d)^2+10/3*b*ln(x^n)*e^2/
d^6/(e*x+d)^3-341/10*b*e^2*n*ln(x)/d^9+21*b*ln(c)/d^8*e^2/(e*x+d)+15/2*b*ln
(c)*e^2/d^7/(e*x+d)^2+3/5*b*ln(x^n)/d^4*e^2/(e*x+d)^5+1/6*b*ln(x^n)*e^2/d^3
/(e*x+d)^6+28*b*ln(x^n)/d^9*e^2*ln(x)+7*b*ln(x^n)/d^8*e/x
```

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

$$\frac{1}{30}\,a\left(\frac{840\,e^{7}x^{7}+4620\,de^{6}x^{6}+10360\,d^{2}e^{5}x^{5}+11970\,d^{3}e^{4}x^{4}+7308\,d^{4}e^{3}x^{3}+2058\,d^{5}e^{2}x^{2}+120\,d^{6}ex-15\,d^{7}}{d^{8}e^{6}x^{8}+6\,d^{9}e^{5}x^{7}+15\,d^{10}e^{4}x^{6}+20\,d^{11}e^{3}x^{5}+15\,d^{12}e^{2}x^{4}+6\,d^{13}ex^{3}+d^{14}x^{2}}-\frac{840\,e^{2}\log}{d^{9}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^7,x, algorithm="maxima")
```

```
[Out] 1/30*a*((840*e^7*x^7 + 4620*d*e^6*x^6 + 10360*d^2*e^5*x^5 + 11970*d^3*e^4*x
^4 + 7308*d^4*e^3*x^3 + 2058*d^5*e^2*x^2 + 120*d^6*e*x - 15*d^7)/(d^8*e^6*x
^8 + 6*d^9*e^5*x^7 + 15*d^10*e^4*x^6 + 20*d^11*e^3*x^5 + 15*d^12*e^2*x^4 +
6*d^13*e*x^3 + d^14*x^2) - 840*e^2*log(e*x + d)/d^9 + 840*e^2*log(x)/d^9) +
 b*integrate((log(c) + log(x^n))/(e^7*x^10 + 7*d*e^6*x^9 + 21*d^2*e^5*x^8 +
 35*d^3*e^4*x^7 + 35*d^4*e^3*x^6 + 21*d^5*e^2*x^5 + 7*d^6*e*x^4 + d^7*x^3),
 x)
```

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

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{7}x^{10}+7\,de^{6}x^{9}+21\,d^{2}e^{5}x^{8}+35\,d^{3}e^{4}x^{7}+35\,d^{4}e^{3}x^{6}+21\,d^{5}e^{2}x^{5}+7\,d^{6}ex^{4}+d^{7}x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^7,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^7*x^10 + 7*d*e^6*x^9 + 21*d^2*e^5*x^8 + 35*d
^3*e^4*x^7 + 35*d^4*e^3*x^6 + 21*d^5*e^2*x^5 + 7*d^6*e*x^4 + d^7*x^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((a+b*ln(c*x**n))/x**3/(e*x+d)**7,x)
```

```
[Out] Timed out
```

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

$$\int \frac{b\log\left(cx^{n}\right)+a}{(ex+d)^{7}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^7,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^7*x^3), x)
```

3.74 $\int \frac{\log(cx)}{1-cx}\,dx$

Optimal. Leaf size=12

$$\frac{\text{PolyLog}(2,1-cx)}{c}$$

```
[Out] PolyLog[2, 1 - c*x]/c
```

Rubi [A] time = 0.0109987, antiderivative size = 12, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {2315}

$$\frac{\text{PolyLog}(2,1-cx)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[Log[c*x]/(1 - c*x),x]

[Out] PolyLog[2, 1 - c*x]/c
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 - c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\log(cx)}{1-cx}\,dx = \frac{\text{Li}_2(1-cx)}{c}$$

Mathematica [A] time = 0.0022577, size = 12, normalized size = 1.

$$\frac{\text{PolyLog}(2,1-cx)}{c}$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[c*x]/(1 - c*x),x]
```

```
[Out] PolyLog[2, 1 - c*x]/c
```

Maple [A] time = 0.038, size = 9, normalized size = 0.8

$$\frac{\mathrm{dilog}\,(cx)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(c*x)/(-c*x+1),x)
```

```
[Out] 1/c*dilog(c*x)
```

Maxima [B] time = 1.21025, size = 65, normalized size = 5.42

$$-\frac{\log\,(cx-1)\log\,(cx)}{c}+\frac{\log\,(cx-1)\log\,(x)}{c}-\frac{\log\,(-cx+1)\log\,(x)+\mathrm{Li}_2\,(cx)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(c*x)/(-c*x+1),x, algorithm="maxima")
```

```
[Out] -log(c*x - 1)*log(c*x)/c + log(c*x - 1)*log(x)/c - (log(-c*x + 1)*log(x) +
dilog(c*x))/c
```

Fricas [A] time = 0.977331, size = 26, normalized size = 2.17

$$\frac{\mathrm{Li}_2\,(-cx+1)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(c*x)/(-c*x+1),x, algorithm="fricas")
```

```
[Out] dilog(-c*x + 1)/c
```

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

$$-\int \frac{\log(cx)}{cx-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(c*x)/(-c*x+1),x)
```

```
[Out] -Integral(log(c*x)/(c*x - 1), x)
```

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

$$\int -\frac{\log(cx)}{cx-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(c*x)/(-c*x+1),x, algorithm="giac")
```

```
[Out] integrate(-log(c*x)/(c*x - 1), x)
```

3.75 $\int \frac{\log\left(\frac{x}{c}\right)}{c-x}\,dx$

Optimal. Leaf size=10

$$\text{PolyLog}\left(2,1-\frac{x}{c}\right)$$

```
[Out] PolyLog[2, 1 - x/c]
```

Rubi [A] time = 0.0105183, antiderivative size = 10, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.071, Rules used = {2315}

$$\text{PolyLog}\left(2,1-\frac{x}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[Log[x/c]/(c - x),x]
```

```
[Out] PolyLog[2, 1 - x/c]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 - c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\log\left(\frac{x}{c}\right)}{c-x}\,dx = \text{Li}_2\left(1-\frac{x}{c}\right)$$

Mathematica [A] time = 0.0022178, size = 11, normalized size = 1.1

$$\text{PolyLog}\left(2,\frac{c-x}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[x/c]/(c - x),x]
```

```
[Out] PolyLog[2, (c - x)/c]
```

Maple [A] time = 0.039, size = 7, normalized size = 0.7

$$\operatorname{dilog}\left(\frac{x}{c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(x/c)/(c-x),x)
```

```
[Out] dilog(x/c)
```

Maxima [B] time = 1.1079, size = 61, normalized size = 6.1

$$\log\left(c-x\right)\log\left(x\right)-\log\left(c-x\right)\log\left(\frac{x}{c}\right)-\log\left(x\right)\log\left(-\frac{x}{c}+1\right)-\operatorname{Li}_{2}\left(\frac{x}{c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x/c)/(c-x),x, algorithm="maxima")
```

```
[Out] log(c - x)*log(x) - log(c - x)*log(x/c) - log(x)*log(-x/c + 1) - dilog(x/c)
```

Fricas [A] time = 0.934072, size = 23, normalized size = 2.3

$$\operatorname{Li}_{2}\left(-\frac{x}{c}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x/c)/(c-x),x, algorithm="fricas")
```

```
[Out] dilog(-x/c + 1)
```

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

$$-\int \frac{\log\left(\frac{x}{c}\right)}{-c+x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(x/c)/(c-x),x)
```

```
[Out] -Integral(log(x/c)/(-c + x), x)
```

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

$$\int \frac{\log\left(\frac{x}{c}\right)}{c-x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x/c)/(c-x),x, algorithm="giac")
```

```
[Out] integrate(log(x/c)/(c - x), x)
```

3.76 $\int x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=109

$$\frac{1}{3}dx^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}bdnx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}ex^4\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{8}benx^4\left(a+b\log\left(cx^n\right)\right)+\frac{2}{27}b^2dn^2x^3+\frac{1}{32}$$

```
[Out] (2*b^2*d*n^2*x^3)/27 + (b^2*e*n^2*x^4)/32 - (2*b*d*n*x^3*(a + b*Log[c*x^n])
)/9 - (b*e*n*x^4*(a + b*Log[c*x^n]))/8 + (d*x^3*(a + b*Log[c*x^n])^2)/3 + (
e*x^4*(a + b*Log[c*x^n])^2)/4
```

Rubi [A] time = 0.143042, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$\frac{1}{3}dx^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}bdnx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}ex^4\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{8}benx^4\left(a+b\log\left(cx^n\right)\right)+\frac{2}{27}b^2dn^2x^3+\frac{1}{32}$$

Antiderivative was successfully verified.

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

```
[Out] (2*b^2*d*n^2*x^3)/27 + (b^2*e*n^2*x^4)/32 - (2*b*d*n*x^3*(a + b*Log[c*x^n])
)/9 - (b*e*n*x^4*(a + b*Log[c*x^n]))/8 + (d*x^3*(a + b*Log[c*x^n])^2)/3 + (
e*x^4*(a + b*Log[c*x^n])^2)/4
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int x^2(d+ex)(a+b\log(cx^n))^2\,dx &= \int\left(dx^2(a+b\log(cx^n))^2+ex^3(a+b\log(cx^n))^2\right)dx\\ &= d\int x^2(a+b\log(cx^n))^2\,dx+e\int x^3(a+b\log(cx^n))^2\,dx\\ &= \frac{1}{3}dx^3(a+b\log(cx^n))^2+\frac{1}{4}ex^4(a+b\log(cx^n))^2-\frac{1}{3}(2bdn)\int x^2(a+b\log(cx^n))\,d\\ &= \frac{2}{27}b^2dn^2x^3+\frac{1}{32}b^2en^2x^4-\frac{2}{9}bdnx^3(a+b\log(cx^n))-\frac{1}{8}benx^4(a+b\log(cx^n))+\frac{1}{3}\end{aligned}$$

Mathematica [A] time = 0.0574034, size = 82, normalized size = 0.75

$$\frac{1}{864}x^3\left(288d(a+b\log(cx^n))^2+64bdn(-3a-3b\log(cx^n)+bn)+216ex(a+b\log(cx^n))^2+27benx(-4a-4b\log(cx^n\right.$$

Antiderivative was successfully verified.

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

```
[Out] (x^3*(27*b*e*n*x*(-4*a + b*n - 4*b*Log[c*x^n]) + 64*b*d*n*(-3*a + b*n - 3*b
*Log[c*x^n]) + 288*d*(a + b*Log[c*x^n])^2 + 216*e*x*(a + b*Log[c*x^n])^2))/
864
```

Maple [C] time = 0.268, size = 1622, normalized size = 14.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*I*ln(c)*Pi*b^2*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*ln(c)*Pi*b^2*e*x
^4*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*Pi*a*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2
+1/3*I*Pi*a*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*ln(c)*Pi*b^2*d*x^3*csgn
(I*x^n)*csgn(I*c*x^n)^2-1/12*Pi^2*b^2*d*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1
```

```
/6*Pi^2*b^2*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5+1/6*Pi^2*b^2*d*x^3*csgn(I*c*x
^n)^5*csgn(I*c)-1/12*Pi^2*b^2*d*x^3*csgn(I*c*x^n)^4*csgn(I*c)^2+1/72*b*(18*
I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-18*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-18*I*Pi*b*e*x^4*csgn(I*c*x^n)^3+18*I*Pi*b*e*x^4*csgn(I*c*
x^n)^2*csgn(I*c)+36*ln(c)*b*e*x^4-9*b*e*n*x^4+36*a*e*x^4+24*I*Pi*b*d*x^3*cs
gn(I*x^n)*csgn(I*c*x^n)^2-24*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-24*I*Pi*b*d*x^3*csgn(I*c*x^n)^3+24*I*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c
)+48*ln(c)*b*d*x^3-16*b*d*n*x^3+48*a*d*x^3)*ln(x^n)-1/3*I*ln(c)*Pi*b^2*d*x^
3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/9*I*Pi*b^2*d*n*x^3*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)-1/3*I*Pi*a*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+
1/4*a^2*e*x^4-2/9*a*b*d*n*x^3-1/16*I*Pi*b^2*e*n*x^4*csgn(I*x^n)*csgn(I*c*x^
n)^2-1/16*I*Pi*b^2*e*n*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*a*b*e*x^4*csg
n(I*x^n)*csgn(I*c*x^n)^2+1/3*I*ln(c)*Pi*b^2*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)
+1/12*b^2*x^3*(3*e*x+4*d)*ln(x^n)^2+1/3*a^2*d*x^3+2/27*b^2*d*n^2*x^3+1/32*b
^2*e*n^2*x^4-1/16*Pi^2*b^2*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/8*Pi^2*b^2
*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^5+1/8*Pi^2*b^2*e*x^4*csgn(I*c*x^n)^5*csgn(
I*c)-1/16*Pi^2*b^2*e*x^4*csgn(I*c*x^n)^4*csgn(I*c)^2-1/8*a*b*e*n*x^4+1/4*I*
Pi*a*b*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/9*I*Pi*b^2*d*n*x^3*csgn(I*x^n)*csg
n(I*c*x^n)^2-1/9*I*Pi*b^2*d*n*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/8*ln(c)*b^2*e
*n*x^4+2/3*ln(c)*a*b*d*x^3-2/9*ln(c)*b^2*d*n*x^3+1/2*ln(c)*a*b*e*x^4+1/6*Pi
^2*b^2*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/4*I*Pi*a*b*e*x^4*csg
n(I*c*x^n)^3-1/4*I*ln(c)*Pi*b^2*e*x^4*csgn(I*c*x^n)^3-1/12*Pi^2*b^2*d*x^3*c
sgn(I*c*x^n)^6+1/8*Pi^2*b^2*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1
/16*Pi^2*b^2*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/4*Pi^2*b^2*e
*x^4*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/8*Pi^2*b^2*e*x^4*csgn(I*x^n)*c
sgn(I*c*x^n)^3*csgn(I*c)^2+1/4*ln(c)^2*b^2*e*x^4-1/16*Pi^2*b^2*e*x^4*csgn(I
*c*x^n)^6+1/3*ln(c)^2*b^2*d*x^3+1/16*I*Pi*b^2*e*n*x^4*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-1/4*I*ln(c)*Pi*b^2*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+1/6*Pi^2*b^2*d*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/12*Pi^2*b^2*d
*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/3*Pi^2*b^2*d*x^3*csgn(I*x^
n)*csgn(I*c*x^n)^4*csgn(I*c)+1/16*I*Pi*b^2*e*n*x^4*csgn(I*c*x^n)^3-1/3*I*ln
(c)*Pi*b^2*d*x^3*csgn(I*c*x^n)^3+1/9*I*Pi*b^2*d*n*x^3*csgn(I*c*x^n)^3-1/3*I
*Pi*a*b*d*x^3*csgn(I*c*x^n)^3-1/4*I*Pi*a*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)
```

Maxima [A] time = 1.12608, size = 204, normalized size = 1.87

$$\frac{1}{4}\,b^2ex^4\log\left(cx^n\right)^2-\frac{1}{8}\,abenx^4+\frac{1}{2}\,abex^4\log\left(cx^n\right)+\frac{1}{3}\,b^2dx^3\log\left(cx^n\right)^2-\frac{2}{9}\,abdnx^3+\frac{1}{4}\,a^2ex^4+\frac{2}{3}\,abdx^3\log\left(cx^n\right)+\frac{1}{3}\,a^2d$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b^2*e*x^4*log(c*x^n)^2 - 1/8*a*b*e*n*x^4 + 1/2*a*b*e*x^4*log(c*x^n) + 1
/3*b^2*d*x^3*log(c*x^n)^2 - 2/9*a*b*d*n*x^3 + 1/4*a^2*e*x^4 + 2/3*a*b*d*x^3
*log(c*x^n) + 1/3*a^2*d*x^3 + 2/27*(n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*d + 1
/32*(n^2*x^4 - 4*n*x^4*log(c*x^n))*b^2*e
```

Fricas [B] time = 1.02166, size = 514, normalized size = 4.72

$$\frac{1}{32}\left(b^2en^2 - 4\,aben + 8\,a^2e\right)x^4 + \frac{1}{27}\left(2\,b^2dn^2 - 6\,abdn + 9\,a^2d\right)x^3 + \frac{1}{12}\left(3\,b^2ex^4 + 4\,b^2dx^3\right)\log\left(c\right)^2 + \frac{1}{12}\left(3\,b^2en^2x^4 + 4\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/32*(b^2*e*n^2 - 4*a*b*e*n + 8*a^2*e)*x^4 + 1/27*(2*b^2*d*n^2 - 6*a*b*d*n
+ 9*a^2*d)*x^3 + 1/12*(3*b^2*e*x^4 + 4*b^2*d*x^3)*log(c)^2 + 1/12*(3*b^2*e*
n^2*x^4 + 4*b^2*d*n^2*x^3)*log(x)^2 - 1/72*(9*(b^2*e*n - 4*a*b*e)*x^4 + 16*
(b^2*d*n - 3*a*b*d)*x^3)*log(c) - 1/72*(9*(b^2*e*n^2 - 4*a*b*e*n)*x^4 + 16*
(b^2*d*n^2 - 3*a*b*d*n)*x^3 - 12*(3*b^2*e*n*x^4 + 4*b^2*d*n*x^3)*log(c))*lo
g(x)
```

Sympy [B] time = 3.83273, size = 309, normalized size = 2.83

$$\frac{a^2dx^3}{3} + \frac{a^2ex^4}{4} + \frac{2abdnx^3\log\left(x\right)}{3} - \frac{2abdnx^3}{9} + \frac{2abdx^3\log\left(c\right)}{3} + \frac{abenx^4\log\left(x\right)}{2} - \frac{abenx^4}{8} + \frac{abex^4\log\left(c\right)}{2} + \frac{b^2dn^2x^3\log}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d*x**3/3 + a**2*e*x**4/4 + 2*a*b*d*n*x**3*log(x)/3 - 2*a*b*d*n*x**3/9
+ 2*a*b*d*x**3*log(c)/3 + a*b*e*n*x**4*log(x)/2 - a*b*e*n*x**4/8 + a*b*e*x*
*4*log(c)/2 + b**2*d*n**2*x**3*log(x)**2/3 - 2*b**2*d*n**2*x**3*log(x)/9 +
2*b**2*d*n**2*x**3/27 + 2*b**2*d*n*x**3*log(c)*log(x)/3 - 2*b**2*d*n*x**3*l
og(c)/9 + b**2*d*x**3*log(c)**2/3 + b**2*e*n**2*x**4*log(x)**2/4 - b**2*e*n
**2*x**4*log(x)/8 + b**2*e*n**2*x**4/32 + b**2*e*n*x**4*log(c)*log(x)/2 - b
**2*e*n*x**4*log(c)/8 + b**2*e*x**4*log(c)**2/4
```

Giac [B] time = 1.34929, size = 339, normalized size = 3.11

$$\frac{1}{4}b^2n^2x^4e\log(x)^2 - \frac{1}{8}b^2n^2x^4e\log(x) + \frac{1}{2}b^2nx^4e\log(c)\log(x) + \frac{1}{3}b^2dn^2x^3\log(x)^2 + \frac{1}{32}b^2n^2x^4e - \frac{1}{8}b^2nx^4e\log(c) + \frac{1}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b^2*n^2*x^4*e*log(x)^2 - 1/8*b^2*n^2*x^4*e*log(x) + 1/2*b^2*n*x^4*e*log
(c)*log(x) + 1/3*b^2*d*n^2*x^3*log(x)^2 + 1/32*b^2*n^2*x^4*e - 1/8*b^2*n*x^
4*e*log(c) + 1/4*b^2*x^4*e*log(c)^2 - 2/9*b^2*d*n^2*x^3*log(x) + 1/2*a*b*n*
x^4*e*log(x) + 2/3*b^2*d*n*x^3*log(c)*log(x) + 2/27*b^2*d*n^2*x^3 - 1/8*a*b
*n*x^4*e - 2/9*b^2*d*n*x^3*log(c) + 1/2*a*b*x^4*e*log(c) + 1/3*b^2*d*x^3*lo
g(c)^2 + 2/3*a*b*d*n*x^3*log(x) - 2/9*a*b*d*n*x^3 + 1/4*a^2*x^4*e + 2/3*a*b
*d*x^3*log(c) + 1/3*a^2*d*x^3
```

3.77 $\int x(d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx$

Optimal. Leaf size=109

$$\frac{1}{2}dx^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}bdnx^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}ex^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}benx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}b^2dn^2x^2+\frac{2}{27}$$

```
[Out] (b^2*d*n^2*x^2)/4 + (2*b^2*e*n^2*x^3)/27 - (b*d*n*x^2*(a + b*Log[c*x^n]))/2
 - (2*b*e*n*x^3*(a + b*Log[c*x^n]))/9 + (d*x^2*(a + b*Log[c*x^n])^2)/2 + (e
*x^3*(a + b*Log[c*x^n])^2)/3
```

Rubi [A] time = 0.11196, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {2353, 2305, 2304}

$$\frac{1}{2}dx^2\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{2}bdnx^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}ex^3\left(a+b\log\left(cx^n\right)\right)^2-\frac{2}{9}benx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}b^2dn^2x^2+\frac{2}{27}$$

Antiderivative was successfully verified.

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

```
[Out] (b^2*d*n^2*x^2)/4 + (2*b^2*e*n^2*x^3)/27 - (b*d*n*x^2*(a + b*Log[c*x^n]))/2
 - (2*b*e*n*x^3*(a + b*Log[c*x^n]))/9 + (d*x^2*(a + b*Log[c*x^n])^2)/2 + (e
*x^3*(a + b*Log[c*x^n])^2)/3
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int x(d+ex)\left(a+b\log\left(cx^n\right)\right)^2\,dx &= \int\left(dx\left(a+b\log\left(cx^n\right)\right)^2+ex^2\left(a+b\log\left(cx^n\right)\right)^2\right)dx\\ &= d\int x\left(a+b\log\left(cx^n\right)\right)^2\,dx+e\int x^2\left(a+b\log\left(cx^n\right)\right)^2\,dx\\ &= \frac{1}{2}dx^2\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{3}ex^3\left(a+b\log\left(cx^n\right)\right)^2-(bdn)\int x\left(a+b\log\left(cx^n\right)\right)dx-\frac{1}{3}(\\ &= \frac{1}{4}b^2dn^2x^2+\frac{2}{27}b^2en^2x^3-\frac{1}{2}bdnx^2\left(a+b\log\left(cx^n\right)\right)-\frac{2}{9}benx^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}dx^2\end{aligned}$$

Mathematica [A] time = 0.0524036, size = 82, normalized size = 0.75

$$\frac{1}{108}x^2\left(54d\left(a+b\log\left(cx^n\right)\right)^2+27bdn\left(-2a-2b\log\left(cx^n\right)+bn\right)+36ex\left(a+b\log\left(cx^n\right)\right)^2+8benx\left(-3a-3b\log\left(cx^n\right)+b\right.\right.$$

Antiderivative was successfully verified.

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

```
[Out] (x^2*(8*b*e*n*x*(-3*a + b*n - 3*b*Log[c*x^n]) + 27*b*d*n*(-2*a + b*n - 2*b*
Log[c*x^n]) + 54*d*(a + b*Log[c*x^n])^2 + 36*e*x*(a + b*Log[c*x^n])^2))/108
```

Maple [C] time = 0.264, size = 1621, normalized size = 14.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*I*ln(c)*Pi*b^2*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/9*I*Pi*b^2*e*n*x^3*csg
n(I*x^n)*csgn(I*c*x^n)^2+1/3*I*Pi*a*b*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I
*ln(c)*Pi*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*a*b*d*x^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*ln(c)*Pi*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-1/3*I*Pi*a*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*
```

```
Pi*b^2*d*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*ln(c)*Pi*b^2*d*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/9*I*Pi*b^2*e*n*x^3*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)-1/3*Pi^2*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)
+1/6*Pi^2*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/4*Pi^2*b^2*d*
x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/8*Pi^2*b^2*d*x^2*csgn(I*x^n)^
2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/4*I*Pi*b^2*d*n*x^2*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/4*I*Pi*b^2*d*n*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*a*b*d*x^2*csgn(
I*x^n)*csgn(I*c*x^n)^2-1/2*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(
I*c)+1/4*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/2*I*ln(c)
*Pi*b^2*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/12*Pi^2*b^2*e*x^3*csgn(I*x^n)^2*c
sgn(I*c*x^n)^4+1/6*Pi^2*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5+1/6*Pi^2*b^2*
e*x^3*csgn(I*c*x^n)^5*csgn(I*c)-1/12*Pi^2*b^2*e*x^3*csgn(I*c*x^n)^4*csgn(I*
c)^2-1/8*Pi^2*b^2*d*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/3*ln(c)^2*b^2*e*x^3
+1/2*ln(c)^2*b^2*d*x^2-1/2*b*n*a*d*x^2-2/9*b*n*a*e*x^3-1/9*I*Pi*b^2*e*n*x^3
*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*Pi*a*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1
/3*a^2*e*x^3+1/2*a^2*d*x^2+1/4*b^2*d*n^2*x^2+2/27*b^2*e*n^2*x^3+1/4*Pi^2*b^
2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+1/4*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^5*csgn
(I*c)-1/8*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^4*csgn(I*c)^2+1/18*b*(6*I*Pi*b*e*x^3
*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)-6*I*Pi*b*e*x^3*csgn(I*c*x^n)^3+6*I*Pi*b*e*x^3*csgn(I*c*x^n)^2*csgn(I*c
)+12*ln(c)*b*e*x^3-4*b*e*n*x^3+12*a*e*x^3+9*I*Pi*b*d*x^2*csgn(I*x^n)*csgn(I
*c*x^n)^2-9*I*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*d*x^2
*csgn(I*c*x^n)^3+9*I*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+18*ln(c)*b*d*x^2-
9*b*d*n*x^2+18*a*d*x^2)*ln(x^n)+1/2*I*Pi*a*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c
)+1/3*I*ln(c)*Pi*b^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/9*I*Pi*b^2*e*n*x^3
*csgn(I*c*x^n)^3-1/3*I*Pi*a*b*e*x^3*csgn(I*c*x^n)^3-1/2*I*ln(c)*Pi*b^2*d*x^
2*csgn(I*c*x^n)^3+ln(c)*a*b*d*x^2-2/9*ln(c)*b^2*e*n*x^3+2/3*ln(c)*a*b*e*x^3
-1/2*ln(c)*b^2*d*n*x^2-1/8*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^6+1/6*b^2*x^2*(2*e*
x+3*d)*ln(x^n)^2-1/12*Pi^2*b^2*e*x^3*csgn(I*c*x^n)^6-1/3*I*ln(c)*Pi*b^2*e*x
^3*csgn(I*c*x^n)^3+1/4*I*Pi*b^2*d*n*x^2*csgn(I*c*x^n)^3-1/2*I*Pi*a*b*d*x^2*
csgn(I*c*x^n)^3+1/6*Pi^2*b^2*e*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-
1/12*Pi^2*b^2*e*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2
```

Maxima [A] time = 1.12567, size = 203, normalized size = 1.86

$$\frac{1}{3}\,b^2ex^3\log\left(cx^n\right)^2-\frac{2}{9}\,abenx^3+\frac{2}{3}\,abex^3\log\left(cx^n\right)+\frac{1}{2}\,b^2dx^2\log\left(cx^n\right)^2-\frac{1}{2}\,abdnx^2+\frac{1}{3}\,a^2ex^3+abdx^2\log\left(cx^n\right)+\frac{1}{2}\,a^2d$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b^2*e*x^3*log(c*x^n)^2 - 2/9*a*b*e*n*x^3 + 2/3*a*b*e*x^3*log(c*x^n) + 1
```

```
/2*b^2*d*x^2*log(c*x^n)^2 - 1/2*a*b*d*n*x^2 + 1/3*a^2*e*x^3 + a*b*d*x^2*log
(c*x^n) + 1/2*a^2*d*x^2 + 1/4*(n^2*x^2 - 2*n*x^2*log(c*x^n))*b^2*d + 2/27*(
n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*e
```

Fricas [B] time = 1.01106, size = 506, normalized size = 4.64

$$\frac{1}{27}\left(2\,b^2en^2-6\,aben+9\,a^2e\right)x^3+\frac{1}{4}\left(b^2dn^2-2\,abdn+2\,a^2d\right)x^2+\frac{1}{6}\left(2\,b^2ex^3+3\,b^2dx^2\right)\log\left(c\right)^2+\frac{1}{6}\left(2\,b^2en^2x^3+3\,b^2dn^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/27*(2*b^2*e*n^2 - 6*a*b*e*n + 9*a^2*e)*x^3 + 1/4*(b^2*d*n^2 - 2*a*b*d*n +
 2*a^2*d)*x^2 + 1/6*(2*b^2*e*x^3 + 3*b^2*d*x^2)*log(c)^2 + 1/6*(2*b^2*e*n^2
*x^3 + 3*b^2*d*n^2*x^2)*log(x)^2 - 1/18*(4*(b^2*e*n - 3*a*b*e)*x^3 + 9*(b^2
*d*n - 2*a*b*d)*x^2)*log(c) - 1/18*(4*(b^2*e*n^2 - 3*a*b*e*n)*x^3 + 9*(b^2*
d*n^2 - 2*a*b*d*n)*x^2 - 6*(2*b^2*e*n*x^3 + 3*b^2*d*n*x^2)*log(c))*log(x)
```

Sympy [B] time = 2.49389, size = 304, normalized size = 2.79

$$\frac{a^2dx^2}{2}+\frac{a^2ex^3}{3}+abdnx^2\log\left(x\right)-\frac{abdnx^2}{2}+abdx^2\log\left(c\right)+\frac{2abenx^3\log\left(x\right)}{3}-\frac{2abenx^3}{9}+\frac{2abex^3\log\left(c\right)}{3}+\frac{b^2dn^2x^2\log\left(\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d*x**2/2 + a**2*e*x**3/3 + a*b*d*n*x**2*log(x) - a*b*d*n*x**2/2 + a*b*
d*x**2*log(c) + 2*a*b*e*n*x**3*log(x)/3 - 2*a*b*e*n*x**3/9 + 2*a*b*e*x**3*l
og(c)/3 + b**2*d*n**2*x**2*log(x)**2/2 - b**2*d*n**2*x**2*log(x)/2 + b**2*d
*n**2*x**2/4 + b**2*d*n*x**2*log(c)*log(x) - b**2*d*n*x**2*log(c)/2 + b**2*
d*x**2*log(c)**2/2 + b**2*e*n**2*x**3*log(x)**2/3 - 2*b**2*e*n**2*x**3*log(
x)/9 + 2*b**2*e*n**2*x**3/27 + 2*b**2*e*n*x**3*log(c)*log(x)/3 - 2*b**2*e*n
*x**3*log(c)/9 + b**2*e*x**3*log(c)**2/3
```

Giac [B] time = 1.28571, size = 335, normalized size = 3.07

$$\frac{1}{3}\,b^2n^2x^3e\log\left(x\right)^2-\frac{2}{9}\,b^2n^2x^3e\log\left(x\right)+\frac{2}{3}\,b^2nx^3e\log\left(c\right)\log\left(x\right)+\frac{1}{2}\,b^2dn^2x^2\log\left(x\right)^2+\frac{2}{27}\,b^2n^2x^3e-\frac{2}{9}\,b^2nx^3e\log\left(c\right)+\frac{1}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b^2*n^2*x^3*e*log(x)^2 - 2/9*b^2*n^2*x^3*e*log(x) + 2/3*b^2*n*x^3*e*log
(c)*log(x) + 1/2*b^2*d*n^2*x^2*log(x)^2 + 2/27*b^2*n^2*x^3*e - 2/9*b^2*n*x^
3*e*log(c) + 1/3*b^2*x^3*e*log(c)^2 - 1/2*b^2*d*n^2*x^2*log(x) + 2/3*a*b*n*
x^3*e*log(x) + b^2*d*n*x^2*log(c)*log(x) + 1/4*b^2*d*n^2*x^2 - 2/9*a*b*n*x^
3*e - 1/2*b^2*d*n*x^2*log(c) + 2/3*a*b*x^3*e*log(c) + 1/2*b^2*d*x^2*log(c)^
2 + a*b*d*n*x^2*log(x) - 1/2*a*b*d*n*x^2 + 1/3*a^2*x^3*e + a*b*d*x^2*log(c)
 + 1/2*a^2*d*x^2
```

3.78 $\int (d+ex)(a+b\log(cx^n))^2\,dx$

Optimal. Leaf size=101

$$dx(a+b\log(cx^n))^2-\frac{1}{2}benx^2(a+b\log(cx^n))+\frac{1}{2}ex^2(a+b\log(cx^n))^2-2abdnx-2b^2dnx\log(cx^n)+2b^2dn^2x+\frac{1}{4}b^2en$$

```
[Out] -2*a*b*d*n*x + 2*b^2*d*n^2*x + (b^2*e*n^2*x^2)/4 - 2*b^2*d*n*x*Log[c*x^n] -
 (b*e*n*x^2*(a + b*Log[c*x^n]))/2 + d*x*(a + b*Log[c*x^n])^2 + (e*x^2*(a +
b*Log[c*x^n])^2)/2
```

Rubi [A] time = 0.0715404, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {2330, 2296, 2295, 2305, 2304}

$$dx(a+b\log(cx^n))^2-\frac{1}{2}benx^2(a+b\log(cx^n))+\frac{1}{2}ex^2(a+b\log(cx^n))^2-2abdnx-2b^2dnx\log(cx^n)+2b^2dn^2x+\frac{1}{4}b^2en$$

Antiderivative was successfully verified.

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

```
[Out] -2*a*b*d*n*x + 2*b^2*d*n^2*x + (b^2*e*n^2*x^2)/4 - 2*b^2*d*n*x*Log[c*x^n] -
 (b*e*n*x^2*(a + b*Log[c*x^n]))/2 + d*x*(a + b*Log[c*x^n])^2 + (e*x^2*(a +
b*Log[c*x^n])^2)/2
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (d+ex)(a+b\log(cx^n))^2\,dx = \int \left(d(a+b\log(cx^n))^2 + ex(a+b\log(cx^n))^2\right)dx$$
$$= d\int (a+b\log(cx^n))^2\,dx + e\int x(a+b\log(cx^n))^2\,dx$$
$$= dx(a+b\log(cx^n))^2 + \frac{1}{2}ex^2(a+b\log(cx^n))^2 - (2bdn)\int (a+b\log(cx^n))\,dx - (ben)$$
$$= -2abdnx + \frac{1}{4}b^2en^2x^2 - \frac{1}{2}benx^2(a+b\log(cx^n)) + dx(a+b\log(cx^n))^2 + \frac{1}{2}ex^2(a+b$$
$$= -2abdnx + 2b^2dn^2x + \frac{1}{4}b^2en^2x^2 - 2b^2dnx\log(cx^n) - \frac{1}{2}benx^2(a+b\log(cx^n)) + dx($$

Mathematica [A] time = 0.0475206, size = 77, normalized size = 0.76

$$\frac{1}{4}x\left(4d(a+b\log(cx^n))^2 - 8bdn(a+b\log(cx^n)-bn) + 2ex(a+b\log(cx^n))^2 + benx(-2a-2b\log(cx^n)+bn)\right)$$

Antiderivative was successfully verified.

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

```
[Out] (x*(b*e*n*x*(-2*a + b*n - 2*b*Log[c*x^n]) + 4*d*(a + b*Log[c*x^n])^2 + 2*e*
x*(a + b*Log[c*x^n])^2 - 8*b*d*n*(a - b*n + b*Log[c*x^n])))/4
```

Maple [C] time = 0.268, size = 1548, normalized size = 15.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/8*Pi^2*b^2*e*x^2*csgn(I*c*x^n)^6-1/4*Pi^2*b^2*d*csgn(I*c*x^n)^6*x-1/2*I*
ln(c)*Pi*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*b^2*n*Pi*e*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*b^2*n*Pi*d*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*x-1/8*Pi^2*b^2*e*x^2*csgn(I*c*x^n)^4*csgn(I*c)^2-1/4*Pi^2*b^2*d*
csgn(I*x^n)^2*csgn(I*c*x^n)^4*x-1/2*b*n*a*e*x^2-1/2*I*Pi*a*b*e*x^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*x-I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+1/2*b^2*x*(e*x+2*d
)*ln(x^n)^2+1/2*a^2*e*x^2+a^2*d*x+1/2*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^
5*x+1/2*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(I*c)*x-1/4*Pi^2*b^2*d*csgn(I*c*x^n)
^4*csgn(I*c)^2*x+1/4*Pi^2*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+1/4*Pi^2*b^
2*e*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/8*Pi^2*b^2*e*x^2*csgn(I*x^n)^2*csgn(I*c
*x^n)^4+2*b^2*d*n^2*x+1/4*b^2*e*n^2*x^2+1/2*ln(c)^2*b^2*e*x^2+ln(c)^2*b^2*d
*x-1/2*b^2*n*ln(c)*e*x^2+ln(c)*a*b*e*x^2+2*ln(c)*a*b*d*x-2*b^2*n*ln(c)*d*x+
I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2*x+I*Pi*a*b*d*csgn(I*x^n)*csgn(
I*c*x^n)^2*x+I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)*x-I*b^2*n*Pi*d*csgn(I*x^n
)*csgn(I*c*x^n)^2*x-I*b^2*n*Pi*d*csgn(I*c*x^n)^2*csgn(I*c)*x+1/2*I*Pi*a*b*e
*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*ln(c)*Pi*b^2*e*x^2*csgn(I*c*x^n)^2*csg
n(I*c)-1/4*I*b^2*n*Pi*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*b^2*n*Pi*e*x^
2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*ln(c)*Pi*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x
^n)^2+1/2*I*Pi*a*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(c)*Pi*b^2*d*csgn(
I*c*x^n)^2*csgn(I*c)*x-1/2*Pi^2*b^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(
I*c)+1/4*Pi^2*b^2*e*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-I*ln(c)*Pi*
b^2*d*csgn(I*c*x^n)^3*x-I*Pi*a*b*d*csgn(I*c*x^n)^3*x-1/2*I*Pi*a*b*e*x^2*csg
n(I*c*x^n)^3+1/2*b*(I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*e*x^2*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e*x^2*csgn(I*c*x^n)^3+I*Pi*b*e*x^
2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*x-2*I*Pi
*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-2*I*Pi*b*d*csgn(I*c*x^n)^3*x+2*I
*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*x+2*ln(c)*b*e*x^2-b*e*n*x^2+4*ln(c)*b*d*x
+2*a*e*x^2-4*b*d*n*x+4*a*x*d)*ln(x^n)+1/4*Pi^2*b^2*e*x^2*csgn(I*x^n)*csgn(I
*c*x^n)^3*csgn(I*c)^2+1/2*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c
)*x-1/4*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x-Pi^2*b^2*d*c
sgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x-1/2*I*ln(c)*Pi*b^2*e*x^2*csgn(I*c*x^
n)^3+1/4*I*b^2*n*Pi*e*x^2*csgn(I*c*x^n)^3+I*b^2*n*Pi*d*csgn(I*c*x^n)^3*x-2*
a*b*d*n*x+1/2*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x-1/8*Pi^2
*b^2*e*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2
```

Maxima [A] time = 1.01274, size = 184, normalized size = 1.82

$$\frac{1}{2}\,b^2ex^2\log\left(cx^n\right)^2-\frac{1}{2}\,abenx^2+abex^2\log\left(cx^n\right)+b^2dx\log\left(cx^n\right)^2-2\,abdnx+\frac{1}{2}\,a^2ex^2+2\,abdx\log\left(cx^n\right)+2\left(n^2x-nx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b^2*e*x^2*log(c*x^n)^2 - 1/2*a*b*e*n*x^2 + a*b*e*x^2*log(c*x^n) + b^2*d
*x*log(c*x^n)^2 - 2*a*b*d*n*x + 1/2*a^2*e*x^2 + 2*a*b*d*x*log(c*x^n) + 2*(n
^2*x - n*x*log(c*x^n))*b^2*d + 1/4*(n^2*x^2 - 2*n*x^2*log(c*x^n))*b^2*e + a
^2*d*x
```

Fricas [B] time = 1.02191, size = 459, normalized size = 4.54

$$\frac{1}{4}\left(b^2en^2-2\,aben+2\,a^2e\right)x^2+\frac{1}{2}\left(b^2ex^2+2\,b^2dx\right)\log\left(c\right)^2+\frac{1}{2}\left(b^2en^2x^2+2\,b^2dn^2x\right)\log\left(x\right)^2+\left(2\,b^2dn^2-2\,abdn+a^2d\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(b^2*e*n^2 - 2*a*b*e*n + 2*a^2*e)*x^2 + 1/2*(b^2*e*x^2 + 2*b^2*d*x)*log
(c)^2 + 1/2*(b^2*e*n^2*x^2 + 2*b^2*d*n^2*x)*log(x)^2 + (2*b^2*d*n^2 - 2*a*b
*d*n + a^2*d)*x - 1/2*((b^2*e*n - 2*a*b*e)*x^2 + 4*(b^2*d*n - a*b*d)*x)*log
(c) - 1/2*((b^2*e*n^2 - 2*a*b*e*n)*x^2 + 4*(b^2*d*n^2 - a*b*d*n)*x - 2*(b^2
*e*n*x^2 + 2*b^2*d*n*x)*log(c))*log(x)
```

Sympy [B] time = 1.94152, size = 270, normalized size = 2.67

$$a^2dx+\frac{a^2ex^2}{2}+2abdnx\log\left(x\right)-2abdnx+2abdx\log\left(c\right)+abenx^2\log\left(x\right)-\frac{abenx^2}{2}+abex^2\log\left(c\right)+b^2dn^2x\log\left(x\right)^2-$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d*x + a**2*e*x**2/2 + 2*a*b*d*n*x*log(x) - 2*a*b*d*n*x + 2*a*b*d*x*log
(c) + a*b*e*n*x**2*log(x) - a*b*e*n*x**2/2 + a*b*e*x**2*log(c) + b**2*d*n**
2*x*log(x)**2 - 2*b**2*d*n**2*x*log(x) + 2*b**2*d*n**2*x + 2*b**2*d*n*x*log
(c)*log(x) - 2*b**2*d*n*x*log(c) + b**2*d*x*log(c)**2 + b**2*e*n**2*x**2*lo
g(x)**2/2 - b**2*e*n**2*x**2*log(x)/2 + b**2*e*n**2*x**2/4 + b**2*e*n*x**2*
log(c)*log(x) - b**2*e*n*x**2*log(c)/2 + b**2*e*x**2*log(c)**2/2
```

Giac [B] time = 1.48279, size = 304, normalized size = 3.01

$$\frac{1}{2}\,b^2n^2x^2e\log\left(x\right)^2 - \frac{1}{2}\,b^2n^2x^2e\log\left(x\right) + b^2nx^2e\log\left(c\right)\log\left(x\right) + b^2dn^2x\log\left(x\right)^2 + \frac{1}{4}\,b^2n^2x^2e - \frac{1}{2}\,b^2nx^2e\log\left(c\right) + \frac{1}{2}\,b^2x^2e$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b^2*n^2*x^2*e*log(x)^2 - 1/2*b^2*n^2*x^2*e*log(x) + b^2*n*x^2*e*log(c)*
log(x) + b^2*d*n^2*x*log(x)^2 + 1/4*b^2*n^2*x^2*e - 1/2*b^2*n*x^2*e*log(c)
+ 1/2*b^2*x^2*e*log(c)^2 - 2*b^2*d*n^2*x*log(x) + a*b*n*x^2*e*log(x) + 2*b^
2*d*n*x*log(c)*log(x) + 2*b^2*d*n^2*x - 1/2*a*b*n*x^2*e - 2*b^2*d*n*x*log(c
) + a*b*x^2*e*log(c) + b^2*d*x*log(c)^2 + 2*a*b*d*n*x*log(x) - 2*a*b*d*n*x
+ 1/2*a^2*x^2*e + 2*a*b*d*x*log(c) + a^2*d*x
```

3.79 $\int \frac{(d+ex)(a+b\log(cx^n))^2}{x}\,dx$

Optimal. Leaf size=70

$$\frac{d(a+b\log(cx^n))^3}{3bn}+ex(a+b\log(cx^n))^2-2abenx-2b^2enx\log(cx^n)+2b^2en^2x$$

```
[Out] -2*a*b*e*n*x + 2*b^2*e*n^2*x - 2*b^2*e*n*x*Log[c*x^n] + e*x*(a + b*Log[c*x^
n])^2 + (d*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.0827744, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2346, 2302, 30, 2296, 2295}

$$\frac{d(a+b\log(cx^n))^3}{3bn}+ex(a+b\log(cx^n))^2-2abenx-2b^2enx\log(cx^n)+2b^2en^2x$$

Antiderivative was successfully verified.

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

```
[Out] -2*a*b*e*n*x + 2*b^2*e*n^2*x - 2*b^2*e*n*x*Log[c*x^n] + e*x*(a + b*Log[c*x^
n])^2 + (d*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)(a+b\log(cx^n))^2}{x}\,dx &= d\int \frac{(a+b\log(cx^n))^2}{x}\,dx + e\int (a+b\log(cx^n))^2\,dx\\ &= ex(a+b\log(cx^n))^2 + \frac{d\,\mathrm{Subst}\left(\int x^2\,dx, x, a+b\log(cx^n)\right)}{bn} - (2ben)\int (a+b\log(cx^n)\\ &= -2abenx + ex(a+b\log(cx^n))^2 + \frac{d(a+b\log(cx^n))^3}{3bn} - \left(2b^2en\right)\int \log(cx^n)\,dx\\ &= -2abenx + 2b^2en^2x - 2b^2enx\log(cx^n) + ex(a+b\log(cx^n))^2 + \frac{d(a+b\log(cx^n))^3}{3bn}\end{aligned}$$

Mathematica [A] time = 0.0207447, size = 59, normalized size = 0.84

$$\frac{d(a+b\log(cx^n))^3}{3bn} + ex(a+b\log(cx^n))^2 - 2benx(a+b\log(cx^n)-bn)$$

Antiderivative was successfully verified.

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

```
[Out] e*x*(a + b*Log[c*x^n])^2 + (d*(a + b*Log[c*x^n])^3)/(3*b*n) - 2*b*e*n*x*(a
- b*n + b*Log[c*x^n])
```

Maple [C] time = 0.338, size = 1555, normalized size = 22.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -I*Pi*b^2*e*n*x*csgn(I*x^n)*csgn(I*c*x^n)^2-I*ln(x)*Pi*a*b*d*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+I*Pi*b^2*e*n*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+a^2*e*x+1/2*Pi^2
*b^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/4*Pi^2*b^2*e*x*csgn(I*x^
n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^4*c
sgn(I*c)+1/2*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+I*ln(c)*P
i*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)^2*cs
gn(I*c)+I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*a*b*e*x*csgn(I*c*x^n)
^2*csgn(I*c)-I*ln(x)*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*l
n(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*a*b*e*x*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b^2*e*n*x*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln
(x)^2*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x)^2*Pi*b^2*d*n*csgn(
I*c*x^n)^2*csgn(I*c)+ln(x)*a^2*d+I*ln(x)*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*
c*x^n)^2+I*ln(x)*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(x)*Pi*a*b*d*
csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(x)*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)+2*b^
2*e*n^2*x+1/2*ln(x)*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/4*
ln(x)*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-ln(x)*Pi^2*b^2*d
*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/2*ln(x)*Pi^2*b^2*d*csgn(I*x^n)*csg
n(I*c*x^n)^3*csgn(I*c)^2+(-b^2*d*n*ln(x)^2+I*Pi*ln(x)*b^2*d*csgn(I*x^n)*csg
n(I*c*x^n)^2-I*Pi*ln(x)*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*ln(x
)*b^2*d*csgn(I*c*x^n)^3+I*Pi*ln(x)*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b^2
*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)-I*Pi*b^2*e*x*csgn(I*c*x^n)^3+I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+
2*ln(c)*ln(x)*b^2*d+2*ln(c)*b^2*e*x-2*b^2*e*n*x+2*ln(x)*a*b*d+2*a*b*e*x)*ln
(x^n)+(b^2*e*x+b^2*d*ln(x))*ln(x^n)^2+1/2*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c
*x^n)^5+1/2*Pi^2*b^2*e*x*csgn(I*c*x^n)^5*csgn(I*c)-1/4*Pi^2*b^2*e*x*csgn(I*
c*x^n)^4*csgn(I*c)^2-1/4*ln(x)*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2
*ln(x)*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^5+1/2*ln(x)*Pi^2*b^2*d*csgn(I*c
*x^n)^5*csgn(I*c)-1/4*ln(x)*Pi^2*b^2*d*csgn(I*c*x^n)^4*csgn(I*c)^2+ln(c)^2*
b^2*e*x+ln(x)*ln(c)^2*b^2*d+1/3*b^2*d*n^2*ln(x)^3+2*ln(c)*a*b*e*x-2*ln(c)*b
^2*e*n*x-ln(x)^2*a*b*n*d-ln(x)^2*ln(c)*b^2*d*n-I*ln(c)*Pi*b^2*e*x*csgn(I*c*
x^n)^3+I*Pi*b^2*e*n*x*csgn(I*c*x^n)^3-1/4*Pi^2*b^2*e*x*csgn(I*c*x^n)^6-1/4*
ln(x)*Pi^2*b^2*d*csgn(I*c*x^n)^6+2*ln(x)*ln(c)*a*b*d-1/4*Pi^2*b^2*e*x*csgn(
I*x^n)^2*csgn(I*c*x^n)^4-2*a*b*e*n*x-I*Pi*a*b*e*x*csgn(I*c*x^n)^3-I*ln(x)*l
n(c)*Pi*b^2*d*csgn(I*c*x^n)^3-I*ln(x)*Pi*a*b*d*csgn(I*c*x^n)^3+1/2*I*ln(x)^
2*Pi*b^2*d*n*csgn(I*c*x^n)^3
```

Maxima [A] time = 1.13951, size = 136, normalized size = 1.94

$$b^2ex\log(cx^n)^2 - 2\,abenx + 2\,abex\log(cx^n) + \frac{b^2d\log(cx^n)^3}{3\,n} + 2\left(n^2x - nx\log(cx^n)\right)b^2e + a^2ex + \frac{abd\log(cx^n)^2}{n} + a^2d\,\mathrm{l}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.03522, size = 347, normalized size = 4.96

$$\frac{1}{3}b^2dn^2\log(x)^3 + b^2ex\log(c)^2 - 2\left(b^2en - abe\right)x\log(c) + \left(b^2en^2x + b^2dn\log(c) + abdn\right)\log(x)^2 + \left(2\,b^2en^2 - 2\,aben + a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Sympy [B] time = 1.74437, size = 204, normalized size = 2.91

$$a^2d\log(x) + a^2ex + abdn\log(x)^2 + 2abd\log(c)\log(x) + 2abenx\log(x) - 2abenx + 2abex\log(c) + \frac{b^2dn^2\log(x)^3}{3} + b^2d$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d*log(x) + a**2*e*x + a*b*d*n*log(x)**2 + 2*a*b*d*log(c)*log(x) + 2*a*
b*e*n*x*log(x) - 2*a*b*e*n*x + 2*a*b*e*x*log(c) + b**2*d*n**2*log(x)**3/3 +
 b**2*d*n*log(c)*log(x)**2 + b**2*d*log(c)**2*log(x) + b**2*e*n**2*x*log(x)
**2 - 2*b**2*e*n**2*x*log(x) + 2*b**2*e*n**2*x + 2*b**2*e*n*x*log(c)*log(x)
 - 2*b**2*e*n*x*log(c) + b**2*e*x*log(c)**2
```

Giac [B] time = 1.21575, size = 228, normalized size = 3.26

$$b^2n^2xe\log(x)^2 + \frac{1}{3}b^2dn^2\log(x)^3 - 2b^2n^2xe\log(x) + 2b^2nxe\log(c)\log(x) + b^2dn\log(c)\log(x)^2 + 2b^2n^2xe - 2b^2nxe$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.80 $\int \frac{(d+ex)(a+b\log(cx^n))^2}{x^2} dx$

Optimal. Leaf size=72

$$-\frac{d(a+b\log(cx^n))^2}{x}-\frac{2bdn(a+b\log(cx^n))}{x}+\frac{e(a+b\log(cx^n))^3}{3bn}-\frac{2b^2dn^2}{x}$$

```
[Out] (-2*b^2*d*n^2)/x - (2*b*d*n*(a + b*Log[c*x^n]))/x - (d*(a + b*Log[c*x^n])^2
)/x + (e*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.116678, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {2353, 2305, 2304, 2302, 30}

$$-\frac{d(a+b\log(cx^n))^2}{x}-\frac{2bdn(a+b\log(cx^n))}{x}+\frac{e(a+b\log(cx^n))^3}{3bn}-\frac{2b^2dn^2}{x}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*b^2*d*n^2)/x - (2*b*d*n*(a + b*Log[c*x^n]))/x - (d*(a + b*Log[c*x^n])^2
)/x + (e*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rubi steps

$$\begin{aligned}\int \frac{(d+ex)(a+b\log(cx^n))^2}{x^2}\,dx &= \int \left(\frac{d(a+b\log(cx^n))^2}{x^2}+\frac{e(a+b\log(cx^n))^2}{x}\right)dx\\ &= d\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx + e\int \frac{(a+b\log(cx^n))^2}{x}\,dx\\ &= -\frac{d(a+b\log(cx^n))^2}{x}+\frac{e\,\text{Subst}\left(\int x^2\,dx, x, a+b\log(cx^n)\right)}{bn}+(2bdn)\int \frac{a+b\log(cx}{x^2}\\ &= -\frac{2b^2dn^2}{x}-\frac{2bdn(a+b\log(cx^n))}{x}-\frac{d(a+b\log(cx^n))^2}{x}+\frac{e(a+b\log(cx^n))^3}{3bn}\end{aligned}$$

Mathematica [A] time = 0.0349871, size = 63, normalized size = 0.88

$$-\frac{d(a+b\log(cx^n))^2}{x}-\frac{2bdn(a+b\log(cx^n)+bn)}{x}+\frac{e(a+b\log(cx^n))^3}{3bn}$$

Antiderivative was successfully verified.

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

```
[Out] -((d*(a + b*Log[c*x^n])^2)/x) + (e*(a + b*Log[c*x^n])^3)/(3*b*n) - (2*b*d*n
*(a + b*n + b*Log[c*x^n]))/x
```

Maple [C] time = 0.258, size = 1544, normalized size = 21.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b^2*(-e*x*ln(x)+d)/x*ln(x^n)^2-b*(-I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n
)^2*x+I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+I*ln(x)*Pi*b*e*c
sgn(I*c*x^n)^3*x-I*ln(x)*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x+I*Pi*b*d*csgn(I
*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d
*csgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+e*n*b*ln(x)^2*x-2*ln(x)
*ln(c)*b*e*x-2*ln(x)*a*e*x+2*ln(c)*b*d+2*b*d*n+2*a*d)/x*ln(x^n)+1/12*(-12*I
*ln(x)*ln(c)*Pi*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+12*I*Pi*b^2*d*n
*csgn(I*c*x^n)^3+12*I*Pi*a*b*d*csgn(I*c*x^n)^3+3*Pi^2*b^2*d*csgn(I*x^n)^2*c
sgn(I*c*x^n)^4-6*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^5+6*ln(x)*Pi^2*b^2*e*
csgn(I*x^n)*csgn(I*c*x^n)^5*x+6*ln(x)*Pi^2*b^2*e*csgn(I*c*x^n)^5*csgn(I*c)*
x-3*ln(x)*Pi^2*b^2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x-12*I*ln(c)*Pi*b^2*d*csgn
(I*x^n)*csgn(I*c*x^n)^2-24*a*b*n*d-12*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n
)^2-12*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)+12*I*ln(x)*ln(c)*Pi*b^2*e*csg
n(I*x^n)*csgn(I*c*x^n)^2*x-12*a^2*d-6*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(I*c)-
24*b^2*d*n^2+12*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*l
n(x)*ln(c)*Pi*b^2*e*csgn(I*c*x^n)^3*x-12*I*ln(x)*Pi*a*b*e*csgn(I*c*x^n)^3*x
+6*ln(x)*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x+12*ln(x)*ln(c
)^2*b^2*e*x+4*b^2*e*n^2*ln(x)^3*x-24*ln(c)*b^2*d*n-24*ln(c)*a*b*d+6*I*ln(x)
^2*Pi*b^2*e*n*csgn(I*c*x^n)^3*x+12*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)+12*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*ln(x)*Pi^2*b^2
*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x-12*ln(x)*Pi^2*b^2*e*csgn(I*x
^n)*csgn(I*c*x^n)^4*csgn(I*c)*x+6*ln(x)*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n
)^3*csgn(I*c)^2*x+24*ln(x)*ln(c)*a*b*e*x-12*ln(x)^2*ln(c)*b^2*e*n*x-12*ln(x
)^2*a*b*n*e*x-3*ln(x)*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x-12*ln(c)^2
*b^2*d+3*Pi^2*b^2*d*csgn(I*c*x^n)^4*csgn(I*c)^2-6*I*ln(x)^2*Pi*b^2*e*n*csgn
(I*x^n)*csgn(I*c*x^n)^2*x+12*I*ln(x)*Pi*a*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x+1
2*I*ln(x)*ln(c)*Pi*b^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x+12*I*ln(x)*Pi*a*b*e*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x-12*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)-1
2*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn
(I*c)+12*ln(x)*a^2*e*x+3*Pi^2*b^2*d*csgn(I*c*x^n)^6-12*I*ln(x)*Pi*a*b*e*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+6*I*ln(x)^2*Pi*b^2*e*n*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*x+12*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3-6*Pi^2*b^2*d*csgn(
I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+3*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)
^2*csgn(I*c)^2-6*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-3*ln(x)
*Pi^2*b^2*e*csgn(I*c*x^n)^6*x-6*I*ln(x)^2*Pi*b^2*e*n*csgn(I*c*x^n)^2*csgn(I
*c)*x+12*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c))/x
```

Maxima [A] time = 1.12538, size = 154, normalized size = 2.14

$$\frac{b^2 e \log(cx^n)^3}{3n} - 2b^2 d\left(\frac{n^2}{x} + \frac{n\log(cx^n)}{x}\right) + \frac{abe\log(cx^n)^2}{n} - \frac{b^2 d\log(cx^n)^2}{x} + a^2 e\log(x) - \frac{2abdn}{x} - \frac{2abd\log(cx^n)}{x} - \frac{a^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.04042, size = 360, normalized size = 5.

$$\frac{b^2en^2x\log(x)^3 - 6b^2dn^2 - 3b^2d\log(c)^2 - 6abdn - 3a^2d + 3\left(b^2enx\log(c) - b^2dn^2 + abenx\right)\log(x)^2 - 6\left(b^2dn + abd\right)}{3x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(b^2*e*n^2*x*log(x)^3 - 6*b^2*d*n^2 - 3*b^2*d*log(c)^2 - 6*a*b*d*n - 3*
a^2*d + 3*(b^2*e*n*x*log(c) - b^2*d*n^2 + a*b*e*n*x)*log(x)^2 - 6*(b^2*d*n
+ a*b*d)*log(c) + 3*(b^2*e*x*log(c)^2 - 2*b^2*d*n^2 - 2*a*b*d*n + a^2*e*x -
 2*(b^2*d*n - a*b*e*x)*log(c))*log(x))/x
```

Sympy [A] time = 8.28364, size = 182, normalized size = 2.53

$$-\frac{a^2d}{x} + a^2e\log(x) - \frac{2abdn}{x} - \frac{2abd\log(cx^n)}{x} - 2abe\left(\begin{cases} -\log(c)\log(x) & \text{for } n = 0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise} \end{cases}\right) - \frac{b^2dn^2\log(x)^2}{x} - \frac{2b^2dn^2\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2*d/x + a**2*e*log(x) - 2*a*b*d*n/x - 2*a*b*d*log(c*x**n)/x - 2*a*b*e*P
iecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True)) - b**2*
d*n**2*log(x)**2/x - 2*b**2*d*n**2*log(x)/x - 2*b**2*d*n**2/x - 2*b**2*d*n*
log(c)*log(x)/x - 2*b**2*d*n*log(c)/x - b**2*d*log(c)**2/x - b**2*e*Piecewi
se((-log(c)**2*log(x), Eq(n, 0)), (-log(c*x**n)**3/(3*n), True))
```

Giac [B] time = 1.20569, size = 232, normalized size = 3.22

$$\frac{b^2n^2xe\log(x)^3 + 3\,b^2nxe\log(c)\log(x)^2 + 3\,b^2xe\log(c)^2\log(x) - 3\,b^2dn^2\log(x)^2 + 3\,abnxe\log(x)^2 - 6\,b^2dn^2\log(x) - \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(b^2*n^2*x*e*log(x)^3 + 3*b^2*n*x*e*log(c)*log(x)^2 + 3*b^2*x*e*log(c)^
2*log(x) - 3*b^2*d*n^2*log(x)^2 + 3*a*b*n*x*e*log(x)^2 - 6*b^2*d*n^2*log(x)
 - 6*b^2*d*n*log(c)*log(x) + 6*a*b*x*e*log(c)*log(x) - 6*b^2*d*n^2 - 6*b^2*
d*n*log(c) - 3*b^2*d*log(c)^2 - 6*a*b*d*n*log(x) + 3*a^2*x*e*log(x) - 6*a*b
*d*n - 6*a*b*d*log(c) - 3*a^2*d)/x
```

3.81 $\int \frac{(d+ex)(a+b\log(cx^n))^2}{x^3}\,dx$

Optimal. Leaf size=103

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{b^2dn^2}{4x^2}-\frac{2b^2en^2}{x}$$

```
[Out] -(b^2*d*n^2)/(4*x^2) - (2*b^2*e*n^2)/x - (b*d*n*(a + b*Log[c*x^n]))/(2*x^2)
 - (2*b*e*n*(a + b*Log[c*x^n]))/x - (d*(a + b*Log[c*x^n])^2)/(2*x^2) - (e*(
a + b*Log[c*x^n])^2)/x
```

Rubi [A] time = 0.133665, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{b^2dn^2}{4x^2}-\frac{2b^2en^2}{x}$$

Antiderivative was successfully verified.

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

```
[Out] -(b^2*d*n^2)/(4*x^2) - (2*b^2*e*n^2)/x - (b*d*n*(a + b*Log[c*x^n]))/(2*x^2)
 - (2*b*e*n*(a + b*Log[c*x^n]))/x - (d*(a + b*Log[c*x^n])^2)/(2*x^2) - (e*(
a + b*Log[c*x^n])^2)/x
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d+ex)(a+b\log(cx^n))^2}{x^3}\,dx = \int \left(\frac{d(a+b\log(cx^n))^2}{x^3}+\frac{e(a+b\log(cx^n))^2}{x^2}\right)dx$$
$$= d\int \frac{(a+b\log(cx^n))^2}{x^3}\,dx + e\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx$$
$$= -\frac{d(a+b\log(cx^n))^2}{2x^2} - \frac{e(a+b\log(cx^n))^2}{x} + (bdn)\int \frac{a+b\log(cx^n)}{x^3}\,dx + (2ben)\int \frac{a}{}$$
$$= -\frac{b^2dn^2}{4x^2} - \frac{2b^2en^2}{x} - \frac{bdn(a+b\log(cx^n))}{2x^2} - \frac{2ben(a+b\log(cx^n))}{x} - \frac{d(a+b\log(cx^n))}{2x^2}$$

Mathematica [A] time = 0.0479543, size = 90, normalized size = 0.87

$$-\frac{2a^2(d+2ex)+2b\log(cx^n)(2a(d+2ex)+bn(d+4ex))+2abn(d+4ex)+2b^2(d+2ex)\log^2(cx^n)+b^2n^2(d+8ex)}{4x^2}$$

Antiderivative was successfully verified.

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

```
[Out] -(2*a^2*(d + 2*e*x) + 2*a*b*n*(d + 4*e*x) + b^2*n^2*(d + 8*e*x) + 2*b*(2*a*
(d + 2*e*x) + b*n*(d + 4*e*x))*Log[c*x^n] + 2*b^2*(d + 2*e*x)*Log[c*x^n]^2)
/(4*x^2)
```

Maple [C] time = 0.198, size = 1483, normalized size = 14.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b^2*(2*e*x+d)/x^2*ln(x^n)^2-1/2*(2*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x
^n)^2-2*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b^2*e*x*csg
n(I*c*x^n)^3+2*I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+4*ln(c)*b^2*e*x+4*b^2
*e*n*x+4*a*b*e*x+I*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b^2*d*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b^2*d*csgn(I*c*x^n)^3+I*Pi*b^2*d*csgn(I*c*
x^n)^2*csgn(I*c)+2*ln(c)*b^2*d+b^2*d*n+2*a*b*d)/x^2*ln(x^n)-1/8*(8*I*ln(c)*
Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+8*I*Pi*a*b*e*x*csgn(I*c*x^n)^2*csgn(I*
c)-8*I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*I*Pi*a*b*e*x*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)-2*I*Pi*b^2*d*n*csgn(I*c*x^n)^3-4*I*Pi*a*b*d*csgn(I*c*x^n)^3-Pi^2*
b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+2*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^
5+8*a^2*e*x+4*Pi^2*b^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-2*Pi^2*b
^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-8*Pi^2*b^2*e*x*csgn(I*x^n)
*csgn(I*c*x^n)^4*csgn(I*c)+4*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(
I*c)^2+4*a*b*n*d+8*I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+8*I*n*Pi*
b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+8*I*n*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I
*c)+4*a^2*d+2*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(I*c)-8*I*Pi*a*b*e*x*csgn(I*c*
x^n)^3+2*b^2*d*n^2+16*b^2*e*n^2*x-8*I*n*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+4*ln(c)*b^2*d*n+8*ln(c)*a*b*d+8*I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I
*c*x^n)^2-2*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*ln(c)*Pi*b
^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*
c*x^n)^5+4*Pi^2*b^2*e*x*csgn(I*c*x^n)^5*csgn(I*c)-2*Pi^2*b^2*e*x*csgn(I*c*x
^n)^4*csgn(I*c)^2+8*ln(c)^2*b^2*e*x+4*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)+
2*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*c
sgn(I*c)+16*ln(c)*a*b*e*x+16*ln(c)*b^2*e*n*x+4*ln(c)^2*b^2*d+4*I*ln(c)*Pi*b
^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2+4*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*
c)+4*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-Pi^2*b^2*d*csgn(I*c*x^n)^4*csgn
(I*c)^2-2*Pi^2*b^2*e*x*csgn(I*c*x^n)^6-4*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3-2
*Pi^2*b^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^4-Pi^2*b^2*d*csgn(I*c*x^n)^6+16*a
*b*e*n*x+2*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-Pi^2*b^2*d*cs
gn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+2*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x
^n)^3*csgn(I*c)^2-8*I*n*Pi*b^2*e*x*csgn(I*c*x^n)^3-8*I*ln(c)*Pi*b^2*e*x*csg
n(I*c*x^n)^3-4*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c))/x^2
```

Maxima [A] time = 1.06153, size = 203, normalized size = 1.97

$$-2\,b^2e\left(\frac{n^2}{x}+\frac{n\log\left(cx^n\right)}{x}\right)-\frac{1}{4}\,b^2d\left(\frac{n^2}{x^2}+\frac{2\,n\log\left(cx^n\right)}{x^2}\right)-\frac{b^2e\log\left(cx^n\right)^2}{x}-\frac{2\,aben}{x}-\frac{2\,abe\log\left(cx^n\right)}{x}-\frac{b^2d\log\left(cx^n\right)^2}{2\,x^2}-\frac{ab}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*b^2*e*(n^2/x + n*log(c*x^n)/x) - 1/4*b^2*d*(n^2/x^2 + 2*n*log(c*x^n)/x^2
) - b^2*e*log(c*x^n)^2/x - 2*a*b*e*n/x - 2*a*b*e*log(c*x^n)/x - 1/2*b^2*d*l
og(c*x^n)^2/x^2 - 1/2*a*b*d*n/x^2 - a^2*e/x - a*b*d*log(c*x^n)/x^2 - 1/2*a^
2*d/x^2
```

Fricas [A] time = 0.991838, size = 420, normalized size = 4.08

$$-\frac{b^2dn^2 + 2\,abdn + 2\,a^2d + 2\left(2\,b^2ex + b^2d\right)\log\left(c\right)^2 + 2\left(2\,b^2en^2x + b^2dn^2\right)\log\left(x\right)^2 + 4\left(2\,b^2en^2 + 2\,aben + a^2e\right)x + 2\left(b^2 \cdots\right.}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*(b^2*d*n^2 + 2*a*b*d*n + 2*a^2*d + 2*(2*b^2*e*x + b^2*d)*log(c)^2 + 2*
(2*b^2*e*n^2*x + b^2*d*n^2)*log(x)^2 + 4*(2*b^2*e*n^2 + 2*a*b*e*n + a^2*e)*
x + 2*(b^2*d*n + 2*a*b*d + 4*(b^2*e*n + a*b*e)*x)*log(c) + 2*(b^2*d*n^2 + 2
*a*b*d*n + 4*(b^2*e*n^2 + a*b*e*n)*x + 2*(2*b^2*e*n*x + b^2*d*n)*log(c))*lo
g(x))/x^2
```

Sympy [B] time = 1.39852, size = 272, normalized size = 2.64

$$-\frac{a^2d}{2x^2} - \frac{a^2e}{x} - \frac{abdn\log\left(x\right)}{x^2} - \frac{abdn}{2x^2} - \frac{abd\log\left(c\right)}{x^2} - \frac{2aben\log\left(x\right)}{x} - \frac{2aben}{x} - \frac{2abe\log\left(c\right)}{x} - \frac{b^2dn^2\log\left(x\right)^2}{2x^2} - \frac{b^2dn^2\log\left(x\right) \cdots}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x**3,x)
```

```
[Out] -a**2*d/(2*x**2) - a**2*e/x - a*b*d*n*log(x)/x**2 - a*b*d*n/(2*x**2) - a*b*
d*log(c)/x**2 - 2*a*b*e*n*log(x)/x - 2*a*b*e*n/x - 2*a*b*e*log(c)/x - b**2*
d*n**2*log(x)**2/(2*x**2) - b**2*d*n**2*log(x)/(2*x**2) - b**2*d*n**2/(4*x*
*2) - b**2*d*n*log(c)*log(x)/x**2 - b**2*d*n*log(c)/(2*x**2) - b**2*d*log(c
)**2/(2*x**2) - b**2*e*n**2*log(x)**2/x - 2*b**2*e*n**2*log(x)/x - 2*b**2*e
*n**2/x - 2*b**2*e*n*log(c)*log(x)/x - 2*b**2*e*n*log(c)/x - b**2*e*log(c)*
*2/x
```

<u>Giac</u> [B] time = 1.34219, size = 277, normalized size = 2.69

$$-\frac{4\,b^2n^2xe\log(x)^2+8\,b^2n^2xe\log(x)+8\,b^2nxe\log(c)\log(x)+2\,b^2dn^2\log(x)^2+8\,b^2n^2xe+8\,b^2nxe\log(c)+4\,b^2xe\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*(4*b^2*n^2*x*e*log(x)^2 + 8*b^2*n^2*x*e*log(x) + 8*b^2*n*x*e*log(c)*lo
g(x) + 2*b^2*d*n^2*log(x)^2 + 8*b^2*n^2*x*e + 8*b^2*n*x*e*log(c) + 4*b^2*x*
e*log(c)^2 + 2*b^2*d*n^2*log(x) + 8*a*b*n*x*e*log(x) + 4*b^2*d*n*log(c)*log
(x) + b^2*d*n^2 + 8*a*b*n*x*e + 2*b^2*d*n*log(c) + 8*a*b*x*e*log(c) + 2*b^2
*d*log(c)^2 + 4*a*b*d*n*log(x) + 2*a*b*d*n + 4*a^2*x*e + 4*a*b*d*log(c) + 2
*a^2*d)/x^2
```

3.82 $\int \frac{(d+ex)(a+b\log(cx^n))^2}{x^4}\,dx$

Optimal. Leaf size=109

$$-\frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{ben\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2b^2dn^2}{27x^3}-\frac{b^2en^2}{4x^2}$$

```
[Out] (-2*b^2*d*n^2)/(27*x^3) - (b^2*e*n^2)/(4*x^2) - (2*b*d*n*(a + b*Log[c*x^n])
)/(9*x^3) - (b*e*n*(a + b*Log[c*x^n]))/(2*x^2) - (d*(a + b*Log[c*x^n])^2)/(
3*x^3) - (e*(a + b*Log[c*x^n])^2)/(2*x^2)
```

Rubi [A] time = 0.133212, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$-\frac{2bdn\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{ben\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2b^2dn^2}{27x^3}-\frac{b^2en^2}{4x^2}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*b^2*d*n^2)/(27*x^3) - (b^2*e*n^2)/(4*x^2) - (2*b*d*n*(a + b*Log[c*x^n])
)/(9*x^3) - (b*e*n*(a + b*Log[c*x^n]))/(2*x^2) - (d*(a + b*Log[c*x^n])^2)/(
3*x^3) - (e*(a + b*Log[c*x^n])^2)/(2*x^2)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex)(a+b\log(cx^n))^2}{x^4}\,dx &= \int \left(\frac{d(a+b\log(cx^n))^2}{x^4}+\frac{e(a+b\log(cx^n))^2}{x^3}\right)dx\\
&= d\int \frac{(a+b\log(cx^n))^2}{x^4}\,dx+e\int \frac{(a+b\log(cx^n))^2}{x^3}\,dx\\
&= -\frac{d(a+b\log(cx^n))^2}{3x^3}-\frac{e(a+b\log(cx^n))^2}{2x^2}+\frac{1}{3}(2bdn)\int \frac{a+b\log(cx^n)}{x^4}\,dx+(ben)\int\\
&= -\frac{2b^2dn^2}{27x^3}-\frac{b^2en^2}{4x^2}-\frac{2bdn(a+b\log(cx^n))}{9x^3}-\frac{ben(a+b\log(cx^n))}{2x^2}-\frac{d(a+b\log(cx^n)}{3x^3}
\end{aligned}$$

Mathematica [A] time = 0.057317, size = 82, normalized size = 0.75

$$-\frac{36d(a+b\log(cx^n))^2+8bdn(3a+3b\log(cx^n)+bn)+54ex(a+b\log(cx^n))^2+27benx(2a+2b\log(cx^n)+bn)}{108x^3}$$

Antiderivative was successfully verified.

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

```
[Out] -(36*d*(a + b*Log[c*x^n])^2 + 54*e*x*(a + b*Log[c*x^n])^2 + 27*b*e*n*x*(2*a
 + b*n + 2*b*Log[c*x^n]) + 8*b*d*n*(3*a + b*n + 3*b*Log[c*x^n]))/(108*x^3)
```

Maple [C] time = 0.208, size = 1486, normalized size = 13.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/6*b^2*(3*e*x+2*d)/x^3*ln(x^n)^2-1/18*(9*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*
c*x^n)^2-9*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b^2*e*x*
```

```
csgn(I*c*x^n)^3+9*I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+18*ln(c)*b^2*e*x+9
*b^2*e*n*x+18*a*b*e*x+6*I*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b^2*d
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6*I*Pi*b^2*d*csgn(I*c*x^n)^3+6*I*Pi*b^
2*d*csgn(I*c*x^n)^2*csgn(I*c)+12*ln(c)*b^2*d+4*b^2*d*n+12*a*b*d)/x^3*ln(x^n
)-1/216*(-24*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-72*I*Pi*a*b*d
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x
^n)^4+36*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^5+108*a^2*e*x+54*Pi^2*b^2*e*x
*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-27*Pi^2*b^2*e*x*csgn(I*x^n)^2*csgn
(I*c*x^n)^2*csgn(I*c)^2-108*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I
*c)+54*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+48*a*b*n*d+72*a
^2*d+36*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(I*c)+16*b^2*d*n^2+54*b^2*e*n^2*x+24
*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)-108*I*Pi*a*b*e*x*csgn(I*c*x^n)^3-54
*I*n*Pi*b^2*e*x*csgn(I*c*x^n)^3-72*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3+108*I*l
n(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+54*I*n*Pi*b^2*e*x*csgn(I*x^n)*c
sgn(I*c*x^n)^2+54*I*n*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+108*I*Pi*a*b*e*x
*csgn(I*x^n)*csgn(I*c*x^n)^2+48*ln(c)*b^2*d*n+144*ln(c)*a*b*d-72*I*ln(c)*Pi
*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+108*I*ln(c)*Pi*b^2*e*x*csgn(I*c*
x^n)^2*csgn(I*c)+108*I*Pi*a*b*e*x*csgn(I*c*x^n)^2*csgn(I*c)-108*I*Pi*a*b*e*
x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-54*I*n*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)-108*I*ln(c)*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+54*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+54*Pi^2*b^2*e*x*csgn(I*c*x^n)^
5*csgn(I*c)-27*Pi^2*b^2*e*x*csgn(I*c*x^n)^4*csgn(I*c)^2+108*ln(c)^2*b^2*e*x
+216*ln(c)*a*b*e*x+108*ln(c)*b^2*e*n*x-108*I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)
^3+72*I*ln(c)*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2+72*ln(c)^2*b^2*d+72*I*ln
(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+72*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x
^n)^2+72*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)-18*Pi^2*b^2*d*csgn(I*c*x^n)^4
*csgn(I*c)^2-27*Pi^2*b^2*e*x*csgn(I*c*x^n)^6-24*I*Pi*b^2*d*n*csgn(I*c*x^n)^
3-72*I*Pi*a*b*d*csgn(I*c*x^n)^3-27*Pi^2*b^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)
^4-18*Pi^2*b^2*d*csgn(I*c*x^n)^6+108*a*b*e*n*x+36*Pi^2*b^2*d*csgn(I*x^n)^2*
csgn(I*c*x^n)^3*csgn(I*c)-18*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(
I*c)^2+36*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+24*I*Pi*b^2*d*
n*csgn(I*x^n)*csgn(I*c*x^n)^2-72*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^4*csg
n(I*c))/x^3
```

Maxima [A] time = 1.10645, size = 204, normalized size = 1.87

$$-\frac{1}{4}\,b^2e\left(\frac{n^2}{x^2}+\frac{2\,n\log\left(cx^n\right)}{x^2}\right)-\frac{2}{27}\,b^2d\left(\frac{n^2}{x^3}+\frac{3\,n\log\left(cx^n\right)}{x^3}\right)-\frac{b^2e\log\left(cx^n\right)^2}{2\,x^2}-\frac{aben}{2\,x^2}-\frac{abe\log\left(cx^n\right)}{x^2}-\frac{b^2d\log\left(cx^n\right)^2}{3\,x^3}-\frac{2\,ab}{9\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/4*b^2*e*(n^2/x^2 + 2*n*log(c*x^n)/x^2) - 2/27*b^2*d*(n^2/x^3 + 3*n*log(c
*x^n)/x^3) - 1/2*b^2*e*log(c*x^n)^2/x^2 - 1/2*a*b*e*n/x^2 - a*b*e*log(c*x^n
)/x^2 - 1/3*b^2*d*log(c*x^n)^2/x^3 - 2/9*a*b*d*n/x^3 - 1/2*a^2*e/x^2 - 2/3*
a*b*d*log(c*x^n)/x^3 - 1/3*a^2*d/x^3
```

Fricas [A] time = 1.03898, size = 454, normalized size = 4.17

$$-\frac{8\,b^2dn^2+24\,abdn+36\,a^2d+18\left(3\,b^2ex+2\,b^2d\right)\log\left(c\right)^2+18\left(3\,b^2en^2x+2\,b^2dn^2\right)\log\left(x\right)^2+27\left(b^2en^2+2\,aben+2\,a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/108*(8*b^2*d*n^2 + 24*a*b*d*n + 36*a^2*d + 18*(3*b^2*e*x + 2*b^2*d)*log(
c)^2 + 18*(3*b^2*e*n^2*x + 2*b^2*d*n^2)*log(x)^2 + 27*(b^2*e*n^2 + 2*a*b*e*
n + 2*a^2*e)*x + 6*(4*b^2*d*n + 12*a*b*d + 9*(b^2*e*n + 2*a*b*e)*x)*log(c)
+ 6*(4*b^2*d*n^2 + 12*a*b*d*n + 9*(b^2*e*n^2 + 2*a*b*e*n)*x + 6*(3*b^2*e*n*
x + 2*b^2*d*n)*log(c))*log(x))/x^3
```

Sympy [B] time = 2.28761, size = 306, normalized size = 2.81

$$-\frac{a^2d}{3x^3}-\frac{a^2e}{2x^2}-\frac{2abdn\log(x)}{3x^3}-\frac{2abdn}{9x^3}-\frac{2abd\log(c)}{3x^3}-\frac{aben\log(x)}{x^2}-\frac{aben}{2x^2}-\frac{abe\log(c)}{x^2}-\frac{b^2dn^2\log(x)^2}{3x^3}-\frac{2b^2dn^2\log}{9x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x**4,x)
```

```
[Out] -a**2*d/(3*x**3) - a**2*e/(2*x**2) - 2*a*b*d*n*log(x)/(3*x**3) - 2*a*b*d*n/
(9*x**3) - 2*a*b*d*log(c)/(3*x**3) - a*b*e*n*log(x)/x**2 - a*b*e*n/(2*x**2)
 - a*b*e*log(c)/x**2 - b**2*d*n**2*log(x)**2/(3*x**3) - 2*b**2*d*n**2*log(x
)/(9*x**3) - 2*b**2*d*n**2/(27*x**3) - 2*b**2*d*n*log(c)*log(x)/(3*x**3) -
2*b**2*d*n*log(c)/(9*x**3) - b**2*d*log(c)**2/(3*x**3) - b**2*e*n**2*log(x)
**2/(2*x**2) - b**2*e*n**2*log(x)/(2*x**2) - b**2*e*n**2/(4*x**2) - b**2*e*
n*log(c)*log(x)/x**2 - b**2*e*n*log(c)/(2*x**2) - b**2*e*log(c)**2/(2*x**2)
```

Giac [B] time = 1.25368, size = 278, normalized size = 2.55

$$-\frac{54\,b^2n^2xe\log\left(x\right)^2+54\,b^2n^2xe\log\left(x\right)+108\,b^2nxe\log\left(c\right)\log\left(x\right)+36\,b^2dn^2\log\left(x\right)^2+27\,b^2n^2xe+54\,b^2nxe\log\left(c\right)+54}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/108*(54*b^2*n^2*x*e*log(x)^2 + 54*b^2*n^2*x*e*log(x) + 108*b^2*n*x*e*log
(c)*log(x) + 36*b^2*d*n^2*log(x)^2 + 27*b^2*n^2*x*e + 54*b^2*n*x*e*log(c) +
 54*b^2*x*e*log(c)^2 + 24*b^2*d*n^2*log(x) + 108*a*b*n*x*e*log(x) + 72*b^2*
d*n*log(c)*log(x) + 8*b^2*d*n^2 + 54*a*b*n*x*e + 24*b^2*d*n*log(c) + 108*a*
b*x*e*log(c) + 36*b^2*d*log(c)^2 + 72*a*b*d*n*log(x) + 24*a*b*d*n + 54*a^2*
x*e + 72*a*b*d*log(c) + 36*a^2*d)/x^3
```

3.83 $\int \frac{(d+ex)(a+b\log(cx^n))^2}{x^5}\,dx$

Optimal. Leaf size=109

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{b^2dn^2}{32x^4}-\frac{2b^2en^2}{27x^3}$$

```
[Out] -(b^2*d*n^2)/(32*x^4) - (2*b^2*e*n^2)/(27*x^3) - (b*d*n*(a + b*Log[c*x^n]))
/(8*x^4) - (2*b*e*n*(a + b*Log[c*x^n]))/(9*x^3) - (d*(a + b*Log[c*x^n])^2)/
(4*x^4) - (e*(a + b*Log[c*x^n])^2)/(3*x^3)
```

Rubi [A] time = 0.135152, antiderivative size = 109, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{b^2dn^2}{32x^4}-\frac{2b^2en^2}{27x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)*(a + b*Log[c*x^n])^2)/x^5,x]
```


```
[Out] -(b^2*d*n^2)/(32*x^4) - (2*b^2*e*n^2)/(27*x^3) - (b*d*n*(a + b*Log[c*x^n]))
/(8*x^4) - (2*b*e*n*(a + b*Log[c*x^n]))/(9*x^3) - (d*(a + b*Log[c*x^n])^2)/
(4*x^4) - (e*(a + b*Log[c*x^n])^2)/(3*x^3)
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d+ex)\left(a+b\log\left(cx^n\right)\right)^2}{x^5}\,dx = \int \left(\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{x^5}+\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{x^4}\right)dx$$

$$= d\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^5}\,dx + e\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^4}\,dx$$

$$= -\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{e\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}+\frac{1}{2}(bdn)\int \frac{a+b\log\left(cx^n\right)}{x^5}\,dx+\frac{1}{3}(2ben)\int$$

$$= -\frac{b^2dn^2}{32x^4}-\frac{2b^2en^2}{27x^3}-\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{2ben\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{d\left(a+b\log\left(cx^n\right)\right)}{4x^4}$$

Mathematica [A] time = 0.0532247, size = 82, normalized size = 0.75

$$-\frac{216d\left(a+b\log\left(cx^n\right)\right)^2+27bdn\left(4a+4b\log\left(cx^n\right)+bn\right)+288ex\left(a+b\log\left(cx^n\right)\right)^2+64benx\left(3a+3b\log\left(cx^n\right)+bn\right)}{864x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)*(a + b*Log[c*x^n])^2)/x^5,x]
```

```
[Out] -(216*d*(a + b*Log[c*x^n])^2 + 288*e*x*(a + b*Log[c*x^n])^2 + 64*b*e*n*x*(3
*a + b*n + 3*b*Log[c*x^n]) + 27*b*d*n*(4*a + b*n + 4*b*Log[c*x^n]))/(864*x^
4)
```

Maple [C] time = 0.204, size = 1486, normalized size = 13.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(a+b*ln(c*x^n))^2/x^5,x)
```

```
[Out] -1/12*b^2*(4*e*x+3*d)/x^4*ln(x^n)^2-1/72*(24*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(
I*c*x^n)^2-24*I*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*Pi*b^2*
e*x*csgn(I*c*x^n)^3+24*I*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+48*ln(c)*b^2*
e*x+16*b^2*e*n*x+48*a*b*e*x+18*I*Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2-18*I*
Pi*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*I*Pi*b^2*d*csgn(I*c*x^n)^3+
18*I*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+36*ln(c)*b^2*d+9*b^2*d*n+36*a*b*d)/
x^4*ln(x^n)-1/864*(-54*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+108*Pi^2*b^
2*d*csgn(I*x^n)*csgn(I*c*x^n)^5+288*a^2*e*x+144*Pi^2*b^2*e*x*csgn(I*x^n)^2*
csgn(I*c*x^n)^3*csgn(I*c)-72*Pi^2*b^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csg
n(I*c)^2-288*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+144*Pi^2*b^
2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+288*I*ln(c)*Pi*b^2*e*x*csgn(I
*x^n)*csgn(I*c*x^n)^2+96*I*n*Pi*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+96*I*n*
Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+288*I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*
x^n)^2+108*a*b*n*d-54*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-216*
I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-216*I*ln(c)*Pi*b^2*d*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+216*a^2*d+108*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(
I*c)-288*I*Pi*a*b*e*x*csgn(I*c*x^n)^3+27*b^2*d*n^2+64*b^2*e*n^2*x+288*I*ln(
c)*Pi*b^2*e*x*csgn(I*c*x^n)^2*csgn(I*c)+288*I*Pi*a*b*e*x*csgn(I*c*x^n)^2*cs
gn(I*c)-54*I*Pi*b^2*d*n*csgn(I*c*x^n)^3-216*I*Pi*a*b*d*csgn(I*c*x^n)^3-216*
I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^3+108*ln(c)*b^2*d*n+432*ln(c)*a*b*d-96*I*n*P
i*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-288*I*ln(c)*Pi*b^2*e*x*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-288*I*Pi*a*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+144*Pi^2*b^2*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+144*Pi^2*b^2*e*x*csgn(
I*c*x^n)^5*csgn(I*c)-72*Pi^2*b^2*e*x*csgn(I*c*x^n)^4*csgn(I*c)^2+288*ln(c)^
2*b^2*e*x+54*I*Pi*b^2*d*n*csgn(I*x^n)*csgn(I*c*x^n)^2+54*I*Pi*b^2*d*n*csgn(
I*c*x^n)^2*csgn(I*c)+576*ln(c)*a*b*e*x+192*ln(c)*b^2*e*n*x+216*ln(c)^2*b^2*
d-54*Pi^2*b^2*d*csgn(I*c*x^n)^4*csgn(I*c)^2+216*I*ln(c)*Pi*b^2*d*csgn(I*x^n
)*csgn(I*c*x^n)^2+216*I*ln(c)*Pi*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)+216*I*Pi*a
*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+216*I*Pi*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)-7
2*Pi^2*b^2*e*x*csgn(I*c*x^n)^6-72*Pi^2*b^2*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^
4-54*Pi^2*b^2*d*csgn(I*c*x^n)^6+192*a*b*e*n*x+108*Pi^2*b^2*d*csgn(I*x^n)^2*
csgn(I*c*x^n)^3*csgn(I*c)-54*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(
I*c)^2+108*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-96*I*n*Pi*b^2
*e*x*csgn(I*c*x^n)^3-288*I*ln(c)*Pi*b^2*e*x*csgn(I*c*x^n)^3-216*Pi^2*b^2*d*
csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c))/x^4
```

Maximu [A] time = 1.15612, size = 204, normalized size = 1.87

$$-\frac{2}{27}\,b^2e\left(\frac{n^2}{x^3}+\frac{3\,n\log\left(cx^n\right)}{x^3}\right)-\frac{1}{32}\,b^2d\left(\frac{n^2}{x^4}+\frac{4\,n\log\left(cx^n\right)}{x^4}\right)-\frac{b^2e\log\left(cx^n\right)^2}{3\,x^3}-\frac{2\,aben}{9\,x^3}-\frac{2\,abe\log\left(cx^n\right)}{3\,x^3}-\frac{b^2d\log\left(cx^n\right)^2}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^5,x, algorithm="maxima")
```

```
[Out] -2/27*b^2*e*(n^2/x^3 + 3*n*log(c*x^n)/x^3) - 1/32*b^2*d*(n^2/x^4 + 4*n*log(
c*x^n)/x^4) - 1/3*b^2*e*log(c*x^n)^2/x^3 - 2/9*a*b*e*n/x^3 - 2/3*a*b*e*log(
c*x^n)/x^3 - 1/4*b^2*d*log(c*x^n)^2/x^4 - 1/8*a*b*d*n/x^4 - 1/3*a^2*e/x^3 -
 1/2*a*b*d*log(c*x^n)/x^4 - 1/4*a^2*d/x^4
```

Fricas [A] time = 1.02065, size = 467, normalized size = 4.28

$$-\frac{27\,b^2dn^2 + 108\,abdn + 216\,a^2d + 72\left(4\,b^2ex + 3\,b^2d\right)\log\left(c\right)^2 + 72\left(4\,b^2en^2x + 3\,b^2dn^2\right)\log\left(x\right)^2 + 32\left(2\,b^2en^2 + 6\,aben + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^5,x, algorithm="fricas")
```

```
[Out] -1/864*(27*b^2*d*n^2 + 108*a*b*d*n + 216*a^2*d + 72*(4*b^2*e*x + 3*b^2*d)*l
og(c)^2 + 72*(4*b^2*e*n^2*x + 3*b^2*d*n^2)*log(x)^2 + 32*(2*b^2*e*n^2 + 6*a
*b*e*n + 9*a^2*e)*x + 12*(9*b^2*d*n + 36*a*b*d + 16*(b^2*e*n + 3*a*b*e)*x)*
log(c) + 12*(9*b^2*d*n^2 + 36*a*b*d*n + 16*(b^2*e*n^2 + 3*a*b*e*n)*x + 12*(
4*b^2*e*n*x + 3*b^2*d*n)*log(c))*log(x))/x^4
```

Sympy [B] time = 4.39674, size = 311, normalized size = 2.85

$$-\frac{a^2d}{4x^4} - \frac{a^2e}{3x^3} - \frac{abdn\log\left(x\right)}{2x^4} - \frac{abdn}{8x^4} - \frac{abd\log\left(c\right)}{2x^4} - \frac{2aben\log\left(x\right)}{3x^3} - \frac{2aben}{9x^3} - \frac{2abe\log\left(c\right)}{3x^3} - \frac{b^2dn^2\log\left(x\right)^2}{4x^4} - \frac{b^2dn^2\log\left(x\right.}{8x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**2/x**5,x)
```

```
[Out] -a**2*d/(4*x**4) - a**2*e/(3*x**3) - a*b*d*n*log(x)/(2*x**4) - a*b*d*n/(8*x
**4) - a*b*d*log(c)/(2*x**4) - 2*a*b*e*n*log(x)/(3*x**3) - 2*a*b*e*n/(9*x**
3) - 2*a*b*e*log(c)/(3*x**3) - b**2*d*n**2*log(x)**2/(4*x**4) - b**2*d*n**2
*log(x)/(8*x**4) - b**2*d*n**2/(32*x**4) - b**2*d*n*log(c)*log(x)/(2*x**4)
- b**2*d*n*log(c)/(8*x**4) - b**2*d*log(c)**2/(4*x**4) - b**2*e*n**2*log(x)
**2/(3*x**3) - 2*b**2*e*n**2*log(x)/(9*x**3) - 2*b**2*e*n**2/(27*x**3) - 2*
b**2*e*n*log(c)*log(x)/(3*x**3) - 2*b**2*e*n*log(c)/(9*x**3) - b**2*e*log(c
)**2/(3*x**3)
```

Giac [B] time = 1.38664, size = 278, normalized size = 2.55

$$-\frac{288\,b^2n^2xe\log(x)^2+192\,b^2n^2xe\log(x)+576\,b^2nxe\log(c)\log(x)+216\,b^2dn^2\log(x)^2+64\,b^2n^2xe+192\,b^2nxe\log(c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^2/x^5,x, algorithm="giac")
```

```
[Out] -1/864*(288*b^2*n^2*x*e*log(x)^2 + 192*b^2*n^2*x*e*log(x) + 576*b^2*n*x*e*l
og(c)*log(x) + 216*b^2*d*n^2*log(x)^2 + 64*b^2*n^2*x*e + 192*b^2*n*x*e*log(
c) + 288*b^2*x*e*log(c)^2 + 108*b^2*d*n^2*log(x) + 576*a*b*n*x*e*log(x) + 4
32*b^2*d*n*log(c)*log(x) + 27*b^2*d*n^2 + 192*a*b*n*x*e + 108*b^2*d*n*log(c
) + 576*a*b*x*e*log(c) + 216*b^2*d*log(c)^2 + 432*a*b*d*n*log(x) + 108*a*b*
d*n + 288*a^2*x*e + 432*a*b*d*log(c) + 216*a^2*d)/x^4
```

3.84 $\int x^2(d+ex)^2 (a+b\log(cx^n))^2 \, dx$

Optimal. Leaf size=178

$$\frac{1}{3}d^2x^3 (a+b\log(cx^n))^2 - \frac{2}{9}bd^2nx^3 (a+b\log(cx^n)) + \frac{1}{2}dex^4 (a+b\log(cx^n))^2 - \frac{1}{4}bdenx^4 (a+b\log(cx^n)) + \frac{1}{5}e^2x^5 (a+b$$

```
[Out] (2*b^2*d^2*n^2*x^3)/27 + (b^2*d*e*n^2*x^4)/16 + (2*b^2*e^2*n^2*x^5)/125 - (
2*b*d^2*n*x^3*(a + b*Log[c*x^n]))/9 - (b*d*e*n*x^4*(a + b*Log[c*x^n]))/4 -
(2*b*e^2*n*x^5*(a + b*Log[c*x^n]))/25 + (d^2*x^3*(a + b*Log[c*x^n])^2)/3 +
(d*e*x^4*(a + b*Log[c*x^n])^2)/2 + (e^2*x^5*(a + b*Log[c*x^n])^2)/5
```

Rubi [A] time = 0.218305, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {2353, 2305, 2304}

$$\frac{1}{3}d^2x^3 (a+b\log(cx^n))^2 - \frac{2}{9}bd^2nx^3 (a+b\log(cx^n)) + \frac{1}{2}dex^4 (a+b\log(cx^n))^2 - \frac{1}{4}bdenx^4 (a+b\log(cx^n)) + \frac{1}{5}e^2x^5 (a+b$$

Antiderivative was successfully verified.

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

```
[Out] (2*b^2*d^2*n^2*x^3)/27 + (b^2*d*e*n^2*x^4)/16 + (2*b^2*e^2*n^2*x^5)/125 - (
2*b*d^2*n*x^3*(a + b*Log[c*x^n]))/9 - (b*d*e*n*x^4*(a + b*Log[c*x^n]))/4 -
(2*b*e^2*n*x^5*(a + b*Log[c*x^n]))/25 + (d^2*x^3*(a + b*Log[c*x^n])^2)/3 +
(d*e*x^4*(a + b*Log[c*x^n])^2)/2 + (e^2*x^5*(a + b*Log[c*x^n])^2)/5
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int x^2(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2\,dx=\int\left(d^2x^2\left(a+b\log\left(cx^n\right)\right)^2+2dex^3\left(a+b\log\left(cx^n\right)\right)^2+e^2x^4\left(a+b\log\left(cx^n\right)\right)^2\right)dx$$
$$=d^2\int x^2\left(a+b\log\left(cx^n\right)\right)^2\,dx+(2de)\int x^3\left(a+b\log\left(cx^n\right)\right)^2\,dx+e^2\int x^4\left(a+b\,\mathrm{lo}\right.$$
$$=\frac{1}{3}d^2x^3\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{2}dex^4\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{5}e^2x^5\left(a+b\log\left(cx^n\right)\right)^2-\frac{1}{3}$$
$$=\frac{2}{27}b^2d^2n^2x^3+\frac{1}{16}b^2den^2x^4+\frac{2}{125}b^2e^2n^2x^5-\frac{2}{9}bd^2nx^3\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdenx^4$$

Mathematica [A] time = 0.0863446, size = 149, normalized size = 0.84

$$\frac{1}{3}d^2x^3\left(a+b\log\left(cx^n\right)\right)^2+\frac{2}{27}bd^2nx^3\left(-3a-3b\log\left(cx^n\right)+bn\right)+\frac{1}{2}dex^4\left(a+b\log\left(cx^n\right)\right)^2+\frac{1}{16}bdenx^4\left(-4a-4b\log\left(cx^n\right.\right.$$

Antiderivative was successfully verified.

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

```
[Out] (2*b*e^2*n*x^5*(-5*a + b*n - 5*b*Log[c*x^n]))/125 + (b*d*e*n*x^4*(-4*a + b*
n - 4*b*Log[c*x^n]))/16 + (2*b*d^2*n*x^3*(-3*a + b*n - 3*b*Log[c*x^n]))/27
+ (d^2*x^3*(a + b*Log[c*x^n])^2)/3 + (d*e*x^4*(a + b*Log[c*x^n])^2)/2 + (e^
2*x^5*(a + b*Log[c*x^n])^2)/5
```

Maple [C] time = 0.306, size = 2597, normalized size = 14.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*I*ln(c)*Pi*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/5*a^2*e^2
*x^5-1/8*I*Pi*b^2*d*e*n*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*a*b*d*e*x^4*
```

csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*a*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-
1/3*I*ln(c)*Pi*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2/25*a*b*e^2
*n*x^5-1/20*Pi^2*b^2*e^2*x^5*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/5*
Pi^2*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/10*Pi^2*b^2*e^2*x^
5*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I
*c*x^n)^3+1/25*I*Pi*b^2*e^2*n*x^5*csgn(I*c*x^n)^3-1/5*I*Pi*a*b*e^2*x^5*csgn
(I*c*x^n)^3-1/8*Pi^2*b^2*d*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^4-1/2*I*ln(c)*
Pi*b^2*d*e*x^4*csgn(I*c*x^n)^3+1/8*I*Pi*b^2*d*e*n*x^4*csgn(I*c*x^n)^3-1/2*I
*Pi*a*b*d*e*x^4*csgn(I*c*x^n)^3-1/8*Pi^2*b^2*d*e*x^4*csgn(I*x^n)^2*csgn(I*c
*x^n)^2*csgn(I*c)^2-1/2*Pi^2*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I
*c)+1/4*Pi^2*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/5*I*Pi*a
*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2-1/9*I*Pi*b^2*d^2*n*x^3*csgn(I*x^n)*c
sgn(I*c*x^n)^2-1/9*I*Pi*b^2*d^2*n*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I*Pi*a*
b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/5*I*Pi*a*b*e^2*x^5*csgn(I*c*x^n)^2*
csgn(I*c)+1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*ln(c
)*Pi*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I*ln(c)*Pi*b^2*d^2*x^3*csg
n(I*c*x^n)^2*csgn(I*c)+1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)
-1/25*I*Pi*b^2*e^2*n*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2-1/25*I*Pi*b^2*e^2*n*x^
5*csgn(I*c*x^n)^2*csgn(I*c)+1/4*Pi^2*b^2*d*e*x^4*csgn(I*x^n)^2*csgn(I*c*x^n
)^3*csgn(I*c)+1/2*a^2*d*e*x^4-1/4*ln(c)*b^2*d*e*n*x^4+ln(c)*a*b*d*e*x^4-1/4
*a*b*d*e*n*x^4+1/3*a^2*d^2*x^3+1/4*Pi^2*b^2*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^
n)^5+1/4*Pi^2*b^2*d*e*x^4*csgn(I*c*x^n)^5*csgn(I*c)+1/3*I*Pi*a*b*d^2*x^3*cs
gn(I*c*x^n)^2*csgn(I*c)+1/900*b*(-300*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^3+450*I*
Pi*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+180*I*Pi*b*e^2*x^5*csgn(I*c*x^n)^2
*csgn(I*c)-180*I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+360*ln(c)
*b*e^2*x^5-72*b*e^2*n*x^5+360*a*e^2*x^5+180*I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn
(I*c*x^n)^2-450*I*Pi*b*d*e*x^4*csgn(I*c*x^n)^3-450*I*Pi*b*d*e*x^4*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-300*I*Pi*b*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+900*ln(c)*b*d*e*x^4-225*b*d*e*n*x^4+900*a*d*e*x^4-180*I*Pi*b*e^2*x^5
*csgn(I*c*x^n)^3+300*I*Pi*b*d^2*x^3*csgn(I*c*x^n)^2*csgn(I*c)+300*I*Pi*b*d^
2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+450*I*Pi*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I
*c)+600*ln(c)*b*d^2*x^3-200*b*d^2*n*x^3+600*a*d^2*x^3)*ln(x^n)+1/25*I*Pi*b^
2*e^2*n*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/5*I*Pi*a*b*e^2*x^5*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(c)*Pi*b^2*d*e*x^4*csgn(I*x^n)*csgn(I
*c*x^n)^2+1/3*ln(c)^2*b^2*d^2*x^3+1/5*ln(c)^2*b^2*e^2*x^5-1/20*Pi^2*b^2*e^2
*x^5*csgn(I*c*x^n)^4*csgn(I*c)^2-1/8*Pi^2*b^2*d*e*x^4*csgn(I*c*x^n)^6-1/12*
Pi^2*b^2*d^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/6*Pi^2*b^2*d^2*x^3*csgn(I*
x^n)*csgn(I*c*x^n)^5+1/6*Pi^2*b^2*d^2*x^3*csgn(I*c*x^n)^5*csgn(I*c)-1/12*Pi
^2*b^2*d^2*x^3*csgn(I*c*x^n)^4*csgn(I*c)^2-1/20*Pi^2*b^2*e^2*x^5*csgn(I*x^n
)^2*csgn(I*c*x^n)^4+1/10*Pi^2*b^2*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)^5+1/10*
Pi^2*b^2*e^2*x^5*csgn(I*c*x^n)^5*csgn(I*c)+1/30*b^2*x^3*(6*e^2*x^2+15*d*e*x
+10*d^2)*ln(x^n)^2+1/2*I*ln(c)*Pi*b^2*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/8
*I*Pi*b^2*d*e*n*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+2/5*ln(c)*a*b*e^2*x^5-2/25*
ln(c)*b^2*e^2*n*x^5+2/27*b^2*d^2*n^2*x^3+2/125*b^2*e^2*n^2*x^5-1/20*Pi^2*b^
2*e^2*x^5*csgn(I*c*x^n)^6-1/12*Pi^2*b^2*d^2*x^3*csgn(I*c*x^n)^6+1/9*I*Pi*b^

```
2*d^2*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*Pi*a*b*d^2*x^3*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/5*I*ln(c)*Pi*b^2*e^2*x^5*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-1/8*Pi^2*b^2*d*e*x^4*csgn(I*c*x^n)^4*csgn(I*c)^2-2/9*ln(c
)*b^2*d^2*n*x^3+2/3*ln(c)*a*b*d^2*x^3+1/2*ln(c)^2*b^2*d*e*x^4-2/9*a*b*d^2*n
*x^3-1/3*I*ln(c)*Pi*b^2*d^2*x^3*csgn(I*c*x^n)^3+1/9*I*Pi*b^2*d^2*n*x^3*csgn
(I*c*x^n)^3-1/3*I*Pi*a*b*d^2*x^3*csgn(I*c*x^n)^3+1/16*b^2*d*e*n^2*x^4+1/8*I
*Pi*b^2*d*e*n*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*a*b*d*e*x^4*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/6*Pi^2*b^2*d^2*x^3*csgn(I*x^n)^2*csgn
(I*c*x^n)^3*csgn(I*c)-1/12*Pi^2*b^2*d^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*c
sgn(I*c)^2-1/3*Pi^2*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/6*P
i^2*b^2*d^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/10*Pi^2*b^2*e^2*x
^5*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)
```

Maxima [A] time = 1.23205, size = 338, normalized size = 1.9

$$\frac{1}{5}\,b^2e^2x^5\log\left(cx^n\right)^2-\frac{2}{25}\,abe^2nx^5+\frac{2}{5}\,abe^2x^5\log\left(cx^n\right)+\frac{1}{2}\,b^2dex^4\log\left(cx^n\right)^2-\frac{1}{4}\,abdenx^4+\frac{1}{5}\,a^2e^2x^5+abdex^4\log\left(cx^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b^2*e^2*x^5*log(c*x^n)^2 - 2/25*a*b*e^2*n*x^5 + 2/5*a*b*e^2*x^5*log(c*x
^n) + 1/2*b^2*d*e*x^4*log(c*x^n)^2 - 1/4*a*b*d*e*n*x^4 + 1/5*a^2*e^2*x^5 +
a*b*d*e*x^4*log(c*x^n) + 1/3*b^2*d^2*x^3*log(c*x^n)^2 - 2/9*a*b*d^2*n*x^3 +
 1/2*a^2*d*e*x^4 + 2/3*a*b*d^2*x^3*log(c*x^n) + 1/3*a^2*d^2*x^3 + 2/27*(n^2
*x^3 - 3*n*x^3*log(c*x^n))*b^2*d^2 + 1/16*(n^2*x^4 - 4*n*x^4*log(c*x^n))*b^
2*d*e + 2/125*(n^2*x^5 - 5*n*x^5*log(c*x^n))*b^2*e^2
```

Fricas [B] time = 1.05749, size = 830, normalized size = 4.66

$$\frac{1}{125}\left(2\,b^2e^2n^2-10\,abe^2n+25\,a^2e^2\right)x^5+\frac{1}{16}\left(b^2den^2-4\,abden+8\,a^2de\right)x^4+\frac{1}{27}\left(2\,b^2d^2n^2-6\,abd^2n+9\,a^2d^2\right)x^3+\frac{1}{30}\Big($$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/125*(2*b^2*e^2*n^2 - 10*a*b*e^2*n + 25*a^2*e^2)*x^5 + 1/16*(b^2*d*e*n^2 -
 4*a*b*d*e*n + 8*a^2*d*e)*x^4 + 1/27*(2*b^2*d^2*n^2 - 6*a*b*d^2*n + 9*a^2*d
```

```
^2)*x^3 + 1/30*(6*b^2*e^2*x^5 + 15*b^2*d*e*x^4 + 10*b^2*d^2*x^3)*log(c)^2 +
 1/30*(6*b^2*e^2*n^2*x^5 + 15*b^2*d*e*n^2*x^4 + 10*b^2*d^2*n^2*x^3)*log(x)^
2 - 1/900*(72*(b^2*e^2*n - 5*a*b*e^2)*x^5 + 225*(b^2*d*e*n - 4*a*b*d*e)*x^4
 + 200*(b^2*d^2*n - 3*a*b*d^2)*x^3)*log(c) - 1/900*(72*(b^2*e^2*n^2 - 5*a*b
*e^2*n)*x^5 + 225*(b^2*d*e*n^2 - 4*a*b*d*e*n)*x^4 + 200*(b^2*d^2*n^2 - 3*a*
b*d^2*n)*x^3 - 60*(6*b^2*e^2*n*x^5 + 15*b^2*d*e*n*x^4 + 10*b^2*d^2*n*x^3)*l
og(c))*log(x)
```

Sympy [B] time = 7.05204, size = 517, normalized size = 2.9

$$\frac{a^2d^2x^3}{3} + \frac{a^2dex^4}{2} + \frac{a^2e^2x^5}{5} + \frac{2abd^2nx^3\log(x)}{3} - \frac{2abd^2nx^3}{9} + \frac{2abd^2x^3\log(c)}{3} + abdenx^4\log(x) - \frac{abdenx^4}{4} + abdex^4\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d**2*x**3/3 + a**2*d*e*x**4/2 + a**2*e**2*x**5/5 + 2*a*b*d**2*n*x**3*l
og(x)/3 - 2*a*b*d**2*n*x**3/9 + 2*a*b*d**2*x**3*log(c)/3 + a*b*d*e*n*x**4*l
og(x) - a*b*d*e*n*x**4/4 + a*b*d*e*x**4*log(c) + 2*a*b*e**2*n*x**5*log(x)/5
 - 2*a*b*e**2*n*x**5/25 + 2*a*b*e**2*x**5*log(c)/5 + b**2*d**2*n**2*x**3*lo
g(x)**2/3 - 2*b**2*d**2*n**2*x**3*log(x)/9 + 2*b**2*d**2*n**2*x**3/27 + 2*b
**2*d**2*n*x**3*log(c)*log(x)/3 - 2*b**2*d**2*n*x**3*log(c)/9 + b**2*d**2*x
**3*log(c)**2/3 + b**2*d*e*n**2*x**4*log(x)**2/2 - b**2*d*e*n**2*x**4*log(x
)/4 + b**2*d*e*n**2*x**4/16 + b**2*d*e*n*x**4*log(c)*log(x) - b**2*d*e*n*x*
*4*log(c)/4 + b**2*d*e*x**4*log(c)**2/2 + b**2*e**2*n**2*x**5*log(x)**2/5 -
 2*b**2*e**2*n**2*x**5*log(x)/25 + 2*b**2*e**2*n**2*x**5/125 + 2*b**2*e**2*
n*x**5*log(c)*log(x)/5 - 2*b**2*e**2*n*x**5*log(c)/25 + b**2*e**2*x**5*log(
c)**2/5
```

Giac [B] time = 1.29531, size = 551, normalized size = 3.1

$$\frac{1}{5}b^2n^2x^5e^2\log(x)^2 + \frac{1}{2}b^2dn^2x^4e\log(x)^2 - \frac{2}{25}b^2n^2x^5e^2\log(x) - \frac{1}{4}b^2dn^2x^4e\log(x) + \frac{2}{5}b^2nx^5e^2\log(c)\log(x) + b^2dnx^4$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*b^2*n^2*x^5*e^2*log(x)^2 + 1/2*b^2*d*n^2*x^4*e*log(x)^2 - 2/25*b^2*n^2*
x^5*e^2*log(x) - 1/4*b^2*d*n^2*x^4*e*log(x) + 2/5*b^2*n*x^5*e^2*log(c)*log(
```

```
x) + b^2*d*n*x^4*e*log(c)*log(x) + 1/3*b^2*d^2*n^2*x^3*log(x)^2 + 2/125*b^2
*n^2*x^5*e^2 + 1/16*b^2*d*n^2*x^4*e - 2/25*b^2*n*x^5*e^2*log(c) - 1/4*b^2*d
*n*x^4*e*log(c) + 1/5*b^2*x^5*e^2*log(c)^2 + 1/2*b^2*d*x^4*e*log(c)^2 - 2/9
*b^2*d^2*n^2*x^3*log(x) + 2/5*a*b*n*x^5*e^2*log(x) + a*b*d*n*x^4*e*log(x) +
 2/3*b^2*d^2*n*x^3*log(c)*log(x) + 2/27*b^2*d^2*n^2*x^3 - 2/25*a*b*n*x^5*e^
2 - 1/4*a*b*d*n*x^4*e - 2/9*b^2*d^2*n*x^3*log(c) + 2/5*a*b*x^5*e^2*log(c) +
 a*b*d*x^4*e*log(c) + 1/3*b^2*d^2*x^3*log(c)^2 + 2/3*a*b*d^2*n*x^3*log(x) -
 2/9*a*b*d^2*n*x^3 + 1/5*a^2*x^5*e^2 + 1/2*a^2*d*x^4*e + 2/3*a*b*d^2*x^3*lo
g(c) + 1/3*a^2*d^2*x^3
```

3.85 $\int x(d+ex)^2 (a+b\log(cx^n))^2 \, dx$

Optimal. Leaf size=178

$$\frac{1}{2}d^2x^2(a+b\log(cx^n))^2-\frac{1}{2}bd^2nx^2(a+b\log(cx^n))+\frac{2}{3}dex^3(a+b\log(cx^n))^2-\frac{4}{9}bdenx^3(a+b\log(cx^n))+\frac{1}{4}e^2x^4(a+b$$

```
[Out] (b^2*d^2*n^2*x^2)/4 + (4*b^2*d*e*n^2*x^3)/27 + (b^2*e^2*n^2*x^4)/32 - (b*d^
2*n*x^2*(a + b*Log[c*x^n]))/2 - (4*b*d*e*n*x^3*(a + b*Log[c*x^n]))/9 - (b*e
^2*n*x^4*(a + b*Log[c*x^n]))/8 + (d^2*x^2*(a + b*Log[c*x^n])^2)/2 + (2*d*e*
x^3*(a + b*Log[c*x^n])^2)/3 + (e^2*x^4*(a + b*Log[c*x^n])^2)/4
```

Rubi [A] time = 0.18062, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2353, 2305, 2304}

$$\frac{1}{2}d^2x^2(a+b\log(cx^n))^2-\frac{1}{2}bd^2nx^2(a+b\log(cx^n))+\frac{2}{3}dex^3(a+b\log(cx^n))^2-\frac{4}{9}bdenx^3(a+b\log(cx^n))+\frac{1}{4}e^2x^4(a+b$$

Antiderivative was successfully verified.

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

```
[Out] (b^2*d^2*n^2*x^2)/4 + (4*b^2*d*e*n^2*x^3)/27 + (b^2*e^2*n^2*x^4)/32 - (b*d^
2*n*x^2*(a + b*Log[c*x^n]))/2 - (4*b*d*e*n*x^3*(a + b*Log[c*x^n]))/9 - (b*e
^2*n*x^4*(a + b*Log[c*x^n]))/8 + (d^2*x^2*(a + b*Log[c*x^n])^2)/2 + (2*d*e*
x^3*(a + b*Log[c*x^n])^2)/3 + (e^2*x^4*(a + b*Log[c*x^n])^2)/4
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int x(d+ex)^2 (a+b\log(cx^n))^2\,dx = \int \left(d^2x(a+b\log(cx^n))^2 + 2dex^2(a+b\log(cx^n))^2 + e^2x^3(a+b\log(cx^n))^2\right)dx$$
$$= d^2\int x(a+b\log(cx^n))^2\,dx + (2de)\int x^2(a+b\log(cx^n))^2\,dx + e^2\int x^3(a+b\log$$
$$= \frac{1}{2}d^2x^2(a+b\log(cx^n))^2 + \frac{2}{3}dex^3(a+b\log(cx^n))^2 + \frac{1}{4}e^2x^4(a+b\log(cx^n))^2 - \big(bd$$
$$= \frac{1}{4}b^2d^2n^2x^2 + \frac{4}{27}b^2den^2x^3 + \frac{1}{32}b^2e^2n^2x^4 - \frac{1}{2}bd^2nx^2(a+b\log(cx^n)) - \frac{4}{9}bdenx^3(a$$

Mathematica [A] time = 0.0897678, size = 134, normalized size = 0.75

$$\frac{1}{864}x^2\left(432d^2(a+b\log(cx^n))^2 + 216bd^2n(-2a-2b\log(cx^n)+bn) + 576dex(a+b\log(cx^n))^2 + 128bdenx(-3a-3b\,\mathrm{l}\right.$$

Antiderivative was successfully verified.

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

```
[Out] (x^2*(27*b*e^2*n*x^2*(-4*a + b*n - 4*b*Log[c*x^n]) + 128*b*d*e*n*x*(-3*a +
b*n - 3*b*Log[c*x^n]) + 216*b*d^2*n*(-2*a + b*n - 2*b*Log[c*x^n]) + 432*d^2
*(a + b*Log[c*x^n])^2 + 576*d*e*x*(a + b*Log[c*x^n])^2 + 216*e^2*x^2*(a + b
*Log[c*x^n])^2))/864
```

Maple [C] time = 0.3, size = 2597, normalized size = 14.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/3*I*ln(c)*Pi*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/3*a^2*d*e
*x^3-2/3*I*Pi*a*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/9*I*Pi*b^2*
```

d*e*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/16*I*Pi*b^2*e^2*n*x^4*csgn(
I*x^n)*csgn(I*c*x^n)^2-1/16*I*Pi*b^2*e^2*n*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/
4*I*Pi*a*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-4/9*b*n*a*d*e*x^3+1/2*I*Pi*a
*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-2/3*I*ln(c)*Pi*b^2*d*e*x^3*csgn(I*c*
x^n)^3+2/9*I*Pi*b^2*d*e*n*x^3*csgn(I*c*x^n)^3+1/3*Pi^2*b^2*d*e*x^3*csgn(I*x
^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/2*b*n*a*d^2*x^2-1/8*b*n*a*e^2*x^4+1/4*a^2
*e^2*x^4+1/2*a^2*d^2*x^2-1/6*Pi^2*b^2*d*e*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2
*csgn(I*c)^2-2/3*Pi^2*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/3
*Pi^2*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/2*I*ln(c)*Pi*b^
2*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*a*b*e^2*x^4*csgn(I*c*x^n)^2*
csgn(I*c)-4/9*ln(c)*b^2*d*e*n*x^3+4/3*ln(c)*a*b*d*e*x^3-1/6*Pi^2*b^2*d*e*x^
3*csgn(I*x^n)^2*csgn(I*c*x^n)^4-1/4*I*ln(c)*Pi*b^2*e^2*x^4*csgn(I*c*x^n)^3+
1/16*I*Pi*b^2*e^2*n*x^4*csgn(I*c*x^n)^3-1/4*I*Pi*a*b*e^2*x^4*csgn(I*c*x^n)^
3+1/72*b*(48*I*Pi*b*d*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+36*I*Pi*b*d^2*x^2*csg
n(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3+18*I*Pi*b*e^2*x^4*
csgn(I*x^n)*csgn(I*c*x^n)^2+36*ln(c)*b*e^2*x^4-9*b*e^2*n*x^4+36*a*e^2*x^4-3
6*I*Pi*b*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*b*d^2*x^2*csgn
(I*x^n)*csgn(I*c*x^n)^2-36*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^3-48*I*Pi*b*d*e*x^3
*csgn(I*c*x^n)^3+96*ln(c)*b*d*e*x^3-32*b*d*e*n*x^3+96*a*d*e*x^3+18*I*Pi*b*e
^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+48*I*Pi*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-48*I*Pi*b*d*e*x^3
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+72*ln(c)*b*d^2*x^2-36*b*d^2*n*x^2+72*a
*d^2*x^2)*ln(x^n)+1/2*I*ln(c)*Pi*b^2*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/4*
I*Pi*b^2*d^2*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*Pi*b^2*d^2*n*x^2*csgn(
I*c*x^n)^2*csgn(I*c)-1/8*ln(c)*b^2*e^2*n*x^4+1/2*ln(c)*a*b*e^2*x^4-1/2*ln(c
)*b^2*d^2*n*x^2+ln(c)*a*b*d^2*x^2-2/3*I*Pi*a*b*d*e*x^3*csgn(I*c*x^n)^3+1/2*
I*Pi*a*b*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*ln(c)*Pi*b^2*e^2*x^4*csgn(
I*x^n)*csgn(I*c*x^n)^2+1/4*I*ln(c)*Pi*b^2*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)
+1/12*b^2*x^2*(3*e^2*x^2+8*d*e*x+6*d^2)*ln(x^n)^2-1/16*Pi^2*b^2*e^2*x^4*csg
n(I*c*x^n)^4*csgn(I*c)^2-1/6*Pi^2*b^2*d*e*x^3*csgn(I*c*x^n)^6+1/4*Pi^2*b^2*
d^2*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/8*Pi^2*b^2*d^2*x^2*csgn(I*c*x^n)^4*csgn
(I*c)^2-1/16*Pi^2*b^2*e^2*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/8*Pi^2*b^2*e^
2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^5+1/8*Pi^2*b^2*e^2*x^4*csgn(I*c*x^n)^5*csgn
(I*c)-1/8*Pi^2*b^2*d^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/4*Pi^2*b^2*d^2*x
^2*csgn(I*x^n)*csgn(I*c*x^n)^5-2/9*I*Pi*b^2*d*e*n*x^3*csgn(I*x^n)*csgn(I*c*
x^n)^2-1/4*I*ln(c)*Pi*b^2*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2/3*I
*ln(c)*Pi*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+2/3*ln(c)^2*b^2*d*e*x^3+1
/3*Pi^2*b^2*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^5+1/3*Pi^2*b^2*d*e*x^3*csgn(I
*c*x^n)^5*csgn(I*c)-1/6*Pi^2*b^2*d*e*x^3*csgn(I*c*x^n)^4*csgn(I*c)^2+1/4*ln
(c)^2*b^2*e^2*x^4+1/2*ln(c)^2*b^2*d^2*x^2+1/4*b^2*d^2*n^2*x^2+1/32*b^2*e^2*
n^2*x^4-1/8*Pi^2*b^2*d^2*x^2*csgn(I*c*x^n)^6+2/3*I*ln(c)*Pi*b^2*d*e*x^3*csg
n(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(c)*Pi*b^2*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-1/4*I*Pi*a*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2/9*I*P
i*b^2*d*e*n*x^3*csgn(I*c*x^n)^2*csgn(I*c)+2/3*I*Pi*a*b*d*e*x^3*csgn(I*x^n)*
csgn(I*c*x^n)^2+2/3*I*Pi*a*b*d*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*b^2

```
*d^2*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*a*b*d^2*x^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+1/16*I*Pi*b^2*e^2*n*x^4*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-1/4*Pi^2*b^2*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/
4*Pi^2*b^2*d^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/8*Pi^2*b^2*d^2
*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/2*Pi^2*b^2*d^2*x^2*csgn(I*
x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/4*Pi^2*b^2*d^2*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^3*csgn(I*c)^2+4/27*b^2*d*e*n^2*x^3-1/2*I*ln(c)*Pi*b^2*d^2*x^2*csgn(I*c*x
^n)^3+1/4*I*Pi*b^2*d^2*n*x^2*csgn(I*c*x^n)^3-1/2*I*Pi*a*b*d^2*x^2*csgn(I*c*
x^n)^3+1/8*Pi^2*b^2*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/8*Pi^
2*b^2*e^2*x^4*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/16*Pi^2*b^2*e^2*x^4
*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/16*Pi^2*b^2*e^2*x^4*csgn(I*c*x
^n)^6
```

Maxima [A] time = 1.06772, size = 338, normalized size = 1.9

$$\frac{1}{4}\,b^2e^2x^4\log\left(cx^n\right)^2-\frac{1}{8}\,abe^2nx^4+\frac{1}{2}\,abe^2x^4\log\left(cx^n\right)+\frac{2}{3}\,b^2dex^3\log\left(cx^n\right)^2-\frac{4}{9}\,abdenx^3+\frac{1}{4}\,a^2e^2x^4+\frac{4}{3}\,abdex^3\log\left(cx^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b^2*e^2*x^4*log(c*x^n)^2 - 1/8*a*b*e^2*n*x^4 + 1/2*a*b*e^2*x^4*log(c*x^
n) + 2/3*b^2*d*e*x^3*log(c*x^n)^2 - 4/9*a*b*d*e*n*x^3 + 1/4*a^2*e^2*x^4 + 4
/3*a*b*d*e*x^3*log(c*x^n) + 1/2*b^2*d^2*x^2*log(c*x^n)^2 - 1/2*a*b*d^2*n*x^
2 + 2/3*a^2*d*e*x^3 + a*b*d^2*x^2*log(c*x^n) + 1/2*a^2*d^2*x^2 + 1/4*(n^2*x
^2 - 2*n*x^2*log(c*x^n))*b^2*d^2 + 4/27*(n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*
d*e + 1/32*(n^2*x^4 - 4*n*x^4*log(c*x^n))*b^2*e^2
```

Fricas [B] time = 1.03039, size = 803, normalized size = 4.51

$$\frac{1}{32}\left(b^2e^2n^2-4\,abe^2n+8\,a^2e^2\right)x^4+\frac{2}{27}\left(2\,b^2den^2-6\,abden+9\,a^2de\right)x^3+\frac{1}{4}\left(b^2d^2n^2-2\,abd^2n+2\,a^2d^2\right)x^2+\frac{1}{12}\left(3\,b^2e^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/32*(b^2*e^2*n^2 - 4*a*b*e^2*n + 8*a^2*e^2)*x^4 + 2/27*(2*b^2*d*e*n^2 - 6*
a*b*d*e*n + 9*a^2*d*e)*x^3 + 1/4*(b^2*d^2*n^2 - 2*a*b*d^2*n + 2*a^2*d^2)*x^
```

```
2 + 1/12*(3*b^2*e^2*x^4 + 8*b^2*d*e*x^3 + 6*b^2*d^2*x^2)*log(c)^2 + 1/12*(3
*b^2*e^2*n^2*x^4 + 8*b^2*d*e*n^2*x^3 + 6*b^2*d^2*n^2*x^2)*log(x)^2 - 1/72*(
9*(b^2*e^2*n - 4*a*b*e^2)*x^4 + 32*(b^2*d*e*n - 3*a*b*d*e)*x^3 + 36*(b^2*d^
2*n - 2*a*b*d^2)*x^2)*log(c) - 1/72*(9*(b^2*e^2*n^2 - 4*a*b*e^2*n)*x^4 + 32
*(b^2*d*e*n^2 - 3*a*b*d*e*n)*x^3 + 36*(b^2*d^2*n^2 - 2*a*b*d^2*n)*x^2 - 12*
(3*b^2*e^2*n*x^4 + 8*b^2*d*e*n*x^3 + 6*b^2*d^2*n*x^2)*log(c))*log(x)
```

Sympy [B] time = 5.7159, size = 510, normalized size = 2.87

$$\frac{a^2d^2x^2}{2} + \frac{2a^2dex^3}{3} + \frac{a^2e^2x^4}{4} + abd^2nx^2\log(x) - \frac{abd^2nx^2}{2} + abd^2x^2\log(c) + \frac{4abdenx^3\log(x)}{3} - \frac{4abdenx^3}{9} + \frac{4abdex^3\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d**2*x**2/2 + 2*a**2*d*e*x**3/3 + a**2*e**2*x**4/4 + a*b*d**2*n*x**2*l
og(x) - a*b*d**2*n*x**2/2 + a*b*d**2*x**2*log(c) + 4*a*b*d*e*n*x**3*log(x)/
3 - 4*a*b*d*e*n*x**3/9 + 4*a*b*d*e*x**3*log(c)/3 + a*b*e**2*n*x**4*log(x)/2
 - a*b*e**2*n*x**4/8 + a*b*e**2*x**4*log(c)/2 + b**2*d**2*n**2*x**2*log(x)*
*2/2 - b**2*d**2*n**2*x**2*log(x)/2 + b**2*d**2*n**2*x**2/4 + b**2*d**2*n*x
**2*log(c)*log(x) - b**2*d**2*n*x**2*log(c)/2 + b**2*d**2*x**2*log(c)**2/2
+ 2*b**2*d*e*n**2*x**3*log(x)**2/3 - 4*b**2*d*e*n**2*x**3*log(x)/9 + 4*b**2
*d*e*n**2*x**3/27 + 4*b**2*d*e*n*x**3*log(c)*log(x)/3 - 4*b**2*d*e*n*x**3*l
og(c)/9 + 2*b**2*d*e*x**3*log(c)**2/3 + b**2*e**2*n**2*x**4*log(x)**2/4 - b
**2*e**2*n**2*x**4*log(x)/8 + b**2*e**2*n**2*x**4/32 + b**2*e**2*n*x**4*log
(c)*log(x)/2 - b**2*e**2*n*x**4*log(c)/8 + b**2*e**2*x**4*log(c)**2/4
```

Giac [B] time = 1.27532, size = 551, normalized size = 3.1

$$\frac{1}{4}b^2n^2x^4e^2\log(x)^2 + \frac{2}{3}b^2dn^2x^3e\log(x)^2 - \frac{1}{8}b^2n^2x^4e^2\log(x) - \frac{4}{9}b^2dn^2x^3e\log(x) + \frac{1}{2}b^2nx^4e^2\log(c)\log(x) + \frac{4}{3}b^2dnx^3$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*b^2*n^2*x^4*e^2*log(x)^2 + 2/3*b^2*d*n^2*x^3*e*log(x)^2 - 1/8*b^2*n^2*x
^4*e^2*log(x) - 4/9*b^2*d*n^2*x^3*e*log(x) + 1/2*b^2*n*x^4*e^2*log(c)*log(x
) + 4/3*b^2*d*n*x^3*e*log(c)*log(x) + 1/2*b^2*d^2*n^2*x^2*log(x)^2 + 1/32*b
```

```
^2*n^2*x^4*e^2 + 4/27*b^2*d*n^2*x^3*e - 1/8*b^2*n*x^4*e^2*log(c) - 4/9*b^2*
d*n*x^3*e*log(c) + 1/4*b^2*x^4*e^2*log(c)^2 + 2/3*b^2*d*x^3*e*log(c)^2 - 1/
2*b^2*d^2*n^2*x^2*log(x) + 1/2*a*b*n*x^4*e^2*log(x) + 4/3*a*b*d*n*x^3*e*log
(x) + b^2*d^2*n*x^2*log(c)*log(x) + 1/4*b^2*d^2*n^2*x^2 - 1/8*a*b*n*x^4*e^2
 - 4/9*a*b*d*n*x^3*e - 1/2*b^2*d^2*n*x^2*log(c) + 1/2*a*b*x^4*e^2*log(c) +
4/3*a*b*d*x^3*e*log(c) + 1/2*b^2*d^2*x^2*log(c)^2 + a*b*d^2*n*x^2*log(x) -
1/2*a*b*d^2*n*x^2 + 1/4*a^2*x^4*e^2 + 2/3*a^2*d*x^3*e + a*b*d^2*x^2*log(c)
+ 1/2*a^2*d^2*x^2
```

3.86 $\int (d+ex)^2 (a+b\log(cx^n))^2 \, dx$

Optimal. Leaf size=173

$$-\frac{2bd^3n\log(x)(a+b\log(cx^n))}{3e} - 2bd^2nx(a+b\log(cx^n)) - bdenx^2(a+b\log(cx^n)) + \frac{(d+ex)^3(a+b\log(cx^n))^2}{3e} - \frac{2}{9}be^2$$

```
[Out] 2*b^2*d^2*n^2*x + (b^2*d*e*n^2*x^2)/2 + (2*b^2*e^2*n^2*x^3)/27 + (b^2*d^3*n
^2*Log[x]^2)/(3*e) - 2*b*d^2*n*x*(a + b*Log[c*x^n]) - b*d*e*n*x^2*(a + b*Lo
g[c*x^n]) - (2*b*e^2*n*x^3*(a + b*Log[c*x^n]))/9 - (2*b*d^3*n*Log[x]*(a + b
*Log[c*x^n]))/(3*e) + ((d + e*x)^3*(a + b*Log[c*x^n])^2)/(3*e)
```

Rubi [A] time = 0.126524, antiderivative size = 141, normalized size of antiderivative = 0.82, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {2319, 43, 2334, 2301}

$$-\frac{bn\left(18d^2ex+6d^3\log(x)+9de^2x^2+2e^3x^3\right)(a+b\log(cx^n))}{9e} + \frac{(d+ex)^3(a+b\log(cx^n))^2}{3e} + \frac{b^2d^3n^2\log^2(x)}{3e} + 2b^2d^2n^2x$$

Antiderivative was successfully verified.

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

```
[Out] 2*b^2*d^2*n^2*x + (b^2*d*e*n^2*x^2)/2 + (2*b^2*e^2*n^2*x^3)/27 + (b^2*d^3*n
^2*Log[x]^2)/(3*e) - (b*n*(18*d^2*e*x + 9*d*e^2*x^2 + 2*e^3*x^3 + 6*d^3*Log
[x])*(a + b*Log[c*x^n]))/(9*e) + ((d + e*x)^3*(a + b*Log[c*x^n])^2)/(3*e)
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (d+ex)^2 (a+b\log(cx^n))^2\,dx = \frac{(d+ex)^3 (a+b\log(cx^n))^2}{3e} - \frac{(2bn)\int \frac{(d+ex)^3(a+b\log(cx^n))}{x}\,dx}{3e}$$

$$= -\frac{bn\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)(a+b\log(cx^n))}{9e} + \frac{(d+ex)^3 (a+b\log(}{3e}$$

$$= -\frac{bn\left(18d^2ex+9de^2x^2+2e^3x^3+6d^3\log(x)\right)(a+b\log(cx^n))}{9e} + \frac{(d+ex)^3 (a+b\log(}{3e}$$

$$= 2b^2d^2n^2x + \frac{1}{2}b^2den^2x^2 + \frac{2}{27}b^2e^2n^2x^3 + \frac{b^2d^3n^2\log^2(x)}{3e} - \frac{bn\left(18d^2ex+9de^2x^2+2e^3\right.}{}$$

Mathematica [A] time = 0.0693212, size = 135, normalized size = 0.78

$$d^2x(a+b\log(cx^n))^2 - 2bd^2nx(a+b\log(cx^n)-bn) + dex^2(a+b\log(cx^n))^2 + \frac{1}{2}bdenx^2(-2a-2b\log(cx^n)+bn) + \frac{1}{3}e$$

Antiderivative was successfully verified.

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

```
[Out] (2*b*e^2*n*x^3*(-3*a + b*n - 3*b*Log[c*x^n]))/27 + (b*d*e*n*x^2*(-2*a + b*n
 - 2*b*Log[c*x^n]))/2 + d^2*x*(a + b*Log[c*x^n])^2 + d*e*x^2*(a + b*Log[c*x
^n])^2 + (e^2*x^3*(a + b*Log[c*x^n])^2)/3 - 2*b*d^2*n*x*(a - b*n + b*Log[c*
x^n])
```

Maple [C] time = 0.35, size = 2565, normalized size = 14.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a^2*d*e*x^2-I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3*x-I*Pi*a*b*d^2*csgn(I*c*x^n)
^3*x-1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*c*x^n)^3+1/9*I*e^2*Pi*b^2*n*x^3*csgn
(I*c*x^n)^3-1/3*I*e^2*Pi*a*b*x^3*csgn(I*c*x^n)^3-2/9*b*n*a*e^2*x^3-2*b*n*a*
d^2*x+1/3*a^2*e^2*x^3+a^2*d^2*x-b*n*a*d*e*x^2+I*Pi*a*b*d^2*csgn(I*x^n)*csgn
(I*c*x^n)^2*x+I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)*x+I*ln(c)*Pi*b^2
*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x+1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*x^n)*c
sgn(I*c*x^n)^2-1/9*I*e^2*Pi*b^2*n*x^3*csgn(I*c*x^n)^2*csgn(I*c)-1/9*I*e^2*P
i*b^2*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*e*ln(c)*Pi*b^2*d*x^2*csgn(I*c*x^n
)^3+1/3*I*e^2*Pi*a*b*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*e*Pi*b^2*d*n*x^2*c
sgn(I*c*x^n)^3+1/3*I*e^2*Pi*a*b*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*e*Pi*a*b*
d*x^2*csgn(I*c*x^n)^3+1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*c*x^n)^2*csgn(I*c)-
I*Pi*b^2*d^2*n*x*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b^2*d^2*n*x*csgn(I*x^n)*csg
n(I*c*x^n)^2+1/3*ln(c)^2*b^2*e^2*x^3+ln(c)^2*b^2*d^2*x+1/2*e*Pi^2*b^2*d*x^2
*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/4*e*Pi^2*b^2*d*x^2*csgn(I*x^n)^2
*csgn(I*c*x^n)^2*csgn(I*c)^2-e*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4*c
sgn(I*c)+1/2*e*Pi^2*b^2*d*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+I*Pi*
a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)*x+1/3*b^2*d^3*n^2*ln(x)^2/e-ln(c)*b^2*d*e
*n*x^2+2*ln(c)*a*b*d*e*x^2-1/12*e^2*Pi^2*b^2*x^3*csgn(I*c*x^n)^4*csgn(I*c)^
2+1/6*e^2*Pi^2*b^2*x^3*csgn(I*c*x^n)^5*csgn(I*c)+1/6*e^2*Pi^2*b^2*x^3*csgn(
I*x^n)*csgn(I*c*x^n)^5-1/12*e^2*Pi^2*b^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4-
1/4*e*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^6-1/4*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(
I*c)^2*x+1/2*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)*x+1/2*Pi^2*b^2*d^2*csgn
(I*x^n)*csgn(I*c*x^n)^5*x-1/4*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x+
2*b^2*d^2*n^2*x+2/27*b^2*e^2*n^2*x^3-2/9*ln(c)*b^2*e^2*n*x^3+ln(c)^2*b^2*d*
e*x^2+2/3*ln(c)*a*b*e^2*x^3-2*ln(c)*b^2*d^2*n*x+2*ln(c)*a*b*d^2*x-1/4*Pi^2*
b^2*d^2*csgn(I*c*x^n)^6*x-1/12*e^2*Pi^2*b^2*x^3*csgn(I*c*x^n)^6-1/9*b*(9*I*
Pi*b*d*e^2*x^2*csgn(I*c*x^n)^3+9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*e*x-9*I*Pi*b*d*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+9*I*Pi*b*d*e^2*x^2*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*d*e^2*x^2*csgn(I*c*x^n)^2*csgn
(I*c)-9*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)*e*x-9*I*Pi*b*d^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2*e*x+3*I*Pi*b*e^3*x^3*csgn(I*c*x^n)^3-3*I*Pi*b*e^3*x^3*csgn(I
*c*x^n)^2*csgn(I*c)+9*I*Pi*b*d^2*csgn(I*c*x^n)^3*e*x-3*I*Pi*b*e^3*x^3*csgn(
I*x^n)*csgn(I*c*x^n)^2+3*I*Pi*b*e^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
-6*ln(c)*b*e^3*x^3+2*b*e^3*n*x^3-18*ln(c)*b*d*e^2*x^2-6*a*e^3*x^3+9*b*d*e^2
*n*x^2+6*b*d^3*n*ln(x)-18*ln(c)*b*d^2*e*x-18*a*d*e^2*x^2+18*b*d^2*e*n*x-18*
```

```
a*d^2*e*x)/e*ln(x^n)+1/2*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)
^2*x-1/4*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x-Pi^2*b^2*
d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x+1/2*Pi^2*b^2*d^2*csgn(I*x^n)^2*
csgn(I*c*x^n)^3*csgn(I*c)*x+I*Pi*b^2*d^2*n*x*csgn(I*c*x^n)^3+1/6*e^2*Pi^2*b
^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/12*e^2*Pi^2*b^2*x^3*csgn(I
*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/3*e^2*Pi^2*b^2*x^3*csgn(I*x^n)*csgn(I
*c*x^n)^4*csgn(I*c)+1/6*e^2*Pi^2*b^2*x^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn
(I*c)-1/4*e*Pi^2*b^2*d*x^2*csgn(I*c*x^n)^4*csgn(I*c)^2+1/2*e*Pi^2*b^2*d*x^2
*csgn(I*c*x^n)^5*csgn(I*c)+1/2*e*Pi^2*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5
-1/4*e*Pi^2*b^2*d*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2*b^2*d*e*n^2*x^2-I*e
*ln(c)*Pi*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*e*Pi*b^2*d*n*
x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*e*Pi*a*b*d*x^2*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+1/3*(e*x+d)^3*b^2/e*ln(x^n)^2+I*Pi*b^2*d^2*n*x*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)+I*e*ln(c)*Pi*b^2*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+
I*e*ln(c)*Pi*b^2*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*e*Pi*a*b*d*x^2*csgn(I*
c*x^n)^2*csgn(I*c)+I*e*Pi*a*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*ln(c)*Pi*
b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-I*Pi*a*b*d^2*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*x-1/3*I*e^2*ln(c)*Pi*b^2*x^3*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+1/9*I*e^2*Pi*b^2*n*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*
e*Pi*b^2*d*n*x^2*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I*e^2*Pi*a*b*x^3*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-1/2*I*e*Pi*b^2*d*n*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2
```

Maxima [A] time = 1.16253, size = 317, normalized size = 1.83

$$\frac{1}{3}\,b^2e^2x^3\log\left(cx^n\right)^2-\frac{2}{9}\,abe^2nx^3+\frac{2}{3}\,abe^2x^3\log\left(cx^n\right)+b^2dex^2\log\left(cx^n\right)^2-abdenx^2+\frac{1}{3}\,a^2e^2x^3+2\,abdex^2\log\left(cx^n\right)+b^2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b^2*e^2*x^3*log(c*x^n)^2 - 2/9*a*b*e^2*n*x^3 + 2/3*a*b*e^2*x^3*log(c*x^
n) + b^2*d*e*x^2*log(c*x^n)^2 - a*b*d*e*n*x^2 + 1/3*a^2*e^2*x^3 + 2*a*b*d*e
*x^2*log(c*x^n) + b^2*d^2*x*log(c*x^n)^2 - 2*a*b*d^2*n*x + a^2*d*e*x^2 + 2*
a*b*d^2*x*log(c*x^n) + 2*(n^2*x - n*x*log(c*x^n))*b^2*d^2 + 1/2*(n^2*x^2 -
2*n*x^2*log(c*x^n))*b^2*d*e + 2/27*(n^2*x^3 - 3*n*x^3*log(c*x^n))*b^2*e^2 +
 a^2*d^2*x
```

Fricas [B] time = 1.01099, size = 757, normalized size = 4.38

$$\frac{1}{27}\left(2\,b^2e^2n^2-6\,abe^2n+9\,a^2e^2\right)x^3+\frac{1}{2}\left(b^2den^2-2\,abden+2\,a^2de\right)x^2+\frac{1}{3}\left(b^2e^2x^3+3\,b^2dex^2+3\,b^2d^2x\right)\log\left(c\right)^2+\frac{1}{3}\left(b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/27*(2*b^2*e^2*n^2 - 6*a*b*e^2*n + 9*a^2*e^2)*x^3 + 1/2*(b^2*d*e*n^2 - 2*a
*b*d*e*n + 2*a^2*d*e)*x^2 + 1/3*(b^2*e^2*x^3 + 3*b^2*d*e*x^2 + 3*b^2*d^2*x)
*log(c)^2 + 1/3*(b^2*e^2*n^2*x^3 + 3*b^2*d*e*n^2*x^2 + 3*b^2*d^2*n^2*x)*log
(x)^2 + (2*b^2*d^2*n^2 - 2*a*b*d^2*n + a^2*d^2)*x - 1/9*(2*(b^2*e^2*n - 3*a
*b*e^2)*x^3 + 9*(b^2*d*e*n - 2*a*b*d*e)*x^2 + 18*(b^2*d^2*n - a*b*d^2)*x)*l
og(c) - 1/9*(2*(b^2*e^2*n^2 - 3*a*b*e^2*n)*x^3 + 9*(b^2*d*e*n^2 - 2*a*b*d*e
*n)*x^2 + 18*(b^2*d^2*n^2 - a*b*d^2*n)*x - 6*(b^2*e^2*n*x^3 + 3*b^2*d*e*n*x
^2 + 3*b^2*d^2*n*x)*log(c))*log(x)
```

Sympy [B] time = 2.52399, size = 478, normalized size = 2.76

$$a^2d^2x + a^2dex^2 + \frac{a^2e^2x^3}{3} + 2abd^2nx\log(x) - 2abd^2nx + 2abd^2x\log(c) + 2abdenx^2\log(x) - abdenx^2 + 2abdex^2\log(c) +$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d**2*x + a**2*d*e*x**2 + a**2*e**2*x**3/3 + 2*a*b*d**2*n*x*log(x) - 2*
a*b*d**2*n*x + 2*a*b*d**2*x*log(c) + 2*a*b*d*e*n*x**2*log(x) - a*b*d*e*n*x*
*2 + 2*a*b*d*e*x**2*log(c) + 2*a*b*e**2*n*x**3*log(x)/3 - 2*a*b*e**2*n*x**3
/9 + 2*a*b*e**2*x**3*log(c)/3 + b**2*d**2*n**2*x*log(x)**2 - 2*b**2*d**2*n*
*2*x*log(x) + 2*b**2*d**2*n**2*x + 2*b**2*d**2*n*x*log(c)*log(x) - 2*b**2*d
**2*n*x*log(c) + b**2*d**2*x*log(c)**2 + b**2*d*e*n**2*x**2*log(x)**2 - b**
2*d*e*n**2*x**2*log(x) + b**2*d*e*n**2*x**2/2 + 2*b**2*d*e*n*x**2*log(c)*lo
g(x) - b**2*d*e*n*x**2*log(c) + b**2*d*e*x**2*log(c)**2 + b**2*e**2*n**2*x*
*3*log(x)**2/3 - 2*b**2*e**2*n**2*x**3*log(x)/9 + 2*b**2*e**2*n**2*x**3/27
+ 2*b**2*e**2*n*x**3*log(c)*log(x)/3 - 2*b**2*e**2*n*x**3*log(c)/9 + b**2*e
**2*x**3*log(c)**2/3
```

Giac [B] time = 1.28002, size = 520, normalized size = 3.01

$$\frac{1}{3}b^2n^2x^3e^2\log(x)^2 + b^2dn^2x^2e\log(x)^2 - \frac{2}{9}b^2n^2x^3e^2\log(x) - b^2dn^2x^2e\log(x) + \frac{2}{3}b^2nx^3e^2\log(c)\log(x) + 2b^2dnx^2e\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b^2*n^2*x^3*e^2*log(x)^2 + b^2*d*n^2*x^2*e*log(x)^2 - 2/9*b^2*n^2*x^3*e
^2*log(x) - b^2*d*n^2*x^2*e*log(x) + 2/3*b^2*n*x^3*e^2*log(c)*log(x) + 2*b^
2*d*n*x^2*e*log(c)*log(x) + b^2*d^2*n^2*x*log(x)^2 + 2/27*b^2*n^2*x^3*e^2 +
 1/2*b^2*d*n^2*x^2*e - 2/9*b^2*n*x^3*e^2*log(c) - b^2*d*n*x^2*e*log(c) + 1/
3*b^2*x^3*e^2*log(c)^2 + b^2*d*x^2*e*log(c)^2 - 2*b^2*d^2*n^2*x*log(x) + 2/
3*a*b*n*x^3*e^2*log(x) + 2*a*b*d*n*x^2*e*log(x) + 2*b^2*d^2*n*x*log(c)*log(
x) + 2*b^2*d^2*n^2*x - 2/9*a*b*n*x^3*e^2 - a*b*d*n*x^2*e - 2*b^2*d^2*n*x*lo
g(c) + 2/3*a*b*x^3*e^2*log(c) + 2*a*b*d*x^2*e*log(c) + b^2*d^2*x*log(c)^2 +
 2*a*b*d^2*n*x*log(x) - 2*a*b*d^2*n*x + 1/3*a^2*x^3*e^2 + a^2*d*x^2*e + 2*a
*b*d^2*x*log(c) + a^2*d^2*x
```

3.87 $\int \frac{(d+ex)^2(a+b\log(cx^n))^2}{x} \, dx$

Optimal. Leaf size=137

$$\frac{d^2 (a + b\log(cx^n))^3}{3bn} + 2dex (a + b\log(cx^n))^2 + \frac{1}{2}e^2x^2 (a + b\log(cx^n))^2 - \frac{1}{2}be^2nx^2 (a + b\log(cx^n)) - 4abdenx - 4b^2denx$$

```
[Out] -4*a*b*d*e*n*x + 4*b^2*d*e*n^2*x + (b^2*e^2*n^2*x^2)/4 - 4*b^2*d*e*n*x*Log[
c*x^n] - (b*e^2*n*x^2*(a + b*Log[c*x^n]))/2 + 2*d*e*x*(a + b*Log[c*x^n])^2
+ (e^2*x^2*(a + b*Log[c*x^n])^2)/2 + (d^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.231319, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2346, 2302, 30, 2296, 2295, 2330, 2305, 2304}

$$\frac{d^2 (a + b\log(cx^n))^3}{3bn} + 2dex (a + b\log(cx^n))^2 + \frac{1}{2}e^2x^2 (a + b\log(cx^n))^2 - \frac{1}{2}be^2nx^2 (a + b\log(cx^n)) - 4abdenx - 4b^2denx$$

Antiderivative was successfully verified.

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

```
[Out] -4*a*b*d*e*n*x + 4*b^2*d*e*n^2*x + (b^2*e^2*n^2*x^2)/4 - 4*b^2*d*e*n*x*Log[
c*x^n] - (b*e^2*n*x^2*(a + b*Log[c*x^n]))/2 + 2*d*e*x*(a + b*Log[c*x^n])^2
+ (e^2*x^2*(a + b*Log[c*x^n])^2)/2 + (d^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d+ex)^2 (a+b\log(cx^n))^2}{x}\,dx = d\int \frac{(d+ex)(a+b\log(cx^n))^2}{x}\,dx + e\int (d+ex)(a+b\log(cx^n))^2\,dx$$
$$= d^2\int \frac{(a+b\log(cx^n))^2}{x}\,dx + e\int \left(d(a+b\log(cx^n))^2 + ex(a+b\log(cx^n))^2\right)dx + (de$$
$$= dex(a+b\log(cx^n))^2 + (de)\int (a+b\log(cx^n))^2\,dx + e^2\int x(a+b\log(cx^n))^2\,dx + $$
$$= -2abdenx + 2dex(a+b\log(cx^n))^2 + \frac{1}{2}e^2x^2(a+b\log(cx^n))^2 + \frac{d^2(a+b\log(cx^n))^3}{3bn}$$
$$= -4abdenx + 2b^2den^2x + \frac{1}{4}b^2e^2n^2x^2 - 2b^2denx\log(cx^n) - \frac{1}{2}be^2nx^2(a+b\log(cx^n)) +$$
$$= -4abdenx + 4b^2den^2x + \frac{1}{4}b^2e^2n^2x^2 - 4b^2denx\log(cx^n) - \frac{1}{2}be^2nx^2(a+b\log(cx^n)) +$$

Mathematica [A] time = 0.037655, size = 114, normalized size = 0.83

$$\frac{d^2(a+b\log(cx^n))^3}{3bn} + 2dex(a+b\log(cx^n))^2 - 4bdenx(a+b\log(cx^n)-bn) + \frac{1}{2}e^2x^2(a+b\log(cx^n))^2 + \frac{1}{4}be^2nx^2(-2a -$$

Antiderivative was successfully verified.

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

```
[Out] (b*e^2*n*x^2*(-2*a + b*n - 2*b*Log[c*x^n]))/4 + 2*d*e*x*(a + b*Log[c*x^n])^
2 + (e^2*x^2*(a + b*Log[c*x^n])^2)/2 + (d^2*(a + b*Log[c*x^n])^3)/(3*b*n) -
 4*b*d*e*n*x*(a - b*n + b*Log[c*x^n])
```

Maple [C] time = 0.369, size = 2543, normalized size = 18.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*a^2*e^2*x^2-1/4*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2*ln
(x)*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^5+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*
c*x^n)^5*csgn(I*c)-1/4*ln(x)*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c)^2+ln(x)
*a^2*d^2+(1/2*b^2*e^2*x^2+2*b^2*d*e*x+b^2*d^2*ln(x))*ln(x^n)^2+(-b^2*d^2*n*
```

ln(x)^2-2*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+I*Pi*ln(x)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*ln(x)*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*ln(x)*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3+1/2*I*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+ln(c)*b^2*e^2*x^2-1/2*b^2*e^2*n*x^2+4*ln(c)*b^2*d*e*x+a*b*e^2*x^2-4*b^2*d*e*n*x+4*a*b*d*e*x-2*I*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*ln(x)*b^2*d^2*csgn(I*c*x^n)^3-1/2*I*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+2*ln(c)*ln(x)*b^2*d^2+2*ln(x)*a*b*d^2)*ln(x^n)-1/2*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*ln(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/2*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+2*I*n*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*ln(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*a^2*d*e*x-1/2*b*n*a*e^2*x^2+Pi^2*b^2*d*e*x*csgn(I*c*x^n)^5*csgn(I*c)-1/2*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^4*csgn(I*c)^2+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/4*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/4*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-1/2*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-1/2*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^3-I*ln(x)*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3-ln(x)^2*a*b*n*d^2-ln(x)^2*ln(c)*b^2*d^2*n+I*ln(x)*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(x)*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(x)*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(x)*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^3-1/4*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*b^2*e^2*n^2*x^2-2*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-2*I*n*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-I*ln(x)*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+4*ln(c)*a*b*d*e*x-4*n*ln(c)*b^2*d*e*x-1/4*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^3-1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/4*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-1/2*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^4+Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+1/2*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+1/2*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-4*a*b*d*e*n*x+4*b^2*d*e*n^2*x-1/4*ln(x)*Pi^2*b^2*d^2*csgn(I*c*x^n)^6-1/8*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^6+1/2*ln(c)^2*b^2*e^2*x^2+ln(x)*ln(c)^2*b^2*d^2+1/3*b^2*d^2*n^2*ln(x)^3-1/2*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^6-1

```
/8*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/4*Pi^2*b^2*e^2*x^2*csgn
(I*x^n)*csgn(I*c*x^n)^5+1/4*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^5*csgn(I*c)-1/8*
Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^4*csgn(I*c)^2-I*ln(x)*Pi*a*b*d^2*csgn(I*c*x^
n)^3+1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*c*x^n)^3+1/4*Pi^2*b^2*e^2*x^2*csgn(I
*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/8*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I
*c*x^n)^2*csgn(I*c)^2-2*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
I*ln(x)*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*n*ln(c)*b^
2*e^2*x^2+2*ln(x)*ln(c)*a*b*d^2+2*ln(c)^2*b^2*d*e*x+ln(c)*a*b*e^2*x^2
```

Maxima [A] time = 1.20348, size = 267, normalized size = 1.95

$$\frac{1}{2}b^2e^2x^2\log\left(cx^n\right)^2 - \frac{1}{2}abe^2nx^2 + abe^2x^2\log\left(cx^n\right) + 2b^2dex\log\left(cx^n\right)^2 - 4abdenx + \frac{1}{2}a^2e^2x^2 + 4abdex\log\left(cx^n\right) + \frac{b^2d^2\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b^2*e^2*x^2*log(c*x^n)^2 - 1/2*a*b*e^2*n*x^2 + a*b*e^2*x^2*log(c*x^n) +
 2*b^2*d*e*x*log(c*x^n)^2 - 4*a*b*d*e*n*x + 1/2*a^2*e^2*x^2 + 4*a*b*d*e*x*l
og(c*x^n) + 1/3*b^2*d^2*log(c*x^n)^3/n + 4*(n^2*x - n*x*log(c*x^n))*b^2*d*e
 + 1/4*(n^2*x^2 - 2*n*x^2*log(c*x^n))*b^2*e^2 + 2*a^2*d*e*x + a*b*d^2*log(c
*x^n)^2/n + a^2*d^2*log(x)
```

Fricas [B] time = 1.07127, size = 660, normalized size = 4.82

$$\frac{1}{3}b^2d^2n^2\log\left(x\right)^3 + \frac{1}{4}\left(b^2e^2n^2 - 2abe^2n + 2a^2e^2\right)x^2 + \frac{1}{2}\left(b^2e^2x^2 + 4b^2dex\right)\log\left(c\right)^2 + \frac{1}{2}\left(b^2e^2n^2x^2 + 4b^2den^2x + 2b^2d^2n\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*b^2*d^2*n^2*log(x)^3 + 1/4*(b^2*e^2*n^2 - 2*a*b*e^2*n + 2*a^2*e^2)*x^2
+ 1/2*(b^2*e^2*x^2 + 4*b^2*d*e*x)*log(c)^2 + 1/2*(b^2*e^2*n^2*x^2 + 4*b^2*d
*e*n^2*x + 2*b^2*d^2*n*log(c) + 2*a*b*d^2*n)*log(x)^2 + 2*(2*b^2*d*e*n^2 -
2*a*b*d*e*n + a^2*d*e)*x - 1/2*((b^2*e^2*n - 2*a*b*e^2)*x^2 + 8*(b^2*d*e*n
- a*b*d*e)*x)*log(c) + 1/2*(2*b^2*d^2*log(c)^2 + 2*a^2*d^2 - (b^2*e^2*n^2 -
 2*a*b*e^2*n)*x^2 - 8*(b^2*d*e*n^2 - a*b*d*e*n)*x + 2*(b^2*e^2*n*x^2 + 4*b^
2*d*e*n*x + 2*a*b*d^2)*log(c))*log(x)
```

Sympy [B] time = 2.83262, size = 398, normalized size = 2.91

$$a^2d^2\log(x) + 2a^2dex + \frac{a^2e^2x^2}{2} + abd^2n\log(x)^2 + 2abd^2\log(c)\log(x) + 4abdenx\log(x) - 4abdenx + 4abdex\log(c) +$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a**2*d**2*log(x) + 2*a**2*d*e*x + a**2*e**2*x**2/2 + a*b*d**2*n*log(x)**2 +
 2*a*b*d**2*log(c)*log(x) + 4*a*b*d*e*n*x*log(x) - 4*a*b*d*e*n*x + 4*a*b*d*
e*x*log(c) + a*b*e**2*n*x**2*log(x) - a*b*e**2*n*x**2/2 + a*b*e**2*x**2*log
(c) + b**2*d**2*n**2*log(x)**3/3 + b**2*d**2*n*log(c)*log(x)**2 + b**2*d**2
*log(c)**2*log(x) + 2*b**2*d*e*n**2*x*log(x)**2 - 4*b**2*d*e*n**2*x*log(x)
+ 4*b**2*d*e*n**2*x + 4*b**2*d*e*n*x*log(c)*log(x) - 4*b**2*d*e*n*x*log(c)
+ 2*b**2*d*e*x*log(c)**2 + b**2*e**2*n**2*x**2*log(x)**2/2 - b**2*e**2*n**2
*x**2*log(x)/2 + b**2*e**2*n**2*x**2/4 + b**2*e**2*n*x**2*log(c)*log(x) - b
**2*e**2*n*x**2*log(c)/2 + b**2*e**2*x**2*log(c)**2/2
```

Giac [B] time = 1.30188, size = 433, normalized size = 3.16

$$\frac{1}{2}b^2n^2x^2e^2\log(x)^2 + 2b^2dn^2xe\log(x)^2 + \frac{1}{3}b^2d^2n^2\log(x)^3 - \frac{1}{2}b^2n^2x^2e^2\log(x) - 4b^2dn^2xe\log(x) + b^2nx^2e^2\log(c)\log$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*b^2*n^2*x^2*e^2*log(x)^2 + 2*b^2*d*n^2*x*e*log(x)^2 + 1/3*b^2*d^2*n^2*l
og(x)^3 - 1/2*b^2*n^2*x^2*e^2*log(x) - 4*b^2*d*n^2*x*e*log(x) + b^2*n*x^2*e
^2*log(c)*log(x) + 4*b^2*d*n*x*e*log(c)*log(x) + b^2*d^2*n*log(c)*log(x)^2
+ 1/4*b^2*n^2*x^2*e^2 + 4*b^2*d*n^2*x*e - 1/2*b^2*n*x^2*e^2*log(c) - 4*b^2*
d*n*x*e*log(c) + 1/2*b^2*x^2*e^2*log(c)^2 + 2*b^2*d*x*e*log(c)^2 + a*b*n*x^
2*e^2*log(x) + 4*a*b*d*n*x*e*log(x) + b^2*d^2*log(c)^2*log(x) + a*b*d^2*n*l
og(x)^2 - 1/2*a*b*n*x^2*e^2 - 4*a*b*d*n*x*e + a*b*x^2*e^2*log(c) + 4*a*b*d*
x*e*log(c) + 2*a*b*d^2*log(c)*log(x) + 1/2*a^2*x^2*e^2 + 2*a^2*d*x*e + a^2*
d^2*log(x)
```

3.88 $\int \frac{(d+ex)^2(a+b\log(cx^n))^2}{x^2}\,dx$

Optimal. Leaf size=133

$$-\frac{d^2(a+b\log(cx^n))^2}{x}-\frac{2bd^2n(a+b\log(cx^n))}{x}+\frac{2de(a+b\log(cx^n))^3}{3bn}+e^2x(a+b\log(cx^n))^2-2abe^2nx-2b^2e^2nx\log($$

```
[Out] (-2*b^2*d^2*n^2)/x - 2*a*b*e^2*n*x + 2*b^2*e^2*n^2*x - 2*b^2*e^2*n*x*Log[c*
x^n] - (2*b*d^2*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/x + e^
2*x*(a + b*Log[c*x^n])^2 + (2*d*e*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.172177, antiderivative size = 133, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2353, 2296, 2295, 2305, 2304, 2302, 30}

$$-\frac{d^2(a+b\log(cx^n))^2}{x}-\frac{2bd^2n(a+b\log(cx^n))}{x}+\frac{2de(a+b\log(cx^n))^3}{3bn}+e^2x(a+b\log(cx^n))^2-2abe^2nx-2b^2e^2nx\log($$

Antiderivative was successfully verified.

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

```
[Out] (-2*b^2*d^2*n^2)/x - 2*a*b*e^2*n*x + 2*b^2*e^2*n^2*x - 2*b^2*e^2*n*x*Log[c*
x^n] - (2*b*d^2*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/x + e^
2*x*(a + b*Log[c*x^n])^2 + (2*d*e*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rubi steps

$$\int \frac{(d+ex)^2 (a+b\log(cx^n))^2}{x^2}\,dx = \int \left(e^2 (a+b\log(cx^n))^2 + \frac{d^2 (a+b\log(cx^n))^2}{x^2} + \frac{2de (a+b\log(cx^n))^2}{x}\right) dx$$

$$= d^2 \int \frac{(a+b\log(cx^n))^2}{x^2}\,dx + (2de)\int \frac{(a+b\log(cx^n))^2}{x}\,dx + e^2 \int (a+b\log(cx^n))^2$$

$$= -\frac{d^2 (a+b\log(cx^n))^2}{x} + e^2 x (a+b\log(cx^n))^2 + \frac{(2de)\,\text{Subst}\left(\int x^2\,dx, x, a+b\log(c\right.}{bn}$$

$$= -\frac{2b^2d^2n^2}{x} - 2abe^2nx - \frac{2bd^2n (a+b\log(cx^n))}{x} - \frac{d^2 (a+b\log(cx^n))^2}{x} + e^2x (a+b\log$$

$$= -\frac{2b^2d^2n^2}{x} - 2abe^2nx + 2b^2e^2n^2x - 2b^2e^2nx\log(cx^n) - \frac{2bd^2n (a+b\log(cx^n))}{x} - \frac{d^2}{}$$

Mathematica [A] time = 0.0389266, size = 107, normalized size = 0.8

$$-\frac{d^2(a+b\log(cx^n))^2}{x}-\frac{2bd^2n(a+b\log(cx^n)+bn)}{x}+\frac{2de(a+b\log(cx^n))^3}{3bn}+e^2x(a+b\log(cx^n))^2-2be^2nx(a+b\log($$

Antiderivative was successfully verified.

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

```
[Out] -((d^2*(a + b*Log[c*x^n])^2)/x) + e^2*x*(a + b*Log[c*x^n])^2 + (2*d*e*(a +
b*Log[c*x^n])^3)/(3*b*n) - 2*b*e^2*n*x*(a - b*n + b*Log[c*x^n]) - (2*b*d^2*
n*(a + b*n + b*Log[c*x^n]))/x
```

Maple [C] time = 0.418, size = 2521, normalized size = 19.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -b^2*(-2*d*e*x*ln(x)-e^2*x^2+d^2)/x*ln(x^n)^2-b*(I*Pi*b*d^2*csgn(I*c*x^n)^2
*csgn(I*c)-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e^2*x^2*cs
gn(I*c*x^n)^2*csgn(I*c)-2*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x-I*
Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*ln(
x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+I*Pi*b*d^2*csgn(I*x^n)*cs
gn(I*c*x^n)^2+2*I*ln(x)*Pi*b*d*e*csgn(I*c*x^n)^3*x-2*I*ln(x)*Pi*b*d*e*csgn(
I*c*x^n)^2*csgn(I*c)*x+I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3+I*Pi*b*e^2*x^2*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*b*d*e*n*ln(x)^2*x-4*ln(x)*ln(c)*b*d*e*x-2*l
n(c)*b*e^2*x^2+2*b*e^2*n*x^2-4*ln(x)*a*d*e*x-2*a*e^2*x^2+2*ln(c)*b*d^2+2*b*
d^2*n+2*a*d^2)/x*ln(x^n)+1/12*(-12*a^2*d^2+12*a^2*e^2*x^2-24*b^2*d^2*n^2+3*
Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-6*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(
I*c*x^n)^5-24*a*b*n*d^2+12*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+12*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3*Pi^2*b^2*d^2*csgn(
I*c*x^n)^4*csgn(I*c)^2-12*ln(c)^2*b^2*d^2+48*ln(x)*ln(c)*a*b*d*e*x-24*ln(c)
*b^2*d*e*n*ln(x)^2*x-24*a*b*d*e*n*ln(x)^2*x-24*b*n*a*e^2*x^2-12*I*Pi*b^2*d^
2*n*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)
+12*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3+24*ln(x)*ln(c)^2*b^2*d*e*x+8*b^2*d*e
*n^2*ln(x)^3*x-12*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-12*I*Pi*a*b*e^2*x^
2*csgn(I*c*x^n)^3-6*ln(x)*Pi^2*b^2*d*e*csgn(I*c*x^n)^6*x-12*I*Pi*b^2*d*e*n*
csgn(I*x^n)*csgn(I*c*x^n)^2*ln(x)^2*x-12*I*Pi*b^2*d*e*n*csgn(I*c*x^n)^2*csg
n(I*c)*ln(x)^2*x-24*ln(c)*b^2*d^2*n-24*ln(c)*a*b*d^2-6*Pi^2*b^2*d^2*csgn(I*
```

```
c*x^n)^5*csgn(I*c)+12*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+12*P
i^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)-6*Pi^2*b^2*d^2*csgn(I*x^n
)*csgn(I*c*x^n)^3*csgn(I*c)^2+24*b^2*e^2*n^2*x^2+12*I*Pi*a*b*e^2*x^2*csgn(I
*x^n)*csgn(I*c*x^n)^2+12*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi
*b^2*d*e*n*csgn(I*c*x^n)^3*ln(x)^2*x+12*ln(x)*Pi^2*b^2*d*e*csgn(I*x^n)^2*cs
gn(I*c*x^n)^3*csgn(I*c)*x-6*ln(x)*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^
2*csgn(I*c)^2*x-24*ln(x)*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)
*x+12*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3+12*I*Pi*a*b*d^2*csgn(I*c*x^n)^3+12
*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^3-6*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^
3*csgn(I*c)+3*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+12*I*P
i*b^2*d*e*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*ln(x)^2*x-24*I*ln(x)*Pi*a*b
*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-24*I*ln(x)*ln(c)*Pi*b^2*d*e*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-12*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*
x^n)^4*csgn(I*c)+6*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2
-6*ln(x)*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x+12*ln(x)*Pi^2*b^2*d*e
*csgn(I*x^n)*csgn(I*c*x^n)^5*x+12*ln(x)*Pi^2*b^2*d*e*csgn(I*c*x^n)^5*csgn(I
*c)*x-6*ln(x)*Pi^2*b^2*d*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x+24*ln(x)*a^2*d*e*x
-24*I*ln(x)*ln(c)*Pi*b^2*d*e*csgn(I*c*x^n)^3*x-24*I*ln(x)*Pi*a*b*d*e*csgn(I
*c*x^n)^3*x+12*ln(x)*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x
+12*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*ln(c)*Pi*b^
2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*Pi*a*b*e^2*x^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-12*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^
2-12*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*a*b*d^2*csgn(I*x^
n)*csgn(I*c*x^n)^2-12*I*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-3*Pi^2*b^2*e^2
*x^2*csgn(I*c*x^n)^6+12*ln(c)^2*b^2*e^2*x^2+24*I*ln(x)*ln(c)*Pi*b^2*d*e*csg
n(I*c*x^n)^2*csgn(I*c)*x+24*I*ln(x)*Pi*a*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*
x+24*I*ln(x)*Pi*a*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x-3*Pi^2*b^2*e^2*x^2*csgn
(I*x^n)^2*csgn(I*c*x^n)^4+6*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+6*
Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^5*csgn(I*c)-3*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)
^4*csgn(I*c)^2+3*Pi^2*b^2*d^2*csgn(I*c*x^n)^6+6*Pi^2*b^2*e^2*x^2*csgn(I*x^n
)^2*csgn(I*c*x^n)^3*csgn(I*c)-3*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n
)^2*csgn(I*c)^2-12*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*n*Pi
*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+12*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+24*I*ln(x)*ln(c)*Pi*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x-24*n*ln(c)*b^2*e
^2*x^2+24*ln(c)*a*b*e^2*x^2)/x
```

Maxima [A] time = 1.18665, size = 270, normalized size = 2.03

$$b^2e^2x\log(cx^n)^2 - 2\,abe^2nx + 2\,abe^2x\log(cx^n) + \frac{2\,b^2de\log(cx^n)^3}{3\,n} + 2\left(n^2x - nx\log(cx^n)\right)b^2e^2 - 2\,b^2d^2\left(\frac{n^2}{x} + \frac{n\log(cx^n)}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] b^2*e^2*x*log(c*x^n)^2 - 2*a*b*e^2*n*x + 2*a*b*e^2*x*log(c*x^n) + 2/3*b^2*d
*e*log(c*x^n)^3/n + 2*(n^2*x - n*x*log(c*x^n))*b^2*e^2 - 2*b^2*d^2*(n^2/x +
 n*log(c*x^n)/x) + a^2*e^2*x + 2*a*b*d*e*log(c*x^n)^2/n - b^2*d^2*log(c*x^n
)^2/x + 2*a^2*d*e*log(x) - 2*a*b*d^2*n/x - 2*a*b*d^2*log(c*x^n)/x - a^2*d^2
/x
```

Fricas [B] time = 1.01888, size = 620, normalized size = 4.66

$$\frac{2\,b^2den^2x\log(x)^3 - 6\,b^2d^2n^2 - 6\,abd^2n - 3\,a^2d^2 + 3\left(2\,b^2e^2n^2 - 2\,abe^2n + a^2e^2\right)x^2 + 3\left(b^2e^2x^2 - b^2d^2\right)\log(c)^2 + 3\left(b^2e^2n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(2*b^2*d*e*n^2*x*log(x)^3 - 6*b^2*d^2*n^2 - 6*a*b*d^2*n - 3*a^2*d^2 + 3
*(2*b^2*e^2*n^2 - 2*a*b*e^2*n + a^2*e^2)*x^2 + 3*(b^2*e^2*x^2 - b^2*d^2)*lo
g(c)^2 + 3*(b^2*e^2*n^2*x^2 + 2*b^2*d*e*n*x*log(c) - b^2*d^2*n^2 + 2*a*b*d*
e*n*x)*log(x)^2 - 6*(b^2*d^2*n + a*b*d^2 + (b^2*e^2*n - a*b*e^2)*x^2)*log(c
) + 6*(b^2*d*e*x*log(c)^2 - b^2*d^2*n^2 - a*b*d^2*n + a^2*d*e*x - (b^2*e^2*
n^2 - a*b*e^2*n)*x^2 + (b^2*e^2*n*x^2 - b^2*d^2*n + 2*a*b*d*e*x)*log(c))*lo
g(x))/x
```

Sympy [B] time = 3.10351, size = 384, normalized size = 2.89

$$-\frac{a^2d^2}{x} + 2a^2de\log(x) + a^2e^2x - \frac{2abd^2n\log(x)}{x} - \frac{2abd^2n}{x} - \frac{2abd^2\log(c)}{x} + 2abden\log(x)^2 + 4abde\log(c)\log(x) + 2ab$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2*d**2/x + 2*a**2*d*e*log(x) + a**2*e**2*x - 2*a*b*d**2*n*log(x)/x - 2*
a*b*d**2*n/x - 2*a*b*d**2*log(c)/x + 2*a*b*d*e*n*log(x)**2 + 4*a*b*d*e*log(
c)*log(x) + 2*a*b*e**2*n*x*log(x) - 2*a*b*e**2*n*x + 2*a*b*e**2*x*log(c) -
b**2*d**2*n**2*log(x)**2/x - 2*b**2*d**2*n**2*log(x)/x - 2*b**2*d**2*n**2/x
 - 2*b**2*d**2*n*log(c)*log(x)/x - 2*b**2*d**2*n*log(c)/x - b**2*d**2*log(c
```

```
)**2/x + 2*b**2*d*e*n**2*log(x)**3/3 + 2*b**2*d*e*n*log(c)*log(x)**2 + 2*b*
*2*d*e*log(c)**2*log(x) + b**2*e**2*n**2*x*log(x)**2 - 2*b**2*e**2*n**2*x*l
og(x) + 2*b**2*e**2*n**2*x + 2*b**2*e**2*n*x*log(c)*log(x) - 2*b**2*e**2*n*
x*log(c) + b**2*e**2*x*log(c)**2
```

Giac [B] time = 1.27369, size = 444, normalized size = 3.34

$$\frac{2\,b^2dn^2xe\log(x)^3+3\,b^2n^2x^2e^2\log(x)^2+6\,b^2dnxe\log(c)\log(x)^2-6\,b^2n^2x^2e^2\log(x)+6\,b^2nx^2e^2\log(c)\log(x)+6\,b^2d}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(2*b^2*d*n^2*x*e*log(x)^3 + 3*b^2*n^2*x^2*e^2*log(x)^2 + 6*b^2*d*n*x*e*
log(c)*log(x)^2 - 6*b^2*n^2*x^2*e^2*log(x) + 6*b^2*n*x^2*e^2*log(c)*log(x)
+ 6*b^2*d*x*e*log(c)^2*log(x) - 3*b^2*d^2*n^2*log(x)^2 + 6*a*b*d*n*x*e*log(
x)^2 + 6*b^2*n^2*x^2*e^2 - 6*b^2*n*x^2*e^2*log(c) + 3*b^2*x^2*e^2*log(c)^2
- 6*b^2*d^2*n^2*log(x) + 6*a*b*n*x^2*e^2*log(x) - 6*b^2*d^2*n*log(c)*log(x)
 + 12*a*b*d*x*e*log(c)*log(x) - 6*b^2*d^2*n^2 - 6*a*b*n*x^2*e^2 - 6*b^2*d^2
*n*log(c) + 6*a*b*x^2*e^2*log(c) - 3*b^2*d^2*log(c)^2 - 6*a*b*d^2*n*log(x)
+ 6*a^2*d*x*e*log(x) - 6*a*b*d^2*n + 3*a^2*x^2*e^2 - 6*a*b*d^2*log(c) - 3*a
^2*d^2)/x
```

3.89 $\int \frac{(d+ex)^2(a+b\log(cx^n))^2}{x^3}\,dx$

Optimal. Leaf size=137

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-$$

```
[Out] -(b^2*d^2*n^2)/(4*x^2) - (4*b^2*d*e*n^2)/x - (b*d^2*n*(a + b*Log[c*x^n]))/(
2*x^2) - (4*b*d*e*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/(2*x
^2) - (2*d*e*(a + b*Log[c*x^n])^2)/x + (e^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.192286, antiderivative size = 137, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2353, 2305, 2304, 2302, 30}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-$$

Antiderivative was successfully verified.

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


```
[Out] -(b^2*d^2*n^2)/(4*x^2) - (4*b^2*d*e*n^2)/x - (b*d^2*n*(a + b*Log[c*x^n]))/(
2*x^2) - (4*b*d*e*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/(2*x
^2) - (2*d*e*(a + b*Log[c*x^n])^2)/x + (e^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rubi steps

$$\int \frac{(d+ex)^2\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx = \int \left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{x^3}+\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x^2}+\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{x}\right)dx$$

$$= d^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^3}\,dx+(2de)\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x^2}\,dx+e^2\int \frac{\left(a+b\log\left(cx^n\right)\right)^2}{x}$$

$$= -\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}+\frac{e^2\,\mathrm{Subst}\left(\int x^2\,dx,x,a+b\log\left(cx^n\right.\right.}{bn}$$

$$= -\frac{b^2d^2n^2}{4x^2}-\frac{4b^2den^2}{x}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{d^2\left(a+b\log\right.}{2x}$$

Mathematica [A] time = 0.0821597, size = 117, normalized size = 0.85

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-\frac{bd^2n\left(2a+2b\log\left(cx^n\right)+bn\right)}{4x^2}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{x}-\frac{4bden\left(a+b\log\left(cx^n\right)+bn\right)}{x}+\frac{e^2\left(a+\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] -(d^2*(a + b*Log[c*x^n])^2)/(2*x^2) - (2*d*e*(a + b*Log[c*x^n])^2)/x + (e^2
*(a + b*Log[c*x^n])^3)/(3*b*n) - (4*b*d*e*n*(a + b*n + b*Log[c*x^n]))/x - (
b*d^2*n*(2*a + b*n + 2*b*Log[c*x^n]))/(4*x^2)
```

Maple [C] time = 0.331, size = 2520, normalized size = 18.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*b^2*(-2*e^2*ln(x)*x^2+4*d*e*x+d^2)/x^2*ln(x^n)^2-1/2*b*(I*Pi*b*d^2*csg
n(I*c*x^n)^2*csgn(I*c)+2*I*ln(x)*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^2-4*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*ln(x)*Pi*b*e^
2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+4*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+
4*I*Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*
x^n)^2-I*Pi*b*d^2*csgn(I*c*x^n)^3-4*I*Pi*b*d*e*x*csgn(I*c*x^n)^3-I*Pi*b*d^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^2*csg
n(I*c)*x^2+2*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^3*x^2+2*b*e^2*n*ln(x)^2*x^2-4*l
n(x)*ln(c)*b*e^2*x^2-4*ln(x)*a*e^2*x^2+8*ln(c)*b*d*e*x+8*b*d*e*n*x+2*ln(c)*
b*d^2+8*a*d*e*x+b*d^2*n+2*a*d^2)/x^2*ln(x^n)+1/24*(-12*a^2*d^2-6*b^2*d^2*n^
2+3*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-6*Pi^2*b^2*d^2*csgn(I*x^n)*c
sgn(I*c*x^n)^5-12*a*b*n*d^2+12*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+3*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c)^2-24*Pi^2*b^2*d*e*x*csgn(I*x^
n)^2*csgn(I*c*x^n)^3*csgn(I*c)+12*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n
)^2*csgn(I*c)^2+24*I*ln(x)*Pi*a*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+24*I*
ln(x)*Pi*a*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^2-12*I*ln(x)^2*Pi*b^2*e^2*n*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x^2-12*ln(c)^2*b^2*d^2-48*a^2*d*e*x-24*Pi^2*b^2*d
*e*x*csgn(I*c*x^n)^5*csgn(I*c)+12*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^4*csgn(I*c)^
2+6*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^3-6*ln(x)*Pi^2*b^2*e^2*csgn(I*c*x^n)^6*x^2
-12*ln(c)*b^2*d^2*n-24*ln(c)*a*b*d^2-6*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*
c)-6*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)-6*I*Pi*b^2*d^2*n*csgn(I*x^n)*
csgn(I*c*x^n)^2+12*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)-6*Pi^
2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+48*Pi^2*b^2*d*e*x*csgn(I*
x^n)*csgn(I*c*x^n)^4*csgn(I*c)-24*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^
3*csgn(I*c)^2-48*I*Pi*b^2*d*e*n*x*csgn(I*c*x^n)^2*csgn(I*c)+24*I*ln(x)*ln(c
)*Pi*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+24*I*ln(x)*ln(c)*Pi*b^2*e^2*cs
gn(I*c*x^n)^2*csgn(I*c)*x^2-96*ln(c)*a*b*d*e*x-96*n*ln(c)*b^2*d*e*x+12*I*ln
(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3+12*I*Pi*a*b*d^2*csgn(I*c*x^n)^3-6*Pi^2*b^2*d
^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+3*Pi^2*b^2*d^2*csgn(I*x^n)^2*csg
n(I*c*x^n)^2*csgn(I*c)^2+12*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^4-24
*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5-48*I*ln(c)*Pi*b^2*d*e*x*csgn(I*
x^n)*csgn(I*c*x^n)^2+24*ln(x)*ln(c)^2*b^2*e^2*x^2+8*b^2*e^2*n^2*ln(x)^3*x^2
+12*I*ln(x)^2*Pi*b^2*e^2*n*csgn(I*c*x^n)^3*x^2-12*I*ln(x)^2*Pi*b^2*e^2*n*cs
gn(I*c*x^n)^2*csgn(I*c)*x^2-12*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)
^2-12*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*a*b*d^2*csgn(I*x
```

```
^n)*csgn(I*c*x^n)^2-12*I*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+12*ln(x)*Pi^2
*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^2-6*ln(x)*Pi^2*b^2*e^2*c
sgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^2-24*ln(x)*Pi^2*b^2*e^2*csgn(I*x
^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^2-96*a*b*d*e*n*x-96*b^2*d*e*n^2*x-6*ln(x)*P
i^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*x^2+12*ln(x)*Pi^2*b^2*e^2*csgn(I*
x^n)*csgn(I*c*x^n)^5*x^2+12*ln(x)*Pi^2*b^2*e^2*csgn(I*c*x^n)^5*csgn(I*c)*x^
2-6*ln(x)*Pi^2*b^2*e^2*csgn(I*c*x^n)^4*csgn(I*c)^2*x^2+48*ln(x)*ln(c)*a*b*e
^2*x^2-24*ln(x)^2*ln(c)*b^2*e^2*n*x^2-24*ln(x)^2*a*b*n*e^2*x^2+12*Pi^2*b^2*
d*e*x*csgn(I*c*x^n)^6+3*Pi^2*b^2*d^2*csgn(I*c*x^n)^6-48*I*n*Pi*b^2*d*e*x*cs
gn(I*x^n)*csgn(I*c*x^n)^2-48*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-48*
I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-48*I*Pi*a*b*d*e*x*csgn(I*c*x
^n)^2*csgn(I*c)-24*I*ln(x)*Pi*a*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x
^2+12*I*ln(x)^2*Pi*b^2*e^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2+48*I*P
i*b^2*d*e*n*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+24*ln(x)*a^2*e^2*x^2+48*I
*ln(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*ln(x)*ln(c)*Pi
*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2+48*I*Pi*a*b*d*e*x*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)+12*ln(x)*Pi^2*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x^
2+48*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^3+48*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+6*I
*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-48*ln(c)^2*b^2*d*e*x+48*I
*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^3-24*I*ln(x)*ln(c)*Pi*b^2*e^2*csgn(I*c*x^
n)^3*x^2-24*I*ln(x)*Pi*a*b*e^2*csgn(I*c*x^n)^3*x^2)/x^2
```

<u>Maxima</u> [A] time = 1.19904, size = 284, normalized size = 2.07

$$\frac{b^2e^2\log{(cx^n)}^3}{3\,n} - 4\,b^2de\left(\frac{n^2}{x} + \frac{n\log{(cx^n)}}{x}\right) - \frac{1}{4}\,b^2d^2\left(\frac{n^2}{x^2} + \frac{2\,n\log{(cx^n)}}{x^2}\right) + \frac{abe^2\log{(cx^n)}^2}{n} - \frac{2\,b^2de\log{(cx^n)}^2}{x} + a^2e^2\,\mathrm{lo}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [B] time = 1.01892, size = 652, normalized size = 4.76

$$\frac{4\,b^2e^2n^2x^2\log\left(x\right)^3-3\,b^2d^2n^2-6\,abd^2n-6\,a^2d^2-6\,\left(4\,b^2dex+b^2d^2\right)\log\left(c\right)^2+6\,\left(2\,b^2e^2nx^2\log\left(c\right)-4\,b^2den^2x+2\,abe^2 n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/12*(4*b^2*e^2*n^2*x^2*log(x)^3 - 3*b^2*d^2*n^2 - 6*a*b*d^2*n - 6*a^2*d^2
- 6*(4*b^2*d*e*x + b^2*d^2)*log(c)^2 + 6*(2*b^2*e^2*n*x^2*log(c) - 4*b^2*d*
e*n^2*x + 2*a*b*e^2*n*x^2 - b^2*d^2*n^2)*log(x)^2 - 24*(2*b^2*d*e*n^2 + 2*a
*b*d*e*n + a^2*d*e)*x - 6*(b^2*d^2*n + 2*a*b*d^2 + 8*(b^2*d*e*n + a*b*d*e)*
x)*log(c) + 6*(2*b^2*e^2*x^2*log(c)^2 - b^2*d^2*n^2 + 2*a^2*e^2*x^2 - 2*a*b
*d^2*n - 8*(b^2*d*e*n^2 + a*b*d*e*n)*x - 2*(4*b^2*d*e*n*x - 2*a*b*e^2*x^2 +
 b^2*d^2*n)*log(c))*log(x))/x^2
```

Sympy [A] time = 14.0588, size = 357, normalized size = 2.61

$$-\frac{a^2d^2}{2x^2}-\frac{2a^2de}{x}+a^2e^2\log\left(x\right)-\frac{abd^2n}{2x^2}-\frac{abd^2\log\left(cx^n\right)}{x^2}-\frac{4abden}{x}-\frac{4abde\log\left(cx^n\right)}{x}-2abe^2\left(\begin{cases}-\log\left(c\right)\log\left(x\right) & \text{for } n = \\ -\frac{\log\left(cx^n\right)^2}{2n} & \text{otherw}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x**3,x)
```

```
[Out] -a**2*d**2/(2*x**2) - 2*a**2*d*e/x + a**2*e**2*log(x) - a*b*d**2*n/(2*x**2)
 - a*b*d**2*log(c*x**n)/x**2 - 4*a*b*d*e*n/x - 4*a*b*d*e*log(c*x**n)/x - 2*
a*b*e**2*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True
)) - b**2*d**2*n**2*log(x)**2/(2*x**2) - b**2*d**2*n**2*log(x)/(2*x**2) - b
**2*d**2*n**2/(4*x**2) - b**2*d**2*n*log(c)*log(x)/x**2 - b**2*d**2*n*log(c
)/(2*x**2) - b**2*d**2*log(c)**2/(2*x**2) - 2*b**2*d*e*n**2*log(x)**2/x - 4
*b**2*d*e*n**2*log(x)/x - 4*b**2*d*e*n**2/x - 4*b**2*d*e*n*log(c)*log(x)/x
- 4*b**2*d*e*n*log(c)/x - 2*b**2*d*e*log(c)**2/x - b**2*e**2*Piecewise((-lo
g(c)**2*log(x), Eq(n, 0)), (-log(c*x**n)**3/(3*n), True))
```

Giac [B] time = 1.36912, size = 439, normalized size = 3.2

$$\frac{4\,b^2n^2x^2e^2\log\left(x\right)^3-24\,b^2dn^2xe\log\left(x\right)^2+12\,b^2nx^2e^2\log\left(c\right)\log\left(x\right)^2-48\,b^2dn^2xe\log\left(x\right)-48\,b^2dnxe\log\left(c\right)\log\left(x\right)+12}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/12*(4*b^2*n^2*x^2*e^2*log(x)^3 - 24*b^2*d*n^2*x*e*log(x)^2 + 12*b^2*n*x^2
*e^2*log(c)*log(x)^2 - 48*b^2*d*n^2*x*e*log(x) - 48*b^2*d*n*x*e*log(c)*log(
x) + 12*b^2*x^2*e^2*log(c)^2*log(x) - 6*b^2*d^2*n^2*log(x)^2 + 12*a*b*n*x^2
*e^2*log(x)^2 - 48*b^2*d*n^2*x*e - 48*b^2*d*n*x*e*log(c) - 24*b^2*d*x*e*log
(c)^2 - 6*b^2*d^2*n^2*log(x) - 48*a*b*d*n*x*e*log(x) - 12*b^2*d^2*n*log(c)*
log(x) + 24*a*b*x^2*e^2*log(c)*log(x) - 3*b^2*d^2*n^2 - 48*a*b*d*n*x*e - 6*
b^2*d^2*n*log(c) - 48*a*b*d*x*e*log(c) - 6*b^2*d^2*log(c)^2 - 12*a*b*d^2*n*
log(x) + 12*a^2*x^2*e^2*log(x) - 6*a*b*d^2*n - 24*a^2*d*x*e - 12*a*b*d^2*lo
g(c) - 6*a^2*d^2)/x^2
```

3.90 $\int \frac{(d+ex)^2(a+b\log(cx^n))^2}{x^4}\,dx$

Optimal. Leaf size=168

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{de\left(a+b\log\left(cx^n\right)\right)^2}{x^2}-\frac{bden\left(a+b\log\left(cx^n\right)\right)}{x^2}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{x}-2$$

```
[Out] (-2*b^2*d^2*n^2)/(27*x^3) - (b^2*d*e*n^2)/(2*x^2) - (2*b^2*e^2*n^2)/x - (2*
b*d^2*n*(a + b*Log[c*x^n]))/(9*x^3) - (b*d*e*n*(a + b*Log[c*x^n]))/x^2 - (2
*b*e^2*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/(3*x^3) - (d*e*
(a + b*Log[c*x^n])^2)/x^2 - (e^2*(a + b*Log[c*x^n])^2)/x
```

Rubi [A] time = 0.20804, antiderivative size = 168, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {2353, 2305, 2304}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{2bd^2n\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{de\left(a+b\log\left(cx^n\right)\right)^2}{x^2}-\frac{bden\left(a+b\log\left(cx^n\right)\right)}{x^2}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{x}-2$$

Antiderivative was successfully verified.

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


```
[Out] (-2*b^2*d^2*n^2)/(27*x^3) - (b^2*d*e*n^2)/(2*x^2) - (2*b^2*e^2*n^2)/x - (2*
b*d^2*n*(a + b*Log[c*x^n]))/(9*x^3) - (b*d*e*n*(a + b*Log[c*x^n]))/x^2 - (2
*b*e^2*n*(a + b*Log[c*x^n]))/x - (d^2*(a + b*Log[c*x^n])^2)/(3*x^3) - (d*e*
(a + b*Log[c*x^n])^2)/x^2 - (e^2*(a + b*Log[c*x^n])^2)/x
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
```

```
c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d+ex)^2 (a+b\log(cx^n))^2}{x^4}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))^2}{x^4} + \frac{2de (a+b\log(cx^n))^2}{x^3} + \frac{e^2 (a+b\log(cx^n))^2}{x^2}\right) dx$$

$$= d^2 \int \frac{(a+b\log(cx^n))^2}{x^4}\,dx + (2de)\int \frac{(a+b\log(cx^n))^2}{x^3}\,dx + e^2 \int \frac{(a+b\log(cx^n))^2}{x^2}$$

$$= -\frac{d^2 (a+b\log(cx^n))^2}{3x^3} - \frac{de (a+b\log(cx^n))^2}{x^2} - \frac{e^2 (a+b\log(cx^n))^2}{x} + \frac{1}{3}\left(2bd^2n\right)\int$$

$$= -\frac{2b^2d^2n^2}{27x^3} - \frac{b^2den^2}{2x^2} - \frac{2b^2e^2n^2}{x} - \frac{2bd^2n (a+b\log(cx^n))}{9x^3} - \frac{bden (a+b\log(cx^n))}{x^2} -$$

Mathematica [A] time = 0.0914908, size = 131, normalized size = 0.78

$$-\frac{18d^2 (a+b\log(cx^n))^2 + 4bd^2n (3a+3b\log(cx^n)+bn) + 54dex (a+b\log(cx^n))^2 + 27bdenx (2a+2b\log(cx^n)+bn)}{54x^3}$$

Antiderivative was successfully verified.

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

```
[Out] -(18*d^2*(a + b*Log[c*x^n])^2 + 54*d*e*x*(a + b*Log[c*x^n])^2 + 54*e^2*x^2*
(a + b*Log[c*x^n])^2 + 108*b*e^2*n*x^2*(a + b*n + b*Log[c*x^n]) + 27*b*d*e*
n*x*(2*a + b*n + 2*b*Log[c*x^n]) + 4*b*d^2*n*(3*a + b*n + 3*b*Log[c*x^n]))/
(54*x^3)
```

Maple [C] time = 0.251, size = 2473, normalized size = 14.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] -1/3*b^2*(3*e^2*x^2+3*d*e*x+d^2)/x^3*ln(x^n)^2-1/9*(9*I*Pi*b^2*d*e*x*csgn(I
*x^n)*csgn(I*c*x^n)^2+9*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b^2
*d^2*csgn(I*c*x^n)^3+3*I*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+18*ln(c)*b^
2*e^2*x^2+18*b^2*e^2*n*x^2+18*a*b*e^2*x^2-9*I*Pi*b^2*d*e*x*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+3*I*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)-9*I*Pi*b^2*e^2
*x^2*csgn(I*c*x^n)^3-9*I*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+18*ln(c)*b^2*d*e*x+9*b^2*d*e*n*x+18*a*b*d*e*x+9*I*Pi*b^2*e^2*x^2*csgn(I*x^
n)*csgn(I*c*x^n)^2+9*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b^2*
d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+6*
ln(c)*b^2*d^2+2*b^2*d^2*n+6*a*b*d^2)/x^3*ln(x^n)-1/108*(36*a^2*d^2-108*I*ln
(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-54*I*Pi*b^2*d*e*n*x*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-108*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+108*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b^2*
d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-36*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)+108*a^2*e^2*x^2+8*b^2*d^2*n^2-9*Pi^2*b^2*d^2*csgn(
I*x^n)^2*csgn(I*c*x^n)^4+18*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^5+108*I*
ln(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-108*I*Pi*a*b*d*e*x*csgn(I*c*
x^n)^3+108*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+24*a*b*n*d^2-108*
I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+108*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*x^n)
*csgn(I*c*x^n)^2-108*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^3+36*I*ln(c)*Pi*b^2*d^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c
)-36*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+108*I*n*Pi*b^2*e^2*x^
2*csgn(I*c*x^n)^2*csgn(I*c)-54*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+108*I*Pi*a*
b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-9*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c
)^2+54*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-27*Pi^2*b^2*d
*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+108*I*Pi*a*b*d*e*x*csgn(I*c*
x^n)^2*csgn(I*c)+36*ln(c)^2*b^2*d^2-36*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3-3
6*I*Pi*a*b*d^2*csgn(I*c*x^n)^3+54*I*Pi*b^2*d*e*n*x*csgn(I*c*x^n)^2*csgn(I*c
)-108*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+108*I*ln(c)*Pi*b
^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+108*a^2*d*e*x+216*b*n*a*e^2*x^2+54*Pi^
2*b^2*d*e*x*csgn(I*c*x^n)^5*csgn(I*c)-27*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^4*csg
n(I*c)^2-108*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+54*I*n*
Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+24*ln(c)*b^2*d^2*n+72*ln(c)*a*b*d^
2+18*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)-12*I*Pi*b^2*d^2*n*csgn(I*c*x^n)
^3-36*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+18*Pi^2*b^2*d^2*cs
gn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+216*b^2*e^2*n^2*x^2-108*Pi^2*b^2*d*e*
x*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+54*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(
I*c*x^n)^3*csgn(I*c)^2+216*ln(c)*a*b*d*e*x+108*n*ln(c)*b^2*d*e*x+12*I*Pi*b^
2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)-108*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3+10
8*I*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-108*I*ln(c)*Pi*b^2*e^2*x^2*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+108*I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*c
sgn(I*c)+18*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-9*Pi^2*b^2
```

```
*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-108*Pi^2*b^2*e^2*x^2*csgn(I*
x^n)*csgn(I*c*x^n)^4*csgn(I*c)+54*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n
)^3*csgn(I*c)^2-27*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^4+54*Pi^2*b^2
*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5-108*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)
^3+108*a*b*d*e*n*x+54*b^2*d*e*n^2*x-27*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^6+108
*ln(c)^2*b^2*e^2*x^2+36*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*a*
b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)
^2-27*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^6-27*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn
(I*c*x^n)^4+54*Pi^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+54*Pi^2*b^2*e^2
*x^2*csgn(I*c*x^n)^5*csgn(I*c)-27*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^4*csgn(I*c
)^2-9*Pi^2*b^2*d^2*csgn(I*c*x^n)^6+54*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I
*c*x^n)^3*csgn(I*c)-27*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(
I*c)^2+216*n*ln(c)*b^2*e^2*x^2+108*ln(c)^2*b^2*d*e*x+216*ln(c)*a*b*e^2*x^2)
/x^3
```

Maxima [A] time = 1.22468, size = 338, normalized size = 2.01

$$-2\,b^2e^2\left(\frac{n^2}{x}+\frac{n\log\left(cx^n\right)}{x}\right)-\frac{1}{2}\,b^2de\left(\frac{n^2}{x^2}+\frac{2\,n\log\left(cx^n\right)}{x^2}\right)-\frac{2}{27}\,b^2d^2\left(\frac{n^2}{x^3}+\frac{3\,n\log\left(cx^n\right)}{x^3}\right)-\frac{b^2e^2\log\left(cx^n\right)^2}{x}-\frac{2\,abe^2n}{x}-2$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*b^2*e^2*(n^2/x + n*log(c*x^n)/x) - 1/2*b^2*d*e*(n^2/x^2 + 2*n*log(c*x^n)
/x^2) - 2/27*b^2*d^2*(n^2/x^3 + 3*n*log(c*x^n)/x^3) - b^2*e^2*log(c*x^n)^2/
x - 2*a*b*e^2*n/x - 2*a*b*e^2*log(c*x^n)/x - b^2*d*e*log(c*x^n)^2/x^2 - a*b
*d*e*n/x^2 - a^2*e^2/x - 2*a*b*d*e*log(c*x^n)/x^2 - 1/3*b^2*d^2*log(c*x^n)^
2/x^3 - 2/9*a*b*d^2*n/x^3 - a^2*d*e/x^2 - 2/3*a*b*d^2*log(c*x^n)/x^3 - 1/3*
a^2*d^2/x^3
```

Fricas [B] time = 1.0441, size = 724, normalized size = 4.31

$$-\frac{4\,b^2d^2n^2+12\,abd^2n+18\,a^2d^2+54\left(2\,b^2e^2n^2+2\,abe^2n+a^2e^2\right)x^2+18\left(3\,b^2e^2x^2+3\,b^2dex+b^2d^2\right)\log\left(c\right)^2+18\left(3\,b^2e\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/54*(4*b^2*d^2*n^2 + 12*a*b*d^2*n + 18*a^2*d^2 + 54*(2*b^2*e^2*n^2 + 2*a*
b*e^2*n + a^2*e^2)*x^2 + 18*(3*b^2*e^2*x^2 + 3*b^2*d*e*x + b^2*d^2)*log(c)^
2 + 18*(3*b^2*e^2*n^2*x^2 + 3*b^2*d*e*n^2*x + b^2*d^2*n^2)*log(x)^2 + 27*(b
^2*d*e*n^2 + 2*a*b*d*e*n + 2*a^2*d*e)*x + 6*(2*b^2*d^2*n + 6*a*b*d^2 + 18*(
b^2*e^2*n + a*b*e^2)*x^2 + 9*(b^2*d*e*n + 2*a*b*d*e)*x)*log(c) + 6*(2*b^2*d
^2*n^2 + 6*a*b*d^2*n + 18*(b^2*e^2*n^2 + a*b*e^2*n)*x^2 + 9*(b^2*d*e*n^2 +
2*a*b*d*e*n)*x + 6*(3*b^2*e^2*n*x^2 + 3*b^2*d*e*n*x + b^2*d^2*n)*log(c))*lo
g(x))/x^3
```

Sympy [B] time = 3.90587, size = 479, normalized size = 2.85

$$-\frac{a^2d^2}{3x^3} - \frac{a^2de}{x^2} - \frac{a^2e^2}{x} - \frac{2abd^2n\log(x)}{3x^3} - \frac{2abd^2n}{9x^3} - \frac{2abd^2\log(c)}{3x^3} - \frac{2abden\log(x)}{x^2} - \frac{abden}{x^2} - \frac{2abde\log(c)}{x^2} - \frac{2abe^2n\log}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x**4,x)
```

```
[Out] -a**2*d**2/(3*x**3) - a**2*d*e/x**2 - a**2*e**2/x - 2*a*b*d**2*n*log(x)/(3*
x**3) - 2*a*b*d**2*n/(9*x**3) - 2*a*b*d**2*log(c)/(3*x**3) - 2*a*b*d*e*n*lo
g(x)/x**2 - a*b*d*e*n/x**2 - 2*a*b*d*e*log(c)/x**2 - 2*a*b*e**2*n*log(x)/x
- 2*a*b*e**2*n/x - 2*a*b*e**2*log(c)/x - b**2*d**2*n**2*log(x)**2/(3*x**3)
- 2*b**2*d**2*n**2*log(x)/(9*x**3) - 2*b**2*d**2*n**2/(27*x**3) - 2*b**2*d*
*2*n*log(c)*log(x)/(3*x**3) - 2*b**2*d**2*n*log(c)/(9*x**3) - b**2*d**2*log
(c)**2/(3*x**3) - b**2*d*e*n**2*log(x)**2/x**2 - b**2*d*e*n**2*log(x)/x**2
- b**2*d*e*n**2/(2*x**2) - 2*b**2*d*e*n*log(c)*log(x)/x**2 - b**2*d*e*n*log
(c)/x**2 - b**2*d*e*log(c)**2/x**2 - b**2*e**2*n**2*log(x)**2/x - 2*b**2*e*
*2*n**2*log(x)/x - 2*b**2*e**2*n**2/x - 2*b**2*e**2*n*log(c)*log(x)/x - 2*b
**2*e**2*n*log(c)/x - b**2*e**2*log(c)**2/x
```

Giac [B] time = 1.36316, size = 494, normalized size = 2.94

$$-\frac{54\,b^2n^2x^2e^2\log(x)^2 + 54\,b^2dn^2xe\log(x)^2 + 108\,b^2n^2x^2e^2\log(x) + 54\,b^2dn^2xe\log(x) + 108\,b^2nx^2e^2\log(c)\log(x) + 108}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/54*(54*b^2*n^2*x^2*e^2*log(x)^2 + 54*b^2*d*n^2*x*e*log(x)^2 + 108*b^2*n^
2*x^2*e^2*log(x) + 54*b^2*d*n^2*x*e*log(x) + 108*b^2*n*x^2*e^2*log(c)*log(x
) + 108*b^2*d*n*x*e*log(c)*log(x) + 18*b^2*d^2*n^2*log(x)^2 + 108*b^2*n^2*x
^2*e^2 + 27*b^2*d*n^2*x*e + 108*b^2*n*x^2*e^2*log(c) + 54*b^2*d*n*x*e*log(c
) + 54*b^2*x^2*e^2*log(c)^2 + 54*b^2*d*x*e*log(c)^2 + 12*b^2*d^2*n^2*log(x)
 + 108*a*b*n*x^2*e^2*log(x) + 108*a*b*d*n*x*e*log(x) + 36*b^2*d^2*n*log(c)*
log(x) + 4*b^2*d^2*n^2 + 108*a*b*n*x^2*e^2 + 54*a*b*d*n*x*e + 12*b^2*d^2*n*
log(c) + 108*a*b*x^2*e^2*log(c) + 108*a*b*d*x*e*log(c) + 18*b^2*d^2*log(c)^
2 + 36*a*b*d^2*n*log(x) + 12*a*b*d^2*n + 54*a^2*x^2*e^2 + 54*a^2*d*x*e + 36
*a*b*d^2*log(c) + 18*a^2*d^2)/x^3
```

3.91 $\int \frac{(d+ex)^2(a+b\log(cx^n))^2}{x^5}\,dx$

Optimal. Leaf size=178

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-$$

```
[Out] -(b^2*d^2*n^2)/(32*x^4) - (4*b^2*d*e*n^2)/(27*x^3) - (b^2*e^2*n^2)/(4*x^2)
- (b*d^2*n*(a + b*Log[c*x^n]))/(8*x^4) - (4*b*d*e*n*(a + b*Log[c*x^n]))/(9*
x^3) - (b*e^2*n*(a + b*Log[c*x^n]))/(2*x^2) - (d^2*(a + b*Log[c*x^n])^2)/(4
*x^4) - (2*d*e*(a + b*Log[c*x^n])^2)/(3*x^3) - (e^2*(a + b*Log[c*x^n])^2)/(
2*x^2)
```

Rubi [A] time = 0.205352, antiderivative size = 178, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {2353, 2305, 2304}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{4x^4}-\frac{bd^2n\left(a+b\log\left(cx^n\right)\right)}{8x^4}-\frac{2de\left(a+b\log\left(cx^n\right)\right)^2}{3x^3}-\frac{4bden\left(a+b\log\left(cx^n\right)\right)}{9x^3}-\frac{e^2\left(a+b\log\left(cx^n\right)\right)^2}{2x^2}-$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^5,x]
```



```
[Out] -(b^2*d^2*n^2)/(32*x^4) - (4*b^2*d*e*n^2)/(27*x^3) - (b^2*e^2*n^2)/(4*x^2)
- (b*d^2*n*(a + b*Log[c*x^n]))/(8*x^4) - (4*b*d*e*n*(a + b*Log[c*x^n]))/(9*
x^3) - (b*e^2*n*(a + b*Log[c*x^n]))/(2*x^2) - (d^2*(a + b*Log[c*x^n])^2)/(4
*x^4) - (2*d*e*(a + b*Log[c*x^n])^2)/(3*x^3) - (e^2*(a + b*Log[c*x^n])^2)/(
2*x^2)
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
```

```
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d+ex)^2 (a+b\log(cx^n))^2}{x^5}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))^2}{x^5} + \frac{2de(a+b\log(cx^n))^2}{x^4} + \frac{e^2 (a+b\log(cx^n))^2}{x^3}\right) dx$$
$$= d^2 \int \frac{(a+b\log(cx^n))^2}{x^5}\,dx + (2de)\int \frac{(a+b\log(cx^n))^2}{x^4}\,dx + e^2 \int \frac{(a+b\log(cx^n))^2}{x^3}$$
$$= -\frac{d^2 (a+b\log(cx^n))^2}{4x^4} - \frac{2de(a+b\log(cx^n))^2}{3x^3} - \frac{e^2 (a+b\log(cx^n))^2}{2x^2} + \frac{1}{2}\left(bd^2 n\right)\int$$
$$= -\frac{b^2 d^2 n^2}{32x^4} - \frac{4b^2 den^2}{27x^3} - \frac{b^2 e^2 n^2}{4x^2} - \frac{bd^2 n(a+b\log(cx^n))}{8x^4} - \frac{4bden(a+b\log(cx^n))}{9x^3} - b$$

Mathematica [A] time = 0.0917837, size = 134, normalized size = 0.75

$$-\frac{216d^2 (a+b\log(cx^n))^2 + 27bd^2 n(4a+4b\log(cx^n)+bn) + 576dex(a+b\log(cx^n))^2 + 128bdenx(3a+3b\log(cx^n)+}{864x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^2*(a + b*Log[c*x^n])^2)/x^5,x]
```

```
[Out] -(216*d^2*(a + b*Log[c*x^n])^2 + 576*d*e*x*(a + b*Log[c*x^n])^2 + 432*e^2*x
^2*(a + b*Log[c*x^n])^2 + 216*b*e^2*n*x^2*(2*a + b*n + 2*b*Log[c*x^n]) + 12
8*b*d*e*n*x*(3*a + b*n + 3*b*Log[c*x^n]) + 27*b*d^2*n*(4*a + b*n + 4*b*Log[
c*x^n]))/(864*x^4)
```

Maple [C] time = 0.254, size = 2475, normalized size = 13.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(a+b*ln(c*x^n))^2/x^5,x)
```

```
[Out] -1/12*b^2*(6*e^2*x^2+8*d*e*x+3*d^2)/x^4*ln(x^n)^2-1/72*(-48*I*Pi*b^2*d*e*x*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+48*I*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*
x^n)^2-48*I*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+18*I*Pi*b^2*d^2*csgn(I*x^n)*csgn(I
*c*x^n)^2+72*ln(c)*b^2*e^2*x^2+36*b^2*e^2*n*x^2+72*a*b*e^2*x^2-36*I*Pi*b^2*
e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+36*I*Pi*b^2*e^2*x^2*csgn(I*x^n)
*csgn(I*c*x^n)^2-36*I*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3+36*I*Pi*b^2*e^2*x^2*cs
gn(I*c*x^n)^2*csgn(I*c)+96*ln(c)*b^2*d*e*x+32*b^2*d*e*n*x+96*a*b*d*e*x+48*I
*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b^2*d^2*csgn(I*c*x^n)^2*csg
n(I*c)-18*I*Pi*b^2*d^2*csgn(I*c*x^n)^3-18*I*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)+36*ln(c)*b^2*d^2+9*b^2*d^2*n+36*a*b*d^2)/x^4*ln(x^n)-1/864*
(216*a^2*d^2-192*I*Pi*b^2*d*e*n*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-576*I
*Pi*a*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-576*I*ln(c)*Pi*b^2*d*e*x*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+432*a^2*e^2*x^2+27*b^2*d^2*n^2-54*Pi^2*
b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+108*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c
*x^n)^5+108*a*b*n*d^2-54*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c)^2+288*Pi^2*
b^2*d*e*x*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-144*Pi^2*b^2*d*e*x*csgn(I
*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+216*ln(c)^2*b^2*d^2+576*a^2*d*e*x+432*b
*n*a*e^2*x^2+432*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+432*I*l
n(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-216*I*ln(c)*Pi*b^2*d^2*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-216*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)-576*I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^3+432*I*Pi*a*b*e^2*x^2*csgn(
I*c*x^n)^2*csgn(I*c)+432*I*Pi*a*b*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-54*I*
Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-576*I*Pi*a*b*d*e*x*csgn(I*
c*x^n)^3+216*I*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+216*I*n*Pi*b^2*
e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-192*I*n*Pi*b^2*d*e*x*csgn(I*c*x^n)^3-54*I
*Pi*b^2*d^2*n*csgn(I*c*x^n)^3+288*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^5*csgn(I*c)-
144*Pi^2*b^2*d*e*x*csgn(I*c*x^n)^4*csgn(I*c)^2+108*ln(c)*b^2*d^2*n+432*ln(c
)*a*b*d^2+108*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)-216*Pi^2*b^2*d^2*csgn(
I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+108*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)
^3*csgn(I*c)^2+216*b^2*e^2*n^2*x^2-576*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*
x^n)^4*csgn(I*c)+288*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2
+192*I*n*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2+576*I*Pi*a*b*d*e*x*csgn(I
*x^n)*csgn(I*c*x^n)^2-432*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+576*I*ln(c)*Pi*b^2*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+1152*ln(c)*a*b
*d*e*x+384*n*ln(c)*b^2*d*e*x+108*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3
*csgn(I*c)-54*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-432*Pi
^2*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+216*Pi^2*b^2*e^2*x^2*c
sgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-144*Pi^2*b^2*d*e*x*csgn(I*x^n)^2*csg
n(I*c*x^n)^4+288*Pi^2*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^5+54*I*Pi*b^2*d^2
*n*csgn(I*x^n)*csgn(I*c*x^n)^2+54*I*Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)-
216*I*Pi*a*b*d^2*csgn(I*c*x^n)^3-216*I*n*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-432
*I*ln(c)*Pi*b^2*e^2*x^2*csgn(I*c*x^n)^3-432*I*Pi*a*b*e^2*x^2*csgn(I*c*x^n)^
```

```
3+384*a*b*d*e*n*x+128*b^2*d*e*n^2*x-108*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^6+43
2*ln(c)^2*b^2*e^2*x^2+216*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+57
6*I*Pi*a*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+192*I*Pi*b^2*d*e*n*x*csgn(I*c*x^
n)^2*csgn(I*c)-216*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3-144*Pi^2*b^2*d*e*x*cs
gn(I*c*x^n)^6-108*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+216*Pi^2*b
^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^5+216*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^5
*csgn(I*c)-108*Pi^2*b^2*e^2*x^2*csgn(I*c*x^n)^4*csgn(I*c)^2-54*Pi^2*b^2*d^2
*csgn(I*c*x^n)^6+576*I*ln(c)*Pi*b^2*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-216*I
*n*Pi*b^2*e^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-432*I*Pi*a*b*e^2*x^2*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+216*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn
(I*c*x^n)^3*csgn(I*c)-108*Pi^2*b^2*e^2*x^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*cs
gn(I*c)^2+216*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)+216*I*Pi*a*b*d^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+216*I*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+432
*n*ln(c)*b^2*e^2*x^2+576*ln(c)^2*b^2*d*e*x+864*ln(c)*a*b*e^2*x^2)/x^4
```

Maxima [A] time = 1.13299, size = 339, normalized size = 1.9

$$-\frac{1}{4}b^2e^2\left(\frac{n^2}{x^2}+\frac{2n\log(cx^n)}{x^2}\right)-\frac{4}{27}b^2de\left(\frac{n^2}{x^3}+\frac{3n\log(cx^n)}{x^3}\right)-\frac{1}{32}b^2d^2\left(\frac{n^2}{x^4}+\frac{4n\log(cx^n)}{x^4}\right)-\frac{b^2e^2\log(cx^n)^2}{2x^2}-\frac{abe^2n}{2x^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*b^2*e^2*(n^2/x^2 + 2*n*log(c*x^n)/x^2) - 4/27*b^2*d*e*(n^2/x^3 + 3*n*l
og(c*x^n)/x^3) - 1/32*b^2*d^2*(n^2/x^4 + 4*n*log(c*x^n)/x^4) - 1/2*b^2*e^2*
log(c*x^n)^2/x^2 - 1/2*a*b*e^2*n/x^2 - a*b*e^2*log(c*x^n)/x^2 - 2/3*b^2*d*e
*log(c*x^n)^2/x^3 - 4/9*a*b*d*e*n/x^3 - 1/2*a^2*e^2/x^2 - 4/3*a*b*d*e*log(c
*x^n)/x^3 - 1/4*b^2*d^2*log(c*x^n)^2/x^4 - 1/8*a*b*d^2*n/x^4 - 2/3*a^2*d*e/
x^3 - 1/2*a*b*d^2*log(c*x^n)/x^4 - 1/4*a^2*d^2/x^4
```

Fricas [B] time = 1.04074, size = 756, normalized size = 4.25

$$-\frac{27b^2d^2n^2+108abd^2n+216a^2d^2+216\left(b^2e^2n^2+2abe^2n+2a^2e^2\right)x^2+72\left(6b^2e^2x^2+8b^2dex+3b^2d^2\right)\log(c)^2+72}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^5,x, algorithm="fricas")
```

```
[Out] -1/864*(27*b^2*d^2*n^2 + 108*a*b*d^2*n + 216*a^2*d^2 + 216*(b^2*e^2*n^2 + 2
*a*b*e^2*n + 2*a^2*e^2)*x^2 + 72*(6*b^2*e^2*x^2 + 8*b^2*d*e*x + 3*b^2*d^2)*
log(c)^2 + 72*(6*b^2*e^2*n^2*x^2 + 8*b^2*d*e*n^2*x + 3*b^2*d^2*n^2)*log(x)^
2 + 64*(2*b^2*d*e*n^2 + 6*a*b*d*e*n + 9*a^2*d*e)*x + 12*(9*b^2*d^2*n + 36*a
*b*d^2 + 36*(b^2*e^2*n + 2*a*b*e^2)*x^2 + 32*(b^2*d*e*n + 3*a*b*d*e)*x)*log
(c) + 12*(9*b^2*d^2*n^2 + 36*a*b*d^2*n + 36*(b^2*e^2*n^2 + 2*a*b*e^2*n)*x^2
 + 32*(b^2*d*e*n^2 + 3*a*b*d*e*n)*x + 12*(6*b^2*e^2*n*x^2 + 8*b^2*d*e*n*x +
 3*b^2*d^2*n)*log(c))*log(x))/x^4
```

Sympy [B] time = 5.57175, size = 512, normalized size = 2.88

$$-\frac{a^2d^2}{4x^4}-\frac{2a^2de}{3x^3}-\frac{a^2e^2}{2x^2}-\frac{abd^2n\log(x)}{2x^4}-\frac{abd^2n}{8x^4}-\frac{abd^2\log(c)}{2x^4}-\frac{4abden\log(x)}{3x^3}-\frac{4abden}{9x^3}-\frac{4abde\log(c)}{3x^3}-\frac{abe^2n\log(x}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**2/x**5,x)
```

```
[Out] -a**2*d**2/(4*x**4) - 2*a**2*d*e/(3*x**3) - a**2*e**2/(2*x**2) - a*b*d**2*n
*log(x)/(2*x**4) - a*b*d**2*n/(8*x**4) - a*b*d**2*log(c)/(2*x**4) - 4*a*b*d
*e*n*log(x)/(3*x**3) - 4*a*b*d*e*n/(9*x**3) - 4*a*b*d*e*log(c)/(3*x**3) - a
*b*e**2*n*log(x)/x**2 - a*b*e**2*n/(2*x**2) - a*b*e**2*log(c)/x**2 - b**2*d
**2*n**2*log(x)**2/(4*x**4) - b**2*d**2*n**2*log(x)/(8*x**4) - b**2*d**2*n*
*2/(32*x**4) - b**2*d**2*n*log(c)*log(x)/(2*x**4) - b**2*d**2*n*log(c)/(8*x
**4) - b**2*d**2*log(c)**2/(4*x**4) - 2*b**2*d*e*n**2*log(x)**2/(3*x**3) -
4*b**2*d*e*n**2*log(x)/(9*x**3) - 4*b**2*d*e*n**2/(27*x**3) - 4*b**2*d*e*n*
log(c)*log(x)/(3*x**3) - 4*b**2*d*e*n*log(c)/(9*x**3) - 2*b**2*d*e*log(c)**
2/(3*x**3) - b**2*e**2*n**2*log(x)**2/(2*x**2) - b**2*e**2*n**2*log(x)/(2*x
**2) - b**2*e**2*n**2/(4*x**2) - b**2*e**2*n*log(c)*log(x)/x**2 - b**2*e**2
*n*log(c)/(2*x**2) - b**2*e**2*log(c)**2/(2*x**2)
```

Giac [B] time = 1.30862, size = 494, normalized size = 2.78

$$-\frac{432\,b^2n^2x^2e^2\log(x)^2+576\,b^2dn^2xe\log(x)^2+432\,b^2n^2x^2e^2\log(x)+384\,b^2dn^2xe\log(x)+864\,b^2nx^2e^2\log(c)\log(x)+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^2/x^5,x, algorithm="giac")
```

```
[Out] -1/864*(432*b^2*n^2*x^2*e^2*log(x)^2 + 576*b^2*d*n^2*x*e*log(x)^2 + 432*b^2
*n^2*x^2*e^2*log(x) + 384*b^2*d*n^2*x*e*log(x) + 864*b^2*n*x^2*e^2*log(c)*l
og(x) + 1152*b^2*d*n*x*e*log(c)*log(x) + 216*b^2*d^2*n^2*log(x)^2 + 216*b^2
*n^2*x^2*e^2 + 128*b^2*d*n^2*x*e + 432*b^2*n*x^2*e^2*log(c) + 384*b^2*d*n*x
*e*log(c) + 432*b^2*x^2*e^2*log(c)^2 + 576*b^2*d*x*e*log(c)^2 + 108*b^2*d^2
*n^2*log(x) + 864*a*b*n*x^2*e^2*log(x) + 1152*a*b*d*n*x*e*log(x) + 432*b^2*
d^2*n*log(c)*log(x) + 27*b^2*d^2*n^2 + 432*a*b*n*x^2*e^2 + 384*a*b*d*n*x*e
+ 108*b^2*d^2*n*log(c) + 864*a*b*x^2*e^2*log(c) + 1152*a*b*d*x*e*log(c) + 2
16*b^2*d^2*log(c)^2 + 432*a*b*d^2*n*log(x) + 108*a*b*d^2*n + 432*a^2*x^2*e^
2 + 576*a^2*d*x*e + 432*a*b*d^2*log(c) + 216*a^2*d^2)/x^4
```

3.92 $\int \frac{x^3(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=271

$$-\frac{2bd^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}+\frac{2b^2d^3n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}-\frac{d^3\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e^4}+\frac{d^2x(a+b\log}{e^3}$$

```
[Out] (-2*a*b*d^2*n*x)/e^3 + (2*b^2*d^2*n^2*x)/e^3 - (b^2*d*n^2*x^2)/(4*e^2) + (2
*b^2*n^2*x^3)/(27*e) - (2*b^2*d^2*n*x*Log[c*x^n])/e^3 + (b*d*n*x^2*(a + b*L
og[c*x^n]))/(2*e^2) - (2*b*n*x^3*(a + b*Log[c*x^n]))/(9*e) + (d^2*x*(a + b*
Log[c*x^n])^2)/e^3 - (d*x^2*(a + b*Log[c*x^n])^2)/(2*e^2) + (x^3*(a + b*Log
[c*x^n])^2)/(3*e) - (d^3*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^4 - (2*b*
d^3*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 + (2*b^2*d^3*n^2*PolyL
og[3, -((e*x)/d)])/e^4
```

Rubi [A] time = 0.276486, antiderivative size = 271, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2296, 2295, 2305, 2304, 2317, 2374, 6589}

$$-\frac{2bd^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}+\frac{2b^2d^3n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}-\frac{d^3\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e^4}+\frac{d^2x(a+b\log}{e^3}$$

Antiderivative was successfully verified.

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


```
[Out] (-2*a*b*d^2*n*x)/e^3 + (2*b^2*d^2*n^2*x)/e^3 - (b^2*d*n^2*x^2)/(4*e^2) + (2
*b^2*n^2*x^3)/(27*e) - (2*b^2*d^2*n*x*Log[c*x^n])/e^3 + (b*d*n*x^2*(a + b*L
og[c*x^n]))/(2*e^2) - (2*b*n*x^3*(a + b*Log[c*x^n]))/(9*e) + (d^2*x*(a + b*
Log[c*x^n])^2)/e^3 - (d*x^2*(a + b*Log[c*x^n])^2)/(2*e^2) + (x^3*(a + b*Log
[c*x^n])^2)/(3*e) - (d^3*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^4 - (2*b*
d^3*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 + (2*b^2*d^3*n^2*PolyL
og[3, -((e*x)/d)])/e^4
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
```

```
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))^2}{d+ex}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))^2}{e^3} - \frac{dx (a+b\log(cx^n))^2}{e^2} + \frac{x^2 (a+b\log(cx^n))^2}{e} - \frac{d^3 (a+b\log(cx^n))}{e^3(d+ex)}\right.$$

$$= \frac{d^2 \int (a+b\log(cx^n))^2\,dx}{e^3} - \frac{d^3 \int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e^3} - \frac{d \int x (a+b\log(cx^n))^2\,dx}{e^2} + \frac{\int x^2 (a+b}{}$$

$$= \frac{d^2 x (a+b\log(cx^n))^2}{e^3} - \frac{dx^2 (a+b\log(cx^n))^2}{2e^2} + \frac{x^3 (a+b\log(cx^n))^2}{3e} - \frac{d^3 (a+b\log(cx^n))^2}{e^4}$$

$$= -\frac{2abd^2nx}{e^3} - \frac{b^2dn^2x^2}{4e^2} + \frac{2b^2n^2x^3}{27e} + \frac{bdnx^2 (a+b\log(cx^n))}{2e^2} - \frac{2bnx^3 (a+b\log(cx^n))}{9e} + \frac{d^2x}{}$$

$$= -\frac{2abd^2nx}{e^3} + \frac{2b^2d^2n^2x}{e^3} - \frac{b^2dn^2x^2}{4e^2} + \frac{2b^2n^2x^3}{27e} - \frac{2b^2d^2nx\log(cx^n)}{e^3} + \frac{bdnx^2 (a+b\log(cx^n))}{2e^2}$$

Mathematica [A] time = 0.162462, size = 211, normalized size = 0.78

$$-\frac{216bd^3n\left(\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) - bn\text{PolyLog}\left(3,-\frac{ex}{d}\right)\right) + 108d^3\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2 - 108d^2ex\,(a}{}$$

Antiderivative was successfully verified.

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

```
[Out] -(-108*d^2*e*x*(a + b*Log[c*x^n])^2 + 54*d*e^2*x^2*(a + b*Log[c*x^n])^2 - 3
6*e^3*x^3*(a + b*Log[c*x^n])^2 + 216*b*d^2*e*n*x*(a - b*n + b*Log[c*x^n]) -
 8*b*e^3*n*x^3*(b*n - 3*(a + b*Log[c*x^n])) + 27*b*d*e^2*n*x^2*(b*n - 2*(a
+ b*Log[c*x^n])) + 108*d^3*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 216*b*d^
3*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]
))/(108*e^4)
```

Maple [F] time = 0.749, size = 0, normalized size = 0.

$$\int \frac{x^3 (a+b\ln(cx^n))^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{1}{6}a^2\left(\frac{6\,d^3\log\left(ex+d\right)}{e^4}-\frac{2\,e^2x^3-3\,dex^2+6\,d^2x}{e^3}\right)+\int\frac{b^2x^3\log\left(x^n\right)^2+2\left(b^2\log\left(c\right)+ab\right)x^3\log\left(x^n\right)+\left(b^2\log\left(c\right)^2+2\right.}{ex+d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b^2x^3\log\left(cx^n\right)^2+2\,abx^3\log\left(cx^n\right)+a^2x^3}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{x^3\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x), x)
```

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

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2x^3}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.93 $\int \frac{x^2(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=200

$$\frac{2bd^2n\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^3}-\frac{2b^2d^2n^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}+\frac{d^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e^3}-\frac{dx\,(a+b\log}{e^2}$$

```
[Out] (2*a*b*d*n*x)/e^2 - (2*b^2*d*n^2*x)/e^2 + (b^2*n^2*x^2)/(4*e) + (2*b^2*d*n*
x*Log[c*x^n])/e^2 - (b*n*x^2*(a + b*Log[c*x^n]))/(2*e) - (d*x*(a + b*Log[c*
x^n])^2)/e^2 + (x^2*(a + b*Log[c*x^n])^2)/(2*e) + (d^2*(a + b*Log[c*x^n])^2
*Log[1 + (e*x)/d])/e^3 + (2*b*d^2*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d
)])/e^3 - (2*b^2*d^2*n^2*PolyLog[3, -((e*x)/d)])/e^3
```

Rubi [A] time = 0.216537, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2296, 2295, 2305, 2304, 2317, 2374, 6589}

$$\frac{2bd^2n\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^3}-\frac{2b^2d^2n^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}+\frac{d^2\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e^3}-\frac{dx\,(a+b\log}{e^2}$$

Antiderivative was successfully verified.

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


```
[Out] (2*a*b*d*n*x)/e^2 - (2*b^2*d*n^2*x)/e^2 + (b^2*n^2*x^2)/(4*e) + (2*b^2*d*n*
x*Log[c*x^n])/e^2 - (b*n*x^2*(a + b*Log[c*x^n]))/(2*e) - (d*x*(a + b*Log[c*
x^n])^2)/e^2 + (x^2*(a + b*Log[c*x^n])^2)/(2*e) + (d^2*(a + b*Log[c*x^n])^2
*Log[1 + (e*x)/d])/e^3 + (2*b*d^2*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d
)])/e^3 - (2*b^2*d^2*n^2*PolyLog[3, -((e*x)/d)])/e^3
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
```

```
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2 (a + b\log(cx^n))^2}{d + ex} dx = \int \left(-\frac{d (a + b\log(cx^n))^2}{e^2} + \frac{x (a + b\log(cx^n))^2}{e} + \frac{d^2 (a + b\log(cx^n))^2}{e^2(d + ex)}\right) dx$$

$$= -\frac{d \int (a + b\log(cx^n))^2 \, dx}{e^2} + \frac{d^2 \int \frac{(a+b\log(cx^n))^2}{d+ex} dx}{e^2} + \frac{\int x (a + b\log(cx^n))^2 \, dx}{e}$$

$$= -\frac{dx (a + b\log(cx^n))^2}{e^2} + \frac{x^2 (a + b\log(cx^n))^2}{2e} + \frac{d^2 (a + b\log(cx^n))^2 \log\left(1 + \frac{ex}{d}\right)}{e^3} - \frac{\left(2bd^2n\right.}{}$$

$$= \frac{2abdnx}{e^2} + \frac{b^2n^2x^2}{4e} - \frac{bnx^2 (a + b\log(cx^n))}{2e} - \frac{dx (a + b\log(cx^n))^2}{e^2} + \frac{x^2 (a + b\log(cx^n))^2}{2e} +$$

$$= \frac{2abdnx}{e^2} - \frac{2b^2dn^2x}{e^2} + \frac{b^2n^2x^2}{4e} + \frac{2b^2dnx\log(cx^n)}{e^2} - \frac{bnx^2 (a + b\log(cx^n))}{2e} - \frac{dx (a + b\log(}{e^2}$$

Mathematica [A] time = 0.09759, size = 158, normalized size = 0.79

$$\frac{8bd^2n \left(\text{PolyLog}\left(2, -\frac{ex}{d}\right)(a + b\log(cx^n)) - bn\text{PolyLog}\left(3, -\frac{ex}{d}\right)\right) + 4d^2\log\left(\frac{ex}{d} + 1\right)(a + b\log(cx^n))^2 - 4dex (a + b\log}{4e^3}$$

Antiderivative was successfully verified.

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

```
[Out] (-4*d*e*x*(a + b*Log[c*x^n])^2 + 2*e^2*x^2*(a + b*Log[c*x^n])^2 + 8*b*d*e*n
*x*(a - b*n + b*Log[c*x^n]) + b*e^2*n*x^2*(b*n - 2*(a + b*Log[c*x^n])) + 4*
d^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 8*b*d^2*n*((a + b*Log[c*x^n])*P
olyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/(4*e^3)
```

Maple [F] time = 0.704, size = 0, normalized size = 0.

$$\int \frac{x^2 (a + b\ln(cx^n))^2}{ex + d} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{1}{2}\,a^2\left(\frac{2\,d^2\log\left(ex+d\right)}{e^3}+\frac{ex^2-2\,dx}{e^2}\right)+\int\frac{b^2x^2\log\left(x^n\right)^2+2\left(b^2\log\left(c\right)+ab\right)x^2\log\left(x^n\right)+\left(b^2\log\left(c\right)^2+2\,ab\log\left(c\right)\right)x^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b^2x^2\log\left(cx^n\right)^2+2\,abx^2\log\left(cx^n\right)+a^2x^2}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x), x)
```

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

$$\int \frac{(b\log (cx^n) + a)^2 x^2}{ex + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.94 $\int \frac{x(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=130

$$-\frac{2bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^2}+\frac{2b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^2}-\frac{d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e^2}+\frac{x(a+b\log(cx}{e}$$

```
[Out] (-2*a*b*n*x)/e + (2*b^2*n^2*x)/e - (2*b^2*n*x*Log[c*x^n])/e + (x*(a + b*Log
[c*x^n])^2)/e - (d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^2 - (2*b*d*n*(a
 + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^2 + (2*b^2*d*n^2*PolyLog[3, -((e
*x)/d)])/e^2
```

Rubi [A] time = 0.155189, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2353, 2296, 2295, 2317, 2374, 6589}

$$-\frac{2bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^2}+\frac{2b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^2}-\frac{d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e^2}+\frac{x(a+b\log(cx}{e}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*a*b*n*x)/e + (2*b^2*n^2*x)/e - (2*b^2*n*x*Log[c*x^n])/e + (x*(a + b*Log
[c*x^n])^2)/e - (d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^2 - (2*b*d*n*(a
 + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^2 + (2*b^2*d*n^2*PolyLog[3, -((e
*x)/d)])/e^2
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
```

```
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x\,(a+b\log(cx^n))^2}{d+ex}\,dx = \int \left(\frac{(a+b\log(cx^n))^2}{e} - \frac{d\,(a+b\log(cx^n))^2}{e(d+ex)}\right)dx$$

$$= \frac{\int (a+b\log(cx^n))^2\,dx}{e} - \frac{d\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e}$$

$$= \frac{x\,(a+b\log(cx^n))^2}{e} - \frac{d\,(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{(2bdn)\int \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e^2} -$$

$$= -\frac{2abnx}{e} + \frac{x\,(a+b\log(cx^n))^2}{e} - \frac{d\,(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e^2} - \frac{2bdn\,(a+b\log(cx^n))\,\mathrm{Li}}{e^2}$$

$$= -\frac{2abnx}{e} + \frac{2b^2n^2x}{e} - \frac{2b^2nx\log(cx^n)}{e} + \frac{x\,(a+b\log(cx^n))^2}{e} - \frac{d\,(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right.}{e^2}$$

Mathematica [A] time = 0.0648672, size = 103, normalized size = 0.79

$$\frac{-2bdn\left(\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))-bn\text{PolyLog}\left(3,-\frac{ex}{d}\right)\right)-d\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2+ex(a+b\log(cx^n))}{e^2}$$

Antiderivative was successfully verified.

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

```
[Out] (e*x*(a + b*Log[c*x^n])^2 - 2*b*e*n*x*(a - b*n + b*Log[c*x^n]) - d*(a + b*L
og[c*x^n])^2*Log[1 + (e*x)/d] - 2*b*d*n*((a + b*Log[c*x^n])*PolyLog[2, -((e
*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/e^2
```

Maple [F] time = 0.718, size = 0, normalized size = 0.

$$\int \frac{x(a+b\ln(cx^n))^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$a^2\left(\frac{x}{e}-\frac{d\log(ex+d)}{e^2}\right)+\int \frac{b^2x\log(x^n)^2+2\left(b^2\log(c)+ab\right)x\log(x^n)+\left(b^2\log(c)^2+2\,ab\log(c)\right)x}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b^2x\log\left(cx^n\right)^2+2\,abx\log\left(cx^n\right)+a^2x}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{x\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x), x)
```

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

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2x}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.95 $\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx$

Optimal. Leaf size=72

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e}+\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e}$$

```
[Out] ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e + (2*b*n*(a + b*Log[c*x^n])*PolyL
og[2, -((e*x)/d)])/e - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e
```

Rubi [A] time = 0.0610311, antiderivative size = 72, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.15, Rules used = {2317, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e}+\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{e}$$

Antiderivative was successfully verified.

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

```
[Out] ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e + (2*b*n*(a + b*Log[c*x^n])*PolyL
og[2, -((e*x)/d)])/e - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e
```

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx &= \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e}-\frac{(2bn)\int \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e}\\ &= \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e}+\frac{2bn(a+b\log(cx^n))\,\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{e}-\frac{\left(2b^2n^2\right)\int \frac{\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{x}\,dx}{e}\\ &= \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e}+\frac{2bn(a+b\log(cx^n))\,\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{e}-\frac{2b^2n^2\mathrm{Li}_3\left(-\frac{ex}{d}\right)}{e}\end{aligned}$$

Mathematica [A] time = 0.0252999, size = 68, normalized size = 0.94

$$\frac{\log\left(\frac{d+ex}{d}\right)(a+b\log(cx^n))^2}{e}-\frac{2bn\left(bn\text{PolyLog}\left(3,-\frac{ex}{d}\right)-\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))\right)}{e}$$

Antiderivative was successfully verified.

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

```
[Out] ((a + b*Log[c*x^n])^2*Log[(d + e*x)/d])/e - (2*b*n*(-((a + b*Log[c*x^n])*Po
lyLog[2, -((e*x)/d)]) + b*n*PolyLog[3, -((e*x)/d)]))/e
```

Maple [C] time = 0.295, size = 1412, normalized size = 19.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*b/e*n*ln(e*x+d)*ln(-e*x/d)*a+I/e*n*ln(e*x+d)*ln(-e*x/d)*b^2*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(e*x+d)/e*ln(c)*Pi*b^2*csgn(I*c*x^n)^3+1/2*l
n(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+1/2*ln(e*x+d)/e
```

```
*Pi^2*b^2*csgn(I*c*x^n)^5*csgn(I*c)-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*c*x^n)^
4*csgn(I*c)^2-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-2*b^2*
ln(e*x+d)/e*ln(x^n)*ln(x)*n+2*b^2*n*ln(x)*ln((e*x+d)/d)/e*ln(x^n)+1/2*ln(e*
x+d)/e*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^5-I*ln(e*x+d)/e*ln(c)*Pi*b^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/e*n*ln(e*x+d)*ln(-e*x/d)*b^2*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*c
sgn(I*c)^2-ln(e*x+d)/e*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+I/e*n
*dilog(-e*x/d)*b^2*Pi*csgn(I*c*x^n)^3-I*ln(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*c
*x^n)^3-2*b/e*n*dilog(-e*x/d)*a-I/e*n*ln(e*x+d)*ln(-e*x/d)*b^2*Pi*csgn(I*c*
x^n)^2*csgn(I*c)+ln(e*x+d)/e*ln(c)^2*b^2+I/e*n*dilog(-e*x/d)*b^2*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)-I*ln(e*x+d)/e*Pi*a*b*csgn(I*c*x^n)^3+1/2*ln(e*x+d)/e*Pi^
2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-I/e*n*dilog(-e*x/d)*b^2*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2-I/e*n*dilog(-e*x/d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I
*c)+I*ln(e*x+d)/e*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)-2/e*n*ln(e*x+d)*ln
(-e*x/d)*b^2*ln(c)+b^2*ln(e*x+d)/e*ln(x^n)^2-I*ln(e*x+d)/e*Pi*a*b*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+I*ln(e*x+d)/e*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2
+I*ln(e*x+d)/e*Pi*a*b*csgn(I*c*x^n)^2*csgn(I*c)+I/e*n*ln(e*x+d)*ln(-e*x/d)*
b^2*Pi*csgn(I*c*x^n)^3+I*ln(e*x+d)/e*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)
^2+I*ln(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(e*x+d)/e*ln(
x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+b^2*n^2/e*ln(x)^2*ln(1+e*x/d)+2*b^2
*n^2/e*ln(x)*polylog(2,-e*x/d)-2*b^2*n^2*dilog((e*x+d)/d)/e*ln(x)-2*b^2*n^2
*ln(x)^2*ln((e*x+d)/d)/e+a^2*ln(e*x+d)/e+b^2*ln(e*x+d)/e*n^2*ln(x)^2+2*b*ln
(e*x+d)/e*ln(x^n)*a+2*b^2*n*dilog((e*x+d)/d)/e*ln(x^n)+2*ln(e*x+d)/e*ln(x^n
)*b^2*ln(c)-1/4*ln(e*x+d)/e*Pi^2*b^2*csgn(I*c*x^n)^6-2/e*n*dilog(-e*x/d)*b^
2*ln(c)+2*ln(e*x+d)/e*ln(c)*a*b-2*b^2*n^2*polylog(3,-e*x/d)/e
```

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

$$\frac{a^2 \log(ex+d)}{e} + \int \frac{b^2 \log(c)^2 + b^2 \log(x^n)^2 + 2\,ab \log(c) + 2\left(b^2 \log(c) + ab\right) \log(x^n)}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x), x)
```

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

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.96 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex)}\,dx$

Optimal. Leaf size=79

$$\frac{2bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)}{d}-\frac{\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))^2}{d}$$

```
[Out] -((Log[1 + d/(e*x)]*(a + b*Log[c*x^n])^2)/d) + (2*b*n*(a + b*Log[c*x^n])*Po
lyLog[2, -(d/(e*x))])/d + (2*b^2*n^2*PolyLog[3, -(d/(e*x))])/d
```

Rubi [A] time = 0.157385, antiderivative size = 98, normalized size of antiderivative = 1.24, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {2344, 2302, 30, 2317, 2374, 6589}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2}{d}+\frac{(a+b\log(cx^n))^3}{3bdn}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*Log[c*x^n])^3/(3*b*d*n) - ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d
- (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d + (2*b^2*n^2*PolyLog[
3, -((e*x)/d)])/d
```

Rule 2344

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

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex)}\,dx = \frac{\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d}$$

$$= -\frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d} + \frac{\text{Subst}\left(\int x^2\,dx, x, a+b\log(cx^n)\right)}{bdn} + \frac{(2bn)\int \frac{(a+b\log(cx^n))\log\ldots}{x}}{d}\ldots$$

$$= \frac{(a+b\log(cx^n))^3}{3bdn} - \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d} - \frac{2bn(a+b\log(cx^n))\,\text{Li}_2\left(-\frac{ex}{d}\right)}{d} + \frac{\left(2b^2n^2\ldots\right.}{\ldots}$$

$$= \frac{(a+b\log(cx^n))^3}{3bdn} - \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d} - \frac{2bn(a+b\log(cx^n))\,\text{Li}_2\left(-\frac{ex}{d}\right)}{d} + \frac{2b^2n^2\text{I}\ldots}{\ldots}$$

Mathematica [A] time = 0.0530728, size = 94, normalized size = 1.19

$$-\frac{2bn\left(\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))-bn\text{PolyLog}\left(3,-\frac{ex}{d}\right)\right)}{d} - \frac{\log\left(\frac{d+ex}{d}\right)(a+b\log(cx^n))^2}{d} + \frac{(a+b\log(cx^n))^3}{3bdn}$$

Antiderivative was successfully verified.

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

```
[Out] (a + b*Log[c*x^n])^3/(3*b*d*n) - ((a + b*Log[c*x^n])^2*Log[(d + e*x)/d])/d
- (2*b*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x
)/d)]))/d
```

Maple [C] time = 0.421, size = 2315, normalized size = 29.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2*b*n/d*ln(e*x+d)*ln(-e*x/d)*a-I*n/d*ln(e*x+d)*ln(-e*x/d)*b^2*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)+2*n/d*ln(e*x+d)*ln(-e*x/d)*b^2*ln(c)-I*n/d*dilog(
-e*x/d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/d*ln(e*x+d)*ln(c)*Pi*b
^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/d*ln(e*x+d)*Pi*a*b*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)+I*ln(x^n)/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+b^2
*ln(x^n)^2/d*ln(x)-1/2/d*ln(e*x+d)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csg
n(I*c)^2-I*n/d*ln(e*x+d)*ln(-e*x/d)*b^2*Pi*csgn(I*c*x^n)^3+2*b*n/d*dilog(-e
*x/d)*a-I/d*ln(e*x+d)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2/d*ln(e*x+d)*Pi
^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^5-1/2/d*ln(e*x+d)*Pi^2*b^2*csgn(I*c*x^n)^5
*csgn(I*c)+1/2/d*ln(x)*Pi^2*b^2*csgn(I*c*x^n)^5*csgn(I*c)-1/4/d*ln(x)*Pi^2*
b^2*csgn(I*c*x^n)^4*csgn(I*c)^2+1/4/d*ln(e*x+d)*Pi^2*b^2*csgn(I*c*x^n)^4*cs
gn(I*c)^2-I/d*ln(e*x+d)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I/d*ln(x)*
Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2+I/d*ln(x)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(
I*c*x^n)^2+I/d*ln(x)*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)-2/d*ln(e*x+d)*l
n(c)*a*b+2/d*ln(x)*ln(c)*a*b-I/d*ln(e*x+d)*Pi*a*b*csgn(I*c*x^n)^2*csgn(I*c)
-I/d*ln(e*x+d)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*n/d*ln(x)^2*b
^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/d*ln(x)*Pi*a*b*csgn(I*c*x^n)^3-I/d*ln(e
*x+d)*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)+I*n/d*dilog(-e*x/d)*b^2*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2+I*n/d*dilog(-e*x/d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*
c)+I*ln(x^n)/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+2*b^2/d*ln(e*x+d)*l
n(x)*ln(x^n)*n-2*b^2*n/d*ln(x)*ln((e*x+d)/d)*ln(x^n)-I/d*ln(e*x+d)*ln(x^n)*
b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*n/d*ln(e*x+d)*ln(-e*x/d)*b^2*Pi*csgn(I
*c*x^n)^2*csgn(I*c)-1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/d*
ln(x)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/d*ln(x)*Pi*a*b*csgn(I*c*
x^n)^2*csgn(I*c)+1/2/d*ln(x)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*
c)-1/4/d*ln(x)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/d*ln(x)
```

```
*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)+1/4/d*ln(e*x+d)*Pi^2*b^2*cs
gn(I*x^n)^2*csgn(I*c*x^n)^4+1/d*ln(x)*ln(c)^2*b^2-1/d*ln(e*x+d)*ln(c)^2*b^2
+1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*c*x^n)^3-I*n/d*dilog(-e*x/d)*b^2*Pi*csgn(I
*c*x^n)^3-1/4/d*ln(x)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-I*ln(x^n)/d*ln
(x)*b^2*Pi*csgn(I*c*x^n)^3+1/d*ln(e*x+d)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)
^4*csgn(I*c)-I/d*ln(x)*ln(c)*Pi*b^2*csgn(I*c*x^n)^3-1/2/d*ln(e*x+d)*Pi^2*b^
2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)+1/4/d*ln(e*x+d)*Pi^2*b^2*csgn(I*x
^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+1/2/d*ln(x)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c
*x^n)^3*csgn(I*c)^2+I/d*ln(e*x+d)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+I*n/d*ln(e*x+d)*ln(-e*x/d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+a^2
/d*ln(x)-a^2/d*ln(e*x+d)+I/d*ln(e*x+d)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3+I/d*l
n(e*x+d)*ln(c)*Pi*b^2*csgn(I*c*x^n)^3+I/d*ln(e*x+d)*Pi*a*b*csgn(I*c*x^n)^3-
I/d*ln(x)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*ln(x^n)/d*ln(x
)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-b^2/d*ln(e*x+d)*ln(x^n)^2+1/3*
b^2*n^2/d*ln(x)^3+2*b^2*n^2/d*polylog(3,-e*x/d)-2/d*ln(e*x+d)*ln(x^n)*b^2*l
n(c)+2*ln(x^n)/d*ln(x)*b^2*ln(c)-b^2/d*ln(x)^2*ln(x^n)*n-2*b^2*n/d*dilog((e
*x+d)/d)*ln(x^n)-n/d*ln(x)^2*b^2*ln(c)+2*n/d*dilog(-e*x/d)*b^2*ln(c)+1/2*I*
n/d*ln(x)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*b^2*n^2/d*ln(x)^2*
ln((e*x+d)/d)-2*b/d*ln(e*x+d)*ln(x^n)*a+2*b*ln(x^n)/d*ln(x)*a+1/4/d*ln(e*x+
d)*Pi^2*b^2*csgn(I*c*x^n)^6-b*n/d*ln(x)^2*a-1/4/d*ln(x)*Pi^2*b^2*csgn(I*c*x
^n)^6+1/2/d*ln(x)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^5-b^2*n^2/d*ln(x)^2*ln
(1+e*x/d)-2*b^2*n^2/d*ln(x)*polylog(2,-e*x/d)+2*b^2*n^2/d*dilog((e*x+d)/d)*
ln(x)-b^2/d*ln(e*x+d)*n^2*ln(x)^2
```

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

$$-a^2\left(\frac{\log(ex+d)}{d}-\frac{\log(x)}{d}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\log(c)+ab\right)\log(x^n)}{ex^2+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\mathrm{integral}\left(\frac{b^2\log(cx^n)^2+2\,ab\log(cx^n)+a^2}{ex^2+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{(a + b\log(cx^n))^2}{x(d + ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)), x)
```

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

$$\int \frac{(b\log(cx^n) + a)^2}{(ex + d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.97 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)}\,dx$

Optimal. Leaf size=135

$$-\frac{2benPolyLog\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d^2}-\frac{2b^2en^2PolyLog\left(3,-\frac{d}{ex}\right)}{d^2}+\frac{e\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))^2}{d^2}-\frac{2bn(a+b\log}{dx}$$

```
[Out] (-2*b^2*n^2)/(d*x) - (2*b*n*(a + b*Log[c*x^n]))/(d*x) - (a + b*Log[c*x^n])^
2/(d*x) + (e*Log[1 + d/(e*x)]*(a + b*Log[c*x^n])^2)/d^2 - (2*b*e*n*(a + b*L
og[c*x^n])*PolyLog[2, -(d/(e*x))])/d^2 - (2*b^2*e*n^2*PolyLog[3, -(d/(e*x))
])/d^2
```

Rubi [A] time = 0.241545, antiderivative size = 155, normalized size of antiderivative = 1.15, number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2305, 2304, 2302, 30, 2317, 2374, 6589}

$$\frac{2benPolyLog\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^2}-\frac{2b^2en^2PolyLog\left(3,-\frac{ex}{d}\right)}{d^2}-\frac{e(a+b\log(cx^n))^3}{3bd^2n}+\frac{e\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n}{d^2}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*b^2*n^2)/(d*x) - (2*b*n*(a + b*Log[c*x^n]))/(d*x) - (a + b*Log[c*x^n])^
2/(d*x) - (e*(a + b*Log[c*x^n])^3)/(3*b*d^2*n) + (e*(a + b*Log[c*x^n])^2*Lo
g[1 + (e*x)/d])/d^2 + (2*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d
^2 - (2*b^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^2
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
```

```
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)}\,dx = \int \left(\frac{(a+b\log(cx^n))^2}{dx^2} - \frac{e(a+b\log(cx^n))^2}{d^2x} + \frac{e^2(a+b\log(cx^n))^2}{d^2(d+ex)}\right)dx$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{x^2}dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^2}{x}dx}{d^2} + \frac{e^2\int \frac{(a+b\log(cx^n))^2}{d+ex}dx}{d^2}$$

$$= -\frac{(a+b\log(cx^n))^2}{dx} + \frac{e(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{e\,\mathrm{Subst}\left(\int x^2\,dx, x, a+b\log(cx^n)\right)}{bd^2n} +$$

$$= -\frac{2b^2n^2}{dx} - \frac{2bn(a+b\log(cx^n))}{dx} - \frac{(a+b\log(cx^n))^2}{dx} - \frac{e(a+b\log(cx^n))^3}{3bd^2n} + \frac{e(a+b\log(cx^n))}{d^2}$$

$$= -\frac{2b^2n^2}{dx} - \frac{2bn(a+b\log(cx^n))}{dx} - \frac{(a+b\log(cx^n))^2}{dx} - \frac{e(a+b\log(cx^n))^3}{3bd^2n} + \frac{e(a+b\log(cx^n))}{d^2}$$

Mathematica [A] time = 0.100397, size = 130, normalized size = 0.96

$$-\frac{-6ben\left(\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) - bn\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)\right) - 3e\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))^2 + \frac{3d(a+b\log(cx^n))^2}{x}}{3d^2}$$

Antiderivative was successfully verified.

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

```
[Out] -((3*d*(a + b*Log[c*x^n])^2)/x + (e*(a + b*Log[c*x^n])^3)/(b*n) + (6*b*d*n*
(a + b*n + b*Log[c*x^n]))/x - 3*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] - 6
*b*e*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/
d)]))/(3*d^2)
```

Maple [F] time = 0.683, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x^2(ex+d)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$a^2\left(\frac{e\log(ex+d)}{d^2}-\frac{e\log(x)}{d^2}-\frac{1}{dx}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\log(c)+ab\right)\log(x^n)}{ex^3+dx^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\mathrm{integral}\left(\frac{b^2\log(cx^n)^2+2\,ab\log(cx^n)+a^2}{ex^3+dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{(a+b\log(cx^n))^2}{x^2(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((a + b*log(c*x**n))**2/(x**2*(d + e*x)), x)
```

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

$$\int \frac{(b\log(cx^n)+a)^2}{(ex+d)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.98 $\int \frac{(a+b\log(cx^n))^2}{x^3(d+ex)}\,dx$

Optimal. Leaf size=204

$$\frac{2be^2n\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d^3}+\frac{2b^2e^2n^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)}{d^3}-\frac{e^2\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))^2}{d^3}+\frac{e(a+b\log(c\ldots}{d^2x}$$

```
[Out] -(b^2*n^2)/(4*d*x^2) + (2*b^2*e*n^2)/(d^2*x) - (b*n*(a + b*Log[c*x^n]))/(2*
d*x^2) + (2*b*e*n*(a + b*Log[c*x^n]))/(d^2*x) - (a + b*Log[c*x^n])^2/(2*d*x
^2) + (e*(a + b*Log[c*x^n])^2)/(d^2*x) - (e^2*Log[1 + d/(e*x)]*(a + b*Log[c
*x^n])^2)/d^3 + (2*b*e^2*n*(a + b*Log[c*x^n])*PolyLog[2, -(d/(e*x))])/d^3 +
 (2*b^2*e^2*n^2*PolyLog[3, -(d/(e*x))])/d^3
```

Rubi [A] time = 0.291788, antiderivative size = 226, normalized size of antiderivative = 1.11, number of steps used = 11, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2305, 2304, 2302, 30, 2317, 2374, 6589}

$$-\frac{2be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}+\frac{2b^2e^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^3}+\frac{e^2(a+b\log(cx^n))^3}{3bd^3n}-\frac{e^2\log\left(\frac{ex}{d}+1\right)(a+b\log\ldots}{d^3}$$

Antiderivative was successfully verified.

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

```
[Out] -(b^2*n^2)/(4*d*x^2) + (2*b^2*e*n^2)/(d^2*x) - (b*n*(a + b*Log[c*x^n]))/(2*
d*x^2) + (2*b*e*n*(a + b*Log[c*x^n]))/(d^2*x) - (a + b*Log[c*x^n])^2/(2*d*x
^2) + (e*(a + b*Log[c*x^n])^2)/(d^2*x) + (e^2*(a + b*Log[c*x^n])^3)/(3*b*d^
3*n) - (e^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^3 - (2*b*e^2*n*(a + b*
Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^3 + (2*b^2*e^2*n^2*PolyLog[3, -((e*x)
/d)])/d^3
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x^3(d+ex)}\,dx = \int \left(\frac{(a+b\log(cx^n))^2}{dx^3} - \frac{e(a+b\log(cx^n))^2}{d^2x^2} + \frac{e^2(a+b\log(cx^n))^2}{d^3x} - \frac{e^3(a+b\log(cx^n))^2}{d^3(d+ex)}\right)dx$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{x^3}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^3} - \frac{e^3\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d^3}$$

$$= -\frac{(a+b\log(cx^n))^2}{2dx^2} + \frac{e(a+b\log(cx^n))^2}{d^2x} - \frac{e^2(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^3} + \frac{e^2\,\mathrm{Subst}\left(\int x^2 d\right.}{}$$

$$= -\frac{b^2n^2}{4dx^2} + \frac{2b^2en^2}{d^2x} - \frac{bn(a+b\log(cx^n))}{2dx^2} + \frac{2ben(a+b\log(cx^n))}{d^2x} - \frac{(a+b\log(cx^n))^2}{2dx^2} + \frac{e(a+b}{}$$

$$= -\frac{b^2n^2}{4dx^2} + \frac{2b^2en^2}{d^2x} - \frac{bn(a+b\log(cx^n))}{2dx^2} + \frac{2ben(a+b\log(cx^n))}{d^2x} - \frac{(a+b\log(cx^n))^2}{2dx^2} + \frac{e(a+b}{}$$

Mathematica [A] time = 0.129609, size = 185, normalized size = 0.91

$$\frac{-24be^2n\left(\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) - bn\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right)\right) - \frac{6d^2(a+b\log(cx^n))^2}{x^2} - \frac{3bd^2n(2a+2b\log(cx^n)+bn)}{x^2} - 12e^2\log\left(\right.}{12d^3}$$

Antiderivative was successfully verified.

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

```
[Out] ((-6*d^2*(a + b*Log[c*x^n])^2)/x^2 + (12*d*e*(a + b*Log[c*x^n])^2)/x + (4*e
^2*(a + b*Log[c*x^n])^3)/(b*n) + (24*b*d*e*n*(a + b*n + b*Log[c*x^n]))/x -
(3*b*d^2*n*(2*a + b*n + 2*b*Log[c*x^n]))/x^2 - 12*e^2*(a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d] - 24*b*e^2*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] -
b*n*PolyLog[3, -((e*x)/d)]))/(12*d^3)
```

Maple [F] time = 0.738, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x^3(ex+d)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$-\frac{1}{2}a^2\left(\frac{2e^2\log(ex+d)}{d^3}-\frac{2e^2\log(x)}{d^3}-\frac{2ex-d}{d^2x^2}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2ab\log(c)+2\left(b^2\log(c)+ab\right)\log(x}{ex^4+dx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b^2\log(cx^n)^2+2ab\log(cx^n)+a^2}{ex^4+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{(a+b\log(cx^n))^2}{x^3(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**3/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**3*(d + e*x)), x)
```

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

$$\int \frac{(b\log(cx^n)+a)^2}{(ex+d)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.99 $\int \frac{(a+b\log(cx^n))^2}{x^4(d+ex)}\,dx$

Optimal. Leaf size=273

$$-\frac{2be^3n\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d^4}-\frac{2b^2e^3n^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)}{d^4}+\frac{e^3\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))^2}{d^4}-\frac{e^2(a+b\log}{d^3}$$

```
[Out] (-2*b^2*n^2)/(27*d*x^3) + (b^2*e*n^2)/(4*d^2*x^2) - (2*b^2*e^2*n^2)/(d^3*x)
 - (2*b*n*(a + b*Log[c*x^n]))/(9*d*x^3) + (b*e*n*(a + b*Log[c*x^n]))/(2*d^2
*x^2) - (2*b*e^2*n*(a + b*Log[c*x^n]))/(d^3*x) - (a + b*Log[c*x^n])^2/(3*d*
x^3) + (e*(a + b*Log[c*x^n])^2)/(2*d^2*x^2) - (e^2*(a + b*Log[c*x^n])^2)/(d
^3*x) + (e^3*Log[1 + d/(e*x)]*(a + b*Log[c*x^n])^2)/d^4 - (2*b*e^3*n*(a + b
*Log[c*x^n])*PolyLog[2, -(d/(e*x))])/d^4 - (2*b^2*e^3*n^2*PolyLog[3, -(d/(e
*x))])/d^4
```

Rubi [A] time = 0.356826, antiderivative size = 295, normalized size of antiderivative = 1.08, number of steps used = 13, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2305, 2304, 2302, 30, 2317, 2374, 6589}

$$\frac{2be^3n\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^4}-\frac{2b^2e^3n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}-\frac{e^3(a+b\log(cx^n))^3}{3bd^4n}+\frac{e^3\log\left(\frac{ex}{d}+1\right)(a+b\log}{d^4}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*b^2*n^2)/(27*d*x^3) + (b^2*e*n^2)/(4*d^2*x^2) - (2*b^2*e^2*n^2)/(d^3*x)
 - (2*b*n*(a + b*Log[c*x^n]))/(9*d*x^3) + (b*e*n*(a + b*Log[c*x^n]))/(2*d^2
*x^2) - (2*b*e^2*n*(a + b*Log[c*x^n]))/(d^3*x) - (a + b*Log[c*x^n])^2/(3*d*
x^3) + (e*(a + b*Log[c*x^n])^2)/(2*d^2*x^2) - (e^2*(a + b*Log[c*x^n])^2)/(d
^3*x) - (e^3*(a + b*Log[c*x^n])^3)/(3*b*d^4*n) + (e^3*(a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d])/d^4 + (2*b*e^3*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)
])/d^4 - (2*b^2*e^3*n^2*PolyLog[3, -((e*x)/d)])/d^4
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
```

```
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

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

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

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

Rule 2317

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

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x^4(d+ex)}\,dx = \int\left(\frac{(a+b\log(cx^n))^2}{dx^4} - \frac{e(a+b\log(cx^n))^2}{d^2x^3} + \frac{e^2(a+b\log(cx^n))^2}{d^3x^2} - \frac{e^3(a+b\log(cx^n))^2}{d^4x} + \frac{e^4}{}\right.$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{x^4}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^2}{x^3}\,dx}{d^2} + \frac{e^2\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx}{d^3} - \frac{e^3\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^4} + \frac{e^4\int}{}$$

$$= -\frac{(a+b\log(cx^n))^2}{3dx^3} + \frac{e(a+b\log(cx^n))^2}{2d^2x^2} - \frac{e^2(a+b\log(cx^n))^2}{d^3x} + \frac{e^3(a+b\log(cx^n))^2\log(1}{d^4}$$

$$= -\frac{2b^2n^2}{27dx^3} + \frac{b^2en^2}{4d^2x^2} - \frac{2b^2e^2n^2}{d^3x} - \frac{2bn(a+b\log(cx^n))}{9dx^3} + \frac{ben(a+b\log(cx^n))}{2d^2x^2} - \frac{2be^2n(a+b\log}{d^3x}$$

$$= -\frac{2b^2n^2}{27dx^3} + \frac{b^2en^2}{4d^2x^2} - \frac{2b^2e^2n^2}{d^3x} - \frac{2bn(a+b\log(cx^n))}{9dx^3} + \frac{ben(a+b\log(cx^n))}{2d^2x^2} - \frac{2be^2n(a+b\log}{d^3x}$$

Mathematica [A] time = 0.129494, size = 237, normalized size = 0.87

$$\frac{216be^3n\left(\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) - bn\text{PolyLog}\left(3,-\frac{ex}{d}\right)\right) + \frac{54d^2e(a+b\log(cx^n))^2}{x^2} + \frac{27bd^2en(2a+2b\log(cx^n)+bn)}{x^2} - \frac{36d^3(}{}}{}$$

Antiderivative was successfully verified.

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

```
[Out] ((-36*d^3*(a + b*Log[c*x^n])^2)/x^3 + (54*d^2*e*(a + b*Log[c*x^n])^2)/x^2 -
 (108*d*e^2*(a + b*Log[c*x^n])^2)/x - (36*e^3*(a + b*Log[c*x^n])^3)/(b*n) -
 (216*b*d*e^2*n*(a + b*n + b*Log[c*x^n]))/x + (27*b*d^2*e*n*(2*a + b*n + 2*
b*Log[c*x^n]))/x^2 - (8*b*d^3*n*(3*a + b*n + 3*b*Log[c*x^n]))/x^3 + 108*e^3
*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 216*b*e^3*n*((a + b*Log[c*x^n])*Po
lyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/(108*d^4)
```

Maple [F] time = 0.79, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x^4(ex+d)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\frac{1}{6}a^2\left(\frac{6e^3\log(ex+d)}{d^4}-\frac{6e^3\log(x)}{d^4}-\frac{6e^2x^2-3dex+2d^2}{d^3x^3}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2ab\log(c)+2\left(b^2\log(c)+\right.}{ex^5+dx^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\text{integral}\left(\frac{b^2\log(cx^n)^2+2ab\log(cx^n)+a^2}{ex^5+dx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int\frac{(a+b\log(cx^n))^2}{x^4(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**4/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**4*(d + e*x)), x)
```

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

$$\int \frac{(b\log(cx^n) + a)^2}{(ex+d)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)*x^4), x)
```

3.100 $\int \frac{x^3(a+b\log(cx^n))^2}{(d+ex)^2} dx$

Optimal. Leaf size=281

$$\frac{6bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}+\frac{2b^2d^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{6b^2d^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{2bd^2n\log\left(\frac{ex}{d}+1\right)(}{e^4}$$

```
[Out] (4*a*b*d*n*x)/e^3 - (4*b^2*d*n^2*x)/e^3 + (b^2*n^2*x^2)/(4*e^2) + (4*b^2*d*
n*x*Log[c*x^n])/e^3 - (b*n*x^2*(a + b*Log[c*x^n]))/(2*e^2) - (2*d*x*(a + b*
Log[c*x^n])^2)/e^3 + (x^2*(a + b*Log[c*x^n])^2)/(2*e^2) - (d^2*x*(a + b*Log
[c*x^n])^2)/(e^3*(d + e*x)) + (2*b*d^2*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d
])/e^4 + (3*d^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^4 + (2*b^2*d^2*n^2
*PolyLog[2, -((e*x)/d)])/e^4 + (6*b*d^2*n*(a + b*Log[c*x^n])*PolyLog[2, -((
e*x)/d)])/e^4 - (6*b^2*d^2*n^2*PolyLog[3, -((e*x)/d)])/e^4
```

Rubi [A] time = 0.309721, antiderivative size = 281, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2353, 2296, 2295, 2305, 2304, 2318, 2317, 2391, 2374, 6589}

$$\frac{6bd^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}+\frac{2b^2d^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}-\frac{6b^2d^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{2bd^2n\log\left(\frac{ex}{d}+1\right)(}{e^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```


```
[Out] (4*a*b*d*n*x)/e^3 - (4*b^2*d*n^2*x)/e^3 + (b^2*n^2*x^2)/(4*e^2) + (4*b^2*d*
n*x*Log[c*x^n])/e^3 - (b*n*x^2*(a + b*Log[c*x^n]))/(2*e^2) - (2*d*x*(a + b*
Log[c*x^n])^2)/e^3 + (x^2*(a + b*Log[c*x^n])^2)/(2*e^2) - (d^2*x*(a + b*Log
[c*x^n])^2)/(e^3*(d + e*x)) + (2*b*d^2*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d
])/e^4 + (3*d^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^4 + (2*b^2*d^2*n^2
*PolyLog[2, -((e*x)/d)])/e^4 + (6*b*d^2*n*(a + b*Log[c*x^n])*PolyLog[2, -((
e*x)/d)])/e^4 - (6*b^2*d^2*n^2*PolyLog[3, -((e*x)/d)])/e^4
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
```

```
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))^2}{(d+ex)^2}\,dx = \int \left(-\frac{2d(a+b\log(cx^n))^2}{e^3} + \frac{x(a+b\log(cx^n))^2}{e^2} - \frac{d^3(a+b\log(cx^n))^2}{e^3(d+ex)^2} + \frac{3d^2(a+b\log(cx^n}{e^3(d+ex)}\right.$$

$$= -\frac{(2d)\int (a+b\log(cx^n))^2\,dx}{e^3} + \frac{(3d^2)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e^3} - \frac{d^3\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e^3} + \frac{\int x(a+b}{}$$

$$= -\frac{2dx(a+b\log(cx^n))^2}{e^3} + \frac{x^2(a+b\log(cx^n))^2}{2e^2} - \frac{d^2x(a+b\log(cx^n))^2}{e^3(d+ex)} + \frac{3d^2(a+b\log(cx^n}{e^4}$$

$$= \frac{4abdnx}{e^3} + \frac{b^2n^2x^2}{4e^2} - \frac{bnx^2(a+b\log(cx^n))}{2e^2} - \frac{2dx(a+b\log(cx^n))^2}{e^3} + \frac{x^2(a+b\log(cx^n))^2}{2e^2} -$$

$$= \frac{4abdnx}{e^3} - \frac{4b^2dn^2x}{e^3} + \frac{b^2n^2x^2}{4e^2} + \frac{4b^2dnx\log(cx^n)}{e^3} - \frac{bnx^2(a+b\log(cx^n))}{2e^2} - \frac{2dx(a+b\log(}{e^3}$$

Mathematica [A] time = 0.20345, size = 240, normalized size = 0.85

$$\frac{4d^2\left(2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)-(a+b\log(cx^n))\left(a+b\log(cx^n)-2bn\log\left(\frac{ex}{d}+1\right)\right)\right)+24bd^2n\left(\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (-8*d*e*x*(a + b*Log[c*x^n])^2 + 2*e^2*x^2*(a + b*Log[c*x^n])^2 + (4*d^3*(a
 + b*Log[c*x^n])^2)/(d + e*x) + 16*b*d*e*n*x*(a - b*n + b*Log[c*x^n]) + b*e
```

```
^2*n*x^2*(b*n - 2*(a + b*Log[c*x^n])) + 12*d^2*(a + b*Log[c*x^n])^2*Log[1 +
 (e*x)/d] + 4*d^2*(-((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 + (
e*x)/d])) + 2*b^2*n^2*PolyLog[2, -((e*x)/d)]) + 24*b*d^2*n*((a + b*Log[c*x^
n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)]))/(4*e^4)
```

Maple [F] time = 0.688, size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b\ln(cx^n))^2}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))^2/(e*x+d)^2,x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))^2/(e*x+d)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\left(\frac{2\,d^3}{e^5x + de^4} + \frac{6\,d^2\log(ex+d)}{e^4} + \frac{ex^2 - 4\,dx}{e^3}\right)a^2 + \int \frac{b^2x^3\log(x^n)^2 + 2\left(b^2\log(c) + ab\right)x^3\log(x^n) + \left(b^2\log(c)^2 + 2\,a\right.}{e^2x^2 + 2\,dex + d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(2*d^3/(e^5*x + d*e^4) + 6*d^2*log(e*x + d)/e^4 + (e*x^2 - 4*d*x)/e^3)*
a^2 + integrate((b^2*x^3*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^3*log(x^n) + (
b^2*log(c)^2 + 2*a*b*log(c))*x^3)/(e^2*x^2 + 2*d*e*x + d^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2x^3\log(cx^n)^2 + 2\,abx^3\log(cx^n) + a^2x^3}{e^2x^2 + 2\,dex + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*log(c*x^n)^2 + 2*a*b*x^3*log(c*x^n) + a^2*x^3)/(e^2*x^2 +
 2*d*e*x + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \log (cx^n))^2}{(d + ex)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log (cx^n) + a)^2 x^3}{(ex + d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^3/(e*x + d)^2, x)
```

3.101 $\int \frac{x^2(a+b\log(cx^n))^2}{(d+ex)^2}\,dx$

Optimal. Leaf size=203

$$-\frac{4bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^3}-\frac{2b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{4b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}-\frac{2bdn\log\left(\frac{ex}{d}+1\right)(a}{e^3}$$

```
[Out] (-2*a*b*n*x)/e^2 + (2*b^2*n^2*x)/e^2 - (2*b^2*n*x*Log[c*x^n])/e^2 + (x*(a +
 b*Log[c*x^n])^2)/e^2 + (d*x*(a + b*Log[c*x^n])^2)/(e^2*(d + e*x)) - (2*b*d
*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^3 - (2*d*(a + b*Log[c*x^n])^2*Log
[1 + (e*x)/d])/e^3 - (2*b^2*d*n^2*PolyLog[2, -((e*x)/d)])/e^3 - (4*b*d*n*(a
 + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^3 + (4*b^2*d*n^2*PolyLog[3, -((e
*x)/d)])/e^3
```

Rubi [A] time = 0.26058, antiderivative size = 203, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2353, 2296, 2295, 2318, 2317, 2391, 2374, 6589}

$$-\frac{4bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^3}-\frac{2b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}+\frac{4b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}-\frac{2bdn\log\left(\frac{ex}{d}+1\right)(a}{e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```


```
[Out] (-2*a*b*n*x)/e^2 + (2*b^2*n^2*x)/e^2 - (2*b^2*n*x*Log[c*x^n])/e^2 + (x*(a +
 b*Log[c*x^n])^2)/e^2 + (d*x*(a + b*Log[c*x^n])^2)/(e^2*(d + e*x)) - (2*b*d
*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^3 - (2*d*(a + b*Log[c*x^n])^2*Log
[1 + (e*x)/d])/e^3 - (2*b^2*d*n^2*PolyLog[2, -((e*x)/d)])/e^3 - (4*b*d*n*(a
 + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^3 + (4*b^2*d*n^2*PolyLog[3, -((e
*x)/d)])/e^3
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2 (a+b\log(cx^n))^2}{(d+ex)^2}\,dx &= \int \left(\frac{(a+b\log(cx^n))^2}{e^2}+\frac{d^2 (a+b\log(cx^n))^2}{e^2(d+ex)^2}-\frac{2d(a+b\log(cx^n))^2}{e^2(d+ex)}\right)dx\\
&= \frac{\int (a+b\log(cx^n))^2\,dx}{e^2}-\frac{(2d)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e^2}+\frac{d^2\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e^2}\\
&= \frac{x(a+b\log(cx^n))^2}{e^2}+\frac{dx(a+b\log(cx^n))^2}{e^2(d+ex)}-\frac{2d(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e^3}+\frac{(4bdn)\int}{}\\
&= -\frac{2abnx}{e^2}+\frac{x(a+b\log(cx^n))^2}{e^2}+\frac{dx(a+b\log(cx^n))^2}{e^2(d+ex)}-\frac{2bdn(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^3}\\
&= -\frac{2abnx}{e^2}+\frac{2b^2n^2x}{e^2}-\frac{2b^2nx\log(cx^n)}{e^2}+\frac{x(a+b\log(cx^n))^2}{e^2}+\frac{dx(a+b\log(cx^n))^2}{e^2(d+ex)}-\frac{2bdn}{}\end{aligned}$$

Mathematica [A] time = 0.158352, size = 186, normalized size = 0.92

$$\frac{-4bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))-2b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)+4b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)-\frac{d^2(a+b\log(cx^n))^2}{d+ex}-2bd}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (d*(a + b*Log[c*x^n])^2 + e*x*(a + b*Log[c*x^n])^2 - (d^2*(a + b*Log[c*x^n]
)^2)/(d + e*x) - 2*b*e*n*x*(a - b*n + b*Log[c*x^n]) - 2*b*d*n*(a + b*Log[c*
x^n])*Log[1 + (e*x)/d] - 2*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] - 2*b^2*
d*n^2*PolyLog[2, -((e*x)/d)] - 4*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x
)/d)] + 4*b^2*d*n^2*PolyLog[3, -((e*x)/d)])/e^3
```

Maple [F] time = 0.726, size = 0, normalized size = 0.

$$\int \frac{x^2 (a+b\ln(cx^n))^2}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))^2/(e*x+d)^2,x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))^2/(e*x+d)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-a^2\left(\frac{d^2}{e^4x+de^3}-\frac{x}{e^2}+\frac{2\,d\log(ex+d)}{e^3}\right)+\int\frac{b^2x^2\log(x^n)^2+2\left(b^2\log(c)+ab\right)x^2\log(x^n)+\left(b^2\log(c)^2+2\,ab\log(c)\right)x^2}{e^2x^2+2\,dex+d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -a^2*(d^2/(e^4*x + d*e^3) - x/e^2 + 2*d*log(e*x + d)/e^3) + integrate((b^2*
x^2*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^2*log(x^n) + (b^2*log(c)^2 + 2*a*b*
log(c))*x^2)/(e^2*x^2 + 2*d*e*x + d^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2x^2\log(cx^n)^2+2\,abx^2\log(cx^n)+a^2x^2}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*log(c*x^n)^2 + 2*a*b*x^2*log(c*x^n) + a^2*x^2)/(e^2*x^2 +
 2*d*e*x + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\log(cx^n)\right)^2}{(d+ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2 x^2}{\left(ex+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^2/(e*x + d)^2, x)
```

3.102 $\int \frac{x(a+b\log(cx^n))^2}{(d+ex)^2} dx$

Optimal. Leaf size=143

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^2}+\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^2}+\frac{2bn\log\left(\frac{ex}{d}+1\right)(a+b\log}{e^2}$$

```
[Out] -((x*(a + b*Log[c*x^n])^2)/(e*(d + e*x))) + (2*b*n*(a + b*Log[c*x^n])*Log[1
 + (e*x)/d])/e^2 + ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^2 + (2*b^2*n^2
*PolyLog[2, -((e*x)/d)])/e^2 + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)
/d)])/e^2 - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^2
```

Rubi [A] time = 0.201671, antiderivative size = 143, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {2353, 2318, 2317, 2391, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^2}+\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^2}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^2}+\frac{2bn\log\left(\frac{ex}{d}+1\right)(a+b\log}{e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] -((x*(a + b*Log[c*x^n])^2)/(e*(d + e*x))) + (2*b*n*(a + b*Log[c*x^n])*Log[1
 + (e*x)/d])/e^2 + ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^2 + (2*b^2*n^2
*PolyLog[2, -((e*x)/d)])/e^2 + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)
/d)])/e^2 - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^2
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
```

```
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x\,(a+b\log(cx^n))^2}{(d+ex)^2}\,dx = \int \left(-\frac{d\,(a+b\log(cx^n))^2}{e(d+ex)^2} + \frac{(a+b\log(cx^n))^2}{e(d+ex)}\right)dx$$
$$= \frac{\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e} - \frac{d\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e}$$
$$= -\frac{x\,(a+b\log(cx^n))^2}{e(d+ex)} + \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e^2} - \frac{(2bn)\int \frac{(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{e^2} + \frac{(2b$$
$$= -\frac{x\,(a+b\log(cx^n))^2}{e(d+ex)} + \frac{2bn\,(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{2$$
$$= -\frac{x\,(a+b\log(cx^n))^2}{e(d+ex)} + \frac{2bn\,(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{e^2} + \frac{2$$

Mathematica [A] time = 0.123893, size = 142, normalized size = 0.99

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) - 2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) + 2bn\log\left(\frac{ex}{d}+1\right)(a+b\log(\ldots}{e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^2,x]
```

```
[Out] (-(a + b*Log[c*x^n])^2 + (d*(a + b*Log[c*x^n])^2)/(d + e*x) + 2*b*n*(a + b*
Log[c*x^n])*Log[1 + (e*x)/d] + (a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 2*b^
2*n^2*PolyLog[2, -((e*x)/d)] + 2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/
d)] - 2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^2
```

Maple [F] time = 0.7, size = 0, normalized size = 0.

$$\int \frac{x\,(a+b\ln(cx^n))^2}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))^2/(e*x+d)^2,x)
```

```
[Out] int(x*(a+b*ln(c*x^n))^2/(e*x+d)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a^2\left(\frac{d}{e^3x+de^2}+\frac{\log(ex+d)}{e^2}\right)+\int\frac{b^2x\log(x^n)^2+2\left(b^2\log(c)+ab\right)x\log(x^n)+\left(b^2\log(c)^2+2\,ab\log(c)\right)x}{e^2x^2+2\,dex+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] a^2*(d/(e^3*x + d*e^2) + log(e*x + d)/e^2) + integrate((b^2*x*log(x^n)^2 +
2*(b^2*log(c) + a*b)*x*log(x^n) + (b^2*log(c)^2 + 2*a*b*log(c))*x)/(e^2*x^2
 + 2*d*e*x + d^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2x\log(cx^n)^2+2\,abx\log(cx^n)+a^2x}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x*log(c*x^n)^2 + 2*a*b*x*log(c*x^n) + a^2*x)/(e^2*x^2 + 2*d*e
*x + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x\left(a+b\log(cx^n)\right)^2}{\left(d+ex\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)^{2}x}{\left(ex+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x/(e*x + d)^2, x)
```

3.103 $\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx$

Optimal. Leaf size=77

$$-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de}-\frac{2bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{de}+\frac{x(a+b\log(cx^n))^2}{d(d+ex)}$$

```
[Out] (x*(a + b*Log[c*x^n])^2)/(d*(d + e*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/(d*e) - (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/(d*e)
```

Rubi [A] time = 0.0581115, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.15, Rules used = {2318, 2317, 2391}

$$-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de}-\frac{2bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{de}+\frac{x(a+b\log(cx^n))^2}{d(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^2)/(d*(d + e*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/(d*e) - (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/(d*e)
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx &= \frac{x(a+b\log(cx^n))^2}{d(d+ex)}-\frac{(2bn)\int\frac{a+b\log(cx^n)}{d+ex}\,dx}{d}\\ &= \frac{x(a+b\log(cx^n))^2}{d(d+ex)}-\frac{2bn(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{de}+\frac{(2b^2n^2)\int\frac{\log\left(1+\frac{ex}{d}\right)}{x}\,dx}{de}\\ &= \frac{x(a+b\log(cx^n))^2}{d(d+ex)}-\frac{2bn(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{de}-\frac{2b^2n^2\mathrm{Li}_2\left(-\frac{ex}{d}\right)}{de}\end{aligned}$$

Mathematica [A] time = 0.0474611, size = 81, normalized size = 1.05

$$\frac{(a+b\log(cx^n))\left(aex+bex\log(cx^n)-2bn(d+ex)\log\left(\frac{ex}{d}+1\right)\right)-2b^2n^2(d+ex)\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x)^2,x]
```

```
[Out] ((a + b*Log[c*x^n])*(a*e*x + b*e*x*Log[c*x^n] - 2*b*n*(d + e*x)*Log[1 + (e*
x)/d]) - 2*b^2*n^2*(d + e*x)*PolyLog[2, -((e*x)/d)])/(d*e*(d + e*x))
```

Maple [C] time = 0.245, size = 755, normalized size = 9.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/(e*x+d)^2,x)
```

```
[Out] I/(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/e*n/d*ln(x
)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+2*b^2/e*n^2/d*dilog(-e*x/d)-I/e*n/d*ln
(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-2*b/e*n/d*ln(e*x+d)*a+2*b/e*n/d*ln
(x)*a-2/e*n/d*ln(e*x+d)*b^2*ln(c)+2/e*n/d*ln(x)*b^2*ln(c)-b^2/e*n^2/d*ln(x)
```

```
^2+I/e*n/d*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/e*n/d*ln(
x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/e*n/d*ln(e*x+d)*b^2*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2-1/4*(I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*b*Pi*csgn(I*c*x^n)^3+I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)+2*b*ln(c)+2*a)^2/(e*x+d)/e-I/(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2+I/e*n/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-2*b^2/e*n*ln(x
^n)/d*ln(e*x+d)+2*b^2/e*n*ln(x^n)/d*ln(x)+I/(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I
*c*x^n)^3+2*b^2/e*n^2/d*ln(e*x+d)*ln(-e*x/d)-b^2/(e*x+d)/e*ln(x^n)^2+I/e*n/
d*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/(e*x+d)/e*ln(x^n)*b^2*Pi*csgn(I*
c*x^n)^2*csgn(I*c)-I/e*n/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^3-2*b/(e*x+d)/e*ln(x^
n)*a-2/(e*x+d)/e*ln(x^n)*b^2*ln(c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-2\,abn\left(\frac{\log\left(ex+d\right)}{de}-\frac{\log\left(x\right)}{de}\right)-b^2\left(\frac{\log\left(x^n\right)^2}{e^2x+de}-\int\frac{ex\log\left(c\right)^2+2\left(dn+\left(en+e\log\left(c\right)\right)x\right)\log\left(x^n\right)}{e^3x^3+2\,de^2x^2+d^2ex}\,dx\right)-\frac{2\,ab\log\left(cx^n\right)}{e^2x+de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -2*a*b*n*(log(e*x + d)/(d*e) - log(x)/(d*e)) - b^2*(log(x^n)^2/(e^2*x + d*e
) - integrate((e*x*log(c)^2 + 2*(d*n + (e*n + e*log(c))*x)*log(x^n))/(e^3*x
^3 + 2*d*e^2*x^2 + d^2*e*x), x)) - 2*a*b*log(c*x^n)/(e^2*x + d*e) - a^2/(e^
2*x + d*e)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{e^2x^2+2\,dex+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^2 + 2*d*e*x + d
^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)^2}{(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x + d)^2, x)
```

3.104 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^2} dx$

Optimal. Leaf size=151

$$\frac{2bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d^2}+\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)}{d^2}+\frac{2bn\log\left(\frac{ex}{d}+1\right)(a+b\log\ldots}{d^2}$$

```
[Out] -((e*x*(a + b*Log[c*x^n])^2)/(d^2*(d + e*x))) - (Log[1 + d/(e*x)]*(a + b*Lo
g[c*x^n])^2)/d^2 + (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^2 + (2*b*n
*(a + b*Log[c*x^n])*PolyLog[2, -(d/(e*x))])/d^2 + (2*b^2*n^2*PolyLog[2, -((
e*x)/d)])/d^2 + (2*b^2*n^2*PolyLog[3, -(d/(e*x))])/d^2
```

Rubi [A] time = 0.307638, antiderivative size = 170, normalized size of antiderivative = 1.13, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^2}+\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^2}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log\ldots}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x)^2),x]
```

```
[Out] -((e*x*(a + b*Log[c*x^n])^2)/(d^2*(d + e*x))) + (a + b*Log[c*x^n])^3/(3*b*d
^2*n) + (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^2 - ((a + b*Log[c*x^n
])^2*Log[1 + (e*x)/d])/d^2 + (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/d^2 - (2*b*
n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^2 + (2*b^2*n^2*PolyLog[3, -(
(e*x)/d)])/d^2
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
```

```
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^2}\,dx = \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex)}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{d}$$

$$= -\frac{ex(a+b\log(cx^n))^2}{d^2(d+ex)} + \frac{\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^2} - \frac{e\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d^2} + \frac{(2ben)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^2}$$

$$= -\frac{ex(a+b\log(cx^n))^2}{d^2(d+ex)} + \frac{2bn(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^2} + \cdots$$

$$= -\frac{ex(a+b\log(cx^n))^2}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^3}{3bd^2n} + \frac{2bn(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(a+b\log(c\cdots}{}$$

$$= -\frac{ex(a+b\log(cx^n))^2}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^3}{3bd^2n} + \frac{2bn(a+b\log(cx^n))\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(a+b\log(c\cdots}{}$$

Mathematica [A] time = 0.163656, size = 166, normalized size = 1.1

$$\frac{-6bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 6b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) + 6b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) - 3\log\left(\frac{ex}{d}+1\right)(a+b\log(\cdots}{3d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x)^2),x]
```

```
[Out] (-3*(a + b*Log[c*x^n])^2 + (3*d*(a + b*Log[c*x^n])^2)/(d + e*x) + (a + b*Lo
g[c*x^n])^3/(b*n) + 6*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 3*(a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d] + 6*b^2*n^2*PolyLog[2, -((e*x)/d)] - 6*b*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 6*b^2*n^2*PolyLog[3, -((e*x)/d)])/
(3*d^2)
```

Maple [F] time = 0.771, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x(ex+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x/(e*x+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x/(e*x+d)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a^2\left(\frac{1}{dex+d^2}-\frac{\log(ex+d)}{d^2}+\frac{\log(x)}{d^2}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\log(c)+ab\right)\log(x^n)}{e^2x^3+2\,dex^2+d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] a^2*(1/(d*e*x + d^2) - log(e*x + d)/d^2 + log(x)/d^2) + integrate((b^2*log(
c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^2*
x^3 + 2*d*e*x^2 + d^2*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log(cx^n)^2+2\,ab\log(cx^n)+a^2}{e^2x^3+2\,dex^2+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^3 + 2*d*e*x^2 +
 d^2*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\log(cx^n))^2}{x\,(d+ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)**2), x)
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex + d)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^2*x), x)
```

3.105 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^2} \, dx$

Optimal. Leaf size=211

$$-\frac{4ben\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d^3}-\frac{2b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}-\frac{4b^2en^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)}{d^3}+\frac{e^2x(a+b\log(cx^n))^2}{d^3(d+ex)}$$

```
[Out] (-2*b^2*n^2)/(d^2*x) - (2*b*n*(a + b*Log[c*x^n]))/(d^2*x) - (a + b*Log[c*x^
n])^2/(d^2*x) + (e^2*x*(a + b*Log[c*x^n])^2)/(d^3*(d + e*x)) + (2*e*Log[1 +
 d/(e*x)]*(a + b*Log[c*x^n])^2)/d^3 - (2*b*e*n*(a + b*Log[c*x^n])*Log[1 + (
e*x)/d])/d^3 - (4*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -(d/(e*x))])/d^3 - (2
*b^2*e*n^2*PolyLog[2, -((e*x)/d)])/d^3 - (4*b^2*e*n^2*PolyLog[3, -(d/(e*x))
])/d^3
```

Rubi [A] time = 0.314867, antiderivative size = 231, normalized size of antiderivative = 1.09, number of steps used = 12, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2353, 2305, 2304, 2302, 30, 2318, 2317, 2391, 2374, 6589}

$$\frac{4ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}-\frac{2b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}-\frac{4b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^3}+\frac{e^2x(a+b\log(cx^n))^2}{d^3(d+ex)}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^2),x]
```

```
[Out] (-2*b^2*n^2)/(d^2*x) - (2*b*n*(a + b*Log[c*x^n]))/(d^2*x) - (a + b*Log[c*x^
n])^2/(d^2*x) + (e^2*x*(a + b*Log[c*x^n])^2)/(d^3*(d + e*x)) - (2*e*(a + b*
Log[c*x^n])^3)/(3*b*d^3*n) - (2*b*e*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/
d^3 + (2*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^3 - (2*b^2*e*n^2*PolyLo
g[2, -((e*x)/d)])/d^3 + (4*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])
/d^3 - (4*b^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^3
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^2}\,dx = \int \left(\frac{(a+b\log(cx^n))^2}{d^2x^2} - \frac{2e(a+b\log(cx^n))^2}{d^3x} + \frac{e^2(a+b\log(cx^n))^2}{d^2(d+ex)^2} + \frac{2e^2(a+b\log(cx^n))^2}{d^3(d+ex)}\right) dx$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx}{d^2} - \frac{(2e)\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^3} + \frac{\left(2e^2\right)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d^3} + \frac{e^2\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{d^2}$$

$$= -\frac{(a+b\log(cx^n))^2}{d^2x} + \frac{e^2x(a+b\log(cx^n))^2}{d^3(d+ex)} + \frac{2e(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^3} - \frac{(2e)\,\mathrm{Subst}\left(\int\right.}{}$$

$$= -\frac{2b^2n^2}{d^2x} - \frac{2bn(a+b\log(cx^n))}{d^2x} - \frac{(a+b\log(cx^n))^2}{d^2x} + \frac{e^2x(a+b\log(cx^n))^2}{d^3(d+ex)} - \frac{2e(a+b\log(cx}{3bd^3n}$$

$$= -\frac{2b^2n^2}{d^2x} - \frac{2bn(a+b\log(cx^n))}{d^2x} - \frac{(a+b\log(cx^n))^2}{d^2x} + \frac{e^2x(a+b\log(cx^n))^2}{d^3(d+ex)} - \frac{2e(a+b\log(cx}{3bd^3n}$$

Mathematica [A] time = 0.307402, size = 223, normalized size = 1.06

$$-\frac{-12ben\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 6b^2en^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right) + 12b^2en^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right) - 6e\log\left(\frac{ex}{d}+1\right)(a+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^2),x]
```

```
[Out] -((6*b^2*d*n^2)/x + (6*b*d*n*(a + b*Log[c*x^n]))/x - 3*e*(a + b*Log[c*x^n])
^2 + (3*d*(a + b*Log[c*x^n])^2)/x + (3*d*e*(a + b*Log[c*x^n])^2)/(d + e*x)
+ (2*e*(a + b*Log[c*x^n])^3)/(b*n) + 6*b*e*n*(a + b*Log[c*x^n])*Log[1 + (e*
x)/d] - 6*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 6*b^2*e*n^2*PolyLog[2,
```

```
-((e*x)/d)] - 12*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 12*b^2*e
*n^2*PolyLog[3, -((e*x)/d)])/(3*d^3)
```

Maple [F] time = 0.717, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\ln \left(cx^{n}\right)\right)^{2}}{x^{2} \left(ex+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x^2/(e*x+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x^2/(e*x+d)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-a^{2}\left(\frac{2\,ex+d}{d^{2}ex^{2}+d^{3}x}-\frac{2\,e\log\left(ex+d\right)}{d^{3}}+\frac{2\,e\log\left(x\right)}{d^{3}}\right)+\int \frac{b^{2}\log\left(c\right)^{2}+b^{2}\log\left(x^{n}\right)^{2}+2\,ab\log\left(c\right)+2\left(b^{2}\log\left(c\right)+ab\right)\log\left(x\right.}{e^{2}x^{4}+2\,dex^{3}+d^{2}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] -a^2*((2*e*x + d)/(d^2*e*x^2 + d^3*x) - 2*e*log(e*x + d)/d^3 + 2*e*log(x)/d
^3) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(
c) + a*b)*log(x^n))/(e^2*x^4 + 2*d*e*x^3 + d^2*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^{2}\log\left(cx^{n}\right)^{2}+2\,ab\log\left(cx^{n}\right)+a^{2}}{e^{2}x^{4}+2\,dex^{3}+d^{2}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^4 + 2*d*e*x^3 +
 d^2*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))^2}{x^2 (d + ex)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**2/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**2*(d + e*x)**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex + d)^2 x^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^2*x^2), x)
```

3.106 $\int \frac{(a+b\log(cx^n))^2}{x^3(d+ex)^2}\,dx$

Optimal. Leaf size=285

$$\frac{6be^2n\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d^4}+\frac{2b^2e^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}+\frac{6b^2e^2n^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)}{d^4}-\frac{e^3x(a+b\log(cx^n$$

```
[Out] -(b^2*n^2)/(4*d^2*x^2) + (4*b^2*e*n^2)/(d^3*x) - (b*n*(a + b*Log[c*x^n]))/(
2*d^2*x^2) + (4*b*e*n*(a + b*Log[c*x^n]))/(d^3*x) - (a + b*Log[c*x^n])^2/(2
*d^2*x^2) + (2*e*(a + b*Log[c*x^n])^2)/(d^3*x) - (e^3*x*(a + b*Log[c*x^n])^
2)/(d^4*(d + e*x)) - (3*e^2*Log[1 + d/(e*x)]*(a + b*Log[c*x^n])^2)/d^4 + (2
*b*e^2*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^4 + (6*b*e^2*n*(a + b*Log[c
*x^n])*PolyLog[2, -(d/(e*x))])/d^4 + (2*b^2*e^2*n^2*PolyLog[2, -((e*x)/d)])
/d^4 + (6*b^2*e^2*n^2*PolyLog[3, -(d/(e*x))])/d^4
```

Rubi [A] time = 0.377446, antiderivative size = 304, normalized size of antiderivative = 1.07, number of steps used = 14, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2353, 2305, 2304, 2302, 30, 2318, 2317, 2391, 2374, 6589}

$$-\frac{6be^2n\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^4}+\frac{2b^2e^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}+\frac{6b^2e^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}-\frac{e^3x(a+b\log(cx$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^3*(d + e*x)^2),x]
```

```
[Out] -(b^2*n^2)/(4*d^2*x^2) + (4*b^2*e*n^2)/(d^3*x) - (b*n*(a + b*Log[c*x^n]))/(
2*d^2*x^2) + (4*b*e*n*(a + b*Log[c*x^n]))/(d^3*x) - (a + b*Log[c*x^n])^2/(2
*d^2*x^2) + (2*e*(a + b*Log[c*x^n])^2)/(d^3*x) - (e^3*x*(a + b*Log[c*x^n])^
2)/(d^4*(d + e*x)) + (e^2*(a + b*Log[c*x^n])^3)/(b*d^4*n) + (2*b*e^2*n*(a +
 b*Log[c*x^n])*Log[1 + (e*x)/d])/d^4 - (3*e^2*(a + b*Log[c*x^n])^2*Log[1 +
(e*x)/d])/d^4 + (2*b^2*e^2*n^2*PolyLog[2, -((e*x)/d)])/d^4 - (6*b*e^2*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^4 + (6*b^2*e^2*n^2*PolyLog[3, -((
e*x)/d)])/d^4
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
```

```
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x^3(d+ex)^2}\,dx = \int\left(\frac{(a+b\log(cx^n))^2}{d^2x^3} - \frac{2e(a+b\log(cx^n))^2}{d^3x^2} + \frac{3e^2(a+b\log(cx^n))^2}{d^4x} - \frac{e^3(a+b\log(cx^n))^2}{d^3(d+ex)^2} -\right.$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{x^3}\,dx}{d^2} - \frac{(2e)\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx}{d^3} + \frac{\left(3e^2\right)\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^4} - \frac{\left(3e^3\right)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,d}{d^4}$$

$$= -\frac{(a+b\log(cx^n))^2}{2d^2x^2} + \frac{2e(a+b\log(cx^n))^2}{d^3x} - \frac{e^3x(a+b\log(cx^n))^2}{d^4(d+ex)} - \frac{3e^2(a+b\log(cx^n))^2\log}{d^4}$$

$$= -\frac{b^2n^2}{4d^2x^2} + \frac{4b^2en^2}{d^3x} - \frac{bn(a+b\log(cx^n))}{2d^2x^2} + \frac{4ben(a+b\log(cx^n))}{d^3x} - \frac{(a+b\log(cx^n))^2}{2d^2x^2} + \frac{2e(a}{}$$

$$= -\frac{b^2n^2}{4d^2x^2} + \frac{4b^2en^2}{d^3x} - \frac{bn(a+b\log(cx^n))}{2d^2x^2} + \frac{4ben(a+b\log(cx^n))}{d^3x} - \frac{(a+b\log(cx^n))^2}{2d^2x^2} + \frac{2e(a}{}$$

Mathematica [A] time = 0.181271, size = 268, normalized size = 0.94

$$\frac{4e^2\left(2b^2n^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)-(a+b\log(cx^n))\left(a+b\log(cx^n)-2bn\log\left(\frac{ex}{d}+1\right)\right)\right)-24be^2n\left(\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^3*(d + e*x)^2),x]
```

```
[Out] ((-2*d^2*(a + b*Log[c*x^n])^2)/x^2 + (8*d*e*(a + b*Log[c*x^n])^2)/x + (4*d*
e^2*(a + b*Log[c*x^n])^2)/(d + e*x) + (4*e^2*(a + b*Log[c*x^n])^3)/(b*n) +
(16*b*d*e*n*(a + b*n + b*Log[c*x^n]))/x - (b*d^2*n*(2*a + b*n + 2*b*Log[c*x
^n]))/x^2 - 12*e^2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 4*e^2*(-((a + b*
Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 + (e*x)/d])) + 2*b^2*n^2*PolyLo
g[2, -((e*x)/d)]) - 24*b*e^2*n*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] -
 b*n*PolyLog[3, -((e*x)/d)]))/(4*d^4)
```

Maple [F] time = 0.875, size = 0, normalized size = 0.

$$\int \frac{(a + b\ln (cx^n))^2}{x^3 (ex + d)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x^3/(e*x+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x^3/(e*x+d)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\, a^2\left(\frac{6\, e^2x^2 + 3\, dex - d^2}{d^3ex^3 + d^4x^2} - \frac{6\, e^2 \log (ex + d)}{d^4} + \frac{6\, e^2 \log (x)}{d^4}\right) + \int \frac{b^2 \log (c)^2 + b^2 \log (x^n)^2 + 2\, ab \log (c) + 2\left(b^2 \log (c) + a\right.}{e^2x^5 + 2\, dex^4 + d^2x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*((6*e^2*x^2 + 3*d*e*x - d^2)/(d^3*e*x^3 + d^4*x^2) - 6*e^2*log(e*x
+ d)/d^4 + 6*e^2*log(x)/d^4) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2
*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^2*x^5 + 2*d*e*x^4 + d^2*x^3
), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2 \log (cx^n)^2 + 2\, ab \log (cx^n) + a^2}{e^2x^5 + 2\, dex^4 + d^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^5 + 2*d*e*x^4 +
 d^2*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b \log{(cx^n)})^2}{x^3 (d + ex)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**3/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**3*(d + e*x)**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log{(cx^n)} + a)^2}{(ex + d)^2 x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^3/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^2*x^3), x)
```

3.107 $\int \frac{x^3(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=296

$$-\frac{6bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}-\frac{5b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{6b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{d^3(a+b\log(cx^n))^2}{2e^4(d+ex)^2}$$

```
[Out] (-2*a*b*n*x)/e^3 + (2*b^2*n^2*x)/e^3 - (2*b^2*n*x*Log[c*x^n])/e^3 + (b*d*n*
x*(a + b*Log[c*x^n]))/(e^3*(d + e*x)) - (d*(a + b*Log[c*x^n])^2)/(2*e^4) +
(x*(a + b*Log[c*x^n])^2)/e^3 + (d^3*(a + b*Log[c*x^n])^2)/(2*e^4*(d + e*x)^
2) + (3*d*x*(a + b*Log[c*x^n])^2)/(e^3*(d + e*x)) - (b^2*d*n^2*Log[d + e*x]
)/e^4 - (5*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4 - (3*d*(a + b*Log
[c*x^n])^2*Log[1 + (e*x)/d])/e^4 - (5*b^2*d*n^2*PolyLog[2, -((e*x)/d)])/e^4
 - (6*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 + (6*b^2*d*n^2*P
olyLog[3, -((e*x)/d)])/e^4
```

Rubi [A] time = 0.490136, antiderivative size = 296, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 14, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.609, Rules used = {2353, 2296, 2295, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318, 2374, 6589}

$$-\frac{6bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}-\frac{5b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^4}+\frac{6b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{d^3(a+b\log(cx^n))^2}{2e^4(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```


```
[Out] (-2*a*b*n*x)/e^3 + (2*b^2*n^2*x)/e^3 - (2*b^2*n*x*Log[c*x^n])/e^3 + (b*d*n*
x*(a + b*Log[c*x^n]))/(e^3*(d + e*x)) - (d*(a + b*Log[c*x^n])^2)/(2*e^4) +
(x*(a + b*Log[c*x^n])^2)/e^3 + (d^3*(a + b*Log[c*x^n])^2)/(2*e^4*(d + e*x)^
2) + (3*d*x*(a + b*Log[c*x^n])^2)/(e^3*(d + e*x)) - (b^2*d*n^2*Log[d + e*x]
)/e^4 - (5*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/e^4 - (3*d*(a + b*Log
[c*x^n])^2*Log[1 + (e*x)/d])/e^4 - (5*b^2*d*n^2*PolyLog[2, -((e*x)/d)])/e^4
 - (6*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 + (6*b^2*d*n^2*P
olyLog[3, -((e*x)/d)])/e^4
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
```

```
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 (a + b\log(cx^n))^2}{(d + ex)^3} dx = \int \left(\frac{(a + b\log(cx^n))^2}{e^3} - \frac{d^3 (a + b\log(cx^n))^2}{e^3(d + ex)^3} + \frac{3d^2 (a + b\log(cx^n))^2}{e^3(d + ex)^2} - \frac{3d (a + b\log(cx^n))}{e^3(d + ex)}\right.$$

$$= \frac{\int (a + b\log(cx^n))^2 \, dx}{e^3} - \frac{(3d)\int \frac{(a+b\log(cx^n))^2}{d+ex} dx}{e^3} + \frac{(3d^2)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2} dx}{e^3} - \frac{d^3 \int \frac{(a+b\log(c}{(d+ex)}}{e^3}$$

$$= \frac{x (a + b\log(cx^n))^2}{e^3} + \frac{d^3 (a + b\log(cx^n))^2}{2e^4(d + ex)^2} + \frac{3dx (a + b\log(cx^n))^2}{e^3(d + ex)} - \frac{3d (a + b\log(cx^n))^2}{e^4}$$

$$= -\frac{2abnx}{e^3} + \frac{x (a + b\log(cx^n))^2}{e^3} + \frac{d^3 (a + b\log(cx^n))^2}{2e^4(d + ex)^2} + \frac{3dx (a + b\log(cx^n))^2}{e^3(d + ex)} - \frac{6bdn (a +}{}$$

$$= -\frac{2abnx}{e^3} + \frac{2b^2n^2x}{e^3} - \frac{2b^2nx\log(cx^n)}{e^3} + \frac{bdnx (a + b\log(cx^n))}{e^3(d + ex)} + \frac{x (a + b\log(cx^n))^2}{e^3} + \frac{d^3 (}{}$$

$$= -\frac{2abnx}{e^3} + \frac{2b^2n^2x}{e^3} - \frac{2b^2nx\log(cx^n)}{e^3} + \frac{bdnx (a + b\log(cx^n))}{e^3(d + ex)} - \frac{d (a + b\log(cx^n))^2}{2e^4} + \frac{x (a}{}$$

$$= -\frac{2abnx}{e^3} + \frac{2b^2n^2x}{e^3} - \frac{2b^2nx\log(cx^n)}{e^3} + \frac{bdnx (a + b\log(cx^n))}{e^3(d + ex)} - \frac{d (a + b\log(cx^n))^2}{2e^4} + \frac{x (a}{}$$

Mathematica [A] time = 0.256989, size = 258, normalized size = 0.87

$$\frac{-12bdn\text{PolyLog}\left(2, -\frac{ex}{d}\right)(a + b\log(cx^n)) - 10b^2dn^2\text{PolyLog}\left(2, -\frac{ex}{d}\right) + 12b^2dn^2\text{PolyLog}\left(3, -\frac{ex}{d}\right) + \frac{d^3(a+b\log(cx^n))^2}{(d+ex)^2} - 6}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] ((-2*b*d^2*n*(a + b*Log[c*x^n]))/(d + e*x) + 5*d*(a + b*Log[c*x^n])^2 + 2*e
*x*(a + b*Log[c*x^n])^2 + (d^3*(a + b*Log[c*x^n])^2)/(d + e*x)^2 - (6*d^2*(
a + b*Log[c*x^n])^2)/(d + e*x) - 4*b*e*n*x*(a - b*n + b*Log[c*x^n]) + 2*b^2
*d*n^2*(Log[x] - Log[d + e*x]) - 10*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/
d] - 6*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] - 10*b^2*d*n^2*PolyLog[2, -(
(e*x)/d)] - 12*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 12*b^2*d*n
^2*PolyLog[3, -((e*x)/d)])/(2*e^4)
```

Maple [F] time = 0.896, size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b\ln(cx^n))^2}{(ex + d)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))^2/(e*x+d)^3,x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))^2/(e*x+d)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a^2\left(\frac{6\,d^2ex + 5\,d^3}{e^6x^2 + 2\,de^5x + d^2e^4} - \frac{2\,x}{e^3} + \frac{6\,d\log(ex + d)}{e^4}\right) + \int \frac{b^2x^3\log(x^n)^2 + 2\left(b^2\log(c) + ab\right)x^3\log(x^n) + \left(b^2\log(c)^2 + 2\right.}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*((6*d^2*e*x + 5*d^3)/(e^6*x^2 + 2*d*e^5*x + d^2*e^4) - 2*x/e^3 + 6
*d*log(e*x + d)/e^4) + integrate((b^2*x^3*log(x^n)^2 + 2*(b^2*log(c) + a*b)
*x^3*log(x^n) + (b^2*log(c)^2 + 2*a*b*log(c))*x^3)/(e^3*x^3 + 3*d*e^2*x^2 +
 3*d^2*e*x + d^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2x^3\log(cx^n)^2 + 2\,abx^3\log(cx^n) + a^2x^3}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*log(c*x^n)^2 + 2*a*b*x^3*log(c*x^n) + a^2*x^3)/(e^3*x^3 +
 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \log (cx^n))^2}{(d + ex)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log (cx^n) + a)^2 x^3}{(ex + d)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^3/(e*x + d)^3, x)
```

3.108 $\int \frac{x^2(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=232

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2}-\frac{bnx}{\cdots}$$

```
[Out] -((b*n*x*(a + b*Log[c*x^n]))/(e^2*(d + e*x))) + (a + b*Log[c*x^n])^2/(2*e^3
) - (d^2*(a + b*Log[c*x^n])^2)/(2*e^3*(d + e*x)^2) - (2*x*(a + b*Log[c*x^n]
)^2)/(e^2*(d + e*x)) + (b^2*n^2*Log[d + e*x])/e^3 + (3*b*n*(a + b*Log[c*x^n
])*Log[1 + (e*x)/d])/e^3 + ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^3 + (3
*b^2*n^2*PolyLog[2, -((e*x)/d)])/e^3 + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2,
 -((e*x)/d)])/e^3 - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^3
```

Rubi [A] time = 0.445967, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{e^3}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2e^3(d+ex)^2}-\frac{bnx}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```


```
[Out] -((b*n*x*(a + b*Log[c*x^n]))/(e^2*(d + e*x))) + (a + b*Log[c*x^n])^2/(2*e^3
) - (d^2*(a + b*Log[c*x^n])^2)/(2*e^3*(d + e*x)^2) - (2*x*(a + b*Log[c*x^n]
)^2)/(e^2*(d + e*x)) + (b^2*n^2*Log[d + e*x])/e^3 + (3*b*n*(a + b*Log[c*x^n
])*Log[1 + (e*x)/d])/e^3 + ((a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^3 + (3
*b^2*n^2*PolyLog[2, -((e*x)/d)])/e^3 + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2,
 -((e*x)/d)])/e^3 - (2*b^2*n^2*PolyLog[3, -((e*x)/d)])/e^3
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
```

```
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))^2}{(d+ex)^3}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))^2}{e^2(d+ex)^3} - \frac{2d (a+b\log(cx^n))^2}{e^2(d+ex)^2} + \frac{(a+b\log(cx^n))^2}{e^2(d+ex)}\right)dx$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e^2} - \frac{(2d)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e^2} + \frac{d^2 \int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{e^2}$$

$$= -\frac{d^2 (a+b\log(cx^n))^2}{2e^3(d+ex)^2} - \frac{2x (a+b\log(cx^n))^2}{e^2(d+ex)} + \frac{(a+b\log(cx^n))^2 \log\left(1+\frac{ex}{d}\right)}{e^3} - \frac{(2bn)\int \frac{(a\cdot}{}}{}$$

$$= -\frac{d^2 (a+b\log(cx^n))^2}{2e^3(d+ex)^2} - \frac{2x (a+b\log(cx^n))^2}{e^2(d+ex)} + \frac{4bn (a+b\log(cx^n)) \log\left(1+\frac{ex}{d}\right)}{e^3} + \frac{(a+b\,}{}$$

$$= -\frac{bnx (a+b\log(cx^n))}{e^2(d+ex)} - \frac{d^2 (a+b\log(cx^n))^2}{2e^3(d+ex)^2} - \frac{2x (a+b\log(cx^n))^2}{e^2(d+ex)} + \frac{4bn (a+b\log(cx^n}{e^3}$$

$$= -\frac{bnx (a+b\log(cx^n))}{e^2(d+ex)} + \frac{(a+b\log(cx^n))^2}{2e^3} - \frac{d^2 (a+b\log(cx^n))^2}{2e^3(d+ex)^2} - \frac{2x (a+b\log(cx^n))^2}{e^2(d+ex)} +$$

$$= -\frac{bnx (a+b\log(cx^n))}{e^2(d+ex)} + \frac{(a+b\log(cx^n))^2}{2e^3} - \frac{d^2 (a+b\log(cx^n))^2}{2e^3(d+ex)^2} - \frac{2x (a+b\log(cx^n))^2}{e^2(d+ex)} +$$

Mathematica [A] time = 0.227929, size = 212, normalized size = 0.91

$$\frac{4bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 6b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) - 4b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) - \frac{d^2(a+b\log(cx^n))^2}{(d+ex)^2} + \frac{2bdn(a+b\log}{d+ex}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] ((2*b*d*n*(a + b*Log[c*x^n]))/(d + e*x) - 3*(a + b*Log[c*x^n])^2 - (d^2*(a
+ b*Log[c*x^n])^2)/(d + e*x)^2 + (4*d*(a + b*Log[c*x^n])^2)/(d + e*x) - 2*b
^2*n^2*(Log[x] - Log[d + e*x]) + 6*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d]
+ 2*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 6*b^2*n^2*PolyLog[2, -((e*x)/d)
] + 4*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - 4*b^2*n^2*PolyLog[3,
-((e*x)/d)])/(2*e^3)
```

Maple [F] time = 0.727, size = 0, normalized size = 0.

$$\int \frac{x^2 (a+b\ln(cx^n))^2}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))^2/(e*x+d)^3,x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))^2/(e*x+d)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^2\left(\frac{4\,dex+3\,d^2}{e^5x^2+2\,de^4x+d^2e^3}+\frac{2\,\log\left(ex+d\right)}{e^3}\right)+\int\frac{b^2x^2\log\left(x^n\right)^2+2\left(b^2\log\left(c\right)+ab\right)x^2\log\left(x^n\right)+\left(b^2\log\left(c\right)^2+2\,ab\log\left(c\right)\right)x^2}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*((4*d*e*x + 3*d^2)/(e^5*x^2 + 2*d*e^4*x + d^2*e^3) + 2*log(e*x + d)
/e^3) + integrate((b^2*x^2*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^2*log(x^n) +
 (b^2*log(c)^2 + 2*a*b*log(c))*x^2)/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^
3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2x^2\log\left(cx^n\right)^2+2\,abx^2\log\left(cx^n\right)+a^2x^2}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*log(c*x^n)^2 + 2*a*b*x^2*log(c*x^n) + a^2*x^2)/(e^3*x^3 +
 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2 x^2}{(ex + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^2/(e*x + d)^3, x)
```

3.109 $\int \frac{x(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=112

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de^2}-\frac{bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n)+bn)}{de^2}+\frac{bnx(a+b\log(cx^n))}{de(d+ex)}+\frac{x^2(a+b\log(cx^n))^2}{2d(d+ex)^2}$$

```
[Out] (b*n*x*(a + b*Log[c*x^n]))/(d*e*(d + e*x)) + (x^2*(a + b*Log[c*x^n])^2)/(2*
d*(d + e*x)^2) - (b*n*(a + b*n + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d*e^2) -
(b^2*n^2*PolyLog[2, -((e*x)/d)])/(d*e^2)
```

Rubi [A] time = 0.356785, antiderivative size = 176, normalized size of antiderivative = 1.57, number of steps used = 13, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318}

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de^2}-\frac{bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{de^2}-\frac{(a+b\log(cx^n))^2}{2de^2}+\frac{d(a+b\log(cx^n))^2}{2e^2(d+ex)^2}+\frac{bnx(a+b\log(cx$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] (b*n*x*(a + b*Log[c*x^n]))/(d*e*(d + e*x)) - (a + b*Log[c*x^n])^2/(2*d*e^2)
 + (d*(a + b*Log[c*x^n])^2)/(2*e^2*(d + e*x)^2) + (x*(a + b*Log[c*x^n])^2)/
(d*e*(d + e*x)) - (b^2*n^2*Log[d + e*x])/(d*e^2) - (b*n*(a + b*Log[c*x^n])*
Log[1 + (e*x)/d])/(d*e^2) - (b^2*n^2*PolyLog[2, -((e*x)/d)])/(d*e^2)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
```

```
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx = \int \left(-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^3}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^2}\right)dx$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e} - \frac{d\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{e}$$

$$= \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{(bdn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{e^2} - \frac{(2bn)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{de}$$

$$= \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex}{d}\right)}{de^2} - \frac{(bn)\int \frac{a+b\log(}{x(d+e}}{e^2}$$

$$= \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)} + \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{2bn\left(a+b\log\left(cx^n\right)\right)\log\left(\right.}{de^2}$$

$$= \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2de^2} + \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{b^2n^2}{}$$

$$= \frac{bnx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)} - \frac{\left(a+b\log\left(cx^n\right)\right)^2}{2de^2} + \frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2} + \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)} - \frac{b^2n^2}{}$$

Mathematica [A] time = 0.219712, size = 155, normalized size = 1.38

$$\frac{-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d} - \frac{2bn(a+b\log(cx^n))}{d+ex} - \frac{2bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d} - \frac{2(a+b\log(cx^n))^2}{d+ex} + \frac{d(a+b\log(cx^n))^2}{(d+ex)^2} + \frac{(a+b\log(cx^n))^2}{d} + \frac{2b^2n^2(\log(x)-}{d}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] ((-2*b*n*(a + b*Log[c*x^n]))/(d + e*x) + (a + b*Log[c*x^n])^2/d + (d*(a + b
*Log[c*x^n])^2)/(d + e*x)^2 - (2*(a + b*Log[c*x^n])^2)/(d + e*x) + (2*b^2*n
^2*(Log[x] - Log[d + e*x]))/d - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])
/d - (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/d)/(2*e^2)
```

Maple [C] time = 0.275, size = 1199, normalized size = 10.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))^2/(e*x+d)^3,x)
```

```
[Out] 1/4*(I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)-I*b*Pi*csgn(I*c*x^n)^3+I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+2*b*ln(c)+2
*a)^2*(1/2*d/e^2/(e*x+d)^2-1/e^2/(e*x+d))+b*ln(x^n)*d/e^2/(e*x+d)^2*a+ln(x^
n)*d/e^2/(e*x+d)^2*b^2*ln(c)-b^2*n/e^2*ln(x^n)/d*ln(e*x+d)+b^2*n/e^2*ln(x^n
)/d*ln(x)+1/2*I/e^2*n/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+I/e^2*ln(x^n)/(e*x+d)*
b^2*Pi*csgn(I*c*x^n)^3+b^2/e^2*n^2/d*ln(e*x+d)*ln(-e*x/d)+1/2*I/e^2*n/d*ln(
e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/e^2*n/d*ln(x)*b^2*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-b^2*ln(x^n)^2/e^2/(e*x+d)+1/2*I/e^2*n
/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/e^2*n/(e*x+d)*b^2*Pi*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x^n)*d/e^2/(e*x+d)^2*b^2*Pi*csgn(I
*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x^n)*d/e^2/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)-1/2*I/e^2*n/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c
)+1/2*I*ln(x^n)*d/e^2/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I/e^2*
n/d*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/e^2*n/d*ln(x)*b^2*Pi
*csgn(I*c*x^n)^2*csgn(I*c)+I/e^2*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)-1/2*I/e^2*n/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2
*I/e^2*n/d*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e^2*n/(e*x+d)*b^2*Pi*csgn
(I*c*x^n)^2*csgn(I*c)-I/e^2*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c
)-I/e^2*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x^n)*d/
e^2/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e^2*n/d*ln(x)*b^2*Pi*csgn(I*c*x^
n)^3-2/e^2*ln(x^n)/(e*x+d)*b^2*ln(c)+1/2*b^2*ln(x^n)^2*d/e^2/(e*x+d)^2-b/e^
2*n/d*ln(e*x+d)*a+b/e^2*n/d*ln(x)*a-1/e^2*n/d*ln(e*x+d)*b^2*ln(c)+1/e^2*n/d
*ln(x)*b^2*ln(c)-1/e^2*n/(e*x+d)*b^2*ln(c)-b/e^2*n/(e*x+d)*a-1/2*b^2/e^2*n^
2/d*ln(x)^2-b^2/e^2*n^2/d*ln(e*x+d)+b^2/e^2*n^2/d*ln(x)+b^2/e^2*n^2/d*dilog
(-e*x/d)-b^2*n/e^2*ln(x^n)/(e*x+d)-2*b/e^2*ln(x^n)/(e*x+d)*a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-abn\left(\frac{1}{e^3x+de^2}+\frac{\log(ex+d)}{de^2}-\frac{\log(x)}{de^2}\right)-\frac{1}{2}\left(\frac{(2\,ex+d)\log(x^n)^2}{e^4x^2+2\,de^3x+d^2e^2}-2\int\frac{e^2x^2\log(c)^2+\left(3\,denx+d^2n+2\left(e^2n+e^2\log(c)\right)x^2\right)\log(x^n)}{e^5x^4+3\,de^4x^3+3\,d^2e^3x^2+d^3e^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -a*b*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)) - 1/2*((
2*e*x + d)*log(x^n)^2/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 2*integrate((e^2*x^
2*log(c)^2 + (3*d*e*n*x + d^2*n + 2*(e^2*n + e^2*log(c))*x^2)*log(x^n))/(e^
5*x^4 + 3*d*e^4*x^3 + 3*d^2*e^3*x^2 + d^3*e^2*x), x))*b^2 - (2*e*x + d)*a*b
*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*(2*e*x + d)*a^2/(e^4*x^2
+ 2*d*e^3*x + d^2*e^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2x\log(cx^n)^2+2\,abx\log(cx^n)+a^2x}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*x*log(c*x^n)^2 + 2*a*b*x*log(c*x^n) + a^2*x)/(e^3*x^3 + 3*d*e
^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x\,(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)^2x}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x/(e*x + d)^3, x)
```

3.110 $\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=126

$$\frac{b^2n^2\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{d^2e}-\frac{bn\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{d^2e}-\frac{bnx(a+b\log(cx^n))}{d^2(d+ex)}-\frac{(a+b\log(cx^n))^2}{2e(d+ex)^2}+\frac{b^2n^2\log(d+ex)}{d^2e}$$

```
[Out] -((b*n*x*(a + b*Log[c*x^n]))/(d^2*(d + e*x))) - (b*n*Log[1 + d/(e*x)]*(a +
b*Log[c*x^n]))/(d^2*e) - (a + b*Log[c*x^n])^2/(2*e*(d + e*x)^2) + (b^2*n^2*
Log[d + e*x])/(d^2*e) + (b^2*n^2*PolyLog[2, -(d/(e*x))])/(d^2*e)
```

Rubi [A] time = 0.201489, antiderivative size = 145, normalized size of antiderivative = 1.15, number of steps used = 8, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2319, 2347, 2344, 2301, 2317, 2391, 2314, 31}

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2e}-\frac{bnx(a+b\log(cx^n))}{d^2(d+ex)}-\frac{bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^2e}+\frac{(a+b\log(cx^n))^2}{2d^2e}-\frac{(a+b\log(cx^n))^2}{2e(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x)^3,x]
```

```
[Out] -((b*n*x*(a + b*Log[c*x^n]))/(d^2*(d + e*x))) + (a + b*Log[c*x^n])^2/(2*d^2
*e) - (a + b*Log[c*x^n])^2/(2*e*(d + e*x)^2) + (b^2*n^2*Log[d + e*x])/(d^2*
e) - (b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d^2*e) - (b^2*n^2*PolyLog[2
, -((e*x)/d)])/(d^2*e)
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
```

```
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx = -\frac{(a+b\log(cx^n))^2}{2e(d+ex)^2} + \frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{e}$$
$$= -\frac{(a+b\log(cx^n))^2}{2e(d+ex)^2} - \frac{(bn)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{d} + \frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{de}$$
$$= -\frac{bnx(a+b\log(cx^n))}{d^2(d+ex)} - \frac{(a+b\log(cx^n))^2}{2e(d+ex)^2} - \frac{(bn)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{d^2} + \frac{(bn)\int \frac{a+b\log(cx^n)}{x}\,dx}{d^2e} + \frac{(b^2}{}$$
$$= -\frac{bnx(a+b\log(cx^n))}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^2}{2d^2e} - \frac{(a+b\log(cx^n))^2}{2e(d+ex)^2} + \frac{b^2n^2\log(d+ex)}{d^2e} - \frac{bn(a+b}{}$$
$$= -\frac{bnx(a+b\log(cx^n))}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^2}{2d^2e} - \frac{(a+b\log(cx^n))^2}{2e(d+ex)^2} + \frac{b^2n^2\log(d+ex)}{d^2e} - \frac{bn(a+b}{}$$

Mathematica [A] time = 0.100528, size = 146, normalized size = 1.16

$$\frac{bn\left(-\frac{bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2} - \frac{\log\left(\frac{d+ex}{d}\right)(a+b\log(cx^n))}{d^2} + \frac{(a+b\log(cx^n))^2}{2bd^2n} + \frac{a+b\log(cx^n)}{d(d+ex)} - \frac{bn\left(\frac{\log(x)}{d}-\frac{\log(d+ex)}{d}\right)}{d}\right)}{e} - \frac{(a+b\log(cx^n))^2}{2e(d+ex)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x)^3,x]
```

```
[Out] -(a + b*Log[c*x^n])^2/(2*e*(d + e*x)^2) + (b*n*((a + b*Log[c*x^n])/(d*(d +
e*x)) + (a + b*Log[c*x^n])^2/(2*b*d^2*n) - (b*n*(Log[x]/d - Log[d + e*x]/d)
)/d - ((a + b*Log[c*x^n])*Log[(d + e*x)/d])/d^2 - (b*n*PolyLog[2, -((e*x)/d
)])/d^2))/e
```

Maple [C] time = 0.256, size = 990, normalized size = 7.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/(e*x+d)^3,x)
```

```
[Out] -1/2*I/e*n/d/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+b^2/e*n^2/d
^2*ln(e*x+d)*ln(-e*x/d)-b/(e*x+d)^2/e*ln(x^n)*a-1/(e*x+d)^2/e*ln(x^n)*b^2*l
```

```
n(c)-b/e*n/d^2*ln(e*x+d)*a+b/e*n/d/(e*x+d)*a+b/e*n/d^2*ln(x)*a-1/e*n/d^2*ln
(e*x+d)*b^2*ln(c)+1/e*n/d/(e*x+d)*b^2*ln(c)+1/e*n/d^2*ln(x)*b^2*ln(c)+1/2*I
/e*n/d^2*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/e*n/d^2*ln(x)*b^2*Pi*
csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/(e*x+d)^2/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-1/2*I/e*n/d^2*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+1/2*I/e*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+1/2*I/e*n/d/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-b^2/e*n*ln(x^n)/d^2*
ln(e*x+d)+b^2/e*n*ln(x^n)/d/(e*x+d)+b^2/e*n*ln(x^n)/d^2*ln(x)-1/2*b^2/(e*x+
d)^2/e*ln(x^n)^2-b^2/e*n^2/d^2*ln(x)+b^2/e*n^2/d^2*dilog(-e*x/d)-1/2*I/e*n/
d^2*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e*n/d^2*ln(e*x+d)*b^
2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/e*n/d/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2-1/2*I/(e*x+d)^2/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2
*I/e*n/d^2*ln(x)*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e*n/d/(e*x+d)*b^2*Pi*csgn(I*c
*x^n)^3+1/2*I/e*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/(e*x+d)^2/e*ln
(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/(e*x+d)^2/e*ln(x^n)*b^2*Pi*csg
n(I*c*x^n)^3-1/2*b^2/e*n^2/d^2*ln(x)^2-1/8*(I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*b*Pi*csgn(I*c*x^n)^3+I*b*P
i*csgn(I*c*x^n)^2*csgn(I*c)+2*b*ln(c)+2*a)^2/(e*x+d)^2/e+b^2*n^2*ln(e*x+d)/
e/d^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$abn\left(\frac{1}{de^2x+d^2e}-\frac{\log(ex+d)}{d^2e}+\frac{\log(x)}{d^2e}\right)-\frac{1}{2}\,b^2\left(\frac{\log(x^n)^2}{e^3x^2+2\,de^2x+d^2e}-2\int\frac{ex\log(c)^2+(dn+(en+2\,e\log(c))x)\log(}{e^4x^4+3\,de^3x^3+3\,d^2e^2x^2+d^3ex}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] a*b*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e)) - 1/2*b
^2*(log(x^n)^2/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 2*integrate((e*x*log(c)^2 +
(d*n + (e*n + 2*e*log(c))*x)*log(x^n))/(e^4*x^4 + 3*d*e^3*x^3 + 3*d^2*e^2*x
^2 + d^3*e*x), x)) - a*b*log(c*x^n)/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 1/2*a^2
/(e^3*x^2 + 2*d*e^2*x + d^2*e)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log(cx^n)^2+2\,ab\log(cx^n)+a^2}{e^3x^3+3\,de^2x^2+3\,d^2ex+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^3*x^3 + 3*d*e^2*x^2
 + 3*d^2*e*x + d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))^2}{(d + ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x + d)^3, x)
```

3.111 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^3}\,dx$

Optimal. Leaf size=257

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}+\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^3}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(}{d^3}$$

```
[Out] (b*e*n*x*(a + b*Log[c*x^n]))/(d^3*(d + e*x)) - (a + b*Log[c*x^n])^2/(2*d^3)
 + (a + b*Log[c*x^n])^2/(2*d*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^2)/(d^3
*(d + e*x)) + (a + b*Log[c*x^n])^3/(3*b*d^3*n) - (b^2*n^2*Log[d + e*x])/d^3
 + (3*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^3 - ((a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d])/d^3 + (3*b^2*n^2*PolyLog[2, -((e*x)/d)])/d^3 - (2*b*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^3 + (2*b^2*n^2*PolyLog[3, -((e*x)
/d)])/d^3
```

Rubi [A] time = 0.593848, antiderivative size = 257, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391, 2319, 2301, 2314, 31}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}+\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^3}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log(}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x)^3),x]
```


```
[Out] (b*e*n*x*(a + b*Log[c*x^n]))/(d^3*(d + e*x)) - (a + b*Log[c*x^n])^2/(2*d^3)
 + (a + b*Log[c*x^n])^2/(2*d*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^2)/(d^3
*(d + e*x)) + (a + b*Log[c*x^n])^3/(3*b*d^3*n) - (b^2*n^2*Log[d + e*x])/d^3
 + (3*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/d^3 - ((a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d])/d^3 + (3*b^2*n^2*PolyLog[2, -((e*x)/d)])/d^3 - (2*b*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^3 + (2*b^2*n^2*PolyLog[3, -((e*x)
/d)])/d^3
```


Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
```

```
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
```

```
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^3}\,dx = \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^2}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{d}$$

$$= \frac{(a+b\log(cx^n))^2}{2d(d+ex)^2} + \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex)}\,dx}{d^2} - \frac{e\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{d^2} - \frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{d}$$

$$= \frac{(a+b\log(cx^n))^2}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^2}{d^3(d+ex)} + \frac{\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^3} - \frac{e\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d^3} - \frac{(bn)\int \frac{a+}{}}{}$$

$$= \frac{benx(a+b\log(cx^n))}{d^3(d+ex)} + \frac{(a+b\log(cx^n))^2}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^2}{d^3(d+ex)} + \frac{2bn(a+b\log(cx^n))\log\left(1\right.}{d^3}$$

$$= \frac{benx(a+b\log(cx^n))}{d^3(d+ex)} - \frac{(a+b\log(cx^n))^2}{2d^3} + \frac{(a+b\log(cx^n))^2}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^2}{d^3(d+ex)} + \frac{(a+b}{3}$$

$$= \frac{benx(a+b\log(cx^n))}{d^3(d+ex)} - \frac{(a+b\log(cx^n))^2}{2d^3} + \frac{(a+b\log(cx^n))^2}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^2}{d^3(d+ex)} + \frac{(a+b}{3}$$

Mathematica [A] time = 0.251811, size = 232, normalized size = 0.9

$$\frac{-12bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 18b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) + 12b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) + \frac{3d^2(a+b\log(cx^n))^2}{(d+ex)^2} - 6\log}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x)^3),x]
```

```
[Out] ((-6*b*d*n*(a + b*Log[c*x^n]))/(d + e*x) - 9*(a + b*Log[c*x^n])^2 + (3*d^2*
(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (6*d*(a + b*Log[c*x^n])^2)/(d + e*x) +
(2*(a + b*Log[c*x^n])^3)/(b*n) + 6*b^2*n^2*(Log[x] - Log[d + e*x]) + 18*b*n
*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 6*(a + b*Log[c*x^n])^2*Log[1 + (e*x)
/d] + 18*b^2*n^2*PolyLog[2, -((e*x)/d)] - 12*b*n*(a + b*Log[c*x^n])*PolyLog
[2, -((e*x)/d)] + 12*b^2*n^2*PolyLog[3, -((e*x)/d)])/(6*d^3)
```

Maple [F] time = 0.718, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x/(e*x+d)^3,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x/(e*x+d)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^2\left(\frac{2\,ex+3\,d}{d^2e^2x^2+2\,d^3ex+d^4}-\frac{2\,\log\left(ex+d\right)}{d^3}+\frac{2\,\log\left(x\right)}{d^3}\right)+\int\frac{b^2\log\left(c\right)^2+b^2\log\left(x^n\right)^2+2\,ab\log\left(c\right)+2\left(b^2\log\left(c\right)+ab\right.}{e^3x^4+3\,de^2x^3+3\,d^2ex^2+d^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*((2*e*x + 3*d)/(d^2*e^2*x^2 + 2*d^3*e*x + d^4) - 2*log(e*x + d)/d^3
 + 2*log(x)/d^3) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c)
+ 2*(b^2*log(c) + a*b)*log(x^n))/(e^3*x^4 + 3*d*e^2*x^3 + 3*d^2*e*x^2 + d^3
*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{e^3x^4+3\,de^2x^3+3\,d^2ex^2+d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^3*x^4 + 3*d*e^2*x^3
 + 3*d^2*e*x^2 + d^3*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)^2}{x\left(d+ex\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)**3), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex+d)^3 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^3*x), x)
```

3.112 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^3}\,dx$

Optimal. Leaf size=322

$$\frac{6ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^4}-\frac{5b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{6b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}+\frac{2e^2x(a+b\log(cx^n))^2}{d^4(d+ex)}$$

```
[Out] (-2*b^2*n^2)/(d^3*x) - (2*b*n*(a + b*Log[c*x^n]))/(d^3*x) - (b*e^2*n*x*(a +
 b*Log[c*x^n]))/(d^4*(d + e*x)) + (e*(a + b*Log[c*x^n])^2)/(2*d^4) - (a + b
*Log[c*x^n])^2/(d^3*x) - (e*(a + b*Log[c*x^n])^2)/(2*d^2*(d + e*x)^2) + (2*
e^2*x*(a + b*Log[c*x^n])^2)/(d^4*(d + e*x)) - (e*(a + b*Log[c*x^n])^3)/(b*d
^4*n) + (b^2*e*n^2*Log[d + e*x])/d^4 - (5*b*e*n*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/d^4 + (3*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^4 - (5*b^2*e*
n^2*PolyLog[2, -((e*x)/d)])/d^4 + (6*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -(
(e*x)/d)])/d^4 - (6*b^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^4
```

Rubi [A] time = 0.537709, antiderivative size = 322, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 16, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.696, Rules used = {2353, 2305, 2304, 2302, 30, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318, 2374, 6589}

$$\frac{6ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^4}-\frac{5b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^4}-\frac{6b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}+\frac{2e^2x(a+b\log(cx^n))^2}{d^4(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^3),x]
```

```
[Out] (-2*b^2*n^2)/(d^3*x) - (2*b*n*(a + b*Log[c*x^n]))/(d^3*x) - (b*e^2*n*x*(a +
 b*Log[c*x^n]))/(d^4*(d + e*x)) + (e*(a + b*Log[c*x^n])^2)/(2*d^4) - (a + b
*Log[c*x^n])^2/(d^3*x) - (e*(a + b*Log[c*x^n])^2)/(2*d^2*(d + e*x)^2) + (2*
e^2*x*(a + b*Log[c*x^n])^2)/(d^4*(d + e*x)) - (e*(a + b*Log[c*x^n])^3)/(b*d
^4*n) + (b^2*e*n^2*Log[d + e*x])/d^4 - (5*b*e*n*(a + b*Log[c*x^n])*Log[1 +
(e*x)/d])/d^4 + (3*e*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^4 - (5*b^2*e*
n^2*PolyLog[2, -((e*x)/d)])/d^4 + (6*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -(
(e*x)/d)])/d^4 - (6*b^2*e*n^2*PolyLog[3, -((e*x)/d)])/d^4
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
```

```
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^3}\,dx = \int \left(\frac{(a+b\log(cx^n))^2}{d^3x^2} - \frac{3e(a+b\log(cx^n))^2}{d^4x} + \frac{e^2(a+b\log(cx^n))^2}{d^2(d+ex)^3} + \frac{2e^2(a+b\log(cx^n))^2}{d^3(d+ex)^2} + \cdots\right.$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx}{d^3} - \frac{(3e)\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^4} + \frac{\left(3e^2\right)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d^4} + \frac{\left(2e^2\right)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{d^3} \cdots$$

$$= -\frac{(a+b\log(cx^n))^2}{d^3x} - \frac{e(a+b\log(cx^n))^2}{2d^2(d+ex)^2} + \frac{2e^2x(a+b\log(cx^n))^2}{d^4(d+ex)} + \frac{3e(a+b\log(cx^n))^2\log(1 \cdots}{d^4} \cdots$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn(a+b\log(cx^n))}{d^3x} - \frac{(a+b\log(cx^n))^2}{d^3x} - \frac{e(a+b\log(cx^n))^2}{2d^2(d+ex)^2} + \frac{2e^2x(a+b\log(cx \cdots}{d^4(d+ex)} \cdots$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn(a+b\log(cx^n))}{d^3x} - \frac{be^2nx(a+b\log(cx^n))}{d^4(d+ex)} - \frac{(a+b\log(cx^n))^2}{d^3x} - \frac{e(a+b\log(cx \cdots}{2d^2(d+ex)^2} \cdots$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn(a+b\log(cx^n))}{d^3x} - \frac{be^2nx(a+b\log(cx^n))}{d^4(d+ex)} + \frac{e(a+b\log(cx^n))^2}{2d^4} - \frac{(a+b\log(cx \cdots}{d^3x} \cdots$$

$$= -\frac{2b^2n^2}{d^3x} - \frac{2bn(a+b\log(cx^n))}{d^3x} - \frac{be^2nx(a+b\log(cx^n))}{d^4(d+ex)} + \frac{e(a+b\log(cx^n))^2}{2d^4} - \frac{(a+b\log(cx \cdots}{d^3x} \cdots$$

Mathematica [A] time = 0.412947, size = 290, normalized size = 0.9

$$-\frac{-12ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 10b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) + 12b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) + \frac{d^2e(a+b\log(cx^n))^2}{(d+ex)^2} - 6 \cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^3),x]
```

```
[Out] -((4*b^2*d*n^2)/x + (4*b*d*n*(a + b*Log[c*x^n]))/x - (2*b*d*e*n*(a + b*Log[
c*x^n]))/(d + e*x) - 5*e*(a + b*Log[c*x^n])^2 + (2*d*(a + b*Log[c*x^n])^2)/
x + (d^2*e*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (4*d*e*(a + b*Log[c*x^n])^2)
/(d + e*x) + (2*e*(a + b*Log[c*x^n])^3)/(b*n) + 2*b^2*e*n^2*(Log[x] - Log[d
 + e*x]) + 10*b*e*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 6*e*(a + b*Log[c*
x^n])^2*Log[1 + (e*x)/d] + 10*b^2*e*n^2*PolyLog[2, -((e*x)/d)] - 12*b*e*n*(
a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 12*b^2*e*n^2*PolyLog[3, -((e*x)/
d)])/(2*d^4)
```

Maple [F] time = 0.768, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\ln\left(cx^{n}\right)\right)^{2}}{x^{2}\left(ex+d\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x^2/(e*x+d)^3,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x^2/(e*x+d)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a^{2}\left(\frac{6\,e^{2}x^{2}+9\,dex+2\,d^{2}}{d^{3}e^{2}x^{3}+2\,d^{4}ex^{2}+d^{5}x}-\frac{6\,e\log\left(ex+d\right)}{d^{4}}+\frac{6\,e\log\left(x\right)}{d^{4}}\right)+\int\frac{b^{2}\log\left(c\right)^{2}+b^{2}\log\left(x^{n}\right)^{2}+2\,ab\log\left(c\right)+2\,\left(b^{2}\log\left(c\right.\right.}{e^{3}x^{5}+3\,de^{2}x^{4}+3\,d^{2}ex^{3}+d^{3}x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*((6*e^2*x^2 + 9*d*e*x + 2*d^2)/(d^3*e^2*x^3 + 2*d^4*e*x^2 + d^5*x)
 - 6*e*log(e*x + d)/d^4 + 6*e*log(x)/d^4) + integrate((b^2*log(c)^2 + b^2*l
og(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^3*x^5 + 3*d*e^
2*x^4 + 3*d^2*e*x^3 + d^3*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^{2}\log\left(cx^{n}\right)^{2}+2\,ab\log\left(cx^{n}\right)+a^{2}}{e^{3}x^{5}+3\,de^{2}x^{4}+3\,d^{2}ex^{3}+d^{3}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^3*x^5 + 3*d*e^2*x^4
 + 3*d^2*e*x^3 + d^3*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))^2}{x^2(d + ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x**2/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x**2*(d + e*x)**3), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex + d)^3 x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^3*x^2), x)
```

3.113 $\int \frac{x^4(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=398

$$-\frac{8bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^5}-\frac{26b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3e^5}+\frac{8b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^5}-\frac{d^4(a+b\log(cx^n))}{3e^5(d+ex)^3}$$

```
[Out] (-2*a*b*n*x)/e^4 + (2*b^2*n^2*x)/e^4 - (b^2*d^2*n^2)/(3*e^5*(d + e*x)) - (b
^2*d*n^2*Log[x])/(3*e^5) - (2*b^2*n*x*Log[c*x^n])/e^4 + (b*d^3*n*(a + b*Log
[c*x^n]))/(3*e^5*(d + e*x)^2) + (10*b*d*n*x*(a + b*Log[c*x^n]))/(3*e^4*(d +
 e*x)) - (5*d*(a + b*Log[c*x^n])^2)/(3*e^5) + (x*(a + b*Log[c*x^n])^2)/e^4
- (d^4*(a + b*Log[c*x^n])^2)/(3*e^5*(d + e*x)^3) + (2*d^3*(a + b*Log[c*x^n]
)^2)/(e^5*(d + e*x)^2) + (6*d*x*(a + b*Log[c*x^n])^2)/(e^4*(d + e*x)) - (3*
b^2*d*n^2*Log[d + e*x])/e^5 - (26*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d]
)/(3*e^5) - (4*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^5 - (26*b^2*d*n^2
*PolyLog[2, -((e*x)/d)])/(3*e^5) - (8*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -
((e*x)/d)])/e^5 + (8*b^2*d*n^2*PolyLog[3, -((e*x)/d)])/e^5
```

Rubi [A] time = 0.825625, antiderivative size = 398, normalized size of antiderivative = 1., number of steps used = 31, number of rules used = 15, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.652, Rules used = {2353, 2296, 2295, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318, 2374, 6589}

$$-\frac{8bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^5}-\frac{26b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3e^5}+\frac{8b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^5}-\frac{d^4(a+b\log(cx^n))}{3e^5(d+ex)^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```


```
[Out] (-2*a*b*n*x)/e^4 + (2*b^2*n^2*x)/e^4 - (b^2*d^2*n^2)/(3*e^5*(d + e*x)) - (b
^2*d*n^2*Log[x])/(3*e^5) - (2*b^2*n*x*Log[c*x^n])/e^4 + (b*d^3*n*(a + b*Log
[c*x^n]))/(3*e^5*(d + e*x)^2) + (10*b*d*n*x*(a + b*Log[c*x^n]))/(3*e^4*(d +
 e*x)) - (5*d*(a + b*Log[c*x^n])^2)/(3*e^5) + (x*(a + b*Log[c*x^n])^2)/e^4
- (d^4*(a + b*Log[c*x^n])^2)/(3*e^5*(d + e*x)^3) + (2*d^3*(a + b*Log[c*x^n]
)^2)/(e^5*(d + e*x)^2) + (6*d*x*(a + b*Log[c*x^n])^2)/(e^4*(d + e*x)) - (3*
b^2*d*n^2*Log[d + e*x])/e^5 - (26*b*d*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d]
)/(3*e^5) - (4*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/e^5 - (26*b^2*d*n^2
*PolyLog[2, -((e*x)/d)])/(3*e^5) - (8*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -
((e*x)/d)])/e^5 + (8*b^2*d*n^2*PolyLog[3, -((e*x)/d)])/e^5
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
```

```
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
```

```
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^4 (a+b\log(cx^n))^2}{(d+ex)^4}\,dx = \int\Bigg(\frac{(a+b\log(cx^n))^2}{e^4} + \frac{d^4(a+b\log(cx^n))^2}{e^4(d+ex)^4} - \frac{4d^3(a+b\log(cx^n))^2}{e^4(d+ex)^3} + \frac{6d^2(a+b\log(cx^n))^2}{e^4(d+ex)^2}$$

$$= \frac{\int (a+b\log(cx^n))^2\,dx}{e^4} - \frac{(4d)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e^4} + \frac{\left(6d^2\right)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e^4} - \frac{\left(4d^3\right)\int \frac{(a+b\log}{(d+e}}{e^4}$$

$$= \frac{x(a+b\log(cx^n))^2}{e^4} - \frac{d^4(a+b\log(cx^n))^2}{3e^5(d+ex)^3} + \frac{2d^3(a+b\log(cx^n))^2}{e^5(d+ex)^2} + \frac{6dx(a+b\log(cx^n))^2}{e^4(d+ex)}$$

$$= -\frac{2abnx}{e^4} + \frac{x(a+b\log(cx^n))^2}{e^4} - \frac{d^4(a+b\log(cx^n))^2}{3e^5(d+ex)^3} + \frac{2d^3(a+b\log(cx^n))^2}{e^5(d+ex)^2} + \frac{6dx(a+b\log}{e^4(d+}$$

$$= -\frac{2abnx}{e^4} + \frac{2b^2n^2x}{e^4} - \frac{2b^2nx\log(cx^n)}{e^4} + \frac{bd^3n(a+b\log(cx^n))}{3e^5(d+ex)^2} + \frac{4bdnx(a+b\log(cx^n))}{e^4(d+ex)} + \frac{x}{}$$

$$= -\frac{2abnx}{e^4} + \frac{2b^2n^2x}{e^4} - \frac{2b^2nx\log(cx^n)}{e^4} + \frac{bd^3n(a+b\log(cx^n))}{3e^5(d+ex)^2} + \frac{10bdnx(a+b\log(cx^n))}{3e^4(d+ex)}$$

$$= -\frac{2abnx}{e^4} + \frac{2b^2n^2x}{e^4} - \frac{b^2d^2n^2}{3e^5(d+ex)} - \frac{b^2dn^2\log(x)}{3e^5} - \frac{2b^2nx\log(cx^n)}{e^4} + \frac{bd^3n(a+b\log(cx^n))}{3e^5(d+ex)^2}$$

$$= -\frac{2abnx}{e^4} + \frac{2b^2n^2x}{e^4} - \frac{b^2d^2n^2}{3e^5(d+ex)} - \frac{b^2dn^2\log(x)}{3e^5} - \frac{2b^2nx\log(cx^n)}{e^4} + \frac{bd^3n(a+b\log(cx^n))}{3e^5(d+ex)^2}$$

Mathematica [A] time = 0.640398, size = 344, normalized size = 0.86

$$-\frac{24bdn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 26b^2dn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) - 24b^2dn^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) + \frac{d^4(a+b\log(cx^n))^2}{(d+ex)^3} - \frac{6d}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] -(-((b*d^3*n*(a + b*Log[c*x^n]))/(d + e*x)^2) + (10*b*d^2*n*(a + b*Log[c*x^
n]))/(d + e*x) - 13*d*(a + b*Log[c*x^n])^2 - 3*e*x*(a + b*Log[c*x^n])^2 + (
d^4*(a + b*Log[c*x^n])^2)/(d + e*x)^3 - (6*d^3*(a + b*Log[c*x^n])^2)/(d + e
*x)^2 + (18*d^2*(a + b*Log[c*x^n])^2)/(d + e*x) + 6*b*e*n*x*(a - b*n + b*Lo
g[c*x^n]) - 10*b^2*d*n^2*(Log[x] - Log[d + e*x]) + (b^2*d*n^2*(d + (d + e*x
)*Log[x] - (d + e*x)*Log[d + e*x]))/(d + e*x) + 26*b*d*n*(a + b*Log[c*x^n])
*Log[1 + (e*x)/d] + 12*d*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 26*b^2*d*n
^2*PolyLog[2, -((e*x)/d)] + 24*b*d*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/
d)] - 24*b^2*d*n^2*PolyLog[3, -((e*x)/d)])/(3*e^5)
```

Maple [F] time = 0.868, size = 0, normalized size = 0.

$$\int \frac{x^4 \left(a + b\ln\left(cx^n\right)\right)^2}{\left(ex + d\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*ln(c*x^n))^2/(e*x+d)^4,x)
```

```
[Out] int(x^4*(a+b*ln(c*x^n))^2/(e*x+d)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{3}\,a^2\left(\frac{18\,d^2e^2x^2 + 30\,d^3ex + 13\,d^4}{e^8x^3 + 3\,de^7x^2 + 3\,d^2e^6x + d^3e^5} - \frac{3\,x}{e^4} + \frac{12\,d\log\left(ex + d\right)}{e^5}\right) + \int \frac{b^2x^4\log\left(x^n\right)^2 + 2\left(b^2\log\left(c\right) + ab\right)x^4\log\left(x^n\right) + \left(\right.}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a^2*((18*d^2*e^2*x^2 + 30*d^3*e*x + 13*d^4)/(e^8*x^3 + 3*d*e^7*x^2 + 3
*d^2*e^6*x + d^3*e^5) - 3*x/e^4 + 12*d*log(e*x + d)/e^5) + integrate((b^2*x
^4*log(x^n)^2 + 2*(b^2*log(c) + a*b)*x^4*log(x^n) + (b^2*log(c)^2 + 2*a*b*l
og(c))*x^4)/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^2x^4\log\left(cx^n\right)^2 + 2\,abx^4\log\left(cx^n\right) + a^2x^4}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^4*log(c*x^n)^2 + 2*a*b*x^4*log(c*x^n) + a^2*x^4)/(e^4*x^4 +
 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4 (a + b \log(cx^n))^2}{(d + ex)^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral(x**4*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log(cx^n) + a)^2 x^4}{(ex + d)^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^4/(e*x + d)^4, x)
```

3.114 $\int \frac{x^3(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=333

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}+\frac{11b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3e^4}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{d^3(a+b\log(cx^n))^2}{3e^4(d+ex)^3}-$$

```
[Out] (b^2*d*n^2)/(3*e^4*(d + e*x)) + (b^2*n^2*Log[x])/(3*e^4) - (b*d^2*n*(a + b*
Log[c*x^n]))/(3*e^4*(d + e*x)^2) - (7*b*n*x*(a + b*Log[c*x^n]))/(3*e^3*(d +
 e*x)) + (7*(a + b*Log[c*x^n])^2)/(6*e^4) + (d^3*(a + b*Log[c*x^n])^2)/(3*e
^4*(d + e*x)^3) - (3*d^2*(a + b*Log[c*x^n])^2)/(2*e^4*(d + e*x)^2) - (3*x*(
a + b*Log[c*x^n])^2)/(e^3*(d + e*x)) + (2*b^2*n^2*Log[d + e*x])/e^4 + (11*b
*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*e^4) + ((a + b*Log[c*x^n])^2*Log
[1 + (e*x)/d])/e^4 + (11*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*e^4) + (2*b*n*(
a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 - (2*b^2*n^2*PolyLog[3, -((e*
x)/d)])/e^4
```

Rubi [A] time = 0.78582, antiderivative size = 333, normalized size of antiderivative = 1., number of steps used = 28, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{e^4}+\frac{11b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3e^4}-\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{e^4}+\frac{d^3(a+b\log(cx^n))^2}{3e^4(d+ex)^3}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```


```
[Out] (b^2*d*n^2)/(3*e^4*(d + e*x)) + (b^2*n^2*Log[x])/(3*e^4) - (b*d^2*n*(a + b*
Log[c*x^n]))/(3*e^4*(d + e*x)^2) - (7*b*n*x*(a + b*Log[c*x^n]))/(3*e^3*(d +
 e*x)) + (7*(a + b*Log[c*x^n])^2)/(6*e^4) + (d^3*(a + b*Log[c*x^n])^2)/(3*e
^4*(d + e*x)^3) - (3*d^2*(a + b*Log[c*x^n])^2)/(2*e^4*(d + e*x)^2) - (3*x*(
a + b*Log[c*x^n])^2)/(e^3*(d + e*x)) + (2*b^2*n^2*Log[d + e*x])/e^4 + (11*b
*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*e^4) + ((a + b*Log[c*x^n])^2*Log
[1 + (e*x)/d])/e^4 + (11*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*e^4) + (2*b*n*(
a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/e^4 - (2*b^2*n^2*PolyLog[3, -((e*
x)/d)])/e^4
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))^2}{(d+ex)^4}\,dx = \int \left(-\frac{d^3 (a+b\log(cx^n))^2}{e^3(d+ex)^4} + \frac{3d^2 (a+b\log(cx^n))^2}{e^3(d+ex)^3} - \frac{3d (a+b\log(cx^n))^2}{e^3(d+ex)^2} + \frac{(a+b\log(cx^n))}{e^3(d+ex)}\right.$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{e^3} - \frac{(3d)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e^3} + \frac{(3d^2)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{e^3} - \frac{d^3\int \frac{(a+b\log(cx^n))^2}{(d+ex)^4}\,dx}{e^3}$$

$$= \frac{d^3 (a+b\log(cx^n))^2}{3e^4(d+ex)^3} - \frac{3d^2 (a+b\log(cx^n))^2}{2e^4(d+ex)^2} - \frac{3x (a+b\log(cx^n))^2}{e^3(d+ex)} + \frac{(a+b\log(cx^n))^2 \log}{e^4}$$

$$= \frac{d^3 (a+b\log(cx^n))^2}{3e^4(d+ex)^3} - \frac{3d^2 (a+b\log(cx^n))^2}{2e^4(d+ex)^2} - \frac{3x (a+b\log(cx^n))^2}{e^3(d+ex)} + \frac{6bn (a+b\log(cx^n))\,\mathrm{l}}{e^4}$$

$$= -\frac{bd^2n (a+b\log(cx^n))}{3e^4(d+ex)^2} - \frac{3bnx (a+b\log(cx^n))}{e^3(d+ex)} + \frac{d^3 (a+b\log(cx^n))^2}{3e^4(d+ex)^3} - \frac{3d^2 (a+b\log(cx^n}{2e^4(d+ex)^2}$$

$$= -\frac{bd^2n (a+b\log(cx^n))}{3e^4(d+ex)^2} - \frac{7bnx (a+b\log(cx^n))}{3e^3(d+ex)} + \frac{3 (a+b\log(cx^n))^2}{2e^4} + \frac{d^3 (a+b\log(cx^n))}{3e^4(d+ex)^3}$$

$$= \frac{b^2dn^2}{3e^4(d+ex)} + \frac{b^2n^2\log(x)}{3e^4} - \frac{bd^2n (a+b\log(cx^n))}{3e^4(d+ex)^2} - \frac{7bnx (a+b\log(cx^n))}{3e^3(d+ex)} + \frac{7 (a+b\log(c}{6e^4}$$

$$= \frac{b^2dn^2}{3e^4(d+ex)} + \frac{b^2n^2\log(x)}{3e^4} - \frac{bd^2n (a+b\log(cx^n))}{3e^4(d+ex)^2} - \frac{7bnx (a+b\log(cx^n))}{3e^3(d+ex)} + \frac{7 (a+b\log(c}{6e^4}$$

Mathematica [A] time = 0.43434, size = 298, normalized size = 0.89

$$12bn\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 22b^2n^2\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right) - 12b^2n^2\mathrm{PolyLog}\left(3,-\frac{ex}{d}\right) + \frac{2d^3(a+b\log(cx^n))^2}{(d+ex)^3} - \frac{9d^2(a+b}{(d+}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] ((-2*b*d^2*n*(a + b*Log[c*x^n]))/(d + e*x)^2 + (14*b*d*n*(a + b*Log[c*x^n])
)/(d + e*x) - 11*(a + b*Log[c*x^n])^2 + (2*d^3*(a + b*Log[c*x^n])^2)/(d + e
*x)^3 - (9*d^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (18*d*(a + b*Log[c*x^n])
^2)/(d + e*x) - 14*b^2*n^2*(Log[x] - Log[d + e*x]) + (2*b^2*n^2*(d + (d + e
*x)*Log[x] - (d + e*x)*Log[d + e*x]))/(d + e*x) + 22*b*n*(a + b*Log[c*x^n])
*Log[1 + (e*x)/d] + 6*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 22*b^2*n^2*Po
lyLog[2, -((e*x)/d)] + 12*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - 1
2*b^2*n^2*PolyLog[3, -((e*x)/d)])/(6*e^4)
```

Maple [F] time = 0.845, size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \ln (cx^n))^2}{(ex + d)^4} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))^2/(e*x+d)^4,x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))^2/(e*x+d)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{6} a^2 \left(\frac{18 de^2 x^2 + 27 d^2 ex + 11 d^3}{e^7 x^3 + 3 de^6 x^2 + 3 d^2 e^5 x + d^3 e^4} + \frac{6 \log (ex + d)}{e^4} \right) + \int \frac{b^2 x^3 \log (x^n)^2 + 2 \left(b^2 \log (c) + ab\right) x^3 \log (x^n) + \left(b^2 \log (c)^2\right.}{e^4 x^4 + 4 de^3 x^3 + 6 d^2 e^2 x^2 + 4 d^3 ex + d^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*((18*d*e^2*x^2 + 27*d^2*e*x + 11*d^3)/(e^7*x^3 + 3*d*e^6*x^2 + 3*d^
2*e^5*x + d^3*e^4) + 6*log(e*x + d)/e^4) + integrate((b^2*x^3*log(x^n)^2 +
2*(b^2*log(c) + a*b)*x^3*log(x^n) + (b^2*log(c)^2 + 2*a*b*log(c))*x^3)/(e^4
*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2 x^3 \log (cx^n)^2 + 2 abx^3 \log (cx^n) + a^2 x^3}{e^4 x^4 + 4 de^3 x^3 + 6 d^2 e^2 x^2 + 4 d^3 ex + d^4}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*log(c*x^n)^2 + 2*a*b*x^3*log(c*x^n) + a^2*x^3)/(e^4*x^4 +
 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \log (cx^n))^2}{(d + ex)^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log (cx^n) + a)^2 x^3}{(ex + d)^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^3/(e*x + d)^4, x)
```

3.115 $\int \frac{x^2(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=161

$$-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3de^3}+\frac{bnx\left(2a+2b\log\left(cx^n\right)+bn\right)}{3de^2(d+ex)}-\frac{bn\log\left(\frac{ex}{d}+1\right)\left(2a+2b\log\left(cx^n\right)+3bn\right)}{3de^3}+\frac{x^3\left(a+b\log\left(cx\right.\right.}{3d(d+ex)^3}$$

```
[Out] (b*n*x^2*(a + b*Log[c*x^n]))/(3*d*e*(d + e*x)^2) + (x^3*(a + b*Log[c*x^n])^
2)/(3*d*(d + e*x)^3) + (b*n*x*(2*a + b*n + 2*b*Log[c*x^n]))/(3*d*e^2*(d + e
*x)) - (b*n*(2*a + 3*b*n + 2*b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*d*e^3) - (2
*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*d*e^3)
```

Rubi [A] time = 0.715541, antiderivative size = 274, normalized size of antiderivative = 1.7, number of steps used = 25, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318}

$$-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3de^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{3e^3(d+ex)^3}+\frac{4bnx\left(a+b\log\left(cx^n\right)\right)}{3de^2(d+ex)}+\frac{bdn\left(a+b\log\left(cx^n\right)\right)}{3e^3(d+ex)^2}-\frac{2bn\log\left(\frac{ex}{d}+1\right)\left(a-\right.}{3de^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] -(b^2*n^2)/(3*e^3*(d + e*x)) - (b^2*n^2*Log[x])/(3*d*e^3) + (b*d*n*(a + b*L
og[c*x^n]))/(3*e^3*(d + e*x)^2) + (4*b*n*x*(a + b*Log[c*x^n]))/(3*d*e^2*(d
+ e*x)) - (2*(a + b*Log[c*x^n])^2)/(3*d*e^3) - (d^2*(a + b*Log[c*x^n])^2)/(
3*e^3*(d + e*x)^3) + (d*(a + b*Log[c*x^n])^2)/(e^3*(d + e*x)^2) + (x*(a + b
*Log[c*x^n])^2)/(d*e^2*(d + e*x)) - (b^2*n^2*Log[d + e*x])/(d*e^3) - (2*b*n
*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*d*e^3) - (2*b^2*n^2*PolyLog[2, -((
e*x)/d)])/(3*d*e^3)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))^2}{(d+ex)^4}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))^2}{e^2(d+ex)^4} - \frac{2d (a+b\log(cx^n))^2}{e^2(d+ex)^3} + \frac{(a+b\log(cx^n))^2}{e^2(d+ex)^2}\right) dx$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e^2} - \frac{(2d)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{e^2} + \frac{d^2\int \frac{(a+b\log(cx^n))^2}{(d+ex)^4}\,dx}{e^2}$$

$$= -\frac{d^2 (a+b\log(cx^n))^2}{3e^3(d+ex)^3} + \frac{d (a+b\log(cx^n))^2}{e^3(d+ex)^2} + \frac{x (a+b\log(cx^n))^2}{de^2(d+ex)} - \frac{(2bdn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{e^3}$$

$$= -\frac{d^2 (a+b\log(cx^n))^2}{3e^3(d+ex)^3} + \frac{d (a+b\log(cx^n))^2}{e^3(d+ex)^2} + \frac{x (a+b\log(cx^n))^2}{de^2(d+ex)} - \frac{2bn (a+b\log(cx^n))\,l}{de^3}$$

$$= \frac{bdn (a+b\log(cx^n))}{3e^3(d+ex)^2} + \frac{2bnx (a+b\log(cx^n))}{de^2(d+ex)} - \frac{d^2 (a+b\log(cx^n))^2}{3e^3(d+ex)^3} + \frac{d (a+b\log(cx^n))^2}{e^3(d+ex)^2}$$

$$= \frac{bdn (a+b\log(cx^n))}{3e^3(d+ex)^2} + \frac{4bnx (a+b\log(cx^n))}{3de^2(d+ex)} - \frac{(a+b\log(cx^n))^2}{de^3} - \frac{d^2 (a+b\log(cx^n))^2}{3e^3(d+ex)^3} +$$

$$= -\frac{b^2n^2}{3e^3(d+ex)} - \frac{b^2n^2\log(x)}{3de^3} + \frac{bdn (a+b\log(cx^n))}{3e^3(d+ex)^2} + \frac{4bnx (a+b\log(cx^n))}{3de^2(d+ex)} - \frac{2 (a+b\log}{3de^3}$$

$$= -\frac{b^2n^2}{3e^3(d+ex)} - \frac{b^2n^2\log(x)}{3de^3} + \frac{bdn (a+b\log(cx^n))}{3e^3(d+ex)^2} + \frac{4bnx (a+b\log(cx^n))}{3de^2(d+ex)} - \frac{2 (a+b\log}{3de^3}$$

Mathematica [B] time = 0.461637, size = 371, normalized size = 2.3

$$-\frac{\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d}+\frac{a^2d^2}{(d+ex)^3}+\frac{3a^2}{d+ex}-\frac{3a^2d}{(d+ex)^2}-\frac{a^2}{d}+\frac{2abd^2\log(cx^n)}{(d+ex)^3}+\frac{6ab\log(cx^n)}{d+ex}-\frac{6abd\log(cx^n)}{(d+ex)^2}-\frac{2ab\log(cx^n)}{d}+\frac{4abn}{d+ex}-\frac{abdn}{(d+ex)^2}+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] -(-(a^2/d) + (a^2*d^2)/(d + e*x)^3 - (3*a^2*d)/(d + e*x)^2 - (a*b*d*n)/(d +
 e*x)^2 + (3*a^2)/(d + e*x) + (4*a*b*n)/(d + e*x) + (b^2*n^2)/(d + e*x) - (
3*b^2*n^2*Log[x])/d - (2*a*b*Log[c*x^n])/d + (2*a*b*d^2*Log[c*x^n])/(d + e*
x)^3 - (6*a*b*d*Log[c*x^n])/(d + e*x)^2 - (b^2*d*n*Log[c*x^n])/(d + e*x)^2
+ (6*a*b*Log[c*x^n])/(d + e*x) + (4*b^2*n*Log[c*x^n])/(d + e*x) - (b^2*Log[
c*x^n]^2)/d + (b^2*d^2*Log[c*x^n]^2)/(d + e*x)^3 - (3*b^2*d*Log[c*x^n]^2)/(
d + e*x)^2 + (3*b^2*Log[c*x^n]^2)/(d + e*x) + (3*b^2*n^2*Log[d + e*x])/d +
(2*a*b*n*Log[1 + (e*x)/d])/d + (2*b^2*n*Log[c*x^n]*Log[1 + (e*x)/d])/d + (2
*b^2*n^2*PolyLog[2, -((e*x)/d)])/d)/(3*e^3)
```

Maple [C] time = 0.301, size = 1658, normalized size = 10.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))^2/(e*x+d)^4,x)
```

```
[Out] 1/4*(I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)-I*b*Pi*csgn(I*c*x^n)^3+I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+2*b*ln(c)+2
*a)^2*(d/e^3/(e*x+d)^2-1/3*d^2/e^3/(e*x+d)^3-1/e^3/(e*x+d))-b^2*ln(x^n)^2/e
^3/(e*x+d)+1/3*I*ln(x^n)*d^2/e^3/(e*x+d)^3*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)+I/e^3*ln(x^n)*d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I/e
^3*ln(x^n)*d/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+2/3*I/e^3*n/(e*x+d)
*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2/3*I/e^3*n/(e*x+d)*b^2*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2+1/3*I/e^3*n/d*ln(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)-I/e^3*ln(x^n)*d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/
3*I*ln(x^n)*d^2/e^3/(e*x+d)^3*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-2/3*b*ln(x
^n)*d^2/e^3/(e*x+d)^3*a+2/e^3*ln(x^n)*d/(e*x+d)^2*b^2*ln(c)-2/3*ln(x^n)*d^2
/e^3/(e*x+d)^3*b^2*ln(c)+1/3/e^3*n*d/(e*x+d)^2*b^2*ln(c)-2/3/e^3*n/d*ln(e*x
+d)*b^2*ln(c)+2/3/e^3*n/d*ln(x)*b^2*ln(c)-1/3*b^2/e^3*n^2/(e*x+d)-2/3*I/e^3
```

```
*n/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/3*I/e^3*n/d*ln(e*x+d)*b^2*Pi*
csgn(I*c*x^n)^3-I/e^3*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/3*
b^2*n/e^3*ln(x^n)*d/(e*x+d)^2-2/3*b^2*n/e^3*ln(x^n)/d*ln(e*x+d)+2/3*b^2*n/e
^3*ln(x^n)/d*ln(x)-I/e^3*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2
+1/3*I*ln(x^n)*d^2/e^3/(e*x+d)^3*b^2*Pi*csgn(I*c*x^n)^3-I/e^3*ln(x^n)*d/(e*
x+d)^2*b^2*Pi*csgn(I*c*x^n)^3-1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^3-1/
6*I/e^3*n*d/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^3-1/3*I/e^3*n/d*ln(e*x+d)*b^2*Pi
*csgn(I*c*x^n)^2*csgn(I*c)+1/6*I/e^3*n*d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2-1/6*I/e^3*n*d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)+1/6*I/e^3*n*d/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I*ln(x^n)*d
^2/e^3/(e*x+d)^3*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I/e^3*n/d*ln(e*x+d)*b
^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+2*b/e^3*ln(x^n)*d/(e*x+d)^2*a+1/3*b/e^3*n
*d/(e*x+d)^2*a-2/3*b/e^3*n/d*ln(e*x+d)*a+2/3*b/e^3*n/d*ln(x)*a+2/3*b^2/e^3*
n^2/d*ln(e*x+d)*ln(-e*x/d)+2/3*I/e^3*n/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+I/e^3
*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2+1/3*I/e^3*n/d*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+I/
e^3*ln(x^n)/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*b^2/e^3*
n^2/d*ln(x)^2+2/3*b^2/e^3*n^2/d*dilog(-e*x/d)-b^2/e^3*n^2/d*ln(e*x+d)+b^2/e
^3*n^2/d*ln(x)-1/3*b^2*ln(x^n)^2*d^2/e^3/(e*x+d)^3-4/3*b^2*n/e^3*ln(x^n)/(e
*x+d)-2*b/e^3*ln(x^n)/(e*x+d)*a-2/e^3*ln(x^n)/(e*x+d)*b^2*ln(c)+b^2*ln(x^n)
^2*d/e^3/(e*x+d)^2-4/3*b/e^3*n/(e*x+d)*a-4/3/e^3*n/(e*x+d)*b^2*ln(c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{3}\,abn\left(\frac{4\,ex+3\,d}{e^5x^2+2\,de^4x+d^2e^3}+\frac{2\,\log\left(ex+d\right)}{de^3}-\frac{2\,\log\left(x\right)}{de^3}\right)-\frac{1}{3}\left(\frac{\left(3\,e^2x^2+3\,dex+d^2\right)\log\left(x^n\right)^2}{e^6x^3+3\,de^5x^2+3\,d^2e^4x+d^3e^3}-3\int\frac{3\,e^3x^3\log\left(c\right)^2}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a*b*n*((4*e*x + 3*d)/(e^5*x^2 + 2*d*e^4*x + d^2*e^3) + 2*log(e*x + d)/
(d*e^3) - 2*log(x)/(d*e^3)) - 1/3*((3*e^2*x^2 + 3*d*e*x + d^2)*log(x^n)^2/(
e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 3*integrate(1/3*(3*e^3*x^3
*log(c)^2 + 2*(6*d*e^2*n*x^2 + 4*d^2*e*n*x + d^3*n + 3*(e^3*n + e^3*log(c))
*x^3)*log(x^n))/(e^7*x^5 + 4*d*e^6*x^4 + 6*d^2*e^5*x^3 + 4*d^3*e^4*x^2 + d^
4*e^3*x), x))*b^2 - 2/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a*b*log(c*x^n)/(e^6*x^3
 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3) - 1/3*(3*e^2*x^2 + 3*d*e*x + d^2)*a
^2/(e^6*x^3 + 3*d*e^5*x^2 + 3*d^2*e^4*x + d^3*e^3)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2x^2\log\left(cx^n\right)^2+2\,abx^2\log\left(cx^n\right)+a^2x^2}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*log(c*x^n)^2 + 2*a*b*x^2*log(c*x^n) + a^2*x^2)/(e^4*x^4 +
 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)^2x^2}{\left(ex+d\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x^2/(e*x + d)^4, x)
```

3.116 $\int \frac{x(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=210

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^2e^2}-\frac{bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{3d^2e^2}+\frac{(a+b\log(cx^n))^2}{6d^2e^2}+\frac{bn(a+b\log(cx^n))}{3de^2(d+ex)}-\frac{bn(a+b\log(c$$

```
[Out] (b^2*n^2)/(3*d*e^2*(d + e*x)) - (b*n*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x)^2
) + (b*n*(a + b*Log[c*x^n]))/(3*d*e^2*(d + e*x)) + (a + b*Log[c*x^n])^2/(6*
d^2*e^2) + (d*(a + b*Log[c*x^n])^2)/(3*e^2*(d + e*x)^3) - (a + b*Log[c*x^n]
)^2/(2*e^2*(d + e*x)^2) - (b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*d^2*
e^2) - (b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*d^2*e^2)
```

Rubi [A] time = 0.620166, antiderivative size = 229, normalized size of antiderivative = 1.09, number of steps used = 22, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44}

$$-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^2e^2}-\frac{bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{3d^2e^2}+\frac{(a+b\log(cx^n))^2}{6d^2e^2}-\frac{bnx(a+b\log(cx^n))}{3d^2e(d+ex)}-\frac{bn(a+b\log(}{3e^2(d+ex}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] (b^2*n^2)/(3*d*e^2*(d + e*x)) + (b^2*n^2*Log[x])/(3*d^2*e^2) - (b*n*(a + b*
Log[c*x^n]))/(3*e^2*(d + e*x)^2) - (b*n*x*(a + b*Log[c*x^n]))/(3*d^2*e*(d +
 e*x)) + (a + b*Log[c*x^n])^2/(6*d^2*e^2) + (d*(a + b*Log[c*x^n])^2)/(3*e^2
*(d + e*x)^3) - (a + b*Log[c*x^n])^2/(2*e^2*(d + e*x)^2) - (b*n*(a + b*Log[
c*x^n])*Log[1 + (e*x)/d])/(3*d^2*e^2) - (b^2*n^2*PolyLog[2, -((e*x)/d)])/(3
*d^2*e^2)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^4}\,dx=\int\left(-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^4}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^3}\right)dx$$

$$=\frac{\int\frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{e}-\frac{d\int\frac{(a+b\log(cx^n))^2}{(d+ex)^4}\,dx}{e}$$

$$=\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3e^2(d+ex)^3}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{(bn)\int\frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{e^2}-\frac{(2bdn)\int\frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx}{3e^2}$$

$$=\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3e^2(d+ex)^3}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}-\frac{(2bn)\int\frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{3e^2}+\frac{(bn)\int\frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{de^2}+\frac{(2\cdots}{\cdots}$$

$$=-\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2}-\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)}+\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3e^2(d+ex)^3}-\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{(b\cdots}{\cdots}$$

$$=-\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2}-\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{3d^2e(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e^2}+\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{3e^2(d+ex)^3}-\frac{(a\cdots}{\cdots}$$

$$=\frac{b^2n^2}{3de^2(d+ex)}+\frac{b^2n^2\log(x)}{3d^2e^2}-\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2}-\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{3d^2e(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\cdots\right.}{6d^2e^2}$$

$$=\frac{b^2n^2}{3de^2(d+ex)}+\frac{b^2n^2\log(x)}{3d^2e^2}-\frac{bn\left(a+b\log\left(cx^n\right)\right)}{3e^2(d+ex)^2}-\frac{bnx\left(a+b\log\left(cx^n\right)\right)}{3d^2e(d+ex)}+\frac{\left(a+b\log\left(cx^n\right)\cdots\right.}{6d^2e^2}$$

Mathematica [A] time = 0.23456, size = 281, normalized size = 1.34

$$\frac{-2b^2n^2(d+ex)^3\text{PolyLog}\left(2,-\frac{ex}{d}\right)+3a^2de^2x^2+a^2e^3x^3-2b\log\left(cx^n\right)\left(bn(d+ex)^3\log\left(\frac{ex}{d}+1\right)-ex(aex(3d+ex)+bdn\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n])^2)/(d + e*x)^4,x]
```

```
[Out] (2*b^2*d^3*n^2 + 2*a*b*d^2*e*n*x + 4*b^2*d^2*e*n^2*x + 3*a^2*d*e^2*x^2 + 2*
a*b*d*e^2*n*x^2 + 2*b^2*d*e^2*n^2*x^2 + a^2*e^3*x^3 + b^2*e^2*x^2*(3*d + e*
x)*Log[c*x^n]^2 - 2*a*b*d^3*n*Log[1 + (e*x)/d] - 6*a*b*d^2*e*n*x*Log[1 + (e
*x)/d] - 6*a*b*d*e^2*n*x^2*Log[1 + (e*x)/d] - 2*a*b*e^3*n*x^3*Log[1 + (e*x)
/d] - 2*b*Log[c*x^n]*(-(e*x*(b*d*n*(d + e*x) + a*e*x*(3*d + e*x))) + b*n*(d
 + e*x)^3*Log[1 + (e*x)/d]) - 2*b^2*n^2*(d + e*x)^3*PolyLog[2, -((e*x)/d)])
/(6*d^2*e^2*(d + e*x)^3)
```

Maple [C] time = 0.276, size = 1400, normalized size = 6.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))^2/(e*x+d)^4,x)
```

```
[Out] 1/3*b^2*n^2/d/e^2/(e*x+d)+1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*b^2*Pi*csgn(I*c*x^n
)^2*csgn(I*c)+1/4*(I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)-I*b*Pi*csgn(I*c*x^n)^3+I*b*Pi*csgn(I*c*x^n)^2*csgn(I*
c)+2*b*ln(c)+2*a)^2*(-1/2/e^2/(e*x+d)^2+1/3*d/e^2/(e*x+d)^3)+1/6*I/e^2*n/(e
*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I/e^2*n/d^2*ln(x)*b^
2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*b^2*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*b/e^2*n/d^2*ln(e*x+d)*a+1/3*b/e^2*n/d^
2*ln(x)*a+1/3*b/e^2*n/d/(e*x+d)*a+1/3/e^2*n/d^2*ln(x)*b^2*ln(c)+1/3/e^2*n/d
/(e*x+d)*b^2*ln(c)-1/3/e^2*n/d^2*ln(e*x+d)*b^2*ln(c)+1/6*I/e^2*n/(e*x+d)^2*
b^2*Pi*csgn(I*c*x^n)^3+1/2*I/e^2*ln(x^n)/(e*x+d)^2*b^2*Pi*csgn(I*c*x^n)^3-1
/6*I/e^2*n/d^2*ln(x)*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e^2*ln(x^n)/(e*x+d)^2*b^2
*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/6*I/e^2*n/d/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-
1/6*I/e^2*n/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I/e^2*n/(e*x+d
)^2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*b^2*Pi*c
sgn(I*c*x^n)^3+1/6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3+2/3*b*ln(x^
n)*d/e^2/(e*x+d)^3*a+2/3*ln(x^n)*d/e^2/(e*x+d)^3*b^2*ln(c)-1/3*b^2*n/e^2*ln
(x^n)/d^2*ln(e*x+d)-1/2*I/e^2*ln(x^n)/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2-1/6*I/e^2*n/d/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/
6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*b^2*ln(x^n)^2/
e^2/(e*x+d)^2+1/3*b^2/e^2*n^2/d^2*ln(e*x+d)*ln(-e*x/d)+1/3*b^2*n/e^2*ln(x^n
)/d/(e*x+d)+1/3*b^2*n/e^2*ln(x^n)/d^2*ln(x)+1/3*I*ln(x^n)*d/e^2/(e*x+d)^3*b
^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I/e^2*n/d^2*ln(e*x+d)*b^2*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2+1/6*I/e^2*n/d^2*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+
```

```
1/6*I/e^2*n/d/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I/e^2*n/d/(e*x
+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/6*I/e^2*n/d^2*ln(x)*b^2*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2+1/2*I/e^2*ln(x^n)/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-1/3*b/e^2*n/(e*x+d)^2*a-1/6*b^2/e^2*n^2/d^2*ln(x)^2+1/3*b^2/
e^2*n^2/d^2*dilog(-e*x/d)-1/3/e^2*n/(e*x+d)^2*b^2*ln(c)+1/3*b^2*ln(x^n)^2*d
/e^2/(e*x+d)^3-1/3*b^2*n/e^2*ln(x^n)/(e*x+d)^2-1/e^2*ln(x^n)/(e*x+d)^2*b^2*
ln(c)-b/e^2*ln(x^n)/(e*x+d)^2*a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}\,abn\left(\frac{x}{de^3x^2+2\,d^2e^2x+d^3e}-\frac{\log(ex+d)}{d^2e^2}+\frac{\log(x)}{d^2e^2}\right)-\frac{1}{6}\left(\frac{(3\,ex+d)\log(x^n)^2}{e^5x^3+3\,de^4x^2+3\,d^2e^3x+d^3e^2}-6\int\frac{3\,e^2x^2\log(c)^2+\left(4\right.}{3\left(e^6x^5+4\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/3*a*b*n*(x/(d*e^3*x^2 + 2*d^2*e^2*x + d^3*e) - log(e*x + d)/(d^2*e^2) + l
og(x)/(d^2*e^2)) - 1/6*((3*e*x + d)*log(x^n)^2/(e^5*x^3 + 3*d*e^4*x^2 + 3*d
^2*e^3*x + d^3*e^2) - 6*integrate(1/3*(3*e^2*x^2*log(c)^2 + (4*d*e*n*x + d^
2*n + 3*(e^2*n + 2*e^2*log(c))*x^2)*log(x^n))/(e^6*x^5 + 4*d*e^5*x^4 + 6*d^
2*e^4*x^3 + 4*d^3*e^3*x^2 + d^4*e^2*x), x))*b^2 - 1/3*(3*e*x + d)*a*b*log(c
*x^n)/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2) - 1/6*(3*e*x + d)*a^2
/(e^5*x^3 + 3*d*e^4*x^2 + 3*d^2*e^3*x + d^3*e^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2x\log(cx^n)^2+2\,abx\log(cx^n)+a^2x}{e^4x^4+4\,de^3x^3+6\,d^2e^2x^2+4\,d^3ex+d^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*x*log(c*x^n)^2 + 2*a*b*x*log(c*x^n) + a^2*x)/(e^4*x^4 + 4*d*e
^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)^{2}}{\left(d+ex\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)^{2}x}{\left(ex+d\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*x/(e*x + d)^4, x)
```

3.117 $\int \frac{(a+b\log(cx^n))^2}{(d+ex)^4}\,dx$

Optimal. Leaf size=203

$$\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{d}{ex}\right)}{3d^3e}-\frac{2bn\log\left(\frac{d}{ex}+1\right)(a+b\log(cx^n))}{3d^3e}-\frac{2bnx(a+b\log(cx^n))}{3d^3(d+ex)}+\frac{bn(a+b\log(cx^n))}{3de(d+ex)^2}-\frac{(a+b\log}{3e(d+}$$

```
[Out] -(b^2*n^2)/(3*d^2*e*(d + e*x)) - (b^2*n^2*Log[x])/(3*d^3*e) + (b*n*(a + b*L
og[c*x^n]))/(3*d*e*(d + e*x)^2) - (2*b*n*x*(a + b*Log[c*x^n]))/(3*d^3*(d +
e*x)) - (2*b*n*Log[1 + d/(e*x)]*(a + b*Log[c*x^n]))/(3*d^3*e) - (a + b*Log[
c*x^n])^2/(3*e*(d + e*x)^3) + (b^2*n^2*Log[d + e*x])/(d^3*e) + (2*b^2*n^2*P
olyLog[2, -(d/(e*x))])/(3*d^3*e)
```

Rubi [A] time = 0.312296, antiderivative size = 221, normalized size of antiderivative = 1.09, number of steps used = 12, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.45, Rules used = {2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44}

$$-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^3e}-\frac{2bnx(a+b\log(cx^n))}{3d^3(d+ex)}-\frac{2bn\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{3d^3e}+\frac{(a+b\log(cx^n))^2}{3d^3e}+\frac{bn(a+b\log}{3de(d+}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x)^4,x]
```

```
[Out] -(b^2*n^2)/(3*d^2*e*(d + e*x)) - (b^2*n^2*Log[x])/(3*d^3*e) + (b*n*(a + b*L
og[c*x^n]))/(3*d*e*(d + e*x)^2) - (2*b*n*x*(a + b*Log[c*x^n]))/(3*d^3*(d +
e*x)) + (a + b*Log[c*x^n])^2/(3*d^3*e) - (a + b*Log[c*x^n])^2/(3*e*(d + e*x
)^3) + (b^2*n^2*Log[d + e*x])/(d^3*e) - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (
e*x)/d])/(3*d^3*e) - (2*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*d^3*e)
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{(d+ex)^4}\,dx = -\frac{(a+b\log(cx^n))^2}{3e(d+ex)^3} + \frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx}{3e}$$

$$= -\frac{(a+b\log(cx^n))^2}{3e(d+ex)^3} - \frac{(2bn)\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{3d} + \frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^2}\,dx}{3de}$$

$$= \frac{bn(a+b\log(cx^n))}{3de(d+ex)^2} - \frac{(a+b\log(cx^n))^2}{3e(d+ex)^3} - \frac{(2bn)\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{3d^2} + \frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)}\,dx}{3d^2e} - \cdots$$

$$= \frac{bn(a+b\log(cx^n))}{3de(d+ex)^2} - \frac{2bnx(a+b\log(cx^n))}{3d^3(d+ex)} - \frac{(a+b\log(cx^n))^2}{3e(d+ex)^3} - \frac{(2bn)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{3d^3} + \cdots$$

$$= -\frac{b^2n^2}{3d^2e(d+ex)} - \frac{b^2n^2\log(x)}{3d^3e} + \frac{bn(a+b\log(cx^n))}{3de(d+ex)^2} - \frac{2bnx(a+b\log(cx^n))}{3d^3(d+ex)} + \frac{(a+b\log(cx^n \cdots}{3d^3e}$$

$$= -\frac{b^2n^2}{3d^2e(d+ex)} - \frac{b^2n^2\log(x)}{3d^3e} + \frac{bn(a+b\log(cx^n))}{3de(d+ex)^2} - \frac{2bnx(a+b\log(cx^n))}{3d^3(d+ex)} + \frac{(a+b\log(cx^n \cdots}{3d^3e}$$

Mathematica [A] time = 0.155564, size = 211, normalized size = 1.04

$$\frac{2bn\left(-\frac{bn\mathrm{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^3} - \frac{\log\left(\frac{d+ex}{d}\right)(a+b\log(cx^n))}{d^3} + \frac{a+b\log(cx^n)}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^2}{2bd^3n} + \frac{a+b\log(cx^n)}{2d(d+ex)^2} - \frac{bn\left(-\frac{\log(d+ex)}{d^2}+\frac{\log(x)}{d^2}+\frac{1}{d(d+ex)}\right)}{2d} - \cdots\right)}{3e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x)^4,x]
```

```
[Out] -(a + b*Log[c*x^n])^2/(3*e*(d + e*x)^3) + (2*b*n*((a + b*Log[c*x^n])/(2*d*(
d + e*x)^2) + (a + b*Log[c*x^n])/(d^2*(d + e*x)) + (a + b*Log[c*x^n])^2/(2*
b*d^3*n) - (b*n*(1/(d*(d + e*x)) + Log[x]/d^2 - Log[d + e*x]/d^2))/(2*d) -
(b*n*(Log[x]/d - Log[d + e*x]/d))/d^2 - ((a + b*Log[c*x^n])*Log[(d + e*x)/d
])/d^3 - (b*n*PolyLog[2, -((e*x)/d)])/d^3))/(3*e)
```

Maple [C] time = 0.277, size = 1227, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/(e*x+d)^4,x)
```

```
[Out] -1/3*b^2*n^2/d^2/e/(e*x+d)+1/3*I/e*n/d^3*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(
I*c)-1/6*I/e*n/d/(e*x+d)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/3*I
/e*n/d^3*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*I/e*n/d^3*ln(
e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/6*I/e*n/d/(e*x+d)^2*b^2
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I/(e*x+d)^3/e*ln(x^n)*b^2*Pi*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)+2/3*b^2/e*n^2/d^3*ln(e*x+d)*ln(-e*x/d)+2/3*b/e*n/
d^2/(e*x+d)*a+1/3*b/e*n/d/(e*x+d)^2*a-2/3*b/e*n/d^3*ln(e*x+d)*a+2/3*b/e*n/d
^3*ln(x)*a+2/3/e*n/d^2/(e*x+d)*b^2*ln(c)+1/3/e*n/d/(e*x+d)^2*b^2*ln(c)-2/3/
e*n/d^3*ln(e*x+d)*b^2*ln(c)+2/3/e*n/d^3*ln(x)*b^2*ln(c)-2/3*b^2/e*n*ln(x^n)
/d^3*ln(e*x+d)+2/3*b^2/e*n*ln(x^n)/d^2/(e*x+d)+1/3*b^2/e*n*ln(x^n)/d/(e*x+d
)^2-1/3*I/e*n/d^2/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/3*I/(e*x+d)^3/e*ln(x^n)*
b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I/e*n/d^3*ln(x)*b^2*Pi*csgn(I*c*x^n)^3
+1/3*I/e*n/d^3*ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^3-1/6*I/e*n/d/(e*x+d)^2*b^2*P
i*csgn(I*c*x^n)^3-1/3*I/(e*x+d)^3/e*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/3*b^2/(e*x+d)^3/e*ln(x^n)^2-1/3*I/e*n/d^2/(e*x+d)*b^2*Pi*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)+2/3*b^2/e*n*ln(x^n)/d^3*ln(x)+1/6*I/e*n/d/(e*x+d)^2
*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-2/3/(e*x+d)^3/e*ln(x^n)*b^2*ln(c)+1/3*I/(
e*x+d)^3/e*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3-1/12*(I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*b*Pi*csgn(I*c*x^n)^3+I
*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+2*b*ln(c)+2*a)^2/(e*x+d)^3/e-1/3*I/e*n/d^3*
ln(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/3*I/e*n/d^3*ln(e*x+d)*b^2*Pi*c
sgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I/e*n/d^2/(e*x+d)*b^2*Pi*csgn(I*c*x^n)^2*csg
n(I*c)+1/3*I/e*n/d^2/(e*x+d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/3*I/e*n/d
^3*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-b^2*n^2*ln(x)/d^3/e+b^2*n^2*ln(
e*x+d)/d^3/e-1/3*b^2/e*n^2/d^3*ln(x)^2+2/3*b^2/e*n^2/d^3*dilog(-e*x/d)-2/3*
b/(e*x+d)^3/e*ln(x^n)*a
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}\,abn\left(\frac{2\,ex+3\,d}{d^2e^3x^2+2\,d^3e^2x+d^4e}-\frac{2\,\log\left(ex+d\right)}{d^3e}+\frac{2\,\log\left(x\right)}{d^3e}\right)-\frac{1}{3}\,b^2\left(\frac{\log\left(x^n\right)^2}{e^4x^3+3\,de^3x^2+3\,d^2e^2x+d^3e}-3\int\frac{3\,ex\log\left(c\right)^2+}{3\left(e^5x^5+4\,de\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/3*a*b*n*((2*e*x + 3*d)/(d^2*e^3*x^2 + 2*d^3*e^2*x + d^4*e) - 2*log(e*x +
d)/(d^3*e) + 2*log(x)/(d^3*e)) - 1/3*b^2*(log(x^n)^2/(e^4*x^3 + 3*d*e^3*x^2
 + 3*d^2*e^2*x + d^3*e) - 3*integrate(1/3*(3*e*x*log(c)^2 + 2*(d*n + (e*n +
 3*e*log(c))*x)*log(x^n))/(e^5*x^5 + 4*d*e^4*x^4 + 6*d^2*e^3*x^3 + 4*d^3*e^
2*x^2 + d^4*e*x), x)) - 2/3*a*b*log(c*x^n)/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e
^2*x + d^3*e) - 1/3*a^2/(e^4*x^3 + 3*d*e^3*x^2 + 3*d^2*e^2*x + d^3*e)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2 + 2\,ab\log\left(cx^n\right) + a^2}{e^4x^4 + 4\,de^3x^3 + 6\,d^2e^2x^2 + 4\,d^3ex + d^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^4*x^4 + 4*d*e^3*x^3
 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(a + b\log\left(cx^n\right)\right)^2}{\left(d + ex\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x+d)**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x)**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^n\right) + a\right)^2}{\left(ex + d\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x + d)^4, x)
```

3.118 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^4}\,dx$

Optimal. Leaf size=351

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^4}+\frac{11b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^4}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log}{d^4}$$

```
[Out] (b^2*n^2)/(3*d^3*(d + e*x)) + (b^2*n^2*Log[x])/(3*d^4) - (b*n*(a + b*Log[c*
x^n]))/(3*d^2*(d + e*x)^2) + (5*b*e*n*x*(a + b*Log[c*x^n]))/(3*d^4*(d + e*x
)) - (5*(a + b*Log[c*x^n])^2)/(6*d^4) + (a + b*Log[c*x^n])^2/(3*d*(d + e*x)
^3) + (a + b*Log[c*x^n])^2/(2*d^2*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^2)
/(d^4*(d + e*x)) + (a + b*Log[c*x^n])^3/(3*b*d^4*n) - (2*b^2*n^2*Log[d + e*
x])/d^4 + (11*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*d^4) - ((a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d])/d^4 + (11*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*
d^4) - (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^4 + (2*b^2*n^2*P
olyLog[3, -((e*x)/d)])/d^4
```

Rubi [A] time = 1.01246, antiderivative size = 351, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 14, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.609, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391, 2319, 2301, 2314, 31, 44}

$$-\frac{2bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^4}+\frac{11b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^4}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^4}-\frac{\log\left(\frac{ex}{d}+1\right)(a+b\log}{d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x)^4),x]
```

```
[Out] (b^2*n^2)/(3*d^3*(d + e*x)) + (b^2*n^2*Log[x])/(3*d^4) - (b*n*(a + b*Log[c*
x^n]))/(3*d^2*(d + e*x)^2) + (5*b*e*n*x*(a + b*Log[c*x^n]))/(3*d^4*(d + e*x
)) - (5*(a + b*Log[c*x^n])^2)/(6*d^4) + (a + b*Log[c*x^n])^2/(3*d*(d + e*x)
^3) + (a + b*Log[c*x^n])^2/(2*d^2*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^2)
/(d^4*(d + e*x)) + (a + b*Log[c*x^n])^3/(3*b*d^4*n) - (2*b^2*n^2*Log[d + e*
x])/d^4 + (11*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(3*d^4) - ((a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d])/d^4 + (11*b^2*n^2*PolyLog[2, -((e*x)/d)])/(3*
d^4) - (2*b*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^4 + (2*b^2*n^2*P
olyLog[3, -((e*x)/d)])/d^4
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^4}\,dx = \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^3}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^2}{(d+ex)^4}\,dx}{d}$$

$$= \frac{(a+b\log(cx^n))^2}{3d(d+ex)^3} + \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^2}\,dx}{d^2} - \frac{e\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{d^2} - \frac{(2bn)\int \frac{a+b\log(cx^n)}{x(d+ex)^3}\,dx}{3d}$$

$$= \frac{(a+b\log(cx^n))^2}{3d(d+ex)^3} + \frac{(a+b\log(cx^n))^2}{2d^2(d+ex)^2} + \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex)}\,dx}{d^3} - \frac{e\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{d^3} - \frac{(2bn)\int \frac{a+b}{x(}}{3d}$$

$$= -\frac{bn(a+b\log(cx^n))}{3d^2(d+ex)^2} + \frac{(a+b\log(cx^n))^2}{3d(d+ex)^3} + \frac{(a+b\log(cx^n))^2}{2d^2(d+ex)^2} - \frac{ex(a+b\log(cx^n))^2}{d^4(d+ex)} + \int \frac{(a+b\,l}{}$$

$$= -\frac{bn(a+b\log(cx^n))}{3d^2(d+ex)^2} + \frac{5benx(a+b\log(cx^n))}{3d^4(d+ex)} + \frac{(a+b\log(cx^n))^2}{3d(d+ex)^3} + \frac{(a+b\log(cx^n))^2}{2d^2(d+ex)^2} - \frac{ex(a}{}$$

$$= \frac{b^2n^2}{3d^3(d+ex)} + \frac{b^2n^2\log(x)}{3d^4} - \frac{bn(a+b\log(cx^n))}{3d^2(d+ex)^2} + \frac{5benx(a+b\log(cx^n))}{3d^4(d+ex)} - \frac{5(a+b\log(cx^n))}{6d^4}$$

$$= \frac{b^2n^2}{3d^3(d+ex)} + \frac{b^2n^2\log(x)}{3d^4} - \frac{bn(a+b\log(cx^n))}{3d^2(d+ex)^2} + \frac{5benx(a+b\log(cx^n))}{3d^4(d+ex)} - \frac{5(a+b\log(cx^n))}{6d^4}$$

Mathematica [A] time = 0.413531, size = 318, normalized size = 0.91

$$\frac{-12bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 22b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) + 12b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) + \frac{2d^3(a+b\log(cx^n))^2}{(d+ex)^3} + \frac{3d^2(a-}{(}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x)^4),x]
```

```
[Out] ((-2*b*d^2*n*(a + b*Log[c*x^n]))/(d + e*x)^2 - (10*b*d*n*(a + b*Log[c*x^n])
)/(d + e*x) - 11*(a + b*Log[c*x^n])^2 + (2*d^3*(a + b*Log[c*x^n])^2)/(d + e
*x)^3 + (3*d^2*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (6*d*(a + b*Log[c*x^n])^
2)/(d + e*x) + (2*(a + b*Log[c*x^n])^3)/(b*n) + 10*b^2*n^2*(Log[x] - Log[d
+ e*x]) + (2*b^2*n^2*(d + (d + e*x)*Log[x] - (d + e*x)*Log[d + e*x]))/(d +
e*x) + 22*b*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 6*(a + b*Log[c*x^n])^2*
Log[1 + (e*x)/d] + 22*b^2*n^2*PolyLog[2, -((e*x)/d)] - 12*b*n*(a + b*Log[c*
x^n])*PolyLog[2, -((e*x)/d)] + 12*b^2*n^2*PolyLog[3, -((e*x)/d)])/(6*d^4)
```

Maple [F] time = 0.852, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x/(e*x+d)^4,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x/(e*x+d)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{6}\,a^2\left(\frac{6\,e^2x^2+15\,dex+11\,d^2}{d^3e^3x^3+3\,d^4e^2x^2+3\,d^5ex+d^6}-\frac{6\,\log(ex+d)}{d^4}+\frac{6\,\log(x)}{d^4}\right)+\int \frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\right.}{e^4x^5+4\,de^3x^4+6\,d^2e^2x^3+4\,d^3e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] 1/6*a^2*((6*e^2*x^2 + 15*d*e*x + 11*d^2)/(d^3*e^3*x^3 + 3*d^4*e^2*x^2 + 3*d
^5*e*x + d^6) - 6*log(e*x + d)/d^4 + 6*log(x)/d^4) + integrate((b^2*log(c)^
2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^4*x^5
 + 4*d*e^3*x^4 + 6*d^2*e^2*x^3 + 4*d^3*e*x^2 + d^4*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log(cx^n)^2+2\,ab\log(cx^n)+a^2}{e^4x^5+4\,de^3x^4+6\,d^2e^2x^3+4\,d^3ex^2+d^4x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^4*x^5 + 4*d*e^3*x^4
 + 6*d^2*e^2*x^3 + 4*d^3*e*x^2 + d^4*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log{(cx^n)})^2}{x\,(d + ex)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(e*x+d)**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(x*(d + e*x)**4), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log{(cx^n)} + a)^2}{(ex + d)^4 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^4*x), x)
```

3.119 $\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^4}\,dx$

Optimal. Leaf size=420

$$\frac{8ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^5}-\frac{26b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^5}-\frac{8b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^5}+\frac{3e^2x(a+b\log(cx^n))}{d^5(d+ex)}$$

```
[Out] (-2*b^2*n^2)/(d^4*x) - (b^2*e*n^2)/(3*d^4*(d + e*x)) - (b^2*e*n^2*Log[x])/(
3*d^5) - (2*b*n*(a + b*Log[c*x^n]))/(d^4*x) + (b*e*n*(a + b*Log[c*x^n]))/(3
*d^3*(d + e*x)^2) - (8*b*e^2*n*x*(a + b*Log[c*x^n]))/(3*d^5*(d + e*x)) + (4
*e*(a + b*Log[c*x^n])^2)/(3*d^5) - (a + b*Log[c*x^n])^2/(d^4*x) - (e*(a + b
*Log[c*x^n])^2)/(3*d^2*(d + e*x)^3) - (e*(a + b*Log[c*x^n])^2)/(d^3*(d + e*
x)^2) + (3*e^2*x*(a + b*Log[c*x^n])^2)/(d^5*(d + e*x)) - (4*e*(a + b*Log[c*
x^n])^3)/(3*b*d^5*n) + (3*b^2*e*n^2*Log[d + e*x])/d^5 - (26*b*e*n*(a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d])/(3*d^5) + (4*e*(a + b*Log[c*x^n])^2*Log[1 + (e*
x)/d])/d^5 - (26*b^2*e*n^2*PolyLog[2, -((e*x)/d)])/(3*d^5) + (8*b*e*n*(a +
b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^5 - (8*b^2*e*n^2*PolyLog[3, -((e*x)
/d)])/d^5
```

Rubi [A] time = 0.89301, antiderivative size = 420, normalized size of antiderivative = 1., number of steps used = 32, number of rules used = 17, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.739, Rules used = {2353, 2305, 2304, 2302, 30, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44, 2318, 2374, 6589}

$$\frac{8ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^5}-\frac{26b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^5}-\frac{8b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)}{d^5}+\frac{3e^2x(a+b\log(cx^n))}{d^5(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^4),x]
```


```
[Out] (-2*b^2*n^2)/(d^4*x) - (b^2*e*n^2)/(3*d^4*(d + e*x)) - (b^2*e*n^2*Log[x])/(
3*d^5) - (2*b*n*(a + b*Log[c*x^n]))/(d^4*x) + (b*e*n*(a + b*Log[c*x^n]))/(3
*d^3*(d + e*x)^2) - (8*b*e^2*n*x*(a + b*Log[c*x^n]))/(3*d^5*(d + e*x)) + (4
*e*(a + b*Log[c*x^n])^2)/(3*d^5) - (a + b*Log[c*x^n])^2/(d^4*x) - (e*(a + b
*Log[c*x^n])^2)/(3*d^2*(d + e*x)^3) - (e*(a + b*Log[c*x^n])^2)/(d^3*(d + e*
x)^2) + (3*e^2*x*(a + b*Log[c*x^n])^2)/(d^5*(d + e*x)) - (4*e*(a + b*Log[c*
x^n])^3)/(3*b*d^5*n) + (3*b^2*e*n^2*Log[d + e*x])/d^5 - (26*b*e*n*(a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d])/(3*d^5) + (4*e*(a + b*Log[c*x^n])^2*Log[1 + (e*
x)/d])/d^5 - (26*b^2*e*n^2*PolyLog[2, -((e*x)/d)])/(3*d^5) + (8*b*e*n*(a +
b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/d^5 - (8*b^2*e*n^2*PolyLog[3, -((e*x)
```

/d)])/d^5

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x^2(d+ex)^4}\,dx = \int\left(\frac{(a+b\log(cx^n))^2}{d^4x^2} - \frac{4e(a+b\log(cx^n))^2}{d^5x} + \frac{e^2(a+b\log(cx^n))^2}{d^2(d+ex)^4} + \frac{2e^2(a+b\log(cx^n))^2}{d^3(d+ex)^3} +\right.$$

$$= \frac{\int \frac{(a+b\log(cx^n))^2}{x^2}\,dx}{d^4} - \frac{(4e)\int \frac{(a+b\log(cx^n))^2}{x}\,dx}{d^5} + \frac{(4e^2)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d^5} + \frac{(3e^2)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,d}{d^4}$$

$$= -\frac{(a+b\log(cx^n))^2}{d^4x} - \frac{e(a+b\log(cx^n))^2}{3d^2(d+ex)^3} - \frac{e(a+b\log(cx^n))^2}{d^3(d+ex)^2} + \frac{3e^2x(a+b\log(cx^n))^2}{d^5(d+ex)} + \frac{4e}{}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{2bn(a+b\log(cx^n))}{d^4x} - \frac{(a+b\log(cx^n))^2}{d^4x} - \frac{e(a+b\log(cx^n))^2}{3d^2(d+ex)^3} - \frac{e(a+b\log(cx^n))}{d^3(d+ex)^2}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{2bn(a+b\log(cx^n))}{d^4x} + \frac{ben(a+b\log(cx^n))}{3d^3(d+ex)^2} - \frac{2be^2nx(a+b\log(cx^n))}{d^5(d+ex)} - \frac{(a+b\log}{d^4}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{2bn(a+b\log(cx^n))}{d^4x} + \frac{ben(a+b\log(cx^n))}{3d^3(d+ex)^2} - \frac{8be^2nx(a+b\log(cx^n))}{3d^5(d+ex)} + \frac{e(a+b\log}{d}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{b^2en^2}{3d^4(d+ex)} - \frac{b^2en^2\log(x)}{3d^5} - \frac{2bn(a+b\log(cx^n))}{d^4x} + \frac{ben(a+b\log(cx^n))}{3d^3(d+ex)^2} - \frac{8be^2n}{}$$

$$= -\frac{2b^2n^2}{d^4x} - \frac{b^2en^2}{3d^4(d+ex)} - \frac{b^2en^2\log(x)}{3d^5} - \frac{2bn(a+b\log(cx^n))}{d^4x} + \frac{ben(a+b\log(cx^n))}{3d^3(d+ex)^2} - \frac{8be^2n}{}$$

Mathematica [A] time = 0.657879, size = 378, normalized size = 0.9

$$-\frac{-24ben\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n)) + 26b^2en^2\text{PolyLog}\left(2,-\frac{ex}{d}\right) + 24b^2en^2\text{PolyLog}\left(3,-\frac{ex}{d}\right) + \frac{d^3e(a+b\log(cx^n))^2}{(d+ex)^3} +}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x^2*(d + e*x)^4),x]
```

```
[Out] -((6*b^2*d*n^2)/x + (6*b*d*n*(a + b*Log[c*x^n]))/x - (b*d^2*e*n*(a + b*Log[
c*x^n]))/(d + e*x)^2 - (8*b*d*e*n*(a + b*Log[c*x^n]))/(d + e*x) - 13*e*(a +
 b*Log[c*x^n])^2 + (3*d*(a + b*Log[c*x^n])^2)/x + (d^3*e*(a + b*Log[c*x^n])
^2)/(d + e*x)^3 + (3*d^2*e*(a + b*Log[c*x^n])^2)/(d + e*x)^2 + (9*d*e*(a +
b*Log[c*x^n])^2)/(d + e*x) + (4*e*(a + b*Log[c*x^n])^3)/(b*n) + 8*b^2*e*n^2
*(Log[x] - Log[d + e*x]) + (b^2*e*n^2*(d + (d + e*x)*Log[x] - (d + e*x)*Log
[d + e*x]))/(d + e*x) + 26*b*e*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d] - 12*e
*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d] + 26*b^2*e*n^2*PolyLog[2, -((e*x)/d)
] - 24*b*e*n*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 24*b^2*e*n^2*PolyL
```

```
og[3, -((e*x)/d)])/(3*d^5)
```

Maple [F] time = 0.846, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x^2(ex+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x^2/(e*x+d)^4,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x^2/(e*x+d)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{3}a^2\left(\frac{12e^3x^3+30de^2x^2+22d^2ex+3d^3}{d^4e^3x^4+3d^5e^2x^3+3d^6ex^2+d^7x}-\frac{12e\log(ex+d)}{d^5}+\frac{12e\log(x)}{d^5}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2ab\log(c)}{e^4x^6+4de^3x^5+6d^2e^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/3*a^2*((12*e^3*x^3 + 30*d*e^2*x^2 + 22*d^2*e*x + 3*d^3)/(d^4*e^3*x^4 + 3
*d^5*e^2*x^3 + 3*d^6*e*x^2 + d^7*x) - 12*e*log(e*x + d)/d^5 + 12*e*log(x)/d
^5) + integrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(
c) + a*b)*log(x^n))/(e^4*x^6 + 4*d*e^3*x^5 + 6*d^2*e^2*x^4 + 4*d^3*e*x^3 +
d^4*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log(cx^n)^2+2ab\log(cx^n)+a^2}{e^4x^6+4de^3x^5+6d^2e^2x^4+4d^3ex^3+d^4x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^4*x^6 + 4*d*e^3*x^5
 + 6*d^2*e^2*x^4 + 4*d^3*e*x^3 + d^4*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*ln(c*x**n))**2/x**2/(e*x+d)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex + d)^4 x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x + d)^4*x^2), x)
```

3.120 $\int \frac{x\log^2(x)}{(d+ex)^4}\,dx$

Optimal. Leaf size=107

$$-\frac{\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^2e^2}-\frac{\log(x)\log\left(\frac{ex}{d}+1\right)}{3d^2e^2}+\frac{x^2\log^2(x)(3d+ex)}{6d^2(d+ex)^3}-\frac{x}{3d^2e(d+ex)}+\frac{x\log(x)}{3de(d+ex)^2}$$

```
[Out] -x/(3*d^2*e*(d + e*x)) + (x*Log[x])/(3*d*e*(d + e*x)^2) + (x^2*(3*d + e*x)*
Log[x]^2)/(6*d^2*(d + e*x)^3) - (Log[x]*Log[1 + (e*x)/d])/(3*d^2*e^2) - Pol
yLog[2, -((e*x)/d)]/(3*d^2*e^2)
```

Rubi [A] time = 0.406657, antiderivative size = 157, normalized size of antiderivative = 1.47, number of steps used = 22, number of rules used = 10, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.769, Rules used = {2353, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 44}

$$-\frac{\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{3d^2e^2}+\frac{\log^2(x)}{6d^2e^2}-\frac{\log(x)\log\left(\frac{ex}{d}+1\right)}{3d^2e^2}+\frac{\log(x)}{3d^2e^2}-\frac{x\log(x)}{3d^2e(d+ex)}+\frac{1}{3de^2(d+ex)}-\frac{\log^2(x)}{2e^2(d+ex)^2}+\frac{d\log^2(x}{3e^2(d+ex}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Log[x]^2)/(d + e*x)^4,x]
```

```
[Out] 1/(3*d*e^2*(d + e*x)) + Log[x]/(3*d^2*e^2) - Log[x]/(3*e^2*(d + e*x)^2) - (
x*Log[x])/(3*d^2*e*(d + e*x)) + Log[x]^2/(6*d^2*e^2) + (d*Log[x]^2)/(3*e^2*
(d + e*x)^3) - Log[x]^2/(2*e^2*(d + e*x)^2) - (Log[x]*Log[1 + (e*x)/d])/(3*
d^2*e^2) - PolyLog[2, -((e*x)/d)]/(3*d^2*e^2)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
```

```
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{x\log^2(x)}{(d+ex)^4}\,dx &= \int \left(-\frac{d\log^2(x)}{e(d+ex)^4}+\frac{\log^2(x)}{e(d+ex)^3}\right)dx\\
&= \frac{\int \frac{\log^2(x)}{(d+ex)^3}\,dx}{e}-\frac{d\int \frac{\log^2(x)}{(d+ex)^4}\,dx}{e}\\
&= \frac{d\log^2(x)}{3e^2(d+ex)^3}-\frac{\log^2(x)}{2e^2(d+ex)^2}+\frac{\int \frac{\log(x)}{x(d+ex)^2}\,dx}{e^2}-\frac{(2d)\int \frac{\log(x)}{x(d+ex)^3}\,dx}{3e^2}\\
&= \frac{d\log^2(x)}{3e^2(d+ex)^3}-\frac{\log^2(x)}{2e^2(d+ex)^2}-\frac{2\int \frac{\log(x)}{x(d+ex)^2}\,dx}{3e^2}+\frac{\int \frac{\log(x)}{x(d+ex)}\,dx}{de^2}+\frac{2\int \frac{\log(x)}{(d+ex)^3}\,dx}{3e}-\frac{\int \frac{\log(x)}{(d+ex)^2}\,dx}{de}\\
&= -\frac{\log(x)}{3e^2(d+ex)^2}-\frac{x\log(x)}{d^2e(d+ex)}+\frac{d\log^2(x)}{3e^2(d+ex)^3}-\frac{\log^2(x)}{2e^2(d+ex)^2}+\frac{\int \frac{1}{x(d+ex)^2}\,dx}{3e^2}+\frac{\int \frac{\log(x)}{x}\,dx}{d^2e^2}-\frac{2\int \frac{\log(x)}{x(d+ex)}\,d}{3de^2}\\
&= -\frac{\log(x)}{3e^2(d+ex)^2}-\frac{x\log(x)}{3d^2e(d+ex)}+\frac{\log^2(x)}{2d^2e^2}+\frac{d\log^2(x)}{3e^2(d+ex)^3}-\frac{\log^2(x)}{2e^2(d+ex)^2}+\frac{\log(d+ex)}{d^2e^2}-\frac{\log(x)\log\left(1+\right.}{d^2e^2}\\
&= \frac{1}{3de^2(d+ex)}+\frac{\log(x)}{3d^2e^2}-\frac{\log(x)}{3e^2(d+ex)^2}-\frac{x\log(x)}{3d^2e(d+ex)}+\frac{\log^2(x)}{6d^2e^2}+\frac{d\log^2(x)}{3e^2(d+ex)^3}-\frac{\log^2(x)}{2e^2(d+ex)^2}-\log(x\\
&= \frac{1}{3de^2(d+ex)}+\frac{\log(x)}{3d^2e^2}-\frac{\log(x)}{3e^2(d+ex)^2}-\frac{x\log(x)}{3d^2e(d+ex)}+\frac{\log^2(x)}{6d^2e^2}+\frac{d\log^2(x)}{3e^2(d+ex)^3}-\frac{\log^2(x)}{2e^2(d+ex)^2}-\log(x
\end{aligned}
$$

Mathematica [A] time = 0.126762, size = 96, normalized size = 0.9

$$
\frac{-2(d+ex)^3\text{PolyLog}\left(2,-\frac{ex}{d}\right)+e^2x^2\log^2(x)(3d+ex)+2d(d+ex)^2-2\log(x)(d+ex)\left((d+ex)^2\log\left(\frac{ex}{d}+1\right)-dex\right)}{6d^2e^2(d+ex)^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Log[x]^2)/(d + e*x)^4,x]
```

```
[Out] (2*d*(d + e*x)^2 + e^2*x^2*(3*d + e*x)*Log[x]^2 - 2*(d + e*x)*Log[x]*(-(d*e
*x) + (d + e*x)^2*Log[1 + (e*x)/d]) - 2*(d + e*x)^3*PolyLog[2, -((e*x)/d)])
/(6*d^2*e^2*(d + e*x)^3)
```

Maple [F] time = 0.345, size = 0, normalized size = 0.

$$\int \frac{x\left(\ln\left(x\right)\right)^{2}}{\left(ex+d\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x)^2/(e*x+d)^4,x)
```

```
[Out] int(x*ln(x)^2/(e*x+d)^4,x)
```

Maxima [A] time = 1.18798, size = 178, normalized size = 1.66

$$-\frac{d^{2}\log\left(x\right)^{2}-2\left(e^{2}\log\left(x\right)+e^{2}\right)x^{2}-2\,d^{2}+\left(3\,de\log\left(x\right)^{2}-2\,de\log\left(x\right)-4\,de\right)x}{6\left(de^{5}x^{3}+3\,d^{2}e^{4}x^{2}+3\,d^{3}e^{3}x+d^{4}e^{2}\right)}+\frac{\log\left(x\right)^{2}}{6\,d^{2}e^{2}}-\frac{\log\left(\frac{ex}{d}+1\right)\log\left(x\right)+\mathrm{Li}_{2}(}{3\,d^{2}e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)^2/(e*x+d)^4,x, algorithm="maxima")
```

```
[Out] -1/6*(d^2*log(x)^2 - 2*(e^2*log(x) + e^2)*x^2 - 2*d^2 + (3*d*e*log(x)^2 - 2
*d*e*log(x) - 4*d*e)*x)/(d*e^5*x^3 + 3*d^2*e^4*x^2 + 3*d^3*e^3*x + d^4*e^2)
 + 1/6*log(x)^2/(d^2*e^2) - 1/3*(log(e*x/d + 1)*log(x) + dilog(-e*x/d))/(d^
2*e^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x\log\left(x\right)^{2}}{e^{4}x^{4}+4\,de^{3}x^{3}+6\,d^{2}e^{2}x^{2}+4\,d^{3}ex+d^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)^2/(e*x+d)^4,x, algorithm="fricas")
```

```
[Out] integral(x*log(x)^2/(e^4*x^4 + 4*d*e^3*x^3 + 6*d^2*e^2*x^2 + 4*d^3*e*x + d^
4), x)
```

Sympy [A] time = 34.4248, size = 357, normalized size = 3.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x)**2/(e*x+d)**4,x)
```

```
[Out] (-d - 3*e*x)*log(x)**2/(6*d**3*e**2 + 18*d**2*e**3*x + 18*d*e**4*x**2 + 6*e
**5*x**3) + Piecewise((x/d**3, Eq(e, 0)), (-1/(2*e*(d + e*x)**2), True))*lo
g(x)/e - Piecewise((x/d**3, Eq(e, 0)), (-1/(2*d**2*e + 2*d*e**2*x) - log(x)
/(2*d**2*e) + log(d/e + x)/(2*d**2*e), True))/e + Piecewise((-1/(e**3*x), E
q(d, 0)), (-1/(2*d*e**2 + 2*e**3*x) - log(d + e*x)/(2*d*e**2), True))/(3*d)
 - Piecewise((1/(e**3*x), Eq(d, 0)), (-1/(2*d*(d/x + e)**2), True))*log(x)/
(3*d) - 2*Piecewise((-1/(e**2*x), Eq(d, 0)), (-log(d**2 + d*e*x)/(d*e), Tru
e))/(3*d*e) + 2*Piecewise((1/(e**2*x), Eq(d, 0)), (-1/(d**2/x + d*e), True)
)*log(x)/(3*d*e) + Piecewise((-1/(e*x), Eq(d, 0)), (Piecewise((log(e)*log(x
) + polylog(2, d*exp_polar(I*pi)/(e*x)), Abs(x) < 1), (-log(e)*log(1/x) + p
olylog(2, d*exp_polar(I*pi)/(e*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)),
((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) + p
olylog(2, d*exp_polar(I*pi)/(e*x)), True))/d, True))/(3*d*e**2) - Piecewise
((1/(e*x), Eq(d, 0)), (log(d/x + e)/d, True))*log(x)/(3*d*e**2)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x \log(x)^2}{(ex+d)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)^2/(e*x+d)^4,x, algorithm="giac")
```

```
[Out] integrate(x*log(x)^2/(e*x + d)^4, x)
```

3.121 $\int \frac{(a+b\log(cx^n))^3}{x(d+ex)}\,dx$

Optimal. Leaf size=113

$$\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d}+\frac{3bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(cx^n))^2}{d}+\frac{6b^3n^3\text{PolyLog}\left(4,-\frac{d}{ex}\right)}{d}-\frac{\log\left(\frac{d}{ex}\right.}{}$$

```
[Out] -((Log[1 + d/(e*x)]*(a + b*Log[c*x^n])^3)/d) + (3*b*n*(a + b*Log[c*x^n])^2*
PolyLog[2, -(d/(e*x))])/d + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, -(d/(e
*x))])/d + (6*b^3*n^3*PolyLog[4, -(d/(e*x))])/d
```

Rubi [A] time = 0.207856, antiderivative size = 130, normalized size of antiderivative = 1.15, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {2344, 2302, 30, 2317, 2374, 2383, 6589}

$$\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d}-\frac{3bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))^2}{d}-\frac{6b^3n^3\text{PolyLog}\left(4,-\frac{ex}{d}\right)}{d}-\frac{\log\left(\frac{ex}{d}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(x*(d + e*x)),x]
```

```
[Out] (a + b*Log[c*x^n])^4/(4*b*d*n) - ((a + b*Log[c*x^n])^3*Log[1 + (e*x)/d])/d
- (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e*x)/d)])/d + (6*b^2*n^2*(a + b
*Log[c*x^n])*PolyLog[3, -((e*x)/d)])/d - (6*b^3*n^3*PolyLog[4, -((e*x)/d)])
/d
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^3}{x(d+ex)}\,dx = \frac{\int \frac{(a+b\log(cx^n))^3}{x}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^3}{d+ex}\,dx}{d}$$

$$= -\frac{(a+b\log(cx^n))^3\log\left(1+\frac{ex}{d}\right)}{d} + \frac{\text{Subst}\left(\int x^3\,dx, x, a+b\log(cx^n)\right)}{bdn} + \frac{(3bn)\int \frac{(a+b\log(cx^n))^2 \log}{x}}{d}$$

$$= \frac{(a+b\log(cx^n))^4}{4bdn} - \frac{(a+b\log(cx^n))^3\log\left(1+\frac{ex}{d}\right)}{d} - \frac{3bn(a+b\log(cx^n))^2\,\text{Li}_2\left(-\frac{ex}{d}\right)}{d} + \frac{(6b^2n}{}$$

$$= \frac{(a+b\log(cx^n))^4}{4bdn} - \frac{(a+b\log(cx^n))^3\log\left(1+\frac{ex}{d}\right)}{d} - \frac{3bn(a+b\log(cx^n))^2\,\text{Li}_2\left(-\frac{ex}{d}\right)}{d} + \frac{6b^2n^2}{}$$

$$= \frac{(a+b\log(cx^n))^4}{4bdn} - \frac{(a+b\log(cx^n))^3\log\left(1+\frac{ex}{d}\right)}{d} - \frac{3bn(a+b\log(cx^n))^2\,\text{Li}_2\left(-\frac{ex}{d}\right)}{d} + \frac{6b^2n^2}{}$$

Mathematica [B] time = 0.175878, size = 243, normalized size = 2.15

$$\frac{-4b^2n^2\left(6\text{PolyLog}\left(3,-\frac{ex}{d}\right) - 6\log(x)\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \log^2(x)\left(\log(x) - 3\log\left(\frac{ex}{d}+1\right)\right)\right)(-a - b\log(cx^n) + bn\log(x}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(x*(d + e*x)),x]
```

```
[Out] (4*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n])^3 - 4*(a - b*n*Log[x] + b*Log[c*x
^n])^3*Log[d + e*x] + 6*b*n*(a - b*n*Log[x] + b*Log[c*x^n])^2*(Log[x]^2 - 2
*(Log[x]*Log[1 + (e*x)/d] + PolyLog[2, -((e*x)/d)])) - 4*b^2*n^2*(-a + b*n*
Log[x] - b*Log[c*x^n])*(Log[x]^2*(Log[x] - 3*Log[1 + (e*x)/d]) - 6*Log[x]*P
olyLog[2, -((e*x)/d)] + 6*PolyLog[3, -((e*x)/d)]) + b^3*n^3*(Log[x]^4 - 4*L
og[x]^3*Log[1 + (e*x)/d] - 12*Log[x]^2*PolyLog[2, -((e*x)/d)] + 24*Log[x]*P
olyLog[3, -((e*x)/d)] - 24*PolyLog[4, -((e*x)/d)]))/(4*d)
```

Maple [C] time = 0.718, size = 9909, normalized size = 87.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^3/x/(e*x+d),x)
```

```
[Out] result too large to display
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-a^3\left(\frac{\log(ex+d)}{d}-\frac{\log(x)}{d}\right)+\int\frac{b^3\log(c)^3+b^3\log(x^n)^3+3\,ab^2\log(c)^2+3\,a^2b\log(c)+3\left(b^3\log(c)+ab^2\right)\log(x^n)^2+}{ex^2+dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d),x, algorithm="maxima")
```

```
[Out] -a^3*(log(e*x + d)/d - log(x)/d) + integrate((b^3*log(c)^3 + b^3*log(x^n)^3
 + 3*a*b^2*log(c)^2 + 3*a^2*b*log(c) + 3*(b^3*log(c) + a*b^2)*log(x^n)^2 +
3*(b^3*log(c)^2 + 2*a*b^2*log(c) + a^2*b)*log(x^n))/(e*x^2 + d*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^3\log(cx^n)^3+3\,ab^2\log(cx^n)^2+3\,a^2b\log(cx^n)+a^3}{ex^2+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e*x^2 + d*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\log(cx^n))^3}{x\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/x/(e*x+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(x*(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^3}{(ex + d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/((e*x + d)*x), x)
```

3.122 $\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^2}\,dx$

Optimal. Leaf size=217

$$\frac{6b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^2}+\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{d}{ex}\right)(a+b\log(cx^n))}{d^2}+\frac{3bn\text{PolyLog}\left(2,-\frac{d}{ex}\right)(a+b\log(c\right.}{d^2}$$

```
[Out] -((e*x*(a + b*Log[c*x^n])^3)/(d^2*(d + e*x))) - (Log[1 + d/(e*x)]*(a + b*Lo
g[c*x^n])^3)/d^2 + (3*b*n*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^2 + (3*b
*n*(a + b*Log[c*x^n])^2*PolyLog[2, -(d/(e*x))])/d^2 + (6*b^2*n^2*(a + b*Log
[c*x^n])*PolyLog[2, -((e*x)/d)])/d^2 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyLo
g[3, -(d/(e*x))])/d^2 - (6*b^3*n^3*PolyLog[3, -((e*x)/d)])/d^2 + (6*b^3*n^3
*PolyLog[4, -(d/(e*x))])/d^2
```

Rubi [A] time = 0.396486, antiderivative size = 234, normalized size of antiderivative = 1.08, number of steps used = 12, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 2383, 6589, 2318}

$$\frac{6b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^2}+\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^2}-\frac{3bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(c\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(x*(d + e*x)^2),x]
```

```
[Out] -((e*x*(a + b*Log[c*x^n])^3)/(d^2*(d + e*x))) + (a + b*Log[c*x^n])^4/(4*b*d
^2*n) + (3*b*n*(a + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/d^2 - ((a + b*Log[c*x
^n])^3*Log[1 + (e*x)/d])/d^2 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((
e*x)/d)])/d^2 - (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e*x)/d)])/d^2 - (
6*b^3*n^3*PolyLog[3, -((e*x)/d)])/d^2 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyL
og[3, -((e*x)/d)])/d^2 - (6*b^3*n^3*PolyLog[4, -((e*x)/d)])/d^2
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^2}\,dx = \frac{\int \frac{(a+b\log(cx^n))^3}{x(d+ex)}\,dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^3}{(d+ex)^2}\,dx}{d}$$

$$= -\frac{ex(a+b\log(cx^n))^3}{d^2(d+ex)} + \frac{\int \frac{(a+b\log(cx^n))^3}{x}\,dx}{d^2} - \frac{e\int \frac{(a+b\log(cx^n))^3}{d+ex}\,dx}{d^2} + \frac{(3ben)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{d^2}$$

$$= -\frac{ex(a+b\log(cx^n))^3}{d^2(d+ex)} + \frac{3bn(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(a+b\log(cx^n))^3\log\left(1+\frac{ex}{d}\right)}{d^2} + \cdots$$

$$= -\frac{ex(a+b\log(cx^n))^3}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^4}{4bd^2n} + \frac{3bn(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(a+b\log(cx\cdots}{\cdots}$$

$$= -\frac{ex(a+b\log(cx^n))^3}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^4}{4bd^2n} + \frac{3bn(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(a+b\log(cx\cdots}{\cdots}$$

$$= -\frac{ex(a+b\log(cx^n))^3}{d^2(d+ex)} + \frac{(a+b\log(cx^n))^4}{4bd^2n} + \frac{3bn(a+b\log(cx^n))^2\log\left(1+\frac{ex}{d}\right)}{d^2} - \frac{(a+b\log(cx\cdots}{\cdots}$$

Mathematica [A] time = 0.471825, size = 432, normalized size = 1.99

$$\frac{4b^2n^2\left(6(d+ex)\text{PolyLog}\left(3,-\frac{ex}{d}\right) - 6(\log(x)-1)(d+ex)\text{PolyLog}\left(2,-\frac{ex}{d}\right) + \log(x)\left(\log^2(x)(d+ex) - 3\log(x)\left((d+ex)\cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(x*(d + e*x)^2),x]
```

```
[Out] (4*d*(a - b*n*Log[x] + b*Log[c*x^n])^3 + 4*(d + e*x)*Log[x]*(a - b*n*Log[x]
 + b*Log[c*x^n])^3 - 4*(d + e*x)*(a - b*n*Log[x] + b*Log[c*x^n])^3*Log[d +
e*x] + 6*b*n*(a - b*n*Log[x] + b*Log[c*x^n])^2*(-2*e*x*Log[x] + (d + e*x)*L
og[x]^2 + 2*(d + e*x)*Log[d + e*x] - 2*(d + e*x)*(Log[x]*Log[1 + (e*x)/d] +
 PolyLog[2, -((e*x)/d)])) + 4*b^2*n^2*(a - b*n*Log[x] + b*Log[c*x^n])*(Log[
x]*((d + e*x)*Log[x]^2 + 6*(d + e*x)*Log[1 + (e*x)/d] - 3*Log[x]*(e*x + (d
```

```
+ e*x)*Log[1 + (e*x)/d])) - 6*(d + e*x)*(-1 + Log[x])*PolyLog[2, -((e*x)/d)
] + 6*(d + e*x)*PolyLog[3, -((e*x)/d)]) + b^3*n^3*((d + e*x)*Log[x]^4 - 4*(
Log[x]^2*(e*x*Log[x] - 3*(d + e*x)*Log[1 + (e*x)/d]) - 6*(d + e*x)*Log[x]*P
olyLog[2, -((e*x)/d)] + 6*(d + e*x)*PolyLog[3, -((e*x)/d)]) - 4*(d + e*x)*(
Log[x]^3*Log[1 + (e*x)/d] + 3*Log[x]^2*PolyLog[2, -((e*x)/d)] - 6*Log[x]*Po
lyLog[3, -((e*x)/d)] + 6*PolyLog[4, -((e*x)/d)])))/(4*d^2*(d + e*x))
```

Maple [F] time = 0.924, size = 0, normalized size = 0.

$$\int \frac{(a + b\ln(cx^n))^3}{x(ex + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^3/x/(e*x+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^3/x/(e*x+d)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a^3\left(\frac{1}{dex + d^2} - \frac{\log(ex + d)}{d^2} + \frac{\log(x)}{d^2}\right) + \int \frac{b^3\log(c)^3 + b^3\log(x^n)^3 + 3\,ab^2\log(c)^2 + 3\,a^2b\log(c) + 3\left(b^3\log(c) + ab^2\right.}{e^2x^3 + 2\,dex^2 + d^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] a^3*(1/(d*e*x + d^2) - log(e*x + d)/d^2 + log(x)/d^2) + integrate((b^3*log(
c)^3 + b^3*log(x^n)^3 + 3*a*b^2*log(c)^2 + 3*a^2*b*log(c) + 3*(b^3*log(c) +
 a*b^2)*log(x^n)^2 + 3*(b^3*log(c)^2 + 2*a*b^2*log(c) + a^2*b)*log(x^n))/(e
^2*x^3 + 2*d*e*x^2 + d^2*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^3\log(cx^n)^3 + 3\,ab^2\log(cx^n)^2 + 3\,a^2b\log(cx^n) + a^3}{e^2x^3 + 2\,dex^2 + d^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^2*x^3 + 2*d*e*x^2 + d^2*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))^3}{x\,(d + ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/x/(e*x+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(x*(d + e*x)**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^3}{(ex + d)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/((e*x + d)^2*x), x)
```

3.123 $\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^3}\,dx$

Optimal. Leaf size=361

$$\frac{9b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}+\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}-\frac{3bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(\right.}{d^3}$$

```
[Out] (3*b*e*n*x*(a + b*Log[c*x^n])^2)/(2*d^3*(d + e*x)) - (a + b*Log[c*x^n])^3/(
2*d^3) + (a + b*Log[c*x^n])^3/(2*d*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^3
)/(d^3*(d + e*x)) + (a + b*Log[c*x^n])^4/(4*b*d^3*n) - (3*b^2*n^2*(a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d])/d^3 + (9*b*n*(a + b*Log[c*x^n])^2*Log[1 + (e*x)
/d])/(2*d^3) - ((a + b*Log[c*x^n])^3*Log[1 + (e*x)/d])/d^3 - (3*b^3*n^3*Pol
yLog[2, -((e*x)/d)])/d^3 + (9*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)
/d)])/d^3 - (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e*x)/d)])/d^3 - (9*b^
3*n^3*PolyLog[3, -((e*x)/d)])/d^3 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3
, -((e*x)/d)])/d^3 - (6*b^3*n^3*PolyLog[4, -((e*x)/d)])/d^3
```

Rubi [A] time = 0.852127, antiderivative size = 361, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2347, 2344, 2302, 30, 2317, 2374, 2383, 6589, 2318, 2319, 2391}

$$\frac{9b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}+\frac{6b^2n^2\text{PolyLog}\left(3,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^3}-\frac{3bn\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(\right.}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(x*(d + e*x)^3),x]
```


```
[Out] (3*b*e*n*x*(a + b*Log[c*x^n])^2)/(2*d^3*(d + e*x)) - (a + b*Log[c*x^n])^3/(
2*d^3) + (a + b*Log[c*x^n])^3/(2*d*(d + e*x)^2) - (e*x*(a + b*Log[c*x^n])^3
)/(d^3*(d + e*x)) + (a + b*Log[c*x^n])^4/(4*b*d^3*n) - (3*b^2*n^2*(a + b*Lo
g[c*x^n])*Log[1 + (e*x)/d])/d^3 + (9*b*n*(a + b*Log[c*x^n])^2*Log[1 + (e*x)
/d])/(2*d^3) - ((a + b*Log[c*x^n])^3*Log[1 + (e*x)/d])/d^3 - (3*b^3*n^3*Pol
yLog[2, -((e*x)/d)])/d^3 + (9*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)
/d)])/d^3 - (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e*x)/d)])/d^3 - (9*b^
3*n^3*PolyLog[3, -((e*x)/d)])/d^3 + (6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3
, -((e*x)/d)])/d^3 - (6*b^3*n^3*PolyLog[4, -((e*x)/d)])/d^3
```


Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^3}dx = \frac{\int \frac{(a+b\log(cx^n))^3}{x(d+ex)^2}dx}{d} - \frac{e\int \frac{(a+b\log(cx^n))^3}{(d+ex)^3}dx}{d}$$

$$= \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} + \frac{\int \frac{(a+b\log(cx^n))^3}{x(d+ex)}dx}{d^2} - \frac{e\int \frac{(a+b\log(cx^n))^3}{(d+ex)^2}dx}{d^2} - \frac{(3bn)\int \frac{(a+b\log(cx^n))^2}{x(d+ex)^2}dx}{2d}$$

$$= \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{\int \frac{(a+b\log(cx^n))^3}{x}dx}{d^3} - \frac{e\int \frac{(a+b\log(cx^n))^3}{d+ex}dx}{d^3} - \frac{(3bn)\int \frac{(}{}}{}$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{3bn(a+b\log(cx^n))^2\log}{d^3}$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{(a+b\log(cx^n))^4}{4bd^3n} - \frac{3b^2n}{}$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} - \frac{(a+b\log(cx^n))^3}{2d^3} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{(a+}{}$$

$$= \frac{3benx(a+b\log(cx^n))^2}{2d^3(d+ex)} - \frac{(a+b\log(cx^n))^3}{2d^3} + \frac{(a+b\log(cx^n))^3}{2d(d+ex)^2} - \frac{ex(a+b\log(cx^n))^3}{d^3(d+ex)} + \frac{(a+}{}$$

Mathematica [A] time = 0.894021, size = 706, normalized size = 1.96

$$\frac{2b^2n^2\left(6(d+ex)^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)-6(d+ex)^2\left(-2\text{PolyLog}\left(3,-\frac{ex}{d}\right)+2\log(x)\text{PolyLog}\left(2,-\frac{ex}{d}\right)+\log^2(x)\log\left(\frac{ex}{d}+1\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(x*(d + e*x)^3),x]
```

```
[Out] (2*d^2*(a - b*n*Log[x] + b*Log[c*x^n])^3 + 4*d*(d + e*x)*(a - b*n*Log[x] +
b*Log[c*x^n])^3 + 4*(d + e*x)^2*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n])^3 -
4*(d + e*x)^2*(a - b*n*Log[x] + b*Log[c*x^n])^3*Log[d + e*x] + 6*b*n*(a - b
*n*Log[x] + b*Log[c*x^n])^2*((d + e*x)^2*Log[x]^2 + (d + e*x)*(-d + 3*(d +
e*x)*Log[d + e*x]) - Log[x]*(e*x*(4*d + 3*e*x) + 2*(d + e*x)^2*Log[1 + (e*x
)/d]) - 2*(d + e*x)^2*PolyLog[2, -((e*x)/d)]) + 2*b^2*n^2*(a - b*n*Log[x] +
 b*Log[c*x^n])*(-3*e*x*(2*d + e*x)*Log[x]^2 + 2*(d + e*x)^2*Log[x]^3 - 6*(d
 + e*x)^2*Log[d + e*x] + 6*(d + e*x)*Log[x]*(e*x + (d + e*x)*Log[1 + (e*x)/
d]) + 6*(d + e*x)^2*PolyLog[2, -((e*x)/d)] - 6*(d + e*x)*(Log[x]*(e*x*Log[x
] - 2*(d + e*x)*Log[1 + (e*x)/d]) - 2*(d + e*x)*PolyLog[2, -((e*x)/d)]) - 6
*(d + e*x)^2*(Log[x]^2*Log[1 + (e*x)/d] + 2*Log[x]*PolyLog[2, -((e*x)/d)] -
```

```
 2*PolyLog[3, -((e*x)/d)])) + b^3*n^3*((d + e*x)^2*Log[x]^4 - 4*(d + e*x)*(
Log[x]^2*(e*x*Log[x] - 3*(d + e*x)*Log[1 + (e*x)/d]) - 6*(d + e*x)*Log[x]*P
olyLog[2, -((e*x)/d)] + 6*(d + e*x)*PolyLog[3, -((e*x)/d)]) - 2*(Log[x]*(e*
x*(2*d + e*x)*Log[x]^2 + 6*(d + e*x)^2*Log[1 + (e*x)/d] - 3*(d + e*x)*Log[x
]*(e*x + (d + e*x)*Log[1 + (e*x)/d])) - 6*(d + e*x)^2*(-1 + Log[x])*PolyLog
[2, -((e*x)/d)] + 6*(d + e*x)^2*PolyLog[3, -((e*x)/d)]) - 4*(d + e*x)^2*(Lo
g[x]^3*Log[1 + (e*x)/d] + 3*Log[x]^2*PolyLog[2, -((e*x)/d)] - 6*Log[x]*Poly
Log[3, -((e*x)/d)] + 6*PolyLog[4, -((e*x)/d)])))/(4*d^3*(d + e*x)^2)
```

Maple [F] time = 1.187, size = 0, normalized size = 0.

$$\int \frac{(a + b \ln (c x^n))^3}{x (ex + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^3/x/(e*x+d)^3,x)
```

```
[Out] int((a+b*ln(c*x^n))^3/x/(e*x+d)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2} a^3 \left(\frac{2 ex + 3 d}{d^2 e^2 x^2 + 2 d^3 ex + d^4} - \frac{2 \log (ex + d)}{d^3} + \frac{2 \log (x)}{d^3} \right) + \int \frac{b^3 \log (c)^3 + b^3 \log (x^n)^3 + 3 ab^2 \log (c)^2 + 3 a^2 b \log (c) +}{e^3 x^4 +}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^3*((2*e*x + 3*d)/(d^2*e^2*x^2 + 2*d^3*e*x + d^4) - 2*log(e*x + d)/d^3
 + 2*log(x)/d^3) + integrate((b^3*log(c)^3 + b^3*log(x^n)^3 + 3*a*b^2*log(c
)^2 + 3*a^2*b*log(c) + 3*(b^3*log(c) + a*b^2)*log(x^n)^2 + 3*(b^3*log(c)^2
+ 2*a*b^2*log(c) + a^2*b)*log(x^n))/(e^3*x^4 + 3*d*e^2*x^3 + 3*d^2*e*x^2 +
d^3*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^3 \log (c x^n)^3 + 3 ab^2 \log (c x^n)^2 + 3 a^2 b \log (c x^n) + a^3}{e^3 x^4 + 3 de^2 x^3 + 3 d^2 ex^2 + d^3 x}, x \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^3*x^4 + 3*d*e^2*x^3 + 3*d^2*e*x^2 + d^3*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))^3}{x(d + ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/x/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(x*(d + e*x)**3), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^3}{(ex + d)^3 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/x/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/((e*x + d)^3*x), x)
```

3.124 $\int (d+ex)\sqrt{a+b\log(cx^n)}\,dx$

Optimal. Leaf size=189

$$-\frac{1}{2}\sqrt{\pi}\sqrt{b}d\sqrt{n}xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\operatorname{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+dx\sqrt{a+b\log(cx^n)}-\frac{1}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}e\sqrt{n}x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\operatorname{Erfi}\left(\frac{\sqrt{2}\sqrt{a}\right.$$

```
[Out] -(Sqrt[b]*d*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[n]
)])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e*Sqrt[n]*Sqrt[Pi/2]*x^2*Erfi
[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(4*E^((2*a)/(b*n))*(c
*x^n)^(2/n)) + d*x*Sqrt[a + b*Log[c*x^n]] + (e*x^2*Sqrt[a + b*Log[c*x^n]])/
2
```

Rubi [A] time = 0.265735, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {2330, 2296, 2300, 2180, 2204, 2305, 2310}

$$-\frac{1}{2}\sqrt{\pi}\sqrt{b}d\sqrt{n}xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\operatorname{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+dx\sqrt{a+b\log(cx^n)}-\frac{1}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}e\sqrt{n}x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\operatorname{Erfi}\left(\frac{\sqrt{2}\sqrt{a}\right.$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] -(Sqrt[b]*d*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[n]
)])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e*Sqrt[n]*Sqrt[Pi/2]*x^2*Erfi
[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(4*E^((2*a)/(b*n))*(c
*x^n)^(2/n)) + d*x*Sqrt[a + b*Log[c*x^n]] + (e*x^2*Sqrt[a + b*Log[c*x^n]])/
2
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
```

```
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2300

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_), x_Symbol] :> Dist[x/(n*(c*x
^n)^(1/n)), Subst[Int[E^(x/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[
{a, b, c, n, p}, x]
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rubi steps

$$\int (d+ex)\sqrt{a+b\log(cx^n)}\,dx = \int \left(d\sqrt{a+b\log(cx^n)}+ex\sqrt{a+b\log(cx^n)}\right)\,dx$$
$$= d\int \sqrt{a+b\log(cx^n)}\,dx + e\int x\sqrt{a+b\log(cx^n)}\,dx$$
$$= dx\sqrt{a+b\log(cx^n)}+\frac{1}{2}ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{2}(bdn)\int \frac{1}{\sqrt{a+b\log(cx^n)}}\,dx-\frac{1}{4}(ben)$$
$$= dx\sqrt{a+b\log(cx^n)}+\frac{1}{2}ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{4}\left(bex^2(cx^n)^{-2/n}\right)\text{Subst}\left(\int \frac{e^{\frac{2x}{n}}}{\sqrt{a+bx}}\,dx,\right.$$
$$= dx\sqrt{a+b\log(cx^n)}+\frac{1}{2}ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{2}\left(ex^2(cx^n)^{-2/n}\right)\text{Subst}\left(\int e^{-\frac{2a}{bn}+\frac{2x^2}{bn}}\,dx,x\right.$$
$$= -\frac{1}{2}\sqrt{b}de^{-\frac{a}{bn}}\sqrt{n}\sqrt{\pi}x(cx^n)^{-1/n}\,\text{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)-\frac{1}{4}\sqrt{b}ee^{-\frac{2a}{bn}}\sqrt{n}\sqrt{\frac{\pi}{2}}x^2(cx^n)^{-2/n}\,\text{er}$$

Mathematica [A] time = 0.274006, size = 169, normalized size = 0.89

$$\frac{1}{8}x\left(4(2d+ex)\sqrt{a+b\log(cx^n)}-4\sqrt{\pi}\sqrt{b}d\sqrt{n}e^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\text{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+\sqrt{2\pi}\left(-\sqrt{b}\right)e\sqrt{n}xe^{-\frac{2a}{bn}}(cx^n)^{-2/n}\,\text{E}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] (x*((-4*Sqrt[b]*d*Sqrt[n]*Sqrt[Pi]*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqr
t[n])])/(E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e*Sqrt[n]*Sqrt[2*Pi]*x*Erfi
[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(E^((2*a)/(b*n))*(c*x
^n)^(2/n)) + 4*(2*d + e*x)*Sqrt[a + b*Log[c*x^n]]))/8
```

Maple [F] time = 0.283, size = 0, normalized size = 0.

$$\int (ex+d)\sqrt{a+b\ln(cx^n)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)*(a+b*ln(c*x^n))^(1/2),x)
```

```
[Out] int((e*x+d)*(a+b*ln(c*x^n))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)\sqrt{b\log(cx^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x + d)*sqrt(b*log(c*x^n) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+b\log(cx^n)}\,(d+ex)\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*ln(c*x**n))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))*(d + e*x), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)\sqrt{b\log(cx^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)*(a+b*log(c*x^n))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)*sqrt(b*log(c*x^n) + a), x)
```

3.125 $\int (d+ex)^2\sqrt{a+b\log(cx^n)}\,dx$

Optimal. Leaf size=298

$$-\frac{1}{2}\sqrt{\pi}\sqrt{b}d^2\sqrt{n}xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\text{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+d^2x\sqrt{a+b\log(cx^n)}-\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}de\sqrt{n}x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\,\text{Erfi}\left(\sqrt{2}\sqrt{}\right.$$

```
[Out] -(Sqrt[b]*d^2*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[
n])])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*d*e*Sqrt[n]*Sqrt[Pi/2]*x^2*
Erfi[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(2*E^((2*a)/(b*n)
)*(c*x^n)^(2/n)) - (Sqrt[b]*e^2*Sqrt[n]*Sqrt[Pi/3]*x^3*Erfi[(Sqrt[3]*Sqrt[a
 + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(6*E^((3*a)/(b*n))*(c*x^n)^(3/n)) + d
^2*x*Sqrt[a + b*Log[c*x^n]] + d*e*x^2*Sqrt[a + b*Log[c*x^n]] + (e^2*x^3*Sqr
t[a + b*Log[c*x^n]])/3
```

Rubi [A] time = 0.466567, antiderivative size = 298, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {2330, 2296, 2300, 2180, 2204, 2305, 2310}

$$-\frac{1}{2}\sqrt{\pi}\sqrt{b}d^2\sqrt{n}xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\text{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+d^2x\sqrt{a+b\log(cx^n)}-\frac{1}{2}\sqrt{\frac{\pi}{2}}\sqrt{b}de\sqrt{n}x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\,\text{Erfi}\left(\sqrt{2}\sqrt{}\right.$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^2*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] -(Sqrt[b]*d^2*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[
n])])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*d*e*Sqrt[n]*Sqrt[Pi/2]*x^2*
Erfi[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(2*E^((2*a)/(b*n)
)*(c*x^n)^(2/n)) - (Sqrt[b]*e^2*Sqrt[n]*Sqrt[Pi/3]*x^3*Erfi[(Sqrt[3]*Sqrt[a
 + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(6*E^((3*a)/(b*n))*(c*x^n)^(3/n)) + d
^2*x*Sqrt[a + b*Log[c*x^n]] + d*e*x^2*Sqrt[a + b*Log[c*x^n]] + (e^2*x^3*Sqr
t[a + b*Log[c*x^n]])/3
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2300

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_), x_Symbol] :> Dist[x/(n*(c*x
^n)^(1/n)), Subst[Int[E^(x/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[
{a, b, c, n, p}, x]
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rubi steps

$$\int (d+ex)^2\sqrt{a+b\log(cx^n)}\,dx = \int \left(d^2\sqrt{a+b\log(cx^n)} + 2dex\sqrt{a+b\log(cx^n)} + e^2x^2\sqrt{a+b\log(cx^n)}\right) dx$$
$$= d^2\int \sqrt{a+b\log(cx^n)}\,dx + (2de)\int x\sqrt{a+b\log(cx^n)}\,dx + e^2\int x^2\sqrt{a+b\log(cx^n)}\,dx$$
$$= d^2x\sqrt{a+b\log(cx^n)} + dex^2\sqrt{a+b\log(cx^n)} + \frac{1}{3}e^2x^3\sqrt{a+b\log(cx^n)} - \frac{1}{2}\left(bd^2n\right)\int \frac{}{\sqrt{a}}$$
$$= d^2x\sqrt{a+b\log(cx^n)} + dex^2\sqrt{a+b\log(cx^n)} + \frac{1}{3}e^2x^3\sqrt{a+b\log(cx^n)} - \frac{1}{6}\left(be^2x^3(cx^n)^{-3/}\right.$$
$$= d^2x\sqrt{a+b\log(cx^n)} + dex^2\sqrt{a+b\log(cx^n)} + \frac{1}{3}e^2x^3\sqrt{a+b\log(cx^n)} - \frac{1}{3}\left(e^2x^3(cx^n)^{-3/n}\right.$$
$$= -\frac{1}{2}\sqrt{b}d^2e^{-\frac{a}{bn}}\sqrt{n}\sqrt{\pi}x(cx^n)^{-1/n}\operatorname{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right) - \frac{1}{2}\sqrt{b}dee^{-\frac{2a}{bn}}\sqrt{n}\sqrt{\frac{\pi}{2}}x^2(cx^n)^{-2/n}$$

Mathematica [A] time = 0.336213, size = 287, normalized size = 0.96

$$\frac{1}{36}x\left(-18\sqrt{\pi}\sqrt{b}d^2\sqrt{n}e^{-\frac{a}{bn}}(cx^n)^{-1/n}\operatorname{Erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right) + 36d^2\sqrt{a+b\log(cx^n)} - 9\sqrt{2\pi}\sqrt{b}de\sqrt{n}xe^{-\frac{2a}{bn}}(cx^n)^{-2/n}\operatorname{Erfi}\left(\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^2*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] (x*((-18*Sqrt[b]*d^2*Sqrt[n]*Sqrt[Pi]*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*
Sqrt[n])])/(E^(a/(b*n))*(c*x^n)^n^(-1)) - (9*Sqrt[b]*d*e*Sqrt[n]*Sqrt[2*Pi]
*x*Erfi[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(E^((2*a)/(b*n
))*(c*x^n)^(2/n)) - (2*Sqrt[b]*e^2*Sqrt[n]*Sqrt[3*Pi]*x^2*Erfi[(Sqrt[3]*Sqr
t[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(E^((3*a)/(b*n))*(c*x^n)^(3/n)) +
36*d^2*Sqrt[a + b*Log[c*x^n]] + 36*d*e*x*Sqrt[a + b*Log[c*x^n]] + 12*e^2*x^
2*Sqrt[a + b*Log[c*x^n]]))/36
```

Maple [F] time = 0.392, size = 0, normalized size = 0.

$$\int (ex+d)^2\sqrt{a+b\ln(cx^n)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^2*(a+b*ln(c*x^n))^(1/2),x)
```

```
[Out] int((e*x+d)^2*(a+b*ln(c*x^n))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^2\sqrt{b\log(cx^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x + d)^2*sqrt(b*log(c*x^n) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a+b\log(cx^n)}\,(d+ex)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**2*(a+b*ln(c*x**n))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))*(d + e*x)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^2\sqrt{b\log(cx^n)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^2*(a+b*log(c*x^n))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^2*sqrt(b*log(c*x^n) + a), x)
```

3.126 $\int (d+ex)^3\sqrt{a+b\log(cx^n)}\,dx$

Optimal. Leaf size=402

$$-\frac{3}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}d^2e\sqrt{n}x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\,\mathrm{Erfi}\left(\frac{\sqrt{2}\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+\frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{2}\sqrt{\pi}\sqrt{b}d^3\sqrt{n}xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\mathrm{E}$$

```
[Out] -(Sqrt[b]*d^3*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[
n])])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e^3*Sqrt[n]*Sqrt[Pi]*x^4*Er
fi[(2*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(16*E^((4*a)/(b*n))*(c*x^
n)^(4/n)) - (3*Sqrt[b]*d^2*e*Sqrt[n]*Sqrt[Pi/2]*x^2*Erfi[(Sqrt[2]*Sqrt[a +
b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(4*E^((2*a)/(b*n))*(c*x^n)^(2/n)) - (Sqr
t[b]*d*e^2*Sqrt[n]*Sqrt[Pi/3]*x^3*Erfi[(Sqrt[3]*Sqrt[a + b*Log[c*x^n]])/(Sq
rt[b]*Sqrt[n])])/(2*E^((3*a)/(b*n))*(c*x^n)^(3/n)) + d^3*x*Sqrt[a + b*Log[c
*x^n]] + (3*d^2*e*x^2*Sqrt[a + b*Log[c*x^n]])/2 + d*e^2*x^3*Sqrt[a + b*Log[
c*x^n]] + (e^3*x^4*Sqrt[a + b*Log[c*x^n]])/4
```

Rubi [A] time = 0.615256, antiderivative size = 402, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {2330, 2296, 2300, 2180, 2204, 2305, 2310}

$$-\frac{3}{4}\sqrt{\frac{\pi}{2}}\sqrt{b}d^2e\sqrt{n}x^2e^{-\frac{2a}{bn}}(cx^n)^{-2/n}\,\mathrm{Erfi}\left(\frac{\sqrt{2}\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right)+\frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)}-\frac{1}{2}\sqrt{\pi}\sqrt{b}d^3\sqrt{n}xe^{-\frac{a}{bn}}(cx^n)^{-1/n}\,\mathrm{E}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^3*Sqrt[a + b*Log[c*x^n]],x]
```


```
[Out] -(Sqrt[b]*d^3*Sqrt[n]*Sqrt[Pi]*x*Erfi[Sqrt[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[
n])])/(2*E^(a/(b*n))*(c*x^n)^n^(-1)) - (Sqrt[b]*e^3*Sqrt[n]*Sqrt[Pi]*x^4*Er
fi[(2*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(16*E^((4*a)/(b*n))*(c*x^
n)^(4/n)) - (3*Sqrt[b]*d^2*e*Sqrt[n]*Sqrt[Pi/2]*x^2*Erfi[(Sqrt[2]*Sqrt[a +
b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])])/(4*E^((2*a)/(b*n))*(c*x^n)^(2/n)) - (Sqr
t[b]*d*e^2*Sqrt[n]*Sqrt[Pi/3]*x^3*Erfi[(Sqrt[3]*Sqrt[a + b*Log[c*x^n]])/(Sq
rt[b]*Sqrt[n])])/(2*E^((3*a)/(b*n))*(c*x^n)^(3/n)) + d^3*x*Sqrt[a + b*Log[c
*x^n]] + (3*d^2*e*x^2*Sqrt[a + b*Log[c*x^n]])/2 + d*e^2*x^3*Sqrt[a + b*Log[
c*x^n]] + (e^3*x^4*Sqrt[a + b*Log[c*x^n]])/4
```


Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
```

```
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2296

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b
*Log[c*x^n])^p, x] - Dist[b*n*p, Int[(a + b*Log[c*x^n])^(p - 1), x], x] /;
FreeQ[{a, b, c, n}, x] && GtQ[p, 0] && IntegerQ[2*p]
```

Rule 2300

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_), x_Symbol] :> Dist[x/(n*(c*x
^n)^(1/n)), Subst[Int[E^(x/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[
{a, b, c, n, p}, x]
```

Rule 2180

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :
> Dist[2/d, Subst[Int[F^(g*(e - (c*f)/d) + (f*g*x^2)/d), x], x, Sqrt[c + d*
x]], x] /; FreeQ[{F, c, d, e, f, g}, x] &&  !$UseGamma === True
```

Rule 2204

```
Int[(F_)^((a_.) + (b_.)*((c_.) + (d_.)*(x_))^2), x_Symbol] :> Simp[(F^a*Sqr
t[Pi]*Erfi[(c + d*x)*Rt[b*Log[F], 2]])/(2*d*Rt[b*Log[F], 2]), x] /; FreeQ[{
F, a, b, c, d}, x] && PosQ[b]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rubi steps

$$\int (d+ex)^3\sqrt{a+b\log(cx^n)}\,dx = \int \left(d^3\sqrt{a+b\log(cx^n)} + 3d^2ex\sqrt{a+b\log(cx^n)} + 3de^2x^2\sqrt{a+b\log(cx^n)} + e^3x^3\sqrt{a+\right.$$

$$= d^3\int\sqrt{a+b\log(cx^n)}\,dx + \left(3d^2e\right)\int x\sqrt{a+b\log(cx^n)}\,dx + \left(3de^2\right)\int x^2\sqrt{a+b\log(c$$

$$= d^3x\sqrt{a+b\log(cx^n)} + \frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)} + de^2x^3\sqrt{a+b\log(cx^n)} + \frac{1}{4}e^3x^4\sqrt{a+b$$

$$= d^3x\sqrt{a+b\log(cx^n)} + \frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)} + de^2x^3\sqrt{a+b\log(cx^n)} + \frac{1}{4}e^3x^4\sqrt{a+b$$

$$= d^3x\sqrt{a+b\log(cx^n)} + \frac{3}{2}d^2ex^2\sqrt{a+b\log(cx^n)} + de^2x^3\sqrt{a+b\log(cx^n)} + \frac{1}{4}e^3x^4\sqrt{a+b$$

$$= -\frac{1}{2}\sqrt{b}d^3e^{-\frac{a}{bn}}\sqrt{n}\sqrt{\pi}x\left(cx^n\right)^{-1/n}\operatorname{erfi}\left(\frac{\sqrt{a+b\log(cx^n)}}{\sqrt{b}\sqrt{n}}\right) - \frac{1}{16}\sqrt{b}e^3e^{-\frac{4a}{bn}}\sqrt{n}\sqrt{\pi}x^4\left(cx^n\right)^{-4/n}$$

Mathematica [A] time = 0.490493, size = 366, normalized size = 0.91

$$\frac{1}{48}xe^{-\frac{4a}{bn}}\left(cx^n\right)^{-4/n}\left(2e^{\frac{a}{bn}}\left(cx^n\right)^{\frac{1}{n}}\left(6e^{\frac{3a}{bn}}\left(cx^n\right)^{3/n}\left(6d^2ex+4d^3+4de^2x^2+e^3x^3\right)\sqrt{a+b\log(cx^n)} - 9\sqrt{2\pi}\sqrt{b}d^2e\sqrt{n}xe^{\frac{a}{bn}}\left(cx^n\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^3*Sqrt[a + b*Log[c*x^n]],x]
```

```
[Out] (x*(-24*Sqrt[b]*d^3*E^((3*a)/(b*n))*Sqrt[n]*Sqrt[Pi]*(c*x^n)^(3/n)*Erfi[Sqr
t[a + b*Log[c*x^n]]/(Sqrt[b]*Sqrt[n])] - 3*Sqrt[b]*e^3*Sqrt[n]*Sqrt[Pi]*x^3
*Erfi[(2*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])] + 2*E^(a/(b*n))*(c*x^n)
^n^(-1)*(-9*Sqrt[b]*d^2*e*E^(a/(b*n))*Sqrt[n]*Sqrt[2*Pi]*x*(c*x^n)^n^(-1)*E
rfi[(Sqrt[2]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n])] - 4*Sqrt[b]*d*e^2*S
qrt[n]*Sqrt[3*Pi]*x^2*Erfi[(Sqrt[3]*Sqrt[a + b*Log[c*x^n]])/(Sqrt[b]*Sqrt[n
])] + 6*E^((3*a)/(b*n))*(c*x^n)^(3/n)*(4*d^3 + 6*d^2*e*x + 4*d*e^2*x^2 + e^
3*x^3)*Sqrt[a + b*Log[c*x^n]])))/(48*E^((4*a)/(b*n))*(c*x^n)^(4/n))
```

Maple [F] time = 0.389, size = 0, normalized size = 0.

$$\int (ex+d)^3\sqrt{a+b\ln(cx^n)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^3*(a+b*ln(c*x^n))^(1/2),x)
```

```
[Out] int((e*x+d)^3*(a+b*ln(c*x^n))^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^3 \sqrt{b \log(cx^n) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*x + d)^3*sqrt(b*log(c*x^n) + a), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{a + b \log(cx^n)}\, (d+ex)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**3*(a+b*ln(c*x**n))**(1/2),x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))*(d + e*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^3 \sqrt{b \log (cx^n) + a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^3*(a+b*log(c*x^n))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^3*sqrt(b*log(c*x^n) + a), x)
```

3.127 $\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{\sqrt{a+b\log(cx^n)}}{d+ex},x\right)$$

```
[Out] Unintegrable[Sqrt[a + b*Log[c*x^n]]/(d + e*x), x]
```

Rubi [A] time = 0.0476515, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*Log[c*x^n]]/(d + e*x),x]
```

```
[Out] Defer[Int][Sqrt[a + b*Log[c*x^n]]/(d + e*x), x]
```

Rubi steps

$$\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx = \int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$$

Mathematica [A] time = 6.10396, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\log(cx^n)}}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x),x]
```

```
[Out] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x), x]
```

Maple [A] time = 0.499, size = 0, normalized size = 0.

$$\int \frac{1}{ex+d}\sqrt{a+b\ln\left(cx^{n}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^(1/2)/(e*x+d),x)
```

```
[Out] int((a+b*ln(c*x^n))^(1/2)/(e*x+d),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\log\left(cx^{n}\right)+a}}{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d), x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\log\left(cx^{n}\right)}}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**(1/2)/(e*x+d),x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))/(d + e*x), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b \log (cx^n) + a}}{ex + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d), x)
```

3.128 $\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^2}\,dx$

Optimal. Leaf size=60

$$\frac{x\sqrt{a+b\log\left(cx^n\right)}}{d(d+ex)}-\frac{bn\text{Unintegrable}\left(\frac{1}{(d+ex)\sqrt{a+b\log(cx^n)}},x\right)}{2d}$$

```
[Out] (x*Sqrt[a + b*Log[c*x^n]])/(d*(d + e*x)) - (b*n*Unintegrable[1/((d + e*x)*S
qrt[a + b*Log[c*x^n]]), x])/(2*d)
```

Rubi [A] time = 0.101237, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{a+b\log\left(cx^n\right)}}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^2,x]
```

```
[Out] (x*Sqrt[a + b*Log[c*x^n]])/(d*(d + e*x)) - (b*n*Defer[Int][1/((d + e*x)*Sqr
t[a + b*Log[c*x^n]]), x])/(2*d)
```

Rubi steps

$$\int \frac{\sqrt{a+b\log\left(cx^n\right)}}{(d+ex)^2}\,dx=\frac{x\sqrt{a+b\log\left(cx^n\right)}}{d(d+ex)}-\frac{(bn)\int \frac{1}{(d+ex)\sqrt{a+b\log(cx^n)}}\,dx}{2d}$$

Mathematica [A] time = 6.42241, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\log\left(cx^n\right)}}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^2,x]
```

```
[Out] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^2, x]
```

Maple [A] time = 0.5, size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)^{2}}\sqrt{a+b\ln(cx^{n})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^(1/2)/(e*x+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^(1/2)/(e*x+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\log(cx^{n})+a}}{(ex+d)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^2, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b \log(cx^n)}}{(d + ex)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**(1/2)/(e*x+d)**2,x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))/(d + e*x)**2, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b \log(cx^n) + a}}{(ex + d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^2, x)
```

3.129 $\int \frac{\sqrt{a+b\log(cx^n)}}{(d+ex)^3}\,dx$

Optimal. Leaf size=65

$$\frac{bn\text{Unintegrable}\left(\frac{1}{x(d+ex)^2\sqrt{a+b\log(cx^n)}},x\right)}{4e}-\frac{\sqrt{a+b\log\left(cx^n\right)}}{2e(d+ex)^2}$$

```
[Out] -Sqrt[a + b*Log[c*x^n]]/(2*e*(d + e*x)^2) + (b*n*Unintegrable[1/(x*(d + e*x
)^2*Sqrt[a + b*Log[c*x^n]]), x])/(4*e)
```

Rubi [A] time = 0.1978, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{\sqrt{a+b\log\left(cx^n\right)}}{(d+ex)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^3,x]
```

```
[Out] -Sqrt[a + b*Log[c*x^n]]/(2*e*(d + e*x)^2) + (b*n*Defer[Int][1/(x*(d + e*x)^
2*Sqrt[a + b*Log[c*x^n]]), x])/(4*e)
```

Rubi steps

$$\int \frac{\sqrt{a+b\log\left(cx^n\right)}}{(d+ex)^3}\,dx=-\frac{\sqrt{a+b\log\left(cx^n\right)}}{2e(d+ex)^2}+\frac{(bn)\int \frac{1}{x(d+ex)^2\sqrt{a+b\log(cx^n)}}\,dx}{4e}$$

Mathematica [A] time = 12.5711, size = 0, normalized size = 0.

$$\int \frac{\sqrt{a+b\log\left(cx^n\right)}}{(d+ex)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^3,x]
```

```
[Out] Integrate[Sqrt[a + b*Log[c*x^n]]/(d + e*x)^3, x]
```

Maple [A] time = 0.494, size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)^3}\sqrt{a+b\ln(cx^n)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^(1/2)/(e*x+d)^3,x)
```

```
[Out] int((a+b*ln(c*x^n))^(1/2)/(e*x+d)^3,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\log(cx^n)+a}}{(ex+d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^3, x)
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{a + b\log\left(cx^n\right)}}{\left(d + ex\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**(1/2)/(e*x+d)**3,x)
```

```
[Out] Integral(sqrt(a + b*log(c*x**n))/(d + e*x)**3, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{b\log\left(cx^n\right) + a}}{\left(ex + d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^(1/2)/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(b*log(c*x^n) + a)/(e*x + d)^3, x)
```

3.130 $\int x^3\sqrt{d+ex}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=242

$$-\frac{2d^3(d+ex)^{3/2}(a+b\log(cx^n))}{3e^4}+\frac{6d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^4}-\frac{6d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^4}+\frac{2(d+ex)^{9/2}(a+b}{9e^4}$$

```
[Out] (64*b*d^4*n*Sqrt[d + e*x])/(315*e^4) + (64*b*d^3*n*(d + e*x)^(3/2))/(945*e^
4) - (356*b*d^2*n*(d + e*x)^(5/2))/(1575*e^4) + (80*b*d*n*(d + e*x)^(7/2))/
(441*e^4) - (4*b*n*(d + e*x)^(9/2))/(81*e^4) - (64*b*d^(9/2)*n*ArcTanh[Sqrt
[d + e*x]/Sqrt[d]])/(315*e^4) - (2*d^3*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/
(3*e^4) + (6*d^2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) - (6*d*(d + e*
x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^4) + (2*(d + e*x)^(9/2)*(a + b*Log[c*x^n]
))/(9*e^4)
```

Rubi [A] time = 0.219638, antiderivative size = 242, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {43, 2350, 12, 1620, 50, 63, 208}

$$-\frac{2d^3(d+ex)^{3/2}(a+b\log(cx^n))}{3e^4}+\frac{6d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^4}-\frac{6d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^4}+\frac{2(d+ex)^{9/2}(a+b}{9e^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (64*b*d^4*n*Sqrt[d + e*x])/(315*e^4) + (64*b*d^3*n*(d + e*x)^(3/2))/(945*e^
4) - (356*b*d^2*n*(d + e*x)^(5/2))/(1575*e^4) + (80*b*d*n*(d + e*x)^(7/2))/
(441*e^4) - (4*b*n*(d + e*x)^(9/2))/(81*e^4) - (64*b*d^(9/2)*n*ArcTanh[Sqrt
[d + e*x]/Sqrt[d]])/(315*e^4) - (2*d^3*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/
(3*e^4) + (6*d^2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) - (6*d*(d + e*
x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^4) + (2*(d + e*x)^(9/2)*(a + b*Log[c*x^n]
))/(9*e^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^3\sqrt{d+ex}\,(a+b\log(cx^n))\,dx = -\frac{2d^3(d+ex)^{3/2}(a+b\log(cx^n))}{3e^4}+\frac{6d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^4}-$$

$$= -\frac{2d^3(d+ex)^{3/2}(a+b\log(cx^n))}{3e^4}+\frac{6d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^4}-$$

$$= -\frac{2d^3(d+ex)^{3/2}(a+b\log(cx^n))}{3e^4}+\frac{6d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^4}-$$

$$= -\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex)^{7/2}}{441e^4}-\frac{4bn(d+ex)^{9/2}}{81e^4}-$$

$$= \frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex)^{7/2}}{441e^4}-\frac{4bn(d+ex)^{9/2}}{81e^4}-$$

$$= \frac{64bd^4n\sqrt{d+ex}}{315e^4}+\frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex)^{7/2}}{441e^4}-$$

$$= \frac{64bd^4n\sqrt{d+ex}}{315e^4}+\frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex)^{7/2}}{441e^4}-$$

$$= \frac{64bd^4n\sqrt{d+ex}}{315e^4}+\frac{64bd^3n(d+ex)^{3/2}}{945e^4}-\frac{356bd^2n(d+ex)^{5/2}}{1575e^4}+\frac{80bdn(d+ex)^{7/2}}{441e^4}-$$

<u>Mathematica</u> [A] time = 0.406325, size = 183, normalized size = 0.76

$$-\frac{2\left(\sqrt{d+ex}\left(315a\left(6d^2e^2x^2-8d^3ex+16d^4-5de^3x^3-35e^4x^4\right)+315b\left(6d^2e^2x^2-8d^3ex+16d^4-5de^3x^3-35e^4x^4\right)\log\right.\right.}{99225e^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*(10080*b*d^(9/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(315*
a*(16*d^4 - 8*d^3*e*x + 6*d^2*e^2*x^2 - 5*d*e^3*x^3 - 35*e^4*x^4) + 2*b*n*(
-4388*d^4 + 934*d^3*e*x - 543*d^2*e^2*x^2 + 400*d*e^3*x^3 + 1225*e^4*x^4) +
 315*b*(16*d^4 - 8*d^3*e*x + 6*d^2*e^2*x^2 - 5*d*e^3*x^3 - 35*e^4*x^4)*Log[
c*x^n])))/(99225*e^4)
```

Maple [F] time = 0.606, size = 0, normalized size = 0.

$$\int x^3 (a + b \ln (c x^n)) \sqrt{ex + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))*(e*x+d)^(1/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))*(e*x+d)^(1/2),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(x^3*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.48266, size = 1220, normalized size = 5.04

$$\left[\frac{2\left(5040\, bd^{\frac{9}{2}} n \log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right) + \left(8776\, bd^4 n - 5040\, ad^4 - 1225\left(2\, be^4 n - 9\, ae^4\right)x^4 - 25\left(32\, bde^3 n - 63\, ade^3\right)x^3 + 6\left(\right.\right.\right.}{} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/99225*(5040*b*d^(9/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (
8776*b*d^4*n - 5040*a*d^4 - 1225*(2*b*e^4*n - 9*a*e^4)*x^4 - 25*(32*b*d*e^3
*n - 63*a*d*e^3)*x^3 + 6*(181*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 4*(467*b*d
^3*e*n - 630*a*d^3*e)*x + 315*(35*b*e^4*x^4 + 5*b*d*e^3*x^3 - 6*b*d^2*e^2*x
^2 + 8*b*d^3*e*x - 16*b*d^4)*log(c) + 315*(35*b*e^4*n*x^4 + 5*b*d*e^3*n*x^3
 - 6*b*d^2*e^2*n*x^2 + 8*b*d^3*e*n*x - 16*b*d^4*n)*log(x))*sqrt(e*x + d))/e
^4, 2/99225*(10080*b*sqrt(-d)*d^4*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (877
6*b*d^4*n - 5040*a*d^4 - 1225*(2*b*e^4*n - 9*a*e^4)*x^4 - 25*(32*b*d*e^3*n
```

```
- 63*a*d*e^3)*x^3 + 6*(181*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 4*(467*b*d^3*
e*n - 630*a*d^3*e)*x + 315*(35*b*e^4*x^4 + 5*b*d*e^3*x^3 - 6*b*d^2*e^2*x^2
+ 8*b*d^3*e*x - 16*b*d^4)*log(c) + 315*(35*b*e^4*n*x^4 + 5*b*d*e^3*n*x^3 -
6*b*d^2*e^2*n*x^2 + 8*b*d^3*e*n*x - 16*b*d^4*n)*log(x))*sqrt(e*x + d))/e^4]
```

Sympy [B] time = 26.5006, size = 518, normalized size = 2.14

$$2\left(-\frac{ad^3(d+ex)^{\frac{3}{2}}}{3}+\frac{3ad^2(d+ex)^{\frac{5}{2}}}{5}-\frac{3ad(d+ex)^{\frac{7}{2}}}{7}+\frac{a(d+ex)^{\frac{9}{2}}}{9}-bd^3\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{3}-\frac{2n\left(\frac{d^2e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)+3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(-a*d**3*(d + e*x)**(3/2)/3 + 3*a*d**2*(d + e*x)**(5/2)/5 - 3*a*d*(d + e*
x)**(7/2)/7 + a*(d + e*x)**(9/2)/9 - b*d**3*((d + e*x)**(3/2)*log(c*(-d/e +
 (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d
*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) + 3*b*d**2*((d + e*x)**(5/2
)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d
))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**
(5/2)/5)/(5*e)) - 3*b*d*((d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)/7
- 2*n*(d**4*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*x)
+ d**2*e*(d + e*x)**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7
)/(7*e)) + b*((d + e*x)**(9/2)*log(c*(-d/e + (d + e*x)/e)**n)/9 - 2*n*(d**5
*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**4*e*sqrt(d + e*x) + d**3*e*(d
 + e*x)**(3/2)/3 + d**2*e*(d + e*x)**(5/2)/5 + d*e*(d + e*x)**(7/2)/7 + e*(
d + e*x)**(9/2)/9)/(9*e)))/e**4
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ex+d}(b\log(cx^n)+a)x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)*x^3, x)
```

3.131 $\int x^2\sqrt{d+ex}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=192

$$\frac{2d^2(d+ex)^{3/2}(a+b\log(cx^n))}{3e^3}-\frac{4d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3}+\frac{2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3}-\frac{32bd^3n\sqrt{d+ex}}{105e^3}-\frac{32b}{}$$

```
[Out] (-32*b*d^3*n*Sqrt[d + e*x])/(105*e^3) - (32*b*d^2*n*(d + e*x)^(3/2))/(315*e
^3) + (36*b*d*n*(d + e*x)^(5/2))/(175*e^3) - (4*b*n*(d + e*x)^(7/2))/(49*e^
3) + (32*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(105*e^3) + (2*d^2*(d
+ e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) - (4*d*(d + e*x)^(5/2)*(a + b*Log[
c*x^n]))/(5*e^3) + (2*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3)
```

Rubi [A] time = 0.176065, antiderivative size = 192, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1261, 208}

$$\frac{2d^2(d+ex)^{3/2}(a+b\log(cx^n))}{3e^3}-\frac{4d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3}+\frac{2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3}-\frac{32bd^3n\sqrt{d+ex}}{105e^3}-\frac{32b}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```


```
[Out] (-32*b*d^3*n*Sqrt[d + e*x])/(105*e^3) - (32*b*d^2*n*(d + e*x)^(3/2))/(315*e
^3) + (36*b*d*n*(d + e*x)^(5/2))/(175*e^3) - (4*b*n*(d + e*x)^(7/2))/(49*e^
3) + (32*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(105*e^3) + (2*d^2*(d
+ e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) - (4*d*(d + e*x)^(5/2)*(a + b*Log[
c*x^n]))/(5*e^3) + (2*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3)
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^2\sqrt{d+ex}\,(a+b\log(cx^n))\,dx = \frac{2d^2(d+ex)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{4d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{2(d+ex)^{7/2}(a+}{7e^3}$$

$$= \frac{2d^2(d+ex)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{4d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{2(d+ex)^{7/2}(a+}{7e^3}$$

$$= \frac{2d^2(d+ex)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{4d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{2(d+ex)^{7/2}(a+}{7e^3}$$

$$= \frac{2d^2(d+ex)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{4d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{2(d+ex)^{7/2}(a+}{7e^3}$$

$$= -\frac{32bd^3n\sqrt{d+ex}}{105e^3} - \frac{32bd^2n(d+ex)^{3/2}}{315e^3} + \frac{36bdn(d+ex)^{5/2}}{175e^3} - \frac{4bn(d+ex)^{7/2}}{49e^3} + 2d^2($$

$$= -\frac{32bd^3n\sqrt{d+ex}}{105e^3} - \frac{32bd^2n(d+ex)^{3/2}}{315e^3} + \frac{36bdn(d+ex)^{5/2}}{175e^3} - \frac{4bn(d+ex)^{7/2}}{49e^3} + \frac{32bd}{}$$

Mathematica [A] time = 0.195985, size = 151, normalized size = 0.79

$$\frac{2\sqrt{d+ex}\left(105a\left(-4d^2ex+8d^3+3de^2x^2+15e^3x^3\right)+105b\left(-4d^2ex+8d^3+3de^2x^2+15e^3x^3\right)\log(cx^n)-2bn\left(-179d^2ex\right.\right.}{11025e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (3360*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(105*a*(
8*d^3 - 4*d^2*e*x + 3*d*e^2*x^2 + 15*e^3*x^3) - 2*b*n*(778*d^3 - 179*d^2*e*
x + 108*d*e^2*x^2 + 225*e^3*x^3) + 105*b*(8*d^3 - 4*d^2*e*x + 3*d*e^2*x^2 +
 15*e^3*x^3)*Log[c*x^n]))/(11025*e^3)
```

Maple [F] time = 0.593, size = 0, normalized size = 0.

$$\int x^2\,(a+b\ln(cx^n))\,\sqrt{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))*(e*x+d)^(1/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))*(e*x+d)^(1/2),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(x^2*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.47922, size = 990, normalized size = 5.16

$$\left[\frac{2\left(840\,bd^{\frac{7}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)-\left(1556\,bd^{3}n-840\,ad^{3}+225\left(2\,be^{3}n-7\,ae^{3}\right)x^{3}+9\left(24\,bde^{2}n-35\,ade^{2}\right)x^{2}-2\left(179\,b\right.\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/11025*(840*b*d^(7/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (1
556*b*d^3*n - 840*a*d^3 + 225*(2*b*e^3*n - 7*a*e^3)*x^3 + 9*(24*b*d*e^2*n -
 35*a*d*e^2)*x^2 - 2*(179*b*d^2*e*n - 210*a*d^2*e)*x - 105*(15*b*e^3*x^3 +
3*b*d*e^2*x^2 - 4*b*d^2*e*x + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^3 + 3*b*d
*e^2*n*x^2 - 4*b*d^2*e*n*x + 8*b*d^3*n)*log(x))*sqrt(e*x + d))/e^3, -2/1102
5*(1680*b*sqrt(-d)*d^3*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (1556*b*d^3*n -
 840*a*d^3 + 225*(2*b*e^3*n - 7*a*e^3)*x^3 + 9*(24*b*d*e^2*n - 35*a*d*e^2)*
x^2 - 2*(179*b*d^2*e*n - 210*a*d^2*e)*x - 105*(15*b*e^3*x^3 + 3*b*d*e^2*x^2
 - 4*b*d^2*e*x + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^3 + 3*b*d*e^2*n*x^2 -
4*b*d^2*e*n*x + 8*b*d^3*n)*log(x))*sqrt(e*x + d))/e^3]
```

Sympy [A] time = 12.9761, size = 364, normalized size = 1.9

$$2\left(\frac{ad^2(d+ex)^{\frac{3}{2}}}{3}-\frac{2ad(d+ex)^{\frac{5}{2}}}{5}+\frac{a(d+ex)^{\frac{7}{2}}}{7}+bd^2\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{3}-\frac{2n\left(\frac{d^2e\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)-2bd\left(\frac{(d+ex)^{\frac{5}{2}}\log\left(\right.}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(a*d**2*(d + e*x)**(3/2)/3 - 2*a*d*(d + e*x)**(5/2)/5 + a*(d + e*x)**(7/2
)/7 + b*d**2*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2
*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)*
*(3/2)/3)/(3*e)) - 2*b*d*((d + e*x)**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5
 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x)
 + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**(5/2)/5)/(5*e)) + b*((d + e*x)**(7
/2)*log(c*(-d/e + (d + e*x)/e)**n)/7 - 2*n*(d**4*e*atan(sqrt(d + e*x)/sqrt(
-d))/sqrt(-d) + d**3*e*sqrt(d + e*x) + d**2*e*(d + e*x)**(3/2)/3 + d*e*(d +
 e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7)/(7*e)))/e**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ex+d}(b\log(cx^n)+a)x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)*x^2, x)
```

3.132 $\int x\sqrt{d+ex}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=142

$$-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{8bd^2n\sqrt{d+ex}}{15e^2}-\frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^2}+\frac{8bdn(d+e}{45e^2}$$

```
[Out] (8*b*d^2*n*Sqrt[d + e*x])/(15*e^2) + (8*b*d*n*(d + e*x)^(3/2))/(45*e^2) - (
4*b*n*(d + e*x)^(5/2))/(25*e^2) - (8*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]])/(15*e^2) - (2*d*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2) + (2*(d +
 e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2)
```

Rubi [A] time = 0.100847, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2350, 12, 80, 50, 63, 208}

$$-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{8bd^2n\sqrt{d+ex}}{15e^2}-\frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^2}+\frac{8bdn(d+e}{45e^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```


```
[Out] (8*b*d^2*n*Sqrt[d + e*x])/(15*e^2) + (8*b*d*n*(d + e*x)^(3/2))/(45*e^2) - (
4*b*n*(d + e*x)^(5/2))/(25*e^2) - (8*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]])/(15*e^2) - (2*d*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2) + (2*(d +
 e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2)
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
```

```
InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x\sqrt{d+ex}\,(a+b\log(cx^n))\,dx = -\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}-(bn)\int\frac{2(d+ex)^{3/2}(\cdots}{15e^2\cdots}$$

$$= -\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}-\frac{(2bn)\int\frac{(d+ex)^{3/2}(-2d+\cdots}{x}}{15e^2}$$

$$= -\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{(4b\cdots}{\cdots}$$

$$= \frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{2(d+ex)^{5/2}(a+b\cdots}{5e^2}$$

$$= \frac{8bd^2n\sqrt{d+ex}}{15e^2}+\frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\cdots$$

$$= \frac{8bd^2n\sqrt{d+ex}}{15e^2}+\frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{2d(d+ex)^{3/2}(a+b\log(cx^n))}{3e^2}+\cdots$$

$$= \frac{8bd^2n\sqrt{d+ex}}{15e^2}+\frac{8bdn(d+ex)^{3/2}}{45e^2}-\frac{4bn(d+ex)^{5/2}}{25e^2}-\frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^2}-\frac{2d(d\cdots}{\cdots}$$

Mathematica [A] time = 0.117947, size = 116, normalized size = 0.82

$$\frac{2\sqrt{d+ex}\left(15a\left(-2d^2+dex+3e^2x^2\right)+15b\left(-2d^2+dex+3e^2x^2\right)\log(cx^n)+2bn\left(31d^2-8dex-9e^2x^2\right)\right)-120bd^{5/2}n\tan\cdots}{225e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-120*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(2*b*n*(
31*d^2 - 8*d*e*x - 9*e^2*x^2) + 15*a*(-2*d^2 + d*e*x + 3*e^2*x^2) + 15*b*(-
2*d^2 + d*e*x + 3*e^2*x^2)*Log[c*x^n]))/(225*e^2)
```

Maple [F] time = 0.616, size = 0, normalized size = 0.

$$\int x\,(a+b\ln(cx^n))\,\sqrt{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))*(e*x+d)^(1/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))*(e*x+d)^(1/2),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(x*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.42823, size = 722, normalized size = 5.08

$$\left[\frac{2\left(30\,bd^{\frac{5}{2}}n\log\left(\frac{ex-2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)+\left(62\,bd^2n-30\,ad^2-9\left(2\,be^2n-5\,ae^2\right)x^2-(16\,bden-15\,ade)x+15\left(3\,be^2x^2+bdex\right.\right.\right.}{225\,e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/225*(30*b*d^(5/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (62*b
*d^2*n - 30*a*d^2 - 9*(2*b*e^2*n - 5*a*e^2)*x^2 - (16*b*d*e*n - 15*a*d*e)*x
 + 15*(3*b*e^2*x^2 + b*d*e*x - 2*b*d^2)*log(c) + 15*(3*b*e^2*n*x^2 + b*d*e*
n*x - 2*b*d^2*n)*log(x))*sqrt(e*x + d))/e^2, 2/225*(60*b*sqrt(-d)*d^2*n*arc
tan(sqrt(e*x + d)*sqrt(-d)/d) + (62*b*d^2*n - 30*a*d^2 - 9*(2*b*e^2*n - 5*a
*e^2)*x^2 - (16*b*d*e*n - 15*a*d*e)*x + 15*(3*b*e^2*x^2 + b*d*e*x - 2*b*d^2
)*log(c) + 15*(3*b*e^2*n*x^2 + b*d*e*n*x - 2*b*d^2*n)*log(x))*sqrt(e*x + d)
)/e^2]
```

Sympy [A] time = 7.3727, size = 224, normalized size = 1.58

$$\frac{2\left(-\frac{ad(d+ex)^{\frac{3}{2}}}{3}+\frac{a(d+ex)^{\frac{5}{2}}}{5}-bd\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{3}-\frac{2n\left(\frac{d^{2}e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)+b\left(\frac{(d+ex)^{\frac{5}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{5}-\frac{2n\left(\cdots\right.}{}\right.\right.}{e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(-a*d*(d + e*x)**(3/2)/3 + a*(d + e*x)**(5/2)/5 - b*d*((d + e*x)**(3/2)*l
og(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/
sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) + b*((d + e*x)*
*(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sq
rt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e
*x)**(5/2)/5)/(5*e)))/e**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ex+d}(b\log(cx^{n})+a)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)*x, x)
```

3.133 $\int \sqrt{d+ex}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=94

$$\frac{2(d+ex)^{3/2}(a+b\log(cx^n))}{3e}+\frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e}-\frac{4bdn\sqrt{d+ex}}{3e}-\frac{4bn(d+ex)^{3/2}}{9e}$$

```
[Out] (-4*b*d*n*Sqrt[d + e*x])/(3*e) - (4*b*n*(d + e*x)^(3/2))/(9*e) + (4*b*d^(3/
2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e) + (2*(d + e*x)^(3/2)*(a + b*Log[
c*x^n]))/(3*e)
```

Rubi [A] time = 0.042146, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {2319, 50, 63, 208}

$$\frac{2(d+ex)^{3/2}(a+b\log(cx^n))}{3e}+\frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e}-\frac{4bdn\sqrt{d+ex}}{3e}-\frac{4bn(d+ex)^{3/2}}{9e}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-4*b*d*n*Sqrt[d + e*x])/(3*e) - (4*b*n*(d + e*x)^(3/2))/(9*e) + (4*b*d^(3/
2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e) + (2*(d + e*x)^(3/2)*(a + b*Log[
c*x^n]))/(3*e)
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
```

```
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \sqrt{d+ex}\,(a+b\log(cx^n))\,dx = \frac{2(d+ex)^{3/2}(a+b\log(cx^n))}{3e} - \frac{(2bn)\int \frac{(d+ex)^{3/2}}{x}\,dx}{3e}$$

$$= -\frac{4bn(d+ex)^{3/2}}{9e} + \frac{2(d+ex)^{3/2}(a+b\log(cx^n))}{3e} - \frac{(2bdn)\int \frac{\sqrt{d+ex}}{x}\,dx}{3e}$$

$$= -\frac{4bdn\sqrt{d+ex}}{3e} - \frac{4bn(d+ex)^{3/2}}{9e} + \frac{2(d+ex)^{3/2}(a+b\log(cx^n))}{3e} - \frac{\left(2bd^2n\right)\int \frac{1}{x\sqrt{d+ex}}\,dx}{3e}$$

$$= -\frac{4bdn\sqrt{d+ex}}{3e} - \frac{4bn(d+ex)^{3/2}}{9e} + \frac{2(d+ex)^{3/2}(a+b\log(cx^n))}{3e} - \frac{\left(4bd^2n\right)\text{Subst}\left(\int -\cdots\right.}{3e}$$

$$= -\frac{4bdn\sqrt{d+ex}}{3e} - \frac{4bn(d+ex)^{3/2}}{9e} + \frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e} + \frac{2(d+ex)^{3/2}(a+b\log(c\cdots}{3e}$$

Mathematica [A] time = 0.0679848, size = 77, normalized size = 0.82

$$\frac{2\left(\sqrt{d+ex}\,(3a(d+ex)+3b(d+ex)\log(cx^n)-2bn(4d+ex))+6bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\right)}{9e}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + e*x]*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*(6*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(3*a*(d +
e*x) - 2*b*n*(4*d + e*x) + 3*b*(d + e*x)*Log[c*x^n])))/(9*e)
```

Maple [F] time = 0.588, size = 0, normalized size = 0.

$$\int (a + b \ln (cx^n)) \sqrt{ex + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x+d)^(1/2),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((a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.42478, size = 475, normalized size = 5.05

$$\left[\frac{2\left(3\,bd^{\frac{3}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right) - (8\,bdn - 3\,ad + (2\,ben - 3\,ae)x - 3\,(bex + bd)\log(c) - 3\,(benx + bdn)\log(x))\sqrt{ex + d}\right.}{9\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/9*(3*b*d^(3/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (8*b*d*n
 - 3*a*d + (2*b*e*n - 3*a*e)*x - 3*(b*e*x + b*d)*log(c) - 3*(b*e*n*x + b*d*
n)*log(x))*sqrt(e*x + d))/e, -2/9*(6*b*sqrt(-d)*d*n*arctan(sqrt(e*x + d)*sq
```

```
rt(-d)/d) + (8*b*d*n - 3*a*d + (2*b*e*n - 3*a*e)*x - 3*(b*e*x + b*d)*log(c)
 - 3*(b*e*n*x + b*d*n)*log(x))*sqrt(e*x + d))/e]
```

Sympy [A] time = 3.88579, size = 102, normalized size = 1.09

$$\frac{2\left(\frac{a(d+ex)^{\frac{3}{2}}}{3}+b\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{3}-\frac{2n\left(\frac{d^{2}e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x+d)**(1/2),x)
```

```
[Out] 2*(a*(d + e*x)**(3/2)/3 + b*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n
)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x)
 + e*(d + e*x)**(3/2)/3)/(3*e)))/e
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ex+d}(b\log(cx^{n})+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a), x)
```

3.134 $\int \frac{\sqrt{d+ex}(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=211

$$-2b\sqrt{d}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)+2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)-2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)-4bn\sqrt{}$$

```
[Out] -4*b*n*Sqrt[d + e*x] + 4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*b*S
qrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2 + 2*Sqrt[d + e*x]*(a + b*Log[c*x^
n]) - 2*Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]) - 4*b*Sqr
t[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e
*x])] - 2*b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])]
```

Rubi [A] time = 0.330594, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2346, 63, 208, 2348, 12, 5984, 5918, 2402, 2315, 2319, 50}

$$-2b\sqrt{d}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)+2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)-2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)-4bn\sqrt{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -4*b*n*Sqrt[d + e*x] + 4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*b*S
qrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2 + 2*Sqrt[d + e*x]*(a + b*Log[c*x^
n]) - 2*Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]) - 4*b*Sqr
t[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e
*x])] - 2*b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])]
```

Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
```

```
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rubi steps

$$\int \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x}\,dx = d\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx + e\int \frac{a+b\log(cx^n)}{\sqrt{d+ex}}\,dx$$

$$= 2\sqrt{d+ex}\,(a+b\log(cx^n)) - 2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n)) - (2bn)\int \frac{\sqrt{d+e}}{x}$$

$$= -4bn\sqrt{d+ex} + 2\sqrt{d+ex}\,(a+b\log(cx^n)) - 2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n)) +$$

$$= -4bn\sqrt{d+ex} + 2\sqrt{d+ex}\,(a+b\log(cx^n)) - 2\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n)) +$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2\sqrt{d+ex}\,(a$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2\sqrt{d+ex}\,(a$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2\sqrt{d+ex}\,(a$$

$$= -4bn\sqrt{d+ex} + 4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 2\sqrt{d+ex}\,(a$$

Mathematica [A] time = 0.205856, size = 331, normalized size = 1.57

$$-\frac{1}{2}b\sqrt{d}n\left(2\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(\log\left(\sqrt{d}-\sqrt{d+ex}\right)+2\log\left(\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)\right)\right)+\frac{1}{2}b\sqrt{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] 2*a*Sqrt[d + e*x] - 4*b*n*(Sqrt[d + e*x] - Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sq
rt[d]]) + 2*b*Sqrt[d + e*x]*Log[c*x^n] + Sqrt[d]*(a + b*Log[c*x^n])*Log[Sqr
```

```
t[d] - Sqrt[d + e*x]] - Sqrt[d]*(a + b*Log[c*x^n])*Log[Sqrt[d] + Sqrt[d + e
*x]] - (b*Sqrt[d]*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*(Log[Sqrt[d] - Sqrt[d + e
*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*PolyLog[2, 1/2 - Sqrt[d +
e*x]/(2*Sqrt[d])]))/2 + (b*Sqrt[d]*n*(Log[Sqrt[d] + Sqrt[d + e*x]]*(Log[Sqr
t[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + 2*PolyLog
[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/2
```

Maple [F] time = 0.53, size = 0, normalized size = 0.

$$\int \frac{a + b\ln\left(c x^{n}\right)}{x}\sqrt{e x + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x+d)^(1/2)/x,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x+d)^(1/2)/x,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((a+b*log(c*x^n))*(e*x+d)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{e x + d} b \log\left(c x^{n}\right) + \sqrt{e x + d} a}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))\sqrt{d + ex}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x+d)**(1/2)/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex + d}(b\log(cx^n) + a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)/x, x)
```

3.135 $\int \frac{\sqrt{d+ex}(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=221

$$-\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}-\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}}-\frac{bn\sqrt{d+ex}}{x}+\frac{ben\,\text{ta}}{}$$

```
[Out] -((b*n*Sqrt[d + e*x])/x) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/Sqrt[d] +
 (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/Sqrt[d] - (Sqrt[d + e*x]*(a + b*L
og[c*x^n]))/x - (e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[
d] - (2*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqr
t[d + e*x])])/Sqrt[d] - (b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d
 + e*x])])/Sqrt[d]
```

Rubi [A] time = 0.277843, antiderivative size = 221, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {47, 63, 208, 2350, 14, 5984, 5918, 2402, 2315}

$$-\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}-\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}}-\frac{bn\sqrt{d+ex}}{x}+\frac{ben\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*n*Sqrt[d + e*x])/x) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/Sqrt[d] +
 (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/Sqrt[d] - (Sqrt[d + e*x]*(a + b*L
og[c*x^n]))/x - (e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[
d] - (2*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqr
t[d + e*x])])/Sqrt[d] - (b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d
 + e*x])])/Sqrt[d]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
```

```
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x^2}\,dx = -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} - (bn)\int \frac{-\sqrt{d+ex} - \cdots}{x \cdots}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} - (bn)\int\left(-\frac{\sqrt{d+ex}}{x^2} - \cdots\right.$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} + (bn)\int \frac{\sqrt{d+ex}}{x^2}\,dx + \cdots$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} + \frac{1}{2}(ben) \cdots$$

$$= -\frac{bn\sqrt{d+ex}}{x} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a \cdots}{\sqrt{d}}$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} \cdots$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} \cdots$$

$$= -\frac{bn\sqrt{d+ex}}{x} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x} \cdots$$

Mathematica [A] time = 0.326947, size = 392, normalized size = 1.77

$$-\frac{2benx\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right) - 2benx\text{PolyLog}\left(2,\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right) + 4a\sqrt{d}\sqrt{d+ex} - 2aex\log\left(\sqrt{d}-\sqrt{d+ex}\right) + 2aex\,\text{lo}\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -(4*a*Sqrt[d]*Sqrt[d + e*x] + 4*b*Sqrt[d]*n*Sqrt[d + e*x] + 4*b*e*n*x*ArcTa
nh[Sqrt[d + e*x]/Sqrt[d]] + 4*b*Sqrt[d]*Sqrt[d + e*x]*Log[c*x^n] - 2*a*e*x*
Log[Sqrt[d] - Sqrt[d + e*x]] - 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*
x]] + b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]^2 + 2*a*e*x*Log[Sqrt[d] + Sqrt[d
 + e*x]] + 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] - b*e*n*x*Log[Sq
rt[d] + Sqrt[d + e*x]]^2 - 2*b*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 -
 Sqrt[d + e*x]/(2*Sqrt[d])] + 2*b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(1
 + Sqrt[d + e*x]/Sqrt[d])/2] + 2*b*e*n*x*PolyLog[2, 1/2 - Sqrt[d + e*x]/(2*
Sqrt[d])] - 2*b*e*n*x*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])/(4*Sqrt[d]
*x)
```

Maple [F] time = 0.515, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^2}\sqrt{ex + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x+d)^(1/2)/x^2,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x+d)^(1/2)/x^2,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((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex + d}b\log(cx^n) + \sqrt{ex + d}a}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^2,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\log(cx^n))\sqrt{d+ex}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x+d)**(1/2)/x**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x)/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex+d}(b\log(cx^n)+a)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)/x^2, x)
```

3.136 $\int \frac{\sqrt{d+ex}(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=298

$$\frac{be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4d^{3/2}}+\frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{3/2}}-\frac{e\sqrt{d+ex}\,(a+b\log(cx^n))}{4dx}-\frac{\sqrt{d+ex}\,(a+b\log}{2x^2}$$

```
[Out] -(b*n*Sqrt[d + e*x])/(4*x^2) - (3*b*e*n*Sqrt[d + e*x])/(8*d*x) - (b*e^2*n*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*d^(3/2)) - (b*e^2*n*ArcTanh[Sqrt[d + e*x]
/Sqrt[d]]^2)/(4*d^(3/2)) - (Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(2*x^2) - (e*
Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*d*x) + (e^2*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]]*(a + b*Log[c*x^n]))/(4*d^(3/2)) + (b*e^2*n*ArcTanh[Sqrt[d + e*x]/Sqrt[
d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*d^(3/2)) + (b*e^2*n*Poly
Log[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*d^(3/2))
```

Rubi [A] time = 0.339009, antiderivative size = 298, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {47, 51, 63, 208, 2350, 12, 14, 5984, 5918, 2402, 2315}

$$\frac{be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4d^{3/2}}+\frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{3/2}}-\frac{e\sqrt{d+ex}\,(a+b\log(cx^n))}{4dx}-\frac{\sqrt{d+ex}\,(a+b\log}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^3,x]
```


```
[Out] -(b*n*Sqrt[d + e*x])/(4*x^2) - (3*b*e*n*Sqrt[d + e*x])/(8*d*x) - (b*e^2*n*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*d^(3/2)) - (b*e^2*n*ArcTanh[Sqrt[d + e*x]
/Sqrt[d]]^2)/(4*d^(3/2)) - (Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(2*x^2) - (e*
Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*d*x) + (e^2*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]]*(a + b*Log[c*x^n]))/(4*d^(3/2)) + (b*e^2*n*ArcTanh[Sqrt[d + e*x]/Sqrt[
d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*d^(3/2)) + (b*e^2*n*Poly
Log[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*d^(3/2))
```


Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
```

```
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x^3}\,dx = -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2x^2} - \frac{e\sqrt{d+ex}\,(a+b\log(cx^n))}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{3/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2x^2} - \frac{e\sqrt{d+ex}\,(a+b\log(cx^n))}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{3/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2x^2} - \frac{e\sqrt{d+ex}\,(a+b\log(cx^n))}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{3/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2x^2} - \frac{e\sqrt{d+ex}\,(a+b\log(cx^n))}{4dx} + \frac{e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log}{4d^{3/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{ben\sqrt{d+ex}}{4dx} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2x^2} - \frac{e\sqrt{d+ex}\,(a+b\log(cx^n))}{4dx} +$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2x^2} - e\sqrt{}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \sqrt{d+e}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{3/2}} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \sqrt{d+e}$$

$$= -\frac{bn\sqrt{d+ex}}{4x^2} - \frac{3ben\sqrt{d+ex}}{8dx} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{3/2}} - \frac{be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \sqrt{d+e}$$

Mathematica [A] time = 0.537554, size = 500, normalized size = 1.68

$$-\frac{-2be^2nx^2\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+2be^2nx^2\text{PolyLog}\left(2,\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)+8ad^{3/2}\sqrt{d+ex}+2ae^2x^2\log\left(\sqrt{d}-\sqrt{d+ex}\right)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x]*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(8*a*d^(3/2)*Sqrt[d + e*x] + 4*b*d^(3/2)*n*Sqrt[d + e*x] + 4*a*Sqrt[d]*e*x
*Sqrt[d + e*x] + 6*b*Sqrt[d]*e*n*x*Sqrt[d + e*x] + 2*b*e^2*n*x^2*ArcTanh[Sq
rt[d + e*x]/Sqrt[d]] + 8*b*d^(3/2)*Sqrt[d + e*x]*Log[c*x^n] + 4*b*Sqrt[d]*e
*x*Sqrt[d + e*x]*Log[c*x^n] + 2*a*e^2*x^2*Log[Sqrt[d] - Sqrt[d + e*x]] + 2*
b*e^2*x^2*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*x]] - b*e^2*n*x^2*Log[Sqrt[d]
 - Sqrt[d + e*x]]^2 - 2*a*e^2*x^2*Log[Sqrt[d] + Sqrt[d + e*x]] - 2*b*e^2*x^
2*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] + b*e^2*n*x^2*Log[Sqrt[d] + Sqrt[
d + e*x]]^2 + 2*b*e^2*n*x^2*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 - Sqrt[d +
 e*x]/(2*Sqrt[d])] - 2*b*e^2*n*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(1 + Sq
rt[d + e*x]/Sqrt[d])/2] - 2*b*e^2*n*x^2*PolyLog[2, 1/2 - Sqrt[d + e*x]/(2*S
qrt[d])] + 2*b*e^2*n*x^2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])/(16*d^(
3/2)*x^2)
```

Maple [F] time = 0.52, size = 0, normalized size = 0.

$$\int \frac{a + b\ln\left(cx^{n}\right)}{x^{3}}\sqrt{ex+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x+d)^(1/2)/x^3,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x+d)^(1/2)/x^3,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((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex+d}b\log(cx^n)+\sqrt{ex+d}a}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^3,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/x^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((a+b*ln(c*x**n))*(e*x+d)**(1/2)/x**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{ex+d}(b\log(cx^n)+a)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x+d)^(1/2)/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x + d)*(b*log(c*x^n) + a)/x^3, x)
```

3.137 $\int x^3(d+ex)^{3/2}(a+b\log(cx^n))\,dx$

Optimal. Leaf size=263

$$-\frac{2d^3(d+ex)^{5/2}(a+b\log(cx^n))}{5e^4}+\frac{6d^2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^4}-\frac{2d(d+ex)^{9/2}(a+b\log(cx^n))}{3e^4}+\frac{2(d+ex)^{11/2}(a+b\log(cx^n))}{11e^4}$$

```
[Out] (64*b*d^5*n*Sqrt[d + e*x])/(1155*e^4) + (64*b*d^4*n*(d + e*x)^(3/2))/(3465*
e^4) + (64*b*d^3*n*(d + e*x)^(5/2))/(5775*e^4) - (172*b*d^2*n*(d + e*x)^(7/
2))/(1617*e^4) + (32*b*d*n*(d + e*x)^(9/2))/(297*e^4) - (4*b*n*(d + e*x)^(1
1/2))/(121*e^4) - (64*b*d^(11/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(1155*e^
4) - (2*d^3*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) + (6*d^2*(d + e*x)^
(7/2)*(a + b*Log[c*x^n]))/(7*e^4) - (2*d*(d + e*x)^(9/2)*(a + b*Log[c*x^n])
)/(3*e^4) + (2*(d + e*x)^(11/2)*(a + b*Log[c*x^n]))/(11*e^4)
```

Rubi [A] time = 0.240274, antiderivative size = 263, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {43, 2350, 12, 1620, 50, 63, 208}

$$-\frac{2d^3(d+ex)^{5/2}(a+b\log(cx^n))}{5e^4}+\frac{6d^2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^4}-\frac{2d(d+ex)^{9/2}(a+b\log(cx^n))}{3e^4}+\frac{2(d+ex)^{11/2}(a+b\log(cx^n))}{11e^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```


```
[Out] (64*b*d^5*n*Sqrt[d + e*x])/(1155*e^4) + (64*b*d^4*n*(d + e*x)^(3/2))/(3465*
e^4) + (64*b*d^3*n*(d + e*x)^(5/2))/(5775*e^4) - (172*b*d^2*n*(d + e*x)^(7/
2))/(1617*e^4) + (32*b*d*n*(d + e*x)^(9/2))/(297*e^4) - (4*b*n*(d + e*x)^(1
1/2))/(121*e^4) - (64*b*d^(11/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(1155*e^
4) - (2*d^3*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) + (6*d^2*(d + e*x)^
(7/2)*(a + b*Log[c*x^n]))/(7*e^4) - (2*d*(d + e*x)^(9/2)*(a + b*Log[c*x^n])
)/(3*e^4) + (2*(d + e*x)^(11/2)*(a + b*Log[c*x^n]))/(11*e^4)
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^3(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx = -\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d+ex)^{9/2}}{}$$

$$= -\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d+ex)^{9/2}}{}$$

$$= -\frac{2d^3(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}+\frac{6d^2(d+ex)^{7/2}\left(a+b\log\left(cx^n\right)\right)}{7e^4}-\frac{2d(d+ex)^{9/2}}{}$$

$$= -\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}+\frac{32bdn(d+ex)^{9/2}}{297e^4}-\frac{4bn(d+ex)^{11/2}}{121e^4}-\frac{2d^3(d+ex)^{5/2}(a+}{5e^4}$$

$$= \frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}+\frac{32bdn(d+ex)^{9/2}}{297e^4}-\frac{4bn(d+ex)^{11/2}}{121e^4}-$$

$$= \frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}+\frac{32bdn(d+ex)^{9/2}}{297e^4}$$

$$= \frac{64bd^5n\sqrt{d+ex}}{1155e^4}+\frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}$$

$$= \frac{64bd^5n\sqrt{d+ex}}{1155e^4}+\frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}$$

$$= \frac{64bd^5n\sqrt{d+ex}}{1155e^4}+\frac{64bd^4n(d+ex)^{3/2}}{3465e^4}+\frac{64bd^3n(d+ex)^{5/2}}{5775e^4}-\frac{172bd^2n(d+ex)^{7/2}}{1617e^4}$$

Mathematica [A] time = 0.328016, size = 187, normalized size = 0.71

$$\frac{2\sqrt{d+ex}\left(-3465a\left(-40d^2ex+16d^3+70de^2x^2-105e^3x^3\right)(d+ex)^2-3465b\left(-40d^2ex+16d^3+70de^2x^2-105e^3x^3\right)(d+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-221760*b*d^(11/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(-34
65*a*(d + e*x)^2*(16*d^3 - 40*d^2*e*x + 70*d*e^2*x^2 - 105*e^3*x^3) + 2*b*n
*(53308*d^5 - 12794*d^4*e*x + 7863*d^3*e^2*x^2 - 5975*d^2*e^3*x^3 - 57575*d
*e^4*x^4 - 33075*e^5*x^5) - 3465*b*(d + e*x)^2*(16*d^3 - 40*d^2*e*x + 70*d*
e^2*x^2 - 105*e^3*x^3)*Log[c*x^n]))/(4002075*e^4)
```

Maple [F] time = 0.572, size = 0, normalized size = 0.

$$\int x^3 (ex+d)^{\frac{3}{2}} (a+b\ln(cx^n))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int(x^3*(e*x+d)^(3/2)*(a+b*ln(c*x^n)),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(x^3*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.50707, size = 1503, normalized size = 5.71

$$\left[\frac{2\left(55440\, bd^{\frac{11}{2}} n \log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right) + \left(106616\, bd^5 n - 55440\, ad^5 - 33075\left(2\, be^5 n - 11\, ae^5\right)x^5 - 2450\left(47\, bde^4 n - 198\, a\right.\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/4002075*(55440*b*d^(11/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x)
 + (106616*b*d^5*n - 55440*a*d^5 - 33075*(2*b*e^5*n - 11*a*e^5)*x^5 - 2450*
(47*b*d*e^4*n - 198*a*d*e^4)*x^4 - 25*(478*b*d^2*e^3*n - 693*a*d^2*e^3)*x^3
 + 6*(2621*b*d^3*e^2*n - 3465*a*d^3*e^2)*x^2 - 4*(6397*b*d^4*e*n - 6930*a*d
^4*e)*x + 3465*(105*b*e^5*x^5 + 140*b*d*e^4*x^4 + 5*b*d^2*e^3*x^3 - 6*b*d^3
*e^2*x^2 + 8*b*d^4*e*x - 16*b*d^5)*log(c) + 3465*(105*b*e^5*n*x^5 + 140*b*d
```

```
*e^4*n*x^4 + 5*b*d^2*e^3*n*x^3 - 6*b*d^3*e^2*n*x^2 + 8*b*d^4*e*n*x - 16*b*d
^5*n)*log(x))*sqrt(e*x + d))/e^4, 2/4002075*(110880*b*sqrt(-d)*d^5*n*arctan
(sqrt(e*x + d)*sqrt(-d)/d) + (106616*b*d^5*n - 55440*a*d^5 - 33075*(2*b*e^5
*n - 11*a*e^5)*x^5 - 2450*(47*b*d*e^4*n - 198*a*d*e^4)*x^4 - 25*(478*b*d^2*
e^3*n - 693*a*d^2*e^3)*x^3 + 6*(2621*b*d^3*e^2*n - 3465*a*d^3*e^2)*x^2 - 4*
(6397*b*d^4*e*n - 6930*a*d^4*e)*x + 3465*(105*b*e^5*x^5 + 140*b*d*e^4*x^4 +
 5*b*d^2*e^3*x^3 - 6*b*d^3*e^2*x^2 + 8*b*d^4*e*x - 16*b*d^5)*log(c) + 3465*
(105*b*e^5*n*x^5 + 140*b*d*e^4*n*x^4 + 5*b*d^2*e^3*n*x^3 - 6*b*d^3*e^2*n*x^
2 + 8*b*d^4*e*n*x - 16*b*d^5*n)*log(x))*sqrt(e*x + d))/e^4]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^{\frac{3}{2}}(b\log(cx^n)+a)x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)*x^3, x)
```

3.138 $\int x^2(d+ex)^{3/2}(a+b\log(cx^n))\,dx$

Optimal. Leaf size=213

$$\frac{2d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3}-\frac{4d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3}+\frac{2(d+ex)^{9/2}(a+b\log(cx^n))}{9e^3}-\frac{32bd^4n\sqrt{d+ex}}{315e^3}-\frac{32bd}{}$$

```
[Out] (-32*b*d^4*n*Sqrt[d + e*x])/(315*e^3) - (32*b*d^3*n*(d + e*x)^(3/2))/(945*e
^3) - (32*b*d^2*n*(d + e*x)^(5/2))/(1575*e^3) + (44*b*d*n*(d + e*x)^(7/2))/
(441*e^3) - (4*b*n*(d + e*x)^(9/2))/(81*e^3) + (32*b*d^(9/2)*n*ArcTanh[Sqrt
[d + e*x]/Sqrt[d]])/(315*e^3) + (2*d^2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/
(5*e^3) - (4*d*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3) + (2*(d + e*x)^(
9/2)*(a + b*Log[c*x^n]))/(9*e^3)
```

Rubi [A] time = 0.197397, antiderivative size = 213, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1261, 208}

$$\frac{2d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3}-\frac{4d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3}+\frac{2(d+ex)^{9/2}(a+b\log(cx^n))}{9e^3}-\frac{32bd^4n\sqrt{d+ex}}{315e^3}-\frac{32bd}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```



```
[Out] (-32*b*d^4*n*Sqrt[d + e*x])/(315*e^3) - (32*b*d^3*n*(d + e*x)^(3/2))/(945*e
^3) - (32*b*d^2*n*(d + e*x)^(5/2))/(1575*e^3) + (44*b*d*n*(d + e*x)^(7/2))/
(441*e^3) - (4*b*n*(d + e*x)^(9/2))/(81*e^3) + (32*b*d^(9/2)*n*ArcTanh[Sqrt
[d + e*x]/Sqrt[d]])/(315*e^3) + (2*d^2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/
(5*e^3) - (4*d*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3) + (2*(d + e*x)^(
9/2)*(a + b*Log[c*x^n]))/(9*e^3)
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^2(d+ex)^{3/2}(a+b\log(cx^n))\,dx = \frac{2d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{4d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{2(d+ex)^{9/2}(a+}{9e^3}$$

$$= \frac{2d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{4d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{2(d+ex)^{9/2}(a+}{9e^3}$$

$$= \frac{2d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{4d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{2(d+ex)^{9/2}(a+}{9e^3}$$

$$= \frac{2d^2(d+ex)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{4d(d+ex)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{2(d+ex)^{9/2}(a+}{9e^3}$$

$$= -\frac{32bd^4n\sqrt{d+ex}}{315e^3} - \frac{32bd^3n(d+ex)^{3/2}}{945e^3} - \frac{32bd^2n(d+ex)^{5/2}}{1575e^3} + \frac{44bdn(d+ex)^{7/2}}{441e^3} - $$

$$= -\frac{32bd^4n\sqrt{d+ex}}{315e^3} - \frac{32bd^3n(d+ex)^{3/2}}{945e^3} - \frac{32bd^2n(d+ex)^{5/2}}{1575e^3} + \frac{44bdn(d+ex)^{7/2}}{441e^3} - $$

Mathematica [A] time = 0.229311, size = 153, normalized size = 0.72

$$\frac{2\left(\sqrt{d+ex}\left(315a\left(8d^2-20dex+35e^2x^2\right)(d+ex)^2+315b\left(8d^2-20dex+35e^2x^2\right)(d+ex)^2\log(cx^n)-2bn\left(429d^2e^2x^2-\right.\right.\right.}{99225e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*(5040*b*d^(9/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(315*a*
(d + e*x)^2*(8*d^2 - 20*d*e*x + 35*e^2*x^2) - 2*b*n*(2614*d^4 - 677*d^3*e*x
 + 429*d^2*e^2*x^2 + 2425*d*e^3*x^3 + 1225*e^4*x^4) + 315*b*(d + e*x)^2*(8*
d^2 - 20*d*e*x + 35*e^2*x^2)*Log[c*x^n])))/(99225*e^3)
```

Maple [F] time = 0.561, size = 0, normalized size = 0.

$$\int x^2(ex+d)^{\frac{3}{2}}(a+b\ln(cx^n))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int(x^2*(e*x+d)^(3/2)*(a+b*ln(c*x^n)),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(x^2*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.47006, size = 1223, normalized size = 5.74

$$\left[\frac{2\left(2520\,bd^{\frac{9}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)-\left(5228\,bd^{4}n-2520\,ad^{4}+1225\left(2\,be^{4}n-9\,ae^{4}\right)x^{4}+50\left(97\,bde^{3}n-315\,ade^{3}\right)x^{3}+\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/99225*(2520*b*d^(9/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (
5228*b*d^4*n - 2520*a*d^4 + 1225*(2*b*e^4*n - 9*a*e^4)*x^4 + 50*(97*b*d*e^3
*n - 315*a*d*e^3)*x^3 + 3*(286*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 2*(677*b*
d^3*e*n - 630*a*d^3*e)*x - 315*(35*b*e^4*x^4 + 50*b*d*e^3*x^3 + 3*b*d^2*e^2
*x^2 - 4*b*d^3*e*x + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^4 + 50*b*d*e^3*n*x
^3 + 3*b*d^2*e^2*n*x^2 - 4*b*d^3*e*n*x + 8*b*d^4*n)*log(x))*sqrt(e*x + d))/
e^3, -2/99225*(5040*b*sqrt(-d)*d^4*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (52
28*b*d^4*n - 2520*a*d^4 + 1225*(2*b*e^4*n - 9*a*e^4)*x^4 + 50*(97*b*d*e^3*n
 - 315*a*d*e^3)*x^3 + 3*(286*b*d^2*e^2*n - 315*a*d^2*e^2)*x^2 - 2*(677*b*d^
3*e*n - 630*a*d^3*e)*x - 315*(35*b*e^4*x^4 + 50*b*d*e^3*x^3 + 3*b*d^2*e^2*x
^2 - 4*b*d^3*e*x + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^4 + 50*b*d*e^3*n*x^3
 + 3*b*d^2*e^2*n*x^2 - 4*b*d^3*e*n*x + 8*b*d^4*n)*log(x))*sqrt(e*x + d))/e^
3]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^{\frac{3}{2}}(b\log(cx^n)+a)x^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)*x^2, x)
```

3.139 $\int x(d+ex)^{3/2}(a+b\log(cx^n))\,dx$

Optimal. Leaf size=163

$$-\frac{2d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^2}+\frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}-\frac{8bd^{7/2}n\tanh^{-1}\Big(}{35e^2}$$

```
[Out] (8*b*d^3*n*Sqrt[d + e*x])/(35*e^2) + (8*b*d^2*n*(d + e*x)^(3/2))/(105*e^2)
+ (8*b*d*n*(d + e*x)^(5/2))/(175*e^2) - (4*b*n*(d + e*x)^(7/2))/(49*e^2) -
(8*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(35*e^2) - (2*d*(d + e*x)^(5
/2)*(a + b*Log[c*x^n]))/(5*e^2) + (2*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7
*e^2)
```

Rubi [A] time = 0.117007, antiderivative size = 163, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2350, 12, 80, 50, 63, 208}

$$-\frac{2d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^2}+\frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}-\frac{8bd^{7/2}n\tanh^{-1}\Big(}{35e^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```


```
[Out] (8*b*d^3*n*Sqrt[d + e*x])/(35*e^2) + (8*b*d^2*n*(d + e*x)^(3/2))/(105*e^2)
+ (8*b*d*n*(d + e*x)^(5/2))/(175*e^2) - (4*b*n*(d + e*x)^(7/2))/(49*e^2) -
(8*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(35*e^2) - (2*d*(d + e*x)^(5
/2)*(a + b*Log[c*x^n]))/(5*e^2) + (2*(d + e*x)^(7/2)*(a + b*Log[c*x^n]))/(7
*e^2)
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x(d+ex)^{3/2}(a+b\log(cx^n))\,dx = -\frac{2d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^2}-(bn)\int\frac{2(d+ex)}{}$$

$$= -\frac{2d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^2}-\frac{(2bn)\int\frac{(d+ex)^{5/2}(-}{x}}{35e^2}$$

$$= -\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2(d+ex)^{7/2}(a+b\log(cx^n))}{7e^2}+$$

$$= \frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+ex)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2(d+ex)^{7/2}(a}{7}$$

$$= \frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+ex)^{5/2}(a+b\log(cx}{5e^2}$$

$$= \frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+e}{}$$

$$= \frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{2d(d+e}{}$$

$$= \frac{8bd^3n\sqrt{d+ex}}{35e^2}+\frac{8bd^2n(d+ex)^{3/2}}{105e^2}+\frac{8bdn(d+ex)^{5/2}}{175e^2}-\frac{4bn(d+ex)^{7/2}}{49e^2}-\frac{8bd^{7/2}n\,\mathrm{t}}{}$$

Mathematica [A] time = 0.167948, size = 120, normalized size = 0.74

$$-\frac{2\left(\sqrt{d+ex}\left(105a(2d-5ex)(d+ex)^2+105b(2d-5ex)(d+ex)^2\log(cx^n)+2bn\left(71d^2ex-247d^3+183de^2x^2+75e^3x^3\right)\right.\right.}{3675e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*(420*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(105*a*
(2*d - 5*e*x)*(d + e*x)^2 + 2*b*n*(-247*d^3 + 71*d^2*e*x + 183*d*e^2*x^2 +
75*e^3*x^3) + 105*b*(2*d - 5*e*x)*(d + e*x)^2*Log[c*x^n])))/(3675*e^2)
```

Maple [F] time = 0.557, size = 0, normalized size = 0.

$$\int x(ex+d)^{\frac{3}{2}}(a+b\ln(cx^n))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int(x*(e*x+d)^(3/2)*(a+b*ln(c*x^n)),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(x*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.5215, size = 960, normalized size = 5.89

$$\left[\frac{2\left(210\,bd^{\frac{7}{2}}n\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)+\left(494\,bd^{3}n-210\,ad^{3}-75\left(2\,be^{3}n-7\,ae^{3}\right)x^{3}-6\left(61\,bde^{2}n-140\,ade^{2}\right)x^{2}-\left(142\,bd^{2}e\right.\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/3675*(210*b*d^(7/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (49
4*b*d^3*n - 210*a*d^3 - 75*(2*b*e^3*n - 7*a*e^3)*x^3 - 6*(61*b*d*e^2*n - 14
0*a*d*e^2)*x^2 - (142*b*d^2*e*n - 105*a*d^2*e)*x + 105*(5*b*e^3*x^3 + 8*b*d
*e^2*x^2 + b*d^2*e*x - 2*b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 + 8*b*d*e^2*n*x
^2 + b*d^2*e*n*x - 2*b*d^3*n)*log(x))*sqrt(e*x + d))/e^2, 2/3675*(420*b*sqr
t(-d)*d^3*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (494*b*d^3*n - 210*a*d^3 - 7
5*(2*b*e^3*n - 7*a*e^3)*x^3 - 6*(61*b*d*e^2*n - 140*a*d*e^2)*x^2 - (142*b*d
^2*e*n - 105*a*d^2*e)*x + 105*(5*b*e^3*x^3 + 8*b*d*e^2*x^2 + b*d^2*e*x - 2*
b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 + 8*b*d*e^2*n*x^2 + b*d^2*e*n*x - 2*b*d^
3*n)*log(x))*sqrt(e*x + d))/e^2]
```

Sympy [B] time = 121.169, size = 583, normalized size = 3.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] 2*a*d*(-d*(d + e*x)**(3/2)/3 + (d + e*x)**(5/2)/5)/e**2 + 2*a*(d**2*(d + e*
x)**(3/2)/3 - 2*d*(d + e*x)**(5/2)/5 + (d + e*x)**(7/2)/7)/e**2 + 2*b*d*(-d
*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt
(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3
*e)) + (d + e*x)**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan
(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(
3/2)/3 + e*(d + e*x)**(5/2)/5)/(5*e))/e**2 + 2*b*(d**2*((d + e*x)**(3/2)*lo
g(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/s
qrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) - 2*d*((d + e*x)
**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/s
qrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d +
e*x)**(5/2)/5)/(5*e)) + (d + e*x)**(7/2)*log(c*(-d/e + (d + e*x)/e)**n)/7 -
 2*n*(d**4*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d**3*e*sqrt(d + e*x) +
 d**2*e*(d + e*x)**(3/2)/3 + d*e*(d + e*x)**(5/2)/5 + e*(d + e*x)**(7/2)/7)
/(7*e))/e**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^{\frac{3}{2}}(b\log(cx^n)+a)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)*x, x)
```

3.140 $\int (d+ex)^{3/2} (a+b\log(cx^n))\, dx$

Optimal. Leaf size=115

$$\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e}-\frac{4bd^2n\sqrt{d+ex}}{5e}+\frac{4bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{5e}-\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}$$

```
[Out] (-4*b*d^2*n*Sqrt[d + e*x])/(5*e) - (4*b*d*n*(d + e*x)^(3/2))/(15*e) - (4*b*
n*(d + e*x)^(5/2))/(25*e) + (4*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/
(5*e) + (2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e)
```

Rubi [A] time = 0.050536, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {2319, 50, 63, 208}

$$\frac{2(d+ex)^{5/2}(a+b\log(cx^n))}{5e}-\frac{4bd^2n\sqrt{d+ex}}{5e}+\frac{4bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{5e}-\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-4*b*d^2*n*Sqrt[d + e*x])/(5*e) - (4*b*d*n*(d + e*x)^(3/2))/(15*e) - (4*b*
n*(d + e*x)^(5/2))/(25*e) + (4*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/
(5*e) + (2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e)
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
```

```
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int (d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{(2bn)\int\frac{(d+ex)^{5/2}}{x}\,dx}{5e}$$

$$= -\frac{4bn(d+ex)^{5/2}}{25e}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{(2bdn)\int\frac{(d+ex)^{3/2}}{x}\,dx}{5e}$$

$$= -\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}-\frac{\left(2bd^2n\right)\int\frac{\sqrt{d+e}}{x}}{5e}$$

$$= -\frac{4bd^2n\sqrt{d+ex}}{5e}-\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}$$

$$= -\frac{4bd^2n\sqrt{d+ex}}{5e}-\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e}$$

$$= -\frac{4bd^2n\sqrt{d+ex}}{5e}-\frac{4bdn(d+ex)^{3/2}}{15e}-\frac{4bn(d+ex)^{5/2}}{25e}+\frac{4bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{5e}+\frac{2(}{}$$

Mathematica [A] time = 0.0828026, size = 87, normalized size = 0.76

$$\frac{2\left((d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)-\frac{2}{15}bn\sqrt{d+ex}\left(23d^2+11dex+3e^2x^2\right)+2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\right)}{5e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*((-2*b*n*Sqrt[d + e*x]*(23*d^2 + 11*d*e*x + 3*e^2*x^2))/15 + 2*b*d^(5/2)
*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + (d + e*x)^(5/2)*(a + b*Log[c*x^n])))/(5
*e)
```

Maple [F] time = 0.563, size = 0, normalized size = 0.

$$\int (ex+d)^{\frac{3}{2}} (a + b\ln(cx^n))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int((e*x+d)^(3/2)*(a+b*ln(c*x^n)),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+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.41295, size = 710, normalized size = 6.17

$$\left[\frac{2\left(15\,bd^{\frac{5}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right) - \left(46\,bd^2n - 15\,ad^2 + 3\left(2\,be^2n - 5\,ae^2\right)x^2 + 2\,(11\,bden - 15\,ade)x - 15\left(be^2x^2 + 2\,bdex\right.\right.\right.}{75\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [2/75*(15*b*d^(5/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (46*b*
d^2*n - 15*a*d^2 + 3*(2*b*e^2*n - 5*a*e^2)*x^2 + 2*(11*b*d*e*n - 15*a*d*e)*
x - 15*(b*e^2*x^2 + 2*b*d*e*x + b*d^2)*log(c) - 15*(b*e^2*n*x^2 + 2*b*d*e*n
*x + b*d^2*n)*log(x))*sqrt(e*x + d))/e, -2/75*(30*b*sqrt(-d)*d^2*n*arctan(s
qrt(e*x + d)*sqrt(-d)/d) + (46*b*d^2*n - 15*a*d^2 + 3*(2*b*e^2*n - 5*a*e^2)
*x^2 + 2*(11*b*d*e*n - 15*a*d*e)*x - 15*(b*e^2*x^2 + 2*b*d*e*x + b*d^2)*log
(c) - 15*(b*e^2*n*x^2 + 2*b*d*e*n*x + b*d^2*n)*log(x))*sqrt(e*x + d))/e]
```

Sympy [A] time = 51.687, size = 333, normalized size = 2.9

$$ad\left(\begin{cases}\sqrt{d}x & \text{for } e=0\\ \frac{2(d+ex)^{\frac{3}{2}}}{3e} & \text{otherwise}\end{cases}\right) + \frac{2a\left(-\frac{d(d+ex)^{\frac{3}{2}}}{3}+\frac{(d+ex)^{\frac{5}{2}}}{5}\right)}{e} + \frac{2bd\left(\frac{(d+ex)^{\frac{3}{2}}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^{n}\right)}{3} - \frac{2n\left(\frac{d^{2}e\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+de\sqrt{d+ex}+\frac{e(d+ex)^{\frac{3}{2}}}{3}\right)}{3e}\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*Piecewise((sqrt(d)*x, Eq(e, 0)), (2*(d + e*x)**(3/2)/(3*e), True)) + 2*
a*(-d*(d + e*x)**(3/2)/3 + (d + e*x)**(5/2)/5)/e + 2*b*d*((d + e*x)**(3/2)*
log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))
/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e))/e + 2*b*(-d*((
d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d
+ e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)
) + (d + e*x)**(5/2)*log(c*(-d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sq
rt(d + e*x)/sqrt(-d))/sqrt(-d) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2
)/3 + e*(d + e*x)**(5/2)/5)/(5*e))/e
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex+d)^{\frac{3}{2}}(b\log(cx^{n})+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a), x)
```

3.141 $\int \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=255

$$-2bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)-2d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))+\frac{2}{3}(d+ex)^{3/2}(a+b\log(cx^n))+2$$

```
[Out] (-16*b*d*n*Sqrt[d + e*x])/3 - (4*b*n*(d + e*x)^(3/2))/9 + (16*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]])/3 + 2*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]]^2 + 2*d*Sqrt[d + e*x]*(a + b*Log[c*x^n]) + (2*(d + e*x)^(3/2)*(a + b*L
og[c*x^n]))/3 - 2*d^(3/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n])
 - 4*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] -
Sqrt[d + e*x])] - 2*b*d^(3/2)*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[
d + e*x])]
```

Rubi [A] time = 0.456245, antiderivative size = 255, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {2346, 63, 208, 2348, 12, 5984, 5918, 2402, 2315, 2319, 50}

$$-2bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)-2d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))+\frac{2}{3}(d+ex)^{3/2}(a+b\log(cx^n))+2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```


```
[Out] (-16*b*d*n*Sqrt[d + e*x])/3 - (4*b*n*(d + e*x)^(3/2))/9 + (16*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x]/Sqrt[d]])/3 + 2*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt
[d]]^2 + 2*d*Sqrt[d + e*x]*(a + b*Log[c*x^n]) + (2*(d + e*x)^(3/2)*(a + b*L
og[c*x^n]))/3 - 2*d^(3/2)*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n])
 - 4*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] -
Sqrt[d + e*x])] - 2*b*d^(3/2)*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[
d + e*x])]
```


Rule 2346

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.))
/(x_), x_Symbol] :> Dist[d, Int[((d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p)/x,
 x], x] + Dist[e, Int[(d + e*x)^(q - 1)*(a + b*Log[c*x^n])^p, x], x] /; Fre
eQ[{a, b, c, d, e, n}, x] && IGtQ[p, 0] && GtQ[q, 0] && IntegerQ[2*q]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
```

```
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rubi steps

$$\int \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x}\,dx = d\int \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{x}\,dx + e\int \sqrt{d+ex}\,(a+b\log(cx^n))\,dx$$

$$= \frac{2}{3}(d+ex)^{3/2}(a+b\log(cx^n)) + d^2\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx + (de)\int \frac{a+b\log(cx^n)}{\sqrt{d+ex}}\,dx -$$

$$= -\frac{4}{9}bn(d+ex)^{3/2} + 2d\sqrt{d+ex}\,(a+b\log(cx^n)) + \frac{2}{3}(d+ex)^{3/2}(a+b\log(cx^n)) - 2d^{3/2}$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + 2d\sqrt{d+ex}\,(a+b\log(cx^n)) + \frac{2}{3}(d+ex)^{3/2}(a+b$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + 2d\sqrt{d+ex}\,(a+b\log(cx^n)) + \frac{2}{3}(d+ex)^{3/2}(a+b$$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\tanh^{-1}\Bigg($$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\tanh^{-1}\Bigg($$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\tanh^{-1}\Bigg($$

$$= -\frac{16}{3}bdn\sqrt{d+ex} - \frac{4}{9}bn(d+ex)^{3/2} + \frac{16}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 2bd^{3/2}n\tanh^{-1}\Bigg($$

Mathematica [A] time = 0.253343, size = 375, normalized size = 1.47

$$-\frac{1}{2}bd^{3/2}n\left(2\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(\log\left(\sqrt{d}-\sqrt{d+ex}\right)+2\log\left(\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)\right)\right)+\frac{1}{2}bd^{3/}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] 2*a*d*Sqrt[d + e*x] - (4*b*n*(d + e*x)^(3/2))/9 + (16*b*d*n*(-Sqrt[d + e*x]
 + Sqrt[d]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]))/3 + 2*b*d*Sqrt[d + e*x]*Log[c*x
^n] + (2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/3 + d^(3/2)*(a + b*Log[c*x^n])
*Log[Sqrt[d] - Sqrt[d + e*x]] - d^(3/2)*(a + b*Log[c*x^n])*Log[Sqrt[d] + Sq
rt[d + e*x]] - (b*d^(3/2)*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*(Log[Sqrt[d] - Sq
rt[d + e*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*PolyLog[2, 1/2 - S
qrt[d + e*x]/(2*Sqrt[d])]))/2 + (b*d^(3/2)*n*(Log[Sqrt[d] + Sqrt[d + e*x]]*
(Log[Sqrt[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + 2
*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/2
```

Maple [F] time = 0.485, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x}(ex + d)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] int((e*x+d)^(3/2)*(a+b*ln(c*x^n))/x,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+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bex + bd)\sqrt{ex + d}\log(cx^n) + (aex + ad)\sqrt{ex + d}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x + b*d)*sqrt(e*x + d)*log(c*x^n) + (a*e*x + a*d)*sqrt(e*x +
 d))/x, 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+d)**(3/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex+d)^{\frac{3}{2}}(b\log(cx^n)+a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)/x, x)
```

3.142 $\int \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=259

$$-3b\sqrt{d}en\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)-\frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x}+3e\sqrt{d+ex}(a+b\log(cx^n))-3\sqrt{d}e\tanh^{-1}\left(\right.$$

```
[Out] -4*b*e*n*Sqrt[d + e*x] - (b*d*n*Sqrt[d + e*x])/x + 3*b*Sqrt[d]*e*n*ArcTanh[
Sqrt[d + e*x]/Sqrt[d]] + 3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2 +
 3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]) - ((d + e*x)^(3/2)*(a + b*Log[c*x^n])
)/x - 3*Sqrt[d]*e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]) - 6*b*S
qrt[d]*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d
 + e*x])] - 3*b*Sqrt[d]*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d +
e*x])]
```

Rubi [A] time = 0.324265, antiderivative size = 259, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {47, 50, 63, 208, 2350, 14, 5984, 5918, 2402, 2315}

$$-3b\sqrt{d}en\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)-\frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x}+3e\sqrt{d+ex}(a+b\log(cx^n))-3\sqrt{d}e\tanh^{-1}\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```


```
[Out] -4*b*e*n*Sqrt[d + e*x] - (b*d*n*Sqrt[d + e*x])/x + 3*b*Sqrt[d]*e*n*ArcTanh[
Sqrt[d + e*x]/Sqrt[d]] + 3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2 +
 3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]) - ((d + e*x)^(3/2)*(a + b*Log[c*x^n])
)/x - 3*Sqrt[d]*e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]) - 6*b*S
qrt[d]*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d
 + e*x])] - 3*b*Sqrt[d]*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d +
e*x])]
```


<u>Rule 47</u>

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
```

```
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
```

```
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x^2}\,dx = 3e\sqrt{d+ex}\,(a+b\log(cx^n)) - \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x} - 3\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)($$

$$= 3e\sqrt{d+ex}\,(a+b\log(cx^n)) - \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x} - 3\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)($$

$$= 3e\sqrt{d+ex}\,(a+b\log(cx^n)) - \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x} - 3\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)($$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3e\sqrt{d+ex}\,(a+b\log(cx^n)) - \frac{(d+ex)^{3/2}(a+b\log(c$$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2 + 3e\sqrt{d+ex}\,(a+b\log($$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 3b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+}}{\sqrt{d}}\right.$$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 3b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+}}{\sqrt{d}}\right.$$

$$= -4ben\sqrt{d+ex} - \frac{bdn\sqrt{d+ex}}{x} + 3b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 3b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+}}{\sqrt{d}}\right.$$

Mathematica [A] time = 0.333317, size = 480, normalized size = 1.85

$$\frac{-6b\sqrt{d}enx\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+6b\sqrt{d}enx\text{PolyLog}\left(2,\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)-4ad\sqrt{d+ex}+8aex\sqrt{d+ex}+6a\sqrt{d}ex\log\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (-4*a*d*Sqrt[d + e*x] - 4*b*d*n*Sqrt[d + e*x] + 8*a*e*x*Sqrt[d + e*x] - 16*
b*e*n*x*Sqrt[d + e*x] + 12*b*Sqrt[d]*e*n*x*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] -
```

```
 4*b*d*Sqrt[d + e*x]*Log[c*x^n] + 8*b*e*x*Sqrt[d + e*x]*Log[c*x^n] + 6*a*Sq
rt[d]*e*x*Log[Sqrt[d] - Sqrt[d + e*x]] + 6*b*Sqrt[d]*e*x*Log[c*x^n]*Log[Sqr
t[d] - Sqrt[d + e*x]] - 3*b*Sqrt[d]*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]^2 -
6*a*Sqrt[d]*e*x*Log[Sqrt[d] + Sqrt[d + e*x]] - 6*b*Sqrt[d]*e*x*Log[c*x^n]*L
og[Sqrt[d] + Sqrt[d + e*x]] + 3*b*Sqrt[d]*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]
]^2 + 6*b*Sqrt[d]*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 - Sqrt[d + e*x
]/(2*Sqrt[d])] - 6*b*Sqrt[d]*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(1 + Sq
rt[d + e*x]/Sqrt[d])/2] - 6*b*Sqrt[d]*e*n*x*PolyLog[2, 1/2 - Sqrt[d + e*x]/
(2*Sqrt[d])] + 6*b*Sqrt[d]*e*n*x*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])
/(4*x)
```

Maple [F] time = 0.504, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^2}(ex+d)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(a+b*ln(c*x^n))/x^2,x)
```

```
[Out] int((e*x+d)^(3/2)*(a+b*ln(c*x^n))/x^2,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+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bex+bd)\sqrt{ex+d}\log(cx^n) + (aex+ad)\sqrt{ex+d}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x + b*d)*sqrt(e*x + d)*log(c*x^n) + (a*e*x + a*d)*sqrt(e*x +
 d))/x^2, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)**(3/2)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex+d)^{\frac{3}{2}}(b\log(cx^n)+a)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)/x^2, x)
```

3.143 $\int \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=293

$$-\frac{3be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4\sqrt{d}}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4\sqrt{d}}-\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x}-\frac{(d+ex)^{3/2}\,(a}{2}$$

```
[Out] -(b*d*n*Sqrt[d + e*x])/(4*x^2) - (11*b*e*n*Sqrt[d + e*x])/(8*x) - (9*b*e^2*
n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*Sqrt[d]) + (3*b*e^2*n*ArcTanh[Sqrt[d +
 e*x]/Sqrt[d]]^2)/(4*Sqrt[d]) - (3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*x
) - ((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(2*x^2) - (3*e^2*ArcTanh[Sqrt[d +
e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/(4*Sqrt[d]) - (3*b*e^2*n*ArcTanh[Sqrt[d +
 e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*Sqrt[d]) - (3
*b*e^2*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*Sqrt[d])
```

Rubi [A] time = 0.383664, antiderivative size = 293, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {47, 63, 208, 2350, 12, 14, 51, 5984, 5918, 2402, 2315}

$$-\frac{3be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4\sqrt{d}}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4\sqrt{d}}-\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x}-\frac{(d+ex)^{3/2}\,(a}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```



```
[Out] -(b*d*n*Sqrt[d + e*x])/(4*x^2) - (11*b*e*n*Sqrt[d + e*x])/(8*x) - (9*b*e^2*
n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*Sqrt[d]) + (3*b*e^2*n*ArcTanh[Sqrt[d +
 e*x]/Sqrt[d]]^2)/(4*Sqrt[d]) - (3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*x
) - ((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(2*x^2) - (3*e^2*ArcTanh[Sqrt[d +
e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/(4*Sqrt[d]) - (3*b*e^2*n*ArcTanh[Sqrt[d +
 e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*Sqrt[d]) - (3
*b*e^2*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*Sqrt[d])
```


Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
```

```
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
```

```
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{x^3}\,dx = -\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x} - \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+}{4\sqrt{d}}$$

$$= -\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x} - \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+}{4\sqrt{d}}$$

$$= -\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x} - \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+}{4\sqrt{d}}$$

$$= -\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x} - \frac{(d+ex)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+}{4\sqrt{d}}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{5ben\sqrt{d+ex}}{4x} - \frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4x} - \frac{(d+ex)^{3/2}(a+b\log(}{2x^2}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{3e\sqrt{d+ex}\,(a+b\log(cx^n}{4x}$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} - \frac{5be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4\sqrt{d}} -$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} - \frac{9be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8\sqrt{d}} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4\sqrt{d}} -$$

$$= -\frac{bdn\sqrt{d+ex}}{4x^2} - \frac{11ben\sqrt{d+ex}}{8x} - \frac{9be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8\sqrt{d}} + \frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4\sqrt{d}} -$$

Mathematica [A] time = 0.584244, size = 501, normalized size = 1.71

$$-\frac{6be^2nx^2\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)-6be^2nx^2\text{PolyLog}\left(2,\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)+8ad^{3/2}\sqrt{d+ex}-6ae^2x^2\log\left(\sqrt{d}-\sqrt{d+ex}\right)+\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(8*a*d^(3/2)*Sqrt[d + e*x] + 4*b*d^(3/2)*n*Sqrt[d + e*x] + 20*a*Sqrt[d]*e*
x*Sqrt[d + e*x] + 22*b*Sqrt[d]*e*n*x*Sqrt[d + e*x] + 18*b*e^2*n*x^2*ArcTanh
[Sqrt[d + e*x]/Sqrt[d]] + 8*b*d^(3/2)*Sqrt[d + e*x]*Log[c*x^n] + 20*b*Sqrt[
d]*e*x*Sqrt[d + e*x]*Log[c*x^n] - 6*a*e^2*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]
- 6*b*e^2*x^2*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*x]] + 3*b*e^2*n*x^2*Log[S
qrt[d] - Sqrt[d + e*x]]^2 + 6*a*e^2*x^2*Log[Sqrt[d] + Sqrt[d + e*x]] + 6*b*
e^2*x^2*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] - 3*b*e^2*n*x^2*Log[Sqrt[d]
 + Sqrt[d + e*x]]^2 - 6*b*e^2*n*x^2*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 -
Sqrt[d + e*x]/(2*Sqrt[d])] + 6*b*e^2*n*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]*Log
[(1 + Sqrt[d + e*x]/Sqrt[d])/2] + 6*b*e^2*n*x^2*PolyLog[2, 1/2 - Sqrt[d + e
*x]/(2*Sqrt[d])] - 6*b*e^2*n*x^2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])
/(16*Sqrt[d]*x^2)
```

Maple [F] time = 0.479, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^3}(ex+d)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x+d)^(3/2)*(a+b*ln(c*x^n))/x^3,x)
```

```
[Out] int((e*x+d)^(3/2)*(a+b*ln(c*x^n))/x^3,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+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bex+bd)\sqrt{ex+d}\log\left(cx^n\right)+(aex+ad)\sqrt{ex+d}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x + b*d)*sqrt(e*x + d)*log(c*x^n) + (a*e*x + a*d)*sqrt(e*x +
 d))/x^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+d)**(3/2)*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(ex+d)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x + d)^(3/2)*(b*log(c*x^n) + a)/x^3, x)
```

3.144 $\int \frac{x^3(a+b\log(cx^n))}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=217

$$-\frac{2d^3\sqrt{d+ex}\,(a+b\log(cx^n))}{e^4}+\frac{2d^2(d+ex)^{3/2}\,(a+b\log(cx^n))}{e^4}-\frac{6d(d+ex)^{5/2}\,(a+b\log(cx^n))}{5e^4}+\frac{2(d+ex)^{7/2}\,(a+b\,\mathrm{lo}}{7e^4}$$

```
[Out] (64*b*d^3*n*Sqrt[d + e*x])/(35*e^4) - (76*b*d^2*n*(d + e*x)^(3/2))/(105*e^4
) + (64*b*d*n*(d + e*x)^(5/2))/(175*e^4) - (4*b*n*(d + e*x)^(7/2))/(49*e^4)
 - (64*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(35*e^4) - (2*d^3*Sqrt[d
 + e*x]*(a + b*Log[c*x^n]))/e^4 + (2*d^2*(d + e*x)^(3/2)*(a + b*Log[c*x^n])
)/e^4 - (6*d*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) + (2*(d + e*x)^(7/
2)*(a + b*Log[c*x^n]))/(7*e^4)
```

Rubi [A] time = 0.203931, antiderivative size = 217, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {43, 2350, 12, 1620, 50, 63, 208}

$$-\frac{2d^3\sqrt{d+ex}\,(a+b\log(cx^n))}{e^4}+\frac{2d^2(d+ex)^{3/2}\,(a+b\log(cx^n))}{e^4}-\frac{6d(d+ex)^{5/2}\,(a+b\log(cx^n))}{5e^4}+\frac{2(d+ex)^{7/2}\,(a+b\,\mathrm{lo}}{7e^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (64*b*d^3*n*Sqrt[d + e*x])/(35*e^4) - (76*b*d^2*n*(d + e*x)^(3/2))/(105*e^4
) + (64*b*d*n*(d + e*x)^(5/2))/(175*e^4) - (4*b*n*(d + e*x)^(7/2))/(49*e^4)
 - (64*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(35*e^4) - (2*d^3*Sqrt[d
 + e*x]*(a + b*Log[c*x^n]))/e^4 + (2*d^2*(d + e*x)^(3/2)*(a + b*Log[c*x^n])
)/e^4 - (6*d*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4) + (2*(d + e*x)^(7/
2)*(a + b*Log[c*x^n]))/(7*e^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^3 (a + b\log(cx^n))}{\sqrt{d+ex}}\,dx = -\frac{2d^3\sqrt{d+ex}\,(a+b\log(cx^n))}{e^4} + \frac{2d^2(d+ex)^{3/2}\,(a+b\log(cx^n))}{e^4} - \frac{6d(d+ex)^{5/2}\,(a+b\log(c}{5e^4}$$

$$= -\frac{2d^3\sqrt{d+ex}\,(a+b\log(cx^n))}{e^4} + \frac{2d^2(d+ex)^{3/2}\,(a+b\log(cx^n))}{e^4} - \frac{6d(d+ex)^{5/2}\,(a+b\log(c}{5e^4}$$

$$= -\frac{2d^3\sqrt{d+ex}\,(a+b\log(cx^n))}{e^4} + \frac{2d^2(d+ex)^{3/2}\,(a+b\log(cx^n))}{e^4} - \frac{6d(d+ex)^{5/2}\,(a+b\log(c}{5e^4}$$

$$= -\frac{76bd^2n(d+ex)^{3/2}}{105e^4} + \frac{64bdn(d+ex)^{5/2}}{175e^4} - \frac{4bn(d+ex)^{7/2}}{49e^4} - \frac{2d^3\sqrt{d+ex}\,(a+b\log(cx^n))}{e^4} +$$

$$= \frac{64bd^3n\sqrt{d+ex}}{35e^4} - \frac{76bd^2n(d+ex)^{3/2}}{105e^4} + \frac{64bdn(d+ex)^{5/2}}{175e^4} - \frac{4bn(d+ex)^{7/2}}{49e^4} - \frac{2d^3\sqrt{d+ex}\,(a}{e}$$

$$= \frac{64bd^3n\sqrt{d+ex}}{35e^4} - \frac{76bd^2n(d+ex)^{3/2}}{105e^4} + \frac{64bdn(d+ex)^{5/2}}{175e^4} - \frac{4bn(d+ex)^{7/2}}{49e^4} - \frac{2d^3\sqrt{d+ex}\,(a}{e}$$

$$= \frac{64bd^3n\sqrt{d+ex}}{35e^4} - \frac{76bd^2n(d+ex)^{3/2}}{105e^4} + \frac{64bdn(d+ex)^{5/2}}{175e^4} - \frac{4bn(d+ex)^{7/2}}{49e^4} - \frac{64bd^{7/2}n\tanh}{35e^4}$$

Mathematica [A] time = 0.219337, size = 150, normalized size = 0.69

$$-\frac{2\left(\sqrt{d+ex}\left(105a\left(-8d^2ex+16d^3+6de^2x^2-5e^3x^3\right)+105b\left(-8d^2ex+16d^3+6de^2x^2-5e^3x^3\right)\log(cx^n)+2bn\left(218d^2e\right.\right.\right.}{3675e^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (-2*(3360*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(105*a
*(16*d^3 - 8*d^2*e*x + 6*d*e^2*x^2 - 5*e^3*x^3) + 2*b*n*(-1276*d^3 + 218*d^
2*e*x - 111*d*e^2*x^2 + 75*e^3*x^3) + 105*b*(16*d^3 - 8*d^2*e*x + 6*d*e^2*x
^2 - 5*e^3*x^3)*Log[c*x^n])))/(3675*e^4)
```

Maple [F] time = 0.605, size = 0, normalized size = 0.

$$\int x^3 (a + b\ln(cx^n)) \frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x+d)^(1/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(e*x+d)^(1/2),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(x^3*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.47126, size = 990, normalized size = 4.56

$$\left[\frac{2\left(1680\,bd^{\frac{7}{2}}n\log\left(\frac{ex-2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)+\left(2552\,bd^{3}n-1680\,ad^{3}-75\left(2\,be^{3}n-7\,ae^{3}\right)x^{3}+6\left(37\,bde^{2}n-105\,ade^{2}\right)x^{2}-4\left(10\right.\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/3675*(1680*b*d^(7/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (2
552*b*d^3*n - 1680*a*d^3 - 75*(2*b*e^3*n - 7*a*e^3)*x^3 + 6*(37*b*d*e^2*n -
 105*a*d*e^2)*x^2 - 4*(109*b*d^2*e*n - 210*a*d^2*e)*x + 105*(5*b*e^3*x^3 -
6*b*d*e^2*x^2 + 8*b*d^2*e*x - 16*b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 - 6*b*d
*e^2*n*x^2 + 8*b*d^2*e*n*x - 16*b*d^3*n)*log(x))*sqrt(e*x + d))/e^4, 2/3675
*(3360*b*sqrt(-d)*d^3*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (2552*b*d^3*n -
1680*a*d^3 - 75*(2*b*e^3*n - 7*a*e^3)*x^3 + 6*(37*b*d*e^2*n - 105*a*d*e^2)*
x^2 - 4*(109*b*d^2*e*n - 210*a*d^2*e)*x + 105*(5*b*e^3*x^3 - 6*b*d*e^2*x^2
+ 8*b*d^2*e*x - 16*b*d^3)*log(c) + 105*(5*b*e^3*n*x^3 - 6*b*d*e^2*n*x^2 + 8
*b*d^2*e*n*x - 16*b*d^3*n)*log(x))*sqrt(e*x + d))/e^4]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log{(cx^n)}+a)x^3}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/sqrt(e*x + d), x)
```

3.145 $\int \frac{x^2(a+b\log(cx^n))}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=169

$$\frac{2d^2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^3}-\frac{4d(d+ex)^{3/2}\,(a+b\log(cx^n))}{3e^3}+\frac{2(d+ex)^{5/2}\,(a+b\log(cx^n))}{5e^3}-\frac{32bd^2n\sqrt{d+ex}}{15e^3}+\frac{32bd^{5/2}}{}$$

```
[Out] (-32*b*d^2*n*Sqrt[d + e*x])/(15*e^3) + (28*b*d*n*(d + e*x)^(3/2))/(45*e^3)
- (4*b*n*(d + e*x)^(5/2))/(25*e^3) + (32*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/
Sqrt[d]])/(15*e^3) + (2*d^2*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^3 - (4*d*(d
 + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) + (2*(d + e*x)^(5/2)*(a + b*Log[c
*x^n]))/(5*e^3)
```

Rubi [A] time = 0.169124, antiderivative size = 169, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1261, 208}

$$\frac{2d^2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^3}-\frac{4d(d+ex)^{3/2}\,(a+b\log(cx^n))}{3e^3}+\frac{2(d+ex)^{5/2}\,(a+b\log(cx^n))}{5e^3}-\frac{32bd^2n\sqrt{d+ex}}{15e^3}+\frac{32bd^{5/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (-32*b*d^2*n*Sqrt[d + e*x])/(15*e^3) + (28*b*d*n*(d + e*x)^(3/2))/(45*e^3)
- (4*b*n*(d + e*x)^(5/2))/(25*e^3) + (32*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/
Sqrt[d]])/(15*e^3) + (2*d^2*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^3 - (4*d*(d
 + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) + (2*(d + e*x)^(5/2)*(a + b*Log[c
*x^n]))/(5*e^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^2 (a + b\log(cx^n))}{\sqrt{d + ex}} dx = \frac{2d^2\sqrt{d + ex}(a + b\log(cx^n))}{e^3} - \frac{4d(d + ex)^{3/2}(a + b\log(cx^n))}{3e^3} + \frac{2(d + ex)^{5/2}(a + b\log(cx^n))}{5e^3}$$

$$= \frac{2d^2\sqrt{d + ex}(a + b\log(cx^n))}{e^3} - \frac{4d(d + ex)^{3/2}(a + b\log(cx^n))}{3e^3} + \frac{2(d + ex)^{5/2}(a + b\log(cx^n))}{5e^3}$$

$$= \frac{2d^2\sqrt{d + ex}(a + b\log(cx^n))}{e^3} - \frac{4d(d + ex)^{3/2}(a + b\log(cx^n))}{3e^3} + \frac{2(d + ex)^{5/2}(a + b\log(cx^n))}{5e^3}$$

$$= \frac{2d^2\sqrt{d + ex}(a + b\log(cx^n))}{e^3} - \frac{4d(d + ex)^{3/2}(a + b\log(cx^n))}{3e^3} + \frac{2(d + ex)^{5/2}(a + b\log(cx^n))}{5e^3}$$

$$= -\frac{32bd^2n\sqrt{d + ex}}{15e^3} + \frac{28bdn(d + ex)^{3/2}}{45e^3} - \frac{4bn(d + ex)^{5/2}}{25e^3} + \frac{2d^2\sqrt{d + ex}(a + b\log(cx^n))}{e^3} - 4d($$

$$= -\frac{32bd^2n\sqrt{d + ex}}{15e^3} + \frac{28bdn(d + ex)^{3/2}}{45e^3} - \frac{4bn(d + ex)^{5/2}}{25e^3} + \frac{32bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{15e^3} + 2d^2\sqrt{d}$$

Mathematica [A] time = 0.175731, size = 118, normalized size = 0.7

$$\frac{2\sqrt{d + ex}\left(15a\left(8d^2 - 4dex + 3e^2x^2\right) + 15b\left(8d^2 - 4dex + 3e^2x^2\right)\log(cx^n) - 2bn\left(94d^2 - 17dex + 9e^2x^2\right)\right) + 480bd^{5/2}n\tan}{225e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (480*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(15*a*(8*
d^2 - 4*d*e*x + 3*e^2*x^2) - 2*b*n*(94*d^2 - 17*d*e*x + 9*e^2*x^2) + 15*b*(
8*d^2 - 4*d*e*x + 3*e^2*x^2)*Log[c*x^n]))/(225*e^3)
```

Maple [F] time = 0.598, size = 0, normalized size = 0.

$$\int x^2 (a + b\ln(cx^n)) \frac{1}{\sqrt{ex + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x+d)^(1/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(e*x+d)^(1/2),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(x^2*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.45459, size = 748, normalized size = 4.43

$$\left[\frac{2\left(120\,bd^{\frac{5}{2}}n\log\left(\frac{ex+2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)-\left(188\,bd^{2}n-120\,ad^{2}+9\left(2\,be^{2}n-5\,ae^{2}\right)x^{2}-2\,(17\,bden-30\,ade)x-15\left(3\,be^{2}x^{2}-\right.\right.}{225\,e^{3}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/225*(120*b*d^(5/2)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) - (188
*b*d^2*n - 120*a*d^2 + 9*(2*b*e^2*n - 5*a*e^2)*x^2 - 2*(17*b*d*e*n - 30*a*d
*e)*x - 15*(3*b*e^2*x^2 - 4*b*d*e*x + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*x^2 -
 4*b*d*e*n*x + 8*b*d^2*n)*log(x))*sqrt(e*x + d))/e^3, -2/225*(240*b*sqrt(-d
)*d^2*n*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (188*b*d^2*n - 120*a*d^2 + 9*(2*
b*e^2*n - 5*a*e^2)*x^2 - 2*(17*b*d*e*n - 30*a*d*e)*x - 15*(3*b*e^2*x^2 - 4*
b*d*e*x + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*x^2 - 4*b*d*e*n*x + 8*b*d^2*n)*lo
g(x))*sqrt(e*x + d))/e^3]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^2}{\sqrt{ex + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/sqrt(e*x + d), x)
```

3.146 $\int \frac{x(a+b\log(cx^n))}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=119

$$-\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^2}+\frac{8bdn\sqrt{d+ex}}{3e^2}-\frac{4bn(d+ex)^{3/}}{9e^2}$$

```
[Out] (8*b*d*n*Sqrt[d + e*x])/(3*e^2) - (4*b*n*(d + e*x)^(3/2))/(9*e^2) - (8*b*d^
(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e^2) - (2*d*Sqrt[d + e*x]*(a + b
*Log[c*x^n]))/e^2 + (2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2)
```

Rubi [A] time = 0.0912596, antiderivative size = 119, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 2350, 12, 80, 50, 63, 208}

$$-\frac{2d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^2}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^2}+\frac{8bdn\sqrt{d+ex}}{3e^2}-\frac{4bn(d+ex)^{3/}}{9e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (8*b*d*n*Sqrt[d + e*x])/(3*e^2) - (4*b*n*(d + e*x)^(3/2))/(9*e^2) - (8*b*d^
(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e^2) - (2*d*Sqrt[d + e*x]*(a + b
*Log[c*x^n]))/e^2 + (2*(d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
```

```
IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x\,(a+b\log(cx^n))}{\sqrt{d+ex}}\,dx = -\frac{2d\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} + \frac{2(d+ex)^{3/2}\,(a+b\log(cx^n))}{3e^2} - (bn)\int \frac{2(-2d+ex)\sqrt{d+ex}}{3e^2x}$$

$$= -\frac{2d\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} + \frac{2(d+ex)^{3/2}\,(a+b\log(cx^n))}{3e^2} - \frac{(2bn)\int \frac{(-2d+ex)\sqrt{d+ex}}{x}\,dx}{3e^2}$$

$$= -\frac{4bn(d+ex)^{3/2}}{9e^2} - \frac{2d\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} + \frac{2(d+ex)^{3/2}\,(a+b\log(cx^n))}{3e^2} + \frac{(4bdn)\int}{3e^2}$$

$$= \frac{8bdn\sqrt{d+ex}}{3e^2} - \frac{4bn(d+ex)^{3/2}}{9e^2} - \frac{2d\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} + \frac{2(d+ex)^{3/2}\,(a+b\log(cx^n))}{3e^2}$$

$$= \frac{8bdn\sqrt{d+ex}}{3e^2} - \frac{4bn(d+ex)^{3/2}}{9e^2} - \frac{2d\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} + \frac{2(d+ex)^{3/2}\,(a+b\log(cx^n))}{3e^2}$$

$$= \frac{8bdn\sqrt{d+ex}}{3e^2} - \frac{4bn(d+ex)^{3/2}}{9e^2} - \frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^2} - \frac{2d\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} + \frac{2}{}$$

Mathematica [A] time = 0.0996774, size = 80, normalized size = 0.67

$$-\frac{2\left(\sqrt{d+ex}\,(6ad-3aex+b(6d-3ex)\log(cx^n)-10bdn+2benx)+12bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\right)}{9e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x],x]
```

```
[Out] (-2*(12*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + Sqrt[d + e*x]*(6*a*d -
 10*b*d*n - 3*a*e*x + 2*b*e*n*x + b*(6*d - 3*e*x)*Log[c*x^n])))/(9*e^2)
```

Maple [F] time = 0.551, size = 0, normalized size = 0.

$$\int x\,(a+b\ln(cx^n))\,\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x+d)^(1/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))/(e*x+d)^(1/2),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(x*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.34229, size = 494, normalized size = 4.15

$$\left[\frac{2\left(6\,bd^{\frac{3}{2}}n\log\left(\frac{ex-2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)+(10\,bdn-6\,ad-(2\,ben-3\,ae)x+3\,(bex-2\,bd)\log(c)+3\,(benx-2\,bdn)\log(x))\sqrt{ex\right.}{9\,e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2/9*(6*b*d^(3/2)*n*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (10*b*d*
n - 6*a*d - (2*b*e*n - 3*a*e)*x + 3*(b*e*x - 2*b*d)*log(c) + 3*(b*e*n*x - 2
*b*d*n)*log(x))*sqrt(e*x + d))/e^2, 2/9*(12*b*sqrt(-d)*d*n*arctan(sqrt(e*x
+ d)*sqrt(-d)/d) + (10*b*d*n - 6*a*d - (2*b*e*n - 3*a*e)*x + 3*(b*e*x - 2*b
*d)*log(c) + 3*(b*e*n*x - 2*b*d*n)*log(x))*sqrt(e*x + d))/e^2]
```

Sympy [A] time = 123.661, size = 473, normalized size = 3.97

$$\begin{cases} -\frac{-\frac{2ad\left(-\frac{d}{\sqrt{d+ex}}-\sqrt{d+ex}\right)}{e}+\frac{2a\left(\frac{d^2}{\sqrt{d+ex}}+2d\sqrt{d+ex}-\frac{(d+ex)^{\frac{3}{2}}}{3}\right)}{e}+\frac{2bd\left(-d\left(\frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}-\frac{2n\,\mathrm{atan}\left(\frac{1}{\sqrt{-\frac{1}{d}}\sqrt{d+ex}}\right)}{d\sqrt{-\frac{1}{d}}}\right)-\sqrt{d+ex}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)-\frac{2n\left(-e\sqrt{d+ex}-\frac{e\,\mathrm{atan}\left(\frac{1}{\sqrt{-\frac{1}{d}}\sqrt{d\cdots}}\right)}{\sqrt{-\frac{1}{d}}}\cdots\right.}{e}\cdots\right.}{e}\cdots}{\cdots} \\ \frac{\frac{ax^2}{2}+b\left(-\frac{nx^2}{4}+\frac{x^2\log\left(cx^n\right)}{2}\right)}{\sqrt{d}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Piecewise((-(2*a*d*(-d/sqrt(d + e*x) - sqrt(d + e*x))/e + 2*a*(d**2/sqrt(d
+ e*x) + 2*d*sqrt(d + e*x) - (d + e*x)**(3/2)/3)/e + 2*b*d*(-d*(log(c*(-d/e
 + (d + e*x)/e)**n)/sqrt(d + e*x) - 2*n*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/
(d*sqrt(-1/d))) - sqrt(d + e*x)*log(c*(-d/e + (d + e*x)/e)**n) - 2*n*(-e*sq
rt(d + e*x) - e*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/sqrt(-1/d))/e)/e + 2*b*(
d**2*(log(c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x) - 2*n*atan(1/(sqrt(-1/d)
*sqrt(d + e*x)))/(d*sqrt(-1/d))) - 2*d*(-sqrt(d + e*x)*log(c*(-d/e + (d + e
*x)/e)**n) - 2*n*(-e*sqrt(d + e*x) - e*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/s
qrt(-1/d))/e) - (d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(-d
*e*sqrt(d + e*x) - d*e*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/sqrt(-1/d) - e*(d
 + e*x)**(3/2)/3)/(3*e))/e)/e, Ne(e, 0)), ((a*x**2/2 + b*(-n*x**2/4 + x**2*
log(c*x**n)/2))/sqrt(d), True))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)x}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/sqrt(e*x + d), x)
```

3.147 $\int \frac{a+b\log(cx^n)}{\sqrt{d+ex}}\,dx$

Optimal. Leaf size=69

$$\frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e}-\frac{4bn\sqrt{d+ex}}{e}+\frac{4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e}$$

```
[Out] (-4*b*n*Sqrt[d + e*x])/e + (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/e
 + (2*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e
```

Rubi [A] time = 0.0337705, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {2319, 50, 63, 208}

$$\frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e}-\frac{4bn\sqrt{d+ex}}{e}+\frac{4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/Sqrt[d + e*x],x]
```

```
[Out] (-4*b*n*Sqrt[d + e*x])/e + (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/e
 + (2*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
```

```
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\log(cx^n)}{\sqrt{d+ex}}\,dx &= \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e} - \frac{(2bn)\int \frac{\sqrt{d+ex}}{x}\,dx}{e} \\
&= -\frac{4bn\sqrt{d+ex}}{e} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e} - \frac{(2bdn)\int \frac{1}{x\sqrt{d+ex}}\,dx}{e} \\
&= -\frac{4bn\sqrt{d+ex}}{e} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e} - \frac{(4bdn)\,\mathrm{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx, x, \sqrt{d+ex}\right)}{e^2} \\
&= -\frac{4bn\sqrt{d+ex}}{e} + \frac{4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e}
\end{aligned}
$$

Mathematica [A] time = 0.0471237, size = 55, normalized size = 0.8

$$
\frac{2\sqrt{d+ex}\,(a+b\log(cx^n)-2bn)+4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/Sqrt[d + e*x],x]
```

```
[Out] (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 2*Sqrt[d + e*x]*(a - 2*b*n
+ b*Log[c*x^n]))/e
```

Maple [A] time = 0.049, size = 70, normalized size = 1.

$$4\frac{\sqrt{d}bn}{e}\mathrm{Artanh}\left(\frac{\sqrt{ex+d}}{\sqrt{d}}\right)+2\frac{\sqrt{ex+d}b\ln\left(cx^{n}\right)}{e}-4\frac{bn\sqrt{ex+d}}{e}+2\frac{\sqrt{ex+d}a}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x+d)^(1/2),x)
```

```
[Out] 4*b*n*arctanh((e*x+d)^(1/2)/d^(1/2))*d^(1/2)/e+2/e*(e*x+d)^(1/2)*b*ln(c*x^n
)-4*b*n*(e*x+d)^(1/2)/e+2/e*(e*x+d)^(1/2)*a
```

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((a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.41235, size = 308, normalized size = 4.46

$$\left[\frac{2\left(b\sqrt{d}n\log\left(\frac{ex+2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)+(bn\log(x)-2bn+b\log(c)+a)\sqrt{ex+d}\right)}{e}, -\frac{2\left(2b\sqrt{-d}n\arctan\left(\frac{\sqrt{ex+d}\sqrt{-d}}{d}\right)-(bn\log\right.}{e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [2*(b*sqrt(d)*n*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x) + (b*n*log(x)
- 2*b*n + b*log(c) + a)*sqrt(e*x + d))/e, -2*(2*b*sqrt(-d)*n*arctan(sqrt(e*
x + d)*sqrt(-d)/d) - (b*n*log(x) - 2*b*n + b*log(c) + a)*sqrt(e*x + d))/e]
```

Sympy [A] time = 17.7907, size = 252, normalized size = 3.65

$$\begin{cases} -\frac{\frac{2ad}{\sqrt{d+ex}}+2a\left(-\frac{d}{\sqrt{d+ex}}-\sqrt{d+ex}\right)+2bd\left(\frac{\log(cx^n)}{\sqrt{d+ex}}-\frac{2n\operatorname{atan}\left(\frac{1}{\sqrt{-\frac{1}{d}}\sqrt{d+ex}}\right)}{d\sqrt{-\frac{1}{d}}}\right)+2b\left(-d\left(\frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}-\frac{2n\operatorname{atan}\left(\frac{1}{\sqrt{-\frac{1}{d}}\sqrt{d+ex}}\right)}{d\sqrt{-\frac{1}{d}}}\right)-\sqrt{d+ex}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)-\frac{2n\left(-e\sqrt{d+\ldots}\right.}{\ldots}\right.}{e} \\ \frac{ax+b(-nx+x\log(cx^n))}{\sqrt{d}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**(1/2),x)
```

```
[Out] Piecewise((-(2*a*d/sqrt(d + e*x) + 2*a*(-d/sqrt(d + e*x) - sqrt(d + e*x)) +
 2*b*d*(log(c*x**n)/sqrt(d + e*x) - 2*n*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/
(d*sqrt(-1/d))) + 2*b*(-d*(log(c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x) - 2
*n*atan(1/(sqrt(-1/d)*sqrt(d + e*x)))/(d*sqrt(-1/d))) - sqrt(d + e*x)*log(c
*(-d/e + (d + e*x)/e)**n) - 2*n*(-e*sqrt(d + e*x) - e*atan(1/(sqrt(-1/d)*sq
rt(d + e*x)))/sqrt(-1/d))/e))/e, Ne(e, 0)), ((a*x + b*(-n*x + x*log(c*x**n)
))/sqrt(d), True))
```

Giac [A] time = 1.25156, size = 105, normalized size = 1.52

$$-2\left(\left(\frac{2\,d\arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right)}{\sqrt{-d}}-\sqrt{xe+d}\log(x)+2\sqrt{xe+d}\right)bn-\sqrt{xe+d}b\log(c)-\sqrt{xe+d}a\right)e^{(-1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] -2*((2*d*arctan(sqrt(x*e + d)/sqrt(-d))/sqrt(-d) - sqrt(x*e + d)*log(x) + 2
*sqrt(x*e + d))*b*n - sqrt(x*e + d)*b*log(c) - sqrt(x*e + d)*a)*e^(-1)
```

3.148 $\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx$

Optimal. Leaf size=152

$$-\frac{2bn\mathrm{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)\mathrm{tan}}{\sqrt{d}}$$

```
[Out] (2*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/Sqrt[d] - (2*ArcTanh[Sqrt[d + e*x]
/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[d] - (4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d
]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/Sqrt[d] - (2*b*n*PolyLog[2,
1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/Sqrt[d]
```

Rubi [A] time = 0.198971, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {63, 208, 2348, 12, 5984, 5918, 2402, 2315}

$$-\frac{2bn\mathrm{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)\mathrm{tan}}{\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x]),x]
```

```
[Out] (2*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/Sqrt[d] - (2*ArcTanh[Sqrt[d + e*x]
/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[d] - (4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d
]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/Sqrt[d] - (2*b*n*PolyLog[2,
1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/Sqrt[d]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx = -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} - (bn)\int -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}x}\,dx$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} + \frac{(2bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}}$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} + \frac{(4bn)\,\text{Subst}\left(\int \frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx, x, \sqrt{d+ex}\right)}{\sqrt{d}}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} - \frac{(4bn)\,\text{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{1-\frac{x}{\sqrt{d}}}\,dx, x, \sqrt{d}\right.}{d}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{\sqrt{d}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{\sqrt{d}}$$

Mathematica [A] time = 0.092909, size = 249, normalized size = 1.64

$$\frac{-bn\left(2\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(\log\left(\sqrt{d}-\sqrt{d+ex}\right)+2\log\left(\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)\right)\right)+bn\left(2\text{PolyLog}\left(\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x]),x]
```

```
[Out] (2*(a + b*Log[c*x^n])*Log[Sqrt[d] - Sqrt[d + e*x]] - 2*(a + b*Log[c*x^n])*L
og[Sqrt[d] + Sqrt[d + e*x]] - b*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*(Log[Sqrt[d
```

```
] - Sqrt[d + e*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*PolyLog[2, 1
/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + b*n*(Log[Sqrt[d] + Sqrt[d + e*x]]*(Log[S
qrt[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + 2*PolyL
og[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/(2*Sqrt[d])
```

Maple [F] time = 0.532, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x} \frac{1}{\sqrt{ex + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(e*x+d)^(1/2),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((a+b*log(c*x^n))/x/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex + d}b\log(cx^n) + \sqrt{ex + d}a}{ex^2 + dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e*x^2 + d*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b \log(cx^n)}{x\sqrt{d + ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x*sqrt(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{\sqrt{ex + d}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*x), x)
```

3.149 $\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex}}\,dx$

Optimal. Leaf size=226

$$\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}+\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}-\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx}-\frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}}-$$

```
[Out] -((b*n*Sqrt[d + e*x])/(d*x)) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(3/
2) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/d^(3/2) - (Sqrt[d + e*x]*(a +
 b*Log[c*x^n]))/(d*x) + (e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]
))/d^(3/2) + (2*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[
d] - Sqrt[d + e*x])])/d^(3/2) + (b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d]
- Sqrt[d + e*x])])/d^(3/2)
```

Rubi [A] time = 0.270374, antiderivative size = 226, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {51, 63, 208, 2350, 14, 47, 5984, 5918, 2402, 2315}

$$\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}+\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}-\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx}-\frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x]),x]
```



```
[Out] -((b*n*Sqrt[d + e*x])/(d*x)) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(3/
2) - (b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/d^(3/2) - (Sqrt[d + e*x]*(a +
 b*Log[c*x^n]))/(d*x) + (e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]
))/d^(3/2) + (2*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[
d] - Sqrt[d + e*x])])/d^(3/2) + (b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d]
- Sqrt[d + e*x])])/d^(3/2)
```


Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
```

```
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
```

```
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex}}\,dx = -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} - (bn)\int \frac{-\frac{\sqrt{d+ex}}{d} + \frac{ex\tanh^{-1}\left(\frac{\sqrt{d+}}{\sqrt{d}}\right.}{d^{3/2}}}{x^2}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} - (bn)\int\left(-\frac{\sqrt{d+ex}}{dx^2} + \frac{e\tanh^{-}}{d^{3}}\right.$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{(bn)\int\frac{\sqrt{d+ex}}{x^2}\,dx}{d} - \frac{(ben)\int \frac{\tan}{}}{d}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} - \frac{(2ben)\,\text{Subst}\left(\int\right.}{}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(}{d^{3/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh}{}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh}{}$$

$$= -\frac{bn\sqrt{d+ex}}{dx} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} - \frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{dx} + \frac{e\tanh}{}$$

Mathematica [A] time = 0.245857, size = 392, normalized size = 1.73

$$-\frac{-2benx\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+2benx\text{PolyLog}\left(2,\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)+4a\sqrt{d}\sqrt{d+ex}+2aex\log\left(\sqrt{d}-\sqrt{d+ex}\right)-2ae}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x]),x]
```

```
[Out] -(4*a*Sqrt[d]*Sqrt[d + e*x] + 4*b*Sqrt[d]*n*Sqrt[d + e*x] + 4*b*e*n*x*ArcTa
nh[Sqrt[d + e*x]/Sqrt[d]] + 4*b*Sqrt[d]*Sqrt[d + e*x]*Log[c*x^n] + 2*a*e*x*
Log[Sqrt[d] - Sqrt[d + e*x]] + 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*
x]] - b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]^2 - 2*a*e*x*Log[Sqrt[d] + Sqrt[d
 + e*x]] - 2*b*e*x*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] + b*e*n*x*Log[Sq
rt[d] + Sqrt[d + e*x]]^2 + 2*b*e*n*x*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 -
 Sqrt[d + e*x]/(2*Sqrt[d])] - 2*b*e*n*x*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(1
 + Sqrt[d + e*x]/Sqrt[d])/2] - 2*b*e*n*x*PolyLog[2, 1/2 - Sqrt[d + e*x]/(2*
Sqrt[d])] + 2*b*e*n*x*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])/(4*d^(3/2)
*x)
```

Maple [F] time = 0.535, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^2}\frac{1}{\sqrt{ex + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^2/(e*x+d)^(1/2),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((a+b*log(c*x^n))/x^2/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex + d}b\log(cx^n) + \sqrt{ex + d}a}{ex^3 + dx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e*x^3 + d*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{x^2\sqrt{d + ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*sqrt(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{\sqrt{ex + d}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*x^2), x)
```

3.150 $\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex}}\,dx$

Optimal. Leaf size=304

$$-\frac{3be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4d^{5/2}}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{5/2}}+\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}-\frac{\sqrt{d+ex}\,(a+b}{2dx^2}$$

```
[Out] -(b*n*Sqrt[d + e*x])/(4*d*x^2) + (5*b*e*n*Sqrt[d + e*x])/(8*d^2*x) + (7*b*e
^2*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*d^(5/2)) + (3*b*e^2*n*ArcTanh[Sqrt[
d + e*x]/Sqrt[d]]^2)/(4*d^(5/2)) - (Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(2*d*
x^2) + (3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*d^2*x) - (3*e^2*ArcTanh[Sq
rt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/(4*d^(5/2)) - (3*b*e^2*n*ArcTanh[S
qrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*d^(5/2
)) - (3*b*e^2*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*d
^(5/2))
```

Rubi [A] time = 0.336228, antiderivative size = 304, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {51, 63, 208, 2350, 12, 14, 47, 5984, 5918, 2402, 2315}

$$-\frac{3be^2n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{4d^{5/2}}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{5/2}}+\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}-\frac{\sqrt{d+ex}\,(a+b}{2dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x]),x]
```


```
[Out] -(b*n*Sqrt[d + e*x])/(4*d*x^2) + (5*b*e*n*Sqrt[d + e*x])/(8*d^2*x) + (7*b*e
^2*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(8*d^(5/2)) + (3*b*e^2*n*ArcTanh[Sqrt[
d + e*x]/Sqrt[d]]^2)/(4*d^(5/2)) - (Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(2*d*
x^2) + (3*e*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(4*d^2*x) - (3*e^2*ArcTanh[Sq
rt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/(4*d^(5/2)) - (3*b*e^2*n*ArcTanh[S
qrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(2*d^(5/2
)) - (3*b*e^2*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/(4*d
^(5/2))
```


Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
```

```
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
```

```
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex}}\,dx = -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2}+\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{5/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2}+\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{5/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2}+\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{5/2}}$$

$$= -\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2}+\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}-\frac{3e^2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{4d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2}+\frac{3ben\sqrt{d+ex}}{4d^2x}-\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2}+\frac{3e\sqrt{d+ex}\,(a+b\log(cx^n))}{4d^2x}-\frac{3e^2\text{ta}}{}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2}+\frac{5ben\sqrt{d+ex}}{8d^2x}+\frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}}-\frac{\sqrt{d+ex}\,(a+b\log(cx^n))}{2dx^2}+\frac{3e\sqrt{d+ex}}{}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2}+\frac{5ben\sqrt{d+ex}}{8d^2x}+\frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{4d^{5/2}}+\frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}}-\frac{\sqrt{d+ex}\,(a+}{2d}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2}+\frac{5ben\sqrt{d+ex}}{8d^2x}+\frac{7be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{5/2}}+\frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}}-\frac{\sqrt{d+ex}\,(a+}{2d}$$

$$= -\frac{bn\sqrt{d+ex}}{4dx^2}+\frac{5ben\sqrt{d+ex}}{8d^2x}+\frac{7be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{8d^{5/2}}+\frac{3be^2n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{4d^{5/2}}-\frac{\sqrt{d+ex}\,(a+}{2d}$$

Mathematica [A] time = 0.341853, size = 501, normalized size = 1.65

$$\frac{-6be^2nx^2\text{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+6be^2nx^2\text{PolyLog}\left(2,\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)-8ad^{3/2}\sqrt{d+ex}+6ae^2x^2\log\left(\sqrt{d}-\sqrt{d+ex}\right)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x]),x]
```

```
[Out] (-8*a*d^(3/2)*Sqrt[d + e*x] - 4*b*d^(3/2)*n*Sqrt[d + e*x] + 12*a*Sqrt[d]*e*
x*Sqrt[d + e*x] + 10*b*Sqrt[d]*e*n*x*Sqrt[d + e*x] + 14*b*e^2*n*x^2*ArcTanh
[Sqrt[d + e*x]/Sqrt[d]] - 8*b*d^(3/2)*Sqrt[d + e*x]*Log[c*x^n] + 12*b*Sqrt[
d]*e*x*Sqrt[d + e*x]*Log[c*x^n] + 6*a*e^2*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]
+ 6*b*e^2*x^2*Log[c*x^n]*Log[Sqrt[d] - Sqrt[d + e*x]] - 3*b*e^2*n*x^2*Log[S
qrt[d] - Sqrt[d + e*x]]^2 - 6*a*e^2*x^2*Log[Sqrt[d] + Sqrt[d + e*x]] - 6*b*
e^2*x^2*Log[c*x^n]*Log[Sqrt[d] + Sqrt[d + e*x]] + 3*b*e^2*n*x^2*Log[Sqrt[d]
 + Sqrt[d + e*x]]^2 + 6*b*e^2*n*x^2*Log[Sqrt[d] + Sqrt[d + e*x]]*Log[1/2 -
Sqrt[d + e*x]/(2*Sqrt[d])] - 6*b*e^2*n*x^2*Log[Sqrt[d] - Sqrt[d + e*x]]*Log
[(1 + Sqrt[d + e*x]/Sqrt[d])/2] - 6*b*e^2*n*x^2*PolyLog[2, 1/2 - Sqrt[d + e
*x]/(2*Sqrt[d])] + 6*b*e^2*n*x^2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2])
/(16*d^(5/2)*x^2)
```

Maple [F] time = 0.513, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^3} \frac{1}{\sqrt{ex + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^3/(e*x+d)^(1/2),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((a+b*log(c*x^n))/x^3/(e*x+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex+d}b\log\left(cx^{n}\right)+\sqrt{ex+d}a}{ex^{4}+dx^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e*x^4 + d*x^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\log\left(cx^{n}\right)}{x^{3}\sqrt{d+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**3*sqrt(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex+d}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*x^3), x)
```

3.151 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=194

$$\frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}}+\frac{6d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-44$$

```
[Out] (-44*b*d^2*n*Sqrt[d + e*x])/(5*e^4) + (16*b*d*n*(d + e*x)^(3/2))/(15*e^4) -
 (4*b*n*(d + e*x)^(5/2))/(25*e^4) + (64*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/S
qrt[d]])/(5*e^4) + (2*d^3*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x]) + (6*d^2*
Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^4 - (2*d*(d + e*x)^(3/2)*(a + b*Log[c*x
^n]))/e^4 + (2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4)
```

Rubi [A] time = 0.195251, antiderivative size = 194, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 1620, 63, 208}

$$\frac{2d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex}}+\frac{6d^2\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{2d(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{2(d+ex)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-44$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```


```
[Out] (-44*b*d^2*n*Sqrt[d + e*x])/(5*e^4) + (16*b*d*n*(d + e*x)^(3/2))/(15*e^4) -
 (4*b*n*(d + e*x)^(5/2))/(25*e^4) + (64*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x]/S
qrt[d]])/(5*e^4) + (2*d^3*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x]) + (6*d^2*
Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^4 - (2*d*(d + e*x)^(3/2)*(a + b*Log[c*x
^n]))/e^4 + (2*(d + e*x)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4)
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^3 (a + b \log (cx^n))}{(d + ex)^{3/2}} dx = \frac{2d^3 (a + b \log (cx^n))}{e^4 \sqrt{d + ex}} + \frac{6d^2 \sqrt{d + ex} (a + b \log (cx^n))}{e^4} - \frac{2d(d + ex)^{3/2} (a + b \log (cx^n))}{e^4} + \frac{2(d +}{}$$

$$= \frac{2d^3 (a + b \log (cx^n))}{e^4 \sqrt{d + ex}} + \frac{6d^2 \sqrt{d + ex} (a + b \log (cx^n))}{e^4} - \frac{2d(d + ex)^{3/2} (a + b \log (cx^n))}{e^4} + \frac{2(d +}{}$$

$$= \frac{2d^3 (a + b \log (cx^n))}{e^4 \sqrt{d + ex}} + \frac{6d^2 \sqrt{d + ex} (a + b \log (cx^n))}{e^4} - \frac{2d(d + ex)^{3/2} (a + b \log (cx^n))}{e^4} + \frac{2(d +}{}$$

$$= -\frac{44bd^2 n \sqrt{d + ex}}{5e^4} + \frac{16bdn(d + ex)^{3/2}}{15e^4} - \frac{4bn(d + ex)^{5/2}}{25e^4} + \frac{2d^3 (a + b \log (cx^n))}{e^4 \sqrt{d + ex}} + \frac{6d^2 \sqrt{d + ex}}{}$$

$$= -\frac{44bd^2 n \sqrt{d + ex}}{5e^4} + \frac{16bdn(d + ex)^{3/2}}{15e^4} - \frac{4bn(d + ex)^{5/2}}{25e^4} + \frac{2d^3 (a + b \log (cx^n))}{e^4 \sqrt{d + ex}} + \frac{6d^2 \sqrt{d + ex}}{}$$

$$= -\frac{44bd^2 n \sqrt{d + ex}}{5e^4} + \frac{16bdn(d + ex)^{3/2}}{15e^4} - \frac{4bn(d + ex)^{5/2}}{25e^4} + \frac{64bd^{5/2} n \tanh^{-1} \left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{5e^4} + \frac{2d^3 (a -}{e^4}$$

Mathematica [A] time = 0.118449, size = 159, normalized size = 0.82

$$\frac{240ad^2 ex + 480ad^3 - 60ade^2 x^2 + 30ae^3 x^3 + 30b \left(8d^2 ex + 16d^3 - 2de^2 x^2 + e^3 x^3\right) \log (cx^n) - 536bd^2 enx + 960bd^{5/2} n \sqrt{d +}}{75e^4 \sqrt{d + ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (480*a*d^3 - 592*b*d^3*n + 240*a*d^2*e*x - 536*b*d^2*e*n*x - 60*a*d*e^2*x^2
 + 44*b*d*e^2*n*x^2 + 30*a*e^3*x^3 - 12*b*e^3*n*x^3 + 960*b*d^(5/2)*n*Sqrt[
d + e*x]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + 30*b*(16*d^3 + 8*d^2*e*x - 2*d*e^
2*x^2 + e^3*x^3)*Log[c*x^n])/(75*e^4*Sqrt[d + e*x])
```

Maple [F] time = 0.502, size = 0, normalized size = 0.

$$\int x^3 (a + b \ln (cx^n)) (ex + d)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x+d)^(3/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(e*x+d)^(3/2),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(x^3*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.59731, size = 1031, normalized size = 5.31

$$\left[\frac{2\left(240\left(bd^2enx+bd^3n\right)\sqrt{d}\log\left(\frac{ex+2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)-\left(296\,bd^3n-240\,ad^3+3\left(2\,be^3n-5\,ae^3\right)x^3-2\left(11\,bde^2n-15\,ade^2\right)\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2/75*(240*(b*d^2*e*n*x + b*d^3*n)*sqrt(d)*log((e*x + 2*sqrt(e*x + d)*sqrt(
d) + 2*d)/x) - (296*b*d^3*n - 240*a*d^3 + 3*(2*b*e^3*n - 5*a*e^3)*x^3 - 2*(
11*b*d*e^2*n - 15*a*d*e^2)*x^2 + 4*(67*b*d^2*e*n - 30*a*d^2*e)*x - 15*(b*e^
3*x^3 - 2*b*d*e^2*x^2 + 8*b*d^2*e*x + 16*b*d^3)*log(c) - 15*(b*e^3*n*x^3 -
2*b*d*e^2*n*x^2 + 8*b*d^2*e*n*x + 16*b*d^3*n)*log(x))*sqrt(e*x + d))/(e^5*x
 + d*e^4), -2/75*(480*(b*d^2*e*n*x + b*d^3*n)*sqrt(-d)*arctan(sqrt(e*x + d)
*sqrt(-d)/d) + (296*b*d^3*n - 240*a*d^3 + 3*(2*b*e^3*n - 5*a*e^3)*x^3 - 2*(
11*b*d*e^2*n - 15*a*d*e^2)*x^2 + 4*(67*b*d^2*e*n - 30*a*d^2*e)*x - 15*(b*e^
3*x^3 - 2*b*d*e^2*x^2 + 8*b*d^2*e*x + 16*b*d^3)*log(c) - 15*(b*e^3*n*x^3 -
2*b*d*e^2*n*x^2 + 8*b*d^2*e*n*x + 16*b*d^3*n)*log(x))*sqrt(e*x + d))/(e^5*x
 + d*e^4)]
```

Sympy [A] time = 66.9555, size = 386, normalized size = 1.99

$$-\frac{-\frac{2ad^3}{\sqrt{d+ex}} - 6ad^2\sqrt{d+ex} + 2ad\,(d+ex)^{\frac{3}{2}} - \frac{2a(d+ex)^{\frac{5}{2}}}{5} + 2bd^3\left(\frac{2n\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}} - \frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}\right) - 6bd^2\left(\sqrt{d+ex}\log\left(c\left(-\frac{d}{e}\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] -(-2*a*d**3/sqrt(d + e*x) - 6*a*d**2*sqrt(d + e*x) + 2*a*d*(d + e*x)**(3/2)
 - 2*a*(d + e*x)**(5/2)/5 + 2*b*d**3*(2*n*atan(sqrt(d + e*x)/sqrt(-d))/sqrt
(-d) - log(c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x)) - 6*b*d**2*(sqrt(d + e
*x)*log(c*(-d/e + (d + e*x)/e)**n) - 2*n*(d*e*atan(sqrt(d + e*x)/sqrt(-d))/
sqrt(-d) + e*sqrt(d + e*x))/e) + 6*b*d*((d + e*x)**(3/2)*log(c*(-d/e + (d +
 e*x)/e)**n)/3 - 2*n*(d**2*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sq
rt(d + e*x) + e*(d + e*x)**(3/2)/3)/(3*e)) - 2*b*((d + e*x)**(5/2)*log(c*(-
d/e + (d + e*x)/e)**n)/5 - 2*n*(d**3*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d
) + d**2*e*sqrt(d + e*x) + d*e*(d + e*x)**(3/2)/3 + e*(d + e*x)**(5/2)/5)/(
5*e)))/e**4
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^3}{(ex+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x + d)^(3/2), x)
```

3.152 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=146

$$-\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}}-\frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{32bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^3}+\frac{20bd$$

```
[Out] (20*b*d*n*Sqrt[d + e*x])/(3*e^3) - (4*b*n*(d + e*x)^(3/2))/(9*e^3) - (32*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e^3) - (2*d^2*(a + b*Log[c*x^n
]))/(e^3*Sqrt[d + e*x]) - (4*d*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^3 + (2*(
d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3)
```

Rubi [A] time = 0.161974, antiderivative size = 146, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {43, 2350, 12, 897, 1153, 208}

$$-\frac{2d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex}}-\frac{4d\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{2(d+ex)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{32bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^3}+\frac{20bd$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```


```
[Out] (20*b*d*n*Sqrt[d + e*x])/(3*e^3) - (4*b*n*(d + e*x)^(3/2))/(9*e^3) - (32*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(3*e^3) - (2*d^2*(a + b*Log[c*x^n
]))/(e^3*Sqrt[d + e*x]) - (4*d*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/e^3 + (2*(
d + e*x)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3)
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^2 (a + b \log (cx^n))}{(d + ex)^{3/2}} dx = -\frac{2d^2 (a + b \log (cx^n))}{e^3 \sqrt{d + ex}} - \frac{4d\sqrt{d + ex} (a + b \log (cx^n))}{e^3} + \frac{2(d + ex)^{3/2} (a + b \log (cx^n))}{3e^3} - (bn)$$

$$= -\frac{2d^2 (a + b \log (cx^n))}{e^3 \sqrt{d + ex}} - \frac{4d\sqrt{d + ex} (a + b \log (cx^n))}{e^3} + \frac{2(d + ex)^{3/2} (a + b \log (cx^n))}{3e^3} - \frac{(2bn)}{}$$

$$= -\frac{2d^2 (a + b \log (cx^n))}{e^3 \sqrt{d + ex}} - \frac{4d\sqrt{d + ex} (a + b \log (cx^n))}{e^3} + \frac{2(d + ex)^{3/2} (a + b \log (cx^n))}{3e^3} - \frac{(4bn)}{}$$

$$= -\frac{2d^2 (a + b \log (cx^n))}{e^3 \sqrt{d + ex}} - \frac{4d\sqrt{d + ex} (a + b \log (cx^n))}{e^3} + \frac{2(d + ex)^{3/2} (a + b \log (cx^n))}{3e^3} - \frac{(4bn)}{}$$

$$= \frac{20bdn\sqrt{d + ex}}{3e^3} - \frac{4bn(d + ex)^{3/2}}{9e^3} - \frac{2d^2 (a + b \log (cx^n))}{e^3 \sqrt{d + ex}} - \frac{4d\sqrt{d + ex} (a + b \log (cx^n))}{e^3} + 2($$

$$= \frac{20bdn\sqrt{d + ex}}{3e^3} - \frac{4bn(d + ex)^{3/2}}{9e^3} - \frac{32bd^{3/2}n \tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{3e^3} - \frac{2d^2 (a + b \log (cx^n))}{e^3 \sqrt{d + ex}} - 4d\sqrt{}$$

Mathematica [A] time = 0.0897264, size = 124, normalized size = 0.85

$$\frac{-48ad^2 - 24adex + 6ae^2x^2 - 6b\left(8d^2 + 4dex - e^2x^2\right)\log (cx^n) - 96bd^{3/2}n\sqrt{d + ex}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right) + 56bd^2n + 52bdenx}{9e^3\sqrt{d + ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (-48*a*d^2 + 56*b*d^2*n - 24*a*d*e*x + 52*b*d*e*n*x + 6*a*e^2*x^2 - 4*b*e^2
*n*x^2 - 96*b*d^(3/2)*n*Sqrt[d + e*x]*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] - 6*b*
(8*d^2 + 4*d*e*x - e^2*x^2)*Log[c*x^n])/(9*e^3*Sqrt[d + e*x])
```

Maple [F] time = 0.557, size = 0, normalized size = 0.

$$\int x^2 (a + b \ln (cx^n)) (ex + d)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x+d)^(3/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(e*x+d)^(3/2),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(x^2*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.45716, size = 784, normalized size = 5.37

$$\left[\frac{2\left(24\left(bdenx+bd^2n\right)\sqrt{d}\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2d}{x}\right)+\left(28bd^2n-24ad^2-\left(2be^2n-3ae^2\right)x^2+2(13bden-6ade)x+3\left(be^2x\cdots\right.\right.\right.}{9\left(e^4x+de^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2/9*(24*(b*d*e*n*x + b*d^2*n)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) +
 2*d)/x) + (28*b*d^2*n - 24*a*d^2 - (2*b*e^2*n - 3*a*e^2)*x^2 + 2*(13*b*d*e
*n - 6*a*d*e)*x + 3*(b*e^2*x^2 - 4*b*d*e*x - 8*b*d^2)*log(c) + 3*(b*e^2*n*x
^2 - 4*b*d*e*n*x - 8*b*d^2*n)*log(x))*sqrt(e*x + d))/(e^4*x + d*e^3), 2/9*(
48*(b*d*e*n*x + b*d^2*n)*sqrt(-d)*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (28*b*
d^2*n - 24*a*d^2 - (2*b*e^2*n - 3*a*e^2)*x^2 + 2*(13*b*d*e*n - 6*a*d*e)*x +
 3*(b*e^2*x^2 - 4*b*d*e*x - 8*b*d^2)*log(c) + 3*(b*e^2*n*x^2 - 4*b*d*e*n*x
- 8*b*d^2*n)*log(x))*sqrt(e*x + d))/(e^4*x + d*e^3)]
```

Sympy [A] time = 60.8541, size = 262, normalized size = 1.79

$$\frac{-\frac{2ad^2}{\sqrt{d+ex}} - 4ad\sqrt{d+ex} + \frac{2a(d+ex)^{\frac{3}{2}}}{3} + 2bd^2\left(\frac{2n\,\mathrm{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}} - \frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}\right) - 4bd\left(\sqrt{d+ex}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right) - \frac{2n\left(\frac{de\ldots}{\ldots}\right.}{\ldots}\right.}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] (-2*a*d**2/sqrt(d + e*x) - 4*a*d*sqrt(d + e*x) + 2*a*(d + e*x)**(3/2)/3 + 2
*b*d**2*(2*n*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) - log(c*(-d/e + (d + e*x
)/e)**n)/sqrt(d + e*x)) - 4*b*d*(sqrt(d + e*x)*log(c*(-d/e + (d + e*x)/e)**
n) - 2*n*(d*e*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + e*sqrt(d + e*x))/e) +
 2*b*((d + e*x)**(3/2)*log(c*(-d/e + (d + e*x)/e)**n)/3 - 2*n*(d**2*e*atan(
sqrt(d + e*x)/sqrt(-d))/sqrt(-d) + d*e*sqrt(d + e*x) + e*(d + e*x)**(3/2)/3
)/(3*e)))/e**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)x^2}{(ex+d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x + d)^(3/2), x)
```

3.153 $\int \frac{x(a+b\log(cx^n))}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=94

$$\frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2}+\frac{2d\,(a+b\log(cx^n))}{e^2\sqrt{d+ex}}-\frac{4bn\sqrt{d+ex}}{e^2}+\frac{8b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e^2}$$

```
[Out] (-4*b*n*Sqrt[d + e*x])/e^2 + (8*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])
/e^2 + (2*d*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*x]) + (2*Sqrt[d + e*x]*(a +
 b*Log[c*x^n]))/e^2
```

Rubi [A] time = 0.086686, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {43, 2350, 12, 80, 63, 208}

$$\frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2}+\frac{2d\,(a+b\log(cx^n))}{e^2\sqrt{d+ex}}-\frac{4bn\sqrt{d+ex}}{e^2}+\frac{8b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (-4*b*n*Sqrt[d + e*x])/e^2 + (8*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])
/e^2 + (2*d*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*x]) + (2*Sqrt[d + e*x]*(a +
 b*Log[c*x^n]))/e^2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
```

```
IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x(a+b\log(cx^n))}{(d+ex)^{3/2}}\,dx = \frac{2d(a+b\log(cx^n))}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} - (bn)\int \frac{2(2d+ex)}{e^2x\sqrt{d+ex}}\,dx$$

$$= \frac{2d(a+b\log(cx^n))}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} - \frac{(2bn)\int \frac{2d+ex}{x\sqrt{d+ex}}\,dx}{e^2}$$

$$= -\frac{4bn\sqrt{d+ex}}{e^2} + \frac{2d(a+b\log(cx^n))}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} - \frac{(4bdn)\int \frac{1}{x\sqrt{d+ex}}\,dx}{e^2}$$

$$= -\frac{4bn\sqrt{d+ex}}{e^2} + \frac{2d(a+b\log(cx^n))}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2} - \frac{(8bdn)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx\right.}{e^3}$$

$$= -\frac{4bn\sqrt{d+ex}}{e^2} + \frac{8b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{e^2} + \frac{2d(a+b\log(cx^n))}{e^2\sqrt{d+ex}} + \frac{2\sqrt{d+ex}\,(a+b\log(cx^n))}{e^2}$$

Mathematica [A] time = 0.0687928, size = 83, normalized size = 0.88

$$\frac{2\left(2ad+aex+b(2d+ex)\log(cx^n)+4b\sqrt{d}n\sqrt{d+ex}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)-2bdn-2benx\right)}{e^2\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x)^(3/2),x]
```

```
[Out] (2*(2*a*d - 2*b*d*n + a*e*x - 2*b*e*n*x + 4*b*Sqrt[d]*n*Sqrt[d + e*x]*ArcTa
nh[Sqrt[d + e*x]/Sqrt[d]] + b*(2*d + e*x)*Log[c*x^n]))/(e^2*Sqrt[d + e*x])
```

Maple [F] time = 0.525, size = 0, normalized size = 0.

$$\int x(a+b\ln(cx^n))(ex+d)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x+d)^(3/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))/(e*x+d)^(3/2),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(x*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.39026, size = 537, normalized size = 5.71

$$\left[\frac{2\left(2\,(benx+bdn)\sqrt{d}\log\left(\frac{ex+2\,\sqrt{ex+d}\sqrt{d}+2\,d}{x}\right)-(2\,bdn-2\,ad+(2\,ben-ae)x-(bex+2\,bd)\log(c)-(benx+2\,bdn)\log(x\right.}{e^3x+de^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2*(2*(b*e*n*x + b*d*n)*sqrt(d)*log((e*x + 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x
) - (2*b*d*n - 2*a*d + (2*b*e*n - a*e)*x - (b*e*x + 2*b*d)*log(c) - (b*e*n*
x + 2*b*d*n)*log(x))*sqrt(e*x + d))/(e^3*x + d*e^2), -2*(4*(b*e*n*x + b*d*n
)*sqrt(-d)*arctan(sqrt(e*x + d)*sqrt(-d)/d) + (2*b*d*n - 2*a*d + (2*b*e*n -
 a*e)*x - (b*e*x + 2*b*d)*log(c) - (b*e*n*x + 2*b*d*n)*log(x))*sqrt(e*x + d
))/(e^3*x + d*e^2)]
```

Sympy [A] time = 62.7711, size = 155, normalized size = 1.65

$$-\frac{-\frac{2ad}{\sqrt{d+ex}}-2a\sqrt{d+ex}+2bd\left(\frac{2n\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}-\frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}\right)-2b\left(\sqrt{d+ex}\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)-\frac{2n\left(\frac{de\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}}+e\sqrt{\right.}{e}\right.}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] -(-2*a*d/sqrt(d + e*x) - 2*a*sqrt(d + e*x) + 2*b*d*(2*n*atan(sqrt(d + e*x)/
sqrt(-d))/sqrt(-d) - log(c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x)) - 2*b*(s
qrt(d + e*x)*log(c*(-d/e + (d + e*x)/e)**n) - 2*n*(d*e*atan(sqrt(d + e*x)/s
qrt(-d))/sqrt(-d) + e*sqrt(d + e*x))/e))/e**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x}{(ex + d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x + d)^(3/2), x)
```

3.154 $\int \frac{a+b\log(cx^n)}{(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=53

$$-\frac{2\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex}}-\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}e}$$

```
[Out] (-4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(Sqrt[d]*e) - (2*(a + b*Log[c*x^n])
)/(e*Sqrt[d + e*x])
```

Rubi [A] time = 0.0321486, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.15, Rules used = {2319, 63, 208}

$$-\frac{2\left(a+b\log\left(cx^n\right)\right)}{e\sqrt{d+ex}}-\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x)^(3/2),x]
```

```
[Out] (-4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(Sqrt[d]*e) - (2*(a + b*Log[c*x^n])
)/(e*Sqrt[d + e*x])
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx^n)}{(d+ex)^{3/2}}\,dx &= -\frac{2(a+b\log(cx^n))}{e\sqrt{d+ex}}+\frac{(2bn)\int\frac{1}{x\sqrt{d+ex}}\,dx}{e}\\ &= -\frac{2(a+b\log(cx^n))}{e\sqrt{d+ex}}+\frac{(4bn)\,\mathrm{Subst}\left(\int\frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex}\right)}{e^2}\\ &= -\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}e}-\frac{2(a+b\log(cx^n))}{e\sqrt{d+ex}}\end{aligned}$$

Mathematica [A] time = 0.0416505, size = 53, normalized size = 1.

$$-\frac{2(a+b\log(cx^n))}{e\sqrt{d+ex}}-\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x)^(3/2),x]
```

```
[Out] (-4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/(Sqrt[d]*e) - (2*(a + b*Log[c*x^n])
)/(e*Sqrt[d + e*x])
```

Maple [F] time = 0.522, size = 0, normalized size = 0.

$$\int (a+b\ln(cx^n))(ex+d)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/(e*x+d)^(3/2),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((a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.43749, size = 382, normalized size = 7.21

$$\left[\frac{2\left((benx + bdn)\sqrt{d}\log\left(\frac{ex-2\sqrt{ex+d}\sqrt{d}+2d}{x}\right) - (bdn\log(x) + bd\log(c) + ad)\sqrt{ex+d}\right)}{de^2x + d^2e}, \frac{2\left(2(benx + bdn)\sqrt{-d}\arctan\left(\frac{\sqrt{ex}}{}\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [2*((b*e*n*x + b*d*n)*sqrt(d)*log((e*x - 2*sqrt(e*x + d)*sqrt(d) + 2*d)/x)
- (b*d*n*log(x) + b*d*log(c) + a*d)*sqrt(e*x + d))/(d*e^2*x + d^2*e), 2*(2*
(b*e*n*x + b*d*n)*sqrt(-d)*arctan(sqrt(e*x + d)*sqrt(-d)/d) - (b*d*n*log(x)
 + b*d*log(c) + a*d)*sqrt(e*x + d))/(d*e^2*x + d^2*e)]
```

Sympy [A] time = 13.7146, size = 66, normalized size = 1.25

$$\frac{-\frac{2a}{\sqrt{d+ex}} + 2b\left(\frac{2n\operatorname{atan}\left(\frac{\sqrt{d+ex}}{\sqrt{-d}}\right)}{\sqrt{-d}} - \frac{\log\left(c\left(-\frac{d}{e}+\frac{d+ex}{e}\right)^n\right)}{\sqrt{d+ex}}\right)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x+d)**(3/2),x)
```

```
[Out] (-2*a/sqrt(d + e*x) + 2*b*(2*n*atan(sqrt(d + e*x)/sqrt(-d))/sqrt(-d) - log(
c*(-d/e + (d + e*x)/e)**n)/sqrt(d + e*x)))/e
```

Giac [A] time = 1.30374, size = 77, normalized size = 1.45

$$\frac{4\,bn\arctan\left(\frac{\sqrt{xe+d}}{\sqrt{-d}}\right)e^{(-1)}}{\sqrt{-d}} - \frac{2\,(bn\log\left(xe\right) - bn + b\log\left(c\right) + a)e^{(-1)}}{\sqrt{xe+d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] 4*b*n*arctan(sqrt(x*e + d)/sqrt(-d))*e^(-1)/sqrt(-d) - 2*(b*n*log(x*e) - b*
n + b*log(c) + a)*e^(-1)/sqrt(x*e + d)
```

3.155 $\int \frac{a+b\log(cx^n)}{x(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=201

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}+\frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}}+\cdots$$

```
[Out] (4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(3/2) + (2*b*n*ArcTanh[Sqrt[d + e*
x]/Sqrt[d]]^2)/d^(3/2) + (2*(a + b*Log[c*x^n]))/(d*Sqrt[d + e*x]) - (2*ArcT
anh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/d^(3/2) - (4*b*n*ArcTanh[Sqr
t[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/d^(3/2) - (
2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/d^(3/2)
```

Rubi [A] time = 0.31977, antiderivative size = 201, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {2347, 63, 208, 2348, 12, 5984, 5918, 2402, 2315, 2319}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{3/2}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}+\frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x)^(3/2)),x]
```

```
[Out] (4*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(3/2) + (2*b*n*ArcTanh[Sqrt[d + e*
x]/Sqrt[d]]^2)/d^(3/2) + (2*(a + b*Log[c*x^n]))/(d*Sqrt[d + e*x]) - (2*ArcT
anh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/d^(3/2) - (4*b*n*ArcTanh[Sqr
t[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/d^(3/2) - (
2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/d^(3/2)
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex)^{3/2}}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex}}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{(d+ex)^{3/2}}\,dx}{d}$$

$$= \frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} - \frac{(bn)\int -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{\sqrt{d}x}\,dx}{d} - \frac{(2bn)\int \frac{}{x\sqrt{}}}{d}$$

$$= \frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{(2bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx}{d^{3/2}} - \frac{(4bn)\,\mathrm{Subst}}{}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{(4bn)\,\mathrm{Subst}\left(\int\right.}{}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(}{d^{3/2}}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(}{d^{3/2}}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(}{d^{3/2}}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{3/2}} + \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{3/2}} + \frac{2(a+b\log(cx^n))}{d\sqrt{d+ex}} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(}{d^{3/2}}$$

Mathematica [A] time = 0.267341, size = 295, normalized size = 1.47

$$\frac{-bn\left(2\mathrm{PolyLog}\left(2,\frac{1}{2}-\frac{\sqrt{d+ex}}{2\sqrt{d}}\right)+\log\left(\sqrt{d}-\sqrt{d+ex}\right)\left(\log\left(\sqrt{d}-\sqrt{d+ex}\right)+2\log\left(\frac{1}{2}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}+1\right)\right)\right)\right)+bn\left(2\mathrm{PolyLog}\left(2,\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x)^(3/2)),x]
```

```
[Out] (8*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]] + (4*Sqrt[d]*(a + b*Log[c*x^n]))/Sqrt
[d + e*x] + 2*(a + b*Log[c*x^n])*Log[Sqrt[d] - Sqrt[d + e*x]] - 2*(a + b*Lo
g[c*x^n])*Log[Sqrt[d] + Sqrt[d + e*x]] - b*n*(Log[Sqrt[d] - Sqrt[d + e*x]]*
(Log[Sqrt[d] - Sqrt[d + e*x]] + 2*Log[(1 + Sqrt[d + e*x]/Sqrt[d])/2]) + 2*P
olyLog[2, 1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]) + b*n*(Log[Sqrt[d] + Sqrt[d + e
*x]]*(Log[Sqrt[d] + Sqrt[d + e*x]] + 2*Log[1/2 - Sqrt[d + e*x]/(2*Sqrt[d])]
) + 2*PolyLog[2, (1 + Sqrt[d + e*x]/Sqrt[d])/2]))/(2*d^(3/2))
```

Maple [F] time = 0.525, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x}(ex+d)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(e*x+d)^(3/2),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((a+b*log(c*x^n))/x/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex+d}b\log(cx^n) + \sqrt{ex+d}a}{e^2x^3 + 2\,dex^2 + d^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e^2*x^3 + 2*d*e*x^
2 + d^2*x), 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*ln(c*x**n))/x/(e*x+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{(ex + d)^{\frac{3}{2}} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^(3/2)*x), x)
```

3.156 $\int \frac{a+b\log(cx^n)}{x^2(d+ex)^{3/2}}\,dx$

Optimal. Leaf size=253

$$\frac{3benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{5/2}}-\frac{3e\left(a+b\log\left(cx^n\right)\right)}{d^2\sqrt{d+ex}}+\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{5/2}}-\frac{a+b\log\left(cx^n\right)}{dx\sqrt{d+ex}}-\frac{bn\sqrt{d-}}{d^2x}$$

```
[Out] -((b*n*Sqrt[d + e*x])/(d^2*x)) - (5*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d
^(5/2) - (3*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/d^(5/2) - (3*e*(a + b*L
og[c*x^n]))/(d^2*Sqrt[d + e*x]) - (a + b*Log[c*x^n])/(d*x*Sqrt[d + e*x]) +
(3*e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/d^(5/2) + (6*b*e*n*
ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/
d^(5/2) + (3*b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])])/d
^(5/2)
```

Rubi [A] time = 0.517039, antiderivative size = 255, normalized size of antiderivative = 1.01, number of steps used = 15, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {51, 63, 208, 2350, 12, 14, 47, 50, 5984, 5918, 2402, 2315}

$$\frac{3benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex}}\right)}{d^{5/2}}-\frac{3\sqrt{d+ex}\left(a+b\log\left(cx^n\right)\right)}{d^2x}+\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{d^{5/2}}+\frac{2\left(a+b\log\left(cx^n\right)\right)}{dx\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x)^(3/2)),x]
```

```
[Out] -((b*n*Sqrt[d + e*x])/(d^2*x)) - (5*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d
^(5/2) - (3*b*e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]^2)/d^(5/2) + (2*(a + b*Log
[c*x^n]))/(d*x*Sqrt[d + e*x]) - (3*Sqrt[d + e*x]*(a + b*Log[c*x^n]))/(d^2*x
) + (3*e*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*(a + b*Log[c*x^n]))/d^(5/2) + (6*b*
e*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x]
)])/d^(5/2) + (3*b*e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x])
])/d^(5/2)
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
```

```
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
```

```
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] && !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) && !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex)^{3/2}}\,dx = \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\,(a+b\log(cx^n))}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}} - (bn)\int -$$

$$= \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\,(a+b\log(cx^n))}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}} - (bn)\int$$

$$= \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\,(a+b\log(cx^n))}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}} - (bn)\int\Bigg($$

$$= -\frac{4ben\sqrt{d+ex}}{d^3} + \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\,(a+b\log(cx^n))}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(}{d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} + \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\,(a+b\log(cx^n))}{d^2x} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)(a+b\log(cx}{d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - \frac{3\sqrt{d+ex}\,(a+b\log(cx^n))}{d^2x} + 3e\tan$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - 3\sqrt{d+ex}\,(a$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - 3\sqrt{d+ex}\,(a$$

$$= -\frac{bn\sqrt{d+ex}}{d^2x} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)^2}{d^{5/2}} + \frac{2(a+b\log(cx^n))}{dx\sqrt{d+ex}} - 3\sqrt{d+ex}\,(a$$

Mathematica [A] time = 0.47813, size = 506, normalized size = 2.

$$2e\left(\frac{3bn\left(2\text{PolyLog}\left(2,\frac{\sqrt{d}-\sqrt{d+ex}}{2\sqrt{d}}\right)+\log^2\left(\sqrt{d}-\sqrt{d+ex}\right)+2\log\left(\frac{\sqrt{d+ex}+\sqrt{d}}{2\sqrt{d}}\right)\log\left(\sqrt{d}-\sqrt{d+ex}\right)\right)}{8d^{5/2}}-\frac{3bn\left(2\text{PolyLog}\left(2\right.\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x)^(3/2)),x]
```

```
[Out] 2*e*((-2*b*n*ArcTanh[Sqrt[d + e*x]/Sqrt[d]])/d^(5/2) + (b*n*((Sqrt[d] - Sqr
t[d + e*x])^(-1) - ArcTanh[Sqrt[d + e*x]/Sqrt[d]]/Sqrt[d]))/(4*d^2) - (b*n*
((Sqrt[d] + Sqrt[d + e*x])^(-1) + ArcTanh[Sqrt[d + e*x]/Sqrt[d]]/Sqrt[d]))/
(4*d^2) - (a + b*Log[c*x^n])/(d^2*Sqrt[d + e*x]) + (a + b*Log[c*x^n])/(4*d^
2*(Sqrt[d] - Sqrt[d + e*x])) - (a + b*Log[c*x^n])/(4*d^2*(Sqrt[d] + Sqrt[d
+ e*x])) - (3*(a + b*Log[c*x^n])*Log[Sqrt[d] - Sqrt[d + e*x]])/(4*d^(5/2))
+ (3*(a + b*Log[c*x^n])*Log[Sqrt[d] + Sqrt[d + e*x]])/(4*d^(5/2)) + (3*b*n*
(Log[Sqrt[d] - Sqrt[d + e*x]]^2 + 2*Log[Sqrt[d] - Sqrt[d + e*x]]*Log[(Sqrt[
d] + Sqrt[d + e*x])/(2*Sqrt[d])] + 2*PolyLog[2, (Sqrt[d] - Sqrt[d + e*x])/(
2*Sqrt[d])]))/(8*d^(5/2)) - (3*b*n*(2*Log[(Sqrt[d] - Sqrt[d + e*x])/(2*Sqrt
[d])]*Log[Sqrt[d] + Sqrt[d + e*x]] + Log[Sqrt[d] + Sqrt[d + e*x]]^2 + 2*Pol
yLog[2, (Sqrt[d] + Sqrt[d + e*x])/(2*Sqrt[d])]))/(8*d^(5/2)))
```

Maple [F] time = 0.573, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x^2}\left(ex+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^2/(e*x+d)^(3/2),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((a+b*log(c*x^n))/x^2/(e*x+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex+d}b\log\left(cx^n\right)+\sqrt{ex+d}a}{e^2x^4+2\,dex^3+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*a)/(e^2*x^4 + 2*d*e*x^
3 + d^2*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x+d)**(3/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x)**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex+d\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x + d)^(3/2)*x^2), x)
```

3.157 $\int \frac{x^2}{(d+ex)(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{x^2}{(d+ex)\,(a+b\log\left(cx^n\right))},x\right)$$

```
[Out] Unintegrable[x^2/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi [A] time = 0.086478, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^2}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((d + e*x)*(a + b*Log[c*x^n])),x]

[Out] Defer[Int][x^2/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{x^2}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx = \int \frac{x^2}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Mathematica [A] time = 1.22889, size = 0, normalized size = 0.

$$\int \frac{x^2}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((d + e*x)*(a + b*Log[c*x^n])),x]

[Out] Integrate[x^2/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Maple [A] time = 0.513, size = 0, normalized size = 0.

$$\int \frac{x^2}{(ex+d)\,(a+b\ln(cx^n))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(e*x+d)/(a+b*ln(c*x^n)),x)
```

```
[Out] int(x^2/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(ex+d)(b\log(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(x^2/((e*x + d)*(b*log(c*x^n) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{x^2}{aex+ad+(bex+bd)\log(cx^n)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral(x^2/(a*e*x + a*d + (b*e*x + b*d)*log(c*x^n)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(a+b\log(cx^n))\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(e*x+d)/(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(x**2/((a + b*log(c*x**n))*(d + e*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2}{(ex+d)(b\log(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(x^2/((e*x + d)*(b*log(c*x^n) + a)), x)
```

3.158 $\int \frac{x}{(d+ex)(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=23

$$\text{Unintegrable}\left(\frac{x}{(d+ex)\,(a+b\log\left(cx^n\right))},x\right)$$

```
[Out] Unintegrable[x/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi [A] time = 0.0605134, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Defer[Int][x/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{x}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx=\int \frac{x}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Mathematica [A] time = 0.708518, size = 0, normalized size = 0.

$$\int \frac{x}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Integrate[x/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Maple [A] time = 0.51, size = 0, normalized size = 0.

$$\int \frac{x}{(ex+d)\,(a+b\ln(cx^n))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(e*x+d)/(a+b*ln(c*x^n)),x)
```

```
[Out] int(x/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(ex+d)(b\log(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(x/((e*x + d)*(b*log(c*x^n) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{x}{aex+ad+(bex+bd)\log(cx^n)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral(x/(a*e*x + a*d + (b*e*x + b*d)*log(c*x^n)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(a+b\log(cx^n))\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(x/((a + b*log(c*x**n))*(d + e*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x}{(ex+d)(b\log(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(x/((e*x + d)*(b*log(c*x^n) + a)), x)
```

3.159 $\int \frac{1}{(d+ex)(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{1}{(d+ex)\,(a+b\log\left(cx^n\right))},x\right)$$

```
[Out] Unintegrable[1/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi [A] time = 0.030349, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Defer[Int][1/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx=\int \frac{1}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Mathematica [A] time = 0.0225119, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex)\,(a+b\log\left(cx^n\right))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Integrate[1/((d + e*x)*(a + b*Log[c*x^n])), x]
```

Maple [A] time = 0.484, size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)\,(a+b\ln(cx^n))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x+d)/(a+b*ln(c*x^n)),x)
```

```
[Out] int(1/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)(b\log(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{aex+ad+(bex+bd)\log(cx^n)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e*x + a*d + (b*e*x + b*d)*log(c*x^n)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(a+b\log(cx^n))\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(1/((a + b*log(c*x**n))*(d + e*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)(b\log(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)), x)
```

3.160 $\int \frac{1}{x(d+ex)(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable[1/(x*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi [A] time = 0.0822645, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Defer[Int][1/(x*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx=\int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 0.259813, size = 0, normalized size = 0.

$$\int \frac{1}{x(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Integrate[1/(x*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Maple [A] time = 0.505, size = 0, normalized size = 0.

$$\int \frac{1}{x\,(ex+d)\,(a+b\ln(cx^n))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(e*x+d)/(a+b*ln(c*x^n)),x)
```

```
[Out] int(1/x/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)(b\log(cx^n)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\operatorname{integral}\left(\frac{1}{aex^2+adx+\left(bex^2+bdx\right)\log(cx^n)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e*x^2 + a*d*x + (b*e*x^2 + b*d*x)*log(c*x^n)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x\,(a+b\log(cx^n))\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(1/(x*(a + b*log(c*x**n))*(d + e*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)(b\log(cx^n)+a)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x), x)
```

3.161 $\int \frac{1}{x^2(d+ex)(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)},x\right)$$

```
[Out] Unintegrable[1/(x^2*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi [A] time = 0.0890865, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Defer[Int][1/(x^2*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx=\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Mathematica [A] time = 0.614304, size = 0, normalized size = 0.

$$\int \frac{1}{x^2(d+ex)\left(a+b\log\left(cx^n\right)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(d + e*x)*(a + b*Log[c*x^n])),x]
```

```
[Out] Integrate[1/(x^2*(d + e*x)*(a + b*Log[c*x^n])), x]
```

Maple [A] time = 0.516, size = 0, normalized size = 0.

$$\int \frac{1}{x^{2}\left(ex+d\right)\left(a+b\ln\left(cx^{n}\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(e*x+d)/(a+b*ln(c*x^n)),x)
```

```
[Out] int(1/x^2/(e*x+d)/(a+b*ln(c*x^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)(b\log\left(cx^{n}\right)+a)x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{aex^{3}+adx^{2}+\left(bex^{3}+bdx^{2}\right)\log\left(cx^{n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e*x^3 + a*d*x^2 + (b*e*x^3 + b*d*x^2)*log(c*x^n)), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{x^{2}\left(a+b\log\left(cx^{n}\right)\right)\left(d+ex\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(e*x+d)/(a+b*ln(c*x**n)),x)
```

```
[Out] Integral(1/(x**2*(a + b*log(c*x**n))*(d + e*x)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(ex+d)(b\log(cx^n)+a)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(e*x+d)/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x + d)*(b*log(c*x^n) + a)*x^2), x)
```

3.162 $\int (fx)^m(d+ex)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=211

$$\frac{3d^2e(fx)^{m+2}(a+b\log(cx^n))}{f^2(m+2)}+\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3de^2(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{e^3(fx)^{m+4}(a+b\log(cx^n$$

```
[Out] -((b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (3*b*d^2*e*n*(f*x)^(2 + m))/(f^2
*(2 + m)^2) - (3*b*d*e^2*n*(f*x)^(3 + m))/(f^3*(3 + m)^2) - (b*e^3*n*(f*x)^
(4 + m))/(f^4*(4 + m)^2) + (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m
)) + (3*d^2*e*(f*x)^(2 + m)*(a + b*Log[c*x^n]))/(f^2*(2 + m)) + (3*d*e^2*(f
*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m)) + (e^3*(f*x)^(4 + m)*(a + b*L
og[c*x^n]))/(f^4*(4 + m))
```

Rubi [A] time = 0.228266, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {43, 2350, 14}

$$\frac{3d^2e(fx)^{m+2}(a+b\log(cx^n))}{f^2(m+2)}+\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3de^2(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{e^3(fx)^{m+4}(a+b\log(cx^n$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```


```
[Out] -((b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (3*b*d^2*e*n*(f*x)^(2 + m))/(f^2
*(2 + m)^2) - (3*b*d*e^2*n*(f*x)^(3 + m))/(f^3*(3 + m)^2) - (b*e^3*n*(f*x)^
(4 + m))/(f^4*(4 + m)^2) + (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m
)) + (3*d^2*e*(f*x)^(2 + m)*(a + b*Log[c*x^n]))/(f^2*(2 + m)) + (3*d*e^2*(f
*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m)) + (e^3*(f*x)^(4 + m)*(a + b*L
og[c*x^n]))/(f^4*(4 + m))
```


Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int (fx)^m(d+ex)^3\left(a+b\log\left(cx^n\right)\right)dx = \frac{d^3(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{3d^2e(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)} + \frac{3de^2(fx)^{3+m}\left(a+b\right.}{f^3(3+m}$$

$$= \frac{d^3(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)} + \frac{3d^2e(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)} + \frac{3de^2(fx)^{3+m}\left(a+b\right.}{f^3(3+m}$$

$$= -\frac{bd^3n(fx)^{1+m}}{f(1+m)^2} - \frac{3bd^2en(fx)^{2+m}}{f^2(2+m)^2} - \frac{3bde^2n(fx)^{3+m}}{f^3(3+m)^2} - \frac{be^3n(fx)^{4+m}}{f^4(4+m)^2} + \frac{d^3(fx)^{1+m}}{f(}$$

Mathematica [A] time = 0.224841, size = 152, normalized size = 0.72

$$x(fx)^m\left(\frac{3d^2ex\left(a+b\log\left(cx^n\right)\right)}{m+2} + \frac{d^3\left(a+b\log\left(cx^n\right)\right)}{m+1} + \frac{3de^2x^2\left(a+b\log\left(cx^n\right)\right)}{m+3} + \frac{e^3x^3\left(a+b\log\left(cx^n\right)\right)}{m+4} - \frac{3bd^2enx}{(m+2)^2} - \frac{b}{(m}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^3*n)/(1 + m)^2) - (3*b*d^2*e*n*x)/(2 + m)^2 - (3*b*d*e^2*
n*x^2)/(3 + m)^2 - (b*e^3*n*x^3)/(4 + m)^2 + (d^3*(a + b*Log[c*x^n]))/(1 +
m) + (3*d^2*e*x*(a + b*Log[c*x^n]))/(2 + m) + (3*d*e^2*x^2*(a + b*Log[c*x^n
]))/(3 + m) + (e^3*x^3*(a + b*Log[c*x^n]))/(4 + m))
```

Maple [C] time = 0.482, size = 5021, normalized size = 23.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x+d)^3*(a+b*ln(c*x^n)),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((f*x)^m*(e*x+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.43351, size = 2942, normalized size = 13.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^3*m^7 + 16*a*e^3*m^6 + 106*a*e^3*m^5 + 376*a*e^3*m^4 + 769*a*e^3*m^3
+ 904*a*e^3*m^2 + 564*a*e^3*m + 144*a*e^3 - (b*e^3*m^6 + 12*b*e^3*m^5 + 58*
b*e^3*m^4 + 144*b*e^3*m^3 + 193*b*e^3*m^2 + 132*b*e^3*m + 36*b*e^3)*n)*x^4
+ 3*(a*d*e^2*m^7 + 17*a*d*e^2*m^6 + 119*a*d*e^2*m^5 + 443*a*d*e^2*m^4 + 944
*a*d*e^2*m^3 + 1148*a*d*e^2*m^2 + 736*a*d*e^2*m + 192*a*d*e^2 - (b*d*e^2*m^
6 + 14*b*d*e^2*m^5 + 77*b*d*e^2*m^4 + 212*b*d*e^2*m^3 + 308*b*d*e^2*m^2 + 2
24*b*d*e^2*m + 64*b*d*e^2)*n)*x^3 + 3*(a*d^2*e*m^7 + 18*a*d^2*e*m^6 + 134*a
*d^2*e*m^5 + 532*a*d^2*e*m^4 + 1209*a*d^2*e*m^3 + 1562*a*d^2*e*m^2 + 1056*a
*d^2*e*m + 288*a*d^2*e - (b*d^2*e*m^6 + 16*b*d^2*e*m^5 + 102*b*d^2*e*m^4 +
328*b*d^2*e*m^3 + 553*b*d^2*e*m^2 + 456*b*d^2*e*m + 144*b*d^2*e)*n)*x^2 + (
a*d^3*m^7 + 19*a*d^3*m^6 + 151*a*d^3*m^5 + 649*a*d^3*m^4 + 1624*a*d^3*m^3 +
 2356*a*d^3*m^2 + 1824*a*d^3*m + 576*a*d^3 - (b*d^3*m^6 + 18*b*d^3*m^5 + 13
3*b*d^3*m^4 + 516*b*d^3*m^3 + 1108*b*d^3*m^2 + 1248*b*d^3*m + 576*b*d^3)*n)
*x + ((b*e^3*m^7 + 16*b*e^3*m^6 + 106*b*e^3*m^5 + 376*b*e^3*m^4 + 769*b*e^3
*m^3 + 904*b*e^3*m^2 + 564*b*e^3*m + 144*b*e^3)*x^4 + 3*(b*d*e^2*m^7 + 17*b
*d*e^2*m^6 + 119*b*d*e^2*m^5 + 443*b*d*e^2*m^4 + 944*b*d*e^2*m^3 + 1148*b*d
*e^2*m^2 + 736*b*d*e^2*m + 192*b*d*e^2)*x^3 + 3*(b*d^2*e*m^7 + 18*b*d^2*e*m
```

```
^6 + 134*b*d^2*e*m^5 + 532*b*d^2*e*m^4 + 1209*b*d^2*e*m^3 + 1562*b*d^2*e*m^
2 + 1056*b*d^2*e*m + 288*b*d^2*e)*x^2 + (b*d^3*m^7 + 19*b*d^3*m^6 + 151*b*d
^3*m^5 + 649*b*d^3*m^4 + 1624*b*d^3*m^3 + 2356*b*d^3*m^2 + 1824*b*d^3*m + 5
76*b*d^3)*x)*log(c) + ((b*e^3*m^7 + 16*b*e^3*m^6 + 106*b*e^3*m^5 + 376*b*e^
3*m^4 + 769*b*e^3*m^3 + 904*b*e^3*m^2 + 564*b*e^3*m + 144*b*e^3)*n*x^4 + 3*
(b*d*e^2*m^7 + 17*b*d*e^2*m^6 + 119*b*d*e^2*m^5 + 443*b*d*e^2*m^4 + 944*b*d
*e^2*m^3 + 1148*b*d*e^2*m^2 + 736*b*d*e^2*m + 192*b*d*e^2)*n*x^3 + 3*(b*d^2
*e*m^7 + 18*b*d^2*e*m^6 + 134*b*d^2*e*m^5 + 532*b*d^2*e*m^4 + 1209*b*d^2*e*
m^3 + 1562*b*d^2*e*m^2 + 1056*b*d^2*e*m + 288*b*d^2*e)*n*x^2 + (b*d^3*m^7 +
 19*b*d^3*m^6 + 151*b*d^3*m^5 + 649*b*d^3*m^4 + 1624*b*d^3*m^3 + 2356*b*d^3
*m^2 + 1824*b*d^3*m + 576*b*d^3)*n*x)*log(x))*e^(m*log(f) + m*log(x))/(m^8
+ 20*m^7 + 170*m^6 + 800*m^5 + 2273*m^4 + 3980*m^3 + 4180*m^2 + 2400*m + 57
6)
```

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((f*x)**m*(e*x+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.40079, size = 717, normalized size = 3.4

$$\frac{bf^3f^mx^4x^me^3\log(c)}{f^3m+4f^3}+\frac{af^3f^mx^4x^me^3}{f^3m+4f^3}+\frac{3\,bdf^2f^mx^3x^me^2\log(c)}{f^2m+3f^2}+\frac{bf^mmnx^4x^me^3\log(x)}{m^2+8m+16}+\frac{3\,bdf^mmnx^3x^me^2\log(x)}{m^2+6m+9}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^3*f^m*x^4*x^m*e^3*log(c)/(f^3*m + 4*f^3) + a*f^3*f^m*x^4*x^m*e^3/(f^3*m
 + 4*f^3) + 3*b*d*f^2*f^m*x^3*x^m*e^2*log(c)/(f^2*m + 3*f^2) + b*f^m*m*n*x^
4*x^m*e^3*log(x)/(m^2 + 8*m + 16) + 3*b*d*f^m*m*n*x^3*x^m*e^2*log(x)/(m^2 +
 6*m + 9) + 3*b*d^2*f^m*m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) + 3*a*d*f^2*f^
m*x^3*x^m*e^2/(f^2*m + 3*f^2) + b*d^3*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1)
+ 4*b*f^m*n*x^4*x^m*e^3*log(x)/(m^2 + 8*m + 16) + 9*b*d*f^m*n*x^3*x^m*e^2*l
```

```
og(x)/(m^2 + 6*m + 9) + 6*b*d^2*f^m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) - b*
f^m*n*x^4*x^m*e^3/(m^2 + 8*m + 16) - 3*b*d*f^m*n*x^3*x^m*e^2/(m^2 + 6*m + 9
) - 3*b*d^2*f^m*n*x^2*x^m*e/(m^2 + 4*m + 4) + 3*b*d^2*f^m*x^2*x^m*e*log(c)/
(m + 2) + b*d^3*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) - b*d^3*f^m*n*x*x^m/(m^2
 + 2*m + 1) + 3*a*d^2*f^m*x^2*x^m*e/(m + 2) + (f*x)^m*b*d^3*x*log(c)/(m + 1
) + (f*x)^m*a*d^3*x/(m + 1)
```

3.163 $\int (fx)^m(d+ex)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=153

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2de(fx)^{m+2}(a+b\log(cx^n))}{f^2(m+2)}+\frac{e^2(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden(fx)^{m+2}}{f^2(m+2)^2}$$

```
[Out] -((b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (2*b*d*e*n*(f*x)^(2 + m))/(f^2*(
2 + m)^2) - (b*e^2*n*(f*x)^(3 + m))/(f^3*(3 + m)^2) + (d^2*(f*x)^(1 + m)*(a
 + b*Log[c*x^n]))/(f*(1 + m)) + (2*d*e*(f*x)^(2 + m)*(a + b*Log[c*x^n]))/(f
^2*(2 + m)) + (e^2*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m))
```

Rubi [A] time = 0.17256, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {43, 2350, 12, 14}

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2de(fx)^{m+2}(a+b\log(cx^n))}{f^2(m+2)}+\frac{e^2(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden(fx)^{m+2}}{f^2(m+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (2*b*d*e*n*(f*x)^(2 + m))/(f^2*(
2 + m)^2) - (b*e^2*n*(f*x)^(3 + m))/(f^3*(3 + m)^2) + (d^2*(f*x)^(1 + m)*(a
 + b*Log[c*x^n]))/(f*(1 + m)) + (2*d*e*(f*x)^(2 + m)*(a + b*Log[c*x^n]))/(f
^2*(2 + m)) + (e^2*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
```

```
IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int (fx)^m(d+ex)^2\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{2de(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)}+\frac{e^2(fx)^{3+m}\left(a+b\,\mathrm{lo}\right.}{f^3(3+m)}$$

$$=\frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{2de(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)}+\frac{e^2(fx)^{3+m}\left(a+b\,\mathrm{lo}\right.}{f^3(3+m)}$$

$$=\frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+\frac{2de(fx)^{2+m}\left(a+b\log\left(cx^n\right)\right)}{f^2(2+m)}+\frac{e^2(fx)^{3+m}\left(a+b\,\mathrm{lo}\right.}{f^3(3+m)}$$

$$=-\frac{bd^2n(fx)^{1+m}}{f(1+m)^2}-\frac{2bden(fx)^{2+m}}{f^2(2+m)^2}-\frac{be^2n(fx)^{3+m}}{f^3(3+m)^2}+\frac{d^2(fx)^{1+m}\left(a+b\log\left(cx^n\right)\right)}{f(1+m)}+$$

Mathematica [A] time = 0.129306, size = 108, normalized size = 0.71

$$x(fx)^m\left(\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{m+1}+\frac{2dex\left(a+b\log\left(cx^n\right)\right)}{m+2}+\frac{e^2x^2\left(a+b\log\left(cx^n\right)\right)}{m+3}-\frac{bd^2n}{(m+1)^2}-\frac{2bdenx}{(m+2)^2}-\frac{be^2nx^2}{(m+3)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^2*n)/(1 + m)^2) - (2*b*d*e*n*x)/(2 + m)^2 - (b*e^2*n*x^2)
/(3 + m)^2 + (d^2*(a + b*Log[c*x^n]))/(1 + m) + (2*d*e*x*(a + b*Log[c*x^n])
)/(2 + m) + (e^2*x^2*(a + b*Log[c*x^n]))/(3 + m))
```

Maple [C] time = 0.276, size = 2702, normalized size = 17.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] b*x*(e^2*m^2*x^2+2*d*e*m^2*x+3*e^2*m*x^2+d^2*m^2+8*d*e*m*x+2*e^2*x^2+5*d^2*
m+6*d*e*x+6*d^2)/(1+m)/(2+m)/(3+m)*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn
(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)
*csgn(I*x)+2*ln(f)+2*ln(x)))*ln(x^n)+1/2*x*(72*ln(c)*b*d^2+12*I*Pi*b*e^2*x^
2*csgn(I*x^n)*csgn(I*c*x^n)^2+12*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+9
6*I*Pi*b*d^2*m*csgn(I*x^n)*csgn(I*c*x^n)^2+72*a*d^2+72*a*d*e*x+2*a*e^2*m^5*
x^2-2*b*d^2*m^4*n+228*a*d*e*m*x+4*a*d*e*m^5*x-2*b*e^2*m^4*n*x^2+62*ln(c)*b*
e^2*m^3*x^2+102*ln(c)*b*e^2*m^2*x^2+80*ln(c)*b*e^2*m*x^2+2*ln(c)*b*e^2*m^5*
x^2+18*ln(c)*b*e^2*m^4*x^2+24*a*e^2*x^2-12*b*e^2*m^3*n*x^2+40*a*d*e*m^4*x-7
4*b*d^2*m^2*n-120*b*d^2*m*n+18*a*e^2*m^4*x^2-20*b*d^2*m^3*n-72*b*d^2*n+2*ln
(c)*b*d^2*m^5+22*ln(c)*b*d^2*m^4+94*ln(c)*b*d^2*m^3+194*ln(c)*b*d^2*m^2+192
*ln(c)*b*d^2*m-51*I*Pi*b*e^2*m^2*x^2*csgn(I*c*x^n)^3+47*I*Pi*b*d^2*m^3*csgn
(I*x^n)*csgn(I*c*x^n)^2+47*I*Pi*b*d^2*m^3*csgn(I*c*x^n)^2*csgn(I*c)-36*b*d*
e*n*x-76*I*Pi*b*d*e*m^3*x*csgn(I*c*x^n)^3+51*I*Pi*b*e^2*m^2*x^2*csgn(I*x^n)
*csgn(I*c*x^n)^2+51*I*Pi*b*e^2*m^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d
*e*m^5*x*csgn(I*c*x^n)^3+22*a*d^2*m^4-I*Pi*b*d^2*m^5*csgn(I*c*x^n)^3+9*I*Pi
*b*e^2*m^4*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+9*I*Pi*b*e^2*m^4*x^2*csgn(I*c*x^
n)^2*csgn(I*c)+76*I*Pi*b*d*e*m^3*x*csgn(I*x^n)*csgn(I*c*x^n)^2+76*I*Pi*b*d*
e*m^3*x*csgn(I*c*x^n)^2*csgn(I*c)+94*a*d^2*m^3+194*a*d^2*m^2+192*a*d^2*m-32
*b*d*e*m^3*n*x-4*b*d*e*m^4*n*x+72*ln(c)*b*d*e*x-36*I*Pi*b*d^2*csgn(I*c*x^n)
^3+24*ln(c)*b*e^2*x^2-40*I*Pi*b*e^2*m*x^2*csgn(I*c*x^n)^3+97*I*Pi*b*d^2*m^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+11*I*Pi*b*d^2*m^4*csgn(I*x^n)*csgn(I*c*x^n)^2+
11*I*Pi*b*d^2*m^4*csgn(I*c*x^n)^2*csgn(I*c)-26*b*e^2*m^2*n*x^2-88*b*d*e*m^2
*n*x-24*b*e^2*m*n*x^2-96*b*d*e*m*n*x-12*I*Pi*b*e^2*x^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-96*I*Pi*b*d^2*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*
e^2*m^5*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*e^2*m^5*x^2*csgn(I*c*x^n)^2*
csgn(I*c)-97*I*Pi*b*d^2*m^2*csgn(I*c*x^n)^3-31*I*Pi*b*e^2*m^3*x^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+2*a*d^2*m^5-51*I*Pi*b*e^2*m^2*x^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+136*I*Pi*b*d*e*m^2*x*csgn(I*x^n)*csgn(I*c*x^n)^2+136*
I*Pi*b*d*e*m^2*x*csgn(I*c*x^n)^2*csgn(I*c)-36*I*Pi*b*d*e*x*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+272*a*d*e*m^2*x-I*Pi*b*d^2*m^5*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-20*I*Pi*b*d*e*m^4*x*csgn(I*c*x^n)^3-I*Pi*b*e^2*m^5*x^2*csgn(I*c
*x^n)^3-9*I*Pi*b*e^2*m^4*x^2*csgn(I*c*x^n)^3+I*Pi*b*d^2*m^5*csgn(I*x^n)*csg
n(I*c*x^n)^2+I*Pi*b*d^2*m^5*csgn(I*c*x^n)^2*csgn(I*c)+97*I*Pi*b*d^2*m^2*csg
n(I*c*x^n)^2*csgn(I*c)-114*I*Pi*b*d*e*m*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-2*I*Pi*b*d*e*m^5*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-20*I*Pi*b*d*e*m^4
```

```
*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+80*a*e^2*m*x^2+152*a*d*e*m^3*x+36*I*
Pi*b*d*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-47*I*Pi*b*d^2*m^3*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)-136*I*Pi*b*d*e*m^2*x*csgn(I*c*x^n)^3-9*I*Pi*b*e^2*m^4*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+20*I*Pi*b*d*e*m^4*x*csgn(I*x^n)*csgn(I
*c*x^n)^2+20*I*Pi*b*d*e*m^4*x*csgn(I*c*x^n)^2*csgn(I*c)-40*I*Pi*b*e^2*m*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+114*I*Pi*b*d*e*m*x*csgn(I*x^n)*csgn(I*
c*x^n)^2+114*I*Pi*b*d*e*m*x*csgn(I*c*x^n)^2*csgn(I*c)+62*a*e^2*m^3*x^2+102*
a*e^2*m^2*x^2-11*I*Pi*b*d^2*m^4*csgn(I*c*x^n)^3+152*ln(c)*b*d*e*m^3*x+272*l
n(c)*b*d*e*m^2*x+228*ln(c)*b*d*e*m*x+40*ln(c)*b*d*e*m^4*x+4*ln(c)*b*d*e*m^5
*x-97*I*Pi*b*d^2*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-114*I*Pi*b*d*e*m*x
*csgn(I*c*x^n)^3-I*Pi*b*e^2*m^5*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I
*Pi*b*d*e*m^5*x*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b*d*e*m^5*x*csgn(I*c*x^n
)^2*csgn(I*c)-76*I*Pi*b*d*e*m^3*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-136*I
*Pi*b*d*e*m^2*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*b*e^2*n*x^2+96*I*Pi*b
*d^2*m*csgn(I*c*x^n)^2*csgn(I*c)-36*I*Pi*b*d*e*x*csgn(I*c*x^n)^3-36*I*Pi*b*
d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-31*I*Pi*b*e^2*m^3*x^2*csgn(I*c*x^n)
^3-12*I*Pi*b*e^2*x^2*csgn(I*c*x^n)^3-96*I*Pi*b*d^2*m*csgn(I*c*x^n)^3+36*I*P
i*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)
-47*I*Pi*b*d^2*m^3*csgn(I*c*x^n)^3-11*I*Pi*b*d^2*m^4*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+36*I*Pi*b*d*e*x*csgn(I*c*x^n)^2*csgn(I*c)+40*I*Pi*b*e^2*m*x^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+40*I*Pi*b*e^2*m*x^2*csgn(I*c*x^n)^2*csgn(I*c)+
31*I*Pi*b*e^2*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+31*I*Pi*b*e^2*m^3*x^2*csg
n(I*c*x^n)^2*csgn(I*c))/(3+m)^2/(1+m)^2/(2+m)^2*exp(1/2*m*(-I*Pi*csgn(I*f*x
)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f
*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^m*(e*x+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.33504, size = 1474, normalized size = 9.63

$$\frac{\left(\left(ae^2m^5 + 9\,ae^2m^4 + 31\,ae^2m^3 + 51\,ae^2m^2 + 40\,ae^2m + 12\,ae^2 - \left(be^2m^4 + 6\,be^2m^3 + 13\,be^2m^2 + 12\,be^2m + 4\,be^2\right)n\right)x^3 + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^2*m^5 + 9*a*e^2*m^4 + 31*a*e^2*m^3 + 51*a*e^2*m^2 + 40*a*e^2*m + 12*a
*e^2 - (b*e^2*m^4 + 6*b*e^2*m^3 + 13*b*e^2*m^2 + 12*b*e^2*m + 4*b*e^2)*n)*x
^3 + 2*(a*d*e*m^5 + 10*a*d*e*m^4 + 38*a*d*e*m^3 + 68*a*d*e*m^2 + 57*a*d*e*m
 + 18*a*d*e - (b*d*e*m^4 + 8*b*d*e*m^3 + 22*b*d*e*m^2 + 24*b*d*e*m + 9*b*d*
e)*n)*x^2 + (a*d^2*m^5 + 11*a*d^2*m^4 + 47*a*d^2*m^3 + 97*a*d^2*m^2 + 96*a*
d^2*m + 36*a*d^2 - (b*d^2*m^4 + 10*b*d^2*m^3 + 37*b*d^2*m^2 + 60*b*d^2*m +
36*b*d^2)*n)*x + ((b*e^2*m^5 + 9*b*e^2*m^4 + 31*b*e^2*m^3 + 51*b*e^2*m^2 +
40*b*e^2*m + 12*b*e^2)*x^3 + 2*(b*d*e*m^5 + 10*b*d*e*m^4 + 38*b*d*e*m^3 + 6
8*b*d*e*m^2 + 57*b*d*e*m + 18*b*d*e)*x^2 + (b*d^2*m^5 + 11*b*d^2*m^4 + 47*b
*d^2*m^3 + 97*b*d^2*m^2 + 96*b*d^2*m + 36*b*d^2)*x)*log(c) + ((b*e^2*m^5 +
9*b*e^2*m^4 + 31*b*e^2*m^3 + 51*b*e^2*m^2 + 40*b*e^2*m + 12*b*e^2)*n*x^3 +
2*(b*d*e*m^5 + 10*b*d*e*m^4 + 38*b*d*e*m^3 + 68*b*d*e*m^2 + 57*b*d*e*m + 18
*b*d*e)*n*x^2 + (b*d^2*m^5 + 11*b*d^2*m^4 + 47*b*d^2*m^3 + 97*b*d^2*m^2 + 9
6*b*d^2*m + 36*b*d^2)*n*x)*log(x))*e^(m*log(f) + m*log(x))/(m^6 + 12*m^5 +
58*m^4 + 144*m^3 + 193*m^2 + 132*m + 36)
```

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((f*x)**m*(e*x+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.34403, size = 505, normalized size = 3.3

$$\frac{bf^2f^mx^3x^me^2\log(c)}{f^2m+3f^2}+\frac{bf^mmnx^3x^me^2\log(x)}{m^2+6m+9}+\frac{2bdf^mmnx^2x^me\log(x)}{m^2+4m+4}+\frac{af^2f^mx^3x^me^2}{f^2m+3f^2}+\frac{bd^2f^mmnxx^m\log(x)}{m^2+2m+1}+\frac{3bf$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^2*f^m*x^3*x^m*e^2*log(c)/(f^2*m + 3*f^2) + b*f^m*m*n*x^3*x^m*e^2*log(x)
/(m^2 + 6*m + 9) + 2*b*d*f^m*m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) + a*f^2*f
^m*x^3*x^m*e^2/(f^2*m + 3*f^2) + b*d^2*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1)
 + 3*b*f^m*n*x^3*x^m*e^2*log(x)/(m^2 + 6*m + 9) + 4*b*d*f^m*n*x^2*x^m*e*log
(x)/(m^2 + 4*m + 4) - b*f^m*n*x^3*x^m*e^2/(m^2 + 6*m + 9) - 2*b*d*f^m*n*x^2
*x^m*e/(m^2 + 4*m + 4) + 2*b*d*f^m*x^2*x^m*e*log(c)/(m + 2) + b*d^2*f^m*n*x
*x^m*log(x)/(m^2 + 2*m + 1) - b*d^2*f^m*n*x*x^m/(m^2 + 2*m + 1) + 2*a*d*f^m
*x^2*x^m*e/(m + 2) + (f*x)^m*b*d^2*x*log(c)/(m + 1) + (f*x)^m*a*d^2*x/(m +
1)
```

3.164 $\int (fx)^m(d+ex)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=95

$$\frac{d(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{e(fx)^{m+2}(a+b\log(cx^n))}{f^2(m+2)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+2}}{f^2(m+2)^2}$$

```
[Out] -((b*d*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (b*e*n*(f*x)^(2 + m))/(f^2*(2 + m)
^2) + (d*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m)) + (e*(f*x)^(2 + m)*(
a + b*Log[c*x^n]))/(f^2*(2 + m))
```

Rubi [A] time = 0.0812859, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {43, 2350}

$$\frac{d(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{e(fx)^{m+2}(a+b\log(cx^n))}{f^2(m+2)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+2}}{f^2(m+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (b*e*n*(f*x)^(2 + m))/(f^2*(2 + m)
^2) + (d*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m)) + (e*(f*x)^(2 + m)*(
a + b*Log[c*x^n]))/(f^2*(2 + m))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m(d+ex)(a+b\log(cx^n))\,dx = \frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{e(fx)^{2+m}(a+b\log(cx^n))}{f^2(2+m)} - (bn)\int (fx)^m\left(\frac{d}{1+m} +\right.$$
$$= \frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{e(fx)^{2+m}(a+b\log(cx^n))}{f^2(2+m)} - (bn)\int \left(\frac{d(fx)^m}{1+m} + \frac{e(f}{f(2}\right.$$
$$= -\frac{bdn(fx)^{1+m}}{f(1+m)^2} - \frac{ben(fx)^{2+m}}{f^2(2+m)^2} + \frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{e(fx)^{2+m}(a+b\log(}{f^2(2+m)}$$

Mathematica [A] time = 0.0681797, size = 64, normalized size = 0.67

$$x(fx)^m\left(\frac{d(a+b\log(cx^n))}{m+1} + \frac{ex(a+b\log(cx^n))}{m+2} - \frac{bdn}{(m+1)^2} - \frac{benx}{(m+2)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d*n)/(1 + m)^2) - (b*e*n*x)/(2 + m)^2 + (d*(a + b*Log[c*x^n
]))/(1 + m) + (e*x*(a + b*Log[c*x^n]))/(2 + m))
```

Maple [C] time = 0.187, size = 1122, normalized size = 11.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] b*x*(e*m*x+d*m+e*x+2*d)/(1+m)/(2+m)*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+I*Pi*csg
n(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f
)*csgn(I*x)+2*ln(f)+2*ln(x)))*ln(x^n)-1/2*x*(-8*a*d-2*a*d*m^3-10*a*e*m*x+5*
I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5*I*Pi*b*e*m*x*csgn(I*x^n)
*csgn(I*c*x^n)^2+8*b*d*n-16*a*d*m-4*ln(c)*b*e*x-4*I*Pi*b*e*m^2*x*csgn(I*c*x
^n)^2*csgn(I*c)-I*Pi*b*e*m^3*x*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d*m^3*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*ln(c)*b*e*m^3*x-8*ln(c)*b*e*m^2*x-10*ln(
c)*b*e*m*x+I*Pi*b*e*m^3*x*csgn(I*c*x^n)^3+4*I*Pi*b*e*m^2*x*csgn(I*c*x^n)^3-
5*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2*b*e*m^2*n*x-8*I*Pi*b*d*m*csgn(
```

```
I*c*x^n)^2*csgn(I*c)-10*ln(c)*b*d*m^2-16*ln(c)*b*d*m-2*ln(c)*b*d*m^3+5*I*Pi
*b*e*m*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*m^3*x*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)+4*I*Pi*b*e*m^2*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5
*I*Pi*b*e*m*x*csgn(I*c*x^n)^2*csgn(I*c)+8*I*Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+2*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*e*m
^2*x*csgn(I*x^n)*csgn(I*c*x^n)^2+4*I*Pi*b*d*csgn(I*c*x^n)^3-2*a*e*m^3*x+2*b
*d*m^2*n-8*ln(c)*b*d+8*b*d*m*n-8*a*e*m^2*x-I*Pi*b*e*m^3*x*csgn(I*c*x^n)^2*c
sgn(I*c)-4*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*m^3*csgn(I*c*x^n)^3-
10*a*d*m^2-2*I*Pi*b*e*x*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*e*x*csgn(I*c*x
^n)^2*csgn(I*c)+4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5*I*Pi*b*d*m
^2*csgn(I*c*x^n)^2*csgn(I*c)+5*I*Pi*b*e*m*x*csgn(I*c*x^n)^3-8*I*Pi*b*d*m*cs
gn(I*x^n)*csgn(I*c*x^n)^2+4*b*e*m*n*x+5*I*Pi*b*d*m^2*csgn(I*c*x^n)^3+8*I*Pi
*b*d*m*csgn(I*c*x^n)^3+2*I*Pi*b*e*x*csgn(I*c*x^n)^3-4*I*Pi*b*d*csgn(I*x^n)*
csgn(I*c*x^n)^2-I*Pi*b*d*m^3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*m^3*csgn(
I*c*x^n)^2*csgn(I*c)-4*a*e*x+2*b*e*n*x)/(2+m)^2/(1+m)^2*exp(1/2*m*(-I*Pi*cs
gn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*
csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^m*(e*x+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.43297, size = 558, normalized size = 5.87

$$\frac{\left(\left(aem^3 + 4\,aem^2 + 5\,aem + 2\,ae - \left(bem^2 + 2\,bem + be\right)n\right)x^2 + \left(adm^3 + 5\,adm^2 + 8\,adm + 4\,ad - \left(bdm^2 + 4\,bdm + 4\,bd\right)n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e*m^3 + 4*a*e*m^2 + 5*a*e*m + 2*a*e - (b*e*m^2 + 2*b*e*m + b*e)*n)*x^2
+ (a*d*m^3 + 5*a*d*m^2 + 8*a*d*m + 4*a*d - (b*d*m^2 + 4*b*d*m + 4*b*d)*n)*x
 + ((b*e*m^3 + 4*b*e*m^2 + 5*b*e*m + 2*b*e)*x^2 + (b*d*m^3 + 5*b*d*m^2 + 8*
```

```
b*d*m + 4*b*d)*x)*log(c) + ((b*e*m^3 + 4*b*e*m^2 + 5*b*e*m + 2*b*e)*n*x^2 +
 (b*d*m^3 + 5*b*d*m^2 + 8*b*d*m + 4*b*d)*n*x)*log(x))*e^(m*log(f) + m*log(x
))/(m^4 + 6*m^3 + 13*m^2 + 12*m + 4)
```

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((f*x)**m*(e*x+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.29936, size = 293, normalized size = 3.08

$$\frac{bf^m mnx^2x^m e\log(x)}{m^2+4m+4} + \frac{bdf^m mnxx^m\log(x)}{m^2+2m+1} + \frac{2bf^m nx^2x^m e\log(x)}{m^2+4m+4} - \frac{bf^m nx^2x^m e}{m^2+4m+4} + \frac{bf^m x^2x^m e\log(c)}{m+2} + \frac{bdf^m nxx^m \mathrm{l}}{m^2+2m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) + b*d*f^m*m*n*x*x^m*log(x)/(m^2
+ 2*m + 1) + 2*b*f^m*n*x^2*x^m*e*log(x)/(m^2 + 4*m + 4) - b*f^m*n*x^2*x^m*e
/(m^2 + 4*m + 4) + b*f^m*x^2*x^m*e*log(c)/(m + 2) + b*d*f^m*n*x*x^m*log(x)/
(m^2 + 2*m + 1) - b*d*f^m*n*x*x^m/(m^2 + 2*m + 1) + a*f^m*x^2*x^m*e/(m + 2)
 + (f*x)^m*b*d*x*log(c)/(m + 1) + (f*x)^m*a*d*x/(m + 1)
```

3.165 $\int (fx)^m (a+b\log(cx^n))\,dx$

Optimal. Leaf size=46

$$\frac{(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rubi [A] time = 0.0165148, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2304}

$$\frac{(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^m (a+b\log(cx^n))\,dx=-\frac{bn(fx)^{1+m}}{f(1+m)^2}+\frac{(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}$$

Mathematica [A] time = 0.0130727, size = 32, normalized size = 0.7

$$\frac{x(fx)^m(am+a+b(m+1)\log(cx^n)-bn)}{(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(f*x)^m*(a + a*m - b*n + b*(1 + m)*Log[c*x^n]))/(1 + m)^2
```

Maple [C] time = 0.109, size = 371, normalized size = 8.1

$$\frac{bx\ln(x^n)}{1+m}\mathrm{e}^{\frac{m\left(-i\pi\left(\mathrm{csgn}(ifx)\right)^3+i\pi\left(\mathrm{csgn}(ifx)\right)^2\mathrm{csgn}(if)+i\pi\left(\mathrm{csgn}(ifx)\right)^2\mathrm{csgn}(ix)-i\pi\,\mathrm{csgn}(ifx)\mathrm{csgn}(if)\mathrm{csgn}(ix)+2\ln(f)+2\ln(x)\right)}{2}} - \frac{\left(-i\pi\, b\mathrm{csgn}\,(ix^n)\,(\mathrm{csgn}\,(i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n)),x)
```

```
[Out] b/(1+m)*x*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*
csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x
)))*ln(x^n)-1/2*(-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2*m+I*Pi*b*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*m+I*Pi*b*csgn(I*c*x^n)^3*m-I*Pi*b*csgn(I*c*x^n)^2*cs
gn(I*c)*m-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+I*b*Pi*csgn(I*c*x^n)^3-I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)-2*b*ln
(c)*m-2*b*ln(c)-2*a*m+2*b*n-2*a)/(1+m)^2*x*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+I
*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*c
sgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^m*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.28986, size = 142, normalized size = 3.09

$$\frac{((bm+b)nx\log(x)+(bm+b)x\log(c)+(am-bn+a)x)e^{\left(m\log\left(f\right)+m\log(x)\right)}}{m^2+2\,m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*m + b)*n*x*log(x) + (b*m + b)*x*log(c) + (a*m - b*n + a)*x)*e^(m*log(f)
 + m*log(x))/(m^2 + 2*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((f*x)**m*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.32657, size = 128, normalized size = 2.78

$$\frac{bf^m mnxx^m\log(x)}{m^2+2\,m+1}+\frac{bf^m nxx^m\log(x)}{m^2+2\,m+1}-\frac{bf^m nxx^m}{m^2+2\,m+1}+\frac{\left(fx\right)^m bx\log(c)}{m+1}+\frac{\left(fx\right)^m ax}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*x*log(c)/(m + 1) + (f*x)^m*a
*x/(m + 1)
```

3.166 $\int \frac{(fx)^m(a+b\log(cx^n))}{d+ex}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x), x]
```

Rubi [A] time = 0.0550209, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x),x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x), x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex}\,dx$$

Mathematica [A] time = 0.101956, size = 72, normalized size = 2.88

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(1,m+1;m+2;-\frac{ex}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,m+1,m+1;m+2,m+2;-\frac{ex}{d}\right)\right)}{d(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x),x]
```

```
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{1, 1 + m, 1 + m}, {2 + m, 2 + m}, -((e
*x)/d)]) + (1 + m)*Hypergeometric2F1[1, 1 + m, 2 + m, -((e*x)/d)]*(a + b*Lo
```

```
g[c*x^n])))/(d*(1 + m)^2)
```

Maple [A] time = 0.869, size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b\ln(cx^n))}{ex + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))/(e*x+d),x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))/(e*x+d),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)(fx)^m}{ex + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx)^m b\log(cx^n) + (fx)^m a}{ex + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e*x + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b\log(cx^n))}{d + ex}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(e*x+d),x)
```

```
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)(fx)^m}{ex + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d), x)
```

3.167 $\int \frac{(fx)^m(a+b\log(cx^n))}{(d+ex)^2}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex)^2},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x)^2, x]
```

Rubi [A] time = 0.0529172, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x)^2,x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex)^2}\,dx=\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex)^2}\,dx$$

Mathematica [A] time = 0.103213, size = 72, normalized size = 2.88

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(2,m+1;m+2;-\frac{ex}{d}\right)(a+b\log(cx^n))-bn\,{}_3F_2\left(2,m+1,m+1;m+2,m+2;-\frac{ex}{d}\right)\right)}{d^2(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x)^2,x]
```

```
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{2, 1 + m, 1 + m}, {2 + m, 2 + m}, -((e
*x)/d)]) + (1 + m)*Hypergeometric2F1[2, 1 + m, 2 + m, -((e*x)/d)]*(a + b*Lo
```

```
g[c*x^n])))/(d^2*(1 + m)^2)
```

Maple [A] time = 0.671, size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{m}\left(a+b\ln\left(cx^{n}\right)\right)}{\left(ex+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))/(e*x+d)^2,x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))/(e*x+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)\left(fx\right)^{m}}{\left(ex+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(fx\right)^{m}b\log\left(cx^{n}\right)+\left(fx\right)^{m}a}{e^{2}x^{2}+2\,dex+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d)^2,x, algorithm="fricas")
```

```
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e^2*x^2 + 2*d*e*x + d^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b\log(cx^n))}{(d + ex)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(e*x+d)**2,x)
```

```
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x)**2, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)(fx)^m}{(ex + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x + d)^2, x)
```

3.168 $\int x(a+bx)^m \log(cx^n)\,dx$

Optimal. Leaf size=17

$$\text{Unintegrable}\left(x(a+bx)^m \log(cx^n),x\right)$$

```
[Out] Unintegrable[x*(a + b*x)^m*Log[c*x^n], x]
```

Rubi [A] time = 0.0189418, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int x(a+bx)^m \log(cx^n)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] Defer[Int][x*(a + b*x)^m*Log[c*x^n], x]
```

Rubi steps

$$\int x(a+bx)^m \log(cx^n)\,dx = \int x(a+bx)^m \log(cx^n)\,dx$$

Mathematica [A] time = 0.2398, size = 173, normalized size = 10.18

$$\frac{(a+bx)^m\left(\frac{bx}{a}+1\right)^{-m}\left(ab(m+2)nx\,{}_3F_2\left(1,1,-m-1;2,2;-\frac{bx}{a}\right)+\left(-a^2\left(\left(\frac{bx}{a}+1\right)^m-1\right)+b^2(m+1)x^2\left(\frac{bx}{a}+1\right)^m+abmx\right.\right.}{b^2(m+1)(m+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] ((a + b*x)^m*(-(n*(2*a*b*x*(1 + (b*x)/a)^m + b^2*x^2*(1 + (b*x)/a)^m + a^2*
(-1 + (1 + (b*x)/a)^m))) + a*b*(2 + m)*n*x*HypergeometricPFQ[{1, 1, -1 - m}
, {2, 2}, -((b*x)/a)] + (a*b*m*x*(1 + (b*x)/a)^m + b^2*(1 + m)*x^2*(1 + (b*
```

```
x)/a)^m - a^2*(-1 + (1 + (b*x)/a)^m))*Log[c*x^n]))/(b^2*(1 + m)*(2 + m)*(1
+ (b*x)/a)^m)
```

Maple [A] time = 0.618, size = 0, normalized size = 0.

$$\int x \left(bx + a\right)^{m} \ln \left(cx^{n}\right) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(b*x+a)^m*ln(c*x^n),x)
```

```
[Out] int(x*(b*x+a)^m*ln(c*x^n),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(x*(b*x+a)^m*log(c*x^n),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bx + a\right)^{m} x \log \left(cx^{n}\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(b*x+a)^m*log(c*x^n),x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*x*log(c*x^n), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int x\left(a+bx\right)^{m}\log\left(cx^{n}\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(b*x+a)**m*ln(c*x**n),x)
```

```
[Out] Integral(x*(a + b*x)**m*log(c*x**n), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)^{m}x\log\left(cx^{n}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(b*x+a)^m*log(c*x^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*x*log(c*x^n), x)
```

3.169 $\int (a+bx)^m \log(cx^n)\,dx$

Optimal. Leaf size=68

$$\frac{(a+bx)^{m+1}\log(cx^n)}{b(m+1)}+\frac{n(a+bx)^{m+2}\,{}_2F_1\left(1,m+2;m+3;\frac{bx}{a}+1\right)}{ab\left(m^2+3m+2\right)}$$

```
[Out] (n*(a + b*x)^(2 + m)*Hypergeometric2F1[1, 2 + m, 3 + m, 1 + (b*x)/a])/(a*b*
(2 + 3*m + m^2)) + ((a + b*x)^(1 + m)*Log[c*x^n])/(b*(1 + m))
```

Rubi [A] time = 0.0283179, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2319, 65}

$$\frac{(a+bx)^{m+1}\log(cx^n)}{b(m+1)}+\frac{n(a+bx)^{m+2}\,{}_2F_1\left(1,m+2;m+3;\frac{bx}{a}+1\right)}{ab\left(m^2+3m+2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] (n*(a + b*x)^(2 + m)*Hypergeometric2F1[1, 2 + m, 3 + m, 1 + (b*x)/a])/(a*b*
(2 + 3*m + m^2)) + ((a + b*x)^(1 + m)*Log[c*x^n])/(b*(1 + m))
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 65

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((c + d*x
)^(n + 1)*Hypergeometric2F1[-m, n + 1, n + 2, 1 + (d*x)/c])/(d*(n + 1)*(-(d
/(b*c)))^m), x] /; FreeQ[{b, c, d, m, n}, x] &&  !IntegerQ[n] && (IntegerQ[
m] || GtQ[-(d/(b*c)), 0])
```

Rubi steps

$$\int (a+bx)^m \log(cx^n)\,dx = \frac{(a+bx)^{1+m}\log(cx^n)}{b(1+m)} - \frac{n\int \frac{(a+bx)^{1+m}}{x}\,dx}{b(1+m)}$$
$$= \frac{n(a+bx)^{2+m}\,{}_2F_1\left(1,2+m;3+m;1+\frac{bx}{a}\right)}{ab\left(2+3m+m^2\right)} + \frac{(a+bx)^{1+m}\log(cx^n)}{b(1+m)}$$

Mathematica [A] time = 0.0187284, size = 61, normalized size = 0.9

$$\frac{(a+bx)^{m+1}\left(n(a+bx)\,{}_2F_1\left(1,m+2;m+3;\frac{bx}{a}+1\right)+a(m+2)\log(cx^n)\right)}{ab(m+1)(m+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*x)^m*Log[c*x^n],x]
```

```
[Out] ((a + b*x)^(1 + m)*(n*(a + b*x)*Hypergeometric2F1[1, 2 + m, 3 + m, 1 + (b*x
)/a] + a*(2 + m)*Log[c*x^n]))/(a*b*(1 + m)*(2 + m))
```

Maple [F] time = 0.535, size = 0, normalized size = 0.

$$\int (bx+a)^m \ln(cx^n)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*ln(c*x^n),x)
```

```
[Out] int((b*x+a)^m*ln(c*x^n),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((b*x+a)^m*log(c*x^n),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left((bx+a)^m \log\left(cx^n\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n),x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*log(c*x^n), x)
```

Sympy [A] time = 36.7339, size = 233, normalized size = 3.43

$$-n\left(\begin{cases} a^m x & \text{for } (b=0 \wedge m \neq -1) \vee b=0 \\ -\frac{b^2 b^m m\left(\frac{a}{b}+x\right)^2\left(\frac{a}{b}+x\right)^m \Phi\left(1+\frac{bx}{a},1,m+2\right)\Gamma(m+2)}{abm\Gamma(m+3)+ab\Gamma(m+3)} - \frac{2b^2 b^m\left(\frac{a}{b}+x\right)^2\left(\frac{a}{b}+x\right)^m \Phi\left(1+\frac{bx}{a},1,m+2\right)\Gamma(m+2)}{abm\Gamma(m+3)+ab\Gamma(m+3)} & \text{for } m > -\infty \wedge m < \infty \wedge m \neq \\ \frac{\begin{cases} \log(a)\log(x) - \text{Li}_2\left(\frac{bxe^{i\pi}}{a}\right) & \text{for } |x|<1 \\ -\log(a)\log\left(\frac{1}{x}\right) - \text{Li}_2\left(\frac{bxe^{i\pi}}{a}\right) & \text{for } \frac{1}{|x|}<1 \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(a) + G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)\log(a) - \text{Li}_2\left(\frac{bxe^{i\pi}}{a}\right) & \text{otherwise} \end{cases}}{b} & \text{otherwise} \end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*ln(c*x**n),x)
```

```
[Out] -n*Piecewise((a**m*x, Eq(b, 0) | (Eq(b, 0) & Ne(m, -1))), (-b**2*b**m*m*(a/
b + x)**2*(a/b + x)**m*lerchphi(1 + b*x/a, 1, m + 2)*gamma(m + 2)/(a*b*m*ga
mma(m + 3) + a*b*gamma(m + 3)) - 2*b**2*b**m*(a/b + x)**2*(a/b + x)**m*lerc
hphi(1 + b*x/a, 1, m + 2)*gamma(m + 2)/(a*b*m*gamma(m + 3) + a*b*gamma(m +
3)), (m > -oo) & (m < oo) & Ne(m, -1)), (Piecewise((log(a)*log(x) - polylog
(2, b*x*exp_polar(I*pi)/a), Abs(x) < 1), (-log(a)*log(1/x) - polylog(2, b*x
*exp_polar(I*pi)/a), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x
)*log(a) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(a) - polylog(2, b*x*e
```

```
xp_polar(I*pi)/a), True))/b, True)) + Piecewise((a**m*x, Eq(b, 0)), (Piecew
ise(((a + b*x)**(m + 1)/(m + 1), Ne(m, -1)), (log(a + b*x), True))/b, True)
)*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (bx+a)^m \log(cx^n)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n),x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*log(c*x^n), x)
```

3.170 $\int \frac{(a+bx)^m \log(cx^n)}{x} \, dx$

Optimal. Leaf size=19

$$\text{Unintegrable}\left(\frac{(a+bx)^m \log(cx^n)}{x}, x\right)$$

```
[Out] Unintegrable[((a + b*x)^m*Log[c*x^n])/x, x]
```

Rubi [A] time = 0.0291745, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(a+bx)^m \log(cx^n)}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[((a + b*x)^m*Log[c*x^n])/x,x]
```

```
[Out] Defer[Int][((a + b*x)^m*Log[c*x^n])/x, x]
```

Rubi steps

$$\int \frac{(a+bx)^m \log(cx^n)}{x} \, dx = \int \frac{(a+bx)^m \log(cx^n)}{x} \, dx$$

Mathematica [A] time = 0.0541875, size = 89, normalized size = 4.68

$$\frac{\left(\frac{a}{bx}+1\right)^{-m} (a+bx)^m \left(m \log(cx^n) \, {}_2F_1\left(-m,-m;1-m;-\frac{a}{bx}\right) - n \, {}_3F_2\left(-m,-m,-m;1-m,1-m;-\frac{a}{bx}\right)\right)}{m^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*x)^m*Log[c*x^n])/x,x]
```

```
[Out] ((a + b*x)^m*(-(n*HypergeometricPFQ[{-m, -m, -m}, {1 - m, 1 - m}, -(a/(b*x)
)]) + m*Hypergeometric2F1[-m, -m, 1 - m, -(a/(b*x))]*Log[c*x^n]))/(m^2*(1 +
```

```
a/(b*x))^m)
```

Maple [A] time = 0.555, size = 0, normalized size = 0.

$$\int \frac{(bx+a)^m \ln(cx^n)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((b*x+a)^m*ln(c*x^n)/x,x)
```

```
[Out] int((b*x+a)^m*ln(c*x^n)/x,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^m \log(cx^n)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n)/x,x, algorithm="maxima")
```

```
[Out] integrate((b*x + a)^m*log(c*x^n)/x, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(bx+a)^m \log(cx^n)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n)/x,x, algorithm="fricas")
```

```
[Out] integral((b*x + a)^m*log(c*x^n)/x, x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+bx)^m \log(cx^n)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)**m*ln(c*x**n)/x,x)
```

```
[Out] Integral((a + b*x)**m*log(c*x**n)/x, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(bx+a)^m \log(cx^n)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((b*x+a)^m*log(c*x^n)/x,x, algorithm="giac")
```

```
[Out] integrate((b*x + a)^m*log(c*x^n)/x, x)
```

3.171 $\int x^5 \left(d+ex^2\right)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=48

$$\frac{1}{24}\left(4dx^6+3ex^8\right)(a+b\log(cx^n))-\frac{1}{36}bdnx^6-\frac{1}{64}benx^8$$

```
[Out] -(b*d*n*x^6)/36 - (b*e*n*x^8)/64 + ((4*d*x^6 + 3*e*x^8)*(a + b*Log[c*x^n]))
/24
```

Rubi [A] time = 0.0430605, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{24}\left(4dx^6+3ex^8\right)(a+b\log(cx^n))-\frac{1}{36}bdnx^6-\frac{1}{64}benx^8$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^6)/36 - (b*e*n*x^8)/64 + ((4*d*x^6 + 3*e*x^8)*(a + b*Log[c*x^n]))
/24
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^5\left(d+ex^2\right)(a+b\log(cx^n))\,dx=\frac{1}{24}\left(4dx^6+3ex^8\right)(a+b\log(cx^n))-(bn)\int\left(\frac{dx^5}{6}+\frac{ex^7}{8}\right)dx$$
$$=-\frac{1}{36}bdnx^6-\frac{1}{64}benx^8+\frac{1}{24}\left(4dx^6+3ex^8\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0027855, size = 69, normalized size = 1.44

$$\frac{1}{6}adx^6+\frac{1}{8}aex^8+\frac{1}{6}bdx^6\log(cx^n)+\frac{1}{8}bex^8\log(cx^n)-\frac{1}{36}bdnx^6-\frac{1}{64}benx^8$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^6)/6 - (b*d*n*x^6)/36 + (a*e*x^8)/8 - (b*e*n*x^8)/64 + (b*d*x^6*Log[
c*x^n])/6 + (b*e*x^8*Log[c*x^n])/8
```

Maple [C] time = 0.203, size = 266, normalized size = 5.5

$$\frac{bx^6\left(3\,ex^2+4\,d\right)\ln(x^n)}{24}+\frac{i}{16}\pi\,bex^8\mathrm{csgn}(ix^n)\left(\mathrm{csgn}(icx^n)\right)^2-\frac{i}{16}\pi\,bex^8\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-\frac{i}{16}\pi\,bex^8\,(\mathrm{csgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/24*b*x^6*(3*e*x^2+4*d)*ln(x^n)+1/16*I*Pi*b*e*x^8*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/16*I*Pi*b*e*x^8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/16*I*Pi*b*e*x^8
*csgn(I*c*x^n)^3+1/16*I*Pi*b*e*x^8*csgn(I*c*x^n)^2*csgn(I*c)+1/8*ln(c)*b*e*
x^8-1/64*b*e*n*x^8+1/8*a*e*x^8+1/12*I*Pi*b*d*x^6*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/12*I*Pi*b*d*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/12*I*Pi*b*d*x^6*c
sgn(I*c*x^n)^3+1/12*I*Pi*b*d*x^6*csgn(I*c*x^n)^2*csgn(I*c)+1/6*ln(c)*b*d*x^
6-1/36*b*d*n*x^6+1/6*a*d*x^6
```

Maxima [A] time = 1.16571, size = 77, normalized size = 1.6

$$-\frac{1}{64}\,benx^8+\frac{1}{8}\,bex^8\log(cx^n)+\frac{1}{8}\,aex^8-\frac{1}{36}\,bdnx^6+\frac{1}{6}\,bdx^6\log(cx^n)+\frac{1}{6}\,adx^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/64*b*e*n*x^8 + 1/8*b*e*x^8*log(c*x^n) + 1/8*a*e*x^8 - 1/36*b*d*n*x^6 + 1
/6*b*d*x^6*log(c*x^n) + 1/6*a*d*x^6
```

Fricas [A] time = 1.30038, size = 181, normalized size = 3.77

$$-\frac{1}{64}(ben-8ae)x^8-\frac{1}{36}(bdn-6ad)x^6+\frac{1}{24}\left(3bex^8+4bdx^6\right)\log(c)+\frac{1}{24}\left(3benx^8+4bdnx^6\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/64*(b*e*n - 8*a*e)*x^8 - 1/36*(b*d*n - 6*a*d)*x^6 + 1/24*(3*b*e*x^8 + 4*
b*d*x^6)*log(c) + 1/24*(3*b*e*n*x^8 + 4*b*d*n*x^6)*log(x)
```

Sympy [B] time = 13.618, size = 87, normalized size = 1.81

$$\frac{adx^6}{6}+\frac{aex^8}{8}+\frac{bdnx^6\log(x)}{6}-\frac{bdnx^6}{36}+\frac{bdx^6\log(c)}{6}+\frac{benx^8\log(x)}{8}-\frac{benx^8}{64}+\frac{bex^8\log(c)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**6/6 + a*e*x**8/8 + b*d*n*x**6*log(x)/6 - b*d*n*x**6/36 + b*d*x**6*lo
g(c)/6 + b*e*n*x**8*log(x)/8 - b*e*n*x**8/64 + b*e*x**8*log(c)/8
```

Giac [A] time = 1.32868, size = 99, normalized size = 2.06

$$\frac{1}{8}bnx^8e\log(x)-\frac{1}{64}bnx^8e+\frac{1}{8}bx^8e\log(c)+\frac{1}{8}ax^8e+\frac{1}{6}bdnx^6\log(x)-\frac{1}{36}bdnx^6+\frac{1}{6}bdx^6\log(c)+\frac{1}{6}adx^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/8*b*n*x^8*e*log(x) - 1/64*b*n*x^8*e + 1/8*b*x^8*e*log(c) + 1/8*a*x^8*e +
1/6*b*d*n*x^6*log(x) - 1/36*b*d*n*x^6 + 1/6*b*d*x^6*log(c) + 1/6*a*d*x^6
```

3.172 $\int x^3 \left(d+ex^2\right) \left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=48

$$\frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bdnx^4-\frac{1}{36}benx^6$$

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^6)/36 + ((3*d*x^4 + 2*e*x^6)*(a + b*Log[c*x^n]))
/12
```

Rubi [A] time = 0.0415739, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{16}bdnx^4-\frac{1}{36}benx^6$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```


```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^6)/36 + ((3*d*x^4 + 2*e*x^6)*(a + b*Log[c*x^n]))
/12
```


Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)\left(a+b\log\left(cx^n\right)\right)\,dx = \frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{dx^3}{4}+\frac{ex^5}{6}\right)dx$$
$$= -\frac{1}{16}bdnx^4-\frac{1}{36}benx^6+\frac{1}{12}\left(3dx^4+2ex^6\right)\left(a+b\log\left(cx^n\right)\right)$$

Mathematica [A] time = 0.0022954, size = 69, normalized size = 1.44

$$\frac{1}{4}adx^4+\frac{1}{6}aex^6+\frac{1}{4}bdx^4\log\left(cx^n\right)+\frac{1}{6}bex^6\log\left(cx^n\right)-\frac{1}{16}bdnx^4-\frac{1}{36}benx^6$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^4)/4 - (b*d*n*x^4)/16 + (a*e*x^6)/6 - (b*e*n*x^6)/36 + (b*d*x^4*Log[
c*x^n])/4 + (b*e*x^6*Log[c*x^n])/6
```

Maple [C] time = 0.317, size = 266, normalized size = 5.5

$$\frac{bx^4\left(2\,ex^2+3\,d\right)\ln\left(x^n\right)}{12}+\frac{i}{12}\pi\,bex^6\mathrm{csgn}\left(ix^n\right)\left(\mathrm{csgn}\left(icx^n\right)\right)^2-\frac{i}{12}\pi\,bex^6\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(icx^n\right)\mathrm{csgn}\left(ic\right)-\frac{i}{12}\pi\,bex^6\left(\mathrm{csgn}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/12*b*x^4*(2*e*x^2+3*d)*ln(x^n)+1/12*I*Pi*b*e*x^6*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/12*I*Pi*b*e*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/12*I*Pi*b*e*x^6
*csgn(I*c*x^n)^3+1/12*I*Pi*b*e*x^6*csgn(I*c*x^n)^2*csgn(I*c)+1/6*ln(c)*b*e*
x^6-1/36*b*e*n*x^6+1/6*a*e*x^6+1/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/8*I*Pi*b*d*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*d*x^4*csgn
(I*c*x^n)^3+1/8*I*Pi*b*d*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*ln(c)*b*d*x^4-1/
16*b*d*n*x^4+1/4*a*d*x^4
```

Maxima [A] time = 1.13715, size = 77, normalized size = 1.6

$$-\frac{1}{36}\,benx^6+\frac{1}{6}\,bex^6\log\left(cx^n\right)+\frac{1}{6}\,aex^6-\frac{1}{16}\,bdnx^4+\frac{1}{4}\,bdx^4\log\left(cx^n\right)+\frac{1}{4}\,adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/36*b*e*n*x^6 + 1/6*b*e*x^6*log(c*x^n) + 1/6*a*e*x^6 - 1/16*b*d*n*x^4 + 1
/4*b*d*x^4*log(c*x^n) + 1/4*a*d*x^4
```

Fricas [A] time = 1.29095, size = 181, normalized size = 3.77

$$-\frac{1}{36}\,(ben-6\,ae)x^6-\frac{1}{16}\,(bdn-4\,ad)x^4+\frac{1}{12}\left(2\,bex^6+3\,bdx^4\right)\log\left(c\right)+\frac{1}{12}\left(2\,benx^6+3\,bdnx^4\right)\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/36*(b*e*n - 6*a*e)*x^6 - 1/16*(b*d*n - 4*a*d)*x^4 + 1/12*(2*b*e*x^6 + 3*
b*d*x^4)*log(c) + 1/12*(2*b*e*n*x^6 + 3*b*d*n*x^4)*log(x)
```

Sympy [B] time = 5.29384, size = 87, normalized size = 1.81

$$\frac{adx^4}{4}+\frac{aex^6}{6}+\frac{bdnx^4\log\left(x\right)}{4}-\frac{bdnx^4}{16}+\frac{bdx^4\log\left(c\right)}{4}+\frac{benx^6\log\left(x\right)}{6}-\frac{benx^6}{36}+\frac{bex^6\log\left(c\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**4/4 + a*e*x**6/6 + b*d*n*x**4*log(x)/4 - b*d*n*x**4/16 + b*d*x**4*lo
g(c)/4 + b*e*n*x**6*log(x)/6 - b*e*n*x**6/36 + b*e*x**6*log(c)/6
```

Giac [A] time = 1.24119, size = 99, normalized size = 2.06

$$\frac{1}{6}\,bnx^6e\log\left(x\right)-\frac{1}{36}\,bnx^6e+\frac{1}{6}\,bx^6e\log\left(c\right)+\frac{1}{6}\,ax^6e+\frac{1}{4}\,bdnx^4\log\left(x\right)-\frac{1}{16}\,bdnx^4+\frac{1}{4}\,bdx^4\log\left(c\right)+\frac{1}{4}\,adx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/6*b*n*x^6*e*log(x) - 1/36*b*n*x^6*e + 1/6*b*x^6*e*log(c) + 1/6*a*x^6*e +
1/4*b*d*n*x^4*log(x) - 1/16*b*d*n*x^4 + 1/4*b*d*x^4*log(c) + 1/4*a*d*x^4
```

3.173 $\int x\left(d+ex^2\right)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=47

$$\frac{1}{4}\left(2dx^2+ex^4\right)(a+b\log(cx^n))-\frac{1}{4}bdnx^2-\frac{1}{16}benx^4$$

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^4)/16 + ((2*d*x^2 + e*x^4)*(a + b*Log[c*x^n]))/4
```

Rubi [A] time = 0.0366205, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {14, 2334, 12}

$$\frac{1}{4}\left(2dx^2+ex^4\right)(a+b\log(cx^n))-\frac{1}{4}bdnx^2-\frac{1}{16}benx^4$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^4)/16 + ((2*d*x^2 + e*x^4)*(a + b*Log[c*x^n]))/4
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int x\left(d+ex^2\right)(a+b\log(cx^n))\,dx = \frac{1}{4}\left(2dx^2+ex^4\right)(a+b\log(cx^n)) - (bn)\int \frac{1}{4}x\left(2d+ex^2\right)dx$$
$$= \frac{1}{4}\left(2dx^2+ex^4\right)(a+b\log(cx^n)) - \frac{1}{4}(bn)\int x\left(2d+ex^2\right)dx$$
$$= \frac{1}{4}\left(2dx^2+ex^4\right)(a+b\log(cx^n)) - \frac{1}{4}(bn)\int \left(2dx+ex^3\right)dx$$
$$= -\frac{1}{4}bdnx^2 - \frac{1}{16}benx^4 + \frac{1}{4}\left(2dx^2+ex^4\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0021318, size = 69, normalized size = 1.47

$$\frac{1}{2}adx^2 + \frac{1}{4}aex^4 + \frac{1}{2}bdx^2\log(cx^n) + \frac{1}{4}bex^4\log(cx^n) - \frac{1}{4}bdnx^2 - \frac{1}{16}benx^4$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^2)/2 - (b*d*n*x^2)/4 + (a*e*x^4)/4 - (b*e*n*x^4)/16 + (b*d*x^2*Log[c
*x^n])/2 + (b*e*x^4*Log[c*x^n])/4
```

Maple [C] time = 0.202, size = 265, normalized size = 5.6

$$\frac{bx^2\left(ex^2+2d\right)\ln(x^n)}{4} + \frac{i}{8}\pi\, bex^4\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2 - \frac{i}{8}\pi\, bex^4\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic) - \frac{i}{8}\pi\, bex^4\,(\mathrm{csgn}(icx^n$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/4*b*x^2*(e*x^2+2*d)*ln(x^n)+1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-
1/8*I*Pi*b*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*e*x^4*csgn(
I*c*x^n)^3+1/8*I*Pi*b*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*ln(c)*b*e*x^4-1/1
6*b*e*n*x^4+1/4*a*e*x^4+1/4*I*Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*
Pi*b*d*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I*Pi*b*d*x^2*csgn(I*c*x^
n)^3+1/4*I*Pi*b*d*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/2*ln(c)*b*d*x^2-1/4*b*d*n
*x^2+1/2*a*d*x^2
```

Maxima [A] time = 1.04448, size = 77, normalized size = 1.64

$$-\frac{1}{16}\,benx^4+\frac{1}{4}\,bex^4\log\left(cx^n\right)+\frac{1}{4}\,aex^4-\frac{1}{4}\,bdnx^2+\frac{1}{2}\,bdx^2\log\left(cx^n\right)+\frac{1}{2}\,adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/16*b*e*n*x^4 + 1/4*b*e*x^4*log(c*x^n) + 1/4*a*e*x^4 - 1/4*b*d*n*x^2 + 1/
2*b*d*x^2*log(c*x^n) + 1/2*a*d*x^2
```

Fricas [A] time = 1.25674, size = 171, normalized size = 3.64

$$-\frac{1}{16}\,(ben-4\,ae)x^4-\frac{1}{4}\,(bdn-2\,ad)x^2+\frac{1}{4}\,\left(bex^4+2\,bdx^2\right)\log\left(c\right)+\frac{1}{4}\,\left(benx^4+2\,bdnx^2\right)\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/16*(b*e*n - 4*a*e)*x^4 - 1/4*(b*d*n - 2*a*d)*x^2 + 1/4*(b*e*x^4 + 2*b*d*
x^2)*log(c) + 1/4*(b*e*n*x^4 + 2*b*d*n*x^2)*log(x)
```

Sympy [B] time = 1.85302, size = 87, normalized size = 1.85

$$\frac{adx^2}{2}+\frac{aex^4}{4}+\frac{bdnx^2\log\left(x\right)}{2}-\frac{bdnx^2}{4}+\frac{bdx^2\log\left(c\right)}{2}+\frac{benx^4\log\left(x\right)}{4}-\frac{benx^4}{16}+\frac{bex^4\log\left(c\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**2/2 + a*e*x**4/4 + b*d*n*x**2*log(x)/2 - b*d*n*x**2/4 + b*d*x**2*log
(c)/2 + b*e*n*x**4*log(x)/4 - b*e*n*x**4/16 + b*e*x**4*log(c)/4
```

Giac [A] time = 1.27323, size = 99, normalized size = 2.11

$$\frac{1}{4}\,bnx^4e\log\left(x\right)-\frac{1}{16}\,bnx^4e+\frac{1}{4}\,bx^4e\log\left(c\right)+\frac{1}{4}\,ax^4e+\frac{1}{2}\,bdnx^2\log\left(x\right)-\frac{1}{4}\,bdnx^2+\frac{1}{2}\,bdx^2\log\left(c\right)+\frac{1}{2}\,adx^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/4*b*n*x^4*e*log(x) - 1/16*b*n*x^4*e + 1/4*b*x^4*e*log(c) + 1/4*a*x^4*e +
1/2*b*d*n*x^2*log(x) - 1/4*b*d*n*x^2 + 1/2*b*d*x^2*log(c) + 1/2*a*d*x^2
```

3.174 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x} dx$

Optimal. Leaf size=52

$$\frac{d(a+b\log(cx^n))^2}{2bn}+\frac{1}{2}ex^2(a+b\log(cx^n))-\frac{1}{4}benx^2$$

```
[Out] -(b*e*n*x^2)/4 + (e*x^2*(a + b*Log[c*x^n]))/2 + (d*(a + b*Log[c*x^n])^2)/(2
*b*n)
```

Rubi [A] time = 0.064304, antiderivative size = 52, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {14, 2351, 2301, 2304}

$$\frac{d(a+b\log(cx^n))^2}{2bn}+\frac{1}{2}ex^2(a+b\log(cx^n))-\frac{1}{4}benx^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -(b*e*n*x^2)/4 + (e*x^2*(a + b*Log[c*x^n]))/2 + (d*(a + b*Log[c*x^n])^2)/(2
*b*n)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^2)(a+b\log(cx^n))}{x}\,dx &= \int \left(\frac{d(a+b\log(cx^n))}{x}+ex(a+b\log(cx^n))\right)dx\\ &= d\int \frac{a+b\log(cx^n)}{x}\,dx+e\int x(a+b\log(cx^n))\,dx\\ &= -\frac{1}{4}benx^2+\frac{1}{2}ex^2(a+b\log(cx^n))+\frac{d(a+b\log(cx^n))^2}{2bn}\end{aligned}$$

Mathematica [A] time = 0.0024418, size = 57, normalized size = 1.1

$$ad\log(x)+\frac{1}{2}aex^2+\frac{bd\log^2(cx^n)}{2n}+\frac{1}{2}bex^2\log(cx^n)-\frac{1}{4}benx^2$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (a*e*x^2)/2 - (b*e*n*x^2)/4 + a*d*Log[x] + (b*e*x^2*Log[c*x^n])/2 + (b*d*Lo
g[c*x^n]^2)/(2*n)
```

Maple [C] time = 0.23, size = 257, normalized size = 4.9

$$\left(\frac{ebx^2}{2}+bd\ln(x)\right)\ln(x^n)-\frac{bdn(\ln(x))^2}{2}+\frac{i}{4}\pi bex^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-\frac{i}{4}\pi bex^2\mathrm{csgn}(ix^n)\mathrm{csgn}(icx^n)\mathrm{csgn}(ic)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] (1/2*e*b*x^2+b*d*ln(x))*ln(x^n)-1/2*b*d*n*ln(x)^2+1/4*I*Pi*b*e*x^2*csgn(I*x
^n)*csgn(I*c*x^n)^2-1/4*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/
4*I*Pi*b*e*x^2*csgn(I*c*x^n)^3+1/4*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1
/2*ln(c)*b*e*x^2-1/4*b*e*n*x^2+1/2*a*e*x^2+1/2*I*ln(x)*Pi*b*d*csgn(I*x^n)*c
sgn(I*c*x^n)^2-1/2*I*ln(x)*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I
*ln(x)*Pi*b*d*csgn(I*c*x^n)^3+1/2*I*ln(x)*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+
ln(x)*ln(c)*b*d+ln(x)*a*d
```

Maxima [A] time = 1.09173, size = 66, normalized size = 1.27

$$-\frac{1}{4}\,benx^2+\frac{1}{2}\,bex^2\log\left(cx^n\right)+\frac{1}{2}\,aex^2+\frac{bd\log\left(cx^n\right)^2}{2\,n}+ad\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] -1/4*b*e*n*x^2 + 1/2*b*e*x^2*log(c*x^n) + 1/2*a*e*x^2 + 1/2*b*d*log(c*x^n)^
2/n + a*d*log(x)
```

Fricas [A] time = 1.3388, size = 155, normalized size = 2.98

$$\frac{1}{2}\,bex^2\log\left(c\right)+\frac{1}{2}\,bdn\log\left(x\right)^2-\frac{1}{4}\,(ben-2\,ae)x^2+\frac{1}{2}\,\left(benx^2+2\,bd\log\left(c\right)+2\,ad\right)\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*b*e*x^2*log(c) + 1/2*b*d*n*log(x)^2 - 1/4*(b*e*n - 2*a*e)*x^2 + 1/2*(b*
e*n*x^2 + 2*b*d*log(c) + 2*a*d)*log(x)
```

Sympy [A] time = 1.18411, size = 71, normalized size = 1.37

$$ad\log\left(x\right)+\frac{aex^2}{2}+\frac{bdn\log\left(x\right)^2}{2}+bd\log\left(c\right)\log\left(x\right)+\frac{benx^2\log\left(x\right)}{2}-\frac{benx^2}{4}+\frac{bex^2\log\left(c\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] a*d*log(x) + a*e*x**2/2 + b*d*n*log(x)**2/2 + b*d*log(c)*log(x) + b*e*n*x**
2*log(x)/2 - b*e*n*x**2/4 + b*e*x**2*log(c)/2
```

Giac [A] time = 1.20174, size = 81, normalized size = 1.56

$$\frac{1}{2}\,bnx^2e\log\left(x\right)-\frac{1}{4}\,bnx^2e+\frac{1}{2}\,bx^2e\log\left(c\right)+\frac{1}{2}\,bdn\log\left(x\right)^2+\frac{1}{2}\,ax^2e+bd\log\left(c\right)\log\left(x\right)+ad\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*n*x^2*e*log(x) - 1/4*b*n*x^2*e + 1/2*b*x^2*e*log(c) + 1/2*b*d*n*log(x
)^2 + 1/2*a*x^2*e + b*d*log(c)*log(x) + a*d*log(x)
```

3.175 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=52

$$-\frac{d\,(a+b\log(cx^n))}{2x^2}+\frac{e\,(a+b\log(cx^n))^2}{2bn}-\frac{bdn}{4x^2}$$

```
[Out] -(b*d*n)/(4*x^2) - (d*(a + b*Log[c*x^n]))/(2*x^2) + (e*(a + b*Log[c*x^n])^2
)/(2*b*n)
```

Rubi [A] time = 0.0485854, antiderivative size = 47, normalized size of antiderivative = 0.9, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 2301}

$$-\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)(a+b\log(cx^n))-\frac{bdn}{4x^2}-\frac{1}{2}ben\log^2(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n*Log[x]^2)/2 - ((d/x^2 - 2*e*Log[x])*(a + b*Log[c*
x^n]))/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^3}\,dx &= -\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(-\frac{d}{2x^3}+\frac{e\log(x)}{x}\right)dx\\ &= -\frac{bdn}{4x^2}-\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)(a+b\log(cx^n))-(ben)\int\frac{\log(x)}{x}\,dx\\ &= -\frac{bdn}{4x^2}-\frac{1}{2}ben\log^2(x)-\frac{1}{2}\left(\frac{d}{x^2}-2e\log(x)\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0023472, size = 57, normalized size = 1.1

$$-\frac{ad}{2x^2}+ae\log(x)-\frac{bd\log(cx^n)}{2x^2}+\frac{be\log^2(cx^n)}{2n}-\frac{bdn}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(a*d)/(2*x^2) - (b*d*n)/(4*x^2) + a*e*Log[x] - (b*d*Log[c*x^n])/(2*x^2) +
(b*e*Log[c*x^n]^2)/(2*n)
```

Maple [C] time = 0.123, size = 266, normalized size = 5.1

$$-\frac{b\left(-2e\ln(x)x^2+d\right)\ln(x^n)}{2x^2}-\frac{-2i\ln(x)\pi be\operatorname{csgn}(ix^n)(\operatorname{csgn}(icx^n))^2x^2+2i\ln(x)\pi be\operatorname{csgn}(ix^n)\operatorname{csgn}(icx^n)\operatorname{csgn}(ic)x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*ln(c*x^n))/x^3,x)
```

```
[Out] -1/2*b*(-2*e*ln(x)*x^2+d)/x^2*ln(x^n)-1/4*(-2*I*ln(x)*Pi*b*e*csgn(I*x^n)*cs
gn(I*c*x^n)^2*x^2+2*I*ln(x)*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2+
2*I*ln(x)*Pi*b*e*csgn(I*c*x^n)^3*x^2-2*I*ln(x)*Pi*b*e*csgn(I*c*x^n)^2*csgn(
I*c)*x^2+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)
```

```
+2*e*n*b*ln(x)^2*x^2-4*ln(x)*ln(c)*b*e*x^2-4*ln(x)*a*e*x^2+2*ln(c)*b*d+b*d*
n+2*a*d)/x^2
```

Maxima [A] time = 1.17201, size = 66, normalized size = 1.27

$$\frac{be\log\left(cx^n\right)^2}{2\,n}+ae\log\left(x\right)-\frac{bdn}{4\,x^2}-\frac{bd\log\left(cx^n\right)}{2\,x^2}-\frac{ad}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*e*log(c*x^n)^2/n + a*e*log(x) - 1/4*b*d*n/x^2 - 1/2*b*d*log(c*x^n)/x^
2 - 1/2*a*d/x^2
```

Fricas [A] time = 1.33245, size = 153, normalized size = 2.94

$$\frac{2\,benx^2\log\left(x\right)^2-bdn-2\,bd\log\left(c\right)-2\,ad+2\left(2\,bex^2\log\left(c\right)+2\,aex^2-bdn\right)\log\left(x\right)}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*e*n*x^2*log(x)^2 - b*d*n - 2*b*d*log(c) - 2*a*d + 2*(2*b*e*x^2*log
(c) + 2*a*e*x^2 - b*d*n)*log(x))/x^2
```

Sympy [A] time = 5.24912, size = 63, normalized size = 1.21

$$-\frac{ad}{2x^2}+ae\log\left(x\right)+bd\left(-\frac{n}{4x^2}-\frac{\log\left(cx^n\right)}{2x^2}\right)-be\left(\begin{cases}-\log\left(c\right)\log\left(x\right) & \text{for } n=0\\ -\frac{\log\left(cx^n\right)^2}{2n} & \text{otherwise}\end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d/(2*x**2) + a*e*log(x) + b*d*(-n/(4*x**2) - log(c*x**n)/(2*x**2)) - b*e
*Piecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

Giac [A] time = 1.326, size = 85, normalized size = 1.63

$$\frac{2\,bnx^2e\log\left(x\right)^2+4\,bx^2e\log\left(c\right)\log\left(x\right)+4\,ax^2e\log\left(x\right)-2\,bdn\log\left(x\right)-bdn-2\,bd\log\left(c\right)-2\,ad}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] 1/4*(2*b*n*x^2*e*log(x)^2 + 4*b*x^2*e*log(c)*log(x) + 4*a*x^2*e*log(x) - 2*
b*d*n*log(x) - b*d*n - 2*b*d*log(c) - 2*a*d)/x^2
```

3.176 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^5} dx$

Optimal. Leaf size=57

$$-\frac{d(a+b\log(cx^n))}{4x^4}-\frac{e(a+b\log(cx^n))}{2x^2}-\frac{bdn}{16x^4}-\frac{ben}{4x^2}$$

```
[Out] -(b*d*n)/(16*x^4) - (b*e*n)/(4*x^2) - (d*(a + b*Log[c*x^n]))/(4*x^4) - (e*(
a + b*Log[c*x^n]))/(2*x^2)
```

Rubi [A] time = 0.0474705, antiderivative size = 47, normalized size of antiderivative = 0.82, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)(a+b\log(cx^n))-\frac{bdn}{16x^4}-\frac{ben}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d*n)/(16*x^4) - (b*e*n)/(4*x^2) - ((d/x^4 + (2*e)/x^2)*(a + b*Log[c*x^n
]))/4
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)(a+b\log(cx^n))}{x^5}\,dx &= -\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)(a+b\log(cx^n))-(bn)\int\frac{-d-2ex^2}{4x^5}\,dx\\
&= -\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\frac{-d-2ex^2}{x^5}\,dx\\
&= -\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\left(-\frac{d}{x^5}-\frac{2e}{x^3}\right)dx\\
&= -\frac{bdn}{16x^4}-\frac{ben}{4x^2}-\frac{1}{4}\left(\frac{d}{x^4}+\frac{2e}{x^2}\right)(a+b\log(cx^n))
\end{aligned}$$

Mathematica [A] time = 0.0024789, size = 69, normalized size = 1.21

$$-\frac{ad}{4x^4}-\frac{ae}{2x^2}-\frac{bd\log(cx^n)}{4x^4}-\frac{be\log(cx^n)}{2x^2}-\frac{bdn}{16x^4}-\frac{ben}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(a*d)/(4*x^4) - (b*d*n)/(16*x^4) - (a*e)/(2*x^2) - (b*e*n)/(4*x^2) - (b*d*
Log[c*x^n])/(4*x^4) - (b*e*Log[c*x^n])/(2*x^2)
```

Maple [C] time = 0.098, size = 248, normalized size = 4.4

$$-\frac{b\left(2\,ex^2+d\right)\ln(x^n)}{4\,x^4}-\frac{4\,i\pi\,bex^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-4\,i\pi\,bex^2\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-4\,i\pi\,bex^2\,(\mathrm{csgn}(icx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/4*b*(2*e*x^2+d)/x^4*ln(x^n)-1/16*(4*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-4*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*e*x^2*csgn
(I*c*x^n)^3+4*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+8*ln(c)*b*e*x^2+4*b*e*
```

```
n*x^2+8*a*e*x^2+2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*d*csgn(I*c*x^n)^3+2*I*Pi*b*d*csgn(I*c*x
^n)^2*csgn(I*c)+4*ln(c)*b*d+b*d*n+4*a*d)/x^4
```

Maxima [A] time = 1.1218, size = 77, normalized size = 1.35

$$-\frac{ben}{4\,x^2}-\frac{be\log\left(cx^n\right)}{2\,x^2}-\frac{ae}{2\,x^2}-\frac{bdn}{16\,x^4}-\frac{bd\log\left(cx^n\right)}{4\,x^4}-\frac{ad}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*b*e*n/x^2 - 1/2*b*e*log(c*x^n)/x^2 - 1/2*a*e/x^2 - 1/16*b*d*n/x^4 - 1/
4*b*d*log(c*x^n)/x^4 - 1/4*a*d/x^4
```

Fricas [A] time = 1.21931, size = 153, normalized size = 2.68

$$-\frac{bdn+4\,(ben+2\,ae)x^2+4\,ad+4\left(2\,bex^2+bd\right)\log\left(c\right)+4\left(2\,benx^2+bdn\right)\log\left(x\right)}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*(b*d*n + 4*(b*e*n + 2*a*e)*x^2 + 4*a*d + 4*(2*b*e*x^2 + b*d)*log(c) +
 4*(2*b*e*n*x^2 + b*d*n)*log(x))/x^4
```

Sympy [A] time = 3.37803, size = 88, normalized size = 1.54

$$-\frac{ad}{4x^4}-\frac{ae}{2x^2}-\frac{bdn\log\left(x\right)}{4x^4}-\frac{bdn}{16x^4}-\frac{bd\log\left(c\right)}{4x^4}-\frac{ben\log\left(x\right)}{2x^2}-\frac{ben}{4x^2}-\frac{be\log\left(c\right)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d/(4*x**4) - a*e/(2*x**2) - b*d*n*log(x)/(4*x**4) - b*d*n/(16*x**4) - b*
d*log(c)/(4*x**4) - b*e*n*log(x)/(2*x**2) - b*e*n/(4*x**2) - b*e*log(c)/(2*
x**2)
```

Giac [A] time = 1.27367, size = 88, normalized size = 1.54

$$-\frac{8\,bnx^2e\log(x) + 4\,bnx^2e + 8\,bx^2e\log(c) + 8\,ax^2e + 4\,bdn\log(x) + bdn + 4\,bd\log(c) + 4\,ad}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] -1/16*(8*b*n*x^2*e*log(x) + 4*b*n*x^2*e + 8*b*x^2*e*log(c) + 8*a*x^2*e + 4*
b*d*n*log(x) + b*d*n + 4*b*d*log(c) + 4*a*d)/x^4
```

3.177 $\int x^4 \left(d+ex^2\right) (a+b\log(cx^n))\,dx$

Optimal. Leaf size=48

$$\frac{1}{35}\left(7dx^5+5ex^7\right)(a+b\log(cx^n))-\frac{1}{25}bdnx^5-\frac{1}{49}benx^7$$

```
[Out] -(b*d*n*x^5)/25 - (b*e*n*x^7)/49 + ((7*d*x^5 + 5*e*x^7)*(a + b*Log[c*x^n]))
/35
```

Rubi [A] time = 0.0431169, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{35}\left(7dx^5+5ex^7\right)(a+b\log(cx^n))-\frac{1}{25}bdnx^5-\frac{1}{49}benx^7$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^5)/25 - (b*e*n*x^7)/49 + ((7*d*x^5 + 5*e*x^7)*(a + b*Log[c*x^n]))
/35
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^4 \left(d+ex^2\right)(a+b\log(cx^n))\,dx = \frac{1}{35}\left(7dx^5+5ex^7\right)(a+b\log(cx^n)) - (bn)\int \left(\frac{dx^4}{5}+\frac{ex^6}{7}\right)dx$$
$$= -\frac{1}{25}bdnx^5 - \frac{1}{49}benx^7 + \frac{1}{35}\left(7dx^5+5ex^7\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0022063, size = 69, normalized size = 1.44

$$\frac{1}{5}adx^5+\frac{1}{7}aex^7+\frac{1}{5}bdx^5\log(cx^n)+\frac{1}{7}bex^7\log(cx^n)-\frac{1}{25}bdnx^5-\frac{1}{49}benx^7$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^5)/5 - (b*d*n*x^5)/25 + (a*e*x^7)/7 - (b*e*n*x^7)/49 + (b*d*x^5*Log[
c*x^n])/5 + (b*e*x^7*Log[c*x^n])/7
```

Maple [C] time = 0.187, size = 266, normalized size = 5.5

$$\frac{bx^5\left(5\,ex^2+7\,d\right)\ln(x^n)}{35}+\frac{i}{14}\pi\,bex^7\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-\frac{i}{14}\pi\,bex^7\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-\frac{i}{14}\pi\,bex^7\,(\mathrm{csgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/35*b*x^5*(5*e*x^2+7*d)*ln(x^n)+1/14*I*Pi*b*e*x^7*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/14*I*Pi*b*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/14*I*Pi*b*e*x^7
*csgn(I*c*x^n)^3+1/14*I*Pi*b*e*x^7*csgn(I*c*x^n)^2*csgn(I*c)+1/7*ln(c)*b*e*
x^7-1/49*b*e*n*x^7+1/7*a*e*x^7+1/10*I*Pi*b*d*x^5*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/10*I*Pi*b*d*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*d*x^5*c
sgn(I*c*x^n)^3+1/10*I*Pi*b*d*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*ln(c)*b*d*x^
5-1/25*b*d*n*x^5+1/5*a*d*x^5
```

Maxima [A] time = 1.08784, size = 77, normalized size = 1.6

$$-\frac{1}{49}\,benx^7+\frac{1}{7}\,bex^7\log(cx^n)+\frac{1}{7}\,aex^7-\frac{1}{25}\,bdnx^5+\frac{1}{5}\,bdx^5\log(cx^n)+\frac{1}{5}\,adx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/49*b*e*n*x^7 + 1/7*b*e*x^7*log(c*x^n) + 1/7*a*e*x^7 - 1/25*b*d*n*x^5 + 1
/5*b*d*x^5*log(c*x^n) + 1/5*a*d*x^5
```

Fricas [A] time = 1.22252, size = 181, normalized size = 3.77

$$-\frac{1}{49}(ben-7ae)x^7-\frac{1}{25}(bdn-5ad)x^5+\frac{1}{35}\left(5bex^7+7bdx^5\right)\log(c)+\frac{1}{35}\left(5benx^7+7bdnx^5\right)\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/49*(b*e*n - 7*a*e)*x^7 - 1/25*(b*d*n - 5*a*d)*x^5 + 1/35*(5*b*e*x^7 + 7*
b*d*x^5)*log(c) + 1/35*(5*b*e*n*x^7 + 7*b*d*n*x^5)*log(x)
```

Sympy [B] time = 9.31182, size = 87, normalized size = 1.81

$$\frac{adx^5}{5}+\frac{aex^7}{7}+\frac{bdnx^5\log(x)}{5}-\frac{bdnx^5}{25}+\frac{bdx^5\log(c)}{5}+\frac{benx^7\log(x)}{7}-\frac{benx^7}{49}+\frac{bex^7\log(c)}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**5/5 + a*e*x**7/7 + b*d*n*x**5*log(x)/5 - b*d*n*x**5/25 + b*d*x**5*lo
g(c)/5 + b*e*n*x**7*log(x)/7 - b*e*n*x**7/49 + b*e*x**7*log(c)/7
```

Giac [A] time = 1.28399, size = 99, normalized size = 2.06

$$\frac{1}{7}bnx^7e\log(x)-\frac{1}{49}bnx^7e+\frac{1}{7}bx^7e\log(c)+\frac{1}{7}ax^7e+\frac{1}{5}bdnx^5\log(x)-\frac{1}{25}bdnx^5+\frac{1}{5}bdx^5\log(c)+\frac{1}{5}adx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/7*b*n*x^7*e*log(x) - 1/49*b*n*x^7*e + 1/7*b*x^7*e*log(c) + 1/7*a*x^7*e +
1/5*b*d*n*x^5*log(x) - 1/25*b*d*n*x^5 + 1/5*b*d*x^5*log(c) + 1/5*a*d*x^5
```

3.178 $\int x^2 \left(d+ex^2\right) (a+b\log(cx^n)) \, dx$

Optimal. Leaf size=48

$$\frac{1}{15}\left(5dx^3+3ex^5\right)(a+b\log(cx^n))-\frac{1}{9}bdnx^3-\frac{1}{25}benx^5$$

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^5)/25 + ((5*d*x^3 + 3*e*x^5)*(a + b*Log[c*x^n]))/
15
```

Rubi [A] time = 0.0418457, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$\frac{1}{15}\left(5dx^3+3ex^5\right)(a+b\log(cx^n))-\frac{1}{9}bdnx^3-\frac{1}{25}benx^5$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^5)/25 + ((5*d*x^3 + 3*e*x^5)*(a + b*Log[c*x^n]))/
15
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^2 \left(d+ex^2\right)(a+b\log(cx^n))\,dx = \frac{1}{15}\left(5dx^3+3ex^5\right)(a+b\log(cx^n)) - (bn)\int\left(\frac{dx^2}{3}+\frac{ex^4}{5}\right)dx$$
$$= -\frac{1}{9}bdnx^3 - \frac{1}{25}benx^5 + \frac{1}{15}\left(5dx^3+3ex^5\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.002122, size = 69, normalized size = 1.44

$$\frac{1}{3}adx^3+\frac{1}{5}aex^5+\frac{1}{3}bdx^3\log(cx^n)+\frac{1}{5}bex^5\log(cx^n)-\frac{1}{9}bdnx^3-\frac{1}{25}benx^5$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (a*d*x^3)/3 - (b*d*n*x^3)/9 + (a*e*x^5)/5 - (b*e*n*x^5)/25 + (b*d*x^3*Log[c
*x^n])/3 + (b*e*x^5*Log[c*x^n])/5
```

Maple [C] time = 0.187, size = 266, normalized size = 5.5

$$\frac{bx^3\left(3\,ex^2+5\,d\right)\ln(x^n)}{15}+\frac{i}{10}\pi\,bex^5\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-\frac{i}{10}\pi\,bex^5\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-\frac{i}{10}\pi\,bex^5\,(\mathrm{csgn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/15*b*x^3*(3*e*x^2+5*d)*ln(x^n)+1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n
)^2-1/10*I*Pi*b*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10*I*Pi*b*e*x^5
*csgn(I*c*x^n)^3+1/10*I*Pi*b*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/5*ln(c)*b*e*
x^5-1/25*b*e*n*x^5+1/5*a*e*x^5+1/6*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/6*I*Pi*b*d*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*d*x^3*csgn
(I*c*x^n)^3+1/6*I*Pi*b*d*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/3*ln(c)*b*d*x^3-1/
9*b*d*n*x^3+1/3*a*d*x^3
```

Maxima [A] time = 1.06058, size = 77, normalized size = 1.6

$$-\frac{1}{25}\,benx^5+\frac{1}{5}\,bex^5\log(cx^n)+\frac{1}{5}\,aex^5-\frac{1}{9}\,bdnx^3+\frac{1}{3}\,bdx^3\log(cx^n)+\frac{1}{3}\,adx^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/25*b*e*n*x^5 + 1/5*b*e*x^5*log(c*x^n) + 1/5*a*e*x^5 - 1/9*b*d*n*x^3 + 1/
3*b*d*x^3*log(c*x^n) + 1/3*a*d*x^3
```

Fricas [A] time = 1.23287, size = 180, normalized size = 3.75

$$-\frac{1}{25}\,(ben-5\,ae)x^{5}-\frac{1}{9}\,(bdn-3\,ad)x^{3}+\frac{1}{15}\left(3\,bex^{5}+5\,bdx^{3}\right)\log\left(c\right)+\frac{1}{15}\left(3\,benx^{5}+5\,bdnx^{3}\right)\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/25*(b*e*n - 5*a*e)*x^5 - 1/9*(b*d*n - 3*a*d)*x^3 + 1/15*(3*b*e*x^5 + 5*b
*d*x^3)*log(c) + 1/15*(3*b*e*n*x^5 + 5*b*d*n*x^3)*log(x)
```

Sympy [B] time = 3.4239, size = 87, normalized size = 1.81

$$\frac{adx^{3}}{3}+\frac{aex^{5}}{5}+\frac{bdnx^{3}\log\left(x\right)}{3}-\frac{bdnx^{3}}{9}+\frac{bdx^{3}\log\left(c\right)}{3}+\frac{benx^{5}\log\left(x\right)}{5}-\frac{benx^{5}}{25}+\frac{bex^{5}\log\left(c\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x**3/3 + a*e*x**5/5 + b*d*n*x**3*log(x)/3 - b*d*n*x**3/9 + b*d*x**3*log
(c)/3 + b*e*n*x**5*log(x)/5 - b*e*n*x**5/25 + b*e*x**5*log(c)/5
```

Giac [A] time = 1.24387, size = 99, normalized size = 2.06

$$\frac{1}{5}\,bnx^{5}e\log\left(x\right)-\frac{1}{25}\,bnx^{5}e+\frac{1}{5}\,bx^{5}e\log\left(c\right)+\frac{1}{5}\,ax^{5}e+\frac{1}{3}\,bdnx^{3}\log\left(x\right)-\frac{1}{9}\,bdnx^{3}+\frac{1}{3}\,bdx^{3}\log\left(c\right)+\frac{1}{3}\,adx^{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/5*b*n*x^5*e*log(x) - 1/25*b*n*x^5*e + 1/5*b*x^5*e*log(c) + 1/5*a*x^5*e +
1/3*b*d*n*x^3*log(x) - 1/9*b*d*n*x^3 + 1/3*b*d*x^3*log(c) + 1/3*a*d*x^3
```

3.179 $\int \left(d+e x^2\right) (a+b \log (c x^n)) \, dx$

Optimal. Leaf size=48

$$d x (a+b \log (c x^n))+\frac{1}{3} e x^3 (a+b \log (c x^n))-b d n x-\frac{1}{9} b e n x^3$$

```
[Out] -(b*d*n*x) - (b*e*n*x^3)/9 + d*x*(a + b*Log[c*x^n]) + (e*x^3*(a + b*Log[c*x
^n]))/3
```

Rubi [A] time = 0.0176313, antiderivative size = 41, normalized size of antiderivative = 0.85, number of steps used = 2, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2313}

$$\frac{1}{3} \left(3 d x+e x^3\right) (a+b \log (c x^n))-b d n x-\frac{1}{9} b e n x^3$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x) - (b*e*n*x^3)/9 + ((3*d*x + e*x^3)*(a + b*Log[c*x^n]))/3
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\begin{aligned} \int \left(d+e x^2\right) (a+b \log (c x^n)) \, dx &= \frac{1}{3} \left(3 d x+e x^3\right) (a+b \log (c x^n))-(b n) \int \left(d+\frac{e x^2}{3}\right) \, dx \\ &= -b d n x-\frac{1}{9} b e n x^3+\frac{1}{3} \left(3 d x+e x^3\right) (a+b \log (c x^n)) \end{aligned}$$

Mathematica [A] time = 0.0014115, size = 55, normalized size = 1.15

$$a d x+\frac{1}{3} a e x^3+b d x \log (c x^n)+\frac{1}{3} b e x^3 \log (c x^n)-b d n x-\frac{1}{9} b e n x^3$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] a*d*x - b*d*n*x + (a*e*x^3)/3 - (b*e*n*x^3)/9 + b*d*x*Log[c*x^n] + (b*e*x^3
*Log[c*x^n])/3
```

Maple [C] time = 0.187, size = 247, normalized size = 5.2

$$\frac{bx\left(ex^2+3\,d\right)\ln\left(x^n\right)}{3}+\frac{i}{6}\pi\,bex^3\mathrm{csgn}\left(ix^n\right)\left(\mathrm{csgn}\left(icx^n\right)\right)^2-\frac{i}{6}\pi\,bex^3\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(icx^n\right)\mathrm{csgn}\left(ic\right)-\frac{i}{6}\pi\,bex^3\left(\mathrm{csgn}\left(icx^n\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/3*b*x*(e*x^2+3*d)*ln(x^n)+1/6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/
6*I*Pi*b*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*Pi*b*e*x^3*csgn(I*
c*x^n)^3+1/6*I*Pi*b*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*b*d*csgn(I*x^n
)*csgn(I*c*x^n)^2*x-1/2*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x-1/2*
I*Pi*b*d*csgn(I*c*x^n)^3*x+1/2*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*x+1/3*ln(
c)*b*e*x^3-1/9*b*e*n*x^3+1/3*a*e*x^3+ln(c)*b*d*x-b*d*n*x+a*x*d
```

Maxima [A] time = 1.04568, size = 66, normalized size = 1.38

$$-\frac{1}{9}\,benx^3+\frac{1}{3}\,bex^3\log\left(cx^n\right)+\frac{1}{3}\,aex^3-bdnx+bdx\log\left(cx^n\right)+adx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/9*b*e*n*x^3 + 1/3*b*e*x^3*log(c*x^n) + 1/3*a*e*x^3 - b*d*n*x + b*d*x*log
(c*x^n) + a*d*x
```

Fricas [A] time = 1.23191, size = 154, normalized size = 3.21

$$-\frac{1}{9}\left(ben-3\,ae\right)x^3-\left(bdn-ad\right)x+\frac{1}{3}\left(bex^3+3\,bdx\right)\log\left(c\right)+\frac{1}{3}\left(benx^3+3\,bdnx\right)\log\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/9*(b*e*n - 3*a*e)*x^3 - (b*d*n - a*d)*x + 1/3*(b*e*x^3 + 3*b*d*x)*log(c)
 + 1/3*(b*e*n*x^3 + 3*b*d*n*x)*log(x)
```

Sympy [A] time = 1.14463, size = 73, normalized size = 1.52

$$adx + \frac{aex^3}{3} + bdnx\log(x) - bdnx + bdx\log(c) + \frac{benx^3\log(x)}{3} - \frac{benx^3}{9} + \frac{bex^3\log(c)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d*x + a*e*x**3/3 + b*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + b*e*n*x**3*l
og(x)/3 - b*e*n*x**3/9 + b*e*x**3*log(c)/3
```

Giac [A] time = 1.34424, size = 84, normalized size = 1.75

$$\frac{1}{3}bnx^3e\log(x) - \frac{1}{9}bnx^3e + \frac{1}{3}bx^3e\log(c) + \frac{1}{3}ax^3e + bdnx\log(x) - bdnx + bdx\log(c) + adx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/3*b*n*x^3*e*log(x) - 1/9*b*n*x^3*e + 1/3*b*x^3*e*log(c) + 1/3*a*x^3*e + b
*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + a*d*x
```

3.180 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=44

$$-\frac{d\,(a+b\log\,(cx^n))}{x}+ex\,(a+b\log\,(cx^n))-\frac{bdn}{x}-benx$$

```
[Out] -((b*d*n)/x) - b*e*n*x - (d*(a + b*Log[c*x^n]))/x + e*x*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0394148, antiderivative size = 37, normalized size of antiderivative = 0.84, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\left(\frac{d}{x}-ex\right)(a+b\log\,(cx^n))-\frac{bdn}{x}-benx$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d*n)/x) - b*e*n*x - (d/x - e*x)*(a + b*Log[c*x^n])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^2}\,dx = -\left(\frac{d}{x}-ex\right)(a+b\log(cx^n)) - (bn)\int\left(e-\frac{d}{x^2}\right)dx$$
$$= -\frac{bdn}{x} - benx - \left(\frac{d}{x}-ex\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.002001, size = 49, normalized size = 1.11

$$-\frac{ad}{x} + aex - \frac{bd\log(cx^n)}{x} + bex\log(cx^n) - \frac{bdn}{x} - benx$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((a*d)/x) - (b*d*n)/x + a*e*x - b*e*n*x - (b*d*Log[c*x^n])/x + b*e*x*Log[c
*x^n]
```

Maple [C] time = 0.214, size = 249, normalized size = 5.7

$$-\frac{b(-ex^2+d)\ln(x^n)}{x} - \frac{-i\pi bex^2\operatorname{csgn}(ix^n)(\operatorname{csgn}(icx^n))^2 + i\pi bex^2\operatorname{csgn}(ix^n)\operatorname{csgn}(icx^n)\operatorname{csgn}(ic) + i\pi bex^2(\operatorname{csgn}(icx^n}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*ln(c*x^n))/x^2,x)
```

```
[Out] -b*(-e*x^2+d)/x*ln(x^n)-1/2*(-I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi
*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*x^2*csgn(I*c*x^n)^3-I
*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-
I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*
b*d*csgn(I*c*x^n)^2*csgn(I*c)-2*ln(c)*b*e*x^2+2*b*e*n*x^2-2*a*e*x^2+2*ln(c)
*b*d+2*b*d*n+2*a*d)/x
```

Maxima [A] time = 1.1841, size = 66, normalized size = 1.5

$$-benx + bex\log(cx^n) + aex - \frac{bdn}{x} - \frac{bd\log(cx^n)}{x} - \frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] -b*e*n*x + b*e*x*log(c*x^n) + a*e*x - b*d*n/x - b*d*log(c*x^n)/x - a*d/x
```

Fricas [A] time = 1.26111, size = 124, normalized size = 2.82

$$-\frac{bdn + (ben - ae)x^2 + ad - \left(bex^2 - bd\right)\log(c) - \left(benx^2 - bdn\right)\log(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(b*d*n + (b*e*n - a*e)*x^2 + a*d - (b*e*x^2 - b*d)*log(c) - (b*e*n*x^2 - b
*d*n)*log(x))/x
```

Sympy [A] time = 1.22656, size = 60, normalized size = 1.36

$$-\frac{ad}{x} + aex - \frac{bdn\log(x)}{x} - \frac{bdn}{x} - \frac{bd\log(c)}{x} + benx\log(x) - benx + bex\log(c)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d/x + a*e*x - b*d*n*log(x)/x - b*d*n/x - b*d*log(c)/x + b*e*n*x*log(x) -
 b*e*n*x + b*e*x*log(c)
```

Giac [A] time = 1.31499, size = 84, normalized size = 1.91

$$\frac{bnx^2e\log(x) - bnx^2e + bx^2e\log(c) + ax^2e - bdn\log(x) - bdn - bd\log(c) - ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] (b*n*x^2*e*log(x) - b*n*x^2*e + b*x^2*e*log(c) + a*x^2*e - b*d*n*log(x) - b
*d*n - b*d*log(c) - a*d)/x
```

3.181 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=53

$$-\frac{d(a+b\log(cx^n))}{3x^3}-\frac{e(a+b\log(cx^n))}{x}-\frac{bdn}{9x^3}-\frac{ben}{x}$$

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n)/x - (d*(a + b*Log[c*x^n]))/(3*x^3) - (e*(a + b*L
og[c*x^n]))/x
```

Rubi [A] time = 0.0466648, antiderivative size = 45, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)(a+b\log(cx^n))-\frac{bdn}{9x^3}-\frac{ben}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n)/x - ((d/x^3 + (3*e)/x)*(a + b*Log[c*x^n]))/3
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(d+ex^2\right)(a+b\log(cx^n))}{x^4}\,dx &= -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)(a+b\log(cx^n))-(bn)\int\frac{-d-3ex^2}{3x^4}\,dx\\
&= -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int\frac{-d-3ex^2}{x^4}\,dx\\
&= -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int\left(-\frac{d}{x^4}-\frac{3e}{x^2}\right)dx\\
&= -\frac{bdn}{9x^3}-\frac{ben}{x}-\frac{1}{3}\left(\frac{d}{x^3}+\frac{3e}{x}\right)(a+b\log(cx^n))
\end{aligned}
$$

Mathematica [A] time = 0.0022991, size = 63, normalized size = 1.19

$$-\frac{ad}{3x^3}-\frac{ae}{x}-\frac{bd\log(cx^n)}{3x^3}-\frac{be\log(cx^n)}{x}-\frac{bdn}{9x^3}-\frac{ben}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(a*d)/(3*x^3) - (b*d*n)/(9*x^3) - (a*e)/x - (b*e*n)/x - (b*d*Log[c*x^n])/(
3*x^3) - (b*e*Log[c*x^n])/x
```

Maple [C] time = 0.103, size = 249, normalized size = 4.7

$$-\frac{b\left(3\,ex^2+d\right)\ln(x^n)}{3\,x^3}-\frac{9\,i\pi\,bex^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-9\,i\pi\,bex^2\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-9\,i\pi\,bex^2\,(\mathrm{csgn}(i$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*ln(c*x^n))/x^4,x)
```

```
[Out] -1/3*b*(3*e*x^2+d)/x^3*ln(x^n)-1/18*(9*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-9*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9*I*Pi*b*e*x^2*csgn
(I*c*x^n)^3+9*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+18*ln(c)*b*e*x^2+18*b*
e*n*x^2+18*a*e*x^2+3*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d*csgn(I*c*x^n)^3+3*I*Pi*b*d*csgn(I*
c*x^n)^2*csgn(I*c)+6*ln(c)*b*d+2*b*d*n+6*a*d)/x^3
```

Maxima [A] time = 1.12883, size = 77, normalized size = 1.45

$$-\frac{ben}{x} - \frac{be\log\left(cx^{n}\right)}{x} - \frac{ae}{x} - \frac{bdn}{9\,x^{3}} - \frac{bd\log\left(cx^{n}\right)}{3\,x^{3}} - \frac{ad}{3\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -b*e*n/x - b*e*log(c*x^n)/x - a*e/x - 1/9*b*d*n/x^3 - 1/3*b*d*log(c*x^n)/x^
3 - 1/3*a*d/x^3
```

Fricas [A] time = 1.31323, size = 149, normalized size = 2.81

$$-\frac{bdn + 9\,(ben + ae)x^{2} + 3\,ad + 3\left(3\,bex^{2} + bd\right)\log\left(c\right) + 3\left(3\,benx^{2} + bdn\right)\log\left(x\right)}{9\,x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(b*d*n + 9*(b*e*n + a*e)*x^2 + 3*a*d + 3*(3*b*e*x^2 + b*d)*log(c) + 3*
(3*b*e*n*x^2 + b*d*n)*log(x))/x^3
```

Sympy [A] time = 2.00741, size = 75, normalized size = 1.42

$$-\frac{ad}{3x^{3}} - \frac{ae}{x} - \frac{bdn\log\left(x\right)}{3x^{3}} - \frac{bdn}{9x^{3}} - \frac{bd\log\left(c\right)}{3x^{3}} - \frac{ben\log\left(x\right)}{x} - \frac{ben}{x} - \frac{be\log\left(c\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d/(3*x**3) - a*e/x - b*d*n*log(x)/(3*x**3) - b*d*n/(9*x**3) - b*d*log(c)
/(3*x**3) - b*e*n*log(x)/x - b*e*n/x - b*e*log(c)/x
```

Giac [A] time = 1.28694, size = 88, normalized size = 1.66

$$-\frac{9\,bnx^2e\log\left(x\right)+9\,bnx^2e+9\,bx^2e\log\left(c\right)+9\,ax^2e+3\,bdn\log\left(x\right)+bdn+3\,bd\log\left(c\right)+3\,ad}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] -1/9*(9*b*n*x^2*e*log(x) + 9*b*n*x^2*e + 9*b*x^2*e*log(c) + 9*a*x^2*e + 3*b
*d*n*log(x) + b*d*n + 3*b*d*log(c) + 3*a*d)/x^3
```

3.182 $\int \frac{(d+ex^2)(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=57

$$-\frac{d(a+b\log(cx^n))}{5x^5}-\frac{e(a+b\log(cx^n))}{3x^3}-\frac{bdn}{25x^5}-\frac{ben}{9x^3}$$

```
[Out] -(b*d*n)/(25*x^5) - (b*e*n)/(9*x^3) - (d*(a + b*Log[c*x^n]))/(5*x^5) - (e*(
a + b*Log[c*x^n]))/(3*x^3)
```

Rubi [A] time = 0.0457509, antiderivative size = 48, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)(a+b\log(cx^n))-\frac{bdn}{25x^5}-\frac{ben}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d*n)/(25*x^5) - (b*e*n)/(9*x^3) - (((3*d)/x^5 + (5*e)/x^3)*(a + b*Log[c
*x^n]))/15
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(d+ex^2\right)(a+b\log(cx^n))}{x^6}\,dx &= -\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)(a+b\log(cx^n))-(bn)\int \frac{-3d-5ex^2}{15x^6}\,dx \\
&= -\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)(a+b\log(cx^n))-\frac{1}{15}(bn)\int \frac{-3d-5ex^2}{x^6}\,dx \\
&= -\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)(a+b\log(cx^n))-\frac{1}{15}(bn)\int \left(-\frac{3d}{x^6}-\frac{5e}{x^4}\right)dx \\
&= -\frac{bdn}{25x^5}-\frac{ben}{9x^3}-\frac{1}{15}\left(\frac{3d}{x^5}+\frac{5e}{x^3}\right)(a+b\log(cx^n))
\end{aligned}
$$

Mathematica [A] time = 0.0023236, size = 69, normalized size = 1.21

$$-\frac{ad}{5x^5}-\frac{ae}{3x^3}-\frac{bd\log(cx^n)}{5x^5}-\frac{be\log(cx^n)}{3x^3}-\frac{bdn}{25x^5}-\frac{ben}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(a*d)/(5*x^5) - (b*d*n)/(25*x^5) - (a*e)/(3*x^3) - (b*e*n)/(9*x^3) - (b*d*
Log[c*x^n])/(5*x^5) - (b*e*Log[c*x^n])/(3*x^3)
```

Maple [C] time = 0.112, size = 251, normalized size = 4.4

$$-\frac{b\left(5\,ex^2+3\,d\right)\ln(x^n)}{15\,x^5}-\frac{75\,i\pi\,bex^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-75\,i\pi\,bex^2\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-75\,i\pi\,bex^2\,(\mathrm{cs}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/15*b*(5*e*x^2+3*d)/x^5*ln(x^n)-1/450*(75*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I
*c*x^n)^2-75*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-75*I*Pi*b*e*x
^2*csgn(I*c*x^n)^3+75*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+150*ln(c)*b*e*
```

```
x^2+50*b*e*n*x^2+150*a*e*x^2+45*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-45*I*P
i*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-45*I*Pi*b*d*csgn(I*c*x^n)^3+45*I*
Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+90*ln(c)*b*d+18*b*d*n+90*a*d)/x^5
```

Maxima [A] time = 1.03525, size = 77, normalized size = 1.35

$$-\frac{ben}{9\,x^3}-\frac{be\log\left(cx^n\right)}{3\,x^3}-\frac{ae}{3\,x^3}-\frac{bdn}{25\,x^5}-\frac{bd\log\left(cx^n\right)}{5\,x^5}-\frac{ad}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -1/9*b*e*n/x^3 - 1/3*b*e*log(c*x^n)/x^3 - 1/3*a*e/x^3 - 1/25*b*d*n/x^5 - 1/
5*b*d*log(c*x^n)/x^5 - 1/5*a*d/x^5
```

Fricas [A] time = 1.26499, size = 167, normalized size = 2.93

$$-\frac{9\,bdn+25\,(ben+3\,ae)x^2+45\,ad+15\left(5\,bex^2+3\,bd\right)\log\left(c\right)+15\left(5\,benx^2+3\,bdn\right)\log\left(x\right)}{225\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/225*(9*b*d*n + 25*(b*e*n + 3*a*e)*x^2 + 45*a*d + 15*(5*b*e*x^2 + 3*b*d)*
log(c) + 15*(5*b*e*n*x^2 + 3*b*d*n)*log(x))/x^5
```

Sympy [A] time = 5.519, size = 88, normalized size = 1.54

$$-\frac{ad}{5x^5}-\frac{ae}{3x^3}-\frac{bdn\log\left(x\right)}{5x^5}-\frac{bdn}{25x^5}-\frac{bd\log\left(c\right)}{5x^5}-\frac{ben\log\left(x\right)}{3x^3}-\frac{ben}{9x^3}-\frac{be\log\left(c\right)}{3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d/(5*x**5) - a*e/(3*x**3) - b*d*n*log(x)/(5*x**5) - b*d*n/(25*x**5) - b*
d*log(c)/(5*x**5) - b*e*n*log(x)/(3*x**3) - b*e*n/(9*x**3) - b*e*log(c)/(3*
x**3)
```

Giac [A] time = 1.3076, size = 89, normalized size = 1.56

$$-\frac{75\,bnx^2e\log(x) + 25\,bnx^2e + 75\,bx^2e\log(c) + 75\,ax^2e + 45\,bdn\log(x) + 9\,bdn + 45\,bd\log(c) + 45\,ad}{225\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/225*(75*b*n*x^2*e*log(x) + 25*b*n*x^2*e + 75*b*x^2*e*log(c) + 75*a*x^2*e
 + 45*b*d*n*log(x) + 9*b*d*n + 45*b*d*log(c) + 45*a*d)/x^5
```

3.183 $\int x^5 \left(d+ex^2\right)^2 (a+b\log(cx^n)) \, dx$

Optimal. Leaf size=74

$$\frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)(a+b\log(cx^n))-\frac{1}{36}bd^2nx^6-\frac{1}{32}bdenx^8-\frac{1}{100}be^2nx^{10}$$

```
[Out] -(b*d^2*n*x^6)/36 - (b*d*e*n*x^8)/32 - (b*e^2*n*x^10)/100 + ((10*d^2*x^6 +
15*d*e*x^8 + 6*e^2*x^10)*(a + b*Log[c*x^n]))/60
```

Rubi [A] time = 0.0865796, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 12, 14}

$$\frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)(a+b\log(cx^n))-\frac{1}{36}bd^2nx^6-\frac{1}{32}bdenx^8-\frac{1}{100}be^2nx^{10}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^6)/36 - (b*d*e*n*x^8)/32 - (b*e^2*n*x^10)/100 + ((10*d^2*x^6 +
15*d*e*x^8 + 6*e^2*x^10)*(a + b*Log[c*x^n]))/60
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
```

```
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^5 \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx &= \frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{60}x^5\left(10d^2+15dex^2+\right.\\ &= \frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)(a+b\log(cx^n))-\frac{1}{60}(bn)\int x^5\left(10d^2+15dex^2+\right.\\ &= \frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)(a+b\log(cx^n))-\frac{1}{60}(bn)\int\left(10d^2x^5+15dex^7+\right.\\ &= -\frac{1}{36}bd^2nx^6-\frac{1}{32}bdenx^8-\frac{1}{100}be^2nx^{10}+\frac{1}{60}\left(10d^2x^6+15dex^8+6e^2x^{10}\right)(a+b\,\mathrm{lo}\end{aligned}$$

Mathematica [A] time = 0.0398215, size = 84, normalized size = 1.14

$$\frac{x^6\left(1200d^2(a+b\log(cx^n))+1800dex^2(a+b\log(cx^n))+720e^2x^4(a+b\log(cx^n))-200bd^2n-225bdenx^2-72be^2nx^4\right.}{7200}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(-200*b*d^2*n - 225*b*d*e*n*x^2 - 72*b*e^2*n*x^4 + 1200*d^2*(a + b*Log
[c*x^n]) + 1800*d*e*x^2*(a + b*Log[c*x^n]) + 720*e^2*x^4*(a + b*Log[c*x^n])
))/7200
```

Maple [C] time = 0.195, size = 434, normalized size = 5.9

$$\frac{bx^6\left(6\,e^2x^4+15\,dex^2+10\,d^2\right)\ln\left(x^n\right)}{60}-\frac{i}{8}\pi\,bdex^8\left(\mathrm{csgn}\left(icx^n\right)\right)^3+\frac{i}{12}\pi\,bd^2x^6\mathrm{csgn}\left(ix^n\right)\left(\mathrm{csgn}\left(icx^n\right)\right)^2+\frac{i}{8}\pi\,bdex^8\left(\mathrm{csgn}\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/60*b*x^6*(6*e^2*x^4+15*d*e*x^2+10*d^2)*ln(x^n)-1/8*I*Pi*b*d*e*x^8*csgn(I*
c*x^n)^3+1/12*I*Pi*b*d^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/8*I*Pi*b*d*e*x^8
*csgn(I*c*x^n)^2*csgn(I*c)+1/8*I*Pi*b*d*e*x^8*csgn(I*x^n)*csgn(I*c*x^n)^2+1
/10*ln(c)*b*e^2*x^10-1/100*b*e^2*n*x^10+1/10*a*e^2*x^10-1/8*I*Pi*b*d*e*x^8*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/20*I*Pi*b*e^2*x^10*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+1/20*I*Pi*b*e^2*x^10*csgn(I*c*x^n)^2*csgn(I*c)+1/20*I*Pi*
b*e^2*x^10*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*ln(c)*b*d*e*x^8-1/32*b*d*e*n*x^8
+1/4*a*d*e*x^8+1/12*I*Pi*b*d^2*x^6*csgn(I*c*x^n)^2*csgn(I*c)-1/12*I*Pi*b*d^
2*x^6*csgn(I*c*x^n)^3-1/12*I*Pi*b*d^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-1/20*I*Pi*b*e^2*x^10*csgn(I*c*x^n)^3+1/6*ln(c)*b*d^2*x^6-1/36*b*d^2*n*x^
6+1/6*a*d^2*x^6
```

Maxima [A] time = 1.05436, size = 135, normalized size = 1.82

$$-\frac{1}{100}\,be^2nx^{10}+\frac{1}{10}\,be^2x^{10}\log\left(cx^n\right)+\frac{1}{10}\,ae^2x^{10}-\frac{1}{32}\,bdenx^8+\frac{1}{4}\,bdex^8\log\left(cx^n\right)+\frac{1}{4}\,adex^8-\frac{1}{36}\,bd^2nx^6+\frac{1}{6}\,bd^2x^6\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/100*b*e^2*n*x^10 + 1/10*b*e^2*x^10*log(c*x^n) + 1/10*a*e^2*x^10 - 1/32*b
*d*e*n*x^8 + 1/4*b*d*e*x^8*log(c*x^n) + 1/4*a*d*e*x^8 - 1/36*b*d^2*n*x^6 +
1/6*b*d^2*x^6*log(c*x^n) + 1/6*a*d^2*x^6
```

Fricas [A] time = 1.33028, size = 297, normalized size = 4.01

$$-\frac{1}{100}\left(be^2n-10\,ae^2\right)x^{10}-\frac{1}{32}\left(bden-8\,ade\right)x^8-\frac{1}{36}\left(bd^2n-6\,ad^2\right)x^6+\frac{1}{60}\left(6\,be^2x^{10}+15\,bdex^8+10\,bd^2x^6\right)\log\left(c\right)+\frac{1}{60}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/100*(b*e^2*n - 10*a*e^2)*x^10 - 1/32*(b*d*e*n - 8*a*d*e)*x^8 - 1/36*(b*d
^2*n - 6*a*d^2)*x^6 + 1/60*(6*b*e^2*x^10 + 15*b*d*e*x^8 + 10*b*d^2*x^6)*log
(c) + 1/60*(6*b*e^2*n*x^10 + 15*b*d*e*n*x^8 + 10*b*d^2*n*x^6)*log(x)
```

Sympy [B] time = 34.1154, size = 151, normalized size = 2.04

$$\frac{ad^2x^6}{6}+\frac{adex^8}{4}+\frac{ae^2x^{10}}{10}+\frac{bd^2nx^6\log(x)}{6}-\frac{bd^2nx^6}{36}+\frac{bd^2x^6\log(c)}{6}+\frac{bdenx^8\log(x)}{4}-\frac{bdenx^8}{32}+\frac{bdex^8\log(c)}{4}+\frac{be^2n$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**6/6 + a*d*e*x**8/4 + a*e**2*x**10/10 + b*d**2*n*x**6*log(x)/6 - b
*d**2*n*x**6/36 + b*d**2*x**6*log(c)/6 + b*d*e*n*x**8*log(x)/4 - b*d*e*n*x*
*8/32 + b*d*e*x**8*log(c)/4 + b*e**2*n*x**10*log(x)/10 - b*e**2*n*x**10/100
 + b*e**2*x**10*log(c)/10
```

Giac [A] time = 1.30353, size = 166, normalized size = 2.24

$$\frac{1}{10}bnx^{10}e^2\log(x)-\frac{1}{100}bnx^{10}e^2+\frac{1}{10}bx^{10}e^2\log(c)+\frac{1}{4}bdnx^8e\log(x)+\frac{1}{10}ax^{10}e^2-\frac{1}{32}bdnx^8e+\frac{1}{4}bdx^8e\log(c)+\frac{1}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/10*b*n*x^10*e^2*log(x) - 1/100*b*n*x^10*e^2 + 1/10*b*x^10*e^2*log(c) + 1/
4*b*d*n*x^8*e*log(x) + 1/10*a*x^10*e^2 - 1/32*b*d*n*x^8*e + 1/4*b*d*x^8*e*l
og(c) + 1/4*a*d*x^8*e + 1/6*b*d^2*n*x^6*log(x) - 1/36*b*d^2*n*x^6 + 1/6*b*d
^2*x^6*log(c) + 1/6*a*d^2*x^6
```

3.184 $\int x^3 \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=74

$$\frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)(a+b\log(cx^n))-\frac{1}{16}bd^2nx^4-\frac{1}{18}bdenx^6-\frac{1}{64}be^2nx^8$$

```
[Out] -(b*d^2*n*x^4)/16 - (b*d*e*n*x^6)/18 - (b*e^2*n*x^8)/64 + ((6*d^2*x^4 + 8*d
*e*x^6 + 3*e^2*x^8)*(a + b*Log[c*x^n]))/24
```

Rubi [A] time = 0.088268, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 12, 14}

$$\frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)(a+b\log(cx^n))-\frac{1}{16}bd^2nx^4-\frac{1}{18}bdenx^6-\frac{1}{64}be^2nx^8$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^4)/16 - (b*d*e*n*x^6)/18 - (b*e^2*n*x^8)/64 + ((6*d^2*x^4 + 8*d
*e*x^6 + 3*e^2*x^8)*(a + b*Log[c*x^n]))/24
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
```

```
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^3 \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx &= \frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)(a+b\log(cx^n))-(bn)\int \frac{1}{24}x^3\left(6d^2+8dex^2+3e^2x\right.\\ &= \frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)(a+b\log(cx^n))-\frac{1}{24}(bn)\int x^3\left(6d^2+8dex^2+3e^2x\right.\\ &= \frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)(a+b\log(cx^n))-\frac{1}{24}(bn)\int\left(6d^2x^3+8dex^5+3e^2x^7\right.\\ &= -\frac{1}{16}bd^2nx^4-\frac{1}{18}bdenx^6-\frac{1}{64}be^2nx^8+\frac{1}{24}\left(6d^2x^4+8dex^6+3e^2x^8\right)(a+b\log(cx\right.\end{aligned}$$

Mathematica [A] time = 0.0365365, size = 87, normalized size = 1.18

$$\frac{1}{576}x^4\left(24a\left(6d^2+8dex^2+3e^2x^4\right)+24b\left(6d^2+8dex^2+3e^2x^4\right)\log(cx^n)-bn\left(36d^2+32dex^2+9e^2x^4\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(24*a*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4) - b*n*(36*d^2 + 32*d*e*x^2 + 9*e
^2*x^4) + 24*b*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4)*Log[c*x^n]))/576
```

Maple [C] time = 0.198, size = 434, normalized size = 5.9

$$\frac{bx^4\left(3e^2x^4+8dex^2+6d^2\right)\ln(x^n)}{24}-\frac{i}{16}\pi be^2x^8\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-\frac{i}{8}\pi bd^2x^4\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(i$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/24*b*x^4*(3*e^2*x^4+8*d*e*x^2+6*d^2)*ln(x^n)-1/16*I*Pi*b*e^2*x^8*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-1/8*I*Pi*b*d^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+1/8*I*Pi*b*d^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-1/6*I*Pi*b*d*e*x^6*c
sgn(I*c*x^n)^3+1/8*ln(c)*b*e^2*x^8-1/64*b*e^2*n*x^8+1/8*a*e^2*x^8+1/8*I*Pi*
b*d^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/6*I*Pi*b*d*e*x^6*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-1/8*I*Pi*b*d^2*x^4*csgn(I*c*x^n)^3+1/6*I*Pi*b*d*e*x^6*csgn(
I*x^n)*csgn(I*c*x^n)^2+1/3*ln(c)*b*d*e*x^6-1/18*b*d*e*n*x^6+1/3*a*d*e*x^6+1
/6*I*Pi*b*d*e*x^6*csgn(I*c*x^n)^2*csgn(I*c)-1/16*I*Pi*b*e^2*x^8*csgn(I*c*x^
n)^3+1/16*I*Pi*b*e^2*x^8*csgn(I*c*x^n)^2*csgn(I*c)+1/16*I*Pi*b*e^2*x^8*csgn
(I*x^n)*csgn(I*c*x^n)^2+1/4*ln(c)*b*d^2*x^4-1/16*b*d^2*n*x^4+1/4*a*d^2*x^4
```

Maxima [A] time = 1.12407, size = 135, normalized size = 1.82

$$-\frac{1}{64}\,be^2nx^8+\frac{1}{8}\,be^2x^8\log\left(cx^n\right)+\frac{1}{8}\,ae^2x^8-\frac{1}{18}\,bdenx^6+\frac{1}{3}\,bdex^6\log\left(cx^n\right)+\frac{1}{3}\,adex^6-\frac{1}{16}\,bd^2nx^4+\frac{1}{4}\,bd^2x^4\log\left(cx^n\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/64*b*e^2*n*x^8 + 1/8*b*e^2*x^8*log(c*x^n) + 1/8*a*e^2*x^8 - 1/18*b*d*e*n
*x^6 + 1/3*b*d*e*x^6*log(c*x^n) + 1/3*a*d*e*x^6 - 1/16*b*d^2*n*x^4 + 1/4*b*
d^2*x^4*log(c*x^n) + 1/4*a*d^2*x^4
```

Fricas [A] time = 1.34008, size = 285, normalized size = 3.85

$$-\frac{1}{64}\left(be^2n-8\,ae^2\right)x^8-\frac{1}{18}\left(bden-6\,ade\right)x^6-\frac{1}{16}\left(bd^2n-4\,ad^2\right)x^4+\frac{1}{24}\left(3\,be^2x^8+8\,bdex^6+6\,bd^2x^4\right)\log\left(c\right)+\frac{1}{24}\left(3\,be^2n\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/64*(b*e^2*n - 8*a*e^2)*x^8 - 1/18*(b*d*e*n - 6*a*d*e)*x^6 - 1/16*(b*d^2*
n - 4*a*d^2)*x^4 + 1/24*(3*b*e^2*x^8 + 8*b*d*e*x^6 + 6*b*d^2*x^4)*log(c) +
```

```
1/24*(3*b*e^2*n*x^8 + 8*b*d*e*n*x^6 + 6*b*d^2*n*x^4)*log(x)
```

Sympy [B] time = 13.8342, size = 151, normalized size = 2.04

$$\frac{ad^2x^4}{4} + \frac{adex^6}{3} + \frac{ae^2x^8}{8} + \frac{bd^2nx^4\log(x)}{4} - \frac{bd^2nx^4}{16} + \frac{bd^2x^4\log(c)}{4} + \frac{bdenx^6\log(x)}{3} - \frac{bdenx^6}{18} + \frac{bdex^6\log(c)}{3} + \frac{be^2nx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**4/4 + a*d*e*x**6/3 + a*e**2*x**8/8 + b*d**2*n*x**4*log(x)/4 - b*d
**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + b*d*e*n*x**6*log(x)/3 - b*d*e*n*x**6
/18 + b*d*e*x**6*log(c)/3 + b*e**2*n*x**8*log(x)/8 - b*e**2*n*x**8/64 + b*e
**2*x**8*log(c)/8
```

Giac [A] time = 1.37819, size = 166, normalized size = 2.24

$$\frac{1}{8}bnx^8e^2\log(x) - \frac{1}{64}bnx^8e^2 + \frac{1}{8}bx^8e^2\log(c) + \frac{1}{3}bdnx^6e\log(x) + \frac{1}{8}ax^8e^2 - \frac{1}{18}bdnx^6e + \frac{1}{3}bdx^6e\log(c) + \frac{1}{3}adx^6e +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/8*b*n*x^8*e^2*log(x) - 1/64*b*n*x^8*e^2 + 1/8*b*x^8*e^2*log(c) + 1/3*b*d*
n*x^6*e*log(x) + 1/8*a*x^8*e^2 - 1/18*b*d*n*x^6*e + 1/3*b*d*x^6*e*log(c) +
1/3*a*d*x^6*e + 1/4*b*d^2*n*x^4*log(x) - 1/16*b*d^2*n*x^4 + 1/4*b*d^2*x^4*l
og(c) + 1/4*a*d^2*x^4
```

3.185 $\int x\left(d+ex^2\right)^2(a+b\log(cx^n))\,dx$

Optimal. Leaf size=76

$$\frac{\left(d+ex^2\right)^3(a+b\log(cx^n))}{6e}-\frac{bd^3n\log(x)}{6e}-\frac{1}{4}bd^2nx^2-\frac{1}{8}bdenx^4-\frac{1}{36}be^2nx^6$$

```
[Out] -(b*d^2*n*x^2)/4 - (b*d*e*n*x^4)/8 - (b*e^2*n*x^6)/36 - (b*d^3*n*Log[x])/(6
*e) + ((d + e*x^2)^3*(a + b*Log[c*x^n]))/(6*e)
```

Rubi [A] time = 0.0678022, antiderivative size = 76, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {261, 2334, 12, 266, 43}

$$\frac{\left(d+ex^2\right)^3(a+b\log(cx^n))}{6e}-\frac{bd^3n\log(x)}{6e}-\frac{1}{4}bd^2nx^2-\frac{1}{8}bdenx^4-\frac{1}{36}be^2nx^6$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^2)/4 - (b*d*e*n*x^4)/8 - (b*e^2*n*x^6)/36 - (b*d^3*n*Log[x])/(6
*e) + ((d + e*x^2)^3*(a + b*Log[c*x^n]))/(6*e)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}
\int x\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)dx &= \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-(bn)\int\frac{\left(d+ex^2\right)^3}{6ex}dx\\
&= \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{(bn)\int\frac{\left(d+ex^2\right)^3}{x}dx}{6e}\\
&= \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{(bn)\,\text{Subst}\left(\int\frac{(d+ex)^3}{x}dx,x,x^2\right)}{12e}\\
&= \frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}-\frac{(bn)\,\text{Subst}\left(\int\left(3d^2e+\frac{d^3}{x}+3de^2x+e^3x^2\right)dx,x,x^2\right)}{12e}\\
&= -\frac{1}{4}bd^2nx^2-\frac{1}{8}bdenx^4-\frac{1}{36}be^2nx^6-\frac{bd^3n\log(x)}{6e}+\frac{\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)}{6e}
\end{aligned}$$

Mathematica [A] time = 0.035075, size = 85, normalized size = 1.12

$$\frac{1}{72}x^2\left(12a\left(3d^2+3dex^2+e^2x^4\right)+12b\left(3d^2+3dex^2+e^2x^4\right)\log\left(cx^n\right)-bn\left(18d^2+9dex^2+2e^2x^4\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(12*a*(3*d^2 + 3*d*e*x^2 + e^2*x^4) - b*n*(18*d^2 + 9*d*e*x^2 + 2*e^2*
x^4) + 12*b*(3*d^2 + 3*d*e*x^2 + e^2*x^4)*Log[c*x^n]))/72
```

Maple [C] time = 0.204, size = 433, normalized size = 5.7

$$\frac{bx^2\left(e^2x^4+3\,dex^2+3\,d^2\right)\ln\left(x^n\right)}{6}-\frac{i}{4}\pi\,bd^2x^2\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(icx^n\right)\mathrm{csgn}\left(ic\right)-\frac{i}{12}\pi\,be^2x^6\left(\mathrm{csgn}\left(icx^n\right)\right)^3-\frac{i}{4}\pi\,bdex^4\left(\mathrm{csgn}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/6*b*x^2*(e^2*x^4+3*d*e*x^2+3*d^2)*ln(x^n)-1/4*I*Pi*b*d^2*x^2*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)-1/12*I*Pi*b*e^2*x^6*csgn(I*c*x^n)^3-1/4*I*Pi*b*d*e*
x^4*csgn(I*c*x^n)^3-1/4*I*Pi*b*d*e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+
1/6*ln(c)*b*e^2*x^6-1/36*b*e^2*n*x^6+1/6*a*e^2*x^6+1/4*I*Pi*b*d^2*x^2*csgn(
I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1/12*I*
Pi*b*e^2*x^6*csgn(I*c*x^n)^2*csgn(I*c)-1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+1/2*ln(c)*b*d*e*x^4-1/8*b*d*e*n*x^4+1/2*a*d*e*x^4+1/4*I
*Pi*b*d*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/4*I*Pi*b*d^2*x^2*csgn(I*c*x^n)^3+
1/12*I*Pi*b*e^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d*e*x^4*csgn(I*x
^n)*csgn(I*c*x^n)^2+1/2*ln(c)*b*d^2*x^2-1/4*b*d^2*n*x^2+1/2*a*d^2*x^2
```

Maxima [A] time = 1.15963, size = 135, normalized size = 1.78

$$-\frac{1}{36}\,be^2nx^6+\frac{1}{6}\,be^2x^6\log\left(cx^n\right)+\frac{1}{6}\,ae^2x^6-\frac{1}{8}\,bdenx^4+\frac{1}{2}\,bdex^4\log\left(cx^n\right)+\frac{1}{2}\,adex^4-\frac{1}{4}\,bd^2nx^2+\frac{1}{2}\,bd^2x^2\log\left(cx^n\right)+\frac{1}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/36*b*e^2*n*x^6 + 1/6*b*e^2*x^6*log(c*x^n) + 1/6*a*e^2*x^6 - 1/8*b*d*e*n*
x^4 + 1/2*b*d*e*x^4*log(c*x^n) + 1/2*a*d*e*x^4 - 1/4*b*d^2*n*x^2 + 1/2*b*d^
2*x^2*log(c*x^n) + 1/2*a*d^2*x^2
```

Fricas [A] time = 1.28354, size = 274, normalized size = 3.61

$$-\frac{1}{36}\left(be^2n-6\,ae^2\right)x^6-\frac{1}{8}\left(bden-4\,ade\right)x^4-\frac{1}{4}\left(bd^2n-2\,ad^2\right)x^2+\frac{1}{6}\left(be^2x^6+3\,bdex^4+3\,bd^2x^2\right)\log\left(c\right)+\frac{1}{6}\left(be^2nx^6+3\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/36*(b*e^2*n - 6*a*e^2)*x^6 - 1/8*(b*d*e*n - 4*a*d*e)*x^4 - 1/4*(b*d^2*n
- 2*a*d^2)*x^2 + 1/6*(b*e^2*x^6 + 3*b*d*e*x^4 + 3*b*d^2*x^2)*log(c) + 1/6*(
b*e^2*n*x^6 + 3*b*d*e*n*x^4 + 3*b*d^2*n*x^2)*log(x)
```

Sympy [B] time = 5.68267, size = 151, normalized size = 1.99

$$\frac{ad^2x^2}{2} + \frac{adex^4}{2} + \frac{ae^2x^6}{6} + \frac{bd^2nx^2\log(x)}{2} - \frac{bd^2nx^2}{4} + \frac{bd^2x^2\log(c)}{2} + \frac{bdenx^4\log(x)}{2} - \frac{bdenx^4}{8} + \frac{bdex^4\log(c)}{2} + \frac{be^2nx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**2/2 + a*d*e*x**4/2 + a*e**2*x**6/6 + b*d**2*n*x**2*log(x)/2 - b*d
**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + b*d*e*n*x**4*log(x)/2 - b*d*e*n*x**4/
8 + b*d*e*x**4*log(c)/2 + b*e**2*n*x**6*log(x)/6 - b*e**2*n*x**6/36 + b*e**
2*x**6*log(c)/6
```

Giac [A] time = 1.86026, size = 166, normalized size = 2.18

$$\frac{1}{6}bnx^6e^2\log(x) - \frac{1}{36}bnx^6e^2 + \frac{1}{6}bx^6e^2\log(c) + \frac{1}{2}bdnx^4e\log(x) + \frac{1}{6}ax^6e^2 - \frac{1}{8}bdnx^4e + \frac{1}{2}bdx^4e\log(c) + \frac{1}{2}adx^4e + \frac{1}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/6*b*n*x^6*e^2*log(x) - 1/36*b*n*x^6*e^2 + 1/6*b*x^6*e^2*log(c) + 1/2*b*d*
n*x^4*e*log(x) + 1/6*a*x^6*e^2 - 1/8*b*d*n*x^4*e + 1/2*b*d*x^4*e*log(c) + 1
/2*a*d*x^4*e + 1/2*b*d^2*n*x^2*log(x) - 1/4*b*d^2*n*x^2 + 1/2*b*d^2*x^2*log
(c) + 1/2*a*d^2*x^2
```

3.186 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=89

$$d^2\log(x)(a+b\log(cx^n))+dex^2(a+b\log(cx^n))+\frac{1}{4}e^2x^4(a+b\log(cx^n))-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx^4$$

```
[Out] -(b*d*e*n*x^2)/2 - (b*e^2*n*x^4)/16 - (b*d^2*n*Log[x]^2)/2 + d*e*x^2*(a + b
*Log[c*x^n]) + (e^2*x^4*(a + b*Log[c*x^n]))/4 + d^2*Log[x]*(a + b*Log[c*x^n
])
```

Rubi [A] time = 0.0818464, antiderivative size = 73, normalized size of antiderivative = 0.82, number of steps used = 3, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {266, 43, 2334, 2301}

$$\frac{1}{4}\left(4d^2\log(x)+4dex^2+e^2x^4\right)(a+b\log(cx^n))-\frac{1}{2}bd^2n\log^2(x)-\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx^4$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -(b*d*e*n*x^2)/2 - (b*e^2*n*x^4)/16 - (b*d^2*n*Log[x]^2)/2 + ((4*d*e*x^2 +
e^2*x^4 + 4*d^2*Log[x])*(a + b*Log[c*x^n]))/4
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2 (a+b\log(cx^n))}{x}\,dx = \frac{1}{4}\left(4dex^2+e^2x^4+4d^2\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(dex+\frac{e^2x^3}{4}+\frac{d^2\log(x)}{x}\right)$$
$$= -\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx^4+\frac{1}{4}\left(4dex^2+e^2x^4+4d^2\log(x)\right)(a+b\log(cx^n))-\left(bd^2n\right)\int$$
$$= -\frac{1}{2}bdenx^2-\frac{1}{16}be^2nx^4-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{4}\left(4dex^2+e^2x^4+4d^2\log(x)\right)(a+b\log($$

Mathematica [A] time = 0.0495569, size = 82, normalized size = 0.92

$$\frac{1}{16}\left(\frac{8d^2(a+b\log(cx^n))^2}{bn}+16dex^2(a+b\log(cx^n))+4e^2x^4(a+b\log(cx^n))-8bdenx^2-be^2nx^4\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-8*b*d*e*n*x^2 - b*e^2*n*x^4 + 16*d*e*x^2*(a + b*Log[c*x^n]) + 4*e^2*x^4*(
a + b*Log[c*x^n]) + (8*d^2*(a + b*Log[c*x^n])^2)/(b*n))/16
```

Maple [C] time = 0.215, size = 423, normalized size = 4.8

$$\left(\frac{be^2x^4}{4}+bdex^2+bd^2\ln(x)\right)\ln(x^n)-\frac{bd^2n(\ln(x))^2}{2}+\frac{i}{8}\pi be^2x^4(\mathrm{csgn}(icx^n))^2\mathrm{csgn}(ic)+\frac{i}{2}\ln(x)\pi bd^2\mathrm{csgn}(ix^n)(\mathrm{csg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n))/x,x)
```

```
[Out] (1/4*b*e^2*x^4+b*d*e*x^2+b*d^2*ln(x))*ln(x^n)-1/2*b*d^2*n*ln(x)^2+1/8*I*Pi*
b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*ln(x)*Pi*b*d^2*csgn(I*x^n)*csgn(I
*c*x^n)^2-1/2*I*ln(x)*Pi*b*d^2*csgn(I*c*x^n)^3-1/2*I*ln(x)*Pi*b*d^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1
/2*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/8*I*Pi*b*e^2*x^4*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x)*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+1/
4*ln(c)*b*e^2*x^4-1/16*b*e^2*n*x^4+1/4*a*e^2*x^4+ln(c)*b*d*e*x^2-1/2*b*d*e*
n*x^2+a*d*e*x^2-1/2*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3+1/8*I*Pi*b*e^2*x^4*csgn(
I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-1/8*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3+ln(x)*ln(c)*b*d^2+ln(x)*a*d^2
```

Maxima [A] time = 1.207, size = 119, normalized size = 1.34

$$-\frac{1}{16}be^2nx^4 + \frac{1}{4}be^2x^4\log(cx^n) + \frac{1}{4}ae^2x^4 - \frac{1}{2}bdenx^2 + bdex^2\log(cx^n) + adex^2 + \frac{bd^2\log(cx^n)^2}{2n} + ad^2\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] -1/16*b*e^2*n*x^4 + 1/4*b*e^2*x^4*log(c*x^n) + 1/4*a*e^2*x^4 - 1/2*b*d*e*n*
x^2 + b*d*e*x^2*log(c*x^n) + a*d*e*x^2 + 1/2*b*d^2*log(c*x^n)^2/n + a*d^2*l
og(x)
```

Fricas [A] time = 1.32966, size = 259, normalized size = 2.91

$$\frac{1}{2}bd^2n\log(x)^2 - \frac{1}{16}\left(be^2n - 4ae^2\right)x^4 - \frac{1}{2}(bden - 2ade)x^2 + \frac{1}{4}\left(be^2x^4 + 4bdex^2\right)\log(c) + \frac{1}{4}\left(be^2nx^4 + 4bdenx^2 + 4bd^2\,\mathrm{l}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*b*d^2*n*log(x)^2 - 1/16*(b*e^2*n - 4*a*e^2)*x^4 - 1/2*(b*d*e*n - 2*a*d*
e)*x^2 + 1/4*(b*e^2*x^4 + 4*b*d*e*x^2)*log(c) + 1/4*(b*e^2*n*x^4 + 4*b*d*e*
n*x^2 + 4*b*d^2*log(c) + 4*a*d^2)*log(x)
```

Sympy [A] time = 3.57275, size = 129, normalized size = 1.45

$$ad^2\log(x) + adex^2 + \frac{ae^2x^4}{4} + \frac{bd^2n\log(x)^2}{2} + bd^2\log(c)\log(x) + bdenx^2\log(x) - \frac{bdenx^2}{2} + bdex^2\log(c) + \frac{be^2nx^4\log}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x,x)
```

```
[Out] a*d**2*log(x) + a*d*e*x**2 + a*e**2*x**4/4 + b*d**2*n*log(x)**2/2 + b*d**2*
log(c)*log(x) + b*d*e*n*x**2*log(x) - b*d*e*n*x**2/2 + b*d*e*x**2*log(c) +
b*e**2*n*x**4*log(x)/4 - b*e**2*n*x**4/16 + b*e**2*x**4*log(c)/4
```

Giac [A] time = 1.36055, size = 142, normalized size = 1.6

$$\frac{1}{4}bnx^4e^2\log(x) - \frac{1}{16}bnx^4e^2 + \frac{1}{4}bx^4e^2\log(c) + bdnx^2e\log(x) + \frac{1}{4}ax^4e^2 - \frac{1}{2}bdnx^2e + bdx^2e\log(c) + \frac{1}{2}bd^2n\log(x)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/4*b*n*x^4*e^2*log(x) - 1/16*b*n*x^4*e^2 + 1/4*b*x^4*e^2*log(c) + b*d*n*x^
2*e*log(x) + 1/4*a*x^4*e^2 - 1/2*b*d*n*x^2*e + b*d*x^2*e*log(c) + 1/2*b*d^2
*n*log(x)^2 + a*d*x^2*e + b*d^2*log(c)*log(x) + a*d^2*log(x)
```

3.187 $\int \frac{\left(d+ex^2\right)^2(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=91

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}+2de\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{1}{2}e^2x^2\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{4x^2}-bden\log^2(x)-\frac{1}{4}be^2nx^2$$

```
[Out] -(b*d^2*n)/(4*x^2) - (b*e^2*n*x^2)/4 - b*d*e*n*Log[x]^2 - (d^2*(a + b*Log[c
*x^n]))/(2*x^2) + (e^2*x^2*(a + b*Log[c*x^n]))/2 + 2*d*e*Log[x]*(a + b*Log[
c*x^n])
```

Rubi [A] time = 0.0986328, antiderivative size = 71, normalized size of antiderivative = 0.78, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$-\frac{1}{2}\left(\frac{d^2}{x^2}-4de\log(x)-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{4x^2}-bden\log^2(x)-\frac{1}{4}be^2nx^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^2*n)/(4*x^2) - (b*e^2*n*x^2)/4 - b*d*e*n*Log[x]^2 - ((d^2/x^2 - e^2*x
^2 - 4*d*e*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2 (a+b\log(cx^n))}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)(a+b\log(cx^n))-(bn)\int \frac{-d^2+e^2x^4+4dex^2\log(x)}{2x^3}\,d$$

$$= -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)(a+b\log(cx^n))-\frac{1}{2}(bn)\int \frac{-d^2+e^2x^4+4dex^2\log(x)}{x^3}$$

$$= -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)(a+b\log(cx^n))-\frac{1}{2}(bn)\int \left(\frac{-d^2+e^2x^4}{x^3}+\frac{4de\log(x)}{x}\right)$$

$$= -\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)(a+b\log(cx^n))-\frac{1}{2}(bn)\int \frac{-d^2+e^2x^4}{x^3}\,dx-(2bden)\int$$

$$= -bden\log^2(x)-\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)(a+b\log(cx^n))-\frac{1}{2}(bn)\int \left(-\frac{d^2}{x^3}+e^2x\right.$$

$$= -\frac{bd^2n}{4x^2}-\frac{1}{4}be^2nx^2-bden\log^2(x)-\frac{1}{2}\left(\frac{d^2}{x^2}-e^2x^2-4de\log(x)\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0584254, size = 83, normalized size = 0.91

$$\frac{1}{4}\left(-\frac{2d^2(a+b\log(cx^n))}{x^2}+\frac{4de(a+b\log(cx^n))^2}{bn}+2e^2x^2(a+b\log(cx^n))-\frac{bd^2n}{x^2}-be^2nx^2\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (-((b*d^2*n)/x^2) - b*e^2*n*x^2 - (2*d^2*(a + b*Log[c*x^n]))/x^2 + 2*e^2*x^
2*(a + b*Log[c*x^n]) + (4*d*e*(a + b*Log[c*x^n])^2)/(b*n))/4
```

Maple [C] time = 0.237, size = 433, normalized size = 4.8

$$-\frac{b\left(-e^{2}x^{4}-4\,de\ln\left(x\right)x^{2}+d^{2}\right)\ln\left(x^{n}\right)}{2\,x^{2}}-\frac{-4\,i\ln\left(x\right)\pi\,bde\mathrm{csgn}\left(ix^{n}\right)\left(\mathrm{csgn}\left(icx^{n}\right)\right)^{2}x^{2}+i\pi\,bd^{2}\mathrm{csgn}\left(ix^{n}\right)\left(\mathrm{csgn}\left(icx^{n}\right)\right)^{2}-i\pi}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n))/x^3,x)
```

```
[Out] -1/2*b*(-e^2*x^4-4*d*e*ln(x)*x^2+d^2)/x^2*ln(x^n)-1/4*(-4*I*ln(x)*Pi*b*d*e*
csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi
*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3-I*Pi*b*
d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c
)+4*I*ln(x)*Pi*b*d*e*csgn(I*c*x^n)^3*x^2+I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)-2*ln(c)*b*e^2*x^4+4*I*ln(x)*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^2-I*Pi*b*d^2*csgn(I*c*x^n)^3-4*I*ln(x)*Pi*b*d*e*csgn(I*c*x
^n)^2*csgn(I*c)*x^2-I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+4*b*d*e*n*ln
(x)^2*x^2+b*e^2*n*x^4-8*ln(x)*ln(c)*b*d*e*x^2-2*a*e^2*x^4-8*ln(x)*a*d*e*x^2
+2*ln(c)*b*d^2+b*d^2*n+2*a*d^2)/x^2
```

Maxima [A] time = 1.0803, size = 123, normalized size = 1.35

$$-\frac{1}{4}\,be^{2}nx^{2}+\frac{1}{2}\,be^{2}x^{2}\log\left(cx^{n}\right)+\frac{1}{2}\,ae^{2}x^{2}+\frac{bde\log\left(cx^{n}\right)^{2}}{n}+2\,ade\log\left(x\right)-\frac{bd^{2}n}{4\,x^{2}}-\frac{bd^{2}\log\left(cx^{n}\right)}{2\,x^{2}}-\frac{ad^{2}}{2\,x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^2*n*x^2 + 1/2*b*e^2*x^2*log(c*x^n) + 1/2*a*e^2*x^2 + b*d*e*log(c*x
^n)^2/n + 2*a*d*e*log(x) - 1/4*b*d^2*n/x^2 - 1/2*b*d^2*log(c*x^n)/x^2 - 1/2
*a*d^2/x^2
```

Fricas [A] time = 1.234, size = 244, normalized size = 2.68

$$\frac{4\,bdenx^2\log\left(x\right)^2-\left(be^2n-2\,ae^2\right)x^4-bd^2n-2\,ad^2+2\left(be^2x^4-bd^2\right)\log\left(c\right)+2\left(be^2nx^4+4\,bdex^2\log\left(c\right)+4\,adex^2-b\right.}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*b*d*e*n*x^2*log(x)^2 - (b*e^2*n - 2*a*e^2)*x^4 - b*d^2*n - 2*a*d^2 +
 2*(b*e^2*x^4 - b*d^2)*log(c) + 2*(b*e^2*n*x^4 + 4*b*d*e*x^2*log(c) + 4*a*d
*e*x^2 - b*d^2*n)*log(x))/x^2
```

Sympy [A] time = 3.54678, size = 136, normalized size = 1.49

$$-\frac{ad^2}{2x^2}+2ade\log\left(x\right)+\frac{ae^2x^2}{2}-\frac{bd^2n\log\left(x\right)}{2x^2}-\frac{bd^2n}{4x^2}-\frac{bd^2\log\left(c\right)}{2x^2}+bden\log\left(x\right)^2+2bde\log\left(c\right)\log\left(x\right)+\frac{be^2nx^2\log\left(x\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d**2/(2*x**2) + 2*a*d*e*log(x) + a*e**2*x**2/2 - b*d**2*n*log(x)/(2*x**2
) - b*d**2*n/(4*x**2) - b*d**2*log(c)/(2*x**2) + b*d*e*n*log(x)**2 + 2*b*d*
e*log(c)*log(x) + b*e**2*n*x**2*log(x)/2 - b*e**2*n*x**2/4 + b*e**2*x**2*lo
g(c)/2
```

Giac [A] time = 1.29697, size = 151, normalized size = 1.66

$$\frac{2\,bnx^4e^2\log\left(x\right)+4\,bdnx^2e\log\left(x\right)^2-bnx^4e^2+2\,bx^4e^2\log\left(c\right)+8\,bdx^2e\log\left(c\right)\log\left(x\right)+2\,ax^4e^2+8\,adx^2e\log\left(x\right)-2\,bd}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] 1/4*(2*b*n*x^4*e^2*log(x) + 4*b*d*n*x^2*e*log(x)^2 - b*n*x^4*e^2 + 2*b*x^4*
e^2*log(c) + 8*b*d*x^2*e*log(c)*log(x) + 2*a*x^4*e^2 + 8*a*d*x^2*e*log(x) -
 2*b*d^2*n*log(x) - b*d^2*n - 2*b*d^2*log(c) - 2*a*d^2)/x^2
```

3.188 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=90

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{de\left(a+b\log\left(cx^n\right)\right)}{x^2}+e^2\log(x)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{16x^4}-\frac{bden}{2x^2}-\frac{1}{2}be^2n\log^2(x)$$

```
[Out] -(b*d^2*n)/(16*x^4) - (b*d*e*n)/(2*x^2) - (b*e^2*n*Log[x]^2)/2 - (d^2*(a +
b*Log[c*x^n]))/(4*x^4) - (d*e*(a + b*Log[c*x^n]))/x^2 + e^2*Log[x]*(a + b*L
og[c*x^n])
```

Rubi [A] time = 0.0892583, antiderivative size = 73, normalized size of antiderivative = 0.81, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 14, 2301}

$$-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{16x^4}-\frac{bden}{2x^2}-\frac{1}{2}be^2n\log^2(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^2*n)/(16*x^4) - (b*d*e*n)/(2*x^2) - (b*e^2*n*Log[x]^2)/2 - ((d^2/x^4
+ (4*d*e)/x^2 - 4*e^2*Log[x])*(a + b*Log[c*x^n]))/4
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)^2 (a+b\log(cx^n))}{x^5}\,dx &= -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)(a+b\log(cx^n))-(bn)\int\left(-\frac{d\left(d+4ex^2\right)}{4x^5}+\frac{e^2\log(x)}{x}\right)\\ &= -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)(a+b\log(cx^n))+\frac{1}{4}(bdn)\int\frac{d+4ex^2}{x^5}\,dx-\left(be^2n\right)\int\\ &= -\frac{1}{2}be^2n\log^2(x)-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)(a+b\log(cx^n))+\frac{1}{4}(bdn)\int\left(\frac{d}{x^5}+\right.\\ &= -\frac{bd^2n}{16x^4}-\frac{bden}{2x^2}-\frac{1}{2}be^2n\log^2(x)-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{4de}{x^2}-4e^2\log(x)\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0542885, size = 82, normalized size = 0.91

$$\frac{1}{16}\left(-\frac{4d^2(a+b\log(cx^n))}{x^4}-\frac{16de(a+b\log(cx^n))}{x^2}+\frac{8e^2(a+b\log(cx^n))^2}{bn}-\frac{bd^2n}{x^4}-\frac{8bden}{x^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (-((b*d^2*n)/x^4) - (8*b*d*e*n)/x^2 - (4*d^2*(a + b*Log[c*x^n]))/x^4 - (16*
d*e*(a + b*Log[c*x^n]))/x^2 + (8*e^2*(a + b*Log[c*x^n])^2)/(b*n))/16
```

Maple [C] time = 0.134, size = 434, normalized size = 4.8

$$-\frac{b\left(-4\,e^{2}\ln\left(x\right)x^{4}+4\,de\,x^{2}+d^{2}\right)\ln\left(x^{n}\right)}{4\,x^{4}}-\frac{8\,i\ln\left(x\right)\pi\,b e^{2}\mathrm{csgn}\left(ix^{n}\right)\mathrm{csgn}\left(icx^{n}\right)\mathrm{csgn}\left(ic\right)x^{4}-8\,i\ln\left(x\right)\pi\,b e^{2}\mathrm{csgn}\left(ix^{n}\right)\left(\mathrm{csg}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/4*b*(-4*e^2*ln(x)*x^4+4*d*e*x^2+d^2)/x^4*ln(x^n)-1/16*(8*I*ln(x)*Pi*b*e^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^4-8*I*ln(x)*Pi*b*e^2*csgn(I*x^n)*cs
gn(I*c*x^n)^2*x^4-8*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3+2*I*Pi*b*d^2*csgn(I*c*x^
n)^2*csgn(I*c)-8*I*ln(x)*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^4+2*I*Pi*b*d^
2*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+8*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+8*b*e^2*n*ln(x)^2*x^4-16*l
n(x)*ln(c)*b*e^2*x^4-2*I*Pi*b*d^2*csgn(I*c*x^n)^3+8*I*Pi*b*d*e*x^2*csgn(I*c
*x^n)^2*csgn(I*c)-8*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+8*I*
ln(x)*Pi*b*e^2*csgn(I*c*x^n)^3*x^4-16*ln(x)*a*e^2*x^4+16*ln(c)*b*d*e*x^2+8*
b*d*e*n*x^2+16*a*d*e*x^2+4*ln(c)*b*d^2+b*d^2*n+4*a*d^2)/x^4
```

Maxima [A] time = 1.09291, size = 122, normalized size = 1.36

$$\frac{be^{2}\log\left(cx^{n}\right)^{2}}{2\,n}+ae^{2}\log\left(x\right)-\frac{bden}{2\,x^{2}}-\frac{bde\log\left(cx^{n}\right)}{x^{2}}-\frac{ade}{x^{2}}-\frac{bd^{2}n}{16\,x^{4}}-\frac{bd^{2}\log\left(cx^{n}\right)}{4\,x^{4}}-\frac{ad^{2}}{4\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] 1/2*b*e^2*log(c*x^n)^2/n + a*e^2*log(x) - 1/2*b*d*e*n/x^2 - b*d*e*log(c*x^n
)/x^2 - a*d*e/x^2 - 1/16*b*d^2*n/x^4 - 1/4*b*d^2*log(c*x^n)/x^4 - 1/4*a*d^2
/x^4
```

Fricas [A] time = 1.33365, size = 254, normalized size = 2.82

$$\frac{8\,be^{2}nx^{4}\log\left(x\right)^{2}-bd^{2}n-4\,ad^{2}-8\,(bden+2\,ade)x^{2}-4\left(4\,bdex^{2}+bd^{2}\right)\log\left(c\right)+4\left(4\,be^{2}x^{4}\log\left(c\right)+4\,ae^{2}x^{4}-4\,bdenx^{2}\right.}{16\,x^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] 1/16*(8*b*e^2*n*x^4*log(x)^2 - b*d^2*n - 4*a*d^2 - 8*(b*d*e*n + 2*a*d*e)*x^
2 - 4*(4*b*d*e*x^2 + b*d^2)*log(c) + 4*(4*b*e^2*x^4*log(c) + 4*a*e^2*x^4 -
4*b*d*e*n*x^2 - b*d^2*n)*log(x))/x^4
```

Sympy [A] time = 6.64322, size = 105, normalized size = 1.17

$$-\frac{ad^2}{4x^4} - \frac{ade}{x^2} + ae^2\log(x) + bd^2\left(-\frac{n}{16x^4} - \frac{\log(cx^n)}{4x^4}\right) + 2bde\left(-\frac{n}{4x^2} - \frac{\log(cx^n)}{2x^2}\right) - be^2\left(\begin{cases} -\log(c)\log(x) & \text{for } n = 0 \\ -\frac{\log(cx^n)^2}{2n} & \text{otherwise} \end{cases}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d**2/(4*x**4) - a*d*e/x**2 + a*e**2*log(x) + b*d**2*(-n/(16*x**4) - log(
c*x**n)/(4*x**4)) + 2*b*d*e*(-n/(4*x**2) - log(c*x**n)/(2*x**2)) - b*e**2*P
iecewise((-log(c)*log(x), Eq(n, 0)), (-log(c*x**n)**2/(2*n), True))
```

Giac [A] time = 1.31556, size = 153, normalized size = 1.7

$$\frac{8\,bnx^4e^2\log(x)^2 + 16\,bx^4e^2\log(c)\log(x) + 16\,ax^4e^2\log(x) - 16\,bdnx^2e\log(x) - 8\,bdnx^2e - 16\,bdx^2e\log(c) - 16\,adx^2e}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] 1/16*(8*b*n*x^4*e^2*log(x)^2 + 16*b*x^4*e^2*log(c)*log(x) + 16*a*x^4*e^2*lo
g(x) - 16*b*d*n*x^2*e*log(x) - 8*b*d*n*x^2*e - 16*b*d*x^2*e*log(c) - 16*a*d
*x^2*e - 4*b*d^2*n*log(x) - b*d^2*n - 4*b*d^2*log(c) - 4*a*d^2)/x^4
```

3.189 $\int x^4 \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=74

$$\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)(a+b\log(cx^n))-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9$$

```
[Out] -(b*d^2*n*x^5)/25 - (2*b*d*e*n*x^7)/49 - (b*e^2*n*x^9)/81 + ((63*d^2*x^5 +
90*d*e*x^7 + 35*e^2*x^9)*(a + b*Log[c*x^n]))/315
```

Rubi [A] time = 0.0723918, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)(a+b\log(cx^n))-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^5)/25 - (2*b*d*e*n*x^7)/49 - (b*e^2*n*x^9)/81 + ((63*d^2*x^5 +
90*d*e*x^7 + 35*e^2*x^9)*(a + b*Log[c*x^n]))/315
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^4\left(d+ex^2\right)^2\left(a+b\log\left(cx^n\right)\right)\,dx=\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\left(\frac{d^2x^4}{5}+\frac{2}{7}dex^6+\frac{e^2x}{9}\right.$$
$$=-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9+\frac{1}{315}\left(63d^2x^5+90dex^7+35e^2x^9\right)\left(a+b\,\mathrm{lo}\right.$$

Mathematica [A] time = 0.0352158, size = 95, normalized size = 1.28

$$\frac{1}{5}d^2x^5\left(a+b\log\left(cx^n\right)\right)+\frac{2}{7}dex^7\left(a+b\log\left(cx^n\right)\right)+\frac{1}{9}e^2x^9\left(a+b\log\left(cx^n\right)\right)-\frac{1}{25}bd^2nx^5-\frac{2}{49}bdenx^7-\frac{1}{81}be^2nx^9$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^5)/25 - (2*b*d*e*n*x^7)/49 - (b*e^2*n*x^9)/81 + (d^2*x^5*(a + b
*Log[c*x^n]))/5 + (2*d*e*x^7*(a + b*Log[c*x^n]))/7 + (e^2*x^9*(a + b*Log[c*
x^n]))/9
```

Maple [C] time = 0.195, size = 434, normalized size = 5.9

$$\frac{bx^5\left(35\,e^2x^4+90\,dex^2+63\,d^2\right)\ln\left(x^n\right)}{315}+\frac{i}{10}\pi\,bd^2x^5\left(\mathrm{csgn}\left(icx^n\right)\right)^2\mathrm{csgn}\left(ic\right)-\frac{i}{18}\pi\,be^2x^9\mathrm{csgn}\left(ix^n\right)\mathrm{csgn}\left(icx^n\right)\mathrm{csgn}\left(ic\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/315*b*x^5*(35*e^2*x^4+90*d*e*x^2+63*d^2)*ln(x^n)+1/10*I*Pi*b*d^2*x^5*csgn
(I*c*x^n)^2*csgn(I*c)-1/18*I*Pi*b*e^2*x^9*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)+1/18*I*Pi*b*e^2*x^9*csgn(I*c*x^n)^2*csgn(I*c)-1/7*I*Pi*b*d*e*x^7*csgn(I*
c*x^n)^3+1/9*ln(c)*b*e^2*x^9-1/81*b*e^2*n*x^9+1/9*a*e^2*x^9+1/7*I*Pi*b*d*e*
x^7*csgn(I*c*x^n)^2*csgn(I*c)-1/7*I*Pi*b*d*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+1/7*I*Pi*b*d*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2+1/10*I*Pi*b*d^2*x^
5*csgn(I*x^n)*csgn(I*c*x^n)^2+2/7*ln(c)*b*d*e*x^7-2/49*b*d*e*n*x^7+2/7*a*d*
e*x^7-1/18*I*Pi*b*e^2*x^9*csgn(I*c*x^n)^3+1/18*I*Pi*b*e^2*x^9*csgn(I*x^n)*c
sgn(I*c*x^n)^2-1/10*I*Pi*b*d^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/10
*I*Pi*b*d^2*x^5*csgn(I*c*x^n)^3+1/5*ln(c)*b*d^2*x^5-1/25*b*d^2*n*x^5+1/5*a*
d^2*x^5
```

Maxima [A] time = 1.10956, size = 135, normalized size = 1.82

$$-\frac{1}{81}be^2nx^9 + \frac{1}{9}be^2x^9\log(cx^n) + \frac{1}{9}ae^2x^9 - \frac{2}{49}bdenx^7 + \frac{2}{7}bdex^7\log(cx^n) + \frac{2}{7}adex^7 - \frac{1}{25}bd^2nx^5 + \frac{1}{5}bd^2x^5\log(cx^n) +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/81*b*e^2*n*x^9 + 1/9*b*e^2*x^9*log(c*x^n) + 1/9*a*e^2*x^9 - 2/49*b*d*e*n
*x^7 + 2/7*b*d*e*x^7*log(c*x^n) + 2/7*a*d*e*x^7 - 1/25*b*d^2*n*x^5 + 1/5*b*
d^2*x^5*log(c*x^n) + 1/5*a*d^2*x^5
```

Fricas [A] time = 1.34951, size = 296, normalized size = 4.

$$-\frac{1}{81}\left(be^2n - 9\,ae^2\right)x^9 - \frac{2}{49}(bden - 7\,ade)x^7 - \frac{1}{25}\left(bd^2n - 5\,ad^2\right)x^5 + \frac{1}{315}\left(35\,be^2x^9 + 90\,bdex^7 + 63\,bd^2x^5\right)\log(c) + \frac{1}{315}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/81*(b*e^2*n - 9*a*e^2)*x^9 - 2/49*(b*d*e*n - 7*a*d*e)*x^7 - 1/25*(b*d^2*
n - 5*a*d^2)*x^5 + 1/315*(35*b*e^2*x^9 + 90*b*d*e*x^7 + 63*b*d^2*x^5)*log(c
) + 1/315*(35*b*e^2*n*x^9 + 90*b*d*e*n*x^7 + 63*b*d^2*n*x^5)*log(x)
```

Sympy [B] time = 25.8695, size = 158, normalized size = 2.14

$$\frac{ad^2x^5}{5} + \frac{2adex^7}{7} + \frac{ae^2x^9}{9} + \frac{bd^2nx^5\log(x)}{5} - \frac{bd^2nx^5}{25} + \frac{bd^2x^5\log(c)}{5} + \frac{2bdenx^7\log(x)}{7} - \frac{2bdenx^7}{49} + \frac{2bdex^7\log(c)}{7} + \frac{be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**5/5 + 2*a*d*e*x**7/7 + a*e**2*x**9/9 + b*d**2*n*x**5*log(x)/5 - b
*d**2*n*x**5/25 + b*d**2*x**5*log(c)/5 + 2*b*d*e*n*x**7*log(x)/7 - 2*b*d*e*
n*x**7/49 + 2*b*d*e*x**7*log(c)/7 + b*e**2*n*x**9*log(x)/9 - b*e**2*n*x**9/
```

```
81 + b*e**2*x**9*log(c)/9
```

Giac [A] time = 1.29064, size = 166, normalized size = 2.24

$$\frac{1}{9}\,bnx^9e^2\log\left(x\right)-\frac{1}{81}\,bnx^9e^2+\frac{1}{9}\,bx^9e^2\log\left(c\right)+\frac{2}{7}\,bdnx^7e\log\left(x\right)+\frac{1}{9}\,ax^9e^2-\frac{2}{49}\,bdnx^7e+\frac{2}{7}\,bdx^7e\log\left(c\right)+\frac{2}{7}\,adx^7e+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*b*n*x^9*e^2*log(x) - 1/81*b*n*x^9*e^2 + 1/9*b*x^9*e^2*log(c) + 2/7*b*d*
n*x^7*e*log(x) + 1/9*a*x^9*e^2 - 2/49*b*d*n*x^7*e + 2/7*b*d*x^7*e*log(c) +
2/7*a*d*x^7*e + 1/5*b*d^2*n*x^5*log(x) - 1/25*b*d^2*n*x^5 + 1/5*b*d^2*x^5*l
og(c) + 1/5*a*d^2*x^5
```

3.190 $\int x^2 \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=74

$$\frac{1}{105}\left(35d^2x^3+42dex^5+15e^2x^7\right)(a+b\log(cx^n))-\frac{1}{9}bd^2nx^3-\frac{2}{25}bdenx^5-\frac{1}{49}be^2nx^7$$

```
[Out] -(b*d^2*n*x^3)/9 - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^7)/49 + ((35*d^2*x^3 + 4
2*d*e*x^5 + 15*e^2*x^7)*(a + b*Log[c*x^n]))/105
```

Rubi [A] time = 0.0711839, antiderivative size = 74, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{1}{105}\left(35d^2x^3+42dex^5+15e^2x^7\right)(a+b\log(cx^n))-\frac{1}{9}bd^2nx^3-\frac{2}{25}bdenx^5-\frac{1}{49}be^2nx^7$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^3)/9 - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^7)/49 + ((35*d^2*x^3 + 4
2*d*e*x^5 + 15*e^2*x^7)*(a + b*Log[c*x^n]))/105
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^2\left(d+ex^2\right)^2(a+b\log(cx^n))\,dx=\frac{1}{105}\left(35d^2x^3+42dex^5+15e^2x^7\right)(a+b\log(cx^n))-(bn)\int\left(\frac{d^2x^2}{3}+\frac{2}{5}dex^4+\frac{e^2x}{7}\right.$$
$$=-\frac{1}{9}bd^2nx^3-\frac{2}{25}bdenx^5-\frac{1}{49}be^2nx^7+\frac{1}{105}\left(35d^2x^3+42dex^5+15e^2x^7\right)(a+b\log$$

Mathematica [A] time = 0.0339193, size = 95, normalized size = 1.28

$$\frac{1}{3}d^2x^3(a+b\log(cx^n))+\frac{2}{5}dex^5(a+b\log(cx^n))+\frac{1}{7}e^2x^7(a+b\log(cx^n))-\frac{1}{9}bd^2nx^3-\frac{2}{25}bdenx^5-\frac{1}{49}be^2nx^7$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^3)/9 - (2*b*d*e*n*x^5)/25 - (b*e^2*n*x^7)/49 + (d^2*x^3*(a + b*
Log[c*x^n]))/3 + (2*d*e*x^5*(a + b*Log[c*x^n]))/5 + (e^2*x^7*(a + b*Log[c*x
^n]))/7
```

Maple [C] time = 0.201, size = 434, normalized size = 5.9

$$\frac{bx^3\left(15\,e^2x^4+42\,dex^2+35\,d^2\right)\ln(x^n)}{105}+\frac{i}{6}\pi\,bd^2x^3\,(\mathrm{csgn}\,(icx^n))^2\,\mathrm{csgn}\,(ic)+\frac{i}{14}\pi\,be^2x^7\,(\mathrm{csgn}\,(icx^n))^2\,\mathrm{csgn}\,(ic)-\frac{i}{5}\pi\,bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/105*b*x^3*(15*e^2*x^4+42*d*e*x^2+35*d^2)*ln(x^n)+1/6*I*Pi*b*d^2*x^3*csgn(
I*c*x^n)^2*csgn(I*c)+1/14*I*Pi*b*e^2*x^7*csgn(I*c*x^n)^2*csgn(I*c)-1/5*I*Pi
*b*d*e*x^5*csgn(I*c*x^n)^3-1/14*I*Pi*b*e^2*x^7*csgn(I*c*x^n)^3+1/7*ln(c)*b*
e^2*x^7-1/49*b*e^2*n*x^7+1/7*a*e^2*x^7+1/6*I*Pi*b*d^2*x^3*csgn(I*x^n)*csgn(
I*c*x^n)^2+1/5*I*Pi*b*d*e*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/6*I*Pi*b*d^2*x^3*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/14*I*Pi*b*e^2*x^7*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+2/5*ln(c)*b*d*e*x^5-2/25*b*d*e*n*x^5+2/5*a*d*e*x^5+1/5*I*P
i*b*d*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2+1/14*I*Pi*b*e^2*x^7*csgn(I*x^n)*csg
n(I*c*x^n)^2-1/5*I*Pi*b*d*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/6*I*P
i*b*d^2*x^3*csgn(I*c*x^n)^3+1/3*ln(c)*b*d^2*x^3-1/9*b*d^2*n*x^3+1/3*a*d^2*x
^3
```

Maxima [A] time = 1.22336, size = 135, normalized size = 1.82

$$-\frac{1}{49}\,be^2nx^7+\frac{1}{7}\,be^2x^7\log\left(cx^n\right)+\frac{1}{7}\,ae^2x^7-\frac{2}{25}\,bdenx^5+\frac{2}{5}\,bdex^5\log\left(cx^n\right)+\frac{2}{5}\,adex^5-\frac{1}{9}\,bd^2nx^3+\frac{1}{3}\,bd^2x^3\log\left(cx^n\right)+\frac{1}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/49*b*e^2*n*x^7 + 1/7*b*e^2*x^7*log(c*x^n) + 1/7*a*e^2*x^7 - 2/25*b*d*e*n
*x^5 + 2/5*b*d*e*x^5*log(c*x^n) + 2/5*a*d*e*x^5 - 1/9*b*d^2*n*x^3 + 1/3*b*d
^2*x^3*log(c*x^n) + 1/3*a*d^2*x^3
```

Fricas [A] time = 1.28705, size = 294, normalized size = 3.97

$$-\frac{1}{49}\left(be^2n-7\,ae^2\right)x^7-\frac{2}{25}\left(bden-5\,ade\right)x^5-\frac{1}{9}\left(bd^2n-3\,ad^2\right)x^3+\frac{1}{105}\left(15\,be^2x^7+42\,bdex^5+35\,bd^2x^3\right)\log\left(c\right)+\frac{1}{105}\,($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/49*(b*e^2*n - 7*a*e^2)*x^7 - 2/25*(b*d*e*n - 5*a*d*e)*x^5 - 1/9*(b*d^2*n
 - 3*a*d^2)*x^3 + 1/105*(15*b*e^2*x^7 + 42*b*d*e*x^5 + 35*b*d^2*x^3)*log(c)
 + 1/105*(15*b*e^2*n*x^7 + 42*b*d*e*n*x^5 + 35*b*d^2*n*x^3)*log(x)
```

Sympy [B] time = 8.61375, size = 158, normalized size = 2.14

$$\frac{ad^2x^3}{3}+\frac{2adex^5}{5}+\frac{ae^2x^7}{7}+\frac{bd^2nx^3\log\left(x\right)}{3}-\frac{bd^2nx^3}{9}+\frac{bd^2x^3\log\left(c\right)}{3}+\frac{2bdenx^5\log\left(x\right)}{5}-\frac{2bdenx^5}{25}+\frac{2bdex^5\log\left(c\right)}{5}+\frac{be}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x**3/3 + 2*a*d*e*x**5/5 + a*e**2*x**7/7 + b*d**2*n*x**3*log(x)/3 - b
*d**2*n*x**3/9 + b*d**2*x**3*log(c)/3 + 2*b*d*e*n*x**5*log(x)/5 - 2*b*d*e*n
*x**5/25 + 2*b*d*e*x**5*log(c)/5 + b*e**2*n*x**7*log(x)/7 - b*e**2*n*x**7/4
```

```
9 + b*e**2*x**7*log(c)/7
```

Giac [A] time = 1.30035, size = 166, normalized size = 2.24

$$\frac{1}{7}bnx^7e^2\log(x) - \frac{1}{49}bnx^7e^2 + \frac{1}{7}bx^7e^2\log(c) + \frac{2}{5}bdnx^5e\log(x) + \frac{1}{7}ax^7e^2 - \frac{2}{25}bdnx^5e + \frac{2}{5}bdx^5e\log(c) + \frac{2}{5}adx^5e +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/7*b*n*x^7*e^2*log(x) - 1/49*b*n*x^7*e^2 + 1/7*b*x^7*e^2*log(c) + 2/5*b*d*
n*x^5*e*log(x) + 1/7*a*x^7*e^2 - 2/25*b*d*n*x^5*e + 2/5*b*d*x^5*e*log(c) +
2/5*a*d*x^5*e + 1/3*b*d^2*n*x^3*log(x) - 1/9*b*d^2*n*x^3 + 1/3*b*d^2*x^3*lo
g(c) + 1/3*a*d^2*x^3
```

3.191 $\int (d+ex^2)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=86

$$d^2x(a+b\log(cx^n))+\frac{2}{3}dex^3(a+b\log(cx^n))+\frac{1}{5}e^2x^5(a+b\log(cx^n))-bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5$$

```
[Out] -(b*d^2*n*x) - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^5)/25 + d^2*x*(a + b*Log[c*x^
n]) + (2*d*e*x^3*(a + b*Log[c*x^n]))/3 + (e^2*x^5*(a + b*Log[c*x^n]))/5
```

Rubi [A] time = 0.0351193, antiderivative size = 68, normalized size of antiderivative = 0.79, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {194, 2313}

$$\frac{1}{15}\left(15d^2x+10dex^3+3e^2x^5\right)(a+b\log(cx^n))-bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x) - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^5)/25 + ((15*d^2*x + 10*d*e*x
^3 + 3*e^2*x^5)*(a + b*Log[c*x^n]))/15
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx = \frac{1}{15}\left(15d^2x+10dex^3+3e^2x^5\right)(a+b\log(cx^n))-(bn)\int\left(d^2+\frac{2}{3}dex^2+\frac{e^2x^4}{5}\right)dx$$
$$= -bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5+\frac{1}{15}\left(15d^2x+10dex^3+3e^2x^5\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.033711, size = 89, normalized size = 1.03

$$\frac{2}{3}dex^3(a+b\log(cx^n))+\frac{1}{5}e^2x^5(a+b\log(cx^n))+ad^2x+bd^2x\log(cx^n)-bd^2nx-\frac{2}{9}bdenx^3-\frac{1}{25}be^2nx^5$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] a*d^2*x - b*d^2*n*x - (2*b*d*e*n*x^3)/9 - (b*e^2*n*x^5)/25 + b*d^2*x*Log[c*
x^n] + (2*d*e*x^3*(a + b*Log[c*x^n]))/3 + (e^2*x^5*(a + b*Log[c*x^n]))/5
```

Maple [C] time = 0.192, size = 416, normalized size = 4.8

$$\frac{bx\left(3e^2x^4+10dex^2+15d^2\right)\ln(x^n)}{15}+\frac{i}{3}\pi bdex^3\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+\frac{i}{2}\pi bd^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2x-\frac{i}{3}\pi bdex$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/15*b*x*(3*e^2*x^4+10*d*e*x^2+15*d^2)*ln(x^n)+1/3*I*Pi*b*d*e*x^3*csgn(I*x^
n)*csgn(I*c*x^n)^2+1/2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x-1/3*I*Pi*b*
d*e*x^3*csgn(I*c*x^n)^3-1/10*I*Pi*b*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)-1/2*I*Pi*b*d^2*csgn(I*c*x^n)^3*x+1/2*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I
*c)*x+1/3*I*Pi*b*d*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/10*I*Pi*b*e^2*x^5*csgn
(I*x^n)*csgn(I*c*x^n)^2-1/10*I*Pi*b*e^2*x^5*csgn(I*c*x^n)^3+1/10*I*Pi*b*e^2
*x^5*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*x-1/3*I*Pi*b*d*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/5*ln(c)*b
*e^2*x^5-1/25*b*e^2*n*x^5+1/5*a*e^2*x^5+2/3*ln(c)*b*d*e*x^3-2/9*b*d*e*n*x^3
+2/3*a*d*e*x^3+ln(c)*b*d^2*x-b*d^2*n*x+a*d^2*x
```

Maxima [A] time = 1.05893, size = 124, normalized size = 1.44

$$-\frac{1}{25}\,be^2nx^5+\frac{1}{5}\,be^2x^5\log\left(cx^n\right)+\frac{1}{5}\,ae^2x^5-\frac{2}{9}\,bdenx^3+\frac{2}{3}\,bdex^3\log\left(cx^n\right)+\frac{2}{3}\,adex^3-bd^2nx+bd^2x\log\left(cx^n\right)+ad^2x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/25*b*e^2*n*x^5 + 1/5*b*e^2*x^5*log(c*x^n) + 1/5*a*e^2*x^5 - 2/9*b*d*e*n*
x^3 + 2/3*b*d*e*x^3*log(c*x^n) + 2/3*a*d*e*x^3 - b*d^2*n*x + b*d^2*x*log(c*
x^n) + a*d^2*x
```

Fricas [A] time = 1.27679, size = 271, normalized size = 3.15

$$-\frac{1}{25}\left(be^2n-5\,ae^2\right)x^5-\frac{2}{9}\left(bden-3\,ade\right)x^3-\left(bd^2n-ad^2\right)x+\frac{1}{15}\left(3\,be^2x^5+10\,bdex^3+15\,bd^2x\right)\log\left(c\right)+\frac{1}{15}\left(3\,be^2nx^5+1\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/25*(b*e^2*n - 5*a*e^2)*x^5 - 2/9*(b*d*e*n - 3*a*d*e)*x^3 - (b*d^2*n - a*
d^2)*x + 1/15*(3*b*e^2*x^5 + 10*b*d*e*x^3 + 15*b*d^2*x)*log(c) + 1/15*(3*b*
e^2*n*x^5 + 10*b*d*e*n*x^3 + 15*b*d^2*n*x)*log(x)
```

Sympy [A] time = 3.30075, size = 144, normalized size = 1.67

$$ad^2x+\frac{2adex^3}{3}+\frac{ae^2x^5}{5}+bd^2nx\log\left(x\right)-bd^2nx+bd^2x\log\left(c\right)+\frac{2bdenx^3\log\left(x\right)}{3}-\frac{2bdenx^3}{9}+\frac{2bdex^3\log\left(c\right)}{3}+\frac{be^2nx^5\log}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x + 2*a*d*e*x**3/3 + a*e**2*x**5/5 + b*d**2*n*x*log(x) - b*d**2*n*x
+ b*d**2*x*log(c) + 2*b*d*e*n*x**3*log(x)/3 - 2*b*d*e*n*x**3/9 + 2*b*d*e*x*
*3*log(c)/3 + b*e**2*n*x**5*log(x)/5 - b*e**2*n*x**5/25 + b*e**2*x**5*log(c
)/5
```

Giac [A] time = 1.31353, size = 151, normalized size = 1.76

$$\frac{1}{5}bnx^5e^2\log(x) - \frac{1}{25}bnx^5e^2 + \frac{1}{5}bx^5e^2\log(c) + \frac{2}{3}bdnx^3e\log(x) + \frac{1}{5}ax^5e^2 - \frac{2}{9}bdnx^3e + \frac{2}{3}bdx^3e\log(c) + \frac{2}{3}adx^3e + b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/5*b*n*x^5*e^2*log(x) - 1/25*b*n*x^5*e^2 + 1/5*b*x^5*e^2*log(c) + 2/3*b*d*
n*x^3*e*log(x) + 1/5*a*x^5*e^2 - 2/9*b*d*n*x^3*e + 2/3*b*d*x^3*e*log(c) + 2
/3*a*d*x^3*e + b*d^2*n*x*log(x) - b*d^2*n*x + b*d^2*x*log(c) + a*d^2*x
```

3.192 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=83

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{x}+2dex\left(a+b\log\left(cx^n\right)\right)+\frac{1}{3}e^2x^3\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x}-2bdenx-\frac{1}{9}be^2nx^3$$

```
[Out] -((b*d^2*n)/x) - 2*b*d*e*n*x - (b*e^2*n*x^3)/9 - (d^2*(a + b*Log[c*x^n]))/x
 + 2*d*e*x*(a + b*Log[c*x^n]) + (e^2*x^3*(a + b*Log[c*x^n]))/3
```

Rubi [A] time = 0.0706047, antiderivative size = 66, normalized size of antiderivative = 0.8, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{3}\left(\frac{3d^2}{x}-6dex-e^2x^3\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{x}-2bdenx-\frac{1}{9}be^2nx^3$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^2*n)/x) - 2*b*d*e*n*x - (b*e^2*n*x^3)/9 - (((3*d^2)/x - 6*d*e*x - e^
2*x^3)*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^2 (a+b\log(cx^n))}{x^2} dx = -\frac{1}{3}\left(\frac{3d^2}{x} - 6dex - e^2x^3\right)(a+b\log(cx^n)) - (bn)\int \left(2de - \frac{d^2}{x^2} + \frac{e^2x^2}{3}\right) dx$$
$$= -\frac{bd^2n}{x} - 2bdenx - \frac{1}{9}be^2nx^3 - \frac{1}{3}\left(\frac{3d^2}{x} - 6dex - e^2x^3\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0346713, size = 86, normalized size = 1.04

$$-\frac{d^2(a+b\log(cx^n))}{x} + \frac{1}{3}e^2x^3(a+b\log(cx^n)) + 2adex + 2bdex\log(cx^n) - \frac{bd^2n}{x} - 2bdenx - \frac{1}{9}be^2nx^3$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^2*n)/x) + 2*a*d*e*x - 2*b*d*e*n*x - (b*e^2*n*x^3)/9 + 2*b*d*e*x*Log[
c*x^n] - (d^2*(a + b*Log[c*x^n]))/x + (e^2*x^3*(a + b*Log[c*x^n]))/3
```

Maple [C] time = 0.207, size = 419, normalized size = 5.1

$$-\frac{b\left(-e^2x^4 - 6\,dex^2 + 3\,d^2\right)\ln(x^n)}{3\,x} - \frac{-9\,i\pi\,bd^2\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic) - 3\,i\pi\,be^2x^4\,(\mathrm{csgn}(icx^n))^2\,\mathrm{csgn}(ic) - 3\,i\pi}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n))/x^2,x)
```

```
[Out] -1/3*b*(-e^2*x^4-6*d*e*x^2+3*d^2)/x*ln(x^n)-1/18*(-9*I*Pi*b*d^2*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*
b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+18*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3-18*
I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I*Pi*b*e^2*x^4*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)-9*I*Pi*b*d^2*csgn(I*c*x^n)^3+9*I*Pi*b*d^2*csgn(I*x^n)*
csgn(I*c*x^n)^2+3*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3+18*I*Pi*b*d*e*x^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+9*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*
b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-6*ln(c)*b*e^2*x^4+2*b*e^2*n*x^4-6*a*e^2
*x^4-36*ln(c)*b*d*e*x^2+36*b*d*e*n*x^2-36*a*d*e*x^2+18*ln(c)*b*d^2+18*b*d^2
*n+18*a*d^2)/x
```

Maxima [A] time = 1.13785, size = 127, normalized size = 1.53

$$-\frac{1}{9}\,be^2nx^3+\frac{1}{3}\,be^2x^3\log\left(cx^n\right)+\frac{1}{3}\,ae^2x^3-2\,bdenx+2\,bdex\log\left(cx^n\right)+2\,adex-\frac{bd^2n}{x}-\frac{bd^2\log\left(cx^n\right)}{x}-\frac{ad^2}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^2*n*x^3 + 1/3*b*e^2*x^3*log(c*x^n) + 1/3*a*e^2*x^3 - 2*b*d*e*n*x +
 2*b*d*e*x*log(c*x^n) + 2*a*d*e*x - b*d^2*n/x - b*d^2*log(c*x^n)/x - a*d^2/
x
```

Fricas [A] time = 1.31644, size = 247, normalized size = 2.98

$$-\frac{\left(be^2n-3\,ae^2\right)x^4+9\,bd^2n+9\,ad^2+18\,(bden-ade)x^2-3\left(be^2x^4+6\,bdex^2-3\,bd^2\right)\log\left(c\right)-3\left(be^2nx^4+6\,bdenx^2-3\,b\right.}{9\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -1/9*((b*e^2*n - 3*a*e^2)*x^4 + 9*b*d^2*n + 9*a*d^2 + 18*(b*d*e*n - a*d*e)*
x^2 - 3*(b*e^2*x^4 + 6*b*d*e*x^2 - 3*b*d^2)*log(c) - 3*(b*e^2*n*x^4 + 6*b*d
*e*n*x^2 - 3*b*d^2*n)*log(x))/x
```

Sympy [A] time = 4.8064, size = 131, normalized size = 1.58

$$-\frac{ad^2}{x}+2adex+\frac{ae^2x^3}{3}-\frac{bd^2n\log\left(x\right)}{x}-\frac{bd^2n}{x}-\frac{bd^2\log\left(c\right)}{x}+2bdenx\log\left(x\right)-2bdenx+2bdex\log\left(c\right)+\frac{be^2nx^3\log\left(x\right)}{3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**2/x + 2*a*d*e*x + a*e**2*x**3/3 - b*d**2*n*log(x)/x - b*d**2*n/x - b*
d**2*log(c)/x + 2*b*d*e*n*x*log(x) - 2*b*d*e*n*x + 2*b*d*e*x*log(c) + b*e**
2*n*x**3*log(x)/3 - b*e**2*n*x**3/9 + b*e**2*x**3*log(c)/3
```

Giac [A] time = 1.28094, size = 157, normalized size = 1.89

$$\frac{3\,bnx^4e^2\log\left(x\right)-bnx^4e^2+3\,bx^4e^2\log\left(c\right)+18\,bdnx^2e\log\left(x\right)+3\,ax^4e^2-18\,bdnx^2e+18\,bdx^2e\log\left(c\right)+18\,adx^2e-9\,bd}{9\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] 1/9*(3*b*n*x^4*e^2*log(x) - b*n*x^4*e^2 + 3*b*x^4*e^2*log(c) + 18*b*d*n*x^2
*e*log(x) + 3*a*x^4*e^2 - 18*b*d*n*x^2*e + 18*b*d*x^2*e*log(c) + 18*a*d*x^2
*e - 9*b*d^2*n*log(x) - 9*b*d^2*n - 9*b*d^2*log(c) - 9*a*d^2)/x
```

3.193 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=82

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{2de\left(a+b\log\left(cx^n\right)\right)}{x}+e^2x\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{9x^3}-\frac{2bden}{x}-be^2nx$$

```
[Out] -(b*d^2*n)/(9*x^3) - (2*b*d*e*n)/x - b*e^2*n*x - (d^2*(a + b*Log[c*x^n]))/(
3*x^3) - (2*d*e*(a + b*Log[c*x^n]))/x + e^2*x*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0725627, antiderivative size = 65, normalized size of antiderivative = 0.79, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6de}{x}-3e^2x\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{9x^3}-\frac{2bden}{x}-be^2nx$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^2*n)/(9*x^3) - (2*b*d*e*n)/x - b*e^2*n*x - ((d^2/x^3 + (6*d*e)/x - 3*
e^2*x)*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^2 (a+b\log(cx^n))}{x^4} dx = -\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6de}{x}-3e^2x\right)(a+b\log(cx^n)) - (bn)\int \left(e^2-\frac{d^2}{3x^4}-\frac{2de}{x^2}\right) dx$$
$$= -\frac{bd^2n}{9x^3}-\frac{2bden}{x}-be^2nx-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6de}{x}-3e^2x\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0397359, size = 80, normalized size = 0.98

$$-\frac{3a\left(d^2+6dex^2-3e^2x^4\right)+3b\left(d^2+6dex^2-3e^2x^4\right)\log(cx^n)+bn\left(d^2+18dex^2+9e^2x^4\right)}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(3*a*(d^2 + 6*d*e*x^2 - 3*e^2*x^4) + b*n*(d^2 + 18*d*e*x^2 + 9*e^2*x^4) +
3*b*(d^2 + 6*d*e*x^2 - 3*e^2*x^4)*Log[c*x^n])/(9*x^3)
```

Maple [C] time = 0.213, size = 417, normalized size = 5.1

$$-\frac{b\left(-3e^2x^4+6dex^2+d^2\right)\ln(x^n)}{3x^3}-\frac{3i\pi bd^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+18i\pi bdex^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+9i\pi be^2x^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n))/x^4,x)
```

```
[Out] -1/3*b*(-3*e^2*x^4+6*d*e*x^2+d^2)/x^3*ln(x^n)-1/18*(3*I*Pi*b*d^2*csgn(I*x^n
)*csgn(I*c*x^n)^2+18*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+9*I*Pi*b*e^
2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2
*csgn(I*c)-9*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-9*I*Pi*b*e^2*x^4*cs
gn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*d*
e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*ln(c)*b*e^2*x^4-18*I*Pi*b*d*e*
x^2*csgn(I*c*x^n)^3-3*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi
*b*d^2*csgn(I*c*x^n)^3+9*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3+18*b*e^2*n*x^4-18*a
*e^2*x^4+36*ln(c)*b*d*e*x^2+36*b*d*e*n*x^2+36*a*d*e*x^2+6*ln(c)*b*d^2+2*b*d
^2*n+6*a*d^2)/x^3
```

Maxima [A] time = 1.07545, size = 124, normalized size = 1.51

$$-be^2nx + be^2x\log(cx^n) + ae^2x - \frac{2\,bden}{x} - \frac{2\,bde\log(cx^n)}{x} - \frac{2\,ade}{x} - \frac{bd^2n}{9\,x^3} - \frac{bd^2\log(cx^n)}{3\,x^3} - \frac{ad^2}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -b*e^2*n*x + b*e^2*x*log(c*x^n) + a*e^2*x - 2*b*d*e*n/x - 2*b*d*e*log(c*x^n
)/x - 2*a*d*e/x - 1/9*b*d^2*n/x^3 - 1/3*b*d^2*log(c*x^n)/x^3 - 1/3*a*d^2/x^
3
```

Fricas [A] time = 1.31971, size = 247, normalized size = 3.01

$$-\frac{9\left(be^2n - ae^2\right)x^4 + bd^2n + 3\,ad^2 + 18\,(bden + ade)x^2 - 3\left(3\,be^2x^4 - 6\,bdex^2 - bd^2\right)\log(c) - 3\left(3\,be^2nx^4 - 6\,bdenx^2 - bd^2\right.}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(9*(b*e^2*n - a*e^2)*x^4 + b*d^2*n + 3*a*d^2 + 18*(b*d*e*n + a*d*e)*x^
2 - 3*(3*b*e^2*x^4 - 6*b*d*e*x^2 - b*d^2)*log(c) - 3*(3*b*e^2*n*x^4 - 6*b*d
*e*n*x^2 - b*d^2*n)*log(x))/x^3
```

Sympy [A] time = 4.25941, size = 131, normalized size = 1.6

$$-\frac{ad^2}{3x^3} - \frac{2ade}{x} + ae^2x - \frac{bd^2n\log(x)}{3x^3} - \frac{bd^2n}{9x^3} - \frac{bd^2\log(c)}{3x^3} - \frac{2bden\log(x)}{x} - \frac{2bden}{x} - \frac{2bde\log(c)}{x} + be^2nx\log(x) - be^2nx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) - 2*a*d*e/x + a*e**2*x - b*d**2*n*log(x)/(3*x**3) - b*d**2
*n/(9*x**3) - b*d**2*log(c)/(3*x**3) - 2*b*d*e*n*log(x)/x - 2*b*d*e*n/x - 2
```

```
*b*d*e*log(c)/x + b*e**2*n*x*log(x) - b*e**2*n*x + b*e**2*x*log(c)
```

Giac [A] time = 1.51212, size = 157, normalized size = 1.91

$$\frac{9\,bnx^4e^2\log\left(x\right)-9\,bnx^4e^2+9\,bx^4e^2\log\left(c\right)-18\,bdnx^2e\log\left(x\right)+9\,ax^4e^2-18\,bdnx^2e-18\,bdx^2e\log\left(c\right)-18\,adx^2e-3\,b}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] 1/9*(9*b*n*x^4*e^2*log(x) - 9*b*n*x^4*e^2 + 9*b*x^4*e^2*log(c) - 18*b*d*n*x
^2*e*log(x) + 9*a*x^4*e^2 - 18*b*d*n*x^2*e - 18*b*d*x^2*e*log(c) - 18*a*d*x
^2*e - 3*b*d^2*n*log(x) - b*d^2*n - 3*b*d^2*log(c) - 3*a*d^2)/x^3
```

3.194 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=91

$$-\frac{d^2(a+b\log(cx^n))}{5x^5}-\frac{2de(a+b\log(cx^n))}{3x^3}-\frac{e^2(a+b\log(cx^n))}{x}-\frac{bd^2n}{25x^5}-\frac{2bden}{9x^3}-\frac{be^2n}{x}$$

```
[Out] -(b*d^2*n)/(25*x^5) - (2*b*d*e*n)/(9*x^3) - (b*e^2*n)/x - (d^2*(a + b*Log[c
*x^n]))/(5*x^5) - (2*d*e*(a + b*Log[c*x^n]))/(3*x^3) - (e^2*(a + b*Log[c*x^
n]))/x
```

Rubi [A] time = 0.0826226, antiderivative size = 72, normalized size of antiderivative = 0.79, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n))-\frac{bd^2n}{25x^5}-\frac{2bden}{9x^3}-\frac{be^2n}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^2*n)/(25*x^5) - (2*b*d*e*n)/(9*x^3) - (b*e^2*n)/x - (((3*d^2)/x^5 + (
10*d*e)/x^3 + (15*e^2)/x)*(a + b*Log[c*x^n]))/15
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)^2 (a+b\log(cx^n))}{x^6}\,dx &= -\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n))-(bn)\int \frac{-3d^2-10dex^2-15e^2x^4}{15x^6}\,dx\\ &= -\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n))-\frac{1}{15}(bn)\int \frac{-3d^2-10dex^2-15e^2x^4}{x^6}\,dx\\ &= -\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n))-\frac{1}{15}(bn)\int \left(-\frac{3d^2}{x^6}-\frac{10de}{x^4}-\frac{15e^2}{x^2}\right)dx\\ &= -\frac{bd^2n}{25x^5}-\frac{2bden}{9x^3}-\frac{be^2n}{x}-\frac{1}{15}\left(\frac{3d^2}{x^5}+\frac{10de}{x^3}+\frac{15e^2}{x}\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0392509, size = 86, normalized size = 0.95

$$-\frac{15a\left(3d^2+10dex^2+15e^2x^4\right)+15b\left(3d^2+10dex^2+15e^2x^4\right)\log(cx^n)+bn\left(9d^2+50dex^2+225e^2x^4\right)}{225x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(15*a*(3*d^2 + 10*d*e*x^2 + 15*e^2*x^4) + b*n*(9*d^2 + 50*d*e*x^2 + 225*e^
2*x^4) + 15*b*(3*d^2 + 10*d*e*x^2 + 15*e^2*x^4)*Log[c*x^n])/(225*x^5)
```

Maple [C] time = 0.109, size = 419, normalized size = 4.6

$$-\frac{b\left(15\,e^2x^4+10\,dex^2+3\,d^2\right)\ln(x^n)}{15\,x^5}-\frac{-150\,i\pi\,bdex^2\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-150\,i\pi\,bdex^2\left(\mathrm{csgn}(icx^n)\right)^3+225}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/15*b*(15*e^2*x^4+10*d*e*x^2+3*d^2)/x^5*ln(x^n)-1/450*(-150*I*Pi*b*d*e*x^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-150*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^3+22
5*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+225*I*Pi*b*e^2*x^4*csgn(I*x^n)*c
sgn(I*c*x^n)^2+450*ln(c)*b*e^2*x^4+450*b*e^2*n*x^4+450*a*e^2*x^4+45*I*Pi*b*
d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+150*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c
)+150*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+45*I*Pi*b*d^2*csgn(I*c*x^n
)^2*csgn(I*c)+300*ln(c)*b*d*e*x^2+100*b*d*e*n*x^2+300*a*d*e*x^2-45*I*Pi*b*d
^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-225*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)-45*I*Pi*b*d^2*csgn(I*c*x^n)^3-225*I*Pi*b*e^2*x^4*csgn(I*
c*x^n)^3+90*ln(c)*b*d^2+18*b*d^2*n+90*a*d^2)/x^5
```

Maxima [A] time = 1.12204, size = 135, normalized size = 1.48

$$-\frac{be^2n}{x}-\frac{be^2\log(cx^n)}{x}-\frac{ae^2}{x}-\frac{2\,bden}{9\,x^3}-\frac{2\,bde\log(cx^n)}{3\,x^3}-\frac{2\,ade}{3\,x^3}-\frac{bd^2n}{25\,x^5}-\frac{bd^2\log(cx^n)}{5\,x^5}-\frac{ad^2}{5\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -b*e^2*n/x - b*e^2*log(c*x^n)/x - a*e^2/x - 2/9*b*d*e*n/x^3 - 2/3*b*d*e*log
(c*x^n)/x^3 - 2/3*a*d*e/x^3 - 1/25*b*d^2*n/x^5 - 1/5*b*d^2*log(c*x^n)/x^5 -
 1/5*a*d^2/x^5
```

Fricas [A] time = 1.17652, size = 273, normalized size = 3.

$$-\frac{225\left(be^2n+ae^2\right)x^4+9\,bd^2n+45\,ad^2+50\,(bden+3\,ade)x^2+15\left(15\,be^2x^4+10\,bdex^2+3\,bd^2\right)\log(c)+15\left(15\,be^2nx^4+\right.}{225\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/225*(225*(b*e^2*n + a*e^2)*x^4 + 9*b*d^2*n + 45*a*d^2 + 50*(b*d*e*n + 3*
a*d*e)*x^2 + 15*(15*b*e^2*x^4 + 10*b*d*e*x^2 + 3*b*d^2)*log(c) + 15*(15*b*e
^2*n*x^4 + 10*b*d*e*n*x^2 + 3*b*d^2*n)*log(x))/x^5
```

Sympy [A] time = 5.87493, size = 146, normalized size = 1.6

$$-\frac{ad^2}{5x^5} - \frac{2ade}{3x^3} - \frac{ae^2}{x} - \frac{bd^2n\log(x)}{5x^5} - \frac{bd^2n}{25x^5} - \frac{bd^2\log(c)}{5x^5} - \frac{2bden\log(x)}{3x^3} - \frac{2bden}{9x^3} - \frac{2bde\log(c)}{3x^3} - \frac{be^2n\log(x)}{x} - \frac{be^2n}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**2/(5*x**5) - 2*a*d*e/(3*x**3) - a*e**2/x - b*d**2*n*log(x)/(5*x**5) -
 b*d**2*n/(25*x**5) - b*d**2*log(c)/(5*x**5) - 2*b*d*e*n*log(x)/(3*x**3) -
2*b*d*e*n/(9*x**3) - 2*b*d*e*log(c)/(3*x**3) - b*e**2*n*log(x)/x - b*e**2*n
/x - b*e**2*log(c)/x
```

Giac [A] time = 1.28698, size = 157, normalized size = 1.73

$$-\frac{225\,bnx^4e^2\log(x) + 225\,bnx^4e^2 + 225\,bx^4e^2\log(c) + 150\,bdnx^2e\log(x) + 225\,ax^4e^2 + 50\,bdnx^2e + 150\,bdx^2e\log(c) +}{225\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/225*(225*b*n*x^4*e^2*log(x) + 225*b*n*x^4*e^2 + 225*b*x^4*e^2*log(c) + 1
50*b*d*n*x^2*e*log(x) + 225*a*x^4*e^2 + 50*b*d*n*x^2*e + 150*b*d*x^2*e*log(
c) + 150*a*d*x^2*e + 45*b*d^2*n*log(x) + 9*b*d^2*n + 45*b*d^2*log(c) + 45*a
*d^2)/x^5
```

3.195 $\int \frac{(d+ex^2)^2(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=95

$$-\frac{d^2(a+b\log(cx^n))}{7x^7}-\frac{2de(a+b\log(cx^n))}{5x^5}-\frac{e^2(a+b\log(cx^n))}{3x^3}-\frac{bd^2n}{49x^7}-\frac{2bden}{25x^5}-\frac{be^2n}{9x^3}$$

```
[Out] -(b*d^2*n)/(49*x^7) - (2*b*d*e*n)/(25*x^5) - (b*e^2*n)/(9*x^3) - (d^2*(a +
b*Log[c*x^n]))/(7*x^7) - (2*d*e*(a + b*Log[c*x^n]))/(5*x^5) - (e^2*(a + b*L
og[c*x^n]))/(3*x^3)
```

Rubi [A] time = 0.0826563, antiderivative size = 74, normalized size of antiderivative = 0.78, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n))-\frac{bd^2n}{49x^7}-\frac{2bden}{25x^5}-\frac{be^2n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^2*n)/(49*x^7) - (2*b*d*e*n)/(25*x^5) - (b*e^2*n)/(9*x^3) - (((15*d^2)
/x^7 + (42*d*e)/x^5 + (35*e^2)/x^3)*(a + b*Log[c*x^n]))/105
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int \frac{\left(d+ex^2\right)^2 (a+b\log(cx^n))}{x^8}\,dx &= -\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n))-(bn)\int \frac{-15d^2-42dex^2-35e^2x^4}{105x^8}\,d\\ &= -\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n))-\frac{1}{105}(bn)\int \frac{-15d^2-42dex^2-35e^2}{x^8}\\ &= -\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n))-\frac{1}{105}(bn)\int\left(-\frac{15d^2}{x^8}-\frac{42de}{x^6}-\frac{35e^2}{x^4}\right.\\ &= -\frac{bd^2n}{49x^7}-\frac{2bden}{25x^5}-\frac{be^2n}{9x^3}-\frac{1}{105}\left(\frac{15d^2}{x^7}+\frac{42de}{x^5}+\frac{35e^2}{x^3}\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.045484, size = 95, normalized size = 1.

$$-\frac{d^2(a+b\log(cx^n))}{7x^7}-\frac{2de(a+b\log(cx^n))}{5x^5}-\frac{e^2(a+b\log(cx^n))}{3x^3}-\frac{bd^2n}{49x^7}-\frac{2bden}{25x^5}-\frac{be^2n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^2*n)/(49*x^7) - (2*b*d*e*n)/(25*x^5) - (b*e^2*n)/(9*x^3) - (d^2*(a +
b*Log[c*x^n]))/(7*x^7) - (2*d*e*(a + b*Log[c*x^n]))/(5*x^5) - (e^2*(a + b*L
og[c*x^n]))/(3*x^3)
```

Maple [C] time = 0.109, size = 419, normalized size = 4.4

$$-\frac{b\left(35e^2x^4+42dex^2+15d^2\right)\ln(x^n)}{105x^7}-\frac{3675i\pi be^2x^4\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+3675i\pi be^2x^4(\mathrm{csgn}(icx^n))^2\mathrm{csgn}(ic)-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*ln(c*x^n))/x^8,x)
```

```
[Out] -1/105*b*(35*e^2*x^4+42*d*e*x^2+15*d^2)/x^7*ln(x^n)-1/22050*(3675*I*Pi*b*e^
2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+3675*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(
I*c)+4410*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1575*I*Pi*b*d^2*csgn(I*x
^n)*csgn(I*c*x^n)^2+7350*ln(c)*b*e^2*x^4+2450*b*e^2*n*x^4+7350*a*e^2*x^4-36
75*I*Pi*b*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1575*I*Pi*b*d^2*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1575*I*Pi*b*d^2*csgn(I*c*x^n)^3-4410*I*Pi*b*
d*e*x^2*csgn(I*c*x^n)^3+8820*ln(c)*b*d*e*x^2+1764*b*d*e*n*x^2+8820*a*d*e*x^
2+1575*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+4410*I*Pi*b*d*e*x^2*csgn(I*x^n)
*csgn(I*c*x^n)^2-3675*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3-4410*I*Pi*b*d*e*x^2*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3150*ln(c)*b*d^2+450*b*d^2*n+3150*a*d^2)/
x^7
```

Maxima [A] time = 1.15342, size = 135, normalized size = 1.42

$$-\frac{be^2n}{9\,x^3}-\frac{be^2\log\left(cx^n\right)}{3\,x^3}-\frac{ae^2}{3\,x^3}-\frac{2\,bden}{25\,x^5}-\frac{2\,bde\log\left(cx^n\right)}{5\,x^5}-\frac{2\,ade}{5\,x^5}-\frac{bd^2n}{49\,x^7}-\frac{bd^2\log\left(cx^n\right)}{7\,x^7}-\frac{ad^2}{7\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^2*n/x^3 - 1/3*b*e^2*log(c*x^n)/x^3 - 1/3*a*e^2/x^3 - 2/25*b*d*e*n/
x^5 - 2/5*b*d*e*log(c*x^n)/x^5 - 2/5*a*d*e/x^5 - 1/49*b*d^2*n/x^7 - 1/7*b*d
^2*log(c*x^n)/x^7 - 1/7*a*d^2/x^7
```

Fricas [A] time = 1.32808, size = 292, normalized size = 3.07

$$-\frac{1225\left(be^2n+3\,ae^2\right)x^4+225\,bd^2n+1575\,ad^2+882\,(bden+5\,ade)x^2+105\left(35\,be^2x^4+42\,bdex^2+15\,bd^2\right)\log\left(c\right)+105}{11025\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/11025*(1225*(b*e^2*n + 3*a*e^2)*x^4 + 225*b*d^2*n + 1575*a*d^2 + 882*(b*
d*e*n + 5*a*d*e)*x^2 + 105*(35*b*e^2*x^4 + 42*b*d*e*x^2 + 15*b*d^2)*log(c)
+ 105*(35*b*e^2*n*x^4 + 42*b*d*e*n*x^2 + 15*b*d^2*n)*log(x))/x^7
```

Sympy [A] time = 13.3084, size = 160, normalized size = 1.68

$$-\frac{ad^2}{7x^7}-\frac{2ade}{5x^5}-\frac{ae^2}{3x^3}-\frac{bd^2n\log(x)}{7x^7}-\frac{bd^2n}{49x^7}-\frac{bd^2\log(c)}{7x^7}-\frac{2bden\log(x)}{5x^5}-\frac{2bden}{25x^5}-\frac{2bde\log(c)}{5x^5}-\frac{be^2n\log(x)}{3x^3}-\frac{be^2n}{9x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] -a*d**2/(7*x**7) - 2*a*d*e/(5*x**5) - a*e**2/(3*x**3) - b*d**2*n*log(x)/(7*
x**7) - b*d**2*n/(49*x**7) - b*d**2*log(c)/(7*x**7) - 2*b*d*e*n*log(x)/(5*x
**5) - 2*b*d*e*n/(25*x**5) - 2*b*d*e*log(c)/(5*x**5) - b*e**2*n*log(x)/(3*x
**3) - b*e**2*n/(9*x**3) - b*e**2*log(c)/(3*x**3)
```

Giac [A] time = 1.34968, size = 157, normalized size = 1.65

$$-\frac{3675\,bnx^4e^2\log(x)+1225\,bnx^4e^2+3675\,bx^4e^2\log(c)+4410\,bdnx^2e\log(x)+3675\,ax^4e^2+882\,bdnx^2e+4410\,bdx^2e}{11025\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] -1/11025*(3675*b*n*x^4*e^2*log(x) + 1225*b*n*x^4*e^2 + 3675*b*x^4*e^2*log(c
) + 4410*b*d*n*x^2*e*log(x) + 3675*a*x^4*e^2 + 882*b*d*n*x^2*e + 4410*b*d*x
^2*e*log(c) + 4410*a*d*x^2*e + 1575*b*d^2*n*log(x) + 225*b*d^2*n + 1575*b*d
^2*log(c) + 1575*a*d^2)/x^7
```

3.196 $\int x^5 \left(d+ex^2\right)^3 (a+b\log(cx^n))\, dx$

Optimal. Leaf size=100

$$\frac{1}{120}\left(45d^2ex^8+20d^3x^6+36de^2x^{10}+10e^3x^{12}\right)(a+b\log(cx^n))-\frac{3}{64}bd^2enx^8-\frac{1}{36}bd^3nx^6-\frac{3}{100}bde^2nx^{10}-\frac{1}{144}be^3nx^{12}$$

```
[Out] -(b*d^3*n*x^6)/36 - (3*b*d^2*e*n*x^8)/64 - (3*b*d*e^2*n*x^10)/100 - (b*e^3*
n*x^12)/144 + ((20*d^3*x^6 + 45*d^2*e*x^8 + 36*d*e^2*x^10 + 10*e^3*x^12)*(a
 + b*Log[c*x^n]))/120
```

Rubi [A] time = 0.106148, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 12, 14}

$$\frac{1}{120}\left(45d^2ex^8+20d^3x^6+36de^2x^{10}+10e^3x^{12}\right)(a+b\log(cx^n))-\frac{3}{64}bd^2enx^8-\frac{1}{36}bd^3nx^6-\frac{3}{100}bde^2nx^{10}-\frac{1}{144}be^3nx^{12}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^6)/36 - (3*b*d^2*e*n*x^8)/64 - (3*b*d*e^2*n*x^10)/100 - (b*e^3*
n*x^12)/144 + ((20*d^3*x^6 + 45*d^2*e*x^8 + 36*d*e^2*x^10 + 10*e^3*x^12)*(a
 + b*Log[c*x^n]))/120
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^5\left(d+ex^2\right)^3\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{120}\left(20d^3x^6+45d^2ex^8+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{120}x^5\Big(\\ &= \frac{1}{120}\left(20d^3x^6+45d^2ex^8+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{120}(bn)\int x^5\Big(\\ &= \frac{1}{120}\left(20d^3x^6+45d^2ex^8+36de^2x^{10}+10e^3x^{12}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{120}(bn)\int\Big(20\\ &= -\frac{1}{36}bd^3nx^6-\frac{3}{64}bd^2enx^8-\frac{3}{100}bde^2nx^{10}-\frac{1}{144}be^3nx^{12}+\frac{1}{120}\Big(20d^3x^6+45d^2ex\end{aligned}$$

Mathematica [A] time = 0.0525838, size = 120, normalized size = 1.2

$$\frac{x^6\left(120a\left(45d^2ex^2+20d^3+36de^2x^4+10e^3x^6\right)+120b\left(45d^2ex^2+20d^3+36de^2x^4+10e^3x^6\right)\log\left(cx^n\right)-bn\Big(675d^2ex^2+\right.}{14400}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(120*a*(20*d^3 + 45*d^2*e*x^2 + 36*d*e^2*x^4 + 10*e^3*x^6) - b*n*(400*
d^3 + 675*d^2*e*x^2 + 432*d*e^2*x^4 + 100*e^3*x^6) + 120*b*(20*d^3 + 45*d^2
*e*x^2 + 36*d*e^2*x^4 + 10*e^3*x^6)*Log[c*x^n]))/14400
```

Maple [C] time = 0.209, size = 602, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] -3/20*I*Pi*b*d*e^2*x^10*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/8*a*d^2*e*x^8
+3/10*a*d*e^2*x^10-3/16*I*Pi*b*d^2*e*x^8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+3/8*ln(c)*b*d^2*e*x^8+3/10*ln(c)*b*d*e^2*x^10+3/20*I*Pi*b*d*e^2*x^10*csgn
(I*c*x^n)^2*csgn(I*c)+3/20*I*Pi*b*d*e^2*x^10*csgn(I*x^n)*csgn(I*c*x^n)^2+3/
16*I*Pi*b*d^2*e*x^8*csgn(I*x^n)*csgn(I*c*x^n)^2-1/12*I*Pi*b*d^3*x^6*csgn(I*
c*x^n)^3-1/24*I*Pi*b*e^3*x^12*csgn(I*c*x^n)^3-1/12*I*Pi*b*d^3*x^6*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)+1/6*a*d^3*x^6-1/24*I*Pi*b*e^3*x^12*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+1/120*b*x^6*(10*e^3*x^6+36*d*e^2*x^4+45*d^2*e*x^2+20
*d^3)*ln(x^n)+1/12*ln(c)*b*e^3*x^12+1/6*ln(c)*b*d^3*x^6+3/16*I*Pi*b*d^2*e*x
^8*csgn(I*c*x^n)^2*csgn(I*c)+1/12*a*e^3*x^12+1/24*I*Pi*b*e^3*x^12*csgn(I*x^
n)*csgn(I*c*x^n)^2+1/24*I*Pi*b*e^3*x^12*csgn(I*c*x^n)^2*csgn(I*c)-3/64*b*d^
2*e*n*x^8-3/100*b*d*e^2*n*x^10+1/12*I*Pi*b*d^3*x^6*csgn(I*x^n)*csgn(I*c*x^n
)^2+1/12*I*Pi*b*d^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)-3/16*I*Pi*b*d^2*e*x^8*csg
n(I*c*x^n)^3-3/20*I*Pi*b*d*e^2*x^10*csgn(I*c*x^n)^3-1/36*b*d^3*n*x^6-1/144*
b*e^3*n*x^12
```

Maxima [A] time = 1.12107, size = 193, normalized size = 1.93

$$-\frac{1}{144}\,be^3nx^{12}+\frac{1}{12}\,be^3x^{12}\log\left(cx^n\right)+\frac{1}{12}\,ae^3x^{12}-\frac{3}{100}\,bde^2nx^{10}+\frac{3}{10}\,bde^2x^{10}\log\left(cx^n\right)+\frac{3}{10}\,ade^2x^{10}-\frac{3}{64}\,bd^2enx^8+\frac{3}{8}\,b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/144*b*e^3*n*x^12 + 1/12*b*e^3*x^12*log(c*x^n) + 1/12*a*e^3*x^12 - 3/100*
b*d*e^2*n*x^10 + 3/10*b*d*e^2*x^10*log(c*x^n) + 3/10*a*d*e^2*x^10 - 3/64*b*
d^2*e*n*x^8 + 3/8*b*d^2*e*x^8*log(c*x^n) + 3/8*a*d^2*e*x^8 - 1/36*b*d^3*n*x
^6 + 1/6*b*d^3*x^6*log(c*x^n) + 1/6*a*d^3*x^6
```

Fricas [A] time = 1.2941, size = 416, normalized size = 4.16

$$-\frac{1}{144}\left(be^3n-12\,ae^3\right)x^{12}-\frac{3}{100}\left(bde^2n-10\,ade^2\right)x^{10}-\frac{3}{64}\left(bd^2en-8\,ad^2e\right)x^8-\frac{1}{36}\left(bd^3n-6\,ad^3\right)x^6+\frac{1}{120}\left(10\,be^3x^{12}+3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/144*(b*e^3*n - 12*a*e^3)*x^12 - 3/100*(b*d*e^2*n - 10*a*d*e^2)*x^10 - 3/
64*(b*d^2*e*n - 8*a*d^2*e)*x^8 - 1/36*(b*d^3*n - 6*a*d^3)*x^6 + 1/120*(10*b
*e^3*x^12 + 36*b*d*e^2*x^10 + 45*b*d^2*e*x^8 + 20*b*d^3*x^6)*log(c) + 1/120
*(10*b*e^3*n*x^12 + 36*b*d*e^2*n*x^10 + 45*b*d^2*e*n*x^8 + 20*b*d^3*n*x^6)*
log(x)
```

Sympy [B] time = 65.0032, size = 230, normalized size = 2.3

$$\frac{ad^3x^6}{6} + \frac{3ad^2ex^8}{8} + \frac{3ade^2x^{10}}{10} + \frac{ae^3x^{12}}{12} + \frac{bd^3nx^6\log(x)}{6} - \frac{bd^3nx^6}{36} + \frac{bd^3x^6\log(c)}{6} + \frac{3bd^2enx^8\log(x)}{8} - \frac{3bd^2enx^8}{64} + \frac{3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**6/6 + 3*a*d**2*e*x**8/8 + 3*a*d*e**2*x**10/10 + a*e**3*x**12/12 +
 b*d**3*n*x**6*log(x)/6 - b*d**3*n*x**6/36 + b*d**3*x**6*log(c)/6 + 3*b*d**
2*e*n*x**8*log(x)/8 - 3*b*d**2*e*n*x**8/64 + 3*b*d**2*e*x**8*log(c)/8 + 3*b
*d*e**2*n*x**10*log(x)/10 - 3*b*d*e**2*n*x**10/100 + 3*b*d*e**2*x**10*log(c
)/10 + b*e**3*n*x**12*log(x)/12 - b*e**3*n*x**12/144 + b*e**3*x**12*log(c)/
12
```

Giac [A] time = 1.29225, size = 234, normalized size = 2.34

$$\frac{1}{12}bnx^{12}e^3\log(x) - \frac{1}{144}bnx^{12}e^3 + \frac{1}{12}bx^{12}e^3\log(c) + \frac{3}{10}bdnx^{10}e^2\log(x) + \frac{1}{12}ax^{12}e^3 - \frac{3}{100}bdnx^{10}e^2 + \frac{3}{10}bdx^{10}e^2\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/12*b*n*x^12*e^3*log(x) - 1/144*b*n*x^12*e^3 + 1/12*b*x^12*e^3*log(c) + 3/
10*b*d*n*x^10*e^2*log(x) + 1/12*a*x^12*e^3 - 3/100*b*d*n*x^10*e^2 + 3/10*b*
d*x^10*e^2*log(c) + 3/8*b*d^2*n*x^8*e*log(x) + 3/10*a*d*x^10*e^2 - 3/64*b*d
^2*n*x^8*e + 3/8*b*d^2*x^8*e*log(c) + 3/8*a*d^2*x^8*e + 1/6*b*d^3*n*x^6*log
(x) - 1/36*b*d^3*n*x^6 + 1/6*b*d^3*x^6*log(c) + 1/6*a*d^3*x^6
```

3.197 $\int x^3 \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=130

$$-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)(a+b\log(cx^n))+\frac{bd^5n\log(x)}{40e^2}+\frac{1}{60}bd^2enx^6+\frac{bd^4nx^2}{20e}+\frac{3}{80}bd^3nx^4+\frac{1}{320}bde^2nx^8-$$

```
[Out] (b*d^4*n*x^2)/(20*e) + (3*b*d^3*n*x^4)/80 + (b*d^2*e*n*x^6)/60 + (b*d*e^2*n
*x^8)/320 - (b*n*(d + e*x^2)^5)/(100*e^2) + (b*d^5*n*Log[x])/(40*e^2) - (((
5*d*(d + e*x^2)^4)/e^2 - (4*(d + e*x^2)^5)/e^2)*(a + b*Log[c*x^n]))/40
```

Rubi [A] time = 0.15226, antiderivative size = 130, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 446, 80}

$$-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)(a+b\log(cx^n))+\frac{bd^5n\log(x)}{40e^2}+\frac{1}{60}bd^2enx^6+\frac{bd^4nx^2}{20e}+\frac{3}{80}bd^3nx^4+\frac{1}{320}bde^2nx^8-$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```


```
[Out] (b*d^4*n*x^2)/(20*e) + (3*b*d^3*n*x^4)/80 + (b*d^2*e*n*x^6)/60 + (b*d*e^2*n
*x^8)/320 - (b*n*(d + e*x^2)^5)/(100*e^2) + (b*d^5*n*Log[x])/(40*e^2) - (((
5*d*(d + e*x^2)^4)/e^2 - (4*(d + e*x^2)^5)/e^2)*(a + b*Log[c*x^n]))/40
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx = -\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)(a+b\log(cx^n))-(bn)\int\frac{\left(d+ex^2\right)^4\left(-d+4e\right.}{40e^2x}$$

$$= -\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)(a+b\log(cx^n))-\frac{(bn)\int\frac{\left(d+ex^2\right)^4\left(-d+4ex^2\right)}{x}dx}{40e^2}$$

$$= -\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)(a+b\log(cx^n))-\frac{(bn)\,\mathrm{Subst}\left(\int\frac{(d+ex)^4(-d+4ex}{x}\right.}{80e^2}$$

$$= -\frac{bn\left(d+ex^2\right)^5}{100e^2}-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)(a+b\log(cx^n))+\frac{(bdn)\,\mathrm{Subs}}{}$$

$$= -\frac{bn\left(d+ex^2\right)^5}{100e^2}-\frac{1}{40}\left(\frac{5d\left(d+ex^2\right)^4}{e^2}-\frac{4\left(d+ex^2\right)^5}{e^2}\right)(a+b\log(cx^n))+\frac{(bdn)\,\mathrm{Subs}}{}$$

$$= \frac{bd^4nx^2}{20e}+\frac{3}{80}bd^3nx^4+\frac{1}{60}bd^2enx^6+\frac{1}{320}bde^2nx^8-\frac{bn\left(d+ex^2\right)^5}{100e^2}+\frac{bd^5n\log(x)}{40e^2}-$$

Mathematica [A] time = 0.0523048, size = 120, normalized size = 0.92

$$\frac{x^4\left(120a\left(20d^2ex^2+10d^3+15de^2x^4+4e^3x^6\right)+120b\left(20d^2ex^2+10d^3+15de^2x^4+4e^3x^6\right)\log(cx^n)-bn\left(400d^2ex^2+300\right.\right.}{4800}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(120*a*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6) - b*n*(300*d
^3 + 400*d^2*e*x^2 + 225*d*e^2*x^4 + 48*e^3*x^6) + 120*b*(10*d^3 + 20*d^2*e
*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6)*Log[c*x^n]))/4800
```

Maple [C] time = 0.208, size = 602, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/2*a*d^2*e*x^6+3/8*a*d*e^2*x^8-1/100*b*e^3*n*x^10-1/8*I*Pi*b*d^3*x^4*csgn(
I*c*x^n)^3-1/8*I*Pi*b*d^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*
b*d^2*e*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1/4*I*Pi*b*d^2*e*x^6*csgn(I*c*x^n)^
2*csgn(I*c)+3/16*I*Pi*b*d*e^2*x^8*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*ln(c)*b*d
^2*e*x^6+3/8*ln(c)*b*d*e^2*x^8+1/4*ln(c)*b*d^3*x^4+3/16*I*Pi*b*d*e^2*x^8*cs
gn(I*c*x^n)^2*csgn(I*c)+1/4*a*d^3*x^4-1/20*I*Pi*b*e^3*x^10*csgn(I*c*x^n)^3+
1/40*b*x^4*(4*e^3*x^6+15*d*e^2*x^4+20*d^2*e*x^2+10*d^3)*ln(x^n)+1/10*ln(c)*
b*e^3*x^10-3/16*I*Pi*b*d*e^2*x^8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/20*I
*Pi*b*e^3*x^10*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3/16*I*Pi*b*d*e^2*x^8*cs
gn(I*c*x^n)^3+1/10*a*e^3*x^10+1/8*I*Pi*b*d^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/12*b*d^2*e*n*x^6-3/64*b*d*e^2*n*x^8+1/20*I*Pi*b*e^3*x^10*csgn(I*x^n)*cs
gn(I*c*x^n)^2+1/20*I*Pi*b*e^3*x^10*csgn(I*c*x^n)^2*csgn(I*c)+1/8*I*Pi*b*d^3
*x^4*csgn(I*c*x^n)^2*csgn(I*c)-1/16*b*d^3*n*x^4-1/4*I*Pi*b*d^2*e*x^6*csgn(I
*c*x^n)^3-1/4*I*Pi*b*d^2*e*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
```

Maxima [A] time = 1.13128, size = 193, normalized size = 1.48

$$-\frac{1}{100}\,be^3nx^{10} + \frac{1}{10}\,be^3x^{10}\log\left(cx^n\right) + \frac{1}{10}\,ae^3x^{10} - \frac{3}{64}\,bde^2nx^8 + \frac{3}{8}\,bde^2x^8\log\left(cx^n\right) + \frac{3}{8}\,ade^2x^8 - \frac{1}{12}\,bd^2enx^6 + \frac{1}{2}\,bd^2ex^6$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/100*b*e^3*n*x^10 + 1/10*b*e^3*x^10*log(c*x^n) + 1/10*a*e^3*x^10 - 3/64*b
*d*e^2*n*x^8 + 3/8*b*d*e^2*x^8*log(c*x^n) + 3/8*a*d*e^2*x^8 - 1/12*b*d^2*e*
n*x^6 + 1/2*b*d^2*e*x^6*log(c*x^n) + 1/2*a*d^2*e*x^6 - 1/16*b*d^3*n*x^4 + 1
/4*b*d^3*x^4*log(c*x^n) + 1/4*a*d^3*x^4
```

Fricas [A] time = 1.3549, size = 404, normalized size = 3.11

$$-\frac{1}{100}\left(be^3n - 10\,ae^3\right)x^{10} - \frac{3}{64}\left(bde^2n - 8\,ade^2\right)x^8 - \frac{1}{12}\left(bd^2en - 6\,ad^2e\right)x^6 - \frac{1}{16}\left(bd^3n - 4\,ad^3\right)x^4 + \frac{1}{40}\left(4\,be^3x^{10} + 15\,bd\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/100*(b*e^3*n - 10*a*e^3)*x^10 - 3/64*(b*d*e^2*n - 8*a*d*e^2)*x^8 - 1/12*
(b*d^2*e*n - 6*a*d^2*e)*x^6 - 1/16*(b*d^3*n - 4*a*d^3)*x^4 + 1/40*(4*b*e^3*
x^10 + 15*b*d*e^2*x^8 + 20*b*d^2*e*x^6 + 10*b*d^3*x^4)*log(c) + 1/40*(4*b*e
^3*n*x^10 + 15*b*d*e^2*n*x^8 + 20*b*d^2*e*n*x^6 + 10*b*d^3*n*x^4)*log(x)
```

Sympy [A] time = 31.2569, size = 223, normalized size = 1.72

$$\frac{ad^3x^4}{4} + \frac{ad^2ex^6}{2} + \frac{3ade^2x^8}{8} + \frac{ae^3x^{10}}{10} + \frac{bd^3nx^4\log(x)}{4} - \frac{bd^3nx^4}{16} + \frac{bd^3x^4\log(c)}{4} + \frac{bd^2enx^6\log(x)}{2} - \frac{bd^2enx^6}{12} + \frac{bd^2ex^6 \log}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**4/4 + a*d**2*e*x**6/2 + 3*a*d*e**2*x**8/8 + a*e**3*x**10/10 + b*d
**3*n*x**4*log(x)/4 - b*d**3*n*x**4/16 + b*d**3*x**4*log(c)/4 + b*d**2*e*n*
x**6*log(x)/2 - b*d**2*e*n*x**6/12 + b*d**2*e*x**6*log(c)/2 + 3*b*d*e**2*n*
x**8*log(x)/8 - 3*b*d*e**2*n*x**8/64 + 3*b*d*e**2*x**8*log(c)/8 + b*e**3*n*
x**10*log(x)/10 - b*e**3*n*x**10/100 + b*e**3*x**10*log(c)/10
```

Giac [A] time = 1.32529, size = 234, normalized size = 1.8

$$\frac{1}{10}\,bnx^{10}e^3\log(x) - \frac{1}{100}\,bnx^{10}e^3 + \frac{1}{10}\,bx^{10}e^3\log(c) + \frac{3}{8}\,bdnx^8e^2\log(x) + \frac{1}{10}\,ax^{10}e^3 - \frac{3}{64}\,bdnx^8e^2 + \frac{3}{8}\,bdx^8e^2\log(c) + \frac{1}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/10*b*n*x^10*e^3*log(x) - 1/100*b*n*x^10*e^3 + 1/10*b*x^10*e^3*log(c) + 3/
8*b*d*n*x^8*e^2*log(x) + 1/10*a*x^10*e^3 - 3/64*b*d*n*x^8*e^2 + 3/8*b*d*x^8
*e^2*log(c) + 1/2*b*d^2*n*x^6*e*log(x) + 3/8*a*d*x^8*e^2 - 1/12*b*d^2*n*x^6
*e + 1/2*b*d^2*x^6*e*log(c) + 1/2*a*d^2*x^6*e + 1/4*b*d^3*n*x^4*log(x) - 1/
16*b*d^3*n*x^4 + 1/4*b*d^3*x^4*log(c) + 1/4*a*d^3*x^4
```

3.198 $\int x\left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=91

$$\frac{\left(d+ex^2\right)^4 (a+b\log(cx^n))}{8e}-\frac{3}{16}bd^2enx^4-\frac{bd^4n\log(x)}{8e}-\frac{1}{4}bd^3nx^2-\frac{1}{12}bde^2nx^6-\frac{1}{64}be^3nx^8$$

```
[Out] -(b*d^3*n*x^2)/4 - (3*b*d^2*e*n*x^4)/16 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*x^8
)/64 - (b*d^4*n*Log[x])/(8*e) + ((d + e*x^2)^4*(a + b*Log[c*x^n]))/(8*e)
```

Rubi [A] time = 0.0746843, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {261, 2334, 12, 266, 43}

$$\frac{\left(d+ex^2\right)^4 (a+b\log(cx^n))}{8e}-\frac{3}{16}bd^2enx^4-\frac{bd^4n\log(x)}{8e}-\frac{1}{4}bd^3nx^2-\frac{1}{12}bde^2nx^6-\frac{1}{64}be^3nx^8$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^2)/4 - (3*b*d^2*e*n*x^4)/16 - (b*d*e^2*n*x^6)/12 - (b*e^3*n*x^8
)/64 - (b*d^4*n*Log[x])/(8*e) + ((d + e*x^2)^4*(a + b*Log[c*x^n]))/(8*e)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$
\begin{aligned}
\int x\left(d+ex^2\right)^3(a+b\log(cx^n))\,dx &= \frac{\left(d+ex^2\right)^4(a+b\log(cx^n))}{8e}-(bn)\int\frac{\left(d+ex^2\right)^4}{8ex}\,dx\\
&= \frac{\left(d+ex^2\right)^4(a+b\log(cx^n))}{8e}-\frac{(bn)\int\frac{\left(d+ex^2\right)^4}{x}\,dx}{8e}\\
&= \frac{\left(d+ex^2\right)^4(a+b\log(cx^n))}{8e}-\frac{(bn)\,\mathrm{Subst}\left(\int\frac{(d+ex)^4}{x}\,dx,x,x^2\right)}{16e}\\
&= \frac{\left(d+ex^2\right)^4(a+b\log(cx^n))}{8e}-\frac{(bn)\,\mathrm{Subst}\left(\int\left(4d^3e+\frac{d^4}{x}+6d^2e^2x+4de^3x^2+e^4x^3\right)\right.}{16e}\\
&= -\frac{1}{4}bd^3nx^2-\frac{3}{16}bd^2enx^4-\frac{1}{12}bde^2nx^6-\frac{1}{64}be^3nx^8-\frac{bd^4n\log(x)}{8e}+\frac{\left(d+ex^2\right)^4(a+}{8e}
\end{aligned}
$$

Mathematica [A] time = 0.0510205, size = 118, normalized size = 1.3

$$
\frac{1}{192}x^2\left(24a\left(6d^2ex^2+4d^3+4de^2x^4+e^3x^6\right)+24b\left(6d^2ex^2+4d^3+4de^2x^4+e^3x^6\right)\log(cx^n)-bn\left(36d^2ex^2+48d^3+16de^2\right.\right.
$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(24*a*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^2*x^4 + e^3*x^6) - b*n*(48*d^3 + 36
*d^2*e*x^2 + 16*d*e^2*x^4 + 3*e^3*x^6) + 24*b*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^
2*x^4 + e^3*x^6)*Log[c*x^n]))/192
```

Maple [C] time = 0.209, size = 601, normalized size = 6.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] -1/16*I*Pi*b*e^3*x^8*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*a*d^3*x^2+1/2*
a*d*e^2*x^6+3/4*a*d^2*e*x^4+3/4*ln(c)*b*d^2*e*x^4+1/2*ln(c)*b*d*e^2*x^6-1/4
*I*Pi*b*d^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b*d*e^2*x^6*cs
gn(I*c*x^n)^2*csgn(I*c)+1/8*ln(c)*b*e^3*x^8+3/8*I*Pi*b*d^2*e*x^4*csgn(I*x^n
)*csgn(I*c*x^n)^2+3/8*I*Pi*b*d^2*e*x^4*csgn(I*c*x^n)^2*csgn(I*c)+1/4*I*Pi*b
*d*e^2*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2-1/16*I*Pi*b*e^3*x^8*csgn(I*c*x^n)^3-
1/4*I*Pi*b*d^3*x^2*csgn(I*c*x^n)^3+1/8*b*x^2*(e^3*x^6+4*d*e^2*x^4+6*d^2*e*x
^2+4*d^3)*ln(x^n)+1/16*I*Pi*b*e^3*x^8*csgn(I*c*x^n)^2*csgn(I*c)-3/8*I*Pi*b*
d^2*e*x^4*csgn(I*c*x^n)^3+1/8*a*e^3*x^8+1/2*ln(c)*b*d^3*x^2-3/8*I*Pi*b*d^2*
e*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/4*I*Pi*b*d^3*x^2*csgn(I*c*x^n)^
2*csgn(I*c)+1/16*I*Pi*b*e^3*x^8*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*Pi*b*d*e^
2*x^6*csgn(I*c*x^n)^3-1/4*b*d^3*n*x^2-1/12*b*d*e^2*n*x^6-3/16*b*d^2*e*n*x^4
+1/4*I*Pi*b*d^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-1/4*I*Pi*b*d*e^2*x^6*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/64*b*e^3*n*x^8
```

Maxima [A] time = 1.20182, size = 193, normalized size = 2.12

$$-\frac{1}{64}\,be^3nx^8+\frac{1}{8}\,be^3x^8\log\left(cx^n\right)+\frac{1}{8}\,ae^3x^8-\frac{1}{12}\,bde^2nx^6+\frac{1}{2}\,bde^2x^6\log\left(cx^n\right)+\frac{1}{2}\,ade^2x^6-\frac{3}{16}\,bd^2enx^4+\frac{3}{4}\,bd^2ex^4\log\left(c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/64*b*e^3*n*x^8 + 1/8*b*e^3*x^8*log(c*x^n) + 1/8*a*e^3*x^8 - 1/12*b*d*e^2
*n*x^6 + 1/2*b*d*e^2*x^6*log(c*x^n) + 1/2*a*d*e^2*x^6 - 3/16*b*d^2*e*n*x^4
+ 3/4*b*d^2*e*x^4*log(c*x^n) + 3/4*a*d^2*e*x^4 - 1/4*b*d^3*n*x^2 + 1/2*b*d^
```

```
3*x^2*log(c*x^n) + 1/2*a*d^3*x^2
```

Fricas [B] time = 1.40845, size = 379, normalized size = 4.16

$$-\frac{1}{64}\left(be^3n - 8\,ae^3\right)x^8 - \frac{1}{12}\left(bde^2n - 6\,ade^2\right)x^6 - \frac{3}{16}\left(bd^2en - 4\,ad^2e\right)x^4 - \frac{1}{4}\left(bd^3n - 2\,ad^3\right)x^2 + \frac{1}{8}\left(be^3x^8 + 4\,bde^2x^6 + 6\,bd\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/64*(b*e^3*n - 8*a*e^3)*x^8 - 1/12*(b*d*e^2*n - 6*a*d*e^2)*x^6 - 3/16*(b*
d^2*e*n - 4*a*d^2*e)*x^4 - 1/4*(b*d^3*n - 2*a*d^3)*x^2 + 1/8*(b*e^3*x^8 + 4
*b*d*e^2*x^6 + 6*b*d^2*e*x^4 + 4*b*d^3*x^2)*log(c) + 1/8*(b*e^3*n*x^8 + 4*b
*d*e^2*n*x^6 + 6*b*d^2*e*n*x^4 + 4*b*d^3*n*x^2)*log(x)
```

Sympy [B] time = 13.6113, size = 223, normalized size = 2.45

$$\frac{ad^3x^2}{2} + \frac{3ad^2ex^4}{4} + \frac{ade^2x^6}{2} + \frac{ae^3x^8}{8} + \frac{bd^3nx^2\log{(x)}}{2} - \frac{bd^3nx^2}{4} + \frac{bd^3x^2\log{(c)}}{2} + \frac{3bd^2enx^4\log{(x)}}{4} - \frac{3bd^2enx^4}{16} + \frac{3bd^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**2/2 + 3*a*d**2*e*x**4/4 + a*d*e**2*x**6/2 + a*e**3*x**8/8 + b*d**
3*n*x**2*log(x)/2 - b*d**3*n*x**2/4 + b*d**3*x**2*log(c)/2 + 3*b*d**2*e*n*x
**4*log(x)/4 - 3*b*d**2*e*n*x**4/16 + 3*b*d**2*e*x**4*log(c)/4 + b*d*e**2*n
*x**6*log(x)/2 - b*d*e**2*n*x**6/12 + b*d*e**2*x**6*log(c)/2 + b*e**3*n*x**
8*log(x)/8 - b*e**3*n*x**8/64 + b*e**3*x**8*log(c)/8
```

Giac [B] time = 1.32775, size = 234, normalized size = 2.57

$$\frac{1}{8}\,bnx^8e^3\log{(x)} - \frac{1}{64}\,bnx^8e^3 + \frac{1}{8}\,bx^8e^3\log{(c)} + \frac{1}{2}\,bdnx^6e^2\log{(x)} + \frac{1}{8}\,ax^8e^3 - \frac{1}{12}\,bdnx^6e^2 + \frac{1}{2}\,bdx^6e^2\log{(c)} + \frac{3}{4}\,bd^2nx^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/8*b*n*x^8*e^3*log(x) - 1/64*b*n*x^8*e^3 + 1/8*b*x^8*e^3*log(c) + 1/2*b*d*
n*x^6*e^2*log(x) + 1/8*a*x^8*e^3 - 1/12*b*d*n*x^6*e^2 + 1/2*b*d*x^6*e^2*log
(c) + 3/4*b*d^2*n*x^4*e*log(x) + 1/2*a*d*x^6*e^2 - 3/16*b*d^2*n*x^4*e + 3/4
*b*d^2*x^4*e*log(c) + 3/4*a*d^2*x^4*e + 1/2*b*d^3*n*x^2*log(x) - 1/4*b*d^3*
n*x^2 + 1/2*b*d^3*x^2*log(c) + 1/2*a*d^3*x^2
```

3.199 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x}\, dx$

Optimal. Leaf size=130

$$\frac{3}{2}d^2ex^2\left(a+b\log\left(cx^n\right)\right)+d^3\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{3}{4}de^2x^4\left(a+b\log\left(cx^n\right)\right)+\frac{1}{6}e^3x^6\left(a+b\log\left(cx^n\right)\right)-\frac{3}{4}bd^2enx^2-\frac{1}{2}b$$

```
[Out] (-3*b*d^2*e*n*x^2)/4 - (3*b*d*e^2*n*x^4)/16 - (b*e^3*n*x^6)/36 - (b*d^3*n*L
og[x]^2)/2 + (3*d^2*e*x^2*(a + b*Log[c*x^n]))/2 + (3*d*e^2*x^4*(a + b*Log[c
*x^n]))/4 + (e^3*x^6*(a + b*Log[c*x^n]))/6 + d^3*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.104462, antiderivative size = 100, normalized size of antiderivative = 0.77, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {266, 43, 2334, 14, 2301}

$$\frac{1}{12}\left(18d^2ex^2+12d^3\log(x)+9de^2x^4+2e^3x^6\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{4}bd^2enx^2-\frac{1}{2}bd^3n\log^2(x)-\frac{3}{16}bde^2nx^4-\frac{1}{36}be^3nx^6$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-3*b*d^2*e*n*x^2)/4 - (3*b*d*e^2*n*x^4)/16 - (b*e^3*n*x^6)/36 - (b*d^3*n*L
og[x]^2)/2 + ((18*d^2*e*x^2 + 9*d*e^2*x^4 + 2*e^3*x^6 + 12*d^3*Log[x])*(a +
 b*Log[c*x^n]))/12
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x}\,dx = \frac{1}{12}\left(18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)\right)(a+b\log(cx^n)) - (bn)\int\left(\frac{1}{12}ex\left(18d^2\right.\right.$$
$$= \frac{1}{12}\left(18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)\right)(a+b\log(cx^n)) - \left(bd^3n\right)\int\frac{\log(x)}{x}\,dx$$
$$= -\frac{1}{2}bd^3n\log^2(x) + \frac{1}{12}\left(18d^2ex^2+9de^2x^4+2e^3x^6+12d^3\log(x)\right)(a+b\log(cx^n)) -$$
$$= -\frac{3}{4}bd^2enx^2 - \frac{3}{16}bde^2nx^4 - \frac{1}{36}be^3nx^6 - \frac{1}{2}bd^3n\log^2(x) + \frac{1}{12}\left(18d^2ex^2+9de^2x^4+2e\right.$$

Mathematica [A] time = 0.0634043, size = 116, normalized size = 0.89

$$\frac{1}{144}\left(216d^2ex^2(a+b\log(cx^n)) + \frac{72d^3(a+b\log(cx^n))^2}{bn} + 108de^2x^4(a+b\log(cx^n)) + 24e^3x^6(a+b\log(cx^n)) - 108bd\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-108*b*d^2*e*n*x^2 - 27*b*d*e^2*n*x^4 - 4*b*e^3*n*x^6 + 216*d^2*e*x^2*(a +
 b*Log[c*x^n]) + 108*d*e^2*x^4*(a + b*Log[c*x^n]) + 24*e^3*x^6*(a + b*Log[c
*x^n]) + (72*d^3*(a + b*Log[c*x^n])^2)/(b*n))/144
```

Maple [C] time = 0.222, size = 595, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x,x)
```

```
[Out] 3/4*ln(c)*b*d*e^2*x^4+3/2*a*d^2*e*x^2+3/4*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn
(I*c*x^n)^2+3/2*ln(c)*b*d^2*e*x^2+(1/6*b*e^3*x^6+3/4*b*d*e^2*x^4+3/2*b*d^2*
e*x^2+b*d^3*ln(x))*ln(x^n)+3/4*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+3
/8*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+3/8*I*Pi*b*d*e^2*x^4*csgn(I
*c*x^n)^2*csgn(I*c)+3/4*a*d*e^2*x^4+1/6*ln(c)*b*e^3*x^6+ln(x)*ln(c)*b*d^3-1
/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*ln(x)*Pi*b*d^
3*csgn(I*c*x^n)^3+1/6*a*e^3*x^6+ln(x)*a*d^3+1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n
)*csgn(I*c*x^n)^2-1/12*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1
/12*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3+1/2*I*ln(x)*Pi*b*d^3*csgn(I*c*x^n)^2*csg
n(I*c)-3/8*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3+1/12*I*Pi*b*e^3*x^6*csgn(I*x^n)
*csgn(I*c*x^n)^2-3/8*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1
/36*b*e^3*n*x^6-3/16*b*d*e^2*n*x^4-3/4*b*d^2*e*n*x^2-3/4*I*Pi*b*d^2*e*x^2*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/12*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn
(I*c)-3/4*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-1/2*b*d^3*n*ln(x)^2
```

Maxima [A] time = 1.16289, size = 180, normalized size = 1.38

$$-\frac{1}{36}\,be^{3}nx^{6}+\frac{1}{6}\,be^{3}x^{6}\log\left(cx^{n}\right)+\frac{1}{6}\,ae^{3}x^{6}-\frac{3}{16}\,bde^{2}nx^{4}+\frac{3}{4}\,bde^{2}x^{4}\log\left(cx^{n}\right)+\frac{3}{4}\,ade^{2}x^{4}-\frac{3}{4}\,bd^{2}enx^{2}+\frac{3}{2}\,bd^{2}ex^{2}\log\left(cx^{n}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] -1/36*b*e^3*n*x^6 + 1/6*b*e^3*x^6*log(c*x^n) + 1/6*a*e^3*x^6 - 3/16*b*d*e^2
*n*x^4 + 3/4*b*d*e^2*x^4*log(c*x^n) + 3/4*a*d*e^2*x^4 - 3/4*b*d^2*e*n*x^2 +
 3/2*b*d^2*e*x^2*log(c*x^n) + 3/2*a*d^2*e*x^2 + 1/2*b*d^3*log(c*x^n)^2/n +
a*d^3*log(x)
```

Fricas [A] time = 1.50386, size = 378, normalized size = 2.91

$$-\frac{1}{36}\left(be^3n-6\,ae^3\right)x^6+\frac{1}{2}\,bd^3n\log\left(x\right)^2-\frac{3}{16}\left(bde^2n-4\,ade^2\right)x^4-\frac{3}{4}\left(bd^2en-2\,ad^2e\right)x^2+\frac{1}{12}\left(2\,be^3x^6+9\,bde^2x^4+18\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] -1/36*(b*e^3*n - 6*a*e^3)*x^6 + 1/2*b*d^3*n*log(x)^2 - 3/16*(b*d*e^2*n - 4*
a*d*e^2)*x^4 - 3/4*(b*d^2*e*n - 2*a*d^2*e)*x^2 + 1/12*(2*b*e^3*x^6 + 9*b*d*
e^2*x^4 + 18*b*d^2*e*x^2)*log(c) + 1/12*(2*b*e^3*n*x^6 + 9*b*d*e^2*n*x^4 +
18*b*d^2*e*n*x^2 + 12*b*d^3*log(c) + 12*a*d^3)*log(x)
```

Sympy [A] time = 8.98491, size = 212, normalized size = 1.63

$$ad^3\log\left(x\right)+\frac{3ad^2ex^2}{2}+\frac{3ade^2x^4}{4}+\frac{ae^3x^6}{6}+\frac{bd^3n\log\left(x\right)^2}{2}+bd^3\log\left(c\right)\log\left(x\right)+\frac{3bd^2enx^2\log\left(x\right)}{2}-\frac{3bd^2enx^2}{4}+\frac{3bd^2e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x,x)
```

```
[Out] a*d**3*log(x) + 3*a*d**2*e*x**2/2 + 3*a*d*e**2*x**4/4 + a*e**3*x**6/6 + b*d
**3*n*log(x)**2/2 + b*d**3*log(c)*log(x) + 3*b*d**2*e*n*x**2*log(x)/2 - 3*b
*d**2*e*n*x**2/4 + 3*b*d**2*e*x**2*log(c)/2 + 3*b*d*e**2*n*x**4*log(x)/4 -
3*b*d*e**2*n*x**4/16 + 3*b*d*e**2*x**4*log(c)/4 + b*e**3*n*x**6*log(x)/6 -
b*e**3*n*x**6/36 + b*e**3*x**6*log(c)/6
```

Giac [A] time = 1.30301, size = 213, normalized size = 1.64

$$\frac{1}{6}\,bnx^6e^3\log\left(x\right)-\frac{1}{36}\,bnx^6e^3+\frac{1}{6}\,bx^6e^3\log\left(c\right)+\frac{3}{4}\,bdnx^4e^2\log\left(x\right)+\frac{1}{6}\,ax^6e^3-\frac{3}{16}\,bdnx^4e^2+\frac{3}{4}\,bdx^4e^2\log\left(c\right)+\frac{3}{2}\,bd^2nx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/6*b*n*x^6*e^3*log(x) - 1/36*b*n*x^6*e^3 + 1/6*b*x^6*e^3*log(c) + 3/4*b*d*
n*x^4*e^2*log(x) + 1/6*a*x^6*e^3 - 3/16*b*d*n*x^4*e^2 + 3/4*b*d*x^4*e^2*log
```

```
(c) + 3/2*b*d^2*n*x^2*e*log(x) + 3/4*a*d*x^4*e^2 - 3/4*b*d^2*n*x^2*e + 3/2*
b*d^2*x^2*e*log(c) + 1/2*b*d^3*n*log(x)^2 + 3/2*a*d^2*x^2*e + b*d^3*log(c)*
log(x) + a*d^3*log(x)
```

3.200 $\int \frac{(d+ex^2)^3(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=131

$$3d^2e\log(x)\left(a+b\log\left(cx^n\right)\right)-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}e^3x^4\left(a+b\log\left(cx^n\right)\right)-\frac{3}{2}bd^2en\log^2(x)$$

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^4)/16 - (3*b*d^2*e*n*
Log[x]^2)/2 - (d^3*(a + b*Log[c*x^n]))/(2*x^2) + (3*d*e^2*x^2*(a + b*Log[c*
x^n]))/2 + (e^3*x^4*(a + b*Log[c*x^n]))/4 + 3*d^2*e*Log[x]*(a + b*Log[c*x^n
])
```

Rubi [A] time = 0.124834, antiderivative size = 100, normalized size of antiderivative = 0.76, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$-\frac{1}{4}\left(-12d^2e\log(x)+\frac{2d^3}{x^2}-6de^2x^2-e^3x^4\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3}{2}bd^2en\log^2(x)-\frac{bd^3n}{4x^2}-\frac{3}{4}bde^2nx^2-\frac{1}{16}be^3nx^4$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d*e^2*n*x^2)/4 - (b*e^3*n*x^4)/16 - (3*b*d^2*e*n*
Log[x]^2)/2 - (((2*d^3)/x^2 - 6*d*e^2*x^2 - e^3*x^4 - 12*d^2*e*Log[x])*(a +
 b*Log[c*x^n]))/4
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x^3}\,dx = -\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)(a+b\log(cx^n))-(bn)\int \frac{-2d^3+6de^2x^4+$$
$$= -\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int \frac{-2d^3+6de^2x^4$$
$$= -\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\left(\frac{-2d^3+6de^2x^4}{x^3}\right.$$
$$= -\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int \frac{-2d^3+6de^2x^4}{x^3}$$
$$= -\frac{3}{2}bd^2en\log^2(x)-\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)$$
$$= -\frac{bd^3n}{4x^2}-\frac{3}{4}bde^2nx^2-\frac{1}{16}be^3nx^4-\frac{3}{2}bd^2en\log^2(x)-\frac{1}{4}\left(\frac{2d^3}{x^2}-6de^2x^2-e^3x^4-12d^2e\,\mathrm{l}\right.$$

Mathematica [A] time = 0.081901, size = 115, normalized size = 0.88

$$\frac{1}{16}\left(\frac{24d^2e(a+b\log(cx^n))^2}{bn}-\frac{8d^3(a+b\log(cx^n))}{x^2}+24de^2x^2(a+b\log(cx^n))+4e^3x^4(a+b\log(cx^n))-\frac{4bd^3n}{x^2}-12bde^2\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] ((-4*b*d^3*n)/x^2 - 12*b*d*e^2*n*x^2 - b*e^3*n*x^4 - (8*d^3*(a + b*Log[c*x^
n]))/x^2 + 24*d*e^2*x^2*(a + b*Log[c*x^n]) + 4*e^3*x^4*(a + b*Log[c*x^n]) +
 (24*d^2*e*(a + b*Log[c*x^n])^2)/(b*n))/16
```

Maple [C] time = 0.242, size = 604, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x^3,x)
```

```
[Out] -1/4*b*(-e^3*x^6-6*d*e^2*x^4-12*d^2*e*ln(x)*x^2+2*d^3)/x^2*ln(x^n)-1/16*(-2
4*ln(c)*b*d*e^2*x^4+8*a*d^3+24*I*ln(x)*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*x^2-24*I*ln(x)*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^2+24*I*ln(
x)*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^2-12*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(
I*c)+2*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*a*d*e^2*x^4+8*
ln(c)*b*d^3-4*ln(c)*b*e^3*x^6-48*ln(x)*a*d^2*e*x^2+12*I*Pi*b*d*e^2*x^4*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*d^3*csgn(I*c*x^n)^3-4*a*e^3*x^6-24
*I*ln(x)*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2+4*b*d^3*n+4*I*Pi*b*d^3*
csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2
-48*ln(x)*ln(c)*b*d^2*e*x^2+24*b*d^2*e*n*ln(x)^2*x^2+4*I*Pi*b*d^3*csgn(I*c*
x^n)^2*csgn(I*c)+2*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3+12*I*Pi*b*d*e^2*x^4*csgn(
I*c*x^n)^3-2*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+b*e^3*n*x^6+12*b*d*
e^2*n*x^4-4*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*e^3*x^6
*csgn(I*c*x^n)^2*csgn(I*c))/x^2
```

Maxima [A] time = 1.05643, size = 180, normalized size = 1.37

$$-\frac{1}{16}\,be^{3}nx^{4}+\frac{1}{4}\,be^{3}x^{4}\log\left(cx^{n}\right)+\frac{1}{4}\,ae^{3}x^{4}-\frac{3}{4}\,bde^{2}nx^{2}+\frac{3}{2}\,bde^{2}x^{2}\log\left(cx^{n}\right)+\frac{3}{2}\,ade^{2}x^{2}+\frac{3\,bd^{2}e\log\left(cx^{n}\right)^{2}}{2\,n}+3\,ad^{2}e\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] -1/16*b*e^3*n*x^4 + 1/4*b*e^3*x^4*log(c*x^n) + 1/4*a*e^3*x^4 - 3/4*b*d*e^2*
n*x^2 + 3/2*b*d*e^2*x^2*log(c*x^n) + 3/2*a*d*e^2*x^2 + 3/2*b*d^2*e*log(c*x^
n)^2/n + 3*a*d^2*e*log(x) - 1/4*b*d^3*n/x^2 - 1/2*b*d^3*log(c*x^n)/x^2 - 1/
2*a*d^3/x^2
```

Fricas [A] time = 1.55742, size = 356, normalized size = 2.72

$$\frac{24\,bd^2enx^2\log(x)^2 - \left(be^3n - 4\,ae^3\right)x^6 - 4\,bd^3n - 12\left(bde^2n - 2\,ade^2\right)x^4 - 8\,ad^3 + 4\left(be^3x^6 + 6\,bde^2x^4 - 2\,bd^3\right)\log(c) + 4}{16\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] 1/16*(24*b*d^2*e*n*x^2*log(x)^2 - (b*e^3*n - 4*a*e^3)*x^6 - 4*b*d^3*n - 12*
(b*d*e^2*n - 2*a*d*e^2)*x^4 - 8*a*d^3 + 4*(b*e^3*x^6 + 6*b*d*e^2*x^4 - 2*b*
d^3)*log(c) + 4*(b*e^3*n*x^6 + 6*b*d*e^2*n*x^4 + 12*b*d^2*e*x^2*log(c) + 12
*a*d^2*e*x^2 - 2*b*d^3*n)*log(x))/x^2
```

Sympy [A] time = 9.21979, size = 209, normalized size = 1.6

$$-\frac{ad^3}{2x^2} + 3ad^2e\log(x) + \frac{3ade^2x^2}{2} + \frac{ae^3x^4}{4} - \frac{bd^3n\log(x)}{2x^2} - \frac{bd^3n}{4x^2} - \frac{bd^3\log(c)}{2x^2} + \frac{3bd^2en\log(x)^2}{2} + 3bd^2e\log(c)\log(x) +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] -a*d**3/(2*x**2) + 3*a*d**2*e*log(x) + 3*a*d*e**2*x**2/2 + a*e**3*x**4/4 -
b*d**3*n*log(x)/(2*x**2) - b*d**3*n/(4*x**2) - b*d**3*log(c)/(2*x**2) + 3*b
*d**2*e*n*log(x)**2/2 + 3*b*d**2*e*log(c)*log(x) + 3*b*d*e**2*n*x**2*log(x)
/2 - 3*b*d*e**2*n*x**2/4 + 3*b*d*e**2*x**2*log(c)/2 + b*e**3*n*x**4*log(x)/
4 - b*e**3*n*x**4/16 + b*e**3*x**4*log(c)/4
```

Giac [A] time = 1.28888, size = 216, normalized size = 1.65

$$\frac{4\,bnx^6e^3\log(x) - bnx^6e^3 + 4\,bx^6e^3\log(c) + 24\,bdnx^4e^2\log(x) + 24\,bd^2nx^2e\log(x)^2 + 4\,ax^6e^3 - 12\,bdnx^4e^2 + 24\,bdx^4e^2}{16\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] 1/16*(4*b*n*x^6*e^3*log(x) - b*n*x^6*e^3 + 4*b*x^6*e^3*log(c) + 24*b*d*n*x^
4*e^2*log(x) + 24*b*d^2*n*x^2*e*log(x)^2 + 4*a*x^6*e^3 - 12*b*d*n*x^4*e^2 +
 24*b*d*x^4*e^2*log(c) + 48*b*d^2*x^2*e*log(c)*log(x) + 24*a*d*x^4*e^2 + 48
*a*d^2*x^2*e*log(x) - 8*b*d^3*n*log(x) - 4*b*d^3*n - 8*b*d^3*log(c) - 8*a*d
^3)/x^2
```

3.201 $\int \frac{(d+ex^2)^3(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=131

$$-\frac{3d^2e(a+b\log(cx^n))}{2x^2}-\frac{d^3(a+b\log(cx^n))}{4x^4}+3de^2\log(x)(a+b\log(cx^n))+\frac{1}{2}e^3x^2(a+b\log(cx^n))-\frac{3bd^2en}{4x^2}-\frac{bd^3n}{16x^4}-$$

```
[Out] -(b*d^3*n)/(16*x^4) - (3*b*d^2*e*n)/(4*x^2) - (b*e^3*n*x^2)/4 - (3*b*d*e^2*
n*Log[x]^2)/2 - (d^3*(a + b*Log[c*x^n]))/(4*x^4) - (3*d^2*e*(a + b*Log[c*x^
n]))/(2*x^2) + (e^3*x^2*(a + b*Log[c*x^n]))/2 + 3*d*e^2*Log[x]*(a + b*Log[c
*x^n])
```

Rubi [A] time = 0.122787, antiderivative size = 99, normalized size of antiderivative = 0.76, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$-\frac{1}{4}\left(\frac{6d^2e}{x^2}+\frac{d^3}{x^4}-12de^2\log(x)-2e^3x^2\right)(a+b\log(cx^n))-\frac{3bd^2en}{4x^2}-\frac{bd^3n}{16x^4}-\frac{3}{2}bde^2n\log^2(x)-\frac{1}{4}be^3nx^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^3*n)/(16*x^4) - (3*b*d^2*e*n)/(4*x^2) - (b*e^3*n*x^2)/4 - (3*b*d*e^2*
n*Log[x]^2)/2 - ((d^3/x^4 + (6*d^2*e)/x^2 - 2*e^3*x^2 - 12*d*e^2*Log[x])*(a
 + b*Log[c*x^n]))/4
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x^5}\,dx = -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)(a+b\log(cx^n))-(bn)\int \frac{-d^3-6d^2ex^2+2}{}$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int \frac{-d^3-6d^2ex^2+}{}$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\left(\frac{-d^3-6d^2ex^2}{x^5}\right.$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int \frac{-d^3-6d^2ex^2+}{x^5}$$

$$= -\frac{3}{2}bde^2n\log^2(x)-\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(x)\right)(a+b\log(cx^n))-\frac{1}{4}(bn)$$

$$= -\frac{bd^3n}{16x^4}-\frac{3bd^2en}{4x^2}-\frac{1}{4}be^3nx^2-\frac{3}{2}bde^2n\log^2(x)-\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6d^2e}{x^2}-2e^3x^2-12de^2\log(\right.$$

Mathematica [A] time = 0.0787547, size = 115, normalized size = 0.88

$$\frac{1}{16}\left(-\frac{24d^2e(a+b\log(cx^n))}{x^2}-\frac{4d^3(a+b\log(cx^n))}{x^4}+\frac{24de^2(a+b\log(cx^n))^2}{bn}+8e^3x^2(a+b\log(cx^n))-\frac{12bd^2en}{x^2}-\frac{bd}{x}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (-((b*d^3*n)/x^4) - (12*b*d^2*e*n)/x^2 - 4*b*e^3*n*x^2 - (4*d^3*(a + b*Log[
c*x^n]))/x^4 - (24*d^2*e*(a + b*Log[c*x^n]))/x^2 + 8*e^3*x^2*(a + b*Log[c*x
^n]) + (24*d*e^2*(a + b*Log[c*x^n])^2)/(b*n))/16
```

Maple [C] time = 0.256, size = 602, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/4*b*(-2*e^3*x^6-12*d*e^2*ln(x)*x^4+6*d^2*e*x^2+d^3)/x^4*ln(x^n)-1/16*(4*
a*d^3+24*I*ln(x)*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^4+24*a*d^
2*e*x^2-48*ln(x)*a*d*e^2*x^4+24*ln(c)*b*d^2*e*x^2+4*ln(c)*b*d^3+12*I*Pi*b*d
^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+12*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*cs
gn(I*c)+4*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*ln(c)*b*e^3*
x^6-4*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*d^2*e*x^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)-8*a*e^3*x^6+b*d^3*n-12*I*Pi*b*d^2*e*x^2*csgn(I*
c*x^n)^3+24*I*ln(x)*Pi*b*d*e^2*csgn(I*c*x^n)^3*x^4+2*I*Pi*b*d^3*csgn(I*x^n)
*csgn(I*c*x^n)^2-24*I*ln(x)*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^4-48*l
n(x)*ln(c)*b*d*e^2*x^4+24*b*d*e^2*n*ln(x)^2*x^4+4*I*Pi*b*e^3*x^6*csgn(I*c*x
^n)^3-2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*b*e^3*n*x^6-2*I*Pi
*b*d^3*csgn(I*c*x^n)^3-24*I*ln(x)*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*x^4-
4*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+12*b*d^2*e*n*x^2+2*I*Pi*b*d^3*
csgn(I*c*x^n)^2*csgn(I*c))/x^4
```

Maxima [A] time = 1.1712, size = 180, normalized size = 1.37

$$-\frac{1}{4}\,be^3nx^2+\frac{1}{2}\,be^3x^2\log\left(cx^n\right)+\frac{1}{2}\,ae^3x^2+\frac{3\,bde^2\log\left(cx^n\right)^2}{2\,n}+3\,ade^2\log\left(x\right)-\frac{3\,bd^2en}{4\,x^2}-\frac{3\,bd^2e\log\left(cx^n\right)}{2\,x^2}-\frac{3\,ad^2e}{2\,x^2}-\frac{bd^3}{16\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] -1/4*b*e^3*n*x^2 + 1/2*b*e^3*x^2*log(c*x^n) + 1/2*a*e^3*x^2 + 3/2*b*d*e^2*l
og(c*x^n)^2/n + 3*a*d*e^2*log(x) - 3/4*b*d^2*e*n/x^2 - 3/2*b*d^2*e*log(c*x^
n)/x^2 - 3/2*a*d^2*e/x^2 - 1/16*b*d^3*n/x^4 - 1/4*b*d^3*log(c*x^n)/x^4 - 1/
4*a*d^3/x^4
```

Fricas [A] time = 1.53736, size = 356, normalized size = 2.72

$$\frac{24\,bde^2nx^4\log(x)^2 - 4\left(be^3n - 2\,ae^3\right)x^6 - bd^3n - 4\,ad^3 - 12\left(bd^2en + 2\,ad^2e\right)x^2 + 4\left(2\,be^3x^6 - 6\,bd^2ex^2 - bd^3\right)\log(c) +}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] 1/16*(24*b*d*e^2*n*x^4*log(x)^2 - 4*(b*e^3*n - 2*a*e^3)*x^6 - b*d^3*n - 4*a
*d^3 - 12*(b*d^2*e*n + 2*a*d^2*e)*x^2 + 4*(2*b*e^3*x^6 - 6*b*d^2*e*x^2 - b*
d^3)*log(c) + 4*(2*b*e^3*n*x^6 + 12*b*d*e^2*x^4*log(c) + 12*a*d*e^2*x^4 - 6
*b*d^2*e*n*x^2 - b*d^3*n)*log(x))/x^4
```

Sympy [A] time = 9.15391, size = 209, normalized size = 1.6

$$-\frac{ad^3}{4x^4} - \frac{3ad^2e}{2x^2} + 3ade^2\log(x) + \frac{ae^3x^2}{2} - \frac{bd^3n\log(x)}{4x^4} - \frac{bd^3n}{16x^4} - \frac{bd^3\log(c)}{4x^4} - \frac{3bd^2en\log(x)}{2x^2} - \frac{3bd^2en}{4x^2} - \frac{3bd^2e\log(c)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] -a*d**3/(4*x**4) - 3*a*d**2*e/(2*x**2) + 3*a*d*e**2*log(x) + a*e**3*x**2/2
- b*d**3*n*log(x)/(4*x**4) - b*d**3*n/(16*x**4) - b*d**3*log(c)/(4*x**4) -
3*b*d**2*e*n*log(x)/(2*x**2) - 3*b*d**2*e*n/(4*x**2) - 3*b*d**2*e*log(c)/(2
*x**2) + 3*b*d*e**2*n*log(x)**2/2 + 3*b*d*e**2*log(c)*log(x) + b*e**3*n*x**
2*log(x)/2 - b*e**3*n*x**2/4 + b*e**3*x**2*log(c)/2
```

Giac [A] time = 1.3287, size = 219, normalized size = 1.67

$$\frac{8\,bnx^6e^3\log(x) + 24\,bdnx^4e^2\log(x)^2 - 4\,bnx^6e^3 + 8\,bx^6e^3\log(c) + 48\,bdx^4e^2\log(c)\log(x) + 8\,ax^6e^3 + 48\,adx^4e^2\log(}{16\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] 1/16*(8*b*n*x^6*e^3*log(x) + 24*b*d*n*x^4*e^2*log(x)^2 - 4*b*n*x^6*e^3 + 8*
b*x^6*e^3*log(c) + 48*b*d*x^4*e^2*log(c)*log(x) + 8*a*x^6*e^3 + 48*a*d*x^4*
e^2*log(x) - 24*b*d^2*n*x^2*e*log(x) - 12*b*d^2*n*x^2*e - 24*b*d^2*x^2*e*lo
g(c) - 24*a*d^2*x^2*e - 4*b*d^3*n*log(x) - b*d^3*n - 4*b*d^3*log(c) - 4*a*d
^3)/x^4
```

3.202 $\int x^4 \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=100

$$\frac{\left(495d^2ex^7+231d^3x^5+385de^2x^9+105e^3x^{11}\right)(a+b\log(cx^n))}{1155}-\frac{3}{49}bd^2enx^7-\frac{1}{25}bd^3nx^5-\frac{1}{27}bde^2nx^9-\frac{1}{121}be^3nx^{11}$$

```
[Out] -(b*d^3*n*x^5)/25 - (3*b*d^2*e*n*x^7)/49 - (b*d*e^2*n*x^9)/27 - (b*e^3*n*x^
11)/121 + ((231*d^3*x^5 + 495*d^2*e*x^7 + 385*d*e^2*x^9 + 105*e^3*x^11)*(a
+ b*Log[c*x^n]))/1155
```

Rubi [A] time = 0.0875338, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{\left(495d^2ex^7+231d^3x^5+385de^2x^9+105e^3x^{11}\right)(a+b\log(cx^n))}{1155}-\frac{3}{49}bd^2enx^7-\frac{1}{25}bd^3nx^5-\frac{1}{27}bde^2nx^9-\frac{1}{121}be^3nx^{11}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```


```
[Out] -(b*d^3*n*x^5)/25 - (3*b*d^2*e*n*x^7)/49 - (b*d*e^2*n*x^9)/27 - (b*e^3*n*x^
11)/121 + ((231*d^3*x^5 + 495*d^2*e*x^7 + 385*d*e^2*x^9 + 105*e^3*x^11)*(a
+ b*Log[c*x^n]))/1155
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] && !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^4 \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx = \frac{\left(231d^3x^5+495d^2ex^7+385de^2x^9+105e^3x^{11}\right)(a+b\log(cx^n))}{1155} - (bn)\int \left(\frac{d^3x^4}{5}+\right.$$

$$= -\frac{1}{25}bd^3nx^5 - \frac{3}{49}bd^2enx^7 - \frac{1}{27}bde^2nx^9 - \frac{1}{121}be^3nx^{11} + \frac{\left(231d^3x^5+495d^2ex^7+38\right.}{}$$

Mathematica [A] time = 0.0471077, size = 133, normalized size = 1.33

$$\frac{3}{7}d^2ex^7(a+b\log(cx^n)) + \frac{1}{5}d^3x^5(a+b\log(cx^n)) + \frac{1}{3}de^2x^9(a+b\log(cx^n)) + \frac{1}{11}e^3x^{11}(a+b\log(cx^n)) - \frac{3}{49}bd^2enx^7 - \frac{1}{25}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^5)/25 - (3*b*d^2*e*n*x^7)/49 - (b*d*e^2*n*x^9)/27 - (b*e^3*n*x^
11)/121 + (d^3*x^5*(a + b*Log[c*x^n]))/5 + (3*d^2*e*x^7*(a + b*Log[c*x^n]))
/7 + (d*e^2*x^9*(a + b*Log[c*x^n]))/3 + (e^3*x^11*(a + b*Log[c*x^n]))/11
```

Maple [C] time = 0.207, size = 602, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(e*x^2+d)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 3/7*a*d^2*e*x^7+1/3*a*d*e^2*x^9-3/14*I*Pi*b*d^2*e*x^7*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)+3/7*ln(c)*b*d^2*e*x^7+1/3*ln(c)*b*d*e^2*x^9+1/6*I*Pi*b*d*e^2
*x^9*csgn(I*x^n)*csgn(I*c*x^n)^2+3/14*I*Pi*b*d^2*e*x^7*csgn(I*c*x^n)^2*csgn
(I*c)-1/22*I*Pi*b*e^3*x^11*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/14*I*Pi*b*
d^2*e*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2-1/10*I*Pi*b*d^3*x^5*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)+1/6*I*Pi*b*d*e^2*x^9*csgn(I*c*x^n)^2*csgn(I*c)+1/5*a*d^3
*x^5+1/1155*b*x^5*(105*e^3*x^6+385*d*e^2*x^4+495*d^2*e*x^2+231*d^3)*ln(x^n)
-1/22*I*Pi*b*e^3*x^11*csgn(I*c*x^n)^3-1/10*I*Pi*b*d^3*x^5*csgn(I*c*x^n)^3+1
/5*ln(c)*b*d^3*x^5+1/11*ln(c)*b*e^3*x^11+1/11*a*e^3*x^11+1/10*I*Pi*b*d^3*x^
5*csgn(I*x^n)*csgn(I*c*x^n)^2-3/14*I*Pi*b*d^2*e*x^7*csgn(I*c*x^n)^3-3/49*b*
d^2*e*n*x^7-1/27*b*d*e^2*n*x^9-1/6*I*Pi*b*d*e^2*x^9*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+1/22*I*Pi*b*e^3*x^11*csgn(I*x^n)*csgn(I*c*x^n)^2+1/22*I*Pi*b*e
```

```
^3*x^11*csgn(I*c*x^n)^2*csgn(I*c)+1/10*I*Pi*b*d^3*x^5*csgn(I*c*x^n)^2*csgn(
I*c)-1/6*I*Pi*b*d*e^2*x^9*csgn(I*c*x^n)^3-1/25*b*d^3*n*x^5-1/121*b*e^3*n*x^
11
```

Maxima [A] time = 1.14965, size = 193, normalized size = 1.93

$$-\frac{1}{121}\,be^3nx^{11}+\frac{1}{11}\,be^3x^{11}\log\left(cx^n\right)+\frac{1}{11}\,ae^3x^{11}-\frac{1}{27}\,bde^2nx^9+\frac{1}{3}\,bde^2x^9\log\left(cx^n\right)+\frac{1}{3}\,ade^2x^9-\frac{3}{49}\,bd^2enx^7+\frac{3}{7}\,bd^2ex^7$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/121*b*e^3*n*x^11 + 1/11*b*e^3*x^11*log(c*x^n) + 1/11*a*e^3*x^11 - 1/27*b
*d*e^2*n*x^9 + 1/3*b*d*e^2*x^9*log(c*x^n) + 1/3*a*d*e^2*x^9 - 3/49*b*d^2*e*
n*x^7 + 3/7*b*d^2*e*x^7*log(c*x^n) + 3/7*a*d^2*e*x^7 - 1/25*b*d^3*n*x^5 + 1
/5*b*d^3*x^5*log(c*x^n) + 1/5*a*d^3*x^5
```

Fricas [A] time = 1.4723, size = 423, normalized size = 4.23

$$-\frac{1}{121}\left(be^3n-11\,ae^3\right)x^{11}-\frac{1}{27}\left(bde^2n-9\,ade^2\right)x^9-\frac{3}{49}\left(bd^2en-7\,ad^2e\right)x^7-\frac{1}{25}\left(bd^3n-5\,ad^3\right)x^5+\frac{1}{1155}\left(105\,be^3x^{11}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/121*(b*e^3*n - 11*a*e^3)*x^11 - 1/27*(b*d*e^2*n - 9*a*d*e^2)*x^9 - 3/49*
(b*d^2*e*n - 7*a*d^2*e)*x^7 - 1/25*(b*d^3*n - 5*a*d^3)*x^5 + 1/1155*(105*b*
e^3*x^11 + 385*b*d*e^2*x^9 + 495*b*d^2*e*x^7 + 231*b*d^3*x^5)*log(c) + 1/11
55*(105*b*e^3*n*x^11 + 385*b*d*e^2*n*x^9 + 495*b*d^2*e*n*x^7 + 231*b*d^3*n*
x^5)*log(x)
```

Sympy [B] time = 42.5899, size = 223, normalized size = 2.23

$$\frac{ad^3x^5}{5}+\frac{3ad^2ex^7}{7}+\frac{ade^2x^9}{3}+\frac{ae^3x^{11}}{11}+\frac{bd^3nx^5\log\left(x\right)}{5}-\frac{bd^3nx^5}{25}+\frac{bd^3x^5\log\left(c\right)}{5}+\frac{3bd^2enx^7\log\left(x\right)}{7}-\frac{3bd^2enx^7}{49}+\frac{3bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**5/5 + 3*a*d**2*e*x**7/7 + a*d*e**2*x**9/3 + a*e**3*x**11/11 + b*d
**3*n*x**5*log(x)/5 - b*d**3*n*x**5/25 + b*d**3*x**5*log(c)/5 + 3*b*d**2*e*
n*x**7*log(x)/7 - 3*b*d**2*e*n*x**7/49 + 3*b*d**2*e*x**7*log(c)/7 + b*d*e**
2*n*x**9*log(x)/3 - b*d*e**2*n*x**9/27 + b*d*e**2*x**9*log(c)/3 + b*e**3*n*
x**11*log(x)/11 - b*e**3*n*x**11/121 + b*e**3*x**11*log(c)/11
```

Giac [A] time = 1.28929, size = 234, normalized size = 2.34

$$\frac{1}{11}\,bnx^{11}e^3\log(x) - \frac{1}{121}\,bnx^{11}e^3 + \frac{1}{11}\,bx^{11}e^3\log(c) + \frac{1}{3}\,bdnx^9e^2\log(x) + \frac{1}{11}\,ax^{11}e^3 - \frac{1}{27}\,bdnx^9e^2 + \frac{1}{3}\,bdx^9e^2\log(c) + \frac{3}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/11*b*n*x^11*e^3*log(x) - 1/121*b*n*x^11*e^3 + 1/11*b*x^11*e^3*log(c) + 1/
3*b*d*n*x^9*e^2*log(x) + 1/11*a*x^11*e^3 - 1/27*b*d*n*x^9*e^2 + 1/3*b*d*x^9
*e^2*log(c) + 3/7*b*d^2*n*x^7*e*log(x) + 1/3*a*d*x^9*e^2 - 3/49*b*d^2*n*x^7
*e + 3/7*b*d^2*x^7*e*log(c) + 3/7*a*d^2*x^7*e + 1/5*b*d^3*n*x^5*log(x) - 1/
25*b*d^3*n*x^5 + 1/5*b*d^3*x^5*log(c) + 1/5*a*d^3*x^5
```

3.203 $\int x^2 \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=100

$$\frac{1}{315}\left(189d^2ex^5+105d^3x^3+135de^2x^7+35e^3x^9\right)(a+b\log(cx^n))-\frac{3}{25}bd^2enx^5-\frac{1}{9}bd^3nx^3-\frac{3}{49}bde^2nx^7-\frac{1}{81}be^3nx^9$$

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^5)/25 - (3*b*d*e^2*n*x^7)/49 - (b*e^3*n*x
^9)/81 + ((105*d^3*x^3 + 189*d^2*e*x^5 + 135*d*e^2*x^7 + 35*e^3*x^9)*(a + b
*Log[c*x^n]))/315
```

Rubi [A] time = 0.0865099, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$\frac{1}{315}\left(189d^2ex^5+105d^3x^3+135de^2x^7+35e^3x^9\right)(a+b\log(cx^n))-\frac{3}{25}bd^2enx^5-\frac{1}{9}bd^3nx^3-\frac{3}{49}bde^2nx^7-\frac{1}{81}be^3nx^9$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^5)/25 - (3*b*d*e^2*n*x^7)/49 - (b*e^3*n*x
^9)/81 + ((105*d^3*x^3 + 189*d^2*e*x^5 + 135*d*e^2*x^7 + 35*e^3*x^9)*(a + b
*Log[c*x^n]))/315
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int x^2 \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx = \frac{1}{315}\left(105d^3x^3+189d^2ex^5+135de^2x^7+35e^3x^9\right)(a+b\log(cx^n))-(bn)\int\left(\frac{d^3x^2}{3}+\right.$$
$$= -\frac{1}{9}bd^3nx^3-\frac{3}{25}bd^2enx^5-\frac{3}{49}bde^2nx^7-\frac{1}{81}be^3nx^9+\frac{1}{315}\left(105d^3x^3+189d^2ex^5+1\right.$$

Mathematica [A] time = 0.0469742, size = 133, normalized size = 1.33

$$\frac{3}{5}d^2ex^5(a+b\log(cx^n))+\frac{1}{3}d^3x^3(a+b\log(cx^n))+\frac{3}{7}de^2x^7(a+b\log(cx^n))+\frac{1}{9}e^3x^9(a+b\log(cx^n))-\frac{3}{25}bd^2enx^5-\frac{1}{9}bd$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^3)/9 - (3*b*d^2*e*n*x^5)/25 - (3*b*d*e^2*n*x^7)/49 - (b*e^3*n*x
^9)/81 + (d^3*x^3*(a + b*Log[c*x^n]))/3 + (3*d^2*e*x^5*(a + b*Log[c*x^n]))/
5 + (3*d*e^2*x^7*(a + b*Log[c*x^n]))/7 + (e^3*x^9*(a + b*Log[c*x^n]))/9
```

Maple [C] time = 0.213, size = 602, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 3/14*I*Pi*b*d*e^2*x^7*csgn(I*c*x^n)^2*csgn(I*c)-3/14*I*Pi*b*d*e^2*x^7*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/7*a*d*e^2*x^7-3/10*I*Pi*b*d^2*e*x^5*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/5*a*d^2*e*x^5+3/14*I*Pi*b*d*e^2*x^7*csgn(I*
x^n)*csgn(I*c*x^n)^2+3/5*ln(c)*b*d^2*e*x^5+1/3*ln(c)*b*d^3*x^3-1/6*I*Pi*b*d
^3*x^3*csgn(I*c*x^n)^3-1/18*I*Pi*b*e^3*x^9*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+3/7*ln(c)*b*d*e^2*x^7+3/10*I*Pi*b*d^2*e*x^5*csgn(I*x^n)*csgn(I*c*x^n)^2
-1/6*I*Pi*b*d^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/315*b*x^3*(35*e^3
*x^6+135*d*e^2*x^4+189*d^2*e*x^2+105*d^3)*ln(x^n)-1/18*I*Pi*b*e^3*x^9*csgn(
I*c*x^n)^3+1/9*ln(c)*b*e^3*x^9+3/10*I*Pi*b*d^2*e*x^5*csgn(I*c*x^n)^2*csgn(I
*c)+1/3*a*d^3*x^3-3/10*I*Pi*b*d^2*e*x^5*csgn(I*c*x^n)^3+1/9*a*e^3*x^9+1/6*I
*Pi*b*d^3*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/6*I*Pi*b*d^3*x^3*csgn(I*c*x^n)^
2*csgn(I*c)-3/49*b*d*e^2*n*x^7+1/18*I*Pi*b*e^3*x^9*csgn(I*c*x^n)^2*csgn(I*c
)-3/14*I*Pi*b*d*e^2*x^7*csgn(I*c*x^n)^3-1/9*b*d^3*n*x^3-3/25*b*d^2*e*n*x^5+
```

```
1/18*I*Pi*b*e^3*x^9*csgn(I*x^n)*csgn(I*c*x^n)^2-1/81*b*e^3*n*x^9
```

Maxima [A] time = 1.03093, size = 193, normalized size = 1.93

$$-\frac{1}{81}be^3nx^9+\frac{1}{9}be^3x^9\log(cx^n)+\frac{1}{9}ae^3x^9-\frac{3}{49}bde^2nx^7+\frac{3}{7}bde^2x^7\log(cx^n)+\frac{3}{7}ade^2x^7-\frac{3}{25}bd^2enx^5+\frac{3}{5}bd^2ex^5\log($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/81*b*e^3*n*x^9 + 1/9*b*e^3*x^9*log(c*x^n) + 1/9*a*e^3*x^9 - 3/49*b*d*e^2
*n*x^7 + 3/7*b*d*e^2*x^7*log(c*x^n) + 3/7*a*d*e^2*x^7 - 3/25*b*d^2*e*n*x^5
+ 3/5*b*d^2*e*x^5*log(c*x^n) + 3/5*a*d^2*e*x^5 - 1/9*b*d^3*n*x^3 + 1/3*b*d^
3*x^3*log(c*x^n) + 1/3*a*d^3*x^3
```

Fricas [A] time = 1.34886, size = 409, normalized size = 4.09

$$-\frac{1}{81}\left(be^3n-9\,ae^3\right)x^9-\frac{3}{49}\left(bde^2n-7\,ade^2\right)x^7-\frac{3}{25}\left(bd^2en-5\,ad^2e\right)x^5-\frac{1}{9}\left(bd^3n-3\,ad^3\right)x^3+\frac{1}{315}\left(35\,be^3x^9+135\,bde\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/81*(b*e^3*n - 9*a*e^3)*x^9 - 3/49*(b*d*e^2*n - 7*a*d*e^2)*x^7 - 3/25*(b*
d^2*e*n - 5*a*d^2*e)*x^5 - 1/9*(b*d^3*n - 3*a*d^3)*x^3 + 1/315*(35*b*e^3*x^
9 + 135*b*d*e^2*x^7 + 189*b*d^2*e*x^5 + 105*b*d^3*x^3)*log(c) + 1/315*(35*b
*e^3*n*x^9 + 135*b*d*e^2*n*x^7 + 189*b*d^2*e*n*x^5 + 105*b*d^3*n*x^3)*log(x
)
```

Sympy [B] time = 20.5486, size = 230, normalized size = 2.3

$$\frac{ad^3x^3}{3}+\frac{3ad^2ex^5}{5}+\frac{3ade^2x^7}{7}+\frac{ae^3x^9}{9}+\frac{bd^3nx^3\log(x)}{3}-\frac{bd^3nx^3}{9}+\frac{bd^3x^3\log(c)}{3}+\frac{3bd^2enx^5\log(x)}{5}-\frac{3bd^2enx^5}{25}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x**3/3 + 3*a*d**2*e*x**5/5 + 3*a*d*e**2*x**7/7 + a*e**3*x**9/9 + b*d
**3*n*x**3*log(x)/3 - b*d**3*n*x**3/9 + b*d**3*x**3*log(c)/3 + 3*b*d**2*e*n
*x**5*log(x)/5 - 3*b*d**2*e*n*x**5/25 + 3*b*d**2*e*x**5*log(c)/5 + 3*b*d*e*
*2*n*x**7*log(x)/7 - 3*b*d*e**2*n*x**7/49 + 3*b*d*e**2*x**7*log(c)/7 + b*e*
*3*n*x**9*log(x)/9 - b*e**3*n*x**9/81 + b*e**3*x**9*log(c)/9
```

Giac [A] time = 1.31562, size = 234, normalized size = 2.34

$$\frac{1}{9}\,bnx^9e^3\log\left(x\right)-\frac{1}{81}\,bnx^9e^3+\frac{1}{9}\,bx^9e^3\log\left(c\right)+\frac{3}{7}\,bdnx^7e^2\log\left(x\right)+\frac{1}{9}\,ax^9e^3-\frac{3}{49}\,bdnx^7e^2+\frac{3}{7}\,bdx^7e^2\log\left(c\right)+\frac{3}{5}\,bd^2nx^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*b*n*x^9*e^3*log(x) - 1/81*b*n*x^9*e^3 + 1/9*b*x^9*e^3*log(c) + 3/7*b*d*
n*x^7*e^2*log(x) + 1/9*a*x^9*e^3 - 3/49*b*d*n*x^7*e^2 + 3/7*b*d*x^7*e^2*log
(c) + 3/5*b*d^2*n*x^5*e*log(x) + 3/7*a*d*x^7*e^2 - 3/25*b*d^2*n*x^5*e + 3/5
*b*d^2*x^5*e*log(c) + 3/5*a*d^2*x^5*e + 1/3*b*d^3*n*x^3*log(x) - 1/9*b*d^3*
n*x^3 + 1/3*b*d^3*x^3*log(c) + 1/3*a*d^3*x^3
```

3.204 $\int \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=121

$$d^2ex^3(a+b\log(cx^n))+d^3x(a+b\log(cx^n))+\frac{3}{5}de^2x^5(a+b\log(cx^n))+\frac{1}{7}e^3x^7(a+b\log(cx^n))-\frac{1}{3}bd^2enx^3-bd^3nx-$$

```
[Out] -(b*d^3*n*x) - (b*d^2*e*n*x^3)/3 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x^7)/49
+ d^3*x*(a + b*Log[c*x^n]) + d^2*e*x^3*(a + b*Log[c*x^n]) + (3*d*e^2*x^5*(a
 + b*Log[c*x^n]))/5 + (e^3*x^7*(a + b*Log[c*x^n]))/7
```

Rubi [A] time = 0.0479855, antiderivative size = 94, normalized size of antiderivative = 0.78, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {194, 2313}

$$\frac{1}{35}\left(35d^2ex^3+35d^3x+21de^2x^5+5e^3x^7\right)(a+b\log(cx^n))-\frac{1}{3}bd^2enx^3-bd^3nx-\frac{3}{25}bde^2nx^5-\frac{1}{49}be^3nx^7$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x) - (b*d^2*e*n*x^3)/3 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x^7)/49
+ ((35*d^3*x + 35*d^2*e*x^3 + 21*d*e^2*x^5 + 5*e^3*x^7)*(a + b*Log[c*x^n]))
/35
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx = \frac{1}{35}\left(35d^3x+35d^2ex^3+21de^2x^5+5e^3x^7\right)(a+b\log(cx^n))-(bn)\int\left(d^3+d^2ex^2+\frac{3}{5}d\right.$$
$$= -bd^3nx-\frac{1}{3}bd^2enx^3-\frac{3}{25}bde^2nx^5-\frac{1}{49}be^3nx^7+\frac{1}{35}\left(35d^3x+35d^2ex^3+21de^2x^5+5e\right.$$

Mathematica [A] time = 0.044881, size = 124, normalized size = 1.02

$$d^2ex^3(a+b\log(cx^n))+\frac{3}{5}de^2x^5(a+b\log(cx^n))+\frac{1}{7}e^3x^7(a+b\log(cx^n))+ad^3x+bd^3x\log(cx^n)-\frac{1}{3}bd^2enx^3-bd^3nx-$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] a*d^3*x - b*d^3*n*x - (b*d^2*e*n*x^3)/3 - (3*b*d*e^2*n*x^5)/25 - (b*e^3*n*x
^7)/49 + b*d^3*x*Log[c*x^n] + d^2*e*x^3*(a + b*Log[c*x^n]) + (3*d*e^2*x^5*(
a + b*Log[c*x^n]))/5 + (e^3*x^7*(a + b*Log[c*x^n]))/7
```

Maple [C] time = 0.201, size = 582, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] ln(c)*b*d^2*e*x^3-1/2*I*Pi*b*d^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
3/10*I*Pi*b*d*e^2*x^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/5*a*d*e^2*x^5+a
*d^2*e*x^3+3/5*ln(c)*b*d*e^2*x^5+1/7*a*e^3*x^7+a*d^3*x+3/10*I*Pi*b*d*e^2*x^
5*csgn(I*x^n)*csgn(I*c*x^n)^2-1/14*I*Pi*b*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)+1/2*I*Pi*b*d^2*e*x^3*csgn(I*c*x^n)^2*csgn(I*c)+1/7*ln(c)*b*e^3*x
^7+3/10*I*Pi*b*d*e^2*x^5*csgn(I*c*x^n)^2*csgn(I*c)+1/35*b*x*(5*e^3*x^6+21*d
*e^2*x^4+35*d^2*e*x^2+35*d^3)*ln(x^n)-1/2*I*Pi*b*d^3*csgn(I*c*x^n)^3*x-1/2*
I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x+ln(c)*b*d^3*x+1/2*I*Pi*b*d
^2*e*x^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1/14*I*Pi*b*e^3*x^7*csgn(I*c*x^n)^3+1/
2*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)*x+1/2*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*
c*x^n)^2*x-b*d^3*n*x-1/2*I*Pi*b*d^2*e*x^3*csgn(I*c*x^n)^3+1/14*I*Pi*b*e^3*x
^7*csgn(I*c*x^n)^2*csgn(I*c)-3/10*I*Pi*b*d*e^2*x^5*csgn(I*c*x^n)^3+1/14*I*P
i*b*e^3*x^7*csgn(I*x^n)*csgn(I*c*x^n)^2-1/49*b*e^3*n*x^7-3/25*b*d*e^2*n*x^5
```

```
-1/3*b*d^2*e*n*x^3
```

Maxima [A] time = 1.02537, size = 180, normalized size = 1.49

$$-\frac{1}{49}be^3nx^7+\frac{1}{7}be^3x^7\log\left(cx^n\right)+\frac{1}{7}ae^3x^7-\frac{3}{25}bde^2nx^5+\frac{3}{5}bde^2x^5\log\left(cx^n\right)+\frac{3}{5}ade^2x^5-\frac{1}{3}bd^2enx^3+bd^2ex^3\log\left(cx^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] -1/49*b*e^3*n*x^7 + 1/7*b*e^3*x^7*log(c*x^n) + 1/7*a*e^3*x^7 - 3/25*b*d*e^2
*n*x^5 + 3/5*b*d*e^2*x^5*log(c*x^n) + 3/5*a*d*e^2*x^5 - 1/3*b*d^2*e*n*x^3 +
 b*d^2*e*x^3*log(c*x^n) + a*d^2*e*x^3 - b*d^3*n*x + b*d^3*x*log(c*x^n) + a*
d^3*x
```

Fricas [A] time = 1.32004, size = 378, normalized size = 3.12

$$-\frac{1}{49}\left(be^3n-7\,ae^3\right)x^7-\frac{3}{25}\left(bde^2n-5\,ade^2\right)x^5-\frac{1}{3}\left(bd^2en-3\,ad^2e\right)x^3-\left(bd^3n-ad^3\right)x+\frac{1}{35}\left(5\,be^3x^7+21\,bde^2x^5+35\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] -1/49*(b*e^3*n - 7*a*e^3)*x^7 - 3/25*(b*d*e^2*n - 5*a*d*e^2)*x^5 - 1/3*(b*d
^2*e*n - 3*a*d^2*e)*x^3 - (b*d^3*n - a*d^3)*x + 1/35*(5*b*e^3*x^7 + 21*b*d*
e^2*x^5 + 35*b*d^2*e*x^3 + 35*b*d^3*x)*log(c) + 1/35*(5*b*e^3*n*x^7 + 21*b*
d*e^2*n*x^5 + 35*b*d^2*e*n*x^3 + 35*b*d^3*n*x)*log(x)
```

Sympy [A] time = 8.74092, size = 204, normalized size = 1.69

$$ad^3x+ad^2ex^3+\frac{3ade^2x^5}{5}+\frac{ae^3x^7}{7}+bd^3nx\log\left(x\right)-bd^3nx+bd^3x\log\left(c\right)+bd^2enx^3\log\left(x\right)-\frac{bd^2enx^3}{3}+bd^2ex^3\log\left(c\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x + a*d**2*e*x**3 + 3*a*d*e**2*x**5/5 + a*e**3*x**7/7 + b*d**3*n*x*l
og(x) - b*d**3*n*x + b*d**3*x*log(c) + b*d**2*e*n*x**3*log(x) - b*d**2*e*n*
x**3/3 + b*d**2*e*x**3*log(c) + 3*b*d*e**2*n*x**5*log(x)/5 - 3*b*d*e**2*n*x
**5/25 + 3*b*d*e**2*x**5*log(c)/5 + b*e**3*n*x**7*log(x)/7 - b*e**3*n*x**7/
49 + b*e**3*x**7*log(c)/7
```

Giac [A] time = 1.311, size = 215, normalized size = 1.78

$$\frac{1}{7}bnx^7e^3\log(x) - \frac{1}{49}bnx^7e^3 + \frac{1}{7}bx^7e^3\log(c) + \frac{3}{5}bdnx^5e^2\log(x) + \frac{1}{7}ax^7e^3 - \frac{3}{25}bdnx^5e^2 + \frac{3}{5}bdx^5e^2\log(c) + bd^2nx^3e\,\mathrm{l}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/7*b*n*x^7*e^3*log(x) - 1/49*b*n*x^7*e^3 + 1/7*b*x^7*e^3*log(c) + 3/5*b*d*
n*x^5*e^2*log(x) + 1/7*a*x^7*e^3 - 3/25*b*d*n*x^5*e^2 + 3/5*b*d*x^5*e^2*log
(c) + b*d^2*n*x^3*e*log(x) + 3/5*a*d*x^5*e^2 - 1/3*b*d^2*n*x^3*e + b*d^2*x^
3*e*log(c) + a*d^2*x^3*e + b*d^3*n*x*log(x) - b*d^3*n*x + b*d^3*x*log(c) +
a*d^3*x
```

3.205 $\int \frac{(d+ex^2)^3(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=118

$$3d^2ex\left(a+b\log\left(cx^n\right)\right)-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{x}+de^2x^3\left(a+b\log\left(cx^n\right)\right)+\frac{1}{5}e^3x^5\left(a+b\log\left(cx^n\right)\right)-3bd^2enx-\frac{bd^3n}{x}-\frac{1}{3}bd$$

```
[Out] -((b*d^3*n)/x) - 3*b*d^2*e*n*x - (b*d*e^2*n*x^3)/3 - (b*e^3*n*x^5)/25 - (d^
3*(a + b*Log[c*x^n]))/x + 3*d^2*e*x*(a + b*Log[c*x^n]) + d*e^2*x^3*(a + b*L
og[c*x^n]) + (e^3*x^5*(a + b*Log[c*x^n]))/5
```

Rubi [A] time = 0.0823846, antiderivative size = 92, normalized size of antiderivative = 0.78, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{5}\left(-15d^2ex+\frac{5d^3}{x}-5de^2x^3-e^3x^5\right)\left(a+b\log\left(cx^n\right)\right)-3bd^2enx-\frac{bd^3n}{x}-\frac{1}{3}bde^2nx^3-\frac{1}{25}be^3nx^5$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^3*n)/x) - 3*b*d^2*e*n*x - (b*d*e^2*n*x^3)/3 - (b*e^3*n*x^5)/25 - (((
5*d^3)/x - 15*d^2*e*x - 5*d*e^2*x^3 - e^3*x^5)*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^2} dx = -\frac{1}{5}\left(\frac{5d^3}{x} - 15d^2ex - 5de^2x^3 - e^3x^5\right)(a+b\log(cx^n)) - (bn)\int \left(3d^2e - \frac{d^3}{x^2} + de^2x^2 + \right.$$

$$= -\frac{bd^3n}{x} - 3bd^2enx - \frac{1}{3}bde^2nx^3 - \frac{1}{25}be^3nx^5 - \frac{1}{5}\left(\frac{5d^3}{x} - 15d^2ex - 5de^2x^3 - e^3x^5\right)(a+$$

Mathematica [A] time = 0.055613, size = 123, normalized size = 1.04

$$-\frac{d^3(a+b\log(cx^n))}{x} + de^2x^3(a+b\log(cx^n)) + \frac{1}{5}e^3x^5(a+b\log(cx^n)) + 3ad^2ex + 3bd^2ex\log(cx^n) - 3bd^2enx - \frac{bd^3n}{x} -$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^3*n)/x) + 3*a*d^2*e*x - 3*b*d^2*e*n*x - (b*d*e^2*n*x^3)/3 - (b*e^3*n
*x^5)/25 + 3*b*d^2*e*x*Log[c*x^n] - (d^3*(a + b*Log[c*x^n]))/x + d*e^2*x^3*
(a + b*Log[c*x^n]) + (e^3*x^5*(a + b*Log[c*x^n]))/5
```

Maple [C] time = 0.238, size = 587, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x^2,x)
```

```
[Out] -1/5*b*(-e^3*x^6-5*d*e^2*x^4-15*d^2*e*x^2+5*d^3)/x*ln(x^n)-1/150*(-150*ln(c
)*b*d*e^2*x^4+150*a*d^3-450*a*d^2*e*x^2-450*ln(c)*b*d^2*e*x^2-150*a*d*e^2*x
^4+150*ln(c)*b*d^3-30*ln(c)*b*e^3*x^6-75*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(
I*c*x^n)^2-75*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+15*I*Pi*b*e^3*x^6*
csgn(I*c*x^n)^3-75*I*Pi*b*d^3*csgn(I*c*x^n)^3+15*I*Pi*b*e^3*x^6*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-225*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+7
5*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+75*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn
(I*c)-225*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-30*a*e^3*x^6+150*b*d^3
*n+225*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3+225*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+75*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-15*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)+75*I*Pi*b*d*e^2*x^4*csgn(I*c
*x^n)^3-75*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-15*I*Pi*b*e^3*x^6
```

```
*csgn(I*x^n)*csgn(I*c*x^n)^2+6*b*e^3*n*x^6+50*b*d*e^2*n*x^4+450*b*d^2*e*n*x
^2)/x
```

Maxima [A] time = 1.00805, size = 182, normalized size = 1.54

$$-\frac{1}{25}\,be^3nx^5+\frac{1}{5}\,be^3x^5\log\left(cx^n\right)+\frac{1}{5}\,ae^3x^5-\frac{1}{3}\,bde^2nx^3+bde^2x^3\log\left(cx^n\right)+ade^2x^3-3\,bd^2enx+3\,bd^2ex\log\left(cx^n\right)+3\,a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] -1/25*b*e^3*n*x^5 + 1/5*b*e^3*x^5*log(c*x^n) + 1/5*a*e^3*x^5 - 1/3*b*d*e^2*
n*x^3 + b*d*e^2*x^3*log(c*x^n) + a*d*e^2*x^3 - 3*b*d^2*e*n*x + 3*b*d^2*e*x*
log(c*x^n) + 3*a*d^2*e*x - b*d^3*n/x - b*d^3*log(c*x^n)/x - a*d^3/x
```

Fricas [A] time = 1.28806, size = 362, normalized size = 3.07

$$-\frac{3\left(be^3n-5\,ae^3\right)x^6+75\,bd^3n+25\left(bde^2n-3\,ade^2\right)x^4+75\,ad^3+225\left(bd^2en-ad^2e\right)x^2-15\left(be^3x^6+5\,bde^2x^4+15\,bd^2\right.}{75\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -1/75*(3*(b*e^3*n - 5*a*e^3)*x^6 + 75*b*d^3*n + 25*(b*d*e^2*n - 3*a*d*e^2)*
x^4 + 75*a*d^3 + 225*(b*d^2*e*n - a*d^2*e)*x^2 - 15*(b*e^3*x^6 + 5*b*d*e^2*
x^4 + 15*b*d^2*e*x^2 - 5*b*d^3)*log(c) - 15*(b*e^3*n*x^6 + 5*b*d*e^2*n*x^4
+ 15*b*d^2*e*n*x^2 - 5*b*d^3*n)*log(x))/x
```

Sympy [A] time = 9.0539, size = 190, normalized size = 1.61

$$-\frac{ad^3}{x}+3ad^2ex+ade^2x^3+\frac{ae^3x^5}{5}-\frac{bd^3n\log\left(x\right)}{x}-\frac{bd^3n}{x}-\frac{bd^3\log\left(c\right)}{x}+3bd^2enx\log\left(x\right)-3bd^2enx+3bd^2ex\log\left(c\right)+b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*x + a*d*e**2*x**3 + a*e**3*x**5/5 - b*d**3*n*log(x)/
x - b*d**3*n/x - b*d**3*log(c)/x + 3*b*d**2*e*n*x*log(x) - 3*b*d**2*e*n*x +
 3*b*d**2*e*x*log(c) + b*d*e**2*n*x**3*log(x) - b*d*e**2*n*x**3/3 + b*d*e**
2*x**3*log(c) + b*e**3*n*x**5*log(x)/5 - b*e**3*n*x**5/25 + b*e**3*x**5*log
(c)/5
```

Giac [A] time = 1.31192, size = 224, normalized size = 1.9

$$\frac{15\,bnx^6e^3\log(x) - 3\,bnx^6e^3 + 15\,bx^6e^3\log(c) + 75\,bdnx^4e^2\log(x) + 15\,ax^6e^3 - 25\,bdnx^4e^2 + 75\,bdx^4e^2\log(c) + 225\,bd^2 \cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] 1/75*(15*b*n*x^6*e^3*log(x) - 3*b*n*x^6*e^3 + 15*b*x^6*e^3*log(c) + 75*b*d*
n*x^4*e^2*log(x) + 15*a*x^6*e^3 - 25*b*d*n*x^4*e^2 + 75*b*d*x^4*e^2*log(c)
+ 225*b*d^2*n*x^2*e*log(x) + 75*a*d*x^4*e^2 - 225*b*d^2*n*x^2*e + 225*b*d^2
*x^2*e*log(c) + 225*a*d^2*x^2*e - 75*b*d^3*n*log(x) - 75*b*d^3*n - 75*b*d^3
*log(c) - 75*a*d^3)/x
```

3.206 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^4} dx$

Optimal. Leaf size=121

$$-\frac{3d^2e\,(a+b\log(cx^n))}{x}-\frac{d^3\,(a+b\log(cx^n))}{3x^3}+3de^2x\,(a+b\log(cx^n))+\frac{1}{3}e^3x^3\,(a+b\log(cx^n))-\frac{3bd^2en}{x}-\frac{bd^3n}{9x^3}-3bd$$

```
[Out] -(b*d^3*n)/(9*x^3) - (3*b*d^2*e*n)/x - 3*b*d*e^2*n*x - (b*e^3*n*x^3)/9 - (d
^3*(a + b*Log[c*x^n]))/(3*x^3) - (3*d^2*e*(a + b*Log[c*x^n]))/x + 3*d*e^2*x
*(a + b*Log[c*x^n]) + (e^3*x^3*(a + b*Log[c*x^n]))/3
```

Rubi [A] time = 0.0910002, antiderivative size = 91, normalized size of antiderivative = 0.75, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {270, 2334, 12}

$$-\frac{1}{3}\left(\frac{9d^2e}{x}+\frac{d^3}{x^3}-9de^2x-e^3x^3\right)(a+b\log(cx^n))-\frac{3bd^2en}{x}-\frac{bd^3n}{9x^3}-3bde^2nx-\frac{1}{9}be^3nx^3$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^3*n)/(9*x^3) - (3*b*d^2*e*n)/x - 3*b*d*e^2*n*x - (b*e^3*n*x^3)/9 - ((
d^3/x^3 + (9*d^2*e)/x - 9*d*e^2*x - e^3*x^3)*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x^4}\,dx = -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{9d^2e}{x}-9de^2x-e^3x^3\right)(a+b\log(cx^n))-(bn)\int\frac{1}{3}\left(9de^2-\frac{d^3}{x^4}-\frac{9d^2e}{x^2}+e^3x\right.$$
$$= -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{9d^2e}{x}-9de^2x-e^3x^3\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int\left(9de^2-\frac{d^3}{x^4}-\frac{9d^2e}{x^2}+e^3x\right.$$
$$= -\frac{bd^3n}{9x^3}-\frac{3bd^2en}{x}-3bde^2nx-\frac{1}{9}be^3nx^3-\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{9d^2e}{x}-9de^2x-e^3x^3\right)(a+b\log(cx$$

Mathematica [A] time = 0.0539169, size = 112, normalized size = 0.93

$$-\frac{3a\left(9d^2ex^2+d^3-9de^2x^4-e^3x^6\right)+3b\left(9d^2ex^2+d^3-9de^2x^4-e^3x^6\right)\log(cx^n)+bn\left(27d^2ex^2+d^3+27de^2x^4+e^3x^6\right)}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(3*a*(d^3 + 9*d^2*e*x^2 - 9*d*e^2*x^4 - e^3*x^6) + b*n*(d^3 + 27*d^2*e*x^2
 + 27*d*e^2*x^4 + e^3*x^6) + 3*b*(d^3 + 9*d^2*e*x^2 - 9*d*e^2*x^4 - e^3*x^6
)*Log[c*x^n])/(9*x^3)
```

Maple [C] time = 0.23, size = 585, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x^4,x)
```

```
[Out] -1/3*b*(-e^3*x^6-9*d*e^2*x^4+9*d^2*e*x^2+d^3)/x^3*ln(x^n)-1/18*(-54*ln(c)*b
*d*e^2*x^4+6*a*d^3+54*a*d^2*e*x^2-3*I*Pi*b*d^3*csgn(I*c*x^n)^3+54*ln(c)*b*d
^2*e*x^2-54*a*d*e^2*x^4+6*ln(c)*b*d^3+27*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*c
sgn(I*c)-27*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-6*ln(c)*b*e^3*x^6+3*
```

```
I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-27*I*Pi*b*d*e^2*x^4*csgn
(I*x^n)*csgn(I*c*x^n)^2+27*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I
*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+27*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)+3*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*e^3*x^6*
csgn(I*c*x^n)^3-6*a*e^3*x^6-27*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)+2*b*d^3*n+2*b*e^3*n*x^6-27*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-3*I*Pi
*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+27*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n
)^3-3*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*e^3*x^6*csgn(I*c*
x^n)^2*csgn(I*c)+54*b*d*e^2*n*x^4+54*b*d^2*e*n*x^2)/x^3
```

Maxima [A] time = 1.026, size = 185, normalized size = 1.53

$$-\frac{1}{9}\,be^3nx^3+\frac{1}{3}\,be^3x^3\log\left(cx^n\right)+\frac{1}{3}\,ae^3x^3-3\,bde^2nx+3\,bde^2x\log\left(cx^n\right)+3\,ade^2x-\frac{3\,bd^2en}{x}-\frac{3\,bd^2e\log\left(cx^n\right)}{x}-\frac{3\,ad^2e}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^3*n*x^3 + 1/3*b*e^3*x^3*log(c*x^n) + 1/3*a*e^3*x^3 - 3*b*d*e^2*n*x
 + 3*b*d*e^2*x*log(c*x^n) + 3*a*d*e^2*x - 3*b*d^2*e*n/x - 3*b*d^2*e*log(c*x
^n)/x - 3*a*d^2*e/x - 1/9*b*d^3*n/x^3 - 1/3*b*d^3*log(c*x^n)/x^3 - 1/3*a*d^
3/x^3
```

Fricas [A] time = 1.31218, size = 340, normalized size = 2.81

$$-\frac{\left(be^3n-3\,ae^3\right)x^6+bd^3n+27\left(bde^2n-ade^2\right)x^4+3\,ad^3+27\left(bd^2en+ad^2e\right)x^2-3\left(be^3x^6+9\,bde^2x^4-9\,bd^2ex^2-bd^3\right)}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*((b*e^3*n - 3*a*e^3)*x^6 + b*d^3*n + 27*(b*d*e^2*n - a*d*e^2)*x^4 + 3*
a*d^3 + 27*(b*d^2*e*n + a*d^2*e)*x^2 - 3*(b*e^3*x^6 + 9*b*d*e^2*x^4 - 9*b*d
^2*e*x^2 - b*d^3)*log(c) - 3*(b*e^3*n*x^6 + 9*b*d*e^2*n*x^4 - 9*b*d^2*e*n*x
^2 - b*d^3*n)*log(x))/x^3
```

Sympy [A] time = 9.09706, size = 202, normalized size = 1.67

$$-\frac{ad^3}{3x^3} - \frac{3ad^2e}{x} + 3ade^2x + \frac{ae^3x^3}{3} - \frac{bd^3n\log(x)}{3x^3} - \frac{bd^3n}{9x^3} - \frac{bd^3\log(c)}{3x^3} - \frac{3bd^2en\log(x)}{x} - \frac{3bd^2en}{x} - \frac{3bd^2e\log(c)}{x} + 3bde^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**3/(3*x**3) - 3*a*d**2*e/x + 3*a*d*e**2*x + a*e**3*x**3/3 - b*d**3*n*l
og(x)/(3*x**3) - b*d**3*n/(9*x**3) - b*d**3*log(c)/(3*x**3) - 3*b*d**2*e*n*
log(x)/x - 3*b*d**2*e*n/x - 3*b*d**2*e*log(c)/x + 3*b*d*e**2*n*x*log(x) - 3
*b*d*e**2*n*x + 3*b*d*e**2*x*log(c) + b*e**3*n*x**3*log(x)/3 - b*e**3*n*x**
3/9 + b*e**3*x**3*log(c)/3
```

Giac [A] time = 1.27344, size = 224, normalized size = 1.85

$$\frac{3\,bnx^6e^3\log(x) - bnx^6e^3 + 3\,bx^6e^3\log(c) + 27\,bdnx^4e^2\log(x) + 3\,ax^6e^3 - 27\,bdnx^4e^2 + 27\,bdx^4e^2\log(c) - 27\,bd^2nx^2e\log}{9\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] 1/9*(3*b*n*x^6*e^3*log(x) - b*n*x^6*e^3 + 3*b*x^6*e^3*log(c) + 27*b*d*n*x^4
*e^2*log(x) + 3*a*x^6*e^3 - 27*b*d*n*x^4*e^2 + 27*b*d*x^4*e^2*log(c) - 27*b
*d^2*n*x^2*e*log(x) + 27*a*d*x^4*e^2 - 27*b*d^2*n*x^2*e - 27*b*d^2*x^2*e*lo
g(c) - 27*a*d^2*x^2*e - 3*b*d^3*n*log(x) - b*d^3*n - 3*b*d^3*log(c) - 3*a*d
^3)/x^3
```

3.207 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^6}\, dx$

Optimal. Leaf size=118

$$-\frac{d^2e\,(a+b\log(cx^n))}{x^3}-\frac{d^3\,(a+b\log(cx^n))}{5x^5}-\frac{3de^2\,(a+b\log(cx^n))}{x}+e^3x\,(a+b\log(cx^n))-\frac{bd^2en}{3x^3}-\frac{bd^3n}{25x^5}-\frac{3bde^2n}{x}-$$

```
[Out] -(b*d^3*n)/(25*x^5) - (b*d^2*e*n)/(3*x^3) - (3*b*d*e^2*n)/x - b*e^3*n*x - (
d^3*(a + b*Log[c*x^n]))/(5*x^5) - (d^2*e*(a + b*Log[c*x^n]))/x^3 - (3*d*e^2
*(a + b*Log[c*x^n]))/x + e^3*x*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.0860084, antiderivative size = 91, normalized size of antiderivative = 0.77, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {270, 2334}

$$-\frac{1}{5}\left(\frac{5d^2e}{x^3}+\frac{d^3}{x^5}+\frac{15de^2}{x}-5e^3x\right)(a+b\log(cx^n))-\frac{bd^2en}{3x^3}-\frac{bd^3n}{25x^5}-\frac{3bde^2n}{x}-be^3nx$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^3*n)/(25*x^5) - (b*d^2*e*n)/(3*x^3) - (3*b*d*e^2*n)/x - b*e^3*n*x - (
(d^3/x^5 + (5*d^2*e)/x^3 + (15*d*e^2)/x - 5*e^3*x)*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x^6}\,dx = -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{5d^2e}{x^3}+\frac{15de^2}{x}-5e^3x\right)(a+b\log(cx^n))-(bn)\int\left(e^3-\frac{d^3}{5x^6}-\frac{d^2e}{x^4}-\frac{3de^2}{x^2}\right)$$

$$= -\frac{bd^3n}{25x^5}-\frac{bd^2en}{3x^3}-\frac{3bde^2n}{x}-be^3nx-\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{5d^2e}{x^3}+\frac{15de^2}{x}-5e^3x\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.0540893, size = 115, normalized size = 0.97

$$-\frac{15a\left(5d^2ex^2+d^3+15de^2x^4-5e^3x^6\right)+15b\left(5d^2ex^2+d^3+15de^2x^4-5e^3x^6\right)\log(cx^n)+bn\left(25d^2ex^2+3d^3+225de^2x^4\right.}{75x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(15*a*(d^3 + 5*d^2*e*x^2 + 15*d*e^2*x^4 - 5*e^3*x^6) + b*n*(3*d^3 + 25*d^2
*e*x^2 + 225*d*e^2*x^4 + 75*e^3*x^6) + 15*b*(d^3 + 5*d^2*e*x^2 + 15*d*e^2*x
^4 - 5*e^3*x^6)*Log[c*x^n])/(75*x^5)
```

Maple [C] time = 0.242, size = 585, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/5*b*(-5*e^3*x^6+15*d*e^2*x^4+5*d^2*e*x^2+d^3)/x^5*ln(x^n)-1/150*(450*ln(
c)*b*d*e^2*x^4+30*a*d^3-75*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+150*a*d^2*e*x^2+150*ln(c)*b*d^2*e*x^2+450*a*d*e^2*x^4+75*I*Pi*b*e^3*x^
6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+225*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn
(I*c*x^n)^2+30*ln(c)*b*d^3-150*ln(c)*b*e^3*x^6-15*I*Pi*b*d^3*csgn(I*c*x^n)^
3-150*a*e^3*x^6+6*b*d^3*n-225*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+225*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+75*I*Pi*b*d^2*e*x^2*
csgn(I*x^n)*csgn(I*c*x^n)^2+75*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+1
5*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+15*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn
(I*c)+75*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3+150*b*e^3*n*x^6+450*b*d*e^2*n*x^4+5
0*b*d^2*e*n*x^2-75*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-15*I*Pi*b*d^3*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)-75*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2-75
```

```
*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)-225*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n
)^3)/x^5
```

Maxima [A] time = 1.0347, size = 182, normalized size = 1.54

$$-be^3nx + be^3x\log(cx^n) + ae^3x - \frac{3\,bde^2n}{x} - \frac{3\,bde^2\log(cx^n)}{x} - \frac{3\,ade^2}{x} - \frac{bd^2en}{3\,x^3} - \frac{bd^2e\log(cx^n)}{x^3} - \frac{ad^2e}{x^3} - \frac{bd^3n}{25\,x^5} - \frac{bd^3\,\mathrm{lo}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] -b*e^3*n*x + b*e^3*x*log(c*x^n) + a*e^3*x - 3*b*d*e^2*n/x - 3*b*d*e^2*log(c
*x^n)/x - 3*a*d*e^2/x - 1/3*b*d^2*e*n/x^3 - b*d^2*e*log(c*x^n)/x^3 - a*d^2*
e/x^3 - 1/25*b*d^3*n/x^5 - 1/5*b*d^3*log(c*x^n)/x^5 - 1/5*a*d^3/x^5
```

Fricas [A] time = 1.34191, size = 362, normalized size = 3.07

$$-\frac{75\left(be^3n - ae^3\right)x^6 + 3\,bd^3n + 225\left(bde^2n + ade^2\right)x^4 + 15\,ad^3 + 25\left(bd^2en + 3\,ad^2e\right)x^2 - 15\left(5\,be^3x^6 - 15\,bde^2x^4 - 5\,bd^2\right.}{75\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/75*(75*(b*e^3*n - a*e^3)*x^6 + 3*b*d^3*n + 225*(b*d*e^2*n + a*d*e^2)*x^4
 + 15*a*d^3 + 25*(b*d^2*e*n + 3*a*d^2*e)*x^2 - 15*(5*b*e^3*x^6 - 15*b*d*e^2
*x^4 - 5*b*d^2*e*x^2 - b*d^3)*log(c) - 15*(5*b*e^3*n*x^6 - 15*b*d*e^2*n*x^4
 - 5*b*d^2*e*n*x^2 - b*d^3*n)*log(x))/x^5
```

Sympy [A] time = 9.12959, size = 190, normalized size = 1.61

$$-\frac{ad^3}{5x^5} - \frac{ad^2e}{x^3} - \frac{3ade^2}{x} + ae^3x - \frac{bd^3n\log(x)}{5x^5} - \frac{bd^3n}{25x^5} - \frac{bd^3\log(c)}{5x^5} - \frac{bd^2en\log(x)}{x^3} - \frac{bd^2en}{3x^3} - \frac{bd^2e\log(c)}{x^3} - \frac{3bde^2n\log(}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] -a*d**3/(5*x**5) - a*d**2*e/x**3 - 3*a*d*e**2/x + a*e**3*x - b*d**3*n*log(x
)/(5*x**5) - b*d**3*n/(25*x**5) - b*d**3*log(c)/(5*x**5) - b*d**2*e*n*log(x
)/x**3 - b*d**2*e*n/(3*x**3) - b*d**2*e*log(c)/x**3 - 3*b*d*e**2*n*log(x)/x
 - 3*b*d*e**2*n/x - 3*b*d*e**2*log(c)/x + b*e**3*n*x*log(x) - b*e**3*n*x +
b*e**3*x*log(c)
```

Giac [A] time = 1.29483, size = 224, normalized size = 1.9

$$\frac{75\,bnx^6e^3\log(x) - 75\,bnx^6e^3 + 75\,bx^6e^3\log(c) - 225\,bdnx^4e^2\log(x) + 75\,ax^6e^3 - 225\,bdnx^4e^2 - 225\,bdx^4e^2\log(c) - 75}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] 1/75*(75*b*n*x^6*e^3*log(x) - 75*b*n*x^6*e^3 + 75*b*x^6*e^3*log(c) - 225*b*
d*n*x^4*e^2*log(x) + 75*a*x^6*e^3 - 225*b*d*n*x^4*e^2 - 225*b*d*x^4*e^2*log
(c) - 75*b*d^2*n*x^2*e*log(x) - 225*a*d*x^4*e^2 - 25*b*d^2*n*x^2*e - 75*b*d
^2*x^2*e*log(c) - 75*a*d^2*x^2*e - 15*b*d^3*n*log(x) - 3*b*d^3*n - 15*b*d^3
*log(c) - 15*a*d^3)/x^5
```

3.208 $\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=127

$$-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{de^2\left(a+b\log\left(cx^n\right)\right)}{x^3}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{3bd^2en}{25x^5}-\frac{bd^3n}{49x^7}-\frac{bde^2n}{3x^3}-$$

```
[Out] -(b*d^3*n)/(49*x^7) - (3*b*d^2*e*n)/(25*x^5) - (b*d*e^2*n)/(3*x^3) - (b*e^3
*n)/x - (d^3*(a + b*Log[c*x^n]))/(7*x^7) - (3*d^2*e*(a + b*Log[c*x^n]))/(5*
x^5) - (d*e^2*(a + b*Log[c*x^n]))/x^3 - (e^3*(a + b*Log[c*x^n]))/x
```

Rubi [A] time = 0.100507, antiderivative size = 98, normalized size of antiderivative = 0.77, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{35}\left(\frac{21d^2e}{x^5}+\frac{5d^3}{x^7}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{25x^5}-\frac{bd^3n}{49x^7}-\frac{bde^2n}{3x^3}-\frac{be^3n}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^3*n)/(49*x^7) - (3*b*d^2*e*n)/(25*x^5) - (b*d*e^2*n)/(3*x^3) - (b*e^3
*n)/x - (((5*d^3)/x^7 + (21*d^2*e)/x^5 + (35*d*e^2)/x^3 + (35*e^3)/x)*(a +
b*Log[c*x^n]))/35
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x^8}\,dx = -\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(a+b\log(cx^n)) - (bn)\int \frac{-5d^3-21d^2ex^2-35 \ldots}{35x^8}$$

$$= -\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(a+b\log(cx^n)) - \frac{1}{35}(bn)\int \frac{-5d^3-21d^2ex^2- \ldots}{x^{\ldots}}$$

$$= -\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(a+b\log(cx^n)) - \frac{1}{35}(bn)\int \left(-\frac{5d^3}{x^8}-\frac{21d^2e}{x^6}- \ldots\right.$$

$$= -\frac{bd^3n}{49x^7}-\frac{3bd^2en}{25x^5}-\frac{bde^2n}{3x^3}-\frac{be^3n}{x}-\frac{1}{35}\left(\frac{5d^3}{x^7}+\frac{21d^2e}{x^5}+\frac{35de^2}{x^3}+\frac{35e^3}{x}\right)(a+b\log(c \ldots$$

Mathematica [A] time = 0.057228, size = 127, normalized size = 1.

$$-\frac{3d^2e(a+b\log(cx^n))}{5x^5}-\frac{d^3(a+b\log(cx^n))}{7x^7}-\frac{de^2(a+b\log(cx^n))}{x^3}-\frac{e^3(a+b\log(cx^n))}{x}-\frac{3bd^2en}{25x^5}-\frac{bd^3n}{49x^7}-\frac{bde^2n}{3x^3}-\frac{be \ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^3*n)/(49*x^7) - (3*b*d^2*e*n)/(25*x^5) - (b*d*e^2*n)/(3*x^3) - (b*e^3
*n)/x - (d^3*(a + b*Log[c*x^n]))/(7*x^7) - (3*d^2*e*(a + b*Log[c*x^n]))/(5*
x^5) - (d*e^2*(a + b*Log[c*x^n]))/x^3 - (e^3*(a + b*Log[c*x^n]))/x
```

Maple [C] time = 0.132, size = 587, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x^8,x)
```

```
[Out] -1/35*b*(35*e^3*x^6+35*d*e^2*x^4+21*d^2*e*x^2+5*d^3)/x^7*ln(x^n)-1/7350*(73
50*ln(c)*b*d*e^2*x^4+1050*a*d^3+4410*a*d^2*e*x^2+3675*I*Pi*b*d*e^2*x^4*csgn
(I*x^n)*csgn(I*c*x^n)^2+2205*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+4
410*ln(c)*b*d^2*e*x^2+2205*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)+7350*
a*d*e^2*x^4+1050*ln(c)*b*d^3+525*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+525
*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-3675*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^3+7
350*ln(c)*b*e^3*x^6-525*I*Pi*b*d^3*csgn(I*c*x^n)^3+7350*a*e^3*x^6+150*b*d^3
*n+3675*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-2205*I*Pi*b*d^2*e*x^2*cs
gn(I*c*x^n)^3-525*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3675*I*Pi*
b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2205*I*Pi*b*d^2*e*x^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-3675*I*Pi*b*d*e^2*x^4*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+7350*b*e^3*n*x^6+2450*b*d*e^2*n*x^4+882*b*d^2*e*n*x^2+3675*I*Pi
*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+3675*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*
csgn(I*c)-3675*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^3)/x^7
```

Maxima [A] time = 1.01334, size = 193, normalized size = 1.52

$$-\frac{be^3n}{x}-\frac{be^3\log\left(cx^n\right)}{x}-\frac{ae^3}{x}-\frac{bde^2n}{3\,x^3}-\frac{bde^2\log\left(cx^n\right)}{x^3}-\frac{ade^2}{x^3}-\frac{3\,bd^2en}{25\,x^5}-\frac{3\,bd^2e\log\left(cx^n\right)}{5\,x^5}-\frac{3\,ad^2e}{5\,x^5}-\frac{bd^3n}{49\,x^7}-\frac{bd^3\log(}{7\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] -b*e^3*n/x - b*e^3*log(c*x^n)/x - a*e^3/x - 1/3*b*d*e^2*n/x^3 - b*d*e^2*log
(c*x^n)/x^3 - a*d*e^2/x^3 - 3/25*b*d^2*e*n/x^5 - 3/5*b*d^2*e*log(c*x^n)/x^5
 - 3/5*a*d^2*e/x^5 - 1/49*b*d^3*n/x^7 - 1/7*b*d^3*log(c*x^n)/x^7 - 1/7*a*d^
3/x^7
```

Fricas [A] time = 1.32045, size = 389, normalized size = 3.06

$$-\frac{3675\left(be^3n+ae^3\right)x^6+75\,bd^3n+1225\left(bde^2n+3\,ade^2\right)x^4+525\,ad^3+441\left(bd^2en+5\,ad^2e\right)x^2+105\left(35\,be^3x^6+35\,bd\right.}{3675\,x^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/3675*(3675*(b*e^3*n + a*e^3)*x^6 + 75*b*d^3*n + 1225*(b*d*e^2*n + 3*a*d*
e^2)*x^4 + 525*a*d^3 + 441*(b*d^2*e*n + 5*a*d^2*e)*x^2 + 105*(35*b*e^3*x^6
+ 35*b*d*e^2*x^4 + 21*b*d^2*e*x^2 + 5*b*d^3)*log(c) + 105*(35*b*e^3*n*x^6 +
 35*b*d*e^2*n*x^4 + 21*b*d^2*e*n*x^2 + 5*b*d^3*n)*log(x))/x^7
```

Sympy [A] time = 13.4882, size = 206, normalized size = 1.62

$$-\frac{ad^3}{7x^7}-\frac{3ad^2e}{5x^5}-\frac{ade^2}{x^3}-\frac{ae^3}{x}-\frac{bd^3n\log(x)}{7x^7}-\frac{bd^3n}{49x^7}-\frac{bd^3\log(c)}{7x^7}-\frac{3bd^2en\log(x)}{5x^5}-\frac{3bd^2en}{25x^5}-\frac{3bd^2e\log(c)}{5x^5}-\frac{bde^2n\log(}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] -a*d**3/(7*x**7) - 3*a*d**2*e/(5*x**5) - a*d*e**2/x**3 - a*e**3/x - b*d**3*
n*log(x)/(7*x**7) - b*d**3*n/(49*x**7) - b*d**3*log(c)/(7*x**7) - 3*b*d**2*
e*n*log(x)/(5*x**5) - 3*b*d**2*e*n/(25*x**5) - 3*b*d**2*e*log(c)/(5*x**5) -
 b*d*e**2*n*log(x)/x**3 - b*d*e**2*n/(3*x**3) - b*d*e**2*log(c)/x**3 - b*e*
*3*n*log(x)/x - b*e**3*n/x - b*e**3*log(c)/x
```

Giac [A] time = 1.27793, size = 224, normalized size = 1.76

$$-\frac{3675\,bnx^6e^3\log(x)+3675\,bnx^6e^3+3675\,bx^6e^3\log(c)+3675\,bdnx^4e^2\log(x)+3675\,ax^6e^3+1225\,bdnx^4e^2+3675\,bdx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] -1/3675*(3675*b*n*x^6*e^3*log(x) + 3675*b*n*x^6*e^3 + 3675*b*x^6*e^3*log(c)
 + 3675*b*d*n*x^4*e^2*log(x) + 3675*a*x^6*e^3 + 1225*b*d*n*x^4*e^2 + 3675*b
*d*x^4*e^2*log(c) + 2205*b*d^2*n*x^2*e*log(x) + 3675*a*d*x^4*e^2 + 441*b*d^
2*n*x^2*e + 2205*b*d^2*x^2*e*log(c) + 2205*a*d^2*x^2*e + 525*b*d^3*n*log(x)
 + 75*b*d^3*n + 525*b*d^3*log(c) + 525*a*d^3)/x^7
```

3.209 $\int \frac{(d+ex^2)^3 (a+b\log(cx^n))}{x^{10}} dx$

Optimal. Leaf size=133

$$-\frac{3d^2e\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{9x^9}-\frac{3de^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{e^3\left(a+b\log\left(cx^n\right)\right)}{3x^3}-\frac{3bd^2en}{49x^7}-\frac{bd^3n}{81x^9}-\frac{3bde^2n}{25x^5}$$

```
[Out] -(b*d^3*n)/(81*x^9) - (3*b*d^2*e*n)/(49*x^7) - (3*b*d*e^2*n)/(25*x^5) - (b*
e^3*n)/(9*x^3) - (d^3*(a + b*Log[c*x^n]))/(9*x^9) - (3*d^2*e*(a + b*Log[c*x
^n]))/(7*x^7) - (3*d*e^2*(a + b*Log[c*x^n]))/(5*x^5) - (e^3*(a + b*Log[c*x^
n]))/(3*x^3)
```

Rubi [A] time = 0.0977795, antiderivative size = 100, normalized size of antiderivative = 0.75, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{315}\left(\frac{135d^2e}{x^7}+\frac{35d^3}{x^9}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2en}{49x^7}-\frac{bd^3n}{81x^9}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -(b*d^3*n)/(81*x^9) - (3*b*d^2*e*n)/(49*x^7) - (3*b*d*e^2*n)/(25*x^5) - (b*
e^3*n)/(9*x^3) - (((35*d^3)/x^9 + (135*d^2*e)/x^7 + (189*d*e^2)/x^5 + (105*
e^3)/x^3)*(a + b*Log[c*x^n]))/315
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 (a+b\log(cx^n))}{x^{10}}\,dx = -\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)(a+b\log(cx^n))-(bn)\int \frac{-35d^3-135d^2e}{}$$

$$= -\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)(a+b\log(cx^n))-\frac{1}{315}(bn)\int \frac{-35d^3-13}{}$$

$$= -\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)(a+b\log(cx^n))-\frac{1}{315}(bn)\int\left(-\frac{35d^3}{x^{10}}-\right.$$

$$= -\frac{bd^3n}{81x^9}-\frac{3bd^2en}{49x^7}-\frac{3bde^2n}{25x^5}-\frac{be^3n}{9x^3}-\frac{1}{315}\left(\frac{35d^3}{x^9}+\frac{135d^2e}{x^7}+\frac{189de^2}{x^5}+\frac{105e^3}{x^3}\right)(a+b$$

Mathematica [A] time = 0.059748, size = 133, normalized size = 1.

$$-\frac{3d^2e(a+b\log(cx^n))}{7x^7}-\frac{d^3(a+b\log(cx^n))}{9x^9}-\frac{3de^2(a+b\log(cx^n))}{5x^5}-\frac{e^3(a+b\log(cx^n))}{3x^3}-\frac{3bd^2en}{49x^7}-\frac{bd^3n}{81x^9}-\frac{3bde^2n}{25x^5}-$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -(b*d^3*n)/(81*x^9) - (3*b*d^2*e*n)/(49*x^7) - (3*b*d*e^2*n)/(25*x^5) - (b*
e^3*n)/(9*x^3) - (d^3*(a + b*Log[c*x^n]))/(9*x^9) - (3*d^2*e*(a + b*Log[c*x
^n]))/(7*x^7) - (3*d*e^2*(a + b*Log[c*x^n]))/(5*x^5) - (e^3*(a + b*Log[c*x^
n]))/(3*x^3)
```

Maple [C] time = 0.127, size = 587, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*ln(c*x^n))/x^10,x)
```

```
[Out] -1/315*b*(105*e^3*x^6+189*d*e^2*x^4+135*d^2*e*x^2+35*d^3)/x^9*ln(x^n)-1/198
450*(33075*I*Pi*b*e^3*x^6*csgn(I*c*x^n)^2*csgn(I*c)+119070*ln(c)*b*d*e^2*x^
4+22050*a*d^3+85050*a*d^2*e*x^2+59535*I*Pi*b*d*e^2*x^4*csgn(I*c*x^n)^2*csgn
(I*c)+85050*ln(c)*b*d^2*e*x^2-33075*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+119070*a*d*e^2*x^4+42525*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^2*csgn(
I*c)+22050*ln(c)*b*d^3+11025*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+66150*l
n(c)*b*e^3*x^6+11025*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-33075*I*Pi*b*e^3*
x^6*csgn(I*c*x^n)^3-11025*I*Pi*b*d^3*csgn(I*c*x^n)^3-42525*I*Pi*b*d^2*e*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+66150*a*e^3*x^6-59535*I*Pi*b*d*e^2*x^4
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2450*b*d^3*n+59535*I*Pi*b*d*e^2*x^4*cs
gn(I*x^n)*csgn(I*c*x^n)^2+42525*I*Pi*b*d^2*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^
2-42525*I*Pi*b*d^2*e*x^2*csgn(I*c*x^n)^3-11025*I*Pi*b*d^3*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)+33075*I*Pi*b*e^3*x^6*csgn(I*x^n)*csgn(I*c*x^n)^2+22050*b
*e^3*n*x^6+23814*b*d*e^2*n*x^4+12150*b*d^2*e*n*x^2-59535*I*Pi*b*d*e^2*x^4*c
sgn(I*c*x^n)^3)/x^9
```

Maxima [A] time = 1.00968, size = 193, normalized size = 1.45

$$-\frac{be^3n}{9\,x^3}-\frac{be^3\log\left(cx^n\right)}{3\,x^3}-\frac{ae^3}{3\,x^3}-\frac{3\,bde^2n}{25\,x^5}-\frac{3\,bde^2\log\left(cx^n\right)}{5\,x^5}-\frac{3\,ade^2}{5\,x^5}-\frac{3\,bd^2en}{49\,x^7}-\frac{3\,bd^2e\log\left(cx^n\right)}{7\,x^7}-\frac{3\,ad^2e}{7\,x^7}-\frac{bd^3n}{81\,x^9}-bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^10,x, algorithm="maxima")
```

```
[Out] -1/9*b*e^3*n/x^3 - 1/3*b*e^3*log(c*x^n)/x^3 - 1/3*a*e^3/x^3 - 3/25*b*d*e^2*
n/x^5 - 3/5*b*d*e^2*log(c*x^n)/x^5 - 3/5*a*d*e^2/x^5 - 3/49*b*d^2*e*n/x^7 -
 3/7*b*d^2*e*log(c*x^n)/x^7 - 3/7*a*d^2*e/x^7 - 1/81*b*d^3*n/x^9 - 1/9*b*d^
3*log(c*x^n)/x^9 - 1/9*a*d^3/x^9
```

Fricas [A] time = 1.32141, size = 413, normalized size = 3.11

$$-\frac{11025\left(be^3n+3\,ae^3\right)x^6+1225\,bd^3n+11907\left(bde^2n+5\,ade^2\right)x^4+11025\,ad^3+6075\left(bd^2en+7\,ad^2e\right)x^2+315\left(105\,be\right.}{99225}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^10,x, algorithm="fricas")
```

```
[Out] -1/99225*(11025*(b*e^3*n + 3*a*e^3)*x^6 + 1225*b*d^3*n + 11907*(b*d*e^2*n +
 5*a*d*e^2)*x^4 + 11025*a*d^3 + 6075*(b*d^2*e*n + 7*a*d^2*e)*x^2 + 315*(105
*b*e^3*x^6 + 189*b*d*e^2*x^4 + 135*b*d^2*e*x^2 + 35*b*d^3)*log(c) + 315*(10
5*b*e^3*n*x^6 + 189*b*d*e^2*n*x^4 + 135*b*d^2*e*n*x^2 + 35*b*d^3*n)*log(x))
/x^9
```

Sympy [A] time = 31.7602, size = 231, normalized size = 1.74

$$-\frac{ad^3}{9x^9} - \frac{3ad^2e}{7x^7} - \frac{3ade^2}{5x^5} - \frac{ae^3}{3x^3} - \frac{bd^3n\log(x)}{9x^9} - \frac{bd^3n}{81x^9} - \frac{bd^3\log(c)}{9x^9} - \frac{3bd^2en\log(x)}{7x^7} - \frac{3bd^2en}{49x^7} - \frac{3bd^2e\log(c)}{7x^7} - \frac{3bde^2n\log(x)}{5x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*ln(c*x**n))/x**10,x)
```

```
[Out] -a*d**3/(9*x**9) - 3*a*d**2*e/(7*x**7) - 3*a*d*e**2/(5*x**5) - a*e**3/(3*x*
*3) - b*d**3*n*log(x)/(9*x**9) - b*d**3*n/(81*x**9) - b*d**3*log(c)/(9*x**9
) - 3*b*d**2*e*n*log(x)/(7*x**7) - 3*b*d**2*e*n/(49*x**7) - 3*b*d**2*e*log(
c)/(7*x**7) - 3*b*d*e**2*n*log(x)/(5*x**5) - 3*b*d*e**2*n/(25*x**5) - 3*b*d
*e**2*log(c)/(5*x**5) - b*e**3*n*log(x)/(3*x**3) - b*e**3*n/(9*x**3) - b*e*
*3*log(c)/(3*x**3)
```

Giac [A] time = 1.41871, size = 224, normalized size = 1.68

$$-\frac{33075\,bnx^6e^3\log(x) + 11025\,bnx^6e^3 + 33075\,bx^6e^3\log(c) + 59535\,bdnx^4e^2\log(x) + 33075\,ax^6e^3 + 11907\,bdnx^4e^2 + 5}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*log(c*x^n))/x^10,x, algorithm="giac")
```

```
[Out] -1/99225*(33075*b*n*x^6*e^3*log(x) + 11025*b*n*x^6*e^3 + 33075*b*x^6*e^3*lo
g(c) + 59535*b*d*n*x^4*e^2*log(x) + 33075*a*x^6*e^3 + 11907*b*d*n*x^4*e^2 +
 59535*b*d*x^4*e^2*log(c) + 42525*b*d^2*n*x^2*e*log(x) + 59535*a*d*x^4*e^2
+ 6075*b*d^2*n*x^2*e + 42525*b*d^2*x^2*e*log(c) + 42525*a*d^2*x^2*e + 11025
*b*d^3*n*log(x) + 1225*b*d^3*n + 11025*b*d^3*log(c) + 11025*a*d^3)/x^9
```

3.210 $\int \frac{x^5(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=121

$$\frac{bd^2n\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^3}+\frac{d^2\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e^3}-\frac{dx^2(a+b\log(cx^n))}{2e^2}+\frac{x^4(a+b\log(cx^n))}{4e}+\frac{bdnx^2}{4e^2}-\frac{bn}{16}$$

```
[Out] (b*d*n*x^2)/(4*e^2) - (b*n*x^4)/(16*e) - (d*x^2*(a + b*Log[c*x^n]))/(2*e^2)
 + (x^4*(a + b*Log[c*x^n]))/(4*e) + (d^2*(a + b*Log[c*x^n])*Log[1 + (e*x^2)
/d])/(2*e^3) + (b*d^2*n*PolyLog[2, -((e*x^2)/d)])/(4*e^3)
```

Rubi [A] time = 0.173342, antiderivative size = 121, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2351, 2304, 2337, 2391}

$$\frac{bd^2n\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^3}+\frac{d^2\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e^3}-\frac{dx^2(a+b\log(cx^n))}{2e^2}+\frac{x^4(a+b\log(cx^n))}{4e}+\frac{bdnx^2}{4e^2}-\frac{bn}{16}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```


```
[Out] (b*d*n*x^2)/(4*e^2) - (b*n*x^4)/(16*e) - (d*x^2*(a + b*Log[c*x^n]))/(2*e^2)
 + (x^4*(a + b*Log[c*x^n]))/(4*e) + (d^2*(a + b*Log[c*x^n])*Log[1 + (e*x^2)
/d])/(2*e^3) + (b*d^2*n*PolyLog[2, -((e*x^2)/d)])/(4*e^3)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5 (a+b\log(cx^n))}{d+ex^2}\,dx = \int \left(-\frac{dx(a+b\log(cx^n))}{e^2}+\frac{x^3(a+b\log(cx^n))}{e}+\frac{d^2x(a+b\log(cx^n))}{e^2\left(d+ex^2\right)}\right)dx$$

$$= -\frac{d\int x(a+b\log(cx^n))\,dx}{e^2}+\frac{d^2\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx}{e^2}+\frac{\int x^3(a+b\log(cx^n))\,dx}{e}$$

$$= \frac{bdnx^2}{4e^2}-\frac{bnx^4}{16e}-\frac{dx^2(a+b\log(cx^n))}{2e^2}+\frac{x^4(a+b\log(cx^n))}{4e}+\frac{d^2(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e^3}$$

$$= \frac{bdnx^2}{4e^2}-\frac{bnx^4}{16e}-\frac{dx^2(a+b\log(cx^n))}{2e^2}+\frac{x^4(a+b\log(cx^n))}{4e}+\frac{d^2(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e^3}$$

Mathematica [A] time = 0.109738, size = 174, normalized size = 1.44

$$\frac{8bd^2n\text{PolyLog}\left(2,\frac{\sqrt{ex}}{\sqrt{-d}}\right)+8bd^2n\text{PolyLog}\left(2,\frac{d\sqrt{ex}}{(-d)^{3/2}}\right)+8d^2\log\left(\frac{\sqrt{ex}}{\sqrt{-d}}+1\right)(a+b\log(cx^n))+8d^2\log\left(\frac{d\sqrt{ex}}{(-d)^{3/2}}+1\right)(a+b\log}{16e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (4*b*d*e*n*x^2 - b*e^2*n*x^4 - 8*d*e*x^2*(a + b*Log[c*x^n]) + 4*e^2*x^4*(a
+ b*Log[c*x^n]) + 8*d^2*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] +
8*d^2*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 8*b*d^2*n*Poly
Log[2, (Sqrt[e]*x)/Sqrt[-d]] + 8*b*d^2*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2
)])/(16*e^3)
```

Maple [C] time = 0.188, size = 641, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

```
[Out] -1/8*I*b*Pi*csgn(I*c*x^n)^3/e*x^4-1/2*b*ln(c)/e^2*x^2*d-1/4*I*b*Pi*csgn(I*c
*x^n)^3*d^2/e^3*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*x^2*d+
1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3*ln(e*x^2+d)-1/8*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x^4+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d
^2/e^3*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x^2*d+1/4*b*l
n(x^n)/e*x^4+1/2*a*d^2/e^3*ln(e*x^2+d)+1/4*b*ln(c)/e*x^4+1/4*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*x^2*d+1/2*b*n*d^2/e^3*ln(x)*ln((e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))+1/2*b*n*d^2/e^3*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))-1/2*b*n*d^2/e^3*ln(x)*ln(e*x^2+d)-1/2*a/e^2*x^2*d+1/2*b*n*d^2/e^3*dil
og((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*d^2/e^3*dilog((e*x+(-d*e)^(1/2
))/(-d*e)^(1/2))+1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x^4+1/8*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2/e*x^4+1/2*b*ln(x^n)*d^2/e^3*ln(e*x^2+d)+1/4*I*b*Pi*
csgn(I*c*x^n)^3/e^2*x^2*d+1/2*b*ln(c)*d^2/e^3*ln(e*x^2+d)+1/4*a/e*x^4-1/2*b
*ln(x^n)/e^2*x^2*d-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3*l
n(e*x^2+d)+1/4*b*d*n*x^2/e^2-1/16*b*n*x^4/e
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}\,a\left(\frac{2\,d^2\log\left(ex^2+d\right)}{e^3}+\frac{ex^4-2\,dx^2}{e^2}\right)+b\int\frac{x^5\log\left(c\right)+x^5\log\left(x^n\right)}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/4*a*(2*d^2*log(e*x^2 + d)/e^3 + (e*x^4 - 2*d*x^2)/e^2) + b*integrate((x^5
*log(c) + x^5*log(x^n))/(e*x^2 + d), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e*x^2 + d), x)
```

Sympy [A] time = 114.791, size = 235, normalized size = 1.94

$$\frac{ad^2\left(\begin{cases}\frac{x^2}{d} & \text{for } e=0\\ \frac{\log\left(d+ex^2\right)}{e} & \text{otherwise}\end{cases}\right)}{2e^2}-\frac{adx^2}{2e^2}+\frac{ax^4}{4e}-\frac{bd^2n\left(\begin{cases}\frac{x^2}{2d}\\ \frac{\begin{cases}\log(d)\log(x)-\frac{\text{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2}\\ -\log(d)\log\left(\frac{1}{x}\right)-\frac{\text{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2}\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(d)-\frac{\text{Li}_2\left(\frac{ex^2e}{d}\right.}{2}\end{cases}}{e}\end{cases}\right.}{2e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] a*d**2*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))/(2*e**2) -
a*d*x**2/(2*e**2) + a*x**4/(4*e) - b*d**2*n*Piecewise((x**2/(2*d), Eq(e, 0)
), (Piecewise((log(d)*log(x) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, Abs(
x) < 1), (-log(d)*log(1/x) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, 1/Abs(
x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1),
 ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, Tru
```

```
e))/e, True))/(2*e**2) + b*d**2*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x*
*2)/e, True))*log(c*x**n)/(2*e**2) + b*d*n*x**2/(4*e**2) - b*d*x**2*log(c*x
**n)/(2*e**2) - b*n*x**4/(16*e) + b*x**4*log(c*x**n)/(4*e)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^5}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d), x)
```

3.211 $\int \frac{x^3(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=83

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^2}-\frac{d\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e^2}+\frac{x^2(a+b\log(cx^n))}{2e}-\frac{bnx^2}{4e}$$

```
[Out] -(b*n*x^2)/(4*e) + (x^2*(a + b*Log[c*x^n]))/(2*e) - (d*(a + b*Log[c*x^n])*L
og[1 + (e*x^2)/d])/(2*e^2) - (b*d*n*PolyLog[2, -((e*x^2)/d)])/(4*e^2)
```

Rubi [A] time = 0.142518, antiderivative size = 83, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2351, 2304, 2337, 2391}

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^2}-\frac{d\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e^2}+\frac{x^2(a+b\log(cx^n))}{2e}-\frac{bnx^2}{4e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] -(b*n*x^2)/(4*e) + (x^2*(a + b*Log[c*x^n]))/(2*e) - (d*(a + b*Log[c*x^n])*L
og[1 + (e*x^2)/d])/(2*e^2) - (b*d*n*PolyLog[2, -((e*x^2)/d)])/(4*e^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3 (a+b\log(cx^n))}{d+ex^2}\,dx &= \int \left(\frac{x(a+b\log(cx^n))}{e} - \frac{dx(a+b\log(cx^n))}{e\left(d+ex^2\right)}\right)dx \\
&= \frac{\int x(a+b\log(cx^n))\,dx}{e} - \frac{d\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx}{e} \\
&= -\frac{bnx^2}{4e} + \frac{x^2(a+b\log(cx^n))}{2e} - \frac{d(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e^2} + \frac{(bdn)\int \frac{\log\left(1+\frac{ex^2}{d}\right)}{x}\,dx}{2e^2} \\
&= -\frac{bnx^2}{4e} + \frac{x^2(a+b\log(cx^n))}{2e} - \frac{d(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e^2} - \frac{bdn\,\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e^2}
\end{aligned}$$

Mathematica [A] time = 0.0706448, size = 135, normalized size = 1.63

$$-\frac{2bdn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)+2bdn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)+2d\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))+2d\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log}{4e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] -(b*e*n*x^2 - 2*e*x^2*(a + b*Log[c*x^n]) + 2*d*(a + b*Log[c*x^n])*Log[1 + (
Sqrt[e]*x)/Sqrt[-d]] + 2*d*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3
/2)] + 2*b*d*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] + 2*b*d*n*PolyLog[2, (d*Sqr
t[e]*x)/(-d)^(3/2)])/(4*e^2)
```

Maple [C] time = 0.174, size = 460, normalized size = 5.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

```
[Out] 1/2*b*ln(x^n)/e*x^2-1/2*b*ln(x^n)*d/e^2*ln(e*x^2+d)-1/4*b*n*x^2/e+1/2*b*n*d
/e^2*ln(x)*ln(e*x^2+d)-1/2*b*n*d/e^2*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1
/2))-1/2*b*n*d/e^2*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d/e^2*
dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d/e^2*dilog((e*x+(-d*e)^(1/
2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2*ln(e
*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^3*d/e^2*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/e*x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2
*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/e*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2/e*x^2-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2*ln(e*x^2+d)+1/4*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x^2+1/2*b*ln(c)/e*x^2-1/2*b*ln(c)*d/e^2*
ln(e*x^2+d)+1/2*a/e*x^2-1/2*a*d/e^2*ln(e*x^2+d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{x^2}{e} - \frac{d\log\left(ex^2+d\right)}{e^2}\right) + b\int \frac{x^3\log\left(c\right) + x^3\log\left(x^n\right)}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(x^2/e - d*log(e*x^2 + d)/e^2) + b*integrate((x^3*log(c) + x^3*log(x^
n))/(e*x^2 + d), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e*x^2 + d), x)
```

Sympy [A] time = 36.34, size = 180, normalized size = 2.17

$$-\frac{ad\left(\begin{cases}\frac{x^2}{d} & \text{for } e=0\\ \frac{\log\left(d+ex^2\right)}{e} & \text{otherwise}\end{cases}\right)}{2e}+\frac{ax^2}{2e}+\frac{bdn\left(\begin{cases}\frac{x^2}{2d} & \\ \frac{\begin{cases}\log\left(d\right)\log\left(x\right)-\frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{f}\\ -\log\left(d\right)\log\left(\frac{1}{x}\right)-\frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{f}\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log\left(d\right)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log\left(d\right)-\frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{c}\end{cases}}{e} & \end{cases}\right)}{2e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] -a*d*Piecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))/(2*e) + a*x**
2/(2*e) + b*d*n*Piecewise((x**2/(2*d), Eq(e, 0)), (Piecewise((log(d)*log(x)
 - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, Abs(x) < 1), (-log(d)*log(1/x) -
 polylog(2, e*x**2*exp_polar(I*pi)/d)/2, 1/Abs(x) < 1), (-meijerg(((), (1,
1)), ((0, 0), ()), x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d
) - polylog(2, e*x**2*exp_polar(I*pi)/d)/2, True))/e, True))/(2*e) - b*d*Pi
ecewise((x**2/d, Eq(e, 0)), (log(d + e*x**2)/e, True))*log(c*x**n)/(2*e) -
b*n*x**2/(4*e) + b*x**2*log(c*x**n)/(2*e)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^3}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d), x)
```

3.212 $\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=49

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e}+\frac{\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e}$$

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e) + (b*n*PolyLog[2, -((e*x^2)/d
)])/(4*e)
```

Rubi [A] time = 0.0483188, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e}+\frac{\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```


```
[Out] ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e) + (b*n*PolyLog[2, -((e*x^2)/d
)])/(4*e)
```


Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx = \frac{(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e} - \frac{(bn)\int \frac{\log\left(1+\frac{ex^2}{d}\right)}{x}\,dx}{2e}$$
$$= \frac{(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e} + \frac{bn\text{Li}_2\left(-\frac{ex^2}{d}\right)}{4e}$$

Mathematica [A] time = 0.0321494, size = 94, normalized size = 1.92

$$\frac{bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)+bn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)+\left(\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)+\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\right)(a+b\log(cx^n))}{2e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] ((a + b*Log[c*x^n])*(Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + Log[1 + (d*Sqrt[e]*x)/
(-d)^(3/2)]) + b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] + b*n*PolyLog[2, (d*Sqr
t[e]*x)/(-d)^(3/2)])/(2*e)
```

Maple [C] time = 0.133, size = 299, normalized size = 6.1

$$\frac{b\ln\left(ex^2+d\right)\ln(x^n)}{2e} - \frac{\ln(x)\,bn\ln\left(ex^2+d\right)}{2e} + \frac{\ln(x)\,bn}{2e}\ln\left(\left(-ex+\sqrt{-de}\right)\frac{1}{\sqrt{-de}}\right) + \frac{\ln(x)\,bn}{2e}\ln\left(\left(ex+\sqrt{-de}\right)\frac{1}{\sqrt{-de}}\right) +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

```
[Out] 1/2*b/e*ln(e*x^2+d)*ln(x^n)-1/2*b/e*n*ln(x)*ln(e*x^2+d)+1/2*b/e*n*ln(x)*ln(
(-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b/e*n*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d
*e)^(1/2))+1/2*b/e*n*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b/e*n*dilo
g((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)^2-1/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1
/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*c*x^n)^3+1/4*I/e*ln(e*x^2+d)*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)+1/2/e*ln(e*x^2+d)*b*ln(c)+1/2*a/e*ln(e*x^2+d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$b\int \frac{x\log(c) + x\log(x^n)}{ex^2 + d}\,dx + \frac{a\log\left(ex^2 + d\right)}{2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] b*integrate((x*log(c) + x*log(x^n))/(e*x^2 + d), x) + 1/2*a*log(e*x^2 + d)/
e
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx\log(cx^n) + ax}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x*log(c*x^n) + a*x)/(e*x^2 + d), x)
```

Sympy [A] time = 10.1925, size = 119, normalized size = 2.43

$$\frac{a\log\left(d + ex^2\right)}{2e} - \frac{bn\left(\begin{cases} \log(d)\log(x) - \frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{for } |x| < 1 \\ -\log(d)\log\left(\frac{1}{x}\right) - \frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{for } \frac{1}{|x|} < 1 \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(d) + G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)\log(d) - \frac{\operatorname{Li}_2\left(\frac{ex^2e^{i\pi}}{d}\right)}{2} & \text{otherwise} \end{cases}\right)}{2e} + \frac{b\log(cx^n)\,l}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] a*log(d + e*x**2)/(2*e) - b*n*Piecewise((log(d)*log(x) - polylog(2, e*x**2*
exp_polar(I*pi)/d)/2, Abs(x) < 1), (-log(d)*log(1/x) - polylog(2, e*x**2*ex
```

```
p_polar(I*pi)/d)/2, 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)
*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) - polylog(2, e*x**2
*exp_polar(I*pi)/d)/2, True))/(2*e) + b*log(c*x**n)*log(d + e*x**2)/(2*e)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^2 + d), x)
```

3.213 $\int \frac{a+b\log(cx^n)}{x(d+ex^2)}\,dx$

Optimal. Leaf size=49

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d}-\frac{\log\left(\frac{d}{ex^2}+1\right)(a+b\log(cx^n))}{2d}$$

```
[Out] -(Log[1 + d/(e*x^2)]*(a + b*Log[c*x^n]))/(2*d) + (b*n*PolyLog[2, -(d/(e*x^2
))])/(4*d)
```

Rubi [A] time = 0.0645087, antiderivative size = 49, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d}-\frac{\log\left(\frac{d}{ex^2}+1\right)(a+b\log(cx^n))}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)),x]
```

```
[Out] -(Log[1 + d/(e*x^2)]*(a + b*Log[c*x^n]))/(2*d) + (b*n*PolyLog[2, -(d/(e*x^2
))])/(4*d)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)}\,dx = -\frac{\log\left(1+\frac{d}{ex^2}\right)(a+b\log(cx^n))}{2d} + \frac{(bn)\int \frac{\log\left(1+\frac{d}{ex^2}\right)}{x}\,dx}{2d}$$
$$= -\frac{\log\left(1+\frac{d}{ex^2}\right)(a+b\log(cx^n))}{2d} + \frac{bn\mathrm{Li}_2\left(-\frac{d}{ex^2}\right)}{4d}$$

Mathematica [B] time = 0.0818811, size = 126, normalized size = 2.57

$$-\frac{b^2n^2\mathrm{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)+b^2n^2\mathrm{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)-(a+b\log(cx^n))\left(a+b\log(cx^n)-bn\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)-bn\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}\right.\right.}{2bdn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)),x]
```

```
[Out] -(-((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - b*n*Log[1 + (Sqrt[e]*x)/Sqrt[-d]
] - b*n*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])) + b^2*n^2*PolyLog[2, (Sqrt[e]*x
)/Sqrt[-d]] + b^2*n^2*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(2*b*d*n)
```

Maple [C] time = 0.212, size = 439, normalized size = 9.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x^2+d),x)
```

```
[Out] b*ln(x^n)/d*ln(x)-1/2*b*ln(x^n)/d*ln(e*x^2+d)-1/2*b*n/d*ln(x)^2-1/2*b*n/d*l
n(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/d*ln(x)*ln((e*x+(-d*e)^(1
/2))/(-d*e)^(1/2))+1/2*b*n/d*ln(x)*ln(e*x^2+d)-1/2*b*n/d*dilog((-e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))-1/2*b*n/d*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*
I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)/d*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^3/d*ln(e*x^2+d)+1/4*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*
csgn(I*c)/d*ln(e*x^2+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d*ln(x)+1/2*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2/d*ln(x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*ln(
e*x^2+d)+b*ln(c)/d*ln(x)-1/2*b*ln(c)/d*ln(e*x^2+d)+a/d*ln(x)-1/2*a/d*ln(e*x
```

```
^2+d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{\log\left(ex^2+d\right)}{d}-\frac{2\,\log\left(x\right)}{d}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{ex^3+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(e*x^2 + d)/d - 2*log(x)/d) + b*integrate((log(c) + log(x^n))/(e
*x^3 + d*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\log\left(cx^n\right)+a}{ex^3+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^3 + d*x), x)
```

Sympy [A] time = 19.8318, size = 124, normalized size = 2.53

$$\frac{a\log\left(x\right)}{d}-\frac{a\log\left(d+ex^2\right)}{2d}+\frac{bn\left(\begin{cases}\log\left(e\right)\log\left(x\right)+\frac{\mathrm{Li}_2\left(\frac{de^{i\pi}}{ex^2}\right)}{2} & \text{for } |x|<1\\ -\log\left(e\right)\log\left(\frac{1}{x}\right)+\frac{\mathrm{Li}_2\left(\frac{de^{i\pi}}{ex^2}\right)}{2} & \text{for } \frac{1}{|x|}<1\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|\,x\right)\log\left(e\right)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|\,x\right)\log\left(e\right)+\frac{\mathrm{Li}_2\left(\frac{de^{i\pi}}{ex^2}\right)}{2} & \text{otherwise}\end{cases}\right)}{2d}-\frac{b\,\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d),x)
```

```
[Out] a*log(x)/d - a*log(d + e*x**2)/(2*d) + b*n*Piecewise((log(e)*log(x) + polyl
og(2, d*exp_polar(I*pi)/(e*x**2))/2, Abs(x) < 1), (-log(e)*log(1/x) + polyl
og(2, d*exp_polar(I*pi)/(e*x**2))/2, 1/Abs(x) < 1), (-meijerg(((), (1, 1)),
 ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) +
polylog(2, d*exp_polar(I*pi)/(e*x**2))/2, True))/(2*d) - b*log(c*x**n)*log(
d/x**2 + e)/(2*d)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{(ex^2 + d)x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x), x)
```

3.214 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)}\,dx$

Optimal. Leaf size=83

$$-\frac{ben\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^2}+\frac{e\log\left(\frac{d}{ex^2}+1\right)(a+b\log(cx^n))}{2d^2}-\frac{a+b\log(cx^n)}{2dx^2}-\frac{bn}{4dx^2}$$

```
[Out] -(b*n)/(4*d*x^2) - (a + b*Log[c*x^n])/(2*d*x^2) + (e*Log[1 + d/(e*x^2)]*(a
+ b*Log[c*x^n]))/(2*d^2) - (b*e*n*PolyLog[2, -(d/(e*x^2))])/(4*d^2)
```

Rubi [A] time = 0.176401, antiderivative size = 109, normalized size of antiderivative = 1.31, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {266, 44, 2351, 2304, 2301, 2337, 2391}

$$\frac{ben\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4d^2}-\frac{e(a+b\log(cx^n))^2}{2bd^2n}+\frac{e\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2d^2}-\frac{a+b\log(cx^n)}{2dx^2}-\frac{bn}{4dx^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)),x]
```

```
[Out] -(b*n)/(4*d*x^2) - (a + b*Log[c*x^n])/(2*d*x^2) - (e*(a + b*Log[c*x^n])^2)/
(2*b*d^2*n) + (e*(a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*d^2) + (b*e*n*Po
lyLog[2, -((e*x^2)/d)])/(4*d^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^3} - \frac{e(a+b\log(cx^n))}{d^2x} + \frac{e^2x(a+b\log(cx^n))}{d^2(d+ex^2)}\right)dx$$
$$= \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x}\,dx}{d^2} + \frac{e^2\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx}{d^2}$$
$$= -\frac{bn}{4dx^2} - \frac{a+b\log(cx^n)}{2dx^2} - \frac{e(a+b\log(cx^n))^2}{2bd^2n} + \frac{e(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2d^2} - \frac{(ben)\int \frac{\log(1+}{x}}{2d^2}$$
$$= -\frac{bn}{4dx^2} - \frac{a+b\log(cx^n)}{2dx^2} - \frac{e(a+b\log(cx^n))^2}{2bd^2n} + \frac{e(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2d^2} + \frac{ben\text{Li}_2\left(-\frac{ex^2}{d}\right.}{4d^2}$$

Mathematica [A] time = 0.108763, size = 157, normalized size = 1.89

$$\frac{2ben\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)+2ben\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)+2e\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))+2e\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(c}{4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)),x]
```

```
[Out] (-((b*d*n)/x^2) - (2*d*(a + b*Log[c*x^n]))/x^2 - (2*e*(a + b*Log[c*x^n])^2)
/(b*n) + 2*e*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + 2*e*(a + b*
Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 2*b*e*n*PolyLog[2, (Sqrt[e]
*x)/Sqrt[-d]] + 2*b*e*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(4*d^2)
```

Maple [C] time = 0.146, size = 611, normalized size = 7.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x^2+d),x)
```

```
[Out] 1/2*b*n*e/d^2*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*e/d^2*ln(x)
*ln(e*x^2+d)+1/2*b*n*e/d^2*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I
*b*Pi*csgn(I*c*x^n)^3/d/x^2-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2*ln(x
)-a*e/d^2*ln(x)-1/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^2*ln(e*x^2+d)-b*ln(c)*e/d^2*
```

```
ln(x)-1/2*b*ln(c)/d/x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x^
2+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)^2*e/d^2*ln(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2*e/d^2*ln(x)-1/2*a/d/x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/x^2-b*l
n(x^n)*e/d^2*ln(x)+1/2*b*ln(x^n)*e/d^2*ln(e*x^2+d)+1/2*b*n*e/d^2*ln(x)^2+1/
2*b*ln(c)*e/d^2*ln(e*x^2+d)-1/2*b*ln(x^n)/d/x^2+1/2*I*b*Pi*csgn(I*c*x^n)^3*
e/d^2*ln(x)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^2+1/2*b*n*e/d^2*dilog(
(-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e/d^2*dilog((e*x+(-d*e)^(1/2))/(-
d*e)^(1/2))+1/2*a*e/d^2*ln(e*x^2+d)-1/4*b*n/d/x^2+1/2*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*e/d^2*ln(x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*e/d^2*ln(e*x^2+d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{e\log\left(ex^2+d\right)}{d^2}-\frac{2e\log(x)}{d^2}-\frac{1}{dx^2}\right)+b\int\frac{\log(c)+\log(x^n)}{ex^5+dx^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(e*log(e*x^2 + d)/d^2 - 2*e*log(x)/d^2 - 1/(d*x^2)) + b*integrate((lo
g(c) + log(x^n))/(e*x^5 + d*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\log(cx^n)+a}{ex^5+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^5 + d*x^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((a+b*ln(c*x**n))/x**3/(e*x**2+d),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{(ex^2 + d)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^3), x)
```

3.215 $\int \frac{a+b\log(cx^n)}{x^5\left(d+ex^2\right)}\,dx$

Optimal. Leaf size=121

$$\frac{be^2n\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^3}-\frac{e^2\log\left(\frac{d}{ex^2}+1\right)(a+b\log(cx^n))}{2d^3}+\frac{e(a+b\log(cx^n))}{2d^2x^2}-\frac{a+b\log(cx^n)}{4dx^4}+\frac{ben}{4d^2x^2}-\frac{bn}{16dx^4}$$

```
[Out] -(b*n)/(16*d*x^4) + (b*e*n)/(4*d^2*x^2) - (a + b*Log[c*x^n])/(4*d*x^4) + (e
*(a + b*Log[c*x^n]))/(2*d^2*x^2) - (e^2*Log[1 + d/(e*x^2)]*(a + b*Log[c*x^n
]))/(2*d^3) + (b*e^2*n*PolyLog[2, -(d/(e*x^2))])/(4*d^3)
```

Rubi [A] time = 0.214049, antiderivative size = 149, normalized size of antiderivative = 1.23, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {266, 44, 2351, 2304, 2301, 2337, 2391}

$$-\frac{be^2n\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4d^3}+\frac{e^2(a+b\log(cx^n))^2}{2bd^3n}-\frac{e^2\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2d^3}+\frac{e(a+b\log(cx^n))}{2d^2x^2}-\frac{a+b\log(cx^n)}{4dx^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^5*(d + e*x^2)),x]
```

```
[Out] -(b*n)/(16*d*x^4) + (b*e*n)/(4*d^2*x^2) - (a + b*Log[c*x^n])/(4*d*x^4) + (e
*(a + b*Log[c*x^n]))/(2*d^2*x^2) + (e^2*(a + b*Log[c*x^n])^2)/(2*b*d^3*n) -
 (e^2*(a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*d^3) - (b*e^2*n*PolyLog[2,
-((e*x^2)/d)])/(4*d^3)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^5(d+ex^2)}\,dx = \int\left(\frac{a+b\log(cx^n)}{dx^5} - \frac{e(a+b\log(cx^n))}{d^2x^3} + \frac{e^2(a+b\log(cx^n))}{d^3x} - \frac{e^3x(a+b\log(cx^n))}{d^3(d+ex^2)}\right)dx$$
$$= \frac{\int \frac{a+b\log(cx^n)}{x^5}dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^3}dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{x}dx}{d^3} - \frac{e^3\int \frac{x(a+b\log(cx^n))}{d+ex^2}dx}{d^3}$$
$$= -\frac{bn}{16dx^4} + \frac{ben}{4d^2x^2} - \frac{a+b\log(cx^n)}{4dx^4} + \frac{e(a+b\log(cx^n))}{2d^2x^2} + \frac{e^2(a+b\log(cx^n))^2}{2bd^3n} - \frac{e^2(a+b\log(cx^n}{2d}$$
$$= -\frac{bn}{16dx^4} + \frac{ben}{4d^2x^2} - \frac{a+b\log(cx^n)}{4dx^4} + \frac{e(a+b\log(cx^n))}{2d^2x^2} + \frac{e^2(a+b\log(cx^n))^2}{2bd^3n} - \frac{e^2(a+b\log(cx^n}{2d}$$

Mathematica [A] time = 0.184593, size = 196, normalized size = 1.62

$$-\frac{8be^2n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right) + 8be^2n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right) + \frac{4d^2(a+b\log(cx^n))}{x^4} + 8e^2\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n)) + 8e^2\log\left(\frac{d}{(-d}\right.}{16d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^5*(d + e*x^2)),x]
```

```
[Out] -((b*d^2*n)/x^4 - (4*b*d*e*n)/x^2 + (4*d^2*(a + b*Log[c*x^n]))/x^4 - (8*d*e
*(a + b*Log[c*x^n]))/x^2 - (8*e^2*(a + b*Log[c*x^n])^2)/(b*n) + 8*e^2*(a +
b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + 8*e^2*(a + b*Log[c*x^n])*Log[
1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 8*b*e^2*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]]
+ 8*b*e^2*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(16*d^3)
```

Maple [C] time = 0.168, size = 805, normalized size = 6.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^5/(e*x^2+d),x)
```

```
[Out] 1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3*ln(e*x^2+d)-1/2*b*n*
e^2/d^3*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*e^2/d^3*ln(x)*ln
((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e^2/d^3*ln(x)*ln(e*x^2+d)+1/8*I*b
```

```
*Pi*csgn(I*c*x^n)^3/d/x^4-1/2*a*e^2/d^3*ln(e*x^2+d)-1/4*b*ln(c)/d/x^4+a*e^2
/d^3*ln(x)+1/2*b*ln(c)*e/d^2/x^2+1/2*a*e/d^2/x^2-1/2*b*ln(c)*e^2/d^3*ln(e*x
^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3*ln(e*x^2+d)-1/2*I*b*Pi*csgn(I*c*x^
n)^3*e^2/d^3*ln(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*ln(x)+1/4
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/x^2+b*ln(x^n)*e^2/d^3*ln(x)+1/2*b
*ln(x^n)*e/d^2/x^2+b*ln(c)*e^2/d^3*ln(x)-1/2*b*ln(x^n)*e^2/d^3*ln(e*x^2+d)-
1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^4-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/d/x^4-1/4*b*ln(x^n)/d/x^4-1/2*b*n*e^2/d^3*ln(x)^2-1/4*I*b*Pi*csgn(I*
c*x^n)^3*e/d^2/x^2-1/2*b*n*e^2/d^3*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-
1/2*b*n*e^2/d^3*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*I*b*Pi*csgn(I*c*
x^n)^2*csgn(I*c)*e^2/d^3*ln(e*x^2+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e
^2/d^3*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/x^2-1/4*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*ln(e*x^2+d)+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)/d/x^4-1/4*a/d/x^4-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*e/d^2/x^2+1/4*b*e*n/d^2/x^2-1/16*b*n/d/x^4-1/2*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*e^2/d^3*ln(x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}\,a\left(\frac{2\,e^2\log\left(ex^2+d\right)}{d^3}-\frac{4\,e^2\log\left(x\right)}{d^3}-\frac{2\,ex^2-d}{d^2x^4}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{ex^7+dx^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^5/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/4*a*(2*e^2*log(e*x^2 + d)/d^3 - 4*e^2*log(x)/d^3 - (2*e*x^2 - d)/(d^2*x^
4)) + b*integrate((log(c) + log(x^n))/(e*x^7 + d*x^5), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{ex^7+dx^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^5/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^7 + d*x^5), 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*ln(c*x**n))/x**5/(e*x**2+d),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log (cx^n) + a}{(ex^2 + d)x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^5/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^5), x)
```

3.216 $\int \frac{x^4(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=167

$$-\frac{ibd^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{ibd^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{5/2}}+\frac{x^3(a+b\log(cx^n))}{3e}-\frac{a\ldots}{e\ldots}$$

```
[Out] -((a*d*x)/e^2) + (b*d*n*x)/e^2 - (b*n*x^3)/(9*e) - (b*d*x*Log[c*x^n])/e^2 +
 (x^3*(a + b*Log[c*x^n]))/(3*e) + (d^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a +
 b*Log[c*x^n]))/e^(5/2) - ((I/2)*b*d^(3/2)*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sq
rt[d]])/e^(5/2) + ((I/2)*b*d^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/e^(
5/2)
```

Rubi [A] time = 0.206553, antiderivative size = 167, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {302, 205, 2351, 2295, 2304, 2324, 12, 4848, 2391}

$$-\frac{ibd^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{ibd^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{5/2}}+\frac{x^3(a+b\log(cx^n))}{3e}-\frac{a\ldots}{e\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```


```
[Out] -((a*d*x)/e^2) + (b*d*n*x)/e^2 - (b*n*x^3)/(9*e) - (b*d*x*Log[c*x^n])/e^2 +
 (x^3*(a + b*Log[c*x^n]))/(3*e) + (d^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a +
 b*Log[c*x^n]))/e^(5/2) - ((I/2)*b*d^(3/2)*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sq
rt[d]])/e^(5/2) + ((I/2)*b*d^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/e^(
5/2)
```


Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4 (a+b\log(cx^n))}{d+ex^2}\,dx = \int \left(-\frac{d(a+b\log(cx^n))}{e^2} + \frac{x^2(a+b\log(cx^n))}{e} + \frac{d^2(a+b\log(cx^n))}{e^2\left(d+ex^2\right)}\right)dx$$

$$= -\frac{d\int (a+b\log(cx^n))\,dx}{e^2} + \frac{d^2\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e^2} + \frac{\int x^2(a+b\log(cx^n))\,dx}{e}$$

$$= -\frac{adx}{e^2} - \frac{bnx^3}{9e} + \frac{x^3(a+b\log(cx^n))}{3e} + \frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{5/2}} - \frac{(bd)\int \log(cx^n)\ c}{e^2}$$

$$= -\frac{adx}{e^2} + \frac{bdnx}{e^2} - \frac{bnx^3}{9e} - \frac{bdx\log(cx^n)}{e^2} + \frac{x^3(a+b\log(cx^n))}{3e} + \frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(c}{e^{5/2}}$$

$$= -\frac{adx}{e^2} + \frac{bdnx}{e^2} - \frac{bnx^3}{9e} - \frac{bdx\log(cx^n)}{e^2} + \frac{x^3(a+b\log(cx^n))}{3e} + \frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(c}{e^{5/2}}$$

$$= -\frac{adx}{e^2} + \frac{bdnx}{e^2} - \frac{bnx^3}{9e} - \frac{bdx\log(cx^n)}{e^2} + \frac{x^3(a+b\log(cx^n))}{3e} + \frac{d^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(c}{e^{5/2}}$$

Mathematica [A] time = 0.149333, size = 208, normalized size = 1.25

$$\frac{9b(-d)^{3/2}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right) - 9b(-d)^{3/2}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right) + 9\sqrt{-d}d\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n)) + 9(-d)^{3/2}\log\left(\right.}{18e^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (-18*a*d*Sqrt[e]*x + 18*b*d*Sqrt[e]*n*x - 2*b*e^(3/2)*n*x^3 - 18*b*d*Sqrt[e
]*x*Log[c*x^n] + 6*e^(3/2)*x^3*(a + b*Log[c*x^n]) + 9*Sqrt[-d]*d*(a + b*Log
[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + 9*(-d)^(3/2)*(a + b*Log[c*x^n])*Lo
g[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + 9*b*(-d)^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/S
qrt[-d]] - 9*b*(-d)^(3/2)*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(18*e^(5/
2))
```

Maple [C] time = 0.184, size = 693, normalized size = 4.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

```
[Out] -b*ln(c)/e^2*d*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^2/(d*
e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/3*b*ln(c)/e*x^3-b*ln(x^n)/e^2*d*x-1/6*I*
b*Pi*csgn(I*c*x^n)^3/e*x^3+b*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln
(x^n)+b*ln(c)*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2*b*n*d^2/e^2/(
-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d^2/e^2/(-d*e)^
(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-b*d^2/e^2/(d*e)^(1/2)*arctan(x
*e/(d*e)^(1/2))*n*ln(x)+1/2*b*n*d^2/e^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^
(1/2))/(-d*e)^(1/2))-1/2*b*n*d^2/e^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2
))/(-d*e)^(1/2))+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x^3+1/2*I*b*Pi*cs
gn(I*c*x^n)^3/e^2*d*x+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^2/(d*e)^(1
/2)*arctan(x*e/(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^2/
(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/3*b*ln(x^n)/e*x^3+1/6*I*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/e*x^3+a*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/3*a
/e*x^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e^2*d*x-1/2*I*b*Pi*cs
gn(I*c*x^n)^2*csgn(I*c)/e^2*d*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*
d*x-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*x^3-1/2*I*b*Pi*csgn(I*
c*x^n)^3*d^2/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+b*d*n*x/e^2-1/9*b*n*x^
3/e-a*d*x/e^2
```

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(x^4*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^4 \log(cx^n) + ax^4}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^4 \left(a + b \log \left(cx^n\right)\right)}{d + ex^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] Integral(x**4*(a + b*log(c*x**n))/(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b \log \left(cx^n\right) + a\right)x^4}{ex^2 + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d), x)
```

3.217 $\int \frac{x^2(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=132

$$\frac{ib\sqrt{d}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{d}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}}+\frac{ax}{e}+\frac{bx\log(cx^n)}{e}-\frac{bnx}{e}$$

```
[Out] (a*x)/e - (b*n*x)/e + (b*x*Log[c*x^n])/e - (Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt
[d]]*(a + b*Log[c*x^n]))/e^(3/2) + ((I/2)*b*Sqrt[d]*n*PolyLog[2, ((-I)*Sqrt
[e]*x)/Sqrt[d]])/e^(3/2) - ((I/2)*b*Sqrt[d]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/e^(3/2)
```

Rubi [A] time = 0.164603, antiderivative size = 132, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {321, 205, 2351, 2295, 2324, 12, 4848, 2391}

$$\frac{ib\sqrt{d}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{ib\sqrt{d}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}}-\frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}}+\frac{ax}{e}+\frac{bx\log(cx^n)}{e}-\frac{bnx}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (a*x)/e - (b*n*x)/e + (b*x*Log[c*x^n])/e - (Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt
[d]]*(a + b*Log[c*x^n]))/e^(3/2) + ((I/2)*b*Sqrt[d]*n*PolyLog[2, ((-I)*Sqrt
[e]*x)/Sqrt[d]])/e^(3/2) - ((I/2)*b*Sqrt[d]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/e^(3/2)
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))}{d+ex^2}\,dx = \int \left(\frac{a+b\log(cx^n)}{e} - \frac{d(a+b\log(cx^n))}{e\left(d+ex^2\right)}\right)dx$$
$$= \frac{\int (a+b\log(cx^n))\,dx}{e} - \frac{d\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e}$$
$$= \frac{ax}{e} - \frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}} + \frac{b\int \log(cx^n)\,dx}{e} + \frac{(bdn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}x}\,dx}{e}$$
$$= \frac{ax}{e} - \frac{bnx}{e} + \frac{bx\log(cx^n)}{e} - \frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}} + \frac{\left(b\sqrt{d}n\right)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{e^{3/2}}$$
$$= \frac{ax}{e} - \frac{bnx}{e} + \frac{bx\log(cx^n)}{e} - \frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}} + \frac{\left(ib\sqrt{d}n\right)\int \frac{\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{2e^{3/2}} - \frac{(ib}{}$$
$$= \frac{ax}{e} - \frac{bnx}{e} + \frac{bx\log(cx^n)}{e} - \frac{\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}} + \frac{ib\sqrt{d}n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2e^{3/2}} - \frac{ib\sqrt{d}n\text{Li}}{2e^{3}}$$

Mathematica [A] time = 0.109913, size = 170, normalized size = 1.29

$$\frac{b\sqrt{-d}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right) - b\sqrt{-d}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right) - \sqrt{-d}\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n)) + \sqrt{-d}\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+}{2e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (2*a*Sqrt[e]*x - 2*b*Sqrt[e]*n*x + 2*b*Sqrt[e]*x*Log[c*x^n] - Sqrt[-d]*(a +
 b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + Sqrt[-d]*(a + b*Log[c*x^n])*
Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + b*Sqrt[-d]*n*PolyLog[2, (Sqrt[e]*x)/Sqr
t[-d]] - b*Sqrt[-d]*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(2*e^(3/2))
```

Maple [C] time = 0.174, size = 512, normalized size = 3.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

```
[Out] b*ln(x^n)/e*x+b*d/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)-b*d/e/(d*e)
^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)-b*n*x/e-1/2*b*n*d/e/(-d*e)^(1/2)*ln(
x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*d/e/(-d*e)^(1/2)*ln(x)*ln((
e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*d/e/(-d*e)^(1/2)*dilog((-e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))+1/2*b*n*d/e/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d
*e)^(1/2))-1/2*I*b*Pi*csgn(I*c*x^n)^3/e*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2*d/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/e*x+1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e/(d*e)^(1/2)*arctan(x*e
/(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x+1/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*I*
b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x+b*ln(c)/e*x-b*ln(c)*d/e/(d*e)^(1/2)*ar
ctan(x*e/(d*e)^(1/2))+a*x/e-a*d/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))
```

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(x^2*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^2 \log(cx^n) + ax^2}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2 (a + b\log(cx^n))}{d + ex^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^2}{ex^2 + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d), x)
```

3.218 $\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx$

Optimal. Leaf size=105

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log\left(cx^n\right))}{\sqrt{d}\sqrt{e}}$$

```
[Out] (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*Sqrt[e]) - ((I/2)
*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e]) + ((I/2)*b*n*P
olyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e])
```

Rubi [A] time = 0.0660322, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {205, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log\left(cx^n\right))}{\sqrt{d}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2),x]
```

```
[Out] (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*Sqrt[e]) - ((I/2)
*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e]) + ((I/2)*b*n*P
olyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx &= \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{e}}-(bn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}x}\,dx\\ &= \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{e}}-\frac{(bn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}\sqrt{e}}\\ &= \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{e}}-\frac{(ibn)\int \frac{\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{2\sqrt{d}\sqrt{e}}+\frac{(ibn)\int \frac{\log\left(1+\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{2\sqrt{d}\sqrt{e}}\\ &= \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{e}}-\frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}+\frac{ibn\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\sqrt{e}}\end{aligned}$$

Mathematica [A] time = 0.0465185, size = 107, normalized size = 1.02

$$\frac{bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)-bn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)+\left(\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)-\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)\right)(-(a+b\log(cx^n)))}{2\sqrt{-d}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2),x]
```

```
[Out] (-((a + b*Log[c*x^n])*(Log[1 + (Sqrt[e]*x)/Sqrt[-d]] - Log[1 + (d*Sqrt[e]*x
)/(-d)^(3/2)])) + b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] - b*n*PolyLog[2, (d*
```

```
Sqrt[e]*x)/(-d)^(3/2)])/(2*Sqrt[-d]*Sqrt[e])
```

Maple [C] time = 0.22, size = 332, normalized size = 3.2

$$-\ln(x)\,bn\arctan\left(ex\frac{1}{\sqrt{de}}\right)\frac{1}{\sqrt{de}}+b\ln(x^n)\arctan\left(ex\frac{1}{\sqrt{de}}\right)\frac{1}{\sqrt{de}}+\frac{\ln(x)\,bn}{2}\ln\left(\left(-ex+\sqrt{-de}\right)\frac{1}{\sqrt{-de}}\right)\frac{1}{\sqrt{-de}}-\frac{\ln(x)\,b}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x^2+d),x)
```

```
[Out] -b/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)+b/(d*e)^(1/2)*arctan(x*e/(d*
e)^(1/2))*ln(x^n)+1/2*b*n/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))-1/2*b*n/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b
*n/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/(-d*e)^(1/2
)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*I/(d*e)^(1/2)*arctan(x*e/(d*e)
^(1/2))*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/(d*e)^(1/2)*arctan(x*e/(d*e)
^(1/2))*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/(d*e)^(1/2)*arctan(x
*e/(d*e)^(1/2))*b*Pi*csgn(I*c*x^n)^3+1/2*I/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/
2))*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*b*
ln(c)+a/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))
```

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((a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{d + ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d), x)
```

3.219 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)}\,dx$

Optimal. Leaf size=134

$$\frac{ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}-\frac{a+b\log(cx^n)}{dx}-\frac{bn}{dx}$$

```
[Out] -((b*n)/(d*x)) - (a + b*Log[c*x^n])/(d*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqr
t[d]]*(a + b*Log[c*x^n]))/d^(3/2) + ((I/2)*b*Sqrt[e]*n*PolyLog[2, ((-I)*Sqr
t[e]*x)/Sqrt[d]])/d^(3/2) - ((I/2)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqr
t[d]])/d^(3/2)
```

Rubi [A] time = 0.17457, antiderivative size = 134, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$\frac{ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}}-\frac{a+b\log(cx^n)}{dx}-\frac{bn}{dx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)),x]
```

```
[Out] -((b*n)/(d*x)) - (a + b*Log[c*x^n])/(d*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqr
t[d]]*(a + b*Log[c*x^n]))/d^(3/2) + ((I/2)*b*Sqrt[e]*n*PolyLog[2, ((-I)*Sqr
t[e]*x)/Sqrt[d]])/d^(3/2) - ((I/2)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqr
t[d]])/d^(3/2)
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^2} - \frac{e(a+b\log(cx^n))}{d(d+ex^2)}\right) dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{d}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{(ben)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}x}\,dx}{d}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{\left(b\sqrt{e}n\right)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{d^{3/2}}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{\left(ib\sqrt{e}n\right)\int \frac{\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{2d^{3/2}} - \frac{\left(ib\sqrt{e}n\right)}{}$$

$$= -\frac{bn}{dx} - \frac{a+b\log(cx^n)}{dx} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{3/2}} + \frac{ib\sqrt{e}n\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}} - \frac{ib\sqrt{e}n\text{Li}_2\left(\frac{i\sqrt{e}x}{\sqrt{d}}\right.}{2d^{3/2}}$$

Mathematica [A] time = 0.139715, size = 173, normalized size = 1.29

$$\frac{d\left(bd\sqrt{e}nx\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right) - bd\sqrt{e}nx\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right) - d\sqrt{e}x\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n)) + d\sqrt{e}x\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}} + \right.\right.}{2(-d)^{7/2}x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)),x]
```

```
[Out] (d*(-2*b*(-d)^(3/2)*n + 2*Sqrt[-d]*d*(a + b*Log[c*x^n]) - d*Sqrt[e]*x*(a +
b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]] + d*Sqrt[e]*x*(a + b*Log[c*x^n]
)*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)] + b*d*Sqrt[e]*n*x*PolyLog[2, (Sqrt[e]*x
)/Sqrt[-d]] - b*d*Sqrt[e]*n*x*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)]))/(2*(-d
)^(7/2)*x)
```

Maple [C] time = 0.268, size = 531, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x^2+d),x)
```

```
[Out] b*e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)-b*e/d/(d*e)^(1/2)*arctan(
x*e/(d*e)^(1/2))*ln(x^n)-b*ln(x^n)/d/x-1/2*b*n*e/d/(-d*e)^(1/2)*ln(x)*ln((-
e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e/d/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*
e)^(1/2))/(-d*e)^(1/2))-1/2*b*n*e/d/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))+1/2*b*n*e/d/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2
))-b*n/d/x-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d/(d*e)^(1/2)*arctan(x*e/
(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x-1/2*I*b*Pi*
csgn(I*x^n)*csgn(I*c*x^n)^2/d/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d/
(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d/(d*e)^(1
/2)*arctan(x*e/(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*c*x^n)^3/d/x-1/2*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x-b*ln(c)*e/d/(d*e)^(1/2)*arctan(x*e/(d*
e)^(1/2))-b*ln(c)/d/x-a*e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-a/d/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((a+b*log(c*x^n))/x^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{ex^4+dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^4 + d*x^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log\left(cx^{n}\right)}{x^{2}\left(d + ex^{2}\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right) + a}{\left(ex^{2} + d\right)x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^2), x)
```

3.220 $\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)}\,dx$

Optimal. Leaf size=165

$$-\frac{ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}+\frac{ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}}+\frac{e(a+b\log(cx^n))}{d^2x}-\frac{a+b}{3}$$

```
[Out] -(b*n)/(9*d*x^3) + (b*e*n)/(d^2*x) - (a + b*Log[c*x^n])/(3*d*x^3) + (e*(a +
 b*Log[c*x^n]))/(d^2*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c
*x^n]))/d^(5/2) - ((I/2)*b*e^(3/2)*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/
d^(5/2) + ((I/2)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/d^(5/2)
```

Rubi [A] time = 0.197425, antiderivative size = 165, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$-\frac{ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}+\frac{ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}}+\frac{e(a+b\log(cx^n))}{d^2x}-\frac{a+b}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)),x]
```

```
[Out] -(b*n)/(9*d*x^3) + (b*e*n)/(d^2*x) - (a + b*Log[c*x^n])/(3*d*x^3) + (e*(a +
 b*Log[c*x^n]))/(d^2*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c
*x^n]))/d^(5/2) - ((I/2)*b*e^(3/2)*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/
d^(5/2) + ((I/2)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/d^(5/2)
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)}\,dx = \int \left(\frac{a+b\log(cx^n)}{dx^4} - \frac{e(a+b\log(cx^n))}{d^2x^2} + \frac{e^2(a+b\log(cx^n))}{d^2(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{x^4}\,dx}{d} - \frac{e\int \frac{a+b\log(cx^n)}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{d^2}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e(a+b\log(cx^n))}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}} - \frac{(be^2n)}{}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e(a+b\log(cx^n))}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}} - \frac{(be^{3/2}n}{}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e(a+b\log(cx^n))}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}} - \frac{(ibe^{3/2}}{}$$

$$= -\frac{bn}{9dx^3} + \frac{ben}{d^2x} - \frac{a+b\log(cx^n)}{3dx^3} + \frac{e(a+b\log(cx^n))}{d^2x} + \frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{d^{5/2}} - \frac{ibe^{3/2}n}{2}$$

Mathematica [A] time = 0.182793, size = 211, normalized size = 1.28

$$\frac{1}{18}\left(\frac{9be^{3/2}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{5/2}} - \frac{9be^{3/2}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{5/2}} + \frac{18e(a+b\log(cx^n))}{d^2x} - \frac{9e^{3/2}\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{(-d)^{5/2}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)),x]
```

```
[Out] ((-2*b*n)/(d*x^3) + (18*b*e*n)/(d^2*x) - (6*(a + b*Log[c*x^n]))/(d*x^3) + (
18*e*(a + b*Log[c*x^n]))/(d^2*x) - (9*e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (S
qrt[e]*x)/Sqrt[-d]])/(-d)^(5/2) + (9*e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (d*
Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(5/2) + (9*b*e^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/
Sqrt[-d]])/(-d)^(5/2) - (9*b*e^(3/2)*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)]
)/(-d)^(5/2))/18
```

Maple [C] time = 0.208, size = 706, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^4/(e*x^2+d),x)
```

```
[Out] -1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/x+a*e^2/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^
(1/2))+1/6*I*b*Pi*csgn(I*c*x^n)^3/d/x^3+b*ln(c)*e^2/d^2/(d*e)^(1/2)*arctan(
x*e/(d*e)^(1/2))-1/2*b*n*e^2/d^2/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*
e)^(1/2))-1/3*b*ln(x^n)/d/x^3+b*e^2/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))
*ln(x^n)+a*e/d^2/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^2/(
d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/3*b*ln(c)/d/x^3-1/6*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2/d/x^3-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/x^3+1/2*I*b*P
i*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1
/2))+b*ln(c)*e/d^2/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/x
+b*ln(x^n)*e/d^2/x-1/3*a/d/x^3-b*e^2/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2)
)*n*ln(x)+1/2*b*n*e^2/d^2/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/
2))+1/2*b*n*e^2/d^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))
-1/2*b*n*e^2/d^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2
*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/6*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/x^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2*e/d^2/x+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/x-1/9*b*n/d/x^
3+b*e*n/x/d^2
```

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((a+b*log(c*x^n))/x^4/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{ex^{6}+dx^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^6 + d*x^4), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log\left(cx^{n}\right)}{x^{4}\left(d + ex^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**4*(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right) + a}{\left(ex^{2} + d\right)x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)*x^4), x)
```

3.221 $\int \frac{x^5(a+b\log(cx^n))}{(d+ex^2)^2} dx$

Optimal. Leaf size=129

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{2e^3}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{d\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{bdn\log\left(d+\right.}{4e^3}$$

```
[Out] -(b*n*x^2)/(4*e^2) + (x^2*(a + b*Log[c*x^n]))/(2*e^2) + (d*x^2*(a + b*Log[c
*x^n]))/(2*e^2*(d + e*x^2)) - (b*d*n*Log[d + e*x^2])/(4*e^3) - (d*(a + b*Lo
g[c*x^n])*Log[1 + (e*x^2)/d])/e^3 - (b*d*n*PolyLog[2, -((e*x^2)/d)])/(2*e^3
)
```

Rubi [A] time = 0.220363, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {266, 43, 2351, 2304, 2335, 260, 2337, 2391}

$$-\frac{bdn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{2e^3}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{d\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}-\frac{bdn\log\left(d+\right.}{4e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] -(b*n*x^2)/(4*e^2) + (x^2*(a + b*Log[c*x^n]))/(2*e^2) + (d*x^2*(a + b*Log[c
*x^n]))/(2*e^2*(d + e*x^2)) - (b*d*n*Log[d + e*x^2])/(4*e^3) - (d*(a + b*Lo
g[c*x^n])*Log[1 + (e*x^2)/d])/e^3 - (b*d*n*PolyLog[2, -((e*x^2)/d)])/(2*e^3
)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^2\right)^2}\,dx=\int\left(\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2}+\frac{d^2x\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)^2}-\frac{2dx\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int x\left(a+b\log\left(cx^n\right)\right)\,dx}{e^2}-\frac{(2d)\int\frac{x(a+b\log(cx^n))}{d+ex^2}\,dx}{e^2}+\frac{d^2\int\frac{x(a+b\log(cx^n))}{\left(d+ex^2\right)^2}\,dx}{e^2}$$

$$=-\frac{bnx^2}{4e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{d\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{ex^2}{d}\right)}{e^3}+\frac{(b\cdots}{\cdots}$$

$$=-\frac{bnx^2}{4e^2}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2e^2}+\frac{dx^2\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{bdn\log\left(d+ex^2\right)}{4e^3}-\frac{d\left(a+b\log\left(cx^n\cdots\right.\right.}{e^3\cdots}$$

Mathematica [C] time = 0.467416, size = 287, normalized size = 2.22

$$\frac{bn\left(-4d\left(\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1+\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)-4d\left(\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)+\frac{d\sqrt{e}x\log(x)}{\sqrt{e}x-i\sqrt{d}}+\frac{d\cdots}{\cdots}}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (2*e*x^2*(a - b*n*Log[x] + b*Log[c*x^n]) - (2*d^2*(a - b*n*Log[x] + b*Log[c
*x^n]))/(d + e*x^2) - 4*d*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2] +
b*n*((d*Sqrt[e]*x*Log[x])/((-I)*Sqrt[d] + Sqrt[e]*x) + (d*Sqrt[e]*x*Log[x])
/(I*Sqrt[d] + Sqrt[e]*x) + e*x^2*(-1 + 2*Log[x]) - d*Log[I*Sqrt[d] - Sqrt[e
]*x] - d*Log[I*Sqrt[d] + Sqrt[e]*x] - 4*d*(Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqr
t[d]] + PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) - 4*d*(Log[x]*Log[1 - (I*Sqrt
[e]*x)/Sqrt[d]] + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(4*e^3)
```

Maple [C] time = 0.19, size = 687, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

```
[Out] b*n*d/e^3*ln(x)*ln(e*x^2+d)-b*n*d/e^3*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))-b*n*d/e^3*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I
*c*x^n)^2*csgn(I*c)/e^2*x^2-1/2*b*ln(c)*d^2/e^3/(e*x^2+d)-b*ln(c)/e^3*d*ln(
e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/e^2*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*d^2/e^3/(e*x^2+d)+1/2*b*ln(c)/e^2*x^2+1/4*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2/e^2*x^2+1/2*b*n/e^3*d*ln(x)-b*n*d/e^3*dilog((-e*x+(-d*e)^
(1/2))/(-d*e)^(1/2))-b*n*d/e^3*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I
*b*Pi*csgn(I*c*x^n)^3*d^2/e^3/(e*x^2+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)/e^3*d*ln(e*x^2+d)-a*d/e^3*ln(e*x^2+d)-1/2*a*d^2/e^3/(e*x^2+d)-1
/2*b*ln(x^n)*d^2/e^3/(e*x^2+d)-b*ln(x^n)*d/e^3*ln(e*x^2+d)+1/2*I*b*Pi*csgn(
I*c*x^n)^3/e^3*d*ln(e*x^2+d)+1/2*b*ln(x^n)/e^2*x^2-1/2*I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)/e^3*d*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3
/(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^3*d*ln(e*x^2+d)-1/4*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)/e^2*x^2+1/2*a/e^2*x^2-1/4*b*d*n*ln(e*x^2+d)/e^3-1/4*b
*n*x^2/e^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{d^2}{e^4x^2+de^3}-\frac{x^2}{e^2}+\frac{2\,d\log\left(ex^2+d\right)}{e^3}\right)+b\int\frac{x^5\log\left(c\right)+x^5\log\left(x^n\right)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(d^2/(e^4*x^2 + d*e^3) - x^2/e^2 + 2*d*log(e*x^2 + d)/e^3) + b*integ
rate((x^5*log(c) + x^5*log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e^2*x^4 + 2*d*e*x^2 + d^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(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^5}{(ex^2 + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^2, x)
```

3.222 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=95

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^2}+\frac{\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e^2}-\frac{x^2(a+b\log(cx^n))}{2e\left(d+ex^2\right)}+\frac{bn\log\left(d+ex^2\right)}{4e^2}$$

```
[Out] -(x^2*(a + b*Log[c*x^n]))/(2*e*(d + e*x^2)) + (b*n*Log[d + e*x^2])/(4*e^2)
+ ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e^2) + (b*n*PolyLog[2, -((e*x^
2)/d)])/(4*e^2)
```

Rubi [A] time = 0.187815, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {266, 43, 2351, 2335, 260, 2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^2}+\frac{\log\left(\frac{ex^2}{d}+1\right)(a+b\log(cx^n))}{2e^2}-\frac{x^2(a+b\log(cx^n))}{2e\left(d+ex^2\right)}+\frac{bn\log\left(d+ex^2\right)}{4e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] -(x^2*(a + b*Log[c*x^n]))/(2*e*(d + e*x^2)) + (b*n*Log[d + e*x^2])/(4*e^2)
+ ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e^2) + (b*n*PolyLog[2, -((e*x^
2)/d)])/(4*e^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3 (a + b\log(cx^n))}{(d + ex^2)^2}\,dx = \int \left(-\frac{dx(a + b\log(cx^n))}{e(d + ex^2)^2} + \frac{x(a + b\log(cx^n))}{e(d + ex^2)} \right) dx$$

$$= \frac{\int \frac{x(a+b\log(cx^n))}{d+ex^2}\,dx}{e} - \frac{d\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^2}\,dx}{e}$$

$$= -\frac{x^2(a + b\log(cx^n))}{2e(d + ex^2)} + \frac{(a + b\log(cx^n))\log\left(1 + \frac{ex^2}{d}\right)}{2e^2} - \frac{(bn)\int \frac{\log\left(1+\frac{ex^2}{d}\right)}{x}\,dx}{2e^2} + \frac{(bn)\int \frac{x}{d+ex^2}\,dx}{2e}$$

$$= -\frac{x^2(a + b\log(cx^n))}{2e(d + ex^2)} + \frac{bn\log(d + ex^2)}{4e^2} + \frac{(a + b\log(cx^n))\log\left(1 + \frac{ex^2}{d}\right)}{2e^2} + \frac{bn\mathrm{Li}_2\left(-\frac{ex^2}{d}\right)}{4e^2}$$

Mathematica [C] time = 0.233394, size = 321, normalized size = 3.38

$$\frac{\frac{bn\left(2(d+ex^2)\mathrm{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+2(d+ex^2)\mathrm{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)+ex^2\log\left(-\sqrt{e}x+i\sqrt{d}\right)+ex^2\log\left(\sqrt{e}x+i\sqrt{d}\right)+2ex^2\log(x)\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+2ex^2\log(x)\log\left(1+\frac{i\sqrt{e}x}{\sqrt{d}}\right)+d\log}{d+ex^2}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] ((2*d*(a - b*n*Log[x] + b*Log[c*x^n]))/(d + e*x^2) + 2*(a - b*n*Log[x] + b*
Log[c*x^n])*Log[d + e*x^2] + (b*n*(-2*e*x^2*Log[x] + d*Log[I*Sqrt[d] - Sqrt
[e]*x] + e*x^2*Log[I*Sqrt[d] - Sqrt[e]*x] + d*Log[I*Sqrt[d] + Sqrt[e]*x] +
e*x^2*Log[I*Sqrt[d] + Sqrt[e]*x] + 2*d*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]
] + 2*e*x^2*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 2*d*Log[x]*Log[1 + (I*S
qrt[e]*x)/Sqrt[d]] + 2*e*x^2*Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 2*(d +
 e*x^2)*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 2*(d + e*x^2)*PolyLog[2, (I*
Sqrt[e]*x)/Sqrt[d]]))/(d + e*x^2))/(4*e^2)
```

Maple [C] time = 0.174, size = 511, normalized size = 5.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*ln(x^n)/e^2*ln(e*x^2+d)+1/2*b*ln(x^n)*d/e^2/(e*x^2+d)-1/2*b*n/e^2*ln(
x)*ln(e*x^2+d)+1/2*b*n/e^2*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b
*n/e^2*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e^2*dilog((-e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e^2*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)-1/2*b*n/e^2*ln(x)+1/4*b*n*ln(e*x^2+d)/e^2-1/4*I*b*Pi*csgn(I*c*x^n)^3/e^2*
ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*ln(e*x^2+d)+1/4*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2*d/e^2/(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^2*ln(e*x^2+
d)-1/4*I*b*Pi*csgn(I*c*x^n)^3*d/e^2/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*d/e^2/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)/e^2*ln(e*x^2+d)+1/2*b*ln(c)/e^2*ln(e*x^2+d)+1/2*b*ln(c)*d/e^2/(e*x^2+
d)+1/2*a/e^2*ln(e*x^2+d)+1/2*a*d/e^2/(e*x^2+d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a\left(\frac{d}{e^3x^2+de^2}+\frac{\log\left(ex^2+d\right)}{e^2}\right)+b\int\frac{x^3\log\left(c\right)+x^3\log\left(x^n\right)}{e^2x^4+2\,dex^2+d^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(d/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/e^2) + b*integrate((x^3*log(c)
+ x^3*log(x^n))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e^2*x^4 + 2*d*e*x^2 + d^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(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^3}{(ex^2 + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d)^2, x)
```

3.223 $\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=50

$$\frac{x^2(a+b\log(cx^n))}{2d(d+ex^2)}-\frac{bn\log(d+ex^2)}{4de}$$

```
[Out] (x^2*(a + b*Log[c*x^n]))/(2*d*(d + e*x^2)) - (b*n*Log[d + e*x^2])/(4*d*e)
```

Rubi [A] time = 0.041939, antiderivative size = 50, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2335, 260}

$$\frac{x^2(a+b\log(cx^n))}{2d(d+ex^2)}-\frac{bn\log(d+ex^2)}{4de}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (x^2*(a + b*Log[c*x^n]))/(2*d*(d + e*x^2)) - (b*n*Log[d + e*x^2])/(4*d*e)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^2}\,dx = \frac{x^2(a+b\log(cx^n))}{2d(d+ex^2)} - \frac{(bn)\int \frac{x}{d+ex^2}\,dx}{2d}$$
$$= \frac{x^2(a+b\log(cx^n))}{2d(d+ex^2)} - \frac{bn\log(d+ex^2)}{4de}$$

Mathematica [A] time = 0.0648603, size = 74, normalized size = 1.48

$$-\frac{2ad+2bd\log(cx^n)+benx^2\log(d+ex^2)-2bn\log(x)(d+ex^2)+bdn\log(d+ex^2)}{4de(d+ex^2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] -(2*a*d - 2*b*n*(d + e*x^2)*Log[x] + 2*b*d*Log[c*x^n] + b*d*n*Log[d + e*x^2
] + b*e*n*x^2*Log[d + e*x^2])/(4*d*e*(d + e*x^2))
```

Maple [C] time = 0.096, size = 179, normalized size = 3.6

$$-\frac{b\ln(x^n)}{2(ex^2+d)e} - \frac{i\pi\, bd\,\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2 - i\pi\, bd\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic) - i\pi\, bd(\mathrm{csgn}(icx^n))^3 + i\pi\, bd(\mathrm{csgn}}{(4ex^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

```
[Out] -1/2*b/e/(e*x^2+d)*ln(x^n)-1/4*(I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b
*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*d*cs
gn(I*c*x^n)^2*csgn(I*c)-2*ln(x)*b*e*n*x^2+ln(e*x^2+d)*b*e*n*x^2-2*ln(x)*b*d
*n+ln(e*x^2+d)*b*d*n+2*ln(c)*b*d+2*a*d)/(e*x^2+d)/e/d
```

Maxima [A] time = 1.19873, size = 96, normalized size = 1.92

$$-\frac{1}{4}bn\left(\frac{\log(ex^2+d)}{de} - \frac{\log(x^2)}{de}\right) - \frac{b\log(cx^n)}{2(e^2x^2+de)} - \frac{a}{2(e^2x^2+de)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/4*b*n*(log(e*x^2 + d)/(d*e) - log(x^2)/(d*e)) - 1/2*b*log(c*x^n)/(e^2*x^
2 + d*e) - 1/2*a/(e^2*x^2 + d*e)
```

Fricas [A] time = 1.34862, size = 143, normalized size = 2.86

$$\frac{2\,benx^2\log(x) - 2\,bd\log(c) - 2\,ad - \left(benx^2 + bdn\right)\log\left(ex^2 + d\right)}{4\left(de^2x^2 + d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*e*n*x^2*log(x) - 2*b*d*log(c) - 2*a*d - (b*e*n*x^2 + b*d*n)*log(e*
x^2 + d))/(d*e^2*x^2 + d^2*e)
```

Sympy [A] time = 78.7155, size = 366, normalized size = 7.32

$$\begin{cases} \tilde{\infty}\left(-\frac{a}{2x^2} - \frac{bn\log(x)}{2x^2} - \frac{bn}{4x^2} - \frac{b\log(c)}{2x^2}\right) \\ \frac{\frac{ax^2}{2} + \frac{bnx^2\log(x)}{2} - \frac{bnx^2}{4} + \frac{bx^2\log(c)}{2}}{d^2} \\ \frac{-\frac{a}{2x^2} - \frac{bn\log(x)}{2x^2} - \frac{bn}{4x^2} - \frac{b\log(c)}{2x^2}}{e^2} \\ -\frac{2ad}{4d^2e+4de^2x^2} - \frac{bdn\log\left(-i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} - \frac{bdn\log\left(i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} + \frac{2benx^2\log(x)}{4d^2e+4de^2x^2} - \frac{benx^2\log\left(-i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} - \frac{benx^2\log\left(i\sqrt{d}\sqrt{\frac{1}{e}}+x\right)}{4d^2e+4de^2x^2} + \frac{2bex^2\log(c)}{4d^2e+4de^2x^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Piecewise((zoo*(-a/(2*x**2) - b*n*log(x)/(2*x**2) - b*n/(4*x**2) - b*log(c)
/(2*x**2)), Eq(d, 0) & Eq(e, 0)), ((a*x**2/2 + b*n*x**2*log(x)/2 - b*n*x**2
/4 + b*x**2*log(c)/2)/d**2, Eq(e, 0)), ((-a/(2*x**2) - b*n*log(x)/(2*x**2)
- b*n/(4*x**2) - b*log(c)/(2*x**2))/e**2, Eq(d, 0)), (-2*a*d/(4*d**2*e + 4*
d*e**2*x**2) - b*d*n*log(-I*sqrt(d)*sqrt(1/e) + x)/(4*d**2*e + 4*d*e**2*x**
```

```
2) - b*d*n*log(I*sqrt(d)*sqrt(1/e) + x)/(4*d**2*e + 4*d*e**2*x**2) + 2*b*e*
n*x**2*log(x)/(4*d**2*e + 4*d*e**2*x**2) - b*e*n*x**2*log(-I*sqrt(d)*sqrt(1
/e) + x)/(4*d**2*e + 4*d*e**2*x**2) - b*e*n*x**2*log(I*sqrt(d)*sqrt(1/e) +
x)/(4*d**2*e + 4*d*e**2*x**2) + 2*b*e*x**2*log(c)/(4*d**2*e + 4*d*e**2*x**2
), True))
```

Giac [A] time = 1.33931, size = 95, normalized size = 1.9

$$-\frac{bnx^2e\log\left(x^2e+d\right)-2\,bnx^2e\log\left(x\right)+bdn\log\left(x^2e+d\right)+2\,bd\log\left(c\right)+2\,ad}{4\left(dx^2e^2+d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] -1/4*(b*n*x^2*e*log(x^2*e + d) - 2*b*n*x^2*e*log(x) + b*d*n*log(x^2*e + d)
+ 2*b*d*log(c) + 2*a*d)/(d*x^2*e^2 + d^2*e)
```

3.224 $\int \frac{a+b\log(cx^n)}{x(d+ex^2)^2}\,dx$

Optimal. Leaf size=82

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^2}-\frac{\log\left(\frac{d}{ex^2}+1\right)(2a+2b\log(cx^n)-bn)}{4d^2}+\frac{a+b\log(cx^n)}{2d(d+ex^2)}$$

```
[Out] (a + b*Log[c*x^n])/(2*d*(d + e*x^2)) - (Log[1 + d/(e*x^2)]*(2*a - b*n + 2*b
*Log[c*x^n]))/(4*d^2) + (b*n*PolyLog[2, -(d/(e*x^2))])/(4*d^2)
```

Rubi [A] time = 0.140375, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {2340, 2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^2}-\frac{\log\left(\frac{d}{ex^2}+1\right)(2a+2b\log(cx^n)-bn)}{4d^2}+\frac{a+b\log(cx^n)}{2d(d+ex^2)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^2),x]
```

```
[Out] (a + b*Log[c*x^n])/(2*d*(d + e*x^2)) - (Log[1 + d/(e*x^2)]*(2*a - b*n + 2*b
*Log[c*x^n]))/(4*d^2) + (b*n*PolyLog[2, -(d/(e*x^2))])/(4*d^2)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^2}\,dx = \frac{a+b\log(cx^n)}{2d\left(d+ex^2\right)} - \frac{\int \frac{-2a+bn-2b\log(cx^n)}{x\left(d+ex^2\right)}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2d\left(d+ex^2\right)} - \frac{\log\left(1+\frac{d}{ex^2}\right)(2a-bn+2b\log(cx^n))}{4d^2} + \frac{(bn)\int \frac{\log\left(1+\frac{d}{ex^2}\right)}{x}\,dx}{2d^2}$$

$$= \frac{a+b\log(cx^n)}{2d\left(d+ex^2\right)} - \frac{\log\left(1+\frac{d}{ex^2}\right)(2a-bn+2b\log(cx^n))}{4d^2} + \frac{bn\mathrm{Li}_2\left(-\frac{d}{ex^2}\right)}{4d^2}$$

Mathematica [C] time = 0.368261, size = 279, normalized size = 3.4

$$\frac{bn\left(-2\left(\mathrm{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1+\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)-2\left(\mathrm{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)+\frac{\sqrt{e}x\log(x)}{-\sqrt{e}x+i\sqrt{d}}-\frac{\sqrt{e}x\log(}{\sqrt{e}x+i\sqrt{}}}{4d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^2),x]
```

```
[Out] (a - b*n*Log[x] + b*Log[c*x^n])/(2*d^2 + 2*d*e*x^2) + (Log[x]*(a - b*n*Log[
x] + b*Log[c*x^n]))/d^2 - ((a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2])/
(2*d^2) + (b*n*((Sqrt[e]*x*Log[x])/(I*Sqrt[d] - Sqrt[e]*x) - (Sqrt[e]*x*Log
[x])/(I*Sqrt[d] + Sqrt[e]*x) + 2*Log[x]^2 + Log[I*Sqrt[d] - Sqrt[e]*x] + Lo
g[I*Sqrt[d] + Sqrt[e]*x] - 2*(Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + PolyL
og[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) - 2*(Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]]
 + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(4*d^2)
```

Maple [C] time = 0.157, size = 644, normalized size = 7.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x^2+d)^2,x)
```

```
[Out] -1/2*b*n/d^2*ln(x)^2-1/2*b*n/d^2*ln(x)-1/4*I*b*Pi*csgn(I*c*x^n)^3/d/(e*x^2+
d)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2*ln(e
*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(e*x^2+d)-1/2*b*n/d^2*
ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/d^2*ln(x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/(e*x^2+d)-1/4*I*b
*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(e*x^2+d)-1/2*b*ln(c)/d^2*ln(e*x^2+d)+1
/2*b*ln(c)/d/(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x^2+d)+1/2
*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(x)-1/2*b*n/d^2*ln(x)*ln((e*x+(-d*e
)^(1/2))/(-d*e)^(1/2))+1/2*b*n/d^2*ln(x)*ln(e*x^2+d)+b*ln(x^n)/d^2*ln(x)-1/
2*b*ln(x^n)/d^2*ln(e*x^2+d)+1/2*b*ln(x^n)/d/(e*x^2+d)+1/4*b*n/d^2*ln(e*x^2+
d)-1/2*b*n/d^2*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n/d^2*dilog((e
*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)/d^2*ln(e*x^2+d)+b*ln(c)/d^2*ln(x)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)/d/(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(
x)+a/d^2*ln(x)-1/2*a/d^2*ln(e*x^2+d)+1/2*a/d/(e*x^2+d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\,a\left(\frac{1}{dex^2+d^2}-\frac{\log\left(ex^2+d\right)}{d^2}+\frac{2\,\log\left(x\right)}{d^2}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^2x^5+2\,dex^3+d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(1/(d*e*x^2 + d^2) - log(e*x^2 + d)/d^2 + 2*log(x)/d^2) + b*integrate
((log(c) + log(x^n))/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^5+2\,dex^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^5 + 2*d*e*x^3 + d^2*x), 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*ln(c*x**n))/x/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log \left(cx^{n}\right) + a}{\left(ex^{2} + d\right)^{2} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x), x)
```

3.225 $\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=126

$$-\frac{ben\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{2d^3}+\frac{e\log\left(\frac{d}{ex^2}+1\right)(4a+4b\log(cx^n)-bn)}{4d^3}-\frac{4a+4b\log(cx^n)-bn}{4d^2x^2}+\frac{a+b\log(cx^n)}{2dx^2\left(d+ex^2\right)}-\frac{bn}{2d^2x^2}$$

```
[Out] -(b*n)/(2*d^2*x^2) + (a + b*Log[c*x^n])/(2*d*x^2*(d + e*x^2)) - (4*a - b*n
+ 4*b*Log[c*x^n])/(4*d^2*x^2) + (e*Log[1 + d/(e*x^2)]*(4*a - b*n + 4*b*Log[
c*x^n]))/(4*d^3) - (b*e*n*PolyLog[2, -(d/(e*x^2))])/(2*d^3)
```

Rubi [A] time = 0.289099, antiderivative size = 159, normalized size of antiderivative = 1.26, number of steps used = 7, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2340, 266, 44, 2351, 2304, 2301, 2337, 2391}

$$\frac{ben\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{2d^3}-\frac{e(4a+4b\log(cx^n)-bn)^2}{16bd^3n}+\frac{e\log\left(\frac{ex^2}{d}+1\right)(4a+4b\log(cx^n)-bn)}{4d^3}-\frac{4a+4b\log(cx^n)-bn}{4d^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -(b*n)/(2*d^2*x^2) + (a + b*Log[c*x^n])/(2*d*x^2*(d + e*x^2)) - (4*a - b*n
+ 4*b*Log[c*x^n])/(4*d^2*x^2) - (e*(4*a - b*n + 4*b*Log[c*x^n])^2)/(16*b*d^
3*n) + (e*(4*a - b*n + 4*b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(4*d^3) + (b*e*n
*PolyLog[2, -((e*x^2)/d)])/(2*d^3)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)^2}\,dx = \frac{a+b\log(cx^n)}{2dx^2(d+ex^2)} - \frac{\int \frac{-4a+bn-4b\log(cx^n)}{x^3(d+ex^2)}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^2(d+ex^2)} - \frac{\int \left(\frac{-4a+bn-4b\log(cx^n)}{dx^3} - \frac{e(-4a+bn-4b\log(cx^n))}{d^2x} + \frac{e^2x(-4a+bn-4b\log(cx^n))}{d^2(d+ex^2)}\right)dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^2(d+ex^2)} - \frac{\int \frac{-4a+bn-4b\log(cx^n)}{x^3}\,dx}{2d^2} + \frac{e\int \frac{-4a+bn-4b\log(cx^n)}{x}\,dx}{2d^3} - \frac{e^2\int \frac{x(-4a+bn-4b\log(cx^n))}{d+ex^2}\,dx}{2d^3}$$

$$= -\frac{bn}{2d^2x^2} + \frac{a+b\log(cx^n)}{2dx^2(d+ex^2)} - \frac{4a-bn+4b\log(cx^n)}{4d^2x^2} - \frac{e(4a-bn+4b\log(cx^n))^2}{16bd^3n} + \frac{e(4a-bn+ \cdots}{\cdots}$$

$$= -\frac{bn}{2d^2x^2} + \frac{a+b\log(cx^n)}{2dx^2(d+ex^2)} - \frac{4a-bn+4b\log(cx^n)}{4d^2x^2} - \frac{e(4a-bn+4b\log(cx^n))^2}{16bd^3n} + \frac{e(4a-bn+ \cdots}{\cdots}$$

Mathematica [C] time = 0.502167, size = 334, normalized size = 2.65

$$\frac{bn\left(4e\left(\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1+\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)+4e\left(\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)+\frac{e^{3/2}x\log(x)}{\sqrt{e}x-i\sqrt{d}}+\frac{e(-\cdots}{\cdots}\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] ((-2*d*(a - b*n*Log[x] + b*Log[c*x^n]))/x^2 - (2*d*e*(a - b*n*Log[x] + b*Lo
g[c*x^n]))/(d + e*x^2) - 8*e*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) + 4*e*(
a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2] + b*n*((e^(3/2)*x*Log[x])/((-
I)*Sqrt[d] + Sqrt[e]*x) - 4*e*Log[x]^2 - (d + 2*d*Log[x])/x^2 - e*Log[I*Sqr
t[d] - Sqrt[e]*x] + ((-I)*e^(3/2)*x*Log[x] + e*(-Sqrt[d] + I*Sqrt[e]*x)*Log
[I*Sqrt[d] + Sqrt[e]*x])/(Sqrt[d] - I*Sqrt[e]*x) + 4*e*(Log[x]*Log[1 + (I*S
qrt[e]*x)/Sqrt[d]] + PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) + 4*e*(Log[x]*Lo
g[1 - (I*Sqrt[e]*x)/Sqrt[d]] + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(4*d^3)
```

Maple [C] time = 0.161, size = 817, normalized size = 6.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^2,x)
```

```
[Out] -1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2/(e*x^2+d)-I*b*Pi*csgn(I*c*x^n)^
2*csgn(I*c)/d^3*e*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*e*ln(e*x^2+d)-2*b*ln
(c)/d^3*e*ln(x)-1/2*a/d^2/x^2+b*n/d^3*e*ln(x)^2+1/2*b*n/d^3*e*ln(x)-b*n/d^3
*e*ln(x)*ln(e*x^2+d)+b*n/d^3*e*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*
n/d^3*e*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)
^3/d^2/x^2+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e*ln(x)+1/2*I*b*P
i*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e*ln(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2/d^2/x^2-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e*x^2+d)-1/
2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e*ln(e*x^2+d)+b*n/d^3*e*di
log((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*n/d^3*e*dilog((e*x+(-d*e)^(1/2))/(-
d*e)^(1/2))-1/4*b*n/d^3*e*ln(e*x^2+d)+b*ln(c)/d^3*e*ln(e*x^2+d)-1/2*b*ln(c)
*e/d^2/(e*x^2+d)+b*ln(x^n)*e/d^3*ln(e*x^2+d)-1/2*b*ln(x^n)*e/d^2/(e*x^2+d)-
1/2*b*ln(x^n)/d^2/x^2+I*b*Pi*csgn(I*c*x^n)^3/d^3*e*ln(x)-1/2*b*ln(c)/d^2/x^
2+a*e/d^3*ln(e*x^2+d)-1/2*a*e/d^2/(e*x^2+d)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/d^3*e*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^
2/x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(e*x^2+d)-I*b*Pi
*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*e*ln(x)+1/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^2/(
e*x^2+d)-2*b*ln(x^n)/d^3*e*ln(x)-2*a/d^3*e*ln(x)-1/4*I*b*Pi*csgn(I*c*x^n)^2
*csgn(I*c)/d^2/x^2-1/4*b*n/d^2/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{2\,ex^2+d}{d^2ex^4+d^3x^2}-\frac{2\,e\log\left(ex^2+d\right)}{d^3}+\frac{4\,e\log\left(x\right)}{d^3}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^2x^7+2\,dex^5+d^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((2*e*x^2 + d)/(d^2*e*x^4 + d^3*x^2) - 2*e*log(e*x^2 + d)/d^3 + 4*e*
log(x)/d^3) + b*integrate((log(c) + log(x^n))/(e^2*x^7 + 2*d*e*x^5 + d^2*x^
3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b \log\left(cx^{n}\right) + a}{e^{2}x^{7} + 2\,dex^{5} + d^{2}x^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^7 + 2*d*e*x^5 + d^2*x^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((a+b*ln(c*x**n))/x**3/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log\left(cx^{n}\right) + a}{\left(ex^{2} + d\right)^{2} x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x^3), x)
```

3.226 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex^2)^2} dx$

Optimal. Leaf size=191

$$\frac{3ib\sqrt{d}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{d}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{5/2}}+\frac{ax}{e^2}$$

```
[Out] (a*x)/e^2 - (b*n*x)/e^2 - (b*Sqrt[d]*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*e^(5
/2)) + (b*x*Log[c*x^n])/e^2 + (d*x*(a + b*Log[c*x^n]))/(2*e^2*(d + e*x^2))
- (3*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(5/2)) +
(((3*I)/4)*b*Sqrt[d]*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/e^(5/2) - (((3
*I)/4)*b*Sqrt[d]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/e^(5/2)
```

Rubi [A] time = 0.296781, antiderivative size = 191, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {288, 321, 205, 2351, 2295, 2323, 2324, 12, 4848, 2391}

$$\frac{3ib\sqrt{d}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4e^{5/2}}-\frac{3ib\sqrt{d}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4e^{5/2}}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{2e^2\left(d+ex^2\right)}-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{5/2}}+\frac{ax}{e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (a*x)/e^2 - (b*n*x)/e^2 - (b*Sqrt[d]*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*e^(5
/2)) + (b*x*Log[c*x^n])/e^2 + (d*x*(a + b*Log[c*x^n]))/(2*e^2*(d + e*x^2))
- (3*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(5/2)) +
(((3*I)/4)*b*Sqrt[d]*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/e^(5/2) - (((3
*I)/4)*b*Sqrt[d]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/e^(5/2)
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4 (a+b\log(cx^n))}{\left(d+ex^2\right)^2}\,dx=\int \left(\frac{a+b\log(cx^n)}{e^2}+\frac{d^2(a+b\log(cx^n))}{e^2\left(d+ex^2\right)^2}-\frac{2d(a+b\log(cx^n))}{e^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int (a+b\log(cx^n))\,dx}{e^2}-\frac{(2d)\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e^2}+\frac{d^2\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx}{e^2}$$

$$=\frac{ax}{e^2}+\frac{dx(a+b\log(cx^n))}{2e^2\left(d+ex^2\right)}-\frac{2\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{5/2}}+\frac{b\int \log(cx^n)\,dx}{e^2}+\frac{d\int \frac{a+b\log}{d+}}{2e}$$

$$=\frac{ax}{e^2}-\frac{bnx}{e^2}-\frac{b\sqrt{d}n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{bx\log(cx^n)}{e^2}+\frac{dx(a+b\log(cx^n))}{2e^2\left(d+ex^2\right)}-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+}{2e^{5/2}}$$

$$=\frac{ax}{e^2}-\frac{bnx}{e^2}-\frac{b\sqrt{d}n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{bx\log(cx^n)}{e^2}+\frac{dx(a+b\log(cx^n))}{2e^2\left(d+ex^2\right)}-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+}{2e^{5/2}}$$

$$=\frac{ax}{e^2}-\frac{bnx}{e^2}-\frac{b\sqrt{d}n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{bx\log(cx^n)}{e^2}+\frac{dx(a+b\log(cx^n))}{2e^2\left(d+ex^2\right)}-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+}{2e^{5/2}}$$

$$=\frac{ax}{e^2}-\frac{bnx}{e^2}-\frac{b\sqrt{d}n\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2e^{5/2}}+\frac{bx\log(cx^n)}{e^2}+\frac{dx(a+b\log(cx^n))}{2e^2\left(d+ex^2\right)}-\frac{3\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+}{2e^{5/2}}$$

Mathematica [A] time = 0.590136, size = 296, normalized size = 1.55

$$3b\sqrt{-d}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)-3b\sqrt{-d}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)-\frac{d(a+b\log(cx^n))}{\sqrt{-d}-\sqrt{e}x}+\frac{d(a+b\log(cx^n))}{\sqrt{-d}+\sqrt{e}x}-3\sqrt{-d}\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (4*a*Sqrt[e]*x - 4*b*Sqrt[e]*n*x + 4*b*Sqrt[e]*x*Log[c*x^n] - (d*(a + b*Log
[c*x^n]))/(Sqrt[-d] - Sqrt[e]*x) + (d*(a + b*Log[c*x^n]))/(Sqrt[-d] + Sqrt[
e]*x) + (b*d*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/Sqrt[-d] + b*Sqrt[-d]*
n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]) - 3*Sqrt[-d]*(a + b*Log[c*x^n])*Log[
1 + (Sqrt[e]*x)/Sqrt[-d]] + 3*Sqrt[-d]*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e
]*x)/(-d)^(3/2)] + 3*b*Sqrt[-d]*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]] - 3*b*Sq
rt[-d]*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(4*e^(5/2))
```

Maple [C] time = 0.273, size = 913, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

```
[Out] -1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2*x/(e*x^2+d)+3/4*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1
/2))-1/4*b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))*x^2+1/4*b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))*x^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2*x/(e*x^2+d)+
1/2*b*d/e^2*x/(e*x^2+d)*ln(x^n)-3/2*b*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1
/2))*ln(x^n)+3/4*I*b*Pi*csgn(I*c*x^n)^3*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^
(1/2))-1/4*I*b*Pi*csgn(I*c*x^n)^3*d/e^2*x/(e*x^2+d)-1/2*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)/e^2*x+3/2*b*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2
))*n*ln(x)-b*n*d/e^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)-1/2*b*n*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-3/4*b*n*d/e^2/(-d*e)^(1
/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/4*b*n*d/e^2/(-d*e)^(1/2)*dilo
g((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*I*b*Pi*csgn(I*c*x^n)^3/e^2*x+1/2*a*d
/e^2*x/(e*x^2+d)-3/2*a*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+b*n*d/e^2/
(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*ln(c)/e^2*x+b*ln(x
^n)/e^2*x-1/4*b*n*d^2/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2)
)/(-d*e)^(1/2))+1/4*b*n*d^2/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e
)^(1/2))/(-d*e)^(1/2))+1/2*b*ln(c)*d/e^2*x/(e*x^2+d)-3/2*b*ln(c)*d/e^2/(d*e
)^(1/2)*arctan(x*e/(d*e)^(1/2))+a*x/e^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/e^2*x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2*x-3/4*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)^2*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-3/4*I*b*Pi*csgn(
I*c*x^n)^2*csgn(I*c)*d/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/4*I*b*Pi*c
```

```
sgn(I*c*x^n)^2*csgn(I*c)*d/e^2*x/(e*x^2+d)-b*n*x/e^2
```

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(x^4*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^4 \log(cx^n) + ax^4}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(e^2*x^4 + 2*d*e*x^2 + d^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(x**4*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log{(cx^n)} + a)x^4}{\left(ex^2 + d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d)^2, x)
```

3.227 $\int \frac{x^2(a+b\log(cx^n))}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=164

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}e^{3/2}}-\frac{x(a+b\log(cx^n))}{2e\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}}$$

```
[Out] (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]*e^(3/2)) - (x*(a + b*Log[c*x^n
]))/(2*e*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2
*Sqrt[d]*e^(3/2)) - ((I/4)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[
d]*e^(3/2)) + ((I/4)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*e^(3/2
))
```

Rubi [A] time = 0.269079, antiderivative size = 164, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {288, 205, 2351, 2323, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}e^{3/2}}-\frac{x(a+b\log(cx^n))}{2e\left(d+ex^2\right)}+\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]*e^(3/2)) - (x*(a + b*Log[c*x^n
]))/(2*e*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2
*Sqrt[d]*e^(3/2)) - ((I/4)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[
d]*e^(3/2)) + ((I/4)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*e^(3/2
))
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))}{\left(d+ex^2\right)^2}\,dx = \int \left(-\frac{d(a+b\log(cx^n))}{e\left(d+ex^2\right)^2} + \frac{a+b\log(cx^n)}{e\left(d+ex^2\right)}\right) dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e} - \frac{d\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx}{e}$$

$$= -\frac{x(a+b\log(cx^n))}{2e\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}e^{3/2}} - \frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{2e} + \frac{(bn)\int \frac{1}{d+ex^2}\,dx}{2e} - \frac{(b}{}$$

$$= \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}} - \frac{x(a+b\log(cx^n))}{2e\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}e^{3/2}} - \frac{(bn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}e^{3/2}} +$$

$$= \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}} - \frac{x(a+b\log(cx^n))}{2e\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}e^{3/2}} - \frac{(ibn)\int \frac{\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{2\sqrt{d}e^{3/2}}$$

$$= \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}} - \frac{x(a+b\log(cx^n))}{2e\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}e^{3/2}} - \frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}} + \frac{ibn\text{I}}{2}$$

$$= \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{3/2}} - \frac{x(a+b\log(cx^n))}{2e\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}e^{3/2}} - \frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{d}e^{3/2}} + \frac{ibn\text{I}}{4}$$

Mathematica [A] time = 0.526648, size = 258, normalized size = 1.57

$$\frac{\frac{bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{\sqrt{-d}} + \frac{bdn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{3/2}} + \frac{d\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{(-d)^{3/2}} + \frac{\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(cx^n))}{\sqrt{-d}} + \frac{a+b\log(cx^n)}{\sqrt{-d}-\sqrt{e}x} - \frac{a+b\log(cx^n)}{\sqrt{-d}+\sqrt{e}x} + \frac{bdn(\text{lo}}{}}{4e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] ((a + b*Log[c*x^n])/(Sqrt[-d] - Sqrt[e]*x) - (a + b*Log[c*x^n])/(Sqrt[-d] +
 Sqrt[e]*x) + (b*d*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(3/2) + (b*
n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/Sqrt[-d] + (d*(a + b*Log[c*x^n])*Lo
g[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) + ((a + b*Log[c*x^n])*Log[1 + (d*Sq
rt[e]*x)/(-d)^(3/2)])/Sqrt[-d] + (b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/Sqr
t[-d] + (b*d*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(3/2))/(4*e^(3/2)
```

)

Maple [C] time = 0.327, size = 752, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

```
[Out] -1/2*b/e*x/(e*x^2+d)*ln(x^n)-1/2*b/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*
ln(x)+1/2*b/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)+1/2*b*n/e/(d*e)^(
1/2)*arctan(x*e/(d*e)^(1/2))-1/4*b*n*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+
(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+1/4*b*n*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*
x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-1/4*b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*
ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*b*n*d/e*ln(x)/(e*x^2+d)/(-d*e)^(1/
2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*b*n/e/(-d*e)^(1/2)*dilog((-e*x+(
-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n/e/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))+1/2*b*n/e/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1
/2))-1/2*b*n/e/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*I
*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*x/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/e*x/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)^3/e*x/
(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-
1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*x/(e*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^
n)^2*csgn(I*c)/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*b*ln(c)/e*x/(e*x^2
+d)+1/2*b*ln(c)/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*a/e*x/(e*x^2+d)+1
/2*a/e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))
```

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(x^2*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^2\log(cx^n)+ax^2}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\,(a+b\log(cx^n))}{\left(d+ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**2)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(b\log(cx^n)+a)x^2}{\left(ex^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^2, x)
```

3.228 $\int \frac{a+b\log(cx^n)}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=164

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}}+\frac{x(a+b\log(cx^n))}{2d(d+ex^2)}-\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}}$$

```
[Out] -(b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(3/2)*Sqrt[e]) + (x*(a + b*Log[c*x^
n]))/(2*d*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(
2*d^(3/2)*Sqrt[e]) - ((I/4)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(d^(3
/2)*Sqrt[e]) + ((I/4)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(d^(3/2)*Sqrt[
e])
```

Rubi [A] time = 0.0990367, antiderivative size = 164, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {2323, 205, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}}+\frac{x(a+b\log(cx^n))}{2d(d+ex^2)}-\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^2,x]
```

```
[Out] -(b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(3/2)*Sqrt[e]) + (x*(a + b*Log[c*x^
n]))/(2*d*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(
2*d^(3/2)*Sqrt[e]) - ((I/4)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]])/(d^(3
/2)*Sqrt[e]) + ((I/4)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(d^(3/2)*Sqrt[
e])
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx = \frac{x\,(a+b\log(cx^n))}{2d\left(d+ex^2\right)} + \frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{2d} - \frac{(bn)\int \frac{1}{d+ex^2}\,dx}{2d}$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x\,(a+b\log(cx^n))}{2d\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{(bn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}x}\,dx}{2d}$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x\,(a+b\log(cx^n))}{2d\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{(bn)\int \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{2d^{3/2}\sqrt{e}}$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x\,(a+b\log(cx^n))}{2d\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{(ibn)\int \frac{\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{4d^{3/2}\sqrt{e}} +$$

$$= -\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{x\,(a+b\log(cx^n))}{2d\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}\sqrt{e}} - \frac{ibn\text{Li}_2\left(-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{3/2}\sqrt{e}} + \frac{ibn\text{L}}{4d}$$

Mathematica [A] time = 0.537206, size = 289, normalized size = 1.76

$$\frac{1}{4}\left(\frac{bdn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{5/2}\sqrt{e}} + \frac{bn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{3/2}\sqrt{e}} + \frac{\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{(-d)^{3/2}\sqrt{e}} + \frac{d\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(cx^n$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^2,x]
```

```
[Out] ((a + b*Log[c*x^n])/(d*(Sqrt[-d]*Sqrt[e] + e*x)) + (a + b*Log[c*x^n])/((-d)
^(3/2)*Sqrt[e] + d*e*x) + (b*d*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/((-d
)^(5/2)*Sqrt[e]) + (b*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/((-d)^(3/2)*S
qrt[e]) + ((a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(3/2)*Sq
rt[e]) + (d*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/((-d)^(5/
2)*Sqrt[e]) + (b*d*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(5/2)*Sqrt[e])
 + (b*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/((-d)^(3/2)*Sqrt[e]))/4
```

Maple [C] time = 0.301, size = 685, normalized size = 4.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*x/d/(e*x^2+d)*ln(x^n)-1/2*b/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*l
n(x)+1/2*b/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)-1/2*b*n/d/(d*e)^(1
/2)*arctan(x*e/(d*e)^(1/2))+1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x
+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2*e-1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(1/2)*l
n((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2*e+1/4*b*n*ln(x)/(e*x^2+d)/(-d*e)^(1/
2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n*ln(x)/(e*x^2+d)/(-d*e)^(1/2
)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*b*n/d/(-d*e)^(1/2)*dilog((-e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n/d/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(
-d*e)^(1/2))-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x/d/(e*x^2+d)-1
/4*I*b*Pi*csgn(I*c*x^n)^3/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/4*I*b*Pi*
csgn(I*c*x^n)^3*x/d/(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*x/d/(e
*x^2+d)+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(d*e)^(1/2)*arctan(x*e/(d*e)
^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*x/d/(e*x^2+d)+1/4*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/4*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2*
b*ln(c)*x/d/(e*x^2+d)+1/2*b*ln(c)/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2
*a*x/d/(e*x^2+d)+1/2*a/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))
```

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((a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{2}x^{4}+2\,dex^{2}+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{(d + ex^2)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**2)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{(ex^2 + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^2, x)
```

3.229 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^2}\,dx$

Optimal. Leaf size=183

$$\frac{3ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{5/2}}-\frac{3ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{5/2}}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(3a+3b\log(cx^n)-bn)}{2d^{5/2}}-\frac{3a+3b\log(cx^n)-}{2d^2x}$$

```
[Out] (-3*b*n)/(2*d^2*x) + (a + b*Log[c*x^n])/(2*d*x*(d + e*x^2)) - (3*a - b*n +
3*b*Log[c*x^n])/(2*d^2*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(3*a - b*n
 + 3*b*Log[c*x^n]))/(2*d^(5/2)) + (((3*I)/4)*b*Sqrt[e]*n*PolyLog[2, ((-I)*S
qrt[e]*x)/Sqrt[d]])/d^(5/2) - (((3*I)/4)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*
x)/Sqrt[d]])/d^(5/2)
```

Rubi [A] time = 0.283844, antiderivative size = 183, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$\frac{3ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{5/2}}-\frac{3ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{5/2}}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(3a+3b\log(cx^n)-bn)}{2d^{5/2}}-\frac{3a+3b\log(cx^n)-}{2d^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^2),x]
```


```
[Out] (-3*b*n)/(2*d^2*x) + (a + b*Log[c*x^n])/(2*d*x*(d + e*x^2)) - (3*a - b*n +
3*b*Log[c*x^n])/(2*d^2*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(3*a - b*n
 + 3*b*Log[c*x^n]))/(2*d^(5/2)) + (((3*I)/4)*b*Sqrt[e]*n*PolyLog[2, ((-I)*S
qrt[e]*x)/Sqrt[d]])/d^(5/2) - (((3*I)/4)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*
x)/Sqrt[d]])/d^(5/2)
```


Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^2}\,dx = \frac{a+b\log(cx^n)}{2dx(d+ex^2)} - \frac{\int \frac{-3a+bn-3b\log(cx^n)}{x^2(d+ex^2)}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx(d+ex^2)} - \frac{\int \left(\frac{-3a+bn-3b\log(cx^n)}{dx^2} - \frac{e(-3a+bn-3b\log(cx^n))}{d(d+ex^2)}\right)dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx(d+ex^2)} - \frac{\int \frac{-3a+bn-3b\log(cx^n)}{x^2}\,dx}{2d^2} + \frac{e\int \frac{-3a+bn-3b\log(cx^n)}{d+ex^2}\,dx}{2d^2}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx(d+ex^2)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(3a-bn+3b\log(cx^n))}{2d^{5/2}} + \frac{(3\cdots}{\cdots}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx(d+ex^2)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(3a-bn+3b\log(cx^n))}{2d^{5/2}} + \frac{(3\cdots}{\cdots}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx(d+ex^2)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(3a-bn+3b\log(cx^n))}{2d^{5/2}} + \frac{(3\cdots}{\cdots}$$

$$= -\frac{3bn}{2d^2x} + \frac{a+b\log(cx^n)}{2dx(d+ex^2)} - \frac{3a-bn+3b\log(cx^n)}{2d^2x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(3a-bn+3b\log(cx^n))}{2d^{5/2}} + \frac{3i\cdots}{\cdots}$$

Mathematica [A] time = 0.78284, size = 328, normalized size = 1.79

$$\frac{1}{4}\left(-\frac{3b\sqrt{e}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{5/2}} + \frac{3b\sqrt{e}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{5/2}} + \frac{\sqrt{e}(a+b\log(cx^n))}{d^2(\sqrt{-d}-\sqrt{e}x)} - \frac{\sqrt{e}(a+b\log(cx^n))}{d^2(\sqrt{-d}+\sqrt{e}x)} - \frac{4(a+b\log(\cdots}{d^2x}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] ((-4*b*n)/(d^2*x) - (4*(a + b*Log[c*x^n]))/(d^2*x) + (Sqrt[e]*(a + b*Log[c*
x^n]))/(d^2*(Sqrt[-d] - Sqrt[e]*x)) - (Sqrt[e]*(a + b*Log[c*x^n]))/(d^2*(Sq
```

```
rt[-d] + Sqrt[e]*x)) + (b*Sqrt[e]*n*(-Log[x] + Log[Sqrt[-d] - Sqrt[e]*x]))/
(-d)^(5/2) + (b*Sqrt[e]*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(5/2)
+ (3*Sqrt[e]*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(5/2) -
 (3*Sqrt[e]*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(5/2
) - (3*b*Sqrt[e]*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(5/2) + (3*b*Sqrt
[e]*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(5/2))/4
```

Maple [C] time = 0.35, size = 933, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^2,x)
```

```
[Out] 1/2*I*b*Pi*csgn(I*c*x^n)^3/d^2/x+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*e/d^2*x/(e*x^2+d)-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2/(d*e)^(
1/2)*arctan(x*e/(d*e)^(1/2))+1/2*b*n*e/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/
2))-1/2*b*ln(c)*e/d^2*x/(e*x^2+d)-3/2*b*ln(c)*e/d^2/(d*e)^(1/2)*arctan(x*e/
(d*e)^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)^3*e/d^2*x/(e*x^2+d)+3/4*I*b*Pi*csgn(I
*c*x^n)^3*e/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*a*e/d^2*x/(e*x^2+d)
-3/2*a*e/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+3/4*I*b*Pi*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*e/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*I*b*Pi*c
sgn(I*c*x^n)^2*csgn(I*c)/d^2/x-1/4*b*n*e/d*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln(
(-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*b*n*e/d*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*
ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/
d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2/d^2/x-1/4*b*n*e^2/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2
))/(-d*e)^(1/2))*x^2+1/4*b*n*e^2/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(
-d*e)^(1/2))/(-d*e)^(1/2))*x^2-a/d^2/x-3/4*b*n*e/d^2/(-d*e)^(1/2)*dilog((-e
*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/4*b*n*e/d^2/(-d*e)^(1/2)*dilog((e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))+3/2*b*e/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(
x)-1/2*b*n*e/d^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/
2*b*n*e/d^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*I*b*
Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/x-1/2*b*e/d^2*x/(e*x^2+d)*ln(x^n
)-3/2*b*e/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)-b*ln(c)/d^2/x-1/4
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^2*x/(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x
^n)^2*csgn(I*c)*e/d^2*x/(e*x^2+d)-b*ln(x^n)/d^2/x-b*n/x/d^2
```

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((a+b*log(c*x^n))/x^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^6+2\,dex^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^6 + 2*d*e*x^4 + d^2*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*ln(c*x**n))/x**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x^2), x)
```

3.230 $\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^2}\,dx$

Optimal. Leaf size=224

$$-\frac{5ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{7/2}}+\frac{5ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{7/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(5a+5b\log(cx^n)-bn)}{2d^{7/2}}+\frac{e(5a+5b\log(c}{2d^3x}$$

```
[Out] (-5*b*n)/(18*d^2*x^3) + (5*b*e*n)/(2*d^3*x) + (a + b*Log[c*x^n])/(2*d*x^3*(
d + e*x^2)) - (5*a - b*n + 5*b*Log[c*x^n])/(6*d^2*x^3) + (e*(5*a - b*n + 5*
b*Log[c*x^n]))/(2*d^3*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(5*a - b*n
+ 5*b*Log[c*x^n]))/(2*d^(7/2)) - (((5*I)/4)*b*e^(3/2)*n*PolyLog[2, ((-I)*Sq
rt[e]*x)/Sqrt[d]])/d^(7/2) + (((5*I)/4)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x
)/Sqrt[d]])/d^(7/2)
```

Rubi [A] time = 0.308939, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$-\frac{5ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{7/2}}+\frac{5ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{4d^{7/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(5a+5b\log(cx^n)-bn)}{2d^{7/2}}+\frac{e(5a+5b\log(c}{2d^3x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^2),x]
```

```
[Out] (-5*b*n)/(18*d^2*x^3) + (5*b*e*n)/(2*d^3*x) + (a + b*Log[c*x^n])/(2*d*x^3*(
d + e*x^2)) - (5*a - b*n + 5*b*Log[c*x^n])/(6*d^2*x^3) + (e*(5*a - b*n + 5*
b*Log[c*x^n]))/(2*d^3*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(5*a - b*n
+ 5*b*Log[c*x^n]))/(2*d^(7/2)) - (((5*I)/4)*b*e^(3/2)*n*PolyLog[2, ((-I)*Sq
rt[e]*x)/Sqrt[d]])/d^(7/2) + (((5*I)/4)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[e]*x
)/Sqrt[d]])/d^(7/2)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
```

```
/; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
```

```
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^2}\,dx = \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{\int \frac{-5a+bn-5b\log(cx^n)}{x^4(d+ex^2)}\,dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{\int \left(\frac{-5a+bn-5b\log(cx^n)}{dx^4} - \frac{e(-5a+bn-5b\log(cx^n))}{d^2x^2} + \frac{e^2(-5a+bn-5b\log(cx^n))}{d^2(d+ex^2)}\right)dx}{2d}$$

$$= \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{\int \frac{-5a+bn-5b\log(cx^n)}{x^4}\,dx}{2d^2} + \frac{e\int \frac{-5a+bn-5b\log(cx^n)}{x^2}\,dx}{2d^3} - \frac{e^2\int \frac{-5a+bn-5b\log(cx^n)}{d+ex^2}\,dx}{2d^3}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x} + \frac{e^{3/2}\text{ta}}{}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x} + \frac{e^{3/2}\text{ta}}{}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x} + \frac{e^{3/2}\text{ta}}{}$$

$$= -\frac{5bn}{18d^2x^3} + \frac{5ben}{2d^3x} + \frac{a+b\log(cx^n)}{2dx^3(d+ex^2)} - \frac{5a-bn+5b\log(cx^n)}{6d^2x^3} + \frac{e(5a-bn+5b\log(cx^n))}{2d^3x} + \frac{e^{3/2}\text{ta}}{}$$

Mathematica [A] time = 0.744269, size = 361, normalized size = 1.61

$$\frac{1}{36}\left(-\frac{45be^{3/2}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{7/2}} + \frac{45be^{3/2}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{7/2}} - \frac{9e^{3/2}(a+b\log(cx^n))}{d^3(\sqrt{-d}-\sqrt{e}x)} + \frac{9e^{3/2}(a+b\log(cx^n))}{d^3(\sqrt{-d}+\sqrt{e}x)} + \frac{72e(}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^2),x]
```

```
[Out] ((-4*b*n)/(d^2*x^3) + (72*b*e*n)/(d^3*x) - (12*(a + b*Log[c*x^n]))/(d^2*x^3
) + (72*e*(a + b*Log[c*x^n]))/(d^3*x) - (9*e^(3/2)*(a + b*Log[c*x^n]))/(d^3
*(Sqrt[-d] - Sqrt[e]*x)) + (9*e^(3/2)*(a + b*Log[c*x^n]))/(d^3*(Sqrt[-d] +
Sqrt[e]*x)) - (9*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(7/
2) + (9*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(7/2) + (45*
e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) - (45*
e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2) -
(45*b*e^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) + (45*b*e^(3/2
)*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2))/36
```

Maple [C] time = 0.296, size = 1133, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^2,x)
```

```
[Out] 1/2*b*e^2/d^3*x/(e*x^2+d)*ln(x^n)+5/2*b*e^2/d^3/(d*e)^(1/2)*arctan(x*e/(d*e
)^(1/2))*ln(x^n)-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e/x+1/4*b*n
*e^3/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*
x^2-1/4*b*n*e^3/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*
e)^(1/2))*x^2-I*b*Pi*csgn(I*c*x^n)^3/d^3*e/x-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*e^2/d^3*x/(e*x^2+d)+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)/d^2/x^3-1/4*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3*x/(e*x^2+d)-5/4*I*b*Pi*
csgn(I*c*x^n)^3*e^2/d^3/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/3*b/d^2/x^3*l
n(x^n)+1/6*I*b*Pi*csgn(I*c*x^n)^3/d^2/x^3-1/4*b*n*e^2/d^2*ln(x)/(e*x^2+d)/(
-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*b*n*e^2/d^2*ln(x)/(e*x^
2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+I*b*Pi*csgn(I*c*x^n)
^2*csgn(I*c)/d^3*e/x+I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*e/x+2*b*ln(x^n)
/d^3*e/x+5/2*a*e^2/d^3/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/4*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2*e^2/d^3*x/(e*x^2+d)+1/2*a*e^2/d^3*x/(e*x^2+d)+5/4*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^2/d^3/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2)
)+2*b*ln(c)/d^3*e/x-1/3*a/d^2/x^3-1/3*b*ln(c)/d^2/x^3-5/2*b*e^2/d^3/(d*e)^(
1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)+b*n*e^2/d^3/(-d*e)^(1/2)*ln(x)*ln((-e*
x+(-d*e)^(1/2))/(-d*e)^(1/2))-b*n*e^2/d^3/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3*x/(e*x^2
+d)+1/2*b*ln(c)*e^2/d^3*x/(e*x^2+d)+5/2*b*ln(c)*e^2/d^3/(d*e)^(1/2)*arctan(
x*e/(d*e)^(1/2))-1/2*b*n*e^2/d^3/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+5/4*b*
n*e^2/d^3/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-5/4*b*n*e^2/
```

```
d^3/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/6*I*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/d^2/x^3-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/x^3+5/
4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^2/d^3/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/
2))+2*a/d^3*e/x-5/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3/(d*e
)^(1/2)*arctan(x*e/(d*e)^(1/2))+2*b*e*n/d^3/x-1/9*b*n/d^2/x^3
```

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((a+b*log(c*x^n))/x^4/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{2}x^{8}+2\,dex^{6}+d^{2}x^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^8 + 2*d*e*x^6 + d^2*x^4), 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*ln(c*x**n))/x**4/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^2x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^2*x^4), x)
```

3.231 $\int \frac{x^5(a+b\log(cx^n))}{\left(d+ex^2\right)^3} dx$

Optimal. Leaf size=152

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}+\frac{\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3}+\frac{bdn}{8e^3\left(d+ex^2\right)}+\frac{3bn}{}$$

```
[Out] (b*d*n)/(8*e^3*(d + e*x^2)) + (b*n*Log[x])/(4*e^3) - (d^2*(a + b*Log[c*x^n]
))/(4*e^3*(d + e*x^2)^2) - (x^2*(a + b*Log[c*x^n]))/(e^2*(d + e*x^2)) + (3*
b*n*Log[d + e*x^2])/(8*e^3) + ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e^
3) + (b*n*PolyLog[2, -((e*x^2)/d)])/(4*e^3)
```

Rubi [A] time = 0.286788, antiderivative size = 152, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {266, 43, 2351, 2338, 44, 2335, 260, 2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{ex^2}{d}\right)}{4e^3}-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4e^3\left(d+ex^2\right)^2}-\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{e^2\left(d+ex^2\right)}+\frac{\log\left(\frac{ex^2}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)}{2e^3}+\frac{bdn}{8e^3\left(d+ex^2\right)}+\frac{3bn}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```


```
[Out] (b*d*n)/(8*e^3*(d + e*x^2)) + (b*n*Log[x])/(4*e^3) - (d^2*(a + b*Log[c*x^n]
))/(4*e^3*(d + e*x^2)^2) - (x^2*(a + b*Log[c*x^n]))/(e^2*(d + e*x^2)) + (3*
b*n*Log[d + e*x^2])/(8*e^3) + ((a + b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(2*e^
3) + (b*n*PolyLog[2, -((e*x^2)/d)])/(4*e^3)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
```

```
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^5 (a+b\log(cx^n))}{(d+ex^2)^3}dx = \int \left(\frac{d^2x(a+b\log(cx^n))}{e^2(d+ex^2)^3} - \frac{2dx(a+b\log(cx^n))}{e^2(d+ex^2)^2} + \frac{x(a+b\log(cx^n))}{e^2(d+ex^2)}\right)dx$$

$$= \frac{\int \frac{x(a+b\log(cx^n))}{d+ex^2}dx}{e^2} - \frac{(2d)\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^2}dx}{e^2} + \frac{d^2\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^3}dx}{e^2}$$

$$= -\frac{d^2(a+b\log(cx^n))}{4e^3(d+ex^2)^2} - \frac{x^2(a+b\log(cx^n))}{e^2(d+ex^2)} + \frac{(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right)}{2e^3} - \frac{(bn)\int \frac{\log\left(1+\frac{ex^2}{d}\right)}{x}$$

$$= -\frac{d^2(a+b\log(cx^n))}{4e^3(d+ex^2)^2} - \frac{x^2(a+b\log(cx^n))}{e^2(d+ex^2)} + \frac{bn\log(d+ex^2)}{2e^3} + \frac{(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right.}{2e^3}$$

$$= -\frac{d^2(a+b\log(cx^n))}{4e^3(d+ex^2)^2} - \frac{x^2(a+b\log(cx^n))}{e^2(d+ex^2)} + \frac{bn\log(d+ex^2)}{2e^3} + \frac{(a+b\log(cx^n))\log\left(1+\frac{ex^2}{d}\right.}{2e^3}$$

$$= \frac{bdn}{8e^3(d+ex^2)} + \frac{bn\log(x)}{4e^3} - \frac{d^2(a+b\log(cx^n))}{4e^3(d+ex^2)^2} - \frac{x^2(a+b\log(cx^n))}{e^2(d+ex^2)} + \frac{3bn\log(d+ex^2)}{8e^3} +$$

Mathematica [C] time = 0.527301, size = 498, normalized size = 3.28

$$\frac{bn\left(4(d+ex^2)^2\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+4(d+ex^2)^2\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)+3d^2\log\left(-\sqrt{e}x+i\sqrt{d}\right)+3d^2\log\left(\sqrt{e}x+i\sqrt{d}\right)+\cdots\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (-2*d^2*(a - b*n*Log[x] + b*Log[c*x^n]) + 8*d*(d + e*x^2)*(a - b*n*Log[x] +
 b*Log[c*x^n]) + 4*(d + e*x^2)^2*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*
x^2] + b*n*(d^2 + d*e*x^2 - 4*d*e*x^2*Log[x] - 6*e^2*x^4*Log[x] + 3*d^2*Log
[I*Sqrt[d] - Sqrt[e]*x] + 6*d*e*x^2*Log[I*Sqrt[d] - Sqrt[e]*x] + 3*e^2*x^4*
Log[I*Sqrt[d] - Sqrt[e]*x] + 3*d^2*Log[I*Sqrt[d] + Sqrt[e]*x] + 6*d*e*x^2*L
og[I*Sqrt[d] + Sqrt[e]*x] + 3*e^2*x^4*Log[I*Sqrt[d] + Sqrt[e]*x] + 4*d^2*Lo
g[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 8*d*e*x^2*Log[x]*Log[1 - (I*Sqrt[e]*x
)/Sqrt[d]] + 4*e^2*x^4*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 4*d^2*Log[x]
*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 8*d*e*x^2*Log[x]*Log[1 + (I*Sqrt[e]*x)/Sq
rt[d]] + 4*e^2*x^4*Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 4*(d + e*x^2)^2*
PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 4*(d + e*x^2)^2*PolyLog[2, (I*Sqrt[e
]*x)/Sqrt[d]]))/(8*e^3*(d + e*x^2)^2)
```

Maple [C] time = 0.159, size = 727, normalized size = 4.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^3,x)
```

```
[Out] 1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^3/(e*x^2+d)-1/4*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)/e^3*ln(e*x^2+d)+1/2*b*n/e^3*ln(x)*ln((-e*x+(-d*e
)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e^3*ln(x)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)-1/2*b*n/e^3*ln(x)*ln(e*x^2+d)-1/4*b*ln(c)*d^2/e^3/(e*x^2+d)^2+b*ln(c)*d/e
^3/(e*x^2+d)-1/4*I*b*Pi*csgn(I*c*x^n)^3/e^3*ln(e*x^2+d)-1/8*I*b*Pi*csgn(I*x
^n)*csgn(I*c*x^n)^2*d^2/e^3/(e*x^2+d)^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)*d/e^3/(e*x^2+d)-1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d^2/e^3/(e*x^2+d)^2+
b*ln(x^n)*d/e^3/(e*x^2+d)-1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e^3/(e*x^2+d)-1/2*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^3/(e*x^2+d)+1/8*I*b*Pi*csgn(I*
c*x^n)^3*d^2/e^3/(e*x^2+d)^2+1/2*b*n/e^3*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(
1/2))+1/2*b*n/e^3*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*ln(x^n)*d^2/
e^3/(e*x^2+d)^2+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3/(e*x
^2+d)^2+1/2*b*ln(x^n)/e^3*ln(e*x^2+d)+1/2*a/e^3*ln(e*x^2+d)-1/4*a*d^2/e^3/(
e*x^2+d)^2+a*d/e^3/(e*x^2+d)+1/2*b*ln(c)/e^3*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*
c*x^n)^2*csgn(I*c)/e^3*ln(e*x^2+d)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e
^3*ln(e*x^2+d)-3/4*b*n*ln(x)/e^3+3/8*b*n*ln(e*x^2+d)/e^3+1/8*b*d*n/e^3/(e*x
^2+d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}a\left(\frac{4\,dex^2+3\,d^2}{e^5x^4+2\,de^4x^2+d^2e^3}+\frac{2\,\log\left(ex^2+d\right)}{e^3}\right)+b\int\frac{x^5\log\left(c\right)+x^5\log\left(x^n\right)}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((4*d*e*x^2 + 3*d^2)/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3) + 2*log(e*x^2
+ d)/e^3) + b*integrate((x^5*log(c) + x^5*log(x^n))/(e^3*x^6 + 3*d*e^2*x^4
+ 3*d^2*e*x^2 + d^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^5\log\left(cx^n\right)+ax^5}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*log(c*x^n) + a*x^5)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
d^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(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log(cx^n) + a)x^5}{(ex^2 + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^3, x)
```

3.232 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=68

$$\frac{x^4(a+b\log(cx^n))}{4d(d+ex^2)^2}-\frac{bn}{8e^2(d+ex^2)}-\frac{bn\log(d+ex^2)}{8de^2}$$

```
[Out] -(b*n)/(8*e^2*(d + e*x^2)) + (x^4*(a + b*Log[c*x^n]))/(4*d*(d + e*x^2)^2) -
 (b*n*Log[d + e*x^2])/(8*d*e^2)
```

Rubi [A] time = 0.079546, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {2335, 266, 43}

$$\frac{x^4(a+b\log(cx^n))}{4d(d+ex^2)^2}-\frac{bn}{8e^2(d+ex^2)}-\frac{bn\log(d+ex^2)}{8de^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] -(b*n)/(8*e^2*(d + e*x^2)) + (x^4*(a + b*Log[c*x^n]))/(4*d*(d + e*x^2)^2) -
 (b*n*Log[d + e*x^2])/(8*d*e^2)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^3}\,dx &= \frac{x^4(a+b\log(cx^n))}{4d(d+ex^2)^2}-\frac{(bn)\int\frac{x^3}{(d+ex^2)^2}\,dx}{4d}\\ &= \frac{x^4(a+b\log(cx^n))}{4d(d+ex^2)^2}-\frac{(bn)\,\mathrm{Subst}\left(\int\frac{x}{(d+ex)^2}\,dx,x,x^2\right)}{8d}\\ &= \frac{x^4(a+b\log(cx^n))}{4d(d+ex^2)^2}-\frac{(bn)\,\mathrm{Subst}\left(\int\left(-\frac{d}{e(d+ex)^2}+\frac{1}{e(d+ex)}\right)dx,x,x^2\right)}{8d}\\ &= -\frac{bn}{8e^2(d+ex^2)}+\frac{x^4(a+b\log(cx^n))}{4d(d+ex^2)^2}-\frac{bn\log(d+ex^2)}{8de^2}\end{aligned}$$

Mathematica [A] time = 0.144152, size = 129, normalized size = 1.9

$$-\frac{2ad^2+4adex^2+2bd(d+2ex^2)\log(cx^n)+bd^2n\log(d+ex^2)+bd^2n+be^2nx^4\log(d+ex^2)+bdenx^2+2bdenx^2\log}{8de^2(d+ex^2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] -(2*a*d^2 + b*d^2*n + 4*a*d*e*x^2 + b*d*e*n*x^2 - 2*b*n*(d + e*x^2)^2*Log[x
] + 2*b*d*(d + 2*e*x^2)*Log[c*x^n] + b*d^2*n*Log[d + e*x^2] + 2*b*d*e*n*x^2
*Log[d + e*x^2] + b*e^2*n*x^4*Log[d + e*x^2])/(8*d*e^2*(d + e*x^2)^2)
```

Maple [C] time = 0.117, size = 369, normalized size = 5.4

$$-\frac{b(2ex^2+d)\ln(x^n)}{4(ex^2+d)^2e^2}-\frac{-2i\pi bdex^2(\mathrm{csgn}(icx^n))^3-i\pi bd^2(\mathrm{csgn}(icx^n))^3+i\pi bd^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2+i\pi bd^2(\mathrm{csg}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^3,x)
```

```
[Out] -1/4*b*(2*e*x^2+d)/(e*x^2+d)^2/e^2*ln(x^n)-1/8*(-2*I*Pi*b*d*e*x^2*csgn(I*c*
x^n)^3-I*Pi*b*d^2*csgn(I*c*x^n)^3+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*
Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-2*ln(x)*b*e^2*n*x^4+ln(e*x^2+d)*b*e^2*n*
x^4+2*I*Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d*e*x^2*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I
*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-4*ln(x)*b*d*e*n*x^2+2*ln(e*x^2+d)
*b*d*e*n*x^2+4*ln(c)*b*d*e*x^2+b*d*e*n*x^2-2*ln(x)*b*d^2*n+ln(e*x^2+d)*b*d^
2*n+4*a*d*e*x^2+2*ln(c)*b*d^2+b*d^2*n+2*a*d^2)/d/e^2/(e*x^2+d)^2
```

Maxima [B] time = 1.19274, size = 173, normalized size = 2.54

$$-\frac{1}{8}bn\left(\frac{1}{e^3x^2+de^2}+\frac{\log\left(ex^2+d\right)}{de^2}-\frac{\log\left(x^2\right)}{de^2}\right)-\frac{\left(2ex^2+d\right)b\log\left(cx^n\right)}{4\left(e^4x^4+2de^3x^2+d^2e^2\right)}-\frac{\left(2ex^2+d\right)a}{4\left(e^4x^4+2de^3x^2+d^2e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/8*b*n*(1/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/(d*e^2) - log(x^2)/(d*e^2))
- 1/4*(2*e*x^2 + d)*b*log(c*x^n)/(e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2) - 1/4*(2
*e*x^2 + d)*a/(e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2)
```

Fricas [B] time = 1.34009, size = 273, normalized size = 4.01

$$\frac{2be^2nx^4\log(x)-bd^2n-2ad^2-(bden+4ade)x^2-\left(be^2nx^4+2bdenx^2+bd^2n\right)\log\left(ex^2+d\right)-2\left(2bdex^2+bd^2\right)\log(c)}{8\left(de^4x^4+2d^2e^3x^2+d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/8*(2*b*e^2*n*x^4*log(x) - b*d^2*n - 2*a*d^2 - (b*d*e*n + 4*a*d*e)*x^2 - (
b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*log(e*x^2 + d) - 2*(2*b*d*e*x^2 + b*
d^2)*log(c))/(d*e^4*x^4 + 2*d^2*e^3*x^2 + d^3*e^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.33218, size = 189, normalized size = 2.78

$$-\frac{bnx^4e^2\log\left(x^2e+d\right)-2\,bnx^4e^2\log\left(x\right)+2\,bdnx^2e\log\left(x^2e+d\right)+bdnx^2e+4\,bdx^2e\log\left(c\right)+4\,adx^2e+bd^2n\log\left(x^2e+\right.}{8\left(dx^4e^4+2\,d^2x^2e^3+d^3e^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] -1/8*(b*n*x^4*e^2*log(x^2*e + d) - 2*b*n*x^4*e^2*log(x) + 2*b*d*n*x^2*e*log
(x^2*e + d) + b*d*n*x^2*e + 4*b*d*x^2*e*log(c) + 4*a*d*x^2*e + b*d^2*n*log(
x^2*e + d) + b*d^2*n + 2*b*d^2*log(c) + 2*a*d^2)/(d*x^4*e^4 + 2*d^2*x^2*e^3
 + d^3*e^2)
```

3.233 $\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=82

$$-\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}-\frac{bn\log\left(d+ex^2\right)}{8d^2e}+\frac{bn\log(x)}{4d^2e}+\frac{bn}{8de\left(d+ex^2\right)}$$

```
[Out] (b*n)/(8*d*e*(d + e*x^2)) + (b*n*Log[x])/(4*d^2*e) - (a + b*Log[c*x^n])/(4*
e*(d + e*x^2)^2) - (b*n*Log[d + e*x^2])/(8*d^2*e)
```

Rubi [A] time = 0.0657028, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2338, 266, 44}

$$-\frac{a+b\log\left(cx^n\right)}{4e\left(d+ex^2\right)^2}-\frac{bn\log\left(d+ex^2\right)}{8d^2e}+\frac{bn\log(x)}{4d^2e}+\frac{bn}{8de\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (b*n)/(8*d*e*(d + e*x^2)) + (b*n*Log[x])/(4*d^2*e) - (a + b*Log[c*x^n])/(4*
e*(d + e*x^2)^2) - (b*n*Log[d + e*x^2])/(8*d^2*e)
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^3}\,dx &= -\frac{a+b\log(cx^n)}{4e(d+ex^2)^2}+\frac{(bn)\int\frac{1}{x(d+ex^2)^2}\,dx}{4e}\\
&= -\frac{a+b\log(cx^n)}{4e(d+ex^2)^2}+\frac{(bn)\,\mathrm{Subst}\left(\int\frac{1}{x(d+ex)^2}\,dx,x,x^2\right)}{8e}\\
&= -\frac{a+b\log(cx^n)}{4e(d+ex^2)^2}+\frac{(bn)\,\mathrm{Subst}\left(\int\left(\frac{1}{d^2x}-\frac{e}{d(d+ex)^2}-\frac{e}{d^2(d+ex)}\right)dx,x,x^2\right)}{8e}\\
&= \frac{bn}{8de(d+ex^2)}+\frac{bn\log(x)}{4d^2e}-\frac{a+b\log(cx^n)}{4e(d+ex^2)^2}-\frac{bn\log(d+ex^2)}{8d^2e}
\end{aligned}
$$

Mathematica [A] time = 0.0690505, size = 111, normalized size = 1.35

$$\frac{-a-b(\log(cx^n)-n\log(x))}{4e(d+ex^2)^2}-\frac{bn\log(d+ex^2)}{8d^2e}+\frac{bn\log(x)}{4d^2e}+\frac{bn}{8de(d+ex^2)}-\frac{bn\log(x)}{4e(d+ex^2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (b*n)/(8*d*e*(d + e*x^2)) + (b*n*Log[x])/(4*d^2*e) - (b*n*Log[x])/(4*e*(d +
 e*x^2)^2) + (-a - b*(-(n*Log[x]) + Log[c*x^n]))/(4*e*(d + e*x^2)^2) - (b*n
*Log[d + e*x^2])/(8*d^2*e)
```

Maple [C] time = 0.102, size = 243, normalized size = 3.

$$-\frac{b\ln(x^n)}{4(ex^2+d)^2e}-\frac{-2\ln(x)be^2nx^4+\ln(ex^2+d)be^2nx^4+i\pi bd^2\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-i\pi bd^2\mathrm{csgn}(ix^n)\mathrm{csgn}(icx^n}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^3,x)
```

```
[Out] -1/4*b/e/(e*x^2+d)^2*ln(x^n)-1/8*(-2*ln(x)*b*e^2*n*x^4+ln(e*x^2+d)*b*e^2*n*
x^4+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-I*Pi*b*d^2*csgn(I*c*x^n)^3+I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I
*c)-4*ln(x)*b*d*e*n*x^2+2*ln(e*x^2+d)*b*d*e*n*x^2-b*d*e*n*x^2-2*ln(x)*b*d^2
*n+ln(e*x^2+d)*b*d^2*n+2*ln(c)*b*d^2-b*d^2*n+2*a*d^2)/e/d^2/(e*x^2+d)^2
```

Maxima [A] time = 1.18669, size = 147, normalized size = 1.79

$$\frac{1}{8}\,bn\left(\frac{1}{de^2x^2+d^2e}-\frac{\log\left(ex^2+d\right)}{d^2e}+\frac{\log\left(x^2\right)}{d^2e}\right)-\frac{b\log\left(cx^n\right)}{4\left(e^3x^4+2\,de^2x^2+d^2e\right)}-\frac{a}{4\left(e^3x^4+2\,de^2x^2+d^2e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*b*n*(1/(d*e^2*x^2 + d^2*e) - log(e*x^2 + d)/(d^2*e) + log(x^2)/(d^2*e))
 - 1/4*b*log(c*x^n)/(e^3*x^4 + 2*d*e^2*x^2 + d^2*e) - 1/4*a/(e^3*x^4 + 2*d*
e^2*x^2 + d^2*e)
```

Fricas [A] time = 1.39759, size = 259, normalized size = 3.16

$$\frac{bdenx^2+bd^2n-2\,bd^2\log\left(c\right)-2\,ad^2-\left(be^2nx^4+2\,bdenx^2+bd^2n\right)\log\left(ex^2+d\right)+2\left(be^2nx^4+2\,bdenx^2\right)\log\left(x\right)}{8\left(d^2e^3x^4+2\,d^3e^2x^2+d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] 1/8*(b*d*e*n*x^2 + b*d^2*n - 2*b*d^2*log(c) - 2*a*d^2 - (b*e^2*n*x^4 + 2*b*
d*e*n*x^2 + b*d^2*n)*log(e*x^2 + d) + 2*(b*e^2*n*x^4 + 2*b*d*e*n*x^2)*log(x
))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4*e)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [A] time = 1.27594, size = 184, normalized size = 2.24

$$-\frac{bnx^4e^2\log\left(x^2e+d\right)-2\,bnx^4e^2\log\left(x\right)+2\,bdnx^2e\log\left(x^2e+d\right)-4\,bdnx^2e\log\left(x\right)-bdnx^2e+bd^2n\log\left(x^2e+d\right)-bd^2}{8\left(d^2x^4e^3+2\,d^3x^2e^2+d^4e\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] -1/8*(b*n*x^4*e^2*log(x^2*e + d) - 2*b*n*x^4*e^2*log(x) + 2*b*d*n*x^2*e*log
(x^2*e + d) - 4*b*d*n*x^2*e*log(x) - b*d*n*x^2*e + b*d^2*n*log(x^2*e + d) -
 b*d^2*n + 2*b*d^2*log(c) + 2*a*d^2)/(d^2*x^4*e^3 + 2*d^3*x^2*e^2 + d^4*e)
```

3.234 $\int \frac{a+b\log(cx^n)}{x(d+ex^2)^3}\,dx$

Optimal. Leaf size=115

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^3}-\frac{\log\left(\frac{d}{ex^2}+1\right)(4a+4b\log(cx^n)-3bn)}{8d^3}+\frac{4a+4b\log(cx^n)-bn}{8d^2(d+ex^2)}+\frac{a+b\log(cx^n)}{4d(d+ex^2)^2}$$

```
[Out] (a + b*Log[c*x^n])/(4*d*(d + e*x^2)^2) - (Log[1 + d/(e*x^2)]*(4*a - 3*b*n +
 4*b*Log[c*x^n]))/(8*d^3) + (4*a - b*n + 4*b*Log[c*x^n])/(8*d^2*(d + e*x^2)
) + (b*n*PolyLog[2, -(d/(e*x^2))])/(4*d^3)
```

Rubi [A] time = 0.217559, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {2340, 2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{d}{ex^2}\right)}{4d^3}-\frac{\log\left(\frac{d}{ex^2}+1\right)(4a+4b\log(cx^n)-3bn)}{8d^3}+\frac{4a+4b\log(cx^n)-bn}{8d^2(d+ex^2)}+\frac{a+b\log(cx^n)}{4d(d+ex^2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^3),x]
```

```
[Out] (a + b*Log[c*x^n])/(4*d*(d + e*x^2)^2) - (Log[1 + d/(e*x^2)]*(4*a - 3*b*n +
 4*b*Log[c*x^n]))/(8*d^3) + (4*a - b*n + 4*b*Log[c*x^n])/(8*d^2*(d + e*x^2)
) + (b*n*PolyLog[2, -(d/(e*x^2))])/(4*d^3)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
```

```
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^2)^3}\,dx = \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} - \frac{\int \frac{-4a+bn-4b\log(cx^n)}{x(d+ex^2)^2}\,dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} + \frac{4a-bn+4b\log(cx^n)}{8d^2(d+ex^2)} + \frac{\int \frac{-4bn-2(-4a+bn)+8b\log(cx^n)}{x(d+ex^2)}\,dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} - \frac{\log\left(1+\frac{d}{ex^2}\right)(4a-3bn+4b\log(cx^n))}{8d^3} + \frac{4a-bn+4b\log(cx^n)}{8d^2(d+ex^2)} + \frac{(bn)\int \frac{\log(1}{}}{2d^3}$$

$$= \frac{a+b\log(cx^n)}{4d(d+ex^2)^2} - \frac{\log\left(1+\frac{d}{ex^2}\right)(4a-3bn+4b\log(cx^n))}{8d^3} + \frac{4a-bn+4b\log(cx^n)}{8d^2(d+ex^2)} + \frac{bn\mathrm{Li}_2\left(-\frac{d}{ex^2}\right.}{4d^3}$$

Mathematica [C] time = 0.916985, size = 396, normalized size = 3.44

$$\frac{-bn\left(8\mathrm{PolyLog}\left(2,-\frac{i\sqrt{ex}}{\sqrt{d}}\right)+8\mathrm{PolyLog}\left(2,\frac{i\sqrt{ex}}{\sqrt{d}}\right)+\frac{d}{d-i\sqrt{d}\sqrt{ex}}+\frac{d}{d+i\sqrt{d}\sqrt{ex}}+8\log(x)\log\left(1-\frac{i\sqrt{ex}}{\sqrt{d}}\right)+8\log(x)\log\left(1+\frac{i\sqrt{ex}}{\sqrt{d}}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^3),x]
```

```
[Out] ((4*d^2*(a - b*n*Log[x] + b*Log[c*x^n]))/(d + e*x^2)^2 + (8*d*(a - b*n*Log[
x] + b*Log[c*x^n]))/(d + e*x^2) + 16*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n])
 - 8*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + e*x^2] - b*n*(d/(d - I*Sqrt[d]
*Sqrt[e]*x) + d/(d + I*Sqrt[d]*Sqrt[e]*x) + 2*Log[x] - (d*Log[x])/(Sqrt[d]
- I*Sqrt[e]*x)^2 - (d*Log[x])/(Sqrt[d] + I*Sqrt[e]*x)^2 + (5*Sqrt[e]*x*Log[
x])/((-I)*Sqrt[d] + Sqrt[e]*x) + (5*Sqrt[e]*x*Log[x])/(I*Sqrt[d] + Sqrt[e]*
```

```
x) - 8*Log[x]^2 - 6*Log[I*Sqrt[d] - Sqrt[e]*x] - 6*Log[I*Sqrt[d] + Sqrt[e]*
x] + 8*Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 8*Log[x]*Log[1 + (I*Sqrt[e]*
x)/Sqrt[d]] + 8*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 8*PolyLog[2, (I*Sqrt
[e]*x)/Sqrt[d]]))/(16*d^3)
```

Maple [C] time = 0.166, size = 841, normalized size = 7.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x^2+d)^3,x)
```

```
[Out] b*ln(c)/d^3*ln(x)+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(e*x
^2+d)-1/2*a/d^3*ln(e*x^2+d)+1/4*a/d/(e*x^2+d)^2+1/2*a/d^2/(e*x^2+d)-1/2*b*n
/d^3*ln(x)^2-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*ln(x)-1/2*b*n/d^3*ln(x)*ln((e*x
+(-d*e)^(1/2))/(-d*e)^(1/2))+1/4*I*b*Pi*csgn(I*c*x^n)^3/d^3*ln(e*x^2+d)-1/8
*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/(e*x^2+d)^2-1/2*b*n/d^3*ln(x)
*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/d^3*ln(x)*ln(e*x^2+d)-1/4*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/(e*x^2+d)+b*ln(x^n)/d^3*ln(x)-1
/2*b*ln(x^n)/d^3*ln(e*x^2+d)+1/4*b*ln(x^n)/d/(e*x^2+d)^2+1/2*b*ln(x^n)/d^2/
(e*x^2+d)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(x)-1/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(x)-1/2*b*ln(c)/d^3*ln(e*x^2+d)+1/4*b*ln
(c)/d/(e*x^2+d)^2+1/2*b*ln(c)/d^2/(e*x^2+d)-1/2*b*n/d^3*dilog((-e*x+(-d*e)^
(1/2))/(-d*e)^(1/2))-1/2*b*n/d^3*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/8
*b*n/d^3*ln(e*x^2+d)-1/8*b*n/d^2/(e*x^2+d)+a/d^3*ln(x)+1/2*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)^2/d^3*ln(x)-1/4*I*b*Pi*csgn(I*c*x^n)^3/d^2/(e*x^2+d)-1/4*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(e*x^2+d)-1/8*I*b*Pi*csgn(I*c*x^n)^
3/d/(e*x^2+d)^2+1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(e*x^2+d)^2+1/4*I*b*
Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(e*x^2+d)+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/d/(e*x^2+d)^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2/(e*x^2+d)-1
/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(e*x^2+d)-3/4*b*n*ln(x)/d^3
```

Maple [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{4}a\left(\frac{2ex^2+3d}{d^2e^2x^4+2d^3ex^2+d^4}-\frac{2\log\left(ex^2+d\right)}{d^3}+\frac{4\log\left(x\right)}{d^3}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^3x^7+3de^2x^5+3d^2ex^3+d^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((2*e*x^2 + 3*d)/(d^2*e^2*x^4 + 2*d^3*e*x^2 + d^4) - 2*log(e*x^2 + d)
/d^3 + 4*log(x)/d^3) + b*integrate((log(c) + log(x^n))/(e^3*x^7 + 3*d*e^2*x
^5 + 3*d^2*e*x^3 + d^3*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{7}+3\,de^{2}x^{5}+3\,d^{2}ex^{3}+d^{3}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2*e*x^3 + d^3*x),
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*ln(c*x**n))/x/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{3}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x), x)
```

3.235 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)^3}\,dx$

Optimal. Leaf size=162

$$-\frac{3benPolyLog\left(2,-\frac{d}{ex^2}\right)}{4d^4}+\frac{6a+6b\log(cx^n)-bn}{8d^2x^2(d+ex^2)}+\frac{e\log\left(\frac{d}{ex^2}+1\right)(12a+12b\log(cx^n)-5bn)}{8d^4}-\frac{12a+12b\log(cx^n)-}{8d^3x^2}$$

```
[Out] (-3*b*n)/(4*d^3*x^2) + (a + b*Log[c*x^n])/(4*d*x^2*(d + e*x^2)^2) + (6*a -
b*n + 6*b*Log[c*x^n])/(8*d^2*x^2*(d + e*x^2)) - (12*a - 5*b*n + 12*b*Log[c*
x^n])/(8*d^3*x^2) + (e*Log[1 + d/(e*x^2)]*(12*a - 5*b*n + 12*b*Log[c*x^n]))
/(8*d^4) - (3*b*e*n*PolyLog[2, -(d/(e*x^2))])/(4*d^4)
```

Rubi [A] time = 0.390189, antiderivative size = 195, normalized size of antiderivative = 1.2, number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2340, 266, 44, 2351, 2304, 2301, 2337, 2391}

$$\frac{3benPolyLog\left(2,-\frac{ex^2}{d}\right)}{4d^4}-\frac{e(12a+12b\log(cx^n)-5bn)^2}{96bd^4n}+\frac{e\log\left(\frac{ex^2}{d}+1\right)(12a+12b\log(cx^n)-5bn)}{8d^4}+\frac{6a+6b\log(cx}{8d^2x^2(d+}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] (-3*b*n)/(4*d^3*x^2) + (a + b*Log[c*x^n])/(4*d*x^2*(d + e*x^2)^2) + (6*a -
b*n + 6*b*Log[c*x^n])/(8*d^2*x^2*(d + e*x^2)) - (12*a - 5*b*n + 12*b*Log[c*
x^n])/(8*d^3*x^2) - (e*(12*a - 5*b*n + 12*b*Log[c*x^n])^2)/(96*b*d^4*n) + (
e*(12*a - 5*b*n + 12*b*Log[c*x^n])*Log[1 + (e*x^2)/d])/(8*d^4) + (3*b*e*n*P
olyLog[2, -((e*x^2)/d)])/(4*d^4)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)^3}\,dx = \frac{a+b\log(cx^n)}{4dx^2(d+ex^2)^2} - \frac{\int \frac{-6a+bn-6b\log(cx^n)}{x^3(d+ex^2)^2}\,dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4dx^2(d+ex^2)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2(d+ex^2)} + \frac{\int \frac{-6bn-4(-6a+bn)+24b\log(cx^n)}{x^3(d+ex^2)}\,dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx^2(d+ex^2)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2(d+ex^2)} + \frac{\int \left(\frac{-6bn-4(-6a+bn)+24b\log(cx^n)}{dx^3} - \frac{e(-6bn-4(-6a+bn)+24b\log}{d^2x}\right.}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx^2(d+ex^2)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2(d+ex^2)} + \frac{\int \frac{-6bn-4(-6a+bn)+24b\log(cx^n)}{x^3}\,dx}{8d^3} - \frac{e\int \frac{-6bn-4(-6a+bn)+2}{x}}{8d^4}$$

$$= -\frac{3bn}{4d^3x^2} + \frac{a+b\log(cx^n)}{4dx^2(d+ex^2)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2(d+ex^2)} - \frac{12a-5bn+12b\log(cx^n)}{8d^3x^2} - \frac{e(12a-5bn}{9}$$

$$= -\frac{3bn}{4d^3x^2} + \frac{a+b\log(cx^n)}{4dx^2(d+ex^2)^2} + \frac{6a-bn+6b\log(cx^n)}{8d^2x^2(d+ex^2)} - \frac{12a-5bn+12b\log(cx^n)}{8d^3x^2} - \frac{e(12a-5bn}{9}$$

Mathematica [C] time = 1.10452, size = 507, normalized size = 3.13

$$bn\left(24e\left(\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1+\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)+24e\left(\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)+\log(x)\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\right)+\frac{9e^{3/2}x\log(x)}{\sqrt{e}x-i\sqrt{d}}+\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] ((-8*d*(a - b*n*Log[x] + b*Log[c*x^n]))/x^2 - (4*d^2*e*(a - b*n*Log[x] + b*
Log[c*x^n]))/(d + e*x^2)^2 - (16*d*e*(a - b*n*Log[x] + b*Log[c*x^n]))/(d +
e*x^2) - 48*e*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) + 24*e*(a - b*n*Log[x]
 + b*Log[c*x^n])*Log[d + e*x^2] + b*n*((9*e^(3/2)*x*Log[x])/((-I)*Sqrt[d] +
 Sqrt[e]*x) - 24*e*Log[x]^2 - (4*d*(1 + 2*Log[x]))/x^2 + e*(d/(d + I*Sqrt[d
]*Sqrt[e]*x) + Log[x] - (d*Log[x])/(Sqrt[d] + I*Sqrt[e]*x)^2 - Log[I*Sqrt[d
] - Sqrt[e]*x]) - 9*e*Log[I*Sqrt[d] - Sqrt[e]*x] + e*(d/(d - I*Sqrt[d]*Sqrt
[e]*x) + Log[x] - (d*Log[x])/(Sqrt[d] - I*Sqrt[e]*x)^2 - Log[I*Sqrt[d] + Sq
rt[e]*x]) + ((-9*I)*e^(3/2)*x*Log[x] + (9*I)*e*(I*Sqrt[d] + Sqrt[e]*x)*Log[
```

```
I*Sqrt[d] + Sqrt[e]*x])/(Sqrt[d] - I*Sqrt[e]*x) + 24*e*(Log[x]*Log[1 + (I*S
qrt[e]*x)/Sqrt[d]] + PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]]) + 24*e*(Log[x]*L
og[1 - (I*Sqrt[e]*x)/Sqrt[d]] + PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])))/(16*d^
4)
```

Maple [C] time = 0.181, size = 1030, normalized size = 6.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^3,x)
```

```
[Out] 3/2*b*n/d^4*e*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/2*b*n/d^4*e*ln(x
)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/2*b*n/d^4*e*ln(x)*ln(e*x^2+d)+1/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^3/(e*x^2+d)+1/8*I*b*Pi*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2/(e*x^2+d)^2-1/2*a/d^3/x^2-a*e/d^3/(e*x^
2+d)+3/2*a*e/d^4*ln(e*x^2+d)-1/4*a*e/d^2/(e*x^2+d)^2+1/4*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/d^3/x^2+3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)/d^4*e*ln(x)+3/2*b*ln(x^n)*e/d^4*ln(e*x^2+d)-1/4*b*ln(x^n)*e/d^2/(e*x^2
+d)^2-b*ln(x^n)*e/d^3/(e*x^2+d)+3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*
e*ln(e*x^2+d)-3*a/d^4*e*ln(x)-3*b*ln(c)/d^4*e*ln(x)-b*ln(c)*e/d^3/(e*x^2+d)
+3/2*b*ln(c)/d^4*e*ln(e*x^2+d)-1/4*b*ln(c)*e/d^2/(e*x^2+d)^2+3/2*b*n/d^4*e*
dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/2*b*n/d^4*e*dilog((e*x+(-d*e)^(1/
2))/(-d*e)^(1/2))-5/8*b*n/d^4*e*ln(e*x^2+d)+1/8*b*n*e/d^3/(e*x^2+d)-3/2*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e*ln(x)-1/8*I*b*Pi*csgn(I*c*x^n)^2*csgn
(I*c)*e/d^2/(e*x^2+d)^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e/d^3/(e*x^2
+d)-1/2*b*ln(x^n)/d^3/x^2+3/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e*ln(e*x
^2+d)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e/d^3/(e*x^2+d)-1/8*I*b*Pi*csgn(
I*x^n)*csgn(I*c*x^n)^2*e/d^2/(e*x^2+d)^2+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^3/(
e*x^2+d)-3/4*I*b*Pi*csgn(I*c*x^n)^3/d^4*e*ln(e*x^2+d)+1/8*I*b*Pi*csgn(I*c*x
^n)^3*e/d^2/(e*x^2+d)^2-3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e*ln(x)+1/
4*I*b*Pi*csgn(I*c*x^n)^3/d^3/x^2-1/2*b*ln(c)/d^3/x^2+3/2*b*n/d^4*e*ln(x)^2-
3*b*ln(x^n)/d^4*e*ln(x)-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/x^2-1/4*I*
b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3/x^2+3/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*e*l
n(x)-3/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e*ln(e*x^2+d)+5/4*b
*e*n*ln(x)/d^4-1/4*b*n/d^3/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{4}a\left(\frac{6e^2x^4+9dex^2+2d^2}{d^3e^2x^6+2d^4ex^4+d^5x^2}-\frac{6e\log\left(ex^2+d\right)}{d^4}+\frac{12e\log\left(x\right)}{d^4}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{e^3x^9+3de^2x^7+3d^2ex^5+d^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*e^2*x^4 + 9*d*e*x^2 + 2*d^2)/(d^3*e^2*x^6 + 2*d^4*e*x^4 + d^5*x^
2) - 6*e*log(e*x^2 + d)/d^4 + 12*e*log(x)/d^4) + b*integrate((log(c) + log(
x^n))/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^3x^9+3de^2x^7+3d^2ex^5+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^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((a+b*ln(c*x**n))/x**3/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x^3), x)
```

3.236 $\int \frac{x^4(a+b\log(cx^n))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=211

$$-\frac{3ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}e^{5/2}}+\frac{3ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}e^{5/2}}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}+\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b}{8\sqrt{d}e^{5/2}}$$

```
[Out] -(b*n*x)/(8*e^2*(d + e*x^2)) + (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]
*e^(5/2)) + (d*x*(a + b*Log[c*x^n]))/(4*e^2*(d + e*x^2)^2) - (5*x*(a + b*Lo
g[c*x^n]))/(8*e^2*(d + e*x^2)) + (3*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[
c*x^n]))/(8*Sqrt[d]*e^(5/2)) - (((3*I)/16)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/
Sqrt[d]])/(Sqrt[d]*e^(5/2)) + (((3*I)/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/(Sqrt[d]*e^(5/2))
```

Rubi [A] time = 0.457664, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 24, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {288, 205, 2351, 2323, 2324, 12, 4848, 2391, 199}

$$-\frac{3ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}e^{5/2}}+\frac{3ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16\sqrt{d}e^{5/2}}-\frac{5x\left(a+b\log\left(cx^n\right)\right)}{8e^2\left(d+ex^2\right)}+\frac{dx\left(a+b\log\left(cx^n\right)\right)}{4e^2\left(d+ex^2\right)^2}+\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b}{8\sqrt{d}e^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```



```
[Out] -(b*n*x)/(8*e^2*(d + e*x^2)) + (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]
*e^(5/2)) + (d*x*(a + b*Log[c*x^n]))/(4*e^2*(d + e*x^2)^2) - (5*x*(a + b*Lo
g[c*x^n]))/(8*e^2*(d + e*x^2)) + (3*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[
c*x^n]))/(8*Sqrt[d]*e^(5/2)) - (((3*I)/16)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/
Sqrt[d]])/(Sqrt[d]*e^(5/2)) + (((3*I)/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/(Sqrt[d]*e^(5/2))
```


Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
```

```
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rubi steps

$$\int \frac{x^4 (a+b\log(cx^n))}{\left(d+ex^2\right)^3}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))}{e^2\left(d+ex^2\right)^3} - \frac{2d (a+b\log(cx^n))}{e^2\left(d+ex^2\right)^2} + \frac{a+b\log(cx^n)}{e^2\left(d+ex^2\right)}\right) dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e^2} - \frac{(2d)\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^2}\,dx}{e^2} + \frac{d^2\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^3}\,dx}{e^2}$$

$$= \frac{dx (a+b\log(cx^n))}{4e^2\left(d+ex^2\right)^2} - \frac{x (a+b\log(cx^n))}{e^2\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}e^{5/2}} - \frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{e^2} \cdots$$

$$= -\frac{bnx}{8e^2\left(d+ex^2\right)} + \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}e^{5/2}} + \frac{dx (a+b\log(cx^n))}{4e^2\left(d+ex^2\right)^2} - \frac{5x (a+b\log(cx^n))}{8e^2\left(d+ex^2\right)} + \frac{3\int \frac{a+b\log(\cdots}{d+ex^2 \cdots}}{8e^2} \cdots$$

$$= -\frac{bnx}{8e^2\left(d+ex^2\right)} + \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}} + \frac{dx (a+b\log(cx^n))}{4e^2\left(d+ex^2\right)^2} - \frac{5x (a+b\log(cx^n))}{8e^2\left(d+ex^2\right)} + \frac{3\tan^{-1}\left(\cdots\right.}{\cdots}$$

$$= -\frac{bnx}{8e^2\left(d+ex^2\right)} + \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}} + \frac{dx (a+b\log(cx^n))}{4e^2\left(d+ex^2\right)^2} - \frac{5x (a+b\log(cx^n))}{8e^2\left(d+ex^2\right)} + \frac{3\tan^{-1}\left(\cdots\right.}{\cdots}$$

$$= -\frac{bnx}{8e^2\left(d+ex^2\right)} + \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}} + \frac{dx (a+b\log(cx^n))}{4e^2\left(d+ex^2\right)^2} - \frac{5x (a+b\log(cx^n))}{8e^2\left(d+ex^2\right)} + \frac{3\tan^{-1}\left(\cdots\right.}{\cdots}$$

$$= -\frac{bnx}{8e^2\left(d+ex^2\right)} + \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}e^{5/2}} + \frac{dx (a+b\log(cx^n))}{4e^2\left(d+ex^2\right)^2} - \frac{5x (a+b\log(cx^n))}{8e^2\left(d+ex^2\right)} + \frac{3\tan^{-1}\left(\cdots\right.}{\cdots}$$

Mathematica [B] time = 1.2998, size = 495, normalized size = 2.35

$$\frac{\frac{3bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{\sqrt{-d}}-\frac{3bn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{\sqrt{-d}}-\frac{3\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{\sqrt{-d}}+\frac{3\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(cx^n))}{\sqrt{-d}}+\frac{5(a+b\log(cx^n))}{\sqrt{-d}-\sqrt{e}x}-\frac{5(a+b\log(cx^n))}{\sqrt{-d}+\sqrt{e}x}-}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] (-((Sqrt[-d]*(a + b*Log[c*x^n]))/(Sqrt[-d] - Sqrt[e]*x)^2) + (5*(a + b*Log[
c*x^n]))/(Sqrt[-d] - Sqrt[e]*x) + (Sqrt[-d]*(a + b*Log[c*x^n]))/(Sqrt[-d] +
 Sqrt[e]*x)^2 - (5*(a + b*Log[c*x^n]))/(Sqrt[-d] + Sqrt[e]*x) - (5*b*n*(Log
[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/Sqrt[-d] + (5*b*n*(Log[x] - Log[Sqrt[-d]
+ Sqrt[e]*x]))/Sqrt[-d] - (b*n*(d + (d - Sqrt[-d]*Sqrt[e]*x)*Log[x] + (-d +
 Sqrt[-d]*Sqrt[e]*x)*Log[Sqrt[-d] + Sqrt[e]*x]))/(d*(Sqrt[-d] + Sqrt[e]*x))
 - (3*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/Sqrt[-d] + (b*n*(d
+ (d + Sqrt[-d]*Sqrt[e]*x)*Log[x] - (d + Sqrt[-d]*Sqrt[e]*x)*Log[(-d)^(3/2)
 + d*Sqrt[e]*x]))/(d*(Sqrt[-d] - Sqrt[e]*x)) + (3*(a + b*Log[c*x^n])*Log[1
+ (d*Sqrt[e]*x)/(-d)^(3/2)])/Sqrt[-d] + (3*b*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[
-d]])/Sqrt[-d] - (3*b*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/Sqrt[-d])/(16
*e^(5/2))
```

Maple [C] time = 0.336, size = 1311, normalized size = 6.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*ln(c*x^n))/(e*x^2+d)^3,x)
```

```
[Out] -3/8*b/(e*x^2+d)^2*d/e^2*x*ln(x^n)+3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/(e*x^2+d)^2*d/e^2*x+5/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
/(e*x^2+d)^2/e*x^3-3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/(e*x^2+d)^2*d/e^2*
x+3/8*b/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)-5/8*b/(e*x^2+d)^2/e
*x^3*ln(x^n)-3/16*b*n*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))*x^4+b*n*d/e^2*ln(x)/(e*x^2+d)^2*x+3/16*b*n*ln(x)/(e*x^2+d)^2/
(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4-5/8*a/(e*x^2+d)^2/e*x
^3+3/8*a/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+3/16*b*n*d^2/e^2*ln(x)/(e*
x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n*d^2/e^2
*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/2*b*n
```

```
/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+1/
2*b*n/e*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^
2-1/2*b*n*d/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^
(1/2))+1/2*b*n*d/e^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d
*e)^(1/2))+1/2*b*n/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+3/16*b*n/e^2/(-d
*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n/e^2/(-d*e)^(1/2)
*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/8*a/(e*x^2+d)^2*d/e^2*x-5/8*b*ln(
c)/(e*x^2+d)^2/e*x^3+3/8*b*ln(c)/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-3/
8*b*ln(c)/(e*x^2+d)^2*d/e^2*x+3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e^2/(
d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e^
2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-5/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2/(e*x^2+d)^2/e*x^3-1/2*b*n/e^2/(-d*e)^(1/2)*ln(x)*ln((e*x+(-d*e)^(1/2))/(
-d*e)^(1/2))-3/8*b/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)-5/16*I*b
*Pi*csgn(I*c*x^n)^2*csgn(I*c)/(e*x^2+d)^2/e*x^3+3/16*I*b*Pi*csgn(I*c*x^n)^3
/(e*x^2+d)^2*d/e^2*x-3/8*b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d
*e)^(1/2))/(-d*e)^(1/2))*x^2+3/8*b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln(
(-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-3/16*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)^2/(e*x^2+d)^2*d/e^2*x+b*n/e*ln(x)/(e*x^2+d)^2*x^3-b*n/e^2*ln(
x)*x/(e*x^2+d)+1/2*b*n/e^2/(-d*e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)
^(1/2))+5/16*I*b*Pi*csgn(I*c*x^n)^3/(e*x^2+d)^2/e*x^3-3/16*I*b*Pi*csgn(I*c*
x^n)^3/e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/8*b*n*x/e^2/(e*x^2+d)
```

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(x^4*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^4\log\left(cx^n\right)+ax^4}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
d^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(x**4*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^4}{\left(ex^2 + d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d)^3, x)
```

3.237 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=187

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8d^{3/2}e^{3/2}}+\frac{x(a+b\log(cx^n))}{8de(d+ex^2)}-\frac{x(a+b\log(c}{4e(d+ex^2)}$$

```
[Out] (b*n*x)/(8*d*e*(d + e*x^2)) - (x*(a + b*Log[c*x^n]))/(4*e*(d + e*x^2)^2) +
(x*(a + b*Log[c*x^n]))/(8*d*e*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(
a + b*Log[c*x^n]))/(8*d^(3/2)*e^(3/2)) - ((I/16)*b*n*PolyLog[2, ((-I)*Sqrt[
e]*x)/Sqrt[d]])/(d^(3/2)*e^(3/2)) + ((I/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sq
rt[d]])/(d^(3/2)*e^(3/2))
```

Rubi [A] time = 0.368746, antiderivative size = 187, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {288, 199, 205, 2351, 2323, 2324, 12, 4848, 2391}

$$-\frac{ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{3/2}e^{3/2}}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8d^{3/2}e^{3/2}}+\frac{x(a+b\log(cx^n))}{8de(d+ex^2)}-\frac{x(a+b\log(c}{4e(d+ex^2)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```



```
[Out] (b*n*x)/(8*d*e*(d + e*x^2)) - (x*(a + b*Log[c*x^n]))/(4*e*(d + e*x^2)^2) +
(x*(a + b*Log[c*x^n]))/(8*d*e*(d + e*x^2)) + (ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(
a + b*Log[c*x^n]))/(8*d^(3/2)*e^(3/2)) - ((I/16)*b*n*PolyLog[2, ((-I)*Sqrt[
e]*x)/Sqrt[d]])/(d^(3/2)*e^(3/2)) + ((I/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sq
rt[d]])/(d^(3/2)*e^(3/2))
```


Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
```

```
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))}{(d+ex^2)^3}\,dx = \int\left(-\frac{d(a+b\log(cx^n))}{e(d+ex^2)^3}+\frac{a+b\log(cx^n)}{e(d+ex^2)^2}\right)dx$$

$$= \frac{\int \frac{a+b\log(cx^n)}{(d+ex^2)^2}\,dx}{e} - \frac{d\int \frac{a+b\log(cx^n)}{(d+ex^2)^3}\,dx}{e}$$

$$= -\frac{x(a+b\log(cx^n))}{4e(d+ex^2)^2}+\frac{x(a+b\log(cx^n))}{2de(d+ex^2)}-\frac{3\int \frac{a+b\log(cx^n)}{(d+ex^2)^2}\,dx}{4e}+\frac{\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{2de}+\frac{(bn)\int \ldots}{4e\ldots}$$

$$= \frac{bnx}{8de(d+ex^2)}-\frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}e^{3/2}}-\frac{x(a+b\log(cx^n))}{4e(d+ex^2)^2}+\frac{x(a+b\log(cx^n))}{8de(d+ex^2)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a\ldots}{2d^{3/2}\ldots}$$

$$= \frac{bnx}{8de(d+ex^2)}-\frac{x(a+b\log(cx^n))}{4e(d+ex^2)^2}+\frac{x(a+b\log(cx^n))}{8de(d+ex^2)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8d^{3/2}e^{3/2}}-\ldots$$

$$= \frac{bnx}{8de(d+ex^2)}-\frac{x(a+b\log(cx^n))}{4e(d+ex^2)^2}+\frac{x(a+b\log(cx^n))}{8de(d+ex^2)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8d^{3/2}e^{3/2}}-\ldots$$

$$= \frac{bnx}{8de(d+ex^2)}-\frac{x(a+b\log(cx^n))}{4e(d+ex^2)^2}+\frac{x(a+b\log(cx^n))}{8de(d+ex^2)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8d^{3/2}e^{3/2}}-\ldots$$

$$= \frac{bnx}{8de(d+ex^2)}-\frac{x(a+b\log(cx^n))}{4e(d+ex^2)^2}+\frac{x(a+b\log(cx^n))}{8de(d+ex^2)}+\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8d^{3/2}e^{3/2}}-\ldots$$

Mathematica [B] time = 1.04301, size = 497, normalized size = 2.66

$$\frac{bdn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{5/2}}+\frac{bn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{3/2}}+\frac{\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+b\log(cx^n))}{(-d)^{3/2}}+\frac{d\log\left(\frac{d\sqrt{e}x}{(-d)^{3/2}}+1\right)(a+b\log(cx^n))}{(-d)^{5/2}}-\frac{a+b\log(cx^n)}{\sqrt{-d}d-d\sqrt{e}x}+\frac{a+b\log(cx^n)}{d\sqrt{e}x+\sqrt{-d}d}+\frac{d(a+}{(-d)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^3,x]
```

```
[Out] ((d*(a + b*Log[c*x^n]))/((-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)^2) + (a + b*Log[
c*x^n])/(Sqrt[-d]*(Sqrt[-d] + Sqrt[e]*x)^2) - (a + b*Log[c*x^n])/(Sqrt[-d]*
d - d*Sqrt[e]*x) + (a + b*Log[c*x^n])/(Sqrt[-d]*d + d*Sqrt[e]*x) + (b*d*n*(
Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(5/2) + (b*n*(Log[x] - Log[Sqrt[-
d] + Sqrt[e]*x]))/(-d)^(3/2) + (b*n*(d + (d - Sqrt[-d]*Sqrt[e]*x)*Log[x] +
(-d + Sqrt[-d]*Sqrt[e]*x)*Log[Sqrt[-d] + Sqrt[e]*x]))/(d^2*(Sqrt[-d] + Sqrt
[e]*x)) + ((a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (
b*n*(d + (d + Sqrt[-d]*Sqrt[e]*x)*Log[x] - (d + Sqrt[-d]*Sqrt[e]*x)*Log[(-d
)^(3/2) + d*Sqrt[e]*x]))/(d^2*(Sqrt[-d] - Sqrt[e]*x)) + (d*(a + b*Log[c*x^n
])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(5/2) + (b*d*n*PolyLog[2, (Sqrt[
e]*x)/Sqrt[-d]])/(-d)^(5/2) + (b*n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-
d)^(3/2))/(16*e^(3/2))
```

Maple [C] time = 0.326, size = 1247, normalized size = 6.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^3,x)
```

```
[Out] 1/8*b/e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)-1/16*I*b*Pi*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)/e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/16*I*b
*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-3/16*
b*n/d*e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))
*x^4-1/16*b*n/d/e/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/8*b
*ln(c)/e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/4*b*n/e*ln(x)/(e*x^2+d)/(-
d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n/e*ln(x)/(e*x^2+d)/(
-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/e*ln(x)*x/d/(e*x^2+
d)-3/16*b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e
)^(1/2))+3/16*b*n*d/e*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/
```

```
(-d*e)^(1/2))+1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))
/(-d*e)^(1/2))*x^2-1/4*b*n*ln(x)/d/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1
/2))/(-d*e)^(1/2))*x^2+1/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/(e*x^2+d)^2/
d*x^3-1/2*b*n/d*ln(x)/(e*x^2+d)^2*x^3-1/2*b*n/e*ln(x)/(e*x^2+d)^2*x+1/16*b*
n/d/e/(-d*e)^(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/8*a/(e*x^2+d)^
2/d*x^3-1/8*a/(e*x^2+d)^2/e*x-1/8*b/(e*x^2+d)^2/e*x*ln(x^n)+1/8*b/(e*x^2+d)
^2/d*x^3*ln(x^n)+1/8*a/e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/8*b*ln(c)/
(e*x^2+d)^2/e*x+1/8*b*ln(c)/(e*x^2+d)^2/d*x^3-1/16*I*b*Pi*csgn(I*c*x^n)^3/e
/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/(e*x^2+d)^2/d*x^3-1/8*b/e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)-3
/8*b*n*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*
x^2+3/8*b*n*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/
2))*x^2-1/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/(e*x^2+d)^2/e*x-1/16*I*b*Pi
*csgn(I*c*x^n)^2*csgn(I*c)/(e*x^2+d)^2/e*x+3/16*b*n/d*e*ln(x)/(e*x^2+d)^2/(
-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4-1/16*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/(e*x^2+d)^2/d*x^3+1/16*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)/(e*x^2+d)^2/e*x-1/16*I*b*Pi*csgn(I*c*x^n)^3/(e*x^2+d)^2/d*x
^3+1/16*I*b*Pi*csgn(I*c*x^n)^3/(e*x^2+d)^2/e*x+1/16*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)^2/e/d/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/8*b*n*x/d/e/(e*x^2+d)
```

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(x^2*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^2\log(cx^n) + ax^2}{e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
d^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(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^2}{\left(ex^2 + d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^3, x)
```

3.238 $\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=210

$$-\frac{3ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}+\frac{3ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}+\frac{3x\left(a+b\log\left(cx^n\right)\right)}{8d^2\left(d+ex^2\right)}+\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8d^{5/2}\sqrt{e}}+\frac{x(a+b}{4d\left(d\right.}$$

```
[Out] -(b*n*x)/(8*d^2*(d + e*x^2)) - (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(5/2)
*Sqrt[e]) + (x*(a + b*Log[c*x^n]))/(4*d*(d + e*x^2)^2) + (3*x*(a + b*Log[c*
x^n]))/(8*d^2*(d + e*x^2)) + (3*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^
n]))/(8*d^(5/2)*Sqrt[e]) - (((3*I)/16)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt
[d]])/(d^(5/2)*Sqrt[e]) + (((3*I)/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]]
)/(d^(5/2)*Sqrt[e])
```

Rubi [A] time = 0.145805, antiderivative size = 210, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.35, Rules used = {2323, 205, 2324, 12, 4848, 2391, 199}

$$-\frac{3ibn\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}+\frac{3ibn\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{5/2}\sqrt{e}}+\frac{3x\left(a+b\log\left(cx^n\right)\right)}{8d^2\left(d+ex^2\right)}+\frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{8d^{5/2}\sqrt{e}}+\frac{x(a+b}{4d\left(d\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^3,x]
```

```
[Out] -(b*n*x)/(8*d^2*(d + e*x^2)) - (b*n*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(5/2)
*Sqrt[e]) + (x*(a + b*Log[c*x^n]))/(4*d*(d + e*x^2)^2) + (3*x*(a + b*Log[c*
x^n]))/(8*d^2*(d + e*x^2)) + (3*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^
n]))/(8*d^(5/2)*Sqrt[e]) - (((3*I)/16)*b*n*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt
[d]])/(d^(5/2)*Sqrt[e]) + (((3*I)/16)*b*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]]
)/(d^(5/2)*Sqrt[e])
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
```

```
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^2)^3}\,dx = \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3\int \frac{a+b\log(cx^n)}{(d+ex^2)^2}\,dx}{4d} - \frac{(bn)\int \frac{1}{(d+ex^2)^2}\,dx}{4d}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\int \frac{a+b\log(cx^n)}{d+ex^2}\,dx}{8d^2} - \frac{(bn)\int \frac{1}{d+ex^2}\,dx}{8d^2}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a}{8d^{5/2}}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a}{8d^{5/2}}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a}{8d^{5/2}}$$

$$= -\frac{bnx}{8d^2(d+ex^2)} - \frac{bn\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}\sqrt{e}} + \frac{x(a+b\log(cx^n))}{4d(d+ex^2)^2} + \frac{3x(a+b\log(cx^n))}{8d^2(d+ex^2)} + \frac{3\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a}{8d^{5/2}}$$

Mathematica [B] time = 0.989545, size = 544, normalized size = 2.59

$$\frac{1}{16}\left(\frac{3bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{5/2}\sqrt{e}} - \frac{3bn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{5/2}\sqrt{e}} + \frac{3(a+b\log(cx^n))}{d^2ex+(-d)^{5/2}\sqrt{e}} + \frac{3(a+b\log(cx^n))}{d^2ex+(-d)^{3/2}d\sqrt{e}} - \frac{3\log\left(\frac{\sqrt{e}x}{\sqrt{-d}}+1\right)(a+}{(-d)^{5/2}\sqrt{e}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^3,x]
```

```
[Out] ((d*(a + b*Log[c*x^n]))/((-d)^(5/2)*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)^2) + (a
+ b*Log[c*x^n])/((-d)^(3/2)*Sqrt[e]*(Sqrt[-d] + Sqrt[e]*x)^2) + (3*(a + b*L
og[c*x^n]))/((-d)^(5/2)*Sqrt[e] + d^2*e*x) + (3*(a + b*Log[c*x^n]))/((-d)^(
3/2)*d*Sqrt[e] + d^2*e*x) + (3*b*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/((
-d)^(5/2)*Sqrt[e]) - (3*b*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/((-d)^(5/
2)*Sqrt[e]) - (b*n*(d + (d - Sqrt[-d]*Sqrt[e]*x)*Log[x] + (-d + Sqrt[-d]*Sq
rt[e]*x)*Log[Sqrt[-d] + Sqrt[e]*x]))/(d^3*(Sqrt[-d]*Sqrt[e] + e*x)) - (3*(a
 + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(5/2)*Sqrt[e]) - (b*n
```

```
*(d + (d + Sqrt[-d]*Sqrt[e]*x)*Log[x] - (d + Sqrt[-d]*Sqrt[e]*x)*Log[(-d)^(
3/2) + d*Sqrt[e]*x]))/((-d)^(7/2)*Sqrt[e] + d^3*e*x) + (3*(a + b*Log[c*x^n]
)*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/((-d)^(5/2)*Sqrt[e]) + (3*b*n*PolyLog[
2, (Sqrt[e]*x)/Sqrt[-d]])/((-d)^(5/2)*Sqrt[e]) - (3*b*n*PolyLog[2, (d*Sqrt[
e]*x)/(-d)^(3/2)])/((-d)^(5/2)*Sqrt[e]))/16
```

Maple [C] time = 0.306, size = 1047, normalized size = 5.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x^2+d)^3,x)
```

```
[Out] -3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*x/(e*x^2+d)-3/16*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2
))-1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x/d/(e*x^2+d)^2-3/8*b/d^2
/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)+3/16*b*n*ln(x)/(e*x^2+d)^2/(-d
*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n*ln(x)/(e*x^2+d)^2/(
-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3/8*b*n*ln(x)/d/(e*x^2+d)^2
*x-3/8*b/d^2*x/(e*x^2+d)*n*ln(x)+3/8*b*ln(c)/d^2/(d*e)^(1/2)*arctan(x*e/(d*
e)^(1/2))+1/4*b*ln(c)*x/d/(e*x^2+d)^2+3/8*b*ln(c)/d^2*x/(e*x^2+d)-1/2*b*n/d
^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+3/16*b*n/d^2/(-d*e)^(1/2)*dilog((-e*
x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n/d^2/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(
1/2))/(-d*e)^(1/2))+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*x/d/(e*x^2+d)^2+
3/8*b*n*ln(x)/d^2/(e*x^2+d)^2*x^3*e+1/4*b*x/d/(e*x^2+d)^2*ln(x^n)-1/8*I*b*P
i*csgn(I*c*x^n)^3*x/d/(e*x^2+d)^2-3/16*b*n*ln(x)/d^2/(e*x^2+d)^2/(-d*e)^(1/
2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4*e^2+3/8*b*n*ln(x)/d/(e*x^2+d)^2/
(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2*e-3/8*b*n*ln(x)/d/(e*
x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2*e+3/16*b*n*ln
(x)/d^2/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4*e
^2+3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(
1/2))-3/16*I*b*Pi*csgn(I*c*x^n)^3/d^2*x/(e*x^2+d)+3/8*b/d^2*x/(e*x^2+d)*ln(
x^n)+3/8*b/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)+3/16*I*b*Pi*csgn
(I*x^n)*csgn(I*c*x^n)^2/d^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/8*I*b*Pi*
csgn(I*c*x^n)^2*csgn(I*c)*x/d/(e*x^2+d)^2+3/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)^2/d^2*x/(e*x^2+d)+1/4*a*x/d/(e*x^2+d)^2+3/8*a/d^2*x/(e*x^2+d)+3/8*a/d^
2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+3/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)
/d^2*x/(e*x^2+d)-1/8*b*n*x/d^2/(e*x^2+d)-3/16*I*b*Pi*csgn(I*c*x^n)^3/d^2/(d
*e)^(1/2)*arctan(x*e/(d*e)^(1/2))
```

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((a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^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((a+b*ln(c*x**n))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^3, x)
```

3.239 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^3}\,dx$

Optimal. Leaf size=219

$$\frac{15ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{7/2}}-\frac{15ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{7/2}}+\frac{5a+5b\log\left(cx^n\right)-bn}{8d^2x\left(d+ex^2\right)}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(15a+15b\log(c}{8d^{7/2}}$$

```
[Out] (-15*b*n)/(8*d^3*x) + (a + b*Log[c*x^n])/(4*d*x*(d + e*x^2)^2) + (5*a - b*n
 + 5*b*Log[c*x^n])/(8*d^2*x*(d + e*x^2)) - (15*a - 8*b*n + 15*b*Log[c*x^n])
/(8*d^3*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(15*a - 8*b*n + 15*b*Log[
c*x^n]))/(8*d^(7/2)) + (((15*I)/16)*b*Sqrt[e]*n*PolyLog[2, ((-I)*Sqrt[e]*x)
/Sqrt[d]])/d^(7/2) - (((15*I)/16)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/d^(7/2)
```

Rubi [A] time = 0.366439, antiderivative size = 219, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$\frac{15ib\sqrt{e}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{7/2}}-\frac{15ib\sqrt{e}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{7/2}}+\frac{5a+5b\log\left(cx^n\right)-bn}{8d^2x\left(d+ex^2\right)}-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(15a+15b\log(c}{8d^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^3),x]
```


```
[Out] (-15*b*n)/(8*d^3*x) + (a + b*Log[c*x^n])/(4*d*x*(d + e*x^2)^2) + (5*a - b*n
 + 5*b*Log[c*x^n])/(8*d^2*x*(d + e*x^2)) - (15*a - 8*b*n + 15*b*Log[c*x^n])
/(8*d^3*x) - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(15*a - 8*b*n + 15*b*Log[
c*x^n]))/(8*d^(7/2)) + (((15*I)/16)*b*Sqrt[e]*n*PolyLog[2, ((-I)*Sqrt[e]*x)
/Sqrt[d]])/d^(7/2) - (((15*I)/16)*b*Sqrt[e]*n*PolyLog[2, (I*Sqrt[e]*x)/Sqrt
[d]])/d^(7/2)
```


Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
```

```
/; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
```

```
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2\left(d+ex^2\right)^3}\,dx = \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} - \frac{\int \frac{-5a+bn-5b\log(cx^n)}{x^2\left(d+ex^2\right)^2}\,dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x\left(d+ex^2\right)} + \frac{\int \frac{-5bn-3(-5a+bn)+15b\log(cx^n)}{x^2\left(d+ex^2\right)}\,dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x\left(d+ex^2\right)} + \frac{\int \left(\frac{-5bn-3(-5a+bn)+15b\log(cx^n)}{dx^2} - \frac{e(-5bn-3(-5a+bn)+15b\log(c}{d\left(d+ex^2\right)}\right.}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x\left(d+ex^2\right)} + \frac{\int \frac{-5bn-3(-5a+bn)+15b\log(cx^n)}{x^2}\,dx}{8d^3} - \frac{e\int \frac{-5bn-3(-5a+bn)+15}{d+ex^2}}{8d^3}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x\left(d+ex^2\right)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{ex}}{\sqrt{d}}\right.}{}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x\left(d+ex^2\right)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{ex}}{\sqrt{d}}\right.}{}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x\left(d+ex^2\right)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{ex}}{\sqrt{d}}\right.}{}$$

$$= -\frac{15bn}{8d^3x} + \frac{a+b\log(cx^n)}{4dx\left(d+ex^2\right)^2} + \frac{5a-bn+5b\log(cx^n)}{8d^2x\left(d+ex^2\right)} - \frac{15a-8bn+15b\log(cx^n)}{8d^3x} - \frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{ex}}{\sqrt{d}}\right.}{}$$

Mathematica [B] time = 1.74584, size = 552, normalized size = 2.52

$$\frac{1}{16}\left(\frac{15b\sqrt{e}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{7/2}}-\frac{15b\sqrt{e}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{7/2}}+\frac{7\sqrt{e}\left(a+b\log\left(cx^n\right)\right)}{d^3\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{7\sqrt{e}\left(a+b\log\left(cx^n\right)\right)}{d^3\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{16\left(a+b\right.}{d}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^3),x]
```

```
[Out] ((-16*b*n)/(d^3*x) - (16*(a + b*Log[c*x^n]))/(d^3*x) + (d*Sqrt[e]*(a + b*Lo
g[c*x^n]))/((-d)^(7/2)*(Sqrt[-d] - Sqrt[e]*x)^2) + (7*Sqrt[e]*(a + b*Log[c*
x^n]))/(d^3*(Sqrt[-d] - Sqrt[e]*x)) + (Sqrt[e]*(a + b*Log[c*x^n]))/((-d)^(5
/2)*(Sqrt[-d] + Sqrt[e]*x)^2) - (7*Sqrt[e]*(a + b*Log[c*x^n]))/(d^3*(Sqrt[-
d] + Sqrt[e]*x)) + (7*b*Sqrt[e]*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d
)^(7/2) - (7*b*Sqrt[e]*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(7/2) +
 (b*d*Sqrt[e]*n*(1/(Sqrt[-d]*(Sqrt[-d] + Sqrt[e]*x)) - Log[x]/d + Log[Sqrt[
-d] + Sqrt[e]*x]/d))/(-d)^(7/2) - (15*Sqrt[e]*(a + b*Log[c*x^n])*Log[1 + (S
qrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) + (b*Sqrt[e]*n*(1/(Sqrt[-d]*(Sqrt[-d] - Sqr
t[e]*x)) - Log[x]/d + Log[(-d)^(3/2) + d*Sqrt[e]*x]/d))/(-d)^(5/2) + (15*Sq
rt[e]*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2) + (1
5*b*Sqrt[e]*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(7/2) - (15*b*Sqrt[e]*
n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(7/2))/16
```

Maple [C] time = 0.258, size = 1518, normalized size = 6.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^3,x)
```

```
[Out] -9/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*e/(e*x^2+d)^2*x+1/2*I*b*Pi*csg
n(I*c*x^n)^3/d^3/x-15/8*b/d^3*e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^n)
-a/d^3/x-9/8*b/d^2*e/(e*x^2+d)^2*x*ln(x^n)-7/8*b/d^3*e^2/(e*x^2+d)^2*x^3*ln
(x^n)+7/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*e^2/(e*x^2+d)^2*x
^3-3/16*b*n*e/d*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e
)^(1/2))+3/16*b*n*e/d*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))-1/4*b*n*e/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1
/2))/(-d*e)^(1/2))-7/8*b*ln(c)/d^3*e^2/(e*x^2+d)^2*x^3-9/8*b*ln(c)/d^2*e/(e
```

```
*x^2+d)^2*x-15/8*b*ln(c)/d^3*e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-7/8*a/d^
3*e^2/(e*x^2+d)^2*x^3-9/8*a/d^2*e/(e*x^2+d)^2*x-15/8*a/d^3*e/(d*e)^(1/2)*ar
ctan(x*e/(d*e)^(1/2))+15/16*I*b*Pi*csgn(I*c*x^n)^3/d^3*e/(d*e)^(1/2)*arctan
(x*e/(d*e)^(1/2))+7/16*I*b*Pi*csgn(I*c*x^n)^3/d^3*e^2/(e*x^2+d)^2*x^3+9/16*
I*b*Pi*csgn(I*c*x^n)^3/d^2*e/(e*x^2+d)^2*x-7/16*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/d^3*e^2/(e*x^2+d)^2*x^3+15/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)/d^3*e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-b*ln(c)/d^3/x+3/8*b*n*e^2/d
^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+3
/16*b*n*e^3/d^3*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)
^(1/2))*x^4-3/16*b*n*e^3/d^3*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))*x^4+1/8*b*n*e/d^3*x/(e*x^2+d)-15/16*b*n*e/d^3/(-d*e)^
(1/2)*dilog((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))-1/4*b*n*e^2/d^3*ln(x)/(e*x^2+
d)/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2-3/8*b*n*e^2/d^2*ln
(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+1/4*b
*n*e^2/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))
*x^2+9/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*e/(e*x^2+d)^2*x+1/
4*b*n*e/d^2*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)+15/16*b*n*e/d^3/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+b*n/d
^3*e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)/d^3/x-b*ln(x^n)/d^3/x-7/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^
3*e^2/(e*x^2+d)^2*x^3-9/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*e/(e*x^2+d)
^2*x+1/2*b*n*e/d^2*ln(x)/(e*x^2+d)^2*x-1/2*b*n*e/d^3*ln(x)*x/(e*x^2+d)-1/2*
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/x-1/2*b*n/d^3*e/(-d*e)^(1/2)*ln(x)*ln(
(-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+1/2*b*n/d^3*e/(-d*e)^(1/2)*ln(x)*ln((e*x+
(-d*e)^(1/2))/(-d*e)^(1/2))+15/8*b/d^3*e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2)
)*n*ln(x)+1/2*b*n*e^2/d^3*ln(x)/(e*x^2+d)^2*x^3-15/16*I*b*Pi*csgn(I*c*x^n)^
2*csgn(I*c)/d^3*e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))-1/2*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2/d^3/x-b*n/d^3/x-15/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/
d^3*e/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))
```

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((a+b*log(c*x^n))/x^2/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{8}+3\,de^{2}x^{6}+3\,d^{2}ex^{4}+d^{3}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^8 + 3*d*e^2*x^6 + 3*d^2*e*x^4 + d^3*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*ln(c*x**n))/x**2/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{3}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x^2), x)
```

3.240 $\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^3}\,dx$

Optimal. Leaf size=260

$$-\frac{35ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{9/2}}+\frac{35ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{9/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(35a+35b\log(cx^n)-12bn)}{8d^{9/2}}+\frac{e(35a}{}$$

```
[Out] (-35*b*n)/(72*d^3*x^3) + (35*b*e*n)/(8*d^4*x) + (a + b*Log[c*x^n])/(4*d*x^3
*(d + e*x^2)^2) + (7*a - b*n + 7*b*Log[c*x^n])/(8*d^2*x^3*(d + e*x^2)) - (3
5*a - 12*b*n + 35*b*Log[c*x^n])/(24*d^3*x^3) + (e*(35*a - 12*b*n + 35*b*Log
[c*x^n]))/(8*d^4*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(35*a - 12*b*n +
 35*b*Log[c*x^n]))/(8*d^(9/2)) - (((35*I)/16)*b*e^(3/2)*n*PolyLog[2, ((-I)*
Sqrt[e]*x)/Sqrt[d]])/d^(9/2) + (((35*I)/16)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[
e]*x)/Sqrt[d]])/d^(9/2)
```

Rubi [A] time = 0.420994, antiderivative size = 260, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {2340, 325, 205, 2351, 2304, 2324, 12, 4848, 2391}

$$-\frac{35ibe^{3/2}n\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{9/2}}+\frac{35ibe^{3/2}n\text{PolyLog}\left(2,\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{16d^{9/2}}+\frac{e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(35a+35b\log(cx^n)-12bn)}{8d^{9/2}}+\frac{e(35a}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^3),x]
```

```
[Out] (-35*b*n)/(72*d^3*x^3) + (35*b*e*n)/(8*d^4*x) + (a + b*Log[c*x^n])/(4*d*x^3
*(d + e*x^2)^2) + (7*a - b*n + 7*b*Log[c*x^n])/(8*d^2*x^3*(d + e*x^2)) - (3
5*a - 12*b*n + 35*b*Log[c*x^n])/(24*d^3*x^3) + (e*(35*a - 12*b*n + 35*b*Log
[c*x^n]))/(8*d^4*x) + (e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]]*(35*a - 12*b*n +
 35*b*Log[c*x^n]))/(8*d^(9/2)) - (((35*I)/16)*b*e^(3/2)*n*PolyLog[2, ((-I)*
Sqrt[e]*x)/Sqrt[d]])/d^(9/2) + (((35*I)/16)*b*e^(3/2)*n*PolyLog[2, (I*Sqrt[
e]*x)/Sqrt[d]])/d^(9/2)
```

Rule 2340

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^2)^(q_.), x_Symbol] :> -Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a + b
```

```
*Log[c*x^n]))/(2*d*f*(q + 1)), x] + Dist[1/(2*d*(q + 1)), Int[(f*x)^m*(d +
e*x^2)^(q + 1)*(a*(m + 2*q + 3) + b*n + b*(m + 2*q + 3)*Log[c*x^n]), x], x]
 /; FreeQ[{a, b, c, d, e, f, m, n}, x] && ILtQ[q, -1] && ILtQ[m, 0]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)^3}\,dx = \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} - \frac{\int \frac{-7a+bn-7b\log(cx^n)}{x^4\left(d+ex^2\right)^2}\,dx}{4d}$$

$$= \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} + \frac{\int \frac{-7bn-5(-7a+bn)+35b\log(cx^n)}{x^4\left(d+ex^2\right)}\,dx}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} + \frac{\int \left(\frac{-7bn-5(-7a+bn)+35b\log(cx^n)}{dx^4} - \frac{e(-7bn-5(-7a+bn)+35b\log}{d^2x^2}\right.}{8d^2}$$

$$= \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} + \frac{\int \frac{-7bn-5(-7a+bn)+35b\log(cx^n)}{x^4}\,dx}{8d^3} - \frac{e\int \frac{-7bn-5(-7a+bn)+3}{x^2}}{8d^4}$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(cx^n)}{24d^3x^3} +$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(cx^n)}{24d^3x^3} +$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(cx^n)}{24d^3x^3} +$$

$$= -\frac{35bn}{72d^3x^3} + \frac{35ben}{8d^4x} + \frac{a+b\log(cx^n)}{4dx^3\left(d+ex^2\right)^2} + \frac{7a-bn+7b\log(cx^n)}{8d^2x^3\left(d+ex^2\right)} - \frac{35a-12bn+35b\log(cx^n)}{24d^3x^3} +$$

Mathematica [B] time = 1.84227, size = 584, normalized size = 2.25

$$\frac{1}{144}\left(\frac{315be^{3/2}n\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{9/2}}-\frac{315be^{3/2}n\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{9/2}}-\frac{99e^{3/2}\left(a+b\log\left(cx^n\right)\right)}{d^4\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{99e^{3/2}\left(a+b\log\left(cx^n\right)\right)}{d^4\left(\sqrt{-d}+\sqrt{e}x\right)}+\cdots\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^3),x]
```

```
[Out] ((-16*b*n)/(d^3*x^3) + (432*b*e*n)/(d^4*x) - (48*(a + b*Log[c*x^n]))/(d^3*x
^3) + (432*e*(a + b*Log[c*x^n]))/(d^4*x) - (9*e^(3/2)*(a + b*Log[c*x^n]))/(
(-d)^(7/2)*(Sqrt[-d] - Sqrt[e]*x)^2) - (99*e^(3/2)*(a + b*Log[c*x^n]))/(d^4
*(Sqrt[-d] - Sqrt[e]*x)) + (9*e^(3/2)*(a + b*Log[c*x^n]))/((-d)^(7/2)*(Sqrt
[-d] + Sqrt[e]*x)^2) + (99*e^(3/2)*(a + b*Log[c*x^n]))/(d^4*(Sqrt[-d] + Sqr
t[e]*x)) + (99*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] - Sqrt[e]*x]))/(-d)^(9/2)
 - (99*b*e^(3/2)*n*(Log[x] - Log[Sqrt[-d] + Sqrt[e]*x]))/(-d)^(9/2) - (9*b*
e^(3/2)*n*(1/(Sqrt[-d]*(Sqrt[-d] + Sqrt[e]*x)) - Log[x]/d + Log[Sqrt[-d] +
Sqrt[e]*x]/d))/(-d)^(7/2) - (315*e^(3/2)*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e
]*x)/Sqrt[-d]])/(-d)^(9/2) + (9*b*e^(3/2)*n*(1/(Sqrt[-d]*(Sqrt[-d] - Sqrt[e
]*x)) - Log[x]/d + Log[(-d)^(3/2) + d*Sqrt[e]*x]/d))/(-d)^(7/2) + (315*e^(3
/2)*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(9/2) + (315
*b*e^(3/2)*n*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(9/2) - (315*b*e^(3/2)*
n*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(9/2))/144
```

Maple [C] time = 0.316, size = 1729, normalized size = 6.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^3,x)
```

```
[Out] -1/3*b*ln(c)/d^3/x^3-1/8*b*n*e^2/d^4*x/(e*x^2+d)-3/2*b*n/d^4*e^2/(d*e)^(1/2
)*arctan(x*e/(d*e)^(1/2))+35/16*b*n*e^2/d^4/(-d*e)^(1/2)*dilog((-e*x+(-d*e)
^(1/2))/(-d*e)^(1/2))-35/16*b*n*e^2/d^4/(-d*e)^(1/2)*dilog((e*x+(-d*e)^(1/2
))/(-d*e)^(1/2))-3/2*I*b*Pi*csgn(I*c*x^n)^3/d^4*e/x+13/8*a/d^3*e^2/(e*x^2+d
)^2*x+11/8*b*ln(c)/d^4*e^3/(e*x^2+d)^2*x^3+13/8*b*ln(c)/d^3*e^2/(e*x^2+d)^2
*x+35/8*b*ln(c)/d^4*e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+11/8*b/d^4*e^3/
(e*x^2+d)^2*x^3*ln(x^n)-13/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^
```

```
3*e^2/(e*x^2+d)^2*x-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3/x^3+3/16*b*n
*e^4/d^4*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2)
)*x^4-1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3/x^3-11/16*I*b*Pi*csgn(I*c*x^
n)^3/d^4*e^3/(e*x^2+d)^2*x^3+3/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*e/x-1
/2*b*n*e^2/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1
/2))+3/16*b*n*e^2/d^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))
/(-d*e)^(1/2))-3/16*b*n*e^2/d^2*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-d*
e)^(1/2))/(-d*e)^(1/2))+1/2*b*n*e^2/d^3*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e
*x+(-d*e)^(1/2))/(-d*e)^(1/2))-3/16*b*n*e^4/d^4*ln(x)/(e*x^2+d)^2/(-d*e)^(1
/2)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^4+3/8*b*n*e^3/d^3*ln(x)/(e*x^2+d)
^2/(-d*e)^(1/2)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))*x^2+13/8*b/d^3*e^2/(e*
x^2+d)^2*x*ln(x^n)+35/8*b/d^4*e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*ln(x^
n)-35/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e^2/(d*e)^(1/2)*arc
tan(x*e/(d*e)^(1/2))-11/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^4*e
^3/(e*x^2+d)^2*x^3-1/3*b/d^3/x^3*ln(x^n)-13/16*I*b*Pi*csgn(I*c*x^n)^3/d^3*e
^2/(e*x^2+d)^2*x+1/2*b*n*e^3/d^4*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((-e*x+(-d*
e)^(1/2))/(-d*e)^(1/2))*x^2+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/
d^3/x^3-1/2*b*n*e^3/d^4*ln(x)/(e*x^2+d)/(-d*e)^(1/2)*ln((e*x+(-d*e)^(1/2))/
(-d*e)^(1/2))*x^2-3/8*b*n*e^3/d^3*ln(x)/(e*x^2+d)^2/(-d*e)^(1/2)*ln((e*x+(-
d*e)^(1/2))/(-d*e)^(1/2))*x^2-35/16*I*b*Pi*csgn(I*c*x^n)^3/d^4*e^2/(d*e)^(1
/2)*arctan(x*e/(d*e)^(1/2))+35/8*a/d^4*e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/
2))+11/8*a/d^4*e^3/(e*x^2+d)^2*x^3+1/6*I*b*Pi*csgn(I*c*x^n)^3/d^3/x^3+3/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^4*e/x-3/2*b*n/d^4*e^2/(-d*e)^(1/2)*ln(x
)*ln((e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+3*a/d^4*e/x-b*n*e^3/d^4*ln(x)/(e*x^2+
d)^2*x^3-35/8*b/d^4*e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))*n*ln(x)-b*n*e^2
/d^3*ln(x)/(e*x^2+d)^2*x+b*n*e^2/d^4*ln(x)*x/(e*x^2+d)+3/2*b*n/d^4*e^2/(-d*
e)^(1/2)*ln(x)*ln((-e*x+(-d*e)^(1/2))/(-d*e)^(1/2))+13/16*I*b*Pi*csgn(I*x^n
)*csgn(I*c*x^n)^2/d^3*e^2/(e*x^2+d)^2*x+35/16*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2/d^4*e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+11/16*I*b*Pi*csgn(I*c*x^n
)^2*csgn(I*c)/d^4*e^3/(e*x^2+d)^2*x^3+35/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c
)/d^4*e^2/(d*e)^(1/2)*arctan(x*e/(d*e)^(1/2))+11/16*I*b*Pi*csgn(I*x^n)*csgn
(I*c*x^n)^2/d^4*e^3/(e*x^2+d)^2*x^3-3/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)/d^4*e/x+13/16*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*e^2/(e*x^2+d)^2*
x+3*b*ln(c)/d^4*e/x+3*b*ln(x^n)/d^4*e/x-1/9*b*n/d^3/x^3-1/3*a/d^3/x^3+3*b*e
*n/d^4/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((a+b*log(c*x^n))/x^4/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{3}x^{10}+3\,de^{2}x^{8}+3\,d^{2}ex^{6}+d^{3}x^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^3*x^10 + 3*d*e^2*x^8 + 3*d^2*e*x^6 + d^3*x^4
), 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*ln(c*x**n))/x**4/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{3}x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^3*x^4), x)
```

3.241 $\int \frac{x\log(cx^2)}{1-cx^2}\,dx$

Optimal. Leaf size=17

$$\frac{\text{PolyLog}(2,1-cx^2)}{2c}$$

```
[Out] PolyLog[2, 1 - c*x^2]/(2*c)
```

Rubi [A] time = 0.0434263, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2336, 2315}

$$\frac{\text{PolyLog}(2,1-cx^2)}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Log[c*x^2])/(1 - c*x^2),x]
```

```
[Out] PolyLog[2, 1 - c*x^2]/(2*c)
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{x\log\left(cx^2\right)}{1-cx^2}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{\log(cx)}{1-cx}\,dx,x,x^2\right)$$
$$= \frac{\text{Li}_2\left(1-cx^2\right)}{2c}$$

Mathematica [A] time = 0.0043547, size = 17, normalized size = 1.

$$\frac{\text{PolyLog}\left(2,1-cx^2\right)}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Log[c*x^2])/(1 - c*x^2),x]
```

```
[Out] PolyLog[2, 1 - c*x^2]/(2*c)
```

Maple [A] time = 0.039, size = 12, normalized size = 0.7

$$\frac{\text{dilog}\left(cx^2\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(c*x^2)/(-c*x^2+1),x)
```

```
[Out] 1/2/c*dilog(c*x^2)
```

Maxima [B] time = 1.16461, size = 103, normalized size = 6.06

$$-\frac{\log\left(cx^2-1\right)\log\left(cx^2\right)}{2\,c}+\frac{\log\left(cx^2-1\right)\log\left(x\right)}{c}+\frac{\log\left(cx^2-1\right)\log\left(cx^2\right)-2\,\log\left(cx^2-1\right)\log\left(x\right)+\text{Li}_2\left(-cx^2+1\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(c*x^2)/(-c*x^2+1),x, algorithm="maxima")
```

```
[Out] -1/2*log(c*x^2 - 1)*log(c*x^2)/c + log(c*x^2 - 1)*log(x)/c + 1/2*(log(c*x^2
 - 1)*log(c*x^2) - 2*log(c*x^2 - 1)*log(x) + dilog(-c*x^2 + 1))/c
```

Fricas [A] time = 1.25382, size = 34, normalized size = 2.

$$\frac{\operatorname{Li}_2\left(-cx^2+1\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(c*x^2)/(-c*x^2+1),x, algorithm="fricas")
```

```
[Out] 1/2*dilog(-c*x^2 + 1)/c
```

Sympy [C] time = 8.71021, size = 78, normalized size = 4.59

$$\frac{\begin{cases} i\pi\log\left(x\right)-\frac{\operatorname{Li}_2\left(cx^2\right)}{2} & \text{for}\ |x|<1\\ -i\pi\log\left(\frac{1}{x}\right)-\frac{\operatorname{Li}_2\left(cx^2\right)}{2} & \text{for}\ \frac{1}{|x|}<1\\ -i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)+i\pi G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)-\frac{\operatorname{Li}_2\left(cx^2\right)}{2} & \text{otherwise}\end{cases}}{c}-\frac{\log\left(cx^2\right)\log\left(cx^2-1\right)}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(c*x**2)/(-c*x**2+1),x)
```

```
[Out] Piecewise((I*pi*log(x) - polylog(2, c*x**2)/2, Abs(x) < 1), (-I*pi*log(1/x)
 - polylog(2, c*x**2)/2, 1/Abs(x) < 1), (-I*pi*meijerg(((), (1, 1)), ((0, 0
), ()), x) + I*pi*meijerg(((1, 1), ()), ((), (0, 0)), x) - polylog(2, c*x**
2)/2, True))/c - log(c*x**2)*log(c*x**2 - 1)/(2*c)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{x\log\left(cx^2\right)}{cx^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(c*x^2)/(-c*x^2+1),x, algorithm="giac")
```

```
[Out] integrate(-x*log(c*x^2)/(c*x^2 - 1), x)
```

3.242 $\int \frac{x \log\left(\frac{x^2}{c}\right)}{c-x^2} \, dx$

Optimal. Leaf size=16

$$\frac{1}{2}\text{PolyLog}\left(2,1-\frac{x^2}{c}\right)$$

```
[Out] PolyLog[2, 1 - x^2/c]/2
```

Rubi [A] time = 0.0429158, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {2336, 2315}

$$\frac{1}{2}\text{PolyLog}\left(2,1-\frac{x^2}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(x*Log[x^2/c])/(c - x^2),x]
```

```
[Out] PolyLog[2, 1 - x^2/c]/2
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{x \log\left(\frac{x^2}{c}\right)}{c-x^2}\,dx = \frac{1}{2}\,\text{Subst}\left(\int \frac{\log\left(\frac{x}{c}\right)}{c-x}\,dx, x, x^2\right)$$
$$= \frac{1}{2}\text{Li}_2\left(1-\frac{x^2}{c}\right)$$

Mathematica [A] time = 0.0039653, size = 17, normalized size = 1.06

$$\frac{1}{2}\text{PolyLog}\left(2, \frac{c-x^2}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Log[x^2/c])/(c - x^2),x]
```

```
[Out] PolyLog[2, (c - x^2)/c]/2
```

Maple [C] time = 0.139, size = 52, normalized size = 3.3

$$-\frac{1}{2}\sum_{\_alpha=\text{RootOf}\left(\_Z^2-c\right)} \ln(x-\_alpha)\ln\left(\frac{x^2}{c}\right) - 2\,\text{dilog}\left(\frac{x}{\_alpha}\right) - 2\,\ln(x-\_alpha)\ln\left(\frac{x}{\_alpha}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x^2/c)/(-x^2+c),x)
```

```
[Out] -1/2*sum(ln(x-_alpha)*ln(x^2/c)-2*dilog(x/_alpha)-2*ln(x-_alpha)*ln(x/_alph
a),_alpha=RootOf(_Z^2-c))
```

Maxima [B] time = 1.13157, size = 78, normalized size = 4.88

$$-\frac{1}{2}\log\left(x^2-c\right)\log\left(\frac{x^2}{c}\right) + \frac{1}{2}\log\left(x^2-c\right)\log\left(\frac{x^2-c}{c}+1\right) + \frac{1}{2}\,\text{Li}_2\left(-\frac{x^2-c}{c}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x^2/c)/(-x^2+c),x, algorithm="maxima")
```

```
[Out] -1/2*log(x^2 - c)*log(x^2/c) + 1/2*log(x^2 - c)*log((x^2 - c)/c + 1) + 1/2*
dilog(-(x^2 - c)/c)
```

Fricas [A] time = 1.29892, size = 31, normalized size = 1.94

$$\frac{1}{2}\,\mathrm{Li}_2\left(-\frac{x^2}{c}+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x^2/c)/(-x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*dilog(-x^2/c + 1)
```

Sympy [A] time = 6.5004, size = 102, normalized size = 6.38

$$\begin{cases} \log(c)\log(x) + i\pi\log(x) - \frac{\mathrm{Li}_2\left(\frac{x^2}{c}\right)}{2} & \text{for } |x| \\ -\log(c)\log\left(\frac{1}{x}\right) - i\pi\log\left(\frac{1}{x}\right) - \frac{\mathrm{Li}_2\left(\frac{x^2}{c}\right)}{2} & \text{for } \frac{1}{|x|} \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(c) - i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right) + G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)\log(c) + i\pi G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right) - \frac{\mathrm{Li}_2\left(\frac{x^2}{c}\right)}{2} & \text{otherv} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x**2/c)/(-x**2+c),x)
```

```
[Out] Piecewise((log(c)*log(x) + I*pi*log(x) - polylog(2, x**2/c)/2, Abs(x) < 1),
 (-log(c)*log(1/x) - I*pi*log(1/x) - polylog(2, x**2/c)/2, 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(c) - I*pi*meijerg(((), (1, 1)),
 ((0, 0), ()), x) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(c) + I*pi*me
ijerg(((1, 1), ()), ((), (0, 0)), x) - polylog(2, x**2/c)/2, True)) - log(x
**2/c)*log(-c + x**2)/2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{x \log\left(\frac{x^2}{c}\right)}{x^2 - c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x^2/c)/(-x^2+c),x, algorithm="giac")
```

```
[Out] integrate(-x*log(x^2/c)/(x^2 - c), x)
```

3.243 $\int \frac{\log(x)}{1-x^2}\,dx$

Optimal. Leaf size=22

$$\frac{1}{2}\text{PolyLog}(2,-x)-\frac{1}{2}\text{PolyLog}(2,x)+\log(x)\tanh^{-1}(x)$$

```
[Out] ArcTanh[x]*Log[x] + PolyLog[2, -x]/2 - PolyLog[2, x]/2
```

Rubi [A] time = 0.0220914, antiderivative size = 22, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 3, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.25, Rules used = {206, 2324, 5912}

$$\frac{1}{2}\text{PolyLog}(2,-x)-\frac{1}{2}\text{PolyLog}(2,x)+\log(x)\tanh^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[Log[x]/(1 - x^2),x]
```

```
[Out] ArcTanh[x]*Log[x] + PolyLog[2, -x]/2 - PolyLog[2, x]/2
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 5912

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x
] + (-Simp[(b*PolyLog[2, -(c*x)])/2, x] + Simp[(b*PolyLog[2, c*x])/2, x]) /
; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\int \frac{\log(x)}{1-x^2}\,dx = \tanh^{-1}(x)\log(x) - \int \frac{\tanh^{-1}(x)}{x}\,dx$$
$$= \tanh^{-1}(x)\log(x) + \frac{\text{Li}_2(-x)}{2} - \frac{\text{Li}_2(x)}{2}$$

Mathematica [A] time = 0.0055929, size = 31, normalized size = 1.41

$$\frac{1}{2}\text{PolyLog}(2,1-x) + \frac{1}{2}\text{PolyLog}(2,-x) + \frac{1}{2}\log(x)\log(x+1)$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[x]/(1 - x^2),x]
```

```
[Out] (Log[x]*Log[1 + x])/2 + PolyLog[2, 1 - x]/2 + PolyLog[2, -x]/2
```

Maple [A] time = 0.041, size = 20, normalized size = 0.9

$$\frac{\text{dilog}(x)}{2} + \frac{\text{dilog}(1+x)}{2} + \frac{\ln(x)\ln(1+x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(x)/(-x^2+1),x)
```

```
[Out] 1/2*dilog(x)+1/2*dilog(1+x)+1/2*ln(x)*ln(1+x)
```

Maxima [B] time = 1.17053, size = 65, normalized size = 2.95

$$-\frac{1}{2}\log(-x)\log(x+1) + \frac{1}{2}(\log(x+1) - \log(x-1))\log(x) + \frac{1}{2}\log(x-1)\log(x) - \frac{1}{2}\text{Li}_2(x+1) + \frac{1}{2}\text{Li}_2(-x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(-x^2+1),x, algorithm="maxima")
```

```
[Out] -1/2*log(-x)*log(x + 1) + 1/2*(log(x + 1) - log(x - 1))*log(x) + 1/2*log(x
- 1)*log(x) - 1/2*dilog(x + 1) + 1/2*dilog(-x + 1)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\log(x)}{x^2-1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(-x^2+1),x, algorithm="fricas")
```

```
[Out] integral(-log(x)/(x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{\log(x)}{x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(x)/(-x**2+1),x)
```

```
[Out] -Integral(log(x)/(x**2 - 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int-\frac{\log(x)}{x^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(-x^2+1),x, algorithm="giac")
```

```
[Out] integrate(-log(x)/(x^2 - 1), x)
```

3.244 $\int \frac{\log(x)}{1+x^2}\,dx$

Optimal. Leaf size=32

$$-\frac{1}{2}i\text{PolyLog}(2,-ix)+\frac{1}{2}i\text{PolyLog}(2,ix)+\log(x)\tan^{-1}(x)$$

```
[Out] ArcTan[x]*Log[x] - (I/2)*PolyLog[2, (-I)*x] + (I/2)*PolyLog[2, I*x]
```

Rubi [A] time = 0.0356959, antiderivative size = 32, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {203, 2324, 4848, 2391}

$$-\frac{1}{2}i\text{PolyLog}(2,-ix)+\frac{1}{2}i\text{PolyLog}(2,ix)+\log(x)\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[Log[x]/(1 + x^2),x]
```

```
[Out] ArcTan[x]*Log[x] - (I/2)*PolyLog[2, (-I)*x] + (I/2)*PolyLog[2, I*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{\log(x)}{1+x^2}\,dx &= \tan^{-1}(x)\log(x) - \int \frac{\tan^{-1}(x)}{x}\,dx\\ &= \tan^{-1}(x)\log(x) - \frac{1}{2}i\int \frac{\log(1-ix)}{x}\,dx + \frac{1}{2}i\int \frac{\log(1+ix)}{x}\,dx\\ &= \tan^{-1}(x)\log(x) - \frac{1}{2}i\mathrm{Li}_2(-ix) + \frac{1}{2}i\mathrm{Li}_2(ix)\end{aligned}$$

Mathematica [B] time = 0.0072243, size = 65, normalized size = 2.03

$$-\frac{1}{2}i\mathrm{PolyLog}(2,-ix)+\frac{1}{2}i\mathrm{PolyLog}(2,ix)-\frac{1}{2}i\log(-i(-x+i))\log(x)+\frac{1}{2}i\log(-i(x+i))\log(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[x]/(1 + x^2),x]
```

```
[Out] (-I/2)*Log[(-I)*(I - x)]*Log[x] + (I/2)*Log[x]*Log[(-I)*(I + x)] - (I/2)*Po
lyLog[2, (-I)*x] + (I/2)*PolyLog[2, I*x]
```

Maple [A] time = 0.064, size = 46, normalized size = 1.4

$$-\frac{i}{2}\ln(x)\ln(1+ix)+\frac{i}{2}\ln(x)\ln(1-ix)-\frac{i}{2}\mathrm{dilog}(1+ix)+\frac{i}{2}\mathrm{dilog}(1-ix)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(x)/(x^2+1),x)
```

```
[Out] -1/2*I*ln(x)*ln(1+I*x)+1/2*I*ln(x)*ln(1-I*x)-1/2*I*dilog(1+I*x)+1/2*I*dilog
(1-I*x)
```

Maxima [A] time = 2.14436, size = 35, normalized size = 1.09

$$\frac{1}{4}\pi\log\left(x^2+1\right)+\frac{1}{2}i\,\mathrm{Li}_2\left(ix+1\right)-\frac{1}{2}i\,\mathrm{Li}_2\left(-ix+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(x^2+1),x, algorithm="maxima")
```

```
[Out] 1/4*pi*log(x^2 + 1) + 1/2*I*dilog(I*x + 1) - 1/2*I*dilog(-I*x + 1)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\log\left(x\right)}{x^2+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(x^2+1),x, algorithm="fricas")
```

```
[Out] integral(log(x)/(x^2 + 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\log\left(x\right)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(x)/(x**2+1),x)
```

```
[Out] Integral(log(x)/(x**2 + 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\log\left(x\right)}{x^2+1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(x)/(x^2+1),x, algorithm="giac")
```

```
[Out] integrate(log(x)/(x^2 + 1), x)
```

3.245 $\int \frac{a+b\log(cx)}{1-ex^2}\,dx$

Optimal. Leaf size=62

$$\frac{b\text{PolyLog}\left(2,-\sqrt{e}x\right)}{2\sqrt{e}}-\frac{b\text{PolyLog}\left(2,\sqrt{e}x\right)}{2\sqrt{e}}+\frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx))}{\sqrt{e}}$$

```
[Out] (ArcTanh[Sqrt[e]*x]*(a + b*Log[c*x]))/Sqrt[e] + (b*PolyLog[2, -(Sqrt[e]*x)]
)/(2*Sqrt[e]) - (b*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Rubi [A] time = 0.0387105, antiderivative size = 62, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.21, Rules used = {206, 2324, 12, 5912}

$$\frac{b\text{PolyLog}\left(2,-\sqrt{e}x\right)}{2\sqrt{e}}-\frac{b\text{PolyLog}\left(2,\sqrt{e}x\right)}{2\sqrt{e}}+\frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx))}{\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/(1 - e*x^2),x]
```

```
[Out] (ArcTanh[Sqrt[e]*x]*(a + b*Log[c*x]))/Sqrt[e] + (b*PolyLog[2, -(Sqrt[e]*x)]
)/(2*Sqrt[e]) - (b*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5912

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x
] + (-Simp[(b*PolyLog[2, -(c*x)])/2, x] + Simp[(b*PolyLog[2, c*x])/2, x]) /
; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log(cx)}{1-ex^2}\,dx &= \frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx))}{\sqrt{e}}-b\int \frac{\tanh^{-1}\left(\sqrt{e}x\right)}{\sqrt{e}x}\,dx\\ &= \frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx))}{\sqrt{e}}-\frac{b\int \frac{\tanh^{-1}\left(\sqrt{e}x\right)}{x}\,dx}{\sqrt{e}}\\ &= \frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx))}{\sqrt{e}}+\frac{b\text{Li}_2\left(-\sqrt{e}x\right)}{2\sqrt{e}}-\frac{b\text{Li}_2\left(\sqrt{e}x\right)}{2\sqrt{e}}\end{aligned}$$

Mathematica [A] time = 0.0295573, size = 68, normalized size = 1.1

$$\frac{b\text{PolyLog}\left(2,-\sqrt{e}x\right)-b\text{PolyLog}\left(2,\sqrt{e}x\right)+\left(\log\left(1-\sqrt{e}x\right)-\log\left(\sqrt{e}x+1\right)\right)(-(a+b\log(cx)))}{2\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/(1 - e*x^2),x]
```

```
[Out] (-((a + b*Log[c*x])*(Log[1 - Sqrt[e]*x] - Log[1 + Sqrt[e]*x])) + b*PolyLog[
2, -(Sqrt[e]*x)] - b*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Maple [B] time = 0.133, size = 103, normalized size = 1.7

$$a\text{Artanh}\left(x\sqrt{e}\right)\frac{1}{\sqrt{e}}-\frac{b\ln(cx)}{2}\ln\left(-\frac{1}{c}\left(cx\sqrt{e}-c\right)\right)\frac{1}{\sqrt{e}}+\frac{b\ln(cx)}{2}\ln\left(\frac{1}{c}\left(cx\sqrt{e}+c\right)\right)\frac{1}{\sqrt{e}}-\frac{b}{2}\text{dilog}\left(-\frac{1}{c}\left(cx\sqrt{e}-c\right)\right)\frac{1}{\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x))/(-e*x^2+1),x)
```

```
[Out] a/e^(1/2)*arctanh(x*e^(1/2))-1/2*b/e^(1/2)*ln(c*x)*ln(-(c*x*e^(1/2)-c)/c)+1
/2*b/e^(1/2)*ln(c*x)*ln((c*x*e^(1/2)+c)/c)-1/2*b/e^(1/2)*dilog(-(c*x*e^(1/2
)-c)/c)+1/2*b/e^(1/2)*dilog((c*x*e^(1/2)+c)/c)
```

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((a+b*log(c*x))/(-e*x^2+1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b\log\left(cx\right)+a}{ex^2-1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(-e*x^2+1),x, algorithm="fricas")
```

```
[Out] integral(-(b*log(c*x) + a)/(e*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{a}{ex^2-1}\,dx-\int\frac{b\log\left(cx\right)}{ex^2-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(-e*x**2+1),x)
```

```
[Out] -Integral(a/(e*x**2 - 1), x) - Integral(b*log(c*x)/(e*x**2 - 1), x)
```

<u>Giac</u> [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b\log\left(cx\right) + a}{ex^2 - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(-e*x^2+1),x, algorithm="giac")
```

```
[Out] integrate(-(b*log(c*x) + a)/(e*x^2 - 1), x)
```

3.246 $\int \frac{a+b\log(cx^n)}{1-ex^2}\,dx$

Optimal. Leaf size=66

$$\frac{bn\text{PolyLog}\left(2,-\sqrt{e}x\right)}{2\sqrt{e}}-\frac{bn\text{PolyLog}\left(2,\sqrt{e}x\right)}{2\sqrt{e}}+\frac{\tanh^{-1}\left(\sqrt{e}x\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}}$$

```
[Out] (ArcTanh[Sqrt[e]*x]*(a + b*Log[c*x^n]))/Sqrt[e] + (b*n*PolyLog[2, -(Sqrt[e]
*x)])/(2*Sqrt[e]) - (b*n*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Rubi [A] time = 0.0387247, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {206, 2324, 12, 5912}

$$\frac{bn\text{PolyLog}\left(2,-\sqrt{e}x\right)}{2\sqrt{e}}-\frac{bn\text{PolyLog}\left(2,\sqrt{e}x\right)}{2\sqrt{e}}+\frac{\tanh^{-1}\left(\sqrt{e}x\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(1 - e*x^2),x]
```

```
[Out] (ArcTanh[Sqrt[e]*x]*(a + b*Log[c*x^n]))/Sqrt[e] + (b*n*PolyLog[2, -(Sqrt[e]
*x)])/(2*Sqrt[e]) - (b*n*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2324

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/((d_) + (e_.)*(x_)^2), x_Symbol]
:> With[{u = IntHide[1/(d + e*x^2), x]}, Simp[u*(a + b*Log[c*x^n]), x] - Di
st[b*n, Int[u/x, x], x]] /; FreeQ[{a, b, c, d, e, n}, x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5912

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x
] + (-Simp[(b*PolyLog[2, -(c*x)])/2, x] + Simp[(b*PolyLog[2, c*x])/2, x]) /
; FreeQ[{a, b, c}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{1-ex^2}\,dx &= \frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx^n))}{\sqrt{e}} - (bn)\int \frac{\tanh^{-1}\left(\sqrt{e}x\right)}{\sqrt{e}x}\,dx \\
&= \frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx^n))}{\sqrt{e}} - \frac{(bn)\int \frac{\tanh^{-1}\left(\sqrt{e}x\right)}{x}\,dx}{\sqrt{e}} \\
&= \frac{\tanh^{-1}\left(\sqrt{e}x\right)(a+b\log(cx^n))}{\sqrt{e}} + \frac{bn\mathrm{Li}_2\left(-\sqrt{e}x\right)}{2\sqrt{e}} - \frac{bn\mathrm{Li}_2\left(\sqrt{e}x\right)}{2\sqrt{e}}
\end{aligned}$$

Mathematica [A] time = 0.0247137, size = 72, normalized size = 1.09

$$\frac{bn\text{PolyLog}\left(2,-\sqrt{e}x\right)-bn\text{PolyLog}\left(2,\sqrt{e}x\right)+\left(\log\left(1-\sqrt{e}x\right)-\log\left(\sqrt{e}x+1\right)\right)(-(a+b\log(cx^n)))}{2\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(1 - e*x^2),x]
```

```
[Out] (-((a + b*Log[c*x^n])*(Log[1 - Sqrt[e]*x] - Log[1 + Sqrt[e]*x])) + b*n*Poly
Log[2, -(Sqrt[e]*x)] - b*n*PolyLog[2, Sqrt[e]*x])/(2*Sqrt[e])
```

Maple [C] time = 0.145, size = 200, normalized size = 3.

$$-(-\frac{i}{2}b\pi\,\text{csgn}(ix^n)(\text{csgn}(icx^n))^2+\frac{i}{2}b\pi\,\text{csgn}(ix^n)\,\text{csgn}(icx^n)\,\text{csgn}(ic)+\frac{i}{2}b\pi\,(\text{csgn}(icx^n))^3-\frac{i}{2}b\pi\,(\text{csgn}(icx^n))^2\,\text{csg}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(-e*x^2+1),x)
```

```
[Out] -(-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+1/2*I*b*Pi*csgn(I*c*x^n)^3-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*
c)-b*ln(c)-a)/e^(1/2)*arctanh(x*e^(1/2))-b/e^(1/2)*arctanh(x*e^(1/2))*n*ln(
x)+b/e^(1/2)*arctanh(x*e^(1/2))*ln(x^n)-1/2*b*n/e^(1/2)*ln(x)*ln(1-x*e^(1/2
))+1/2*b*n/e^(1/2)*ln(x)*ln(x*e^(1/2)+1)-1/2*b*n/e^(1/2)*dilog(1-x*e^(1/2))
+1/2*b*n/e^(1/2)*dilog(x*e^(1/2)+1)
```

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((a+b*log(c*x^n))/(-e*x^2+1),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{b\log\left(cx^{n}\right)+a}{ex^{2}-1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x^2+1),x, algorithm="fricas")
```

```
[Out] integral(-(b*log(c*x^n) + a)/(e*x^2 - 1), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$-\int\frac{a}{ex^{2}-1}\,dx-\int\frac{b\log\left(cx^{n}\right)}{ex^{2}-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(-e*x**2+1),x)
```

```
[Out] -Integral(a/(e*x**2 - 1), x) - Integral(b*log(c*x**n)/(e*x**2 - 1), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{b\log(cx^n) + a}{ex^2 - 1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x^2+1),x, algorithm="giac")
```

```
[Out] integrate(-(b*log(c*x^n) + a)/(e*x^2 - 1), x)
```

3.247 $\int \frac{(a+b\log(cx^n))^2}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=509

$$\frac{bn\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}-\frac{bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}\sqrt{e}}+\frac{b^2n^2\text{PolyL}}{2(-d)}$$

```
[Out] (x*(a + b*Log[c*x^n])^2)/(4*(-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (x*(a + b*
Log[c*x^n])^2)/(4*(-d)^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*n*(a + b*Log[c*x^
n])*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - ((a + b*Log[c*x
^n])^2*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (b*n*(a + b*
Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) + ((a + b
*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (b^2
*n^2*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) + (b*n*(a
+ b*Log[c*x^n])*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e])
 + (b^2*n^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - (b*n
*(a + b*Log[c*x^n])*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]
) - (b^2*n^2*PolyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) +
(b^2*n^2*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e])
```

Rubi [A] time = 0.611818, antiderivative size = 509, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2330, 2318, 2317, 2391, 2374, 6589}

$$\frac{bn\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}-\frac{bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}-\frac{b^2n^2\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}\sqrt{e}}+\frac{b^2n^2\text{PolyL}}{2(-d)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x^2)^2,x]
```



```
[Out] (x*(a + b*Log[c*x^n])^2)/(4*(-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (x*(a + b*
Log[c*x^n])^2)/(4*(-d)^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) + (b*n*(a + b*Log[c*x^
n])*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - ((a + b*Log[c*x
^n])^2*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (b*n*(a + b*
Log[c*x^n])*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) + ((a + b
*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (b^2
*n^2*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) + (b*n*(a
```

```
+ b*Log[c*x^n])*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e])
 + (b^2*n^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - (b*n
*(a + b*Log[c*x^n])*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]
) - (b^2*n^2*PolyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) +
(b^2*n^2*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e])
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{\left(d+ex^2\right)^2}\,dx = \int \left(-\frac{e(a+b\log(cx^n))^2}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e(a+b\log(cx^n))^2}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e(a+b\log(cx^n))^2}{2d\left(-de-e^2x^2\right)}\right)dx$$

$$= -\frac{e\int \frac{(a+b\log(cx^n))^2}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}\,dx}{4d}-\frac{e\int \frac{(a+b\log(cx^n))^2}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}\,dx}{4d}-\frac{e\int \frac{(a+b\log(cx^n))^2}{-de-e^2x^2}\,dx}{2d}$$

$$= \frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{e\int\left(-\frac{\sqrt{-d}(a+b\log(cx^n))^2}{2de\left(\sqrt{-d}-\sqrt{e}x\right)}-\frac{\sqrt{-d}(a+b\log(cx^n))^2}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{2d}$$

$$= \frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn(a+b\log(cx^n))\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{bn(a+ \ldots}{}$$

$$= \frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn(a+b\log(cx^n))\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{(a+b\,\mathrm{lo} \ldots}{}$$

$$= \frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn(a+b\log(cx^n))\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{(a+b\,\mathrm{lo} \ldots}{}$$

$$= \frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{x(a+b\log(cx^n))^2}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{bn(a+b\log(cx^n))\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{2(-d)^{3/2}\sqrt{e}}-\frac{(a+b\,\mathrm{lo} \ldots}{}$$

Mathematica [A] time = 0.775516, size = 432, normalized size = 0.85

$$\frac{-\frac{2bn\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{(-d)^{3/2}}+\frac{2bn\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)(a+b\log(cx^n))}{(-d)^{3/2}}+\frac{2b^2n^2\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{2b^2n^2\text{PolyLog}\left(2,\frac{d\sqrt{e}x}{(-d)^{3/2}}\right)}{(-d)^{3/2}}+\frac{2b^2n^2\text{PolyLog}\left(3,\ldots\right)}{(-d)^{3/2}}\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x^2)^2,x]
```

```
[Out] (-((a + b*Log[c*x^n])^2/(d*(Sqrt[-d] - Sqrt[e]*x))) + (a + b*Log[c*x^n])^2/
(d*(Sqrt[-d] + Sqrt[e]*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (Sqrt[e]*x)/
```

```
Sqrt[-d]])/(-d)^(3/2) + ((a + b*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]]
)/(-d)^(3/2) + (2*b*n*(a + b*Log[c*x^n])*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])
/(-d)^(3/2) + (d*(a + b*Log[c*x^n])^2*Log[1 + (d*Sqrt[e]*x)/(-d)^(3/2)])/(-
d)^(5/2) + (2*b^2*n^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (2*b*n
*(a + b*Log[c*x^n])*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (2*b^2*n
^2*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(3/2) + (2*b*n*(a + b*Log[c*x
^n])*PolyLog[2, (d*Sqrt[e]*x)/(-d)^(3/2)])/(-d)^(3/2) + (2*b^2*n^2*PolyLog[
3, (Sqrt[e]*x)/Sqrt[-d]])/(-d)^(3/2) - (2*b^2*n^2*PolyLog[3, (d*Sqrt[e]*x)/
(-d)^(3/2)])/(-d)^(3/2))/(4*Sqrt[e])
```

Maple [F] time = 4.638, size = 0, normalized size = 0.

$$\int \frac{(a + b\ln(cx^n))^2}{(ex^2 + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/(e*x^2+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/(e*x^2+d)^2,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((a+b*log(c*x^n))^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log(cx^n)^2 + 2\,ab\log(cx^n) + a^2}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^4 + 2*d*e*x^2 +
 d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))^2}{\left(d + ex^2\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2/(d + e*x**2)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{\left(ex^2 + d\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x^2 + d)^2, x)
```

3.248 $\int \frac{(a+b\log(cx^n))^3}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=711

$$-\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}+\frac{3b^2n^2\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}-\frac{3b^2n^2\text{PolyLog}\left(3,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a}{2(-d)^{3/2}\sqrt{e}}$$

```
[Out] (x*(a + b*Log[c*x^n])^3)/(4*(-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (x*(a + b*
Log[c*x^n])^3)/(4*(-d)^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) + (3*b*n*(a + b*Log[c*
x^n])^2*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - ((a + b*Log
[c*x^n])^3*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (3*b*n*(
a + b*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) +
 ((a + b*Log[c*x^n])^3*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]
) - (3*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(
-d)^(3/2)*Sqrt[e]) + (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((Sqrt[e]*x)/S
qrt[-d])])/(4*(-d)^(3/2)*Sqrt[e]) + (3*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2
, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - (3*b*n*(a + b*Log[c*x^n])
^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) + (3*b^3*n^3*Po
lyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) - (3*b^2*n^2*(a +
 b*Log[c*x^n])*PolyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e])
- (3*b^3*n^3*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) + (3*
b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*
Sqrt[e]) + (3*b^3*n^3*PolyLog[4, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sq
rt[e]) - (3*b^3*n^3*PolyLog[4, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]
)
```

Rubi [A] time = 0.845976, antiderivative size = 711, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2330, 2318, 2317, 2374, 6589, 2383}

$$-\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}+\frac{3b^2n^2\text{PolyLog}\left(2,\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a+b\log(cx^n))}{2(-d)^{3/2}\sqrt{e}}-\frac{3b^2n^2\text{PolyLog}\left(3,-\frac{\sqrt{e}x}{\sqrt{-d}}\right)(a}{2(-d)^{3/2}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(d + e*x^2)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^3)/(4*(-d)^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) + (x*(a + b*
Log[c*x^n])^3)/(4*(-d)^(3/2)*(Sqrt[-d] + Sqrt[e]*x)) + (3*b*n*(a + b*Log[c*
```

```
x^n])^2*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - ((a + b*Log
[c*x^n])^3*Log[1 - (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) - (3*b*n*(
a + b*Log[c*x^n])^2*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) +
 ((a + b*Log[c*x^n])^3*Log[1 + (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]
) - (3*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(
-d)^(3/2)*Sqrt[e]) + (3*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((Sqrt[e]*x)/S
qrt[-d])])/(4*(-d)^(3/2)*Sqrt[e]) + (3*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2
, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) - (3*b*n*(a + b*Log[c*x^n])
^2*PolyLog[2, (Sqrt[e]*x)/Sqrt[-d]])/(4*(-d)^(3/2)*Sqrt[e]) + (3*b^3*n^3*Po
lyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e]) - (3*b^2*n^2*(a +
 b*Log[c*x^n])*PolyLog[3, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sqrt[e])
- (3*b^3*n^3*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]) + (3*
b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*
Sqrt[e]) + (3*b^3*n^3*PolyLog[4, -((Sqrt[e]*x)/Sqrt[-d])])/(2*(-d)^(3/2)*Sq
rt[e]) - (3*b^3*n^3*PolyLog[4, (Sqrt[e]*x)/Sqrt[-d]])/(2*(-d)^(3/2)*Sqrt[e]
)
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
```

```
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^3}{(d+ex^2)^2}\,dx = \int \left(-\frac{e(a+b\log(cx^n))^3}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2} - \frac{e(a+b\log(cx^n))^3}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2} - \frac{e(a+b\log(cx^n))^3}{2d\left(-de-e^2x^2\right)}\right)dx$$

$$= -\frac{e\int \frac{(a+b\log(cx^n))^3}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx}{4d} - \frac{e\int \frac{(a+b\log(cx^n))^3}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx}{4d} - \frac{e\int \frac{(a+b\log(cx^n))^3}{-de-e^2x^2}dx}{2d}$$

$$= \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} - \frac{e\int\left(-\frac{\sqrt{-d}(a+b\log(cx^n))^3}{2de\left(\sqrt{-d}-\sqrt{e}x\right)} - \frac{\sqrt{-d}(a+b\log(cx^n))^3}{2de\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{2d}$$

$$= \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{3bn(a+b\log(cx^n))^2\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}} - \frac{3bn(}{}$$

$$= \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{3bn(a+b\log(cx^n))^2\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}} - \frac{(a+b}{}$$

$$= \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{3bn(a+b\log(cx^n))^2\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}} - \frac{(a+b}{}$$

$$= \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{3bn(a+b\log(cx^n))^2\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}} - \frac{(a+b}{}$$

$$= \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{4(-d)^{3/2}\left(\sqrt{-d}+\sqrt{e}x\right)} + \frac{3bn(a+b\log(cx^n))^2\log\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)}{4(-d)^{3/2}\sqrt{e}} - \frac{(a+b}{}$$

Mathematica [C] time = 2.19558, size = 1073, normalized size = 1.51

$$\frac{ib^3\left(\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\log^3(x)-\log\left(\frac{i\sqrt{e}x}{\sqrt{d}}+1\right)\log^3(x)+\frac{\sqrt{d}\log^3(x)}{i\sqrt{e}x+\sqrt{d}}+\frac{\sqrt{e}x\log^3(x)}{\sqrt{e}x+i\sqrt{d}}-\log^3(x)-3\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\log^2(x)+3\log\left(\frac{i\sqrt{e}x}{\sqrt{d}}+1\right)\log^2(x)-3(\log(x)-2)\text{PolyLog}\left(2,-\frac{i\sqrt{e}x}{\sqrt{d}}\right)\text{l}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(d + e*x^2)^2,x]
```

```
[Out] ((2*Sqrt[d]*x*(a - b*n*Log[x] + b*Log[c*x^n])^3)/(d + e*x^2) + (2*ArcTan[(S
qrt[e]*x)/Sqrt[d]]*(a - b*n*Log[x] + b*Log[c*x^n])^3)/Sqrt[e] + 3*b*n*(a -
```

```
b*n*Log[x] + b*Log[c*x^n])^2*((Sqrt[e]*x*Log[x] + I*(Sqrt[d] + I*Sqrt[e]*x)
*Log[I*Sqrt[d] - Sqrt[e]*x])/(Sqrt[d]*Sqrt[e] + I*e*x) + (Sqrt[e]*x*Log[x]
+ ((-I)*Sqrt[d] - Sqrt[e]*x)*Log[I*Sqrt[d] + Sqrt[e]*x])/(Sqrt[d]*Sqrt[e] -
 I*e*x) - (I*(Log[x]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + PolyLog[2, ((-I)*Sqrt
[e]*x)/Sqrt[d]]))/Sqrt[e] + (I*(Log[x]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + Pol
yLog[2, (I*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e]) + 3*b^2*n^2*(a - b*n*Log[x] + b*L
og[c*x^n])*((Log[x]*(Sqrt[e]*x*Log[x] + (2*I)*(Sqrt[d] + I*Sqrt[e]*x)*Log[1
 + (I*Sqrt[e]*x)/Sqrt[d]]) + (2*I)*(Sqrt[d] + I*Sqrt[e]*x)*PolyLog[2, ((-I)
*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e] + I*e*x) + (Log[x]*(Sqrt[e]*x*Log[x]
 - (2*I)*(Sqrt[d] - I*Sqrt[e]*x)*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]]) - 2*(I*Sqr
t[d] + Sqrt[e]*x)*PolyLog[2, (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e] - I*e
*x) - (I*(Log[x]^2*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] + 2*Log[x]*PolyLog[2, ((-
I)*Sqrt[e]*x)/Sqrt[d]] - 2*PolyLog[3, ((-I)*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e] +
 (I*(Log[x]^2*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 2*Log[x]*PolyLog[2, (I*Sqrt[
e]*x)/Sqrt[d]] - 2*PolyLog[3, (I*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e]) + (I*b^3*n^
3*(-Log[x]^3 + (Sqrt[d]*Log[x]^3)/(Sqrt[d] + I*Sqrt[e]*x) + (Sqrt[e]*x*Log[
x]^3)/(I*Sqrt[d] + Sqrt[e]*x) - 3*Log[x]^2*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] +
 Log[x]^3*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]] + 3*Log[x]^2*Log[1 + (I*Sqrt[e]*x)
/Sqrt[d]] - Log[x]^3*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]] - 3*(-2 + Log[x])*Log[x
]*PolyLog[2, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 3*(-2 + Log[x])*Log[x]*PolyLog[2,
(I*Sqrt[e]*x)/Sqrt[d]] - 6*PolyLog[3, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 6*Log[x]*
PolyLog[3, ((-I)*Sqrt[e]*x)/Sqrt[d]] + 6*PolyLog[3, (I*Sqrt[e]*x)/Sqrt[d]]
- 6*Log[x]*PolyLog[3, (I*Sqrt[e]*x)/Sqrt[d]] - 6*PolyLog[4, ((-I)*Sqrt[e]*x
)/Sqrt[d]] + 6*PolyLog[4, (I*Sqrt[e]*x)/Sqrt[d]]))/Sqrt[e])/(4*d^(3/2))
```

Maple [F] time = 7.904, size = 0, normalized size = 0.

$$\int \frac{(a + b\ln(cx^n))^3}{(ex^2 + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^3/(e*x^2+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^3/(e*x^2+d)^2,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((a+b*log(c*x^n))^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^3\log\left(cx^n\right)^3 + 3\,ab^2\log\left(cx^n\right)^2 + 3\,a^2b\log\left(cx^n\right) + a^3}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a + b\log\left(cx^n\right)\right)^3}{\left(d + ex^2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**3/(e*x**2+d)**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3/(d + e*x**2)**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\log\left(cx^n\right) + a\right)^3}{\left(ex^2 + d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/(e*x^2 + d)^2, x)
```

3.249 $\int \frac{1}{\left(d+ex^2\right)^2 (a+b\log(cx^n))} dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\left(d+ex^2\right)^2 (a+b\log(cx^n))},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^2*(a + b*Log[c*x^n])), x]
```

Rubi [A] time = 0.0332444, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^2 (a+b\log(cx^n))} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*Log[c*x^n])),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^2 (a+b\log(cx^n))} dx=\int \frac{1}{\left(d+ex^2\right)^2 (a+b\log(cx^n))} dx$$

Mathematica [A] time = 2.77396, size = 0, normalized size = 0.

$$\int \frac{1}{\left(d+ex^2\right)^2 (a+b\log(cx^n))} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])),x]
```

```
[Out] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])), x]
```

Maple [A] time = 0.495, size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2\left(a+b\ln\left(cx^n\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^2+d)^2/(a+b*ln(c*x^n)),x)
```

```
[Out] int(1/(e*x^2+d)^2/(a+b*ln(c*x^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2\left(b\log\left(cx^n\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^2 + d)^2*(b*log(c*x^n) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\log\left(cx^n\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*
d^2)*log(c*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(1/(e*x**2+d)**2/(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2 (b\log\left(cx^n\right)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^2*(b*log(c*x^n) + a)), x)
```

3.250 $\int \frac{1}{\left(d+ex^2\right)^2(a+b\log(cx^n))^2}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\left(d+ex^2\right)^2(a+b\log(cx^n))^2},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2), x]
```

Rubi [A] time = 0.0324521, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(d+ex^2\right)^2(a+b\log(cx^n))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^2\right)^2(a+b\log(cx^n))^2}\,dx=\int \frac{1}{\left(d+ex^2\right)^2(a+b\log(cx^n))^2}\,dx$$

Mathematica [A] time = 12.0129, size = 0, normalized size = 0.

$$\int \frac{1}{\left(d+ex^2\right)^2(a+b\log(cx^n))^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2),x]
```

[Out] Integrate[1/((d + e*x^2)^2*(a + b*Log[c*x^n])^2), x]

Maple [A] time = 2.377, size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^{2}+d\right)^{2} \left(a+b\ln\left(cx^{n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(e*x^2+d)^2/(a+b*ln(c*x^n))^2,x)

[Out] int(1/(e*x^2+d)^2/(a+b*ln(c*x^n))^2,x)

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{x}{b^{2}d^{2}n\log\left(c\right)+abd^{2}n+\left(b^{2}e^{2}n\log\left(c\right)+abe^{2}n\right)x^{4}+2\left(b^{2}den\log\left(c\right)+abden\right)x^{2}+\left(b^{2}e^{2}nx^{4}+2\,b^{2}denx^{2}+b^{2}d^{2}n\right)\log\left(x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n))^2,x, algorithm="maxima")

[Out] -x/(b^2*d^2*n*log(c) + a*b*d^2*n + (b^2*e^2*n*log(c) + a*b*e^2*n)*x^4 + 2*(b^2*d*e*n*log(c) + a*b*d*e*n)*x^2 + (b^2*e^2*n*x^4 + 2*b^2*d*e*n*x^2 + b^2*d^2*n)*log(x^n)) - integrate((3*e*x^2 - d)/((b^2*e^3*n*log(c) + a*b*e^3*n)*x^6 + b^2*d^3*n*log(c) + a*b*d^3*n + 3*(b^2*d*e^2*n*log(c) + a*b*d*e^2*n)*x^4 + 3*(b^2*d^2*e*n*log(c) + a*b*d^2*e*n)*x^2 + (b^2*e^3*n*x^6 + 3*b^2*d*e^2*n*x^4 + 3*b^2*d^2*e*n*x^2 + b^2*d^3*n)*log(x^n)), x)

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{1}{a^{2}e^{2}x^{4}+2\,a^{2}dex^{2}+a^{2}d^{2}+\left(b^{2}e^{2}x^{4}+2\,b^{2}dex^{2}+b^{2}d^{2}\right)\log\left(cx^{n}\right)^{2}+2\left(abe^{2}x^{4}+2\,abdex^{2}+abd^{2}\right)\log\left(cx^{n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*
e*x^2 + b^2*d^2)*log(c*x^n)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*l
og(c*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(1/(e*x**2+d)**2/(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^2+d\right)^2 (b\log\left(cx^n\right)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^2+d)^2/(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^2 + d)^2*(b*log(c*x^n) + a)^2), x)
```

3.251 $\int x^5\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=208

$$\frac{d^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3}-\frac{2d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3}-\frac{8bd^3n\sqrt{d+ex^2}}{105e^3}-\frac{8b}{}$$

```
[Out] (-8*b*d^3*n*Sqrt[d + e*x^2])/(105*e^3) - (8*b*d^2*n*(d + e*x^2)^(3/2))/(315
*e^3) + (9*b*d*n*(d + e*x^2)^(5/2))/(175*e^3) - (b*n*(d + e*x^2)^(7/2))/(49
*e^3) + (8*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(105*e^3) + (d^2*(
d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) - (2*d*(d + e*x^2)^(5/2)*(a +
b*Log[c*x^n]))/(5*e^3) + ((d + e*x^2)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3)
```

Rubi [A] time = 0.249717, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 208}

$$\frac{d^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3}-\frac{2d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3}-\frac{8bd^3n\sqrt{d+ex^2}}{105e^3}-\frac{8b}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*d^3*n*Sqrt[d + e*x^2])/(105*e^3) - (8*b*d^2*n*(d + e*x^2)^(3/2))/(315
*e^3) + (9*b*d*n*(d + e*x^2)^(5/2))/(175*e^3) - (b*n*(d + e*x^2)^(7/2))/(49
*e^3) + (8*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(105*e^3) + (d^2*(
d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) - (2*d*(d + e*x^2)^(5/2)*(a +
b*Log[c*x^n]))/(5*e^3) + ((d + e*x^2)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^5\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx = \frac{d^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{\left(d+ex^2\right)^{7/2}(a}{7e^3}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{\left(d+ex^2\right)^{7/2}(a}{7e^3}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{\left(d+ex^2\right)^{7/2}(a}{7e^3}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{\left(d+ex^2\right)^{7/2}(a}{7e^3}$$

$$= \frac{d^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{2d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} + \frac{\left(d+ex^2\right)^{7/2}(a}{7e^3}$$

$$= -\frac{8bd^3n\sqrt{d+ex^2}}{105e^3} - \frac{8bd^2n\left(d+ex^2\right)^{3/2}}{315e^3} + \frac{9bdn\left(d+ex^2\right)^{5/2}}{175e^3} - \frac{bn\left(d+ex^2\right)^{7/2}}{49e^3} + \frac{d^2(}{}$$

$$= -\frac{8bd^3n\sqrt{d+ex^2}}{105e^3} - \frac{8bd^2n\left(d+ex^2\right)^{3/2}}{315e^3} + \frac{9bdn\left(d+ex^2\right)^{5/2}}{175e^3} - \frac{bn\left(d+ex^2\right)^{7/2}}{49e^3} + \frac{8bd}{}$$

Mathematica [A] time = 0.195219, size = 251, normalized size = 1.21

$$\sqrt{d+ex^2}\left(-\frac{d^2x^2(420a+420b(\log(cx^n)-n\log(x))-179bn)}{11025e^2} + \frac{2d^3(420a+420b(\log(cx^n)-n\log(x))-389bn)}{11025e^3} + \frac{dx^4}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*d^(7/2)*n*Log[x])/(105*e^3) + (b*n*Sqrt[d + e*x^2]*(8*d^3 - 4*d^2*e*x
^2 + 3*d*e^2*x^4 + 15*e^3*x^6)*Log[x])/(105*e^3) + Sqrt[d + e*x^2]*((x^6*(7
*a - b*n + 7*b*(-(n*Log[x]) + Log[c*x^n])))/49 + (d*x^4*(35*a - 12*b*n + 35
*b*(-(n*Log[x]) + Log[c*x^n])))/(1225*e) + (2*d^3*(420*a - 389*b*n + 420*b*
(-(n*Log[x]) + Log[c*x^n])))/(11025*e^3) - (d^2*x^2*(420*a - 179*b*n + 420*
b*(-(n*Log[x]) + Log[c*x^n])))/(11025*e^2)) + (8*b*d^(7/2)*n*Log[d + Sqrt[d
```

```
]*Sqrt[d + e*x^2]])/(105*e^3)
```

Maple [F] time = 0.488, size = 0, normalized size = 0.

$$\int x^5 (a + b\ln(cx^n))\sqrt{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^5*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),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(x^5*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.75575, size = 1006, normalized size = 4.84

$$\left[\frac{420\,bd^{\frac{7}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\sqrt{d}+2\,d}{x^2}\right) - \left(225\left(be^3n - 7\,ae^3\right)x^6 + 778\,bd^3n + 9\left(12\,bde^2n - 35\,ade^2\right)x^4 - 840\,ad^3 - \left(179\,bd^2\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/11025*(420*b*d^(7/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^
2) - (225*(b*e^3*n - 7*a*e^3)*x^6 + 778*b*d^3*n + 9*(12*b*d*e^2*n - 35*a*d*
e^2)*x^4 - 840*a*d^3 - (179*b*d^2*e*n - 420*a*d^2*e)*x^2 - 105*(15*b*e^3*x^
```

```
6 + 3*b*d*e^2*x^4 - 4*b*d^2*e*x^2 + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^6 +
 3*b*d*e^2*n*x^4 - 4*b*d^2*e*n*x^2 + 8*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^
3, -1/11025*(840*b*sqrt(-d)*d^3*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (225*(
b*e^3*n - 7*a*e^3)*x^6 + 778*b*d^3*n + 9*(12*b*d*e^2*n - 35*a*d*e^2)*x^4 -
840*a*d^3 - (179*b*d^2*e*n - 420*a*d^2*e)*x^2 - 105*(15*b*e^3*x^6 + 3*b*d*e
^2*x^4 - 4*b*d^2*e*x^2 + 8*b*d^3)*log(c) - 105*(15*b*e^3*n*x^6 + 3*b*d*e^2*
n*x^4 - 4*b*d^2*e*n*x^2 + 8*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^3]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.4689, size = 400, normalized size = 1.92

$$\frac{1}{7}\sqrt{x^2e+d}bx^6\log(c)+\frac{1}{35}\sqrt{x^2e+d}bdx^4e^{(-1)}\log(c)+\frac{1}{7}\sqrt{x^2e+d}ax^6+\frac{1}{35}\sqrt{x^2e+d}adx^4e^{(-1)}-\frac{4}{105}\sqrt{x^2e+d}bd^2x^2e^{(-2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] 1/7*sqrt(x^2*e + d)*b*x^6*log(c) + 1/35*sqrt(x^2*e + d)*b*d*x^4*e^(-1)*log(
c) + 1/7*sqrt(x^2*e + d)*a*x^6 + 1/35*sqrt(x^2*e + d)*a*d*x^4*e^(-1) - 4/10
5*sqrt(x^2*e + d)*b*d^2*x^2*e^(-2)*log(c) - 4/105*sqrt(x^2*e + d)*a*d^2*x^2
*e^(-2) + 8/105*sqrt(x^2*e + d)*b*d^3*e^(-3)*log(c) + 8/105*sqrt(x^2*e + d)
*a*d^3*e^(-3) + 1/11025*(105*(15*(x^2*e + d)^(7/2) - 42*(x^2*e + d)^(5/2)*d
 + 35*(x^2*e + d)^(3/2)*d^2)*e^(-3)*log(x) - (840*d^4*arctan(sqrt(x^2*e + d
)/sqrt(-d))/sqrt(-d) + 225*(x^2*e + d)^(7/2) - 567*(x^2*e + d)^(5/2)*d + 28
0*(x^2*e + d)^(3/2)*d^2 + 840*sqrt(x^2*e + d)*d^3)*e^(-3))*b*n
```

3.252 $\int x^3\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=154

$$-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2bd^2n\sqrt{d+ex^2}}{15e^2}-\frac{2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{15e^2}+\frac{2bdn\,(\ldots}{4\ldots}$$

```
[Out] (2*b*d^2*n*Sqrt[d + e*x^2])/(15*e^2) + (2*b*d*n*(d + e*x^2)^(3/2))/(45*e^2)
 - (b*n*(d + e*x^2)^(5/2))/(25*e^2) - (2*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^2
]/Sqrt[d]])/(15*e^2) - (d*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2) + (
(d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2)
```

Rubi [A] time = 0.175445, antiderivative size = 154, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{2bd^2n\sqrt{d+ex^2}}{15e^2}-\frac{2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{15e^2}+\frac{2bdn\,(\ldots}{4\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*b*d^2*n*Sqrt[d + e*x^2])/(15*e^2) + (2*b*d*n*(d + e*x^2)^(3/2))/(45*e^2)
 - (b*n*(d + e*x^2)^(5/2))/(25*e^2) - (2*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^2
]/Sqrt[d]])/(15*e^2) - (d*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2) + (
(d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^3\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx = -\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}-(bn)\int\frac{\left(d+ex^2\right.}{}$$

$$=-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}-\frac{(bn)\int\frac{\left(d+ex^2\right)^{3/2}(}{x}}{15e^2}$$

$$=-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}-\frac{(bn)\,\mathrm{Subst}\left(\int\right.}{}$$

$$=-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^2}-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}$$

$$=\frac{2bdn\left(d+ex^2\right)^{3/2}}{45e^2}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^2}-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{\left(d+ex^2\right)^{5/}}{}$$

$$=\frac{2bd^2n\sqrt{d+ex^2}}{15e^2}+\frac{2bdn\left(d+ex^2\right)^{3/2}}{45e^2}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^2}-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(}{3e^2}$$

$$=\frac{2bd^2n\sqrt{d+ex^2}}{15e^2}+\frac{2bdn\left(d+ex^2\right)^{3/2}}{45e^2}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^2}-\frac{d\left(d+ex^2\right)^{3/2}(a+b\log(}{3e^2}$$

$$=\frac{2bd^2n\sqrt{d+ex^2}}{15e^2}+\frac{2bdn\left(d+ex^2\right)^{3/2}}{45e^2}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e^2}-\frac{2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{15e^2}$$

Mathematica [A] time = 0.147632, size = 204, normalized size = 1.32

$$\sqrt{d+ex^2}\left(-\frac{d^2(30a+30b(\log(cx^n)-n\log(x))-31bn)}{225e^2}+\frac{dx^2(15a+15b(\log(cx^n)-n\log(x))-8bn)}{225e}+\frac{1}{25}x^4(5a+5b\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*b*d^(5/2)*n*Log[x])/(15*e^2) - (b*n*Sqrt[d + e*x^2]*(2*d^2 - d*e*x^2 - 3
*e^2*x^4)*Log[x])/(15*e^2) + Sqrt[d + e*x^2]*((x^4*(5*a - b*n + 5*b*(-(n*Lo
g[x]) + Log[c*x^n])))/25 + (d*x^2*(15*a - 8*b*n + 15*b*(-(n*Log[x]) + Log[c
*x^n])))/(225*e) - (d^2*(30*a - 31*b*n + 30*b*(-(n*Log[x]) + Log[c*x^n])))/
(225*e^2)) - (2*b*d^(5/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(15*e^2)
```

Maple [F] time = 0.464, size = 0, normalized size = 0.

$$\int x^3 (a + b\ln(cx^n))\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),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(x^3*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.58401, size = 745, normalized size = 4.84

$$\left[\frac{15\,bd^{\frac{5}{2}}n\log\left(-\frac{ex^2-2\sqrt{ex^2+d}\sqrt{d}+2\,d}{x^2}\right)-\left(9\left(be^2n-5\,ae^2\right)x^4-31\,bd^2n+30\,ad^2+(8\,bden-15\,ade)x^2-15\left(3\,be^2x^4+bdex^2-\right.\right.}{225\,e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/225*(15*b*d^(5/2)*n*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2)
- (9*(b*e^2*n - 5*a*e^2)*x^4 - 31*b*d^2*n + 30*a*d^2 + (8*b*d*e*n - 15*a*d*
e)*x^2 - 15*(3*b*e^2*x^4 + b*d*e*x^2 - 2*b*d^2)*log(c) - 15*(3*b*e^2*n*x^4
+ b*d*e*n*x^2 - 2*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/e^2, 1/225*(30*b*sqrt(-
d)*d^2*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (9*(b*e^2*n - 5*a*e^2)*x^4 - 31
*b*d^2*n + 30*a*d^2 + (8*b*d*e*n - 15*a*d*e)*x^2 - 15*(3*b*e^2*x^4 + b*d*e*
x^2 - 2*b*d^2)*log(c) - 15*(3*b*e^2*n*x^4 + b*d*e*n*x^2 - 2*b*d^2*n)*log(x)
)*sqrt(e*x^2 + d))/e^2]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^3 \left(a + b \log \left(cx^n\right)\right) \sqrt{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

Giac [A] time = 1.78015, size = 298, normalized size = 1.94

$$\frac{1}{5}\sqrt{x^2e+d}bx^4\log\left(c\right)+\frac{1}{15}\sqrt{x^2e+d}bdx^2e^{(-1)}\log\left(c\right)+\frac{1}{5}\sqrt{x^2e+d}ax^4+\frac{1}{15}\sqrt{x^2e+d}adx^2e^{(-1)}-\frac{2}{15}\sqrt{x^2e+d}bd^2e^{(-2)}\,\mathrm{lo}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] 1/5*sqrt(x^2*e + d)*b*x^4*log(c) + 1/15*sqrt(x^2*e + d)*b*d*x^2*e^(-1)*log(
c) + 1/5*sqrt(x^2*e + d)*a*x^4 + 1/15*sqrt(x^2*e + d)*a*d*x^2*e^(-1) - 2/15
*sqrt(x^2*e + d)*b*d^2*e^(-2)*log(c) - 2/15*sqrt(x^2*e + d)*a*d^2*e^(-2) +
1/225*(15*(3*(x^2*e + d)^(5/2) - 5*(x^2*e + d)^(3/2)*d)*e^(-2)*log(x) + (30
*d^3*arctan(sqrt(x^2*e + d)/sqrt(-d))/sqrt(-d) - 9*(x^2*e + d)^(5/2) + 10*(
x^2*e + d)^(3/2)*d + 30*sqrt(x^2*e + d)*d^2)*e^(-2))*b*n
```

3.253 $\int x\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=102

$$\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e}+\frac{bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e}-\frac{bdn\sqrt{d+ex^2}}{3e}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}$$

```
[Out] -(b*d*n*Sqrt[d + e*x^2])/(3*e) - (b*n*(d + e*x^2)^(3/2))/(9*e) + (b*d^(3/2)
*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e) + ((d + e*x^2)^(3/2)*(a + b*Log[
c*x^n]))/(3*e)
```

Rubi [A] time = 0.0878957, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2338, 266, 50, 63, 208}

$$\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e}+\frac{bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e}-\frac{bdn\sqrt{d+ex^2}}{3e}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*Sqrt[d + e*x^2])/(3*e) - (b*n*(d + e*x^2)^(3/2))/(9*e) + (b*d^(3/2)
*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e) + ((d + e*x^2)^(3/2)*(a + b*Log[
c*x^n]))/(3*e)
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx = \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e} - \frac{(bn)\int\frac{\left(d+ex^2\right)^{3/2}}{x}\,dx}{3e}$$
$$= \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e} - \frac{(bn)\,\text{Subst}\left(\int\frac{(d+ex)^{3/2}}{x}\,dx,x,x^2\right)}{6e}$$
$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{9e} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e} - \frac{(bdn)\,\text{Subst}\left(\int\frac{\sqrt{d+ex}}{x}\,dx,x,x^2\right)}{6e}$$
$$= -\frac{bdn\sqrt{d+ex^2}}{3e} - \frac{bn\left(d+ex^2\right)^{3/2}}{9e} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e} - \frac{\left(bd^2n\right)\text{Subst}\left(\int\right.}{6e}$$
$$= -\frac{bdn\sqrt{d+ex^2}}{3e} - \frac{bn\left(d+ex^2\right)^{3/2}}{9e} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e} - \frac{\left(bd^2n\right)\text{Subst}\left(\int\right.}{}$$
$$= -\frac{bdn\sqrt{d+ex^2}}{3e} - \frac{bn\left(d+ex^2\right)^{3/2}}{9e} + \frac{bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log}{3e}$$

Mathematica [A] time = 0.104242, size = 136, normalized size = 1.33

$$\frac{3aex^2\sqrt{d+ex^2} + 3ad\sqrt{d+ex^2} + 3b\left(d+ex^2\right)^{3/2}\log(cx^n) + 3bd^{3/2}n\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right) - 3bd^{3/2}n\log(x) - benx^2\sqrt{d+}}{9e}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (3*a*d*Sqrt[d + e*x^2] - 4*b*d*n*Sqrt[d + e*x^2] + 3*a*e*x^2*Sqrt[d + e*x^2
] - b*e*n*x^2*Sqrt[d + e*x^2] - 3*b*d^(3/2)*n*Log[x] + 3*b*(d + e*x^2)^(3/2
)*Log[c*x^n] + 3*b*d^(3/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(9*e)
```

Maple [F] time = 0.468, size = 0, normalized size = 0.

$$\int x\,(a+b\ln(cx^n))\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),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(x*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.55026, size = 505, normalized size = 4.95

$$\left[\frac{3\,bd^{\frac{3}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\sqrt{d}+2\,d}{x^2}\right)-2\left(4\,bdn+(ben-3\,ae)x^2-3\,ad-3\left(bex^2+bd\right)\log\left(c\right)-3\left(benx^2+bdn\right)\log\left(x\right)\right)\sqrt{e}}{18\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/18*(3*b*d^(3/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) -
2*(4*b*d*n + (b*e*n - 3*a*e)*x^2 - 3*a*d - 3*(b*e*x^2 + b*d)*log(c) - 3*(b*
e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/e, -1/9*(3*b*sqrt(-d)*d*n*arctan(
sqrt(-d)/sqrt(e*x^2 + d)) + (4*b*d*n + (b*e*n - 3*a*e)*x^2 - 3*a*d - 3*(b*e
*x^2 + b*d)*log(c) - 3*(b*e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/e]
```

Sympy [A] time = 20.0459, size = 155, normalized size = 1.52

$$a\left(\begin{cases}\frac{\sqrt{d}x^2}{2} & \text{for}\ e=0\\ \frac{\left(d+ex^2\right)^{\frac{3}{2}}}{3e} & \text{otherwise}\end{cases}\right)-bn\left(\begin{cases}\frac{\sqrt{d}x^2}{4} & \text{for}\ e=0\\ \frac{4d^{\frac{3}{2}}\sqrt{1+\frac{ex^2}{d}}}{9e}+\frac{d^{\frac{3}{2}}\log\left(\frac{ex^2}{d}\right)}{6e}-\frac{d^{\frac{3}{2}}\log\left(\sqrt{1+\frac{ex^2}{d}}+1\right)}{3e}+\frac{\sqrt{d}x^2\sqrt{1+\frac{ex^2}{d}}}{9} & \text{otherwise}\end{cases}\right)+b\left(\begin{cases}\frac{\sqrt{d}x^2}{2}\\ \frac{\left(d+ex^2\right)}{3e}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] a*Piecewise((sqrt(d)*x**2/2, Eq(e, 0)), ((d + e*x**2)**(3/2)/(3*e), True))
- b*n*Piecewise((sqrt(d)*x**2/4, Eq(e, 0)), (4*d**(3/2)*sqrt(1 + e*x**2/d)/
(9*e) + d**(3/2)*log(e*x**2/d)/(6*e) - d**(3/2)*log(sqrt(1 + e*x**2/d) + 1)
/(3*e) + sqrt(d)*x**2*sqrt(1 + e*x**2/d)/9, True)) + b*Piecewise((sqrt(d)*x
**2/2, Eq(e, 0)), ((d + e*x**2)**(3/2)/(3*e), True))*log(c*x**n)
```

Giac [A] time = 1.40223, size = 196, normalized size = 1.92

$$\frac{1}{3}\sqrt{x^2e+d}bx^2\log(c)+\frac{1}{3}\sqrt{x^2e+d}bde^{(-1)}\log(c)+\frac{1}{3}\sqrt{x^2e+d}ax^2+\frac{1}{3}\sqrt{x^2e+d}ade^{(-1)}+\frac{1}{9}\left(3\left(x^2e+d\right)^{\frac{3}{2}}e^{(-1)}\log(x)-\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] 1/3*sqrt(x^2*e + d)*b*x^2*log(c) + 1/3*sqrt(x^2*e + d)*b*d*e^(-1)*log(c) +
1/3*sqrt(x^2*e + d)*a*x^2 + 1/3*sqrt(x^2*e + d)*a*d*e^(-1) + 1/9*(3*(x^2*e
+ d)^(3/2)*e^(-1)*log(x) - (3*d^2*arctan(sqrt(x^2*e + d)/sqrt(-d))/sqrt(-d)
 + (x^2*e + d)^(3/2) + 3*sqrt(x^2*e + d)*d)*e^(-1))*b*n
```

3.254 $\int \frac{\sqrt{d+ex^2}(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=220

$$-\frac{1}{2}b\sqrt{d}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)+\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-bn\sqrt{d+ex^2}+\frac{1}{2}b$$

```
[Out] -(b*n*Sqrt[d + e*x^2]) + b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]] + (b*
Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/2 + (Sqrt[d + e*x^2] - Sqrt[d
]*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])*(a + b*Log[c*x^n]) - b*Sqrt[d]*n*ArcTan
h[Sqrt[d + e*x^2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])] - (
b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2
```

Rubi [A] time = 0.333701, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{1}{2}b\sqrt{d}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)+\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-bn\sqrt{d+ex^2}+\frac{1}{2}b$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2]) + b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]] + (b*
Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/2 + (Sqrt[d + e*x^2] - Sqrt[d
]*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])*(a + b*Log[c*x^n]) - b*Sqrt[d]*n*ArcTan
h[Sqrt[d + e*x^2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])] - (
b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
```

```
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
```

```
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x}\,dx = \left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-(bn)\int\left(\frac{\sqrt{d+ex^2}}{x}-\frac{\sqrt{d}\tan$$

$$=\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-(bn)\int\frac{\sqrt{d+ex^2}}{x}\,dx+\left(b\sqrt{d}\right.$$

$$=\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-\frac{1}{2}(bn)\,\text{Subst}\left(\int\frac{\sqrt{d+ex}}{x}\,dx\right.$$

$$=-bn\sqrt{d+ex^2}+\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))+\left(b\sqrt{d}n\right)\text{Sub}$$

$$=-bn\sqrt{d+ex^2}+\frac{1}{2}b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\left(\sqrt{d+ex^2}-\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)$$

$$=-bn\sqrt{d+ex^2}+b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\left(\sqrt{d+ex\right.$$

$$=-bn\sqrt{d+ex^2}+b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\left(\sqrt{d+ex\right.$$

$$=-bn\sqrt{d+ex^2}+b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\left(\sqrt{d+ex\right.$$

Mathematica [C] time = 0.321716, size = 203, normalized size = 0.92

$$\frac{bn\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{d}{ex^2}\right)+\log(x)\sqrt{\frac{d}{ex^2}+1}-\frac{\sqrt{d}\log(x)\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{e}x}\right)}{\sqrt{\frac{d}{ex^2}+1}}+\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)-bn\log(x\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (b*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2}, -(
d/(e*x^2))] + Sqrt[1 + d/(e*x^2)]*Log[x] - (Sqrt[d]*ArcSinh[Sqrt[d]/(Sqrt[e
]*x)]*Log[x])/(Sqrt[e]*x)))/Sqrt[1 + d/(e*x^2)] + Sqrt[d + e*x^2]*(a - b*n*
Log[x] + b*Log[c*x^n]) + Sqrt[d]*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) - S
qrt[d]*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]
```

Maple [F] time = 0.408, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x}\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x,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((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log\left(cx^n\right)+\sqrt{ex^2+d}a}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\log\left(cx^n\right))\sqrt{d+ex^2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{ex^2+d}(b\log\left(cx^n\right)+a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x, x)
```

3.255 $\int \frac{\sqrt{d+ex^2}(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=252

$$-\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4\sqrt{d}}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}}-\frac{bn\sqrt{d+ex^2}}{4x^2}+\frac{ben}{}$$

```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*x^2) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
4*Sqrt[d]) + (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*Sqrt[d]) - (Sqrt
[d + e*x^2]*(a + b*Log[c*x^n]))/(2*x^2) - (e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d
]]*(a + b*Log[c*x^n]))/(2*Sqrt[d]) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]
]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*Sqrt[d]) - (b*e*n*PolyLo
g[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*Sqrt[d])
```

Rubi [A] time = 0.375995, antiderivative size = 252, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {266, 47, 63, 208, 2350, 12, 14, 5984, 5918, 2402, 2315}

$$-\frac{ben\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4\sqrt{d}}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2}-\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}}-\frac{bn\sqrt{d+ex^2}}{4x^2}+\frac{ben}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^3,x]
```


```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*x^2) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
4*Sqrt[d]) + (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*Sqrt[d]) - (Sqrt
[d + e*x^2]*(a + b*Log[c*x^n]))/(2*x^2) - (e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d
]]*(a + b*Log[c*x^n]))/(2*Sqrt[d]) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]
]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*Sqrt[d]) - (b*e*n*PolyLo
g[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*Sqrt[d])
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
```

```
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x^3}\,dx = -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}} - (bn)\int \frac{-\sqrt{d+ex^2}}{}$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}} - \frac{1}{2}(bn)\int \frac{-\sqrt{d+}}{}$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}} - \frac{1}{2}(bn)\int \left(-\frac{\sqrt{d+}}{x}\right.$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}} + \frac{1}{2}(bn)\int \frac{\sqrt{d+e}}{x^3}$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}} + \frac{1}{4}(bn)\,\mathrm{Subst}\left(\int\right.$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{d}} + \frac{1}{8}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2x^2} - \frac{e\tanh^{-1}\left(\frac{\sqrt{d+}}{\sqrt{d}}\right.}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,(a+b\log}{2x^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,(a+b\log}{2x^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4x^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4\sqrt{d}} + \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4\sqrt{d}} - \frac{\sqrt{d+ex^2}\,(a+b\log}{2x^2}$$

Mathematica [C] time = 0.487486, size = 303, normalized size = 1.2

$$-2b\sqrt{d}n\sqrt{d+ex^2}\,{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{d}{ex^2}\right)+\sqrt{\frac{d}{ex^2}+1}\left(2ex^2\log(x)\left(a+b\log\left(cx^n\right)+bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)\right)-2a\sqrt{d}\sqrt{\cdots}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (-2*b*Sqrt[d]*n*Sqrt[d + e*x^2]*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/
2}, -(d/(e*x^2))] - b*Sqrt[e]*n*x*Sqrt[d + e*x^2]*ArcSinh[Sqrt[d]/(Sqrt[e]*
x)]*(1 + 2*Log[x]) + Sqrt[1 + d/(e*x^2)]*(-2*a*Sqrt[d]*Sqrt[d + e*x^2] - b*
Sqrt[d]*n*Sqrt[d + e*x^2] - 2*b*e*n*x^2*Log[x]^2 - 2*a*e*x^2*Log[d + Sqrt[d
]*Sqrt[d + e*x^2]] + 2*e*x^2*Log[x]*(a + b*Log[c*x^n] + b*n*Log[d + Sqrt[d]
*Sqrt[d + e*x^2]]) - 2*b*Log[c*x^n]*(Sqrt[d]*Sqrt[d + e*x^2] + e*x^2*Log[d
+ Sqrt[d]*Sqrt[d + e*x^2]])))/(4*Sqrt[d]*Sqrt[1 + d/(e*x^2)]*x^2)
```

Maple [F] time = 0.449, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x^3}\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^3,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^3,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((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log\left(cx^n\right)+\sqrt{ex^2+d}a}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^3,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(a+b\log\left(cx^n\right))\sqrt{d+ex^2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{ex^2+d}(b\log\left(cx^n\right)+a)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^3, x)
```

3.256 $\int x^4\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=469

$$-\frac{bd^{5/2}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{32e^{5/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e^2}+\frac{d^{5/2}\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{16e^{5/2}\sqrt{\frac{ex^2}{d}+1}}$$

```
[Out] (7*b*d^2*n*x*Sqrt[d + e*x^2])/(192*e^2) - (5*b*d*n*x^3*Sqrt[d + e*x^2])/(28
8*e) - (b*n*x^5*Sqrt[d + e*x^2])/36 + (5*b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSin
h[(Sqrt[e]*x)/Sqrt[d]])/(192*e^(5/2)*Sqrt[1 + (e*x^2)/d]) + (b*d^(5/2)*n*Sq
rt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(32*e^(5/2)*Sqrt[1 + (e*x^2)/
d]) - (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(
2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*e^(5/2)*Sqrt[1 + (e*x^2)/d]) - (d^2*x
*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(16*e^2) + (d*x^3*Sqrt[d + e*x^2]*(a +
 b*Log[c*x^n]))/(24*e) + (x^5*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/6 + (d^(5
/2)*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(16*e^
(5/2)*Sqrt[1 + (e*x^2)/d]) - (b*d^(5/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(32*e^(5/2)*Sqrt[1 + (e*x^2)/d])
```

Rubi [A] time = 0.597734, antiderivative size = 469, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.52, Rules used = {2341, 279, 321, 215, 2350, 12, 14, 195, 5659, 3716, 2190, 2279, 2391}

$$-\frac{bd^{5/2}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{32e^{5/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e^2}+\frac{d^{5/2}\sqrt{d+ex^2}\,\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{16e^{5/2}\sqrt{\frac{ex^2}{d}+1}}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```


```
[Out] (7*b*d^2*n*x*Sqrt[d + e*x^2])/(192*e^2) - (5*b*d*n*x^3*Sqrt[d + e*x^2])/(28
8*e) - (b*n*x^5*Sqrt[d + e*x^2])/36 + (5*b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSin
h[(Sqrt[e]*x)/Sqrt[d]])/(192*e^(5/2)*Sqrt[1 + (e*x^2)/d]) + (b*d^(5/2)*n*Sq
rt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(32*e^(5/2)*Sqrt[1 + (e*x^2)/
d]) - (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(
2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*e^(5/2)*Sqrt[1 + (e*x^2)/d]) - (d^2*x
*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(16*e^2) + (d*x^3*Sqrt[d + e*x^2]*(a +
```

```
b*Log[c*x^n]))/(24*e) + (x^5*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/6 + (d^(5
/2)*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(16*e^
(5/2)*Sqrt[1 + (e*x^2)/d]) - (b*d^(5/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(32*e^(5/2)*Sqrt[1 + (e*x^2)/d])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 279

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + n*p + 1)), x] + Dist[(a*n*p)/(m + n*p +
1), Int[(c*x)^m*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c, m}, x] && IG
tQ[n, 0] && GtQ[p, 0] && NeQ[m + n*p + 1, 0] && IntBinomialQ[a, b, c, n, m,
 p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int x^4\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx = \frac{\sqrt{d+ex^2}\int x^4\sqrt{1+\frac{ex^2}{d}}\,(a+b\log(cx^n))\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e^2} + \frac{dx^3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{24e} + \frac{1}{6}x^5\sqrt{d+ex^2}\,(a+$$

$$= -\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e^2} + \frac{dx^3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{24e} + \frac{1}{6}x^5\sqrt{d+ex^2}\,(a+$$

$$= -\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e^2} + \frac{dx^3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{24e} + \frac{1}{6}x^5\sqrt{d+ex^2}\,(a+$$

$$= -\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e^2} + \frac{dx^3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{24e} + \frac{1}{6}x^5\sqrt{d+ex^2}\,(a+$$

$$= \frac{bd^2nx\sqrt{d+ex^2}}{32e^2} - \frac{bdnx^3\sqrt{d+ex^2}}{96e} - \frac{1}{36}bnx^5\sqrt{d+ex^2} - \frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n}{16e^2}$$

$$= \frac{5bd^2nx\sqrt{d+ex^2}}{192e^2} - \frac{5bdnx^3\sqrt{d+ex^2}}{288e} - \frac{1}{36}bnx^5\sqrt{d+ex^2} + \frac{bd^{5/2}n\sqrt{d+ex^2}\sinh^{-1}\Big(}{32e^{5/2}\sqrt{1+\frac{ex^2}{d}}}$$

$$= \frac{7bd^2nx\sqrt{d+ex^2}}{192e^2} - \frac{5bdnx^3\sqrt{d+ex^2}}{288e} - \frac{1}{36}bnx^5\sqrt{d+ex^2} + \frac{7bd^{5/2}n\sqrt{d+ex^2}\sinh^{-1}\Big(}{192e^{5/2}\sqrt{1+\frac{ex^2}{d}}}$$

$$= \frac{7bd^2nx\sqrt{d+ex^2}}{192e^2} - \frac{5bdnx^3\sqrt{d+ex^2}}{288e} - \frac{1}{36}bnx^5\sqrt{d+ex^2} + \frac{5bd^{5/2}n\sqrt{d+ex^2}\sinh^{-1}\Big(}{192e^{5/2}\sqrt{1+\frac{ex^2}{d}}}$$

$$= \frac{7bd^2nx\sqrt{d+ex^2}}{192e^2} - \frac{5bdnx^3\sqrt{d+ex^2}}{288e} - \frac{1}{36}bnx^5\sqrt{d+ex^2} + \frac{5bd^{5/2}n\sqrt{d+ex^2}\sinh^{-1}\Big(}{192e^{5/2}\sqrt{1+\frac{ex^2}{d}}}$$

Mathematica [C] time = 0.660345, size = 276, normalized size = 0.59

$$\frac{-48be^{5/2}nx^5\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{ex^2}{d}\right)+25\sqrt{\frac{ex^2}{d}+1}\left(3d^3\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(a-bn\log(x))+a\sqrt{e}x\sqrt{d+e\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-48*b*e^(5/2)*n*x^5*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 5/2, 5/2}, {7
/2, 7/2}, -((e*x^2)/d)] + 75*b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x
)/Sqrt[d]]*Log[x] + 25*Sqrt[1 + (e*x^2)/d]*(a*Sqrt[e]*x*Sqrt[d + e*x^2]*(-3
*d^2 + 2*d*e*x^2 + 8*e^2*x^4) + 3*d^3*(a - b*n*Log[x])*Log[e*x + Sqrt[e]*Sq
rt[d + e*x^2]] + b*Log[c*x^n]*(Sqrt[e]*x*Sqrt[d + e*x^2]*(-3*d^2 + 2*d*e*x^
2 + 8*e^2*x^4) + 3*d^3*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])))/(1200*e^(5/2)*
Sqrt[1 + (e*x^2)/d])
```

Maple [F] time = 0.448, size = 0, normalized size = 0.

$$\int x^4\left(a+b\ln\left(cx^n\right)\right)\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^4*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),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(x^4*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{ex^2+d}bx^4\log\left(cx^n\right)+\sqrt{ex^2+d}ax^4,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*b*x^4*log(c*x^n) + sqrt(e*x^2 + d)*a*x^4, 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(x**4*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\sqrt{ex^2+d}(b\log\left(cx^n\right)+a)x^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)*x^4, x)
```

3.257 $\int x^2\sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=409

$$\frac{bd^{3/2}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{16e^{3/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^{3/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{1}{4}x^3\sqrt{d+ex^2}\,(a+b\log(cx^n)$$

```
[Out] (-3*b*d*n*x*Sqrt[d + e*x^2])/(32*e) - (b*n*x^3*Sqrt[d + e*x^2])/16 - (b*d^(
3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(32*e^(3/2)*Sqrt[1 + (
e*x^2)/d]) - (b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(
16*e^(3/2)*Sqrt[1 + (e*x^2)/d]) + (b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqr
t[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(8*e^(3/2)*Sq
rt[1 + (e*x^2)/d]) + (d*x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(8*e) + (x^3*
Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/4 - (d^(3/2)*Sqrt[d + e*x^2]*ArcSinh[(S
qrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(8*e^(3/2)*Sqrt[1 + (e*x^2)/d]) + (b
*d^(3/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/
(16*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Rubi [A] time = 0.41311, antiderivative size = 410, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.48, Rules used = {2341, 279, 321, 215, 2350, 388, 195, 5659, 3716, 2190, 2279, 2391}

$$\frac{bd^{3/2}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{16e^{3/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^{3/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{1}{4}x^3\sqrt{d+ex^2}\,(a+b\log(cx^n)$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x*Sqrt[d + e*x^2])/(32*e) - (b*n*x*(d + e*x^2)^(3/2))/(16*e) - (b*d
^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(32*e^(3/2)*Sqrt[1 +
 (e*x^2)/d]) - (b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)
/(16*e^(3/2)*Sqrt[1 + (e*x^2)/d]) + (b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(S
qrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(8*e^(3/2)*
Sqrt[1 + (e*x^2)/d]) + (d*x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(8*e) + (x^
3*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/4 - (d^(3/2)*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(8*e^(3/2)*Sqrt[1 + (e*x^2)/d]) +
```

```
(b*d^(3/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])]
)/(16*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 279

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + n*p + 1)), x] + Dist[(a*n*p)/(m + n*p +
1), Int[(c*x)^m*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c, m}, x] && IG
tQ[n, 0] && GtQ[p, 0] && NeQ[m + n*p + 1, 0] && IntBinomialQ[a, b, c, n, m,
 p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
```

```
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int x^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)\,dx=\frac{\sqrt{d+ex^2}\int x^2\sqrt{1+\frac{ex^2}{d}}\left(a+b\log\left(cx^n\right)\right)\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$=\frac{dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{8e}+\frac{1}{4}x^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{d^{3/2}\sqrt{d+ex^2}\sinh^{-1}}{8e^{3/2}}$$

$$=\frac{dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{8e}+\frac{1}{4}x^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{d^{3/2}\sqrt{d+ex^2}\sinh^{-1}}{8e^{3/2}}$$

$$=-\frac{bnx\left(d+ex^2\right)^{3/2}}{16e}+\frac{dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{8e}+\frac{1}{4}x^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-$$

$$=-\frac{bdnx\sqrt{d+ex^2}}{32e}-\frac{bnx\left(d+ex^2\right)^{3/2}}{16e}-\frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16e^{3/2}\sqrt{1+\frac{ex^2}{d}}}+\frac{dx\sqrt{d+ex^2}\,(}{}$$

$$=-\frac{bdnx\sqrt{d+ex^2}}{32e}-\frac{bnx\left(d+ex^2\right)^{3/2}}{16e}-\frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{32e^{3/2}\sqrt{1+\frac{ex^2}{d}}}-\frac{bd^{3/2}n\sqrt{d+ex}}{16e^{3/2}}$$

$$=-\frac{bdnx\sqrt{d+ex^2}}{32e}-\frac{bnx\left(d+ex^2\right)^{3/2}}{16e}-\frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{32e^{3/2}\sqrt{1+\frac{ex^2}{d}}}-\frac{bd^{3/2}n\sqrt{d+ex}}{16e^{3/2}}$$

$$=-\frac{bdnx\sqrt{d+ex^2}}{32e}-\frac{bnx\left(d+ex^2\right)^{3/2}}{16e}-\frac{bd^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{32e^{3/2}\sqrt{1+\frac{ex^2}{d}}}-\frac{bd^{3/2}n\sqrt{d+ex}}{16e^{3/2}}$$

Mathematica [C] time = 0.418249, size = 250, normalized size = 0.61

$$\frac{-8be^{3/2}nx^3\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right)+9\sqrt{\frac{ex^2}{d}+1}\left(d^2\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)\left(bn\log(x)-a\right)+a\sqrt{e}x\sqrt{d+ex^2}\,\left(d\right.\right.}{72e^{3/2}\sqrt{\frac{ex}{d}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*e^(3/2)*n*x^3*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 3/2, 3/2}, {5/
2, 5/2}, -((e*x^2)/d)] - 9*b*d^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/
Sqrt[d]]*Log[x] + 9*Sqrt[1 + (e*x^2)/d]*(a*Sqrt[e]*x*Sqrt[d + e*x^2]*(d + 2
*e*x^2) + d^2*(-a + b*n*Log[x])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] + b*Log[
c*x^n]*(Sqrt[e]*x*Sqrt[d + e*x^2]*(d + 2*e*x^2) - d^2*Log[e*x + Sqrt[e]*Sqr
t[d + e*x^2]])))/(72*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Maple [F] time = 0.482, size = 0, normalized size = 0.

$$\int x^2 (a + b \ln (cx^n)) \sqrt{ex^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))*(e*x^2+d)^(1/2),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(x^2*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{ex^2 + d}bx^2 \log (cx^n) + \sqrt{ex^2 + d}ax^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*b*x^2*log(c*x^n) + sqrt(e*x^2 + d)*a*x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int x^2 \left(a + b \log \left(cx^n\right)\right) \sqrt{d + ex^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ex^2 + d}(b \log \left(cx^n\right) + a)x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)*x^2, x)
```

3.258 $\int \sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx$

Optimal. Leaf size=330

$$-\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4\sqrt{e}\sqrt{d+ex^2}}+\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log(cx^n)$$

```
[Out] -(b*n*x*Sqrt[d + e*x^2])/4 + (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt
[e]*x)/Sqrt[d]]^2)/(4*Sqrt[e]*Sqrt[d + e*x^2]) - (b*d*n*ArcTanh[(Sqrt[e]*x)
/Sqrt[d + e*x^2]])/(4*Sqrt[e]) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[e]
*Sqrt[d + e*x^2]) + (x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 + (d^(3/2)*Sqr
t[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*Sqrt[e
]*Sqrt[d + e*x^2]) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSi
nh[(Sqrt[e]*x)/Sqrt[d]])])/(4*Sqrt[e]*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.200677, antiderivative size = 330, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2321, 195, 217, 206, 2327, 2325, 5659, 3716, 2190, 2279, 2391}

$$-\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4\sqrt{e}\sqrt{d+ex^2}}+\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log(cx^n)$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```


```
[Out] -(b*n*x*Sqrt[d + e*x^2])/4 + (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt
[e]*x)/Sqrt[d]]^2)/(4*Sqrt[e]*Sqrt[d + e*x^2]) - (b*d*n*ArcTanh[(Sqrt[e]*x)
/Sqrt[d + e*x^2]])/(4*Sqrt[e]) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[e]
*Sqrt[d + e*x^2]) + (x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 + (d^(3/2)*Sqr
t[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*Sqrt[e
]*Sqrt[d + e*x^2]) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSi
nh[(Sqrt[e]*x)/Sqrt[d]])])/(4*Sqrt[e]*Sqrt[d + e*x^2])
```


Rule 2321

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Sy
mbol] :> Simp[(x*(d + e*x^2)^q*(a + b*Log[c*x^n]))/(2*q + 1), x] + (-Dist[(
b*n)/(2*q + 1), Int[(d + e*x^2)^q, x], x] + Dist[(2*d*q)/(2*q + 1), Int[(d
+ e*x^2)^(q - 1)*(a + b*Log[c*x^n]), x], x]) /; FreeQ[{a, b, c, d, e, n}, x
] && GtQ[q, 0]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2327

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Dist[Sqrt[1 + (e*x^2)/d]/Sqrt[d + e*x^2], Int[(a + b*Log[c*x^n])/Sqr
t[1 + (e*x^2)/d], x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&  !GtQ[d, 0]
```

Rule 2325

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[e, 2], x]
 - Dist[(b*n)/Rt[e, 2], Int[ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]/x, x], x] /; Free
Q[{a, b, c, d, e, n}, x] && GtQ[d, 0] && PosQ[e]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \sqrt{d+ex^2}\,(a+b\log(cx^n))\,dx = \frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log(cx^n)) + \frac{1}{2}d\int \frac{a+b\log(cx^n)}{\sqrt{d+ex^2}}\,dx - \frac{1}{2}(bn)\int \sqrt{d+ex^2}\,dx$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2} + \frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log(cx^n)) - \frac{1}{4}(bdn)\int \frac{1}{\sqrt{d+ex^2}}\,dx + \frac{\left(d\sqrt{1+\frac{ex^2}{d}}\right.}{2}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2} + \frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log(cx^n)) + \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log}{2\sqrt{e}\sqrt{d+ex^2}}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2} - \frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}} + \frac{1}{2}x\sqrt{d+ex^2}\,(a+b\log(cx^n)) + \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}}{}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2} + \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}} - \frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}} + \frac{1}{2}x\sqrt{d+e}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2} + \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}} - \frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}} - \frac{bd^{3/2}n\sqrt{1}}{}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2} + \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}} - \frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}} - \frac{bd^{3/2}n\sqrt{1}}{}$$

$$= -\frac{1}{4}bnx\sqrt{d+ex^2} + \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4\sqrt{e}\sqrt{d+ex^2}} - \frac{bdn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{4\sqrt{e}} - \frac{bd^{3/2}n\sqrt{1}}{}$$

Mathematica [C] time = 0.354149, size = 237, normalized size = 0.72

$$\frac{-2b\sqrt{e}nx\sqrt{d+ex^2}\,{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{ex^2}{d}\right) + \sqrt{\frac{ex^2}{d}+1}\left(\sqrt{e}x(2a-bn)\sqrt{d+ex^2} + 2d\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(a-bn\log(x)\right.}{4\sqrt{e}\sqrt{\frac{ex^2}{d}+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*b*Sqrt[e]*n*x*Sqrt[d + e*x^2]*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2,
3/2}, -((e*x^2)/d)] + b*Sqrt[d]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[
```

```
d]]*(-1 + 2*Log[x]) + Sqrt[1 + (e*x^2)/d]*(Sqrt[e]*(2*a - b*n)*x*Sqrt[d + e
*x^2] + 2*d*(a - b*n*Log[x])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] + 2*b*Log[c
*x^n]*(Sqrt[e]*x*Sqrt[d + e*x^2] + d*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])))/
(4*Sqrt[e]*Sqrt[1 + (e*x^2)/d])
```

Maple [F] time = 0.439, size = 0, normalized size = 0.

$$\int (a + b \ln (c x^n)) \sqrt{e x^2 + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2),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((a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\sqrt{e x^2 + d} b \log (c x^n) + \sqrt{e x^2 + d} a, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b\log(cx^n))\sqrt{d + ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \sqrt{ex^2 + d}(b\log(cx^n) + a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a), x)
```

3.259 $\int \frac{\sqrt{d+ex^2}(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=345

$$-\frac{b\sqrt{e}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x}+\frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-$$

```
[Out] -((b*n*Sqrt[d + e*x^2])/x) + (b*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*
x)/Sqrt[d]])/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) + (b*Sqrt[e]*n*Sqrt[d + e*x^2]*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*Sqrt[e]
*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[
e]*x)/Sqrt[d]])])/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/x + (Sqrt[e]*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a +
b*Log[c*x^n]))/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*Sqrt[e]*n*Sqrt[d + e*x^2]
*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[d]*Sqrt[1 + (e*x^2
)/d])
```

Rubi [A] time = 0.394141, antiderivative size = 345, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2341, 277, 215, 2350, 14, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{e}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x}+\frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/x) + (b*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*
x)/Sqrt[d]])/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) + (b*Sqrt[e]*n*Sqrt[d + e*x^2]*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*Sqrt[e]
*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[
e]*x)/Sqrt[d]])])/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/x + (Sqrt[e]*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a +
b*Log[c*x^n]))/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*Sqrt[e]*n*Sqrt[d + e*x^2]
*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[d]*Sqrt[1 + (e*x^2
```

```
)/d])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx = \frac{\sqrt{d+ex^2}\int \frac{\sqrt{1+\frac{ex^2}{d}}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{\left(bn\sqrt{d+e\right.}{}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{\left(bn\sqrt{d+e\right.}{}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{\left(bn\sqrt{d+e\right.}{\sqrt{}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} - \frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{x} + \frac{\sqrt{e}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right.\right.}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{\sqrt{d+}}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{b\sqrt{e}n}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{b\sqrt{e}n}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{x} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{b\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{b\sqrt{e}n}{}$$

Mathematica [C] time = 0.559439, size = 183, normalized size = 0.53

$$\frac{bn\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{ex^2}{d}\right)-\log(x)\sqrt{\frac{ex^2}{d}+1}+\frac{\sqrt{e}x\log(x)\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}}\right)}{x\sqrt{\frac{ex^2}{d}+1}}-\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)-bn\log\right.}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (b*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2}, -(
(e*x^2)/d)] - Sqrt[1 + (e*x^2)/d]*Log[x] + (Sqrt[e]*x*ArcSinh[(Sqrt[e]*x)/S
qrt[d]]*Log[x])/Sqrt[d]))/(x*Sqrt[1 + (e*x^2)/d]) - (Sqrt[d + e*x^2]*(a - b
*n*Log[x] + b*Log[c*x^n]))/x + Sqrt[e]*(a - b*n*Log[x] + b*Log[c*x^n])*Log[
e*x + Sqrt[e]*Sqrt[d + e*x^2]]
```

Maple [F] time = 0.443, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x^2}\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^2,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^2,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((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log\left(cx^n\right)+\sqrt{ex^2+d}a}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^2,x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)\sqrt{d+ex^2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\sqrt{ex^2+d}\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^2, x)
```

3.260 $\int \frac{\sqrt{d+ex^2}(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=112

$$-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3dx^3}+\frac{be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d}-\frac{ben\sqrt{d+ex^2}}{3dx}-\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}$$

```
[Out] -(b*e*n*Sqrt[d + e*x^2])/(3*d*x) - (b*n*(d + e*x^2)^(3/2))/(9*d*x^3) + (b*e
^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d) - ((d + e*x^2)^(3/2)*(
a + b*Log[c*x^n]))/(3*d*x^3)
```

Rubi [A] time = 0.104005, antiderivative size = 112, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {2335, 277, 217, 206}

$$-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3dx^3}+\frac{be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d}-\frac{ben\sqrt{d+ex^2}}{3dx}-\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*e*n*Sqrt[d + e*x^2])/(3*d*x) - (b*n*(d + e*x^2)^(3/2))/(9*d*x^3) + (b*e
^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d) - ((d + e*x^2)^(3/2)*(
a + b*Log[c*x^n]))/(3*d*x^3)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
```

```
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x^4}\,dx &= -\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3dx^3}+\frac{(bn)\int\frac{\left(d+ex^2\right)^{3/2}}{x^4}\,dx}{3d}\\ &= -\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3dx^3}+\frac{(ben)\int\frac{\sqrt{d+ex^2}}{x^2}\,dx}{3d}\\ &= -\frac{ben\sqrt{d+ex^2}}{3dx}-\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3dx^3}+\frac{\left(be^2n\right)\int\frac{1}{\sqrt{d+ex^2}}\,dx}{3d}\\ &= -\frac{ben\sqrt{d+ex^2}}{3dx}-\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3dx^3}+\frac{\left(be^2n\right)\text{Subst}\left(\int\frac{}{1-}\right.}{3d}\\ &= -\frac{ben\sqrt{d+ex^2}}{3dx}-\frac{bn\left(d+ex^2\right)^{3/2}}{9dx^3}+\frac{be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(c}{3dx^3}\end{aligned}$$

Mathematica [A] time = 0.145032, size = 99, normalized size = 0.88

$$-\frac{\sqrt{d+ex^2}\left(3a\left(d+ex^2\right)+bn\left(d+4ex^2\right)\right)+3b\left(d+ex^2\right)^{3/2}\log(cx^n)-3be^{3/2}nx^3\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{9dx^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(Sqrt[d + e*x^2]*(3*a*(d + e*x^2) + b*n*(d + 4*e*x^2)) + 3*b*(d + e*x^2)^(
3/2)*Log[c*x^n] - 3*b*e^(3/2)*n*x^3*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(9*
```

```
d*x^3)
```

Maple [F] time = 0.475, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^4}\sqrt{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^4,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^4,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((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.48604, size = 529, normalized size = 4.72

$$\left[\frac{3\,be^{\frac{3}{2}}nx^3\log\left(-2\,ex^2 - 2\,\sqrt{ex^2 + d}\sqrt{e}x - d\right) - 2\left(bdn + (4\,ben + 3\,ae)x^2 + 3\,ad + 3\left(bex^2 + bd\right)\log(c) + 3\left(benx^2 + bdn\right.\right.}{18\,dx^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^4,x, algorithm="fricas")
```

```
[Out] [1/18*(3*b*e^(3/2)*n*x^3*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) -
2*(b*d*n + (4*b*e*n + 3*a*e)*x^2 + 3*a*d + 3*(b*e*x^2 + b*d)*log(c) + 3*(b*
e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/(d*x^3), -1/9*(3*b*sqrt(-e)*e*n*x
^3*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (b*d*n + (4*b*e*n + 3*a*e)*x^2 + 3*
```

```
a*d + 3*(b*e*x^2 + b*d)*log(c) + 3*(b*e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 +
 d))/(d*x^3)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log{(cx^n)})\sqrt{d + ex^2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**2)/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex^2 + d}(b\log{(cx^n)} + a)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^4, x)
```

3.261 $\int \frac{\sqrt{d+ex^2}(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=170

$$\frac{2e\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{15d^2x^3}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5}+\frac{2be^2n\sqrt{d+ex^2}}{15d^2x}-\frac{2be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{15d^2}+\frac{2ben\left(d\right.}{45d}$$

```
[Out] (2*b*e^2*n*Sqrt[d + e*x^2])/(15*d^2*x) + (2*b*e*n*(d + e*x^2)^(3/2))/(45*d^
2*x^3) - (b*n*(d + e*x^2)^(5/2))/(25*d^2*x^5) - (2*b*e^(5/2)*n*ArcTanh[(Sqr
t[e]*x)/Sqrt[d + e*x^2]])/(15*d^2) - ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))
/(5*d*x^5) + (2*e*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(15*d^2*x^3)
```

Rubi [A] time = 0.151702, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {271, 264, 2350, 12, 451, 277, 217, 206}

$$\frac{2e\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{15d^2x^3}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5}+\frac{2be^2n\sqrt{d+ex^2}}{15d^2x}-\frac{2be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{15d^2}+\frac{2ben\left(d\right.}{45d}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^6,x]
```



```
[Out] (2*b*e^2*n*Sqrt[d + e*x^2])/(15*d^2*x) + (2*b*e*n*(d + e*x^2)^(3/2))/(45*d^
2*x^3) - (b*n*(d + e*x^2)^(5/2))/(25*d^2*x^5) - (2*b*e^(5/2)*n*ArcTanh[(Sqr
t[e]*x)/Sqrt[d + e*x^2]])/(15*d^2) - ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))
/(5*d*x^5) + (2*e*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(15*d^2*x^3)
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x^6}\,dx = -\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{15d^2x^3} - (bn)\int \frac{\left(d+ex^2\right)^{3}}{1}$$

$$= -\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{15d^2x^3} - \frac{(bn)\int \frac{\left(d+ex^2\right)^{3/2}(-3}{x^6}}{15d^2}$$

$$= -\frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5} - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{15d^2x^3} -$$

$$= \frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5} - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}}{15d}$$

$$= \frac{2be^2n\sqrt{d+ex^2}}{15d^2x} + \frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5} - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5}$$

$$= \frac{2be^2n\sqrt{d+ex^2}}{15d^2x} + \frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5} - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{5dx^5}$$

$$= \frac{2be^2n\sqrt{d+ex^2}}{15d^2x} + \frac{2ben\left(d+ex^2\right)^{3/2}}{45d^2x^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25d^2x^5} - \frac{2be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{15d^2} - ($$

Mathematica [A] time = 0.194641, size = 145, normalized size = 0.85

$$-\frac{\sqrt{d+ex^2}\left(15a\left(3d^2+dex^2-2e^2x^4\right)+bn\left(9d^2+8dex^2-31e^2x^4\right)\right)+15b\sqrt{d+ex^2}\left(3d^2+dex^2-2e^2x^4\right)\log(cx^n)+30b}{225d^2x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(Sqrt[d + e*x^2]*(b*n*(9*d^2 + 8*d*e*x^2 - 31*e^2*x^4) + 15*a*(3*d^2 + d*e
*x^2 - 2*e^2*x^4)) + 15*b*Sqrt[d + e*x^2]*(3*d^2 + d*e*x^2 - 2*e^2*x^4)*Log
[c*x^n] + 30*b*e^(5/2)*n*x^5*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(225*d^2*x
^5)
```

Maple [F] time = 0.507, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^6}\sqrt{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^6,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^6,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((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.62611, size = 772, normalized size = 4.54

$$\left[\frac{15\,be^{\frac{5}{2}}nx^5\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\sqrt{e}x-d\right)+\left(\left(31\,be^2n+30\,ae^2\right)x^4-9\,bd^2n-45\,ad^2-(8\,bden+15\,ade)x^2+15\left(2\,be^2\right.\right.}{225\,d^2x^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^6,x, algorithm="fricas")
```

```
[Out] [1/225*(15*b*e^(5/2)*n*x^5*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d)
+ ((31*b*e^2*n + 30*a*e^2)*x^4 - 9*b*d^2*n - 45*a*d^2 - (8*b*d*e*n + 15*a*d
*e)*x^2 + 15*(2*b*e^2*x^4 - b*d*e*x^2 - 3*b*d^2)*log(c) + 15*(2*b*e^2*n*x^4
 - b*d*e*n*x^2 - 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^5), 1/225*(30*b
*sqrt(-e)*e^2*n*x^5*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + ((31*b*e^2*n + 30*
a*e^2)*x^4 - 9*b*d^2*n - 45*a*d^2 - (8*b*d*e*n + 15*a*d*e)*x^2 + 15*(2*b*e^
2*x^4 - b*d*e*x^2 - 3*b*d^2)*log(c) + 15*(2*b*e^2*n*x^4 - b*d*e*n*x^2 - 3*b
*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^5)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex^2+d}(b\log(cx^n)+a)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^6,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^6, x)
```

3.262 $\int \frac{\sqrt{d+ex^2}(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=230

$$-\frac{8e^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{105d^3x^3}+\frac{4e\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{35d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{7dx^7}-\frac{8be^3n\sqrt{d+ex^2}}{105d^3x}-$$

```
[Out] (-8*b*e^3*n*Sqrt[d + e*x^2])/(105*d^3*x) - (8*b*e^2*n*(d + e*x^2)^(3/2))/(3
15*d^3*x^3) - (b*n*(d + e*x^2)^(5/2))/(49*d^2*x^7) + (38*b*e*n*(d + e*x^2)^
(5/2))/(1225*d^3*x^5) + (8*b*e^(7/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]]
)/(105*d^3) - ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(7*d*x^7) + (4*e*(d +
e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(35*d^2*x^5) - (8*e^2*(d + e*x^2)^(3/2)*(a
 + b*Log[c*x^n]))/(105*d^3*x^3)
```

Rubi [A] time = 0.198763, antiderivative size = 230, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {271, 264, 2350, 12, 1265, 451, 277, 217, 206}

$$-\frac{8e^2\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{105d^3x^3}+\frac{4e\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{35d^2x^5}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{7dx^7}-\frac{8be^3n\sqrt{d+ex^2}}{105d^3x}-$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (-8*b*e^3*n*Sqrt[d + e*x^2])/(105*d^3*x) - (8*b*e^2*n*(d + e*x^2)^(3/2))/(3
15*d^3*x^3) - (b*n*(d + e*x^2)^(5/2))/(49*d^2*x^7) + (38*b*e*n*(d + e*x^2)^
(5/2))/(1225*d^3*x^5) + (8*b*e^(7/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]]
)/(105*d^3) - ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(7*d*x^7) + (4*e*(d +
e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(35*d^2*x^5) - (8*e^2*(d + e*x^2)^(3/2)*(a
 + b*Log[c*x^n]))/(105*d^3*x^3)
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x^8}\,dx = -\frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{7dx^7}+\frac{4e(d+ex^2)^{3/2}(a+b\log(cx^n))}{35d^2x^5}-\frac{8e^2(d+ex^2)^{3/2}(a\ \cdots}{105d^3x\ \cdots}$$

$$= -\frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{7dx^7}+\frac{4e(d+ex^2)^{3/2}(a+b\log(cx^n))}{35d^2x^5}-\frac{8e^2(d+ex^2)^{3/2}(a\ \cdots}{105d^3x\ \cdots}$$

$$= -\frac{bn(d+ex^2)^{5/2}}{49d^2x^7}-\frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{7dx^7}+\frac{4e(d+ex^2)^{3/2}(a+b\log(cx^n))}{35d^2x^5}-\cdots$$

$$= -\frac{bn(d+ex^2)^{5/2}}{49d^2x^7}+\frac{38ben(d+ex^2)^{5/2}}{1225d^3x^5}-\frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{7dx^7}+\frac{4e(d+ex^2)^{3/2}\cdots}{35\cdots}$$

$$= -\frac{8be^2n(d+ex^2)^{3/2}}{315d^3x^3}-\frac{bn(d+ex^2)^{5/2}}{49d^2x^7}+\frac{38ben(d+ex^2)^{5/2}}{1225d^3x^5}-\frac{(d+ex^2)^{3/2}(a+b\log(c\cdots}{7dx^7}$$

$$= -\frac{8be^3n\sqrt{d+ex^2}}{105d^3x}-\frac{8be^2n(d+ex^2)^{3/2}}{315d^3x^3}-\frac{bn(d+ex^2)^{5/2}}{49d^2x^7}+\frac{38ben(d+ex^2)^{5/2}}{1225d^3x^5}-\frac{(d+e\cdots}{\cdots}$$

$$= -\frac{8be^3n\sqrt{d+ex^2}}{105d^3x}-\frac{8be^2n(d+ex^2)^{3/2}}{315d^3x^3}-\frac{bn(d+ex^2)^{5/2}}{49d^2x^7}+\frac{38ben(d+ex^2)^{5/2}}{1225d^3x^5}-\frac{(d+e\cdots}{\cdots}$$

$$= -\frac{8be^3n\sqrt{d+ex^2}}{105d^3x}-\frac{8be^2n(d+ex^2)^{3/2}}{315d^3x^3}-\frac{bn(d+ex^2)^{5/2}}{49d^2x^7}+\frac{38ben(d+ex^2)^{5/2}}{1225d^3x^5}+\frac{8be^{7/2}\cdots}{\cdots}$$

Mathematica [A] time = 0.232031, size = 180, normalized size = 0.78

$$-\frac{\sqrt{d+ex^2}\left(105a\left(3d^2ex^2+15d^3-4de^2x^4+8e^3x^6\right)+bn\left(108d^2ex^2+225d^3-179de^2x^4+778e^3x^6\right)\right)+105b\sqrt{d+ex^2}\left(3d\cdots\right.}{11025d^3x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(Sqrt[d + e*x^2]*(105*a*(15*d^3 + 3*d^2*e*x^2 - 4*d*e^2*x^4 + 8*e^3*x^6) +
 b*n*(225*d^3 + 108*d^2*e*x^2 - 179*d*e^2*x^4 + 778*e^3*x^6)) + 105*b*Sqrt[
d + e*x^2]*(15*d^3 + 3*d^2*e*x^2 - 4*d*e^2*x^4 + 8*e^3*x^6)*Log[c*x^n] - 84
0*b*e^(7/2)*n*x^7*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(11025*d^3*x^7)
```

Maple [F] time = 0.53, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^8}\sqrt{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^8,x)
```

```
[Out] int((a+b*ln(c*x^n))*(e*x^2+d)^(1/2)/x^8,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((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.838, size = 1044, normalized size = 4.54

$$\left[\frac{420\, be^{\frac{7}{2}} nx^7 \log\left(-2\, ex^2 - 2\, \sqrt{ex^2 + d}\sqrt{e}x - d\right) - \left(2\left(389\, be^3 n + 420\, ae^3\right)x^6 + 225\, bd^3 n - \left(179\, bde^2 n + 420\, ade^2\right)x^4 + 15\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^8,x, algorithm="fricas")
```

```
[Out] [1/11025*(420*b*e^(7/2)*n*x^7*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x -
d) - (2*(389*b*e^3*n + 420*a*e^3)*x^6 + 225*b*d^3*n - (179*b*d*e^2*n + 420*
a*d*e^2)*x^4 + 1575*a*d^3 + 9*(12*b*d^2*e*n + 35*a*d^2*e)*x^2 + 105*(8*b*e^
3*x^6 - 4*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + 15*b*d^3)*log(c) + 105*(8*b*e^3*n*x
^6 - 4*b*d*e^2*n*x^4 + 3*b*d^2*e*n*x^2 + 15*b*d^3*n)*log(x))*sqrt(e*x^2 + d
))/(d^3*x^7), -1/11025*(840*b*sqrt(-e)*e^3*n*x^7*arctan(sqrt(-e)*x/sqrt(e*x
^2 + d)) + (2*(389*b*e^3*n + 420*a*e^3)*x^6 + 225*b*d^3*n - (179*b*d*e^2*n
+ 420*a*d*e^2)*x^4 + 1575*a*d^3 + 9*(12*b*d^2*e*n + 35*a*d^2*e)*x^2 + 105*(
8*b*e^3*x^6 - 4*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + 15*b*d^3)*log(c) + 105*(8*b*e
^3*n*x^6 - 4*b*d*e^2*n*x^4 + 3*b*d^2*e*n*x^2 + 15*b*d^3*n)*log(x))*sqrt(e*x
^2 + d))/(d^3*x^7)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))*(e*x**2+d)**(1/2)/x**8,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex^2+d}\,(b\log(cx^n)+a)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))*(e*x^2+d)^(1/2)/x^8,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^2 + d)*(b*log(c*x^n) + a)/x^8, x)
```

3.263 $\int x^5 \left(d+ex^2\right)^{3/2} (a+b\log(cx^n))\,dx$

Optimal. Leaf size=231

$$\frac{d^2\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3}-\frac{2d\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3}+\frac{\left(d+ex^2\right)^{9/2}(a+b\log(cx^n))}{9e^3}-\frac{8bd^4n\sqrt{d+ex^2}}{315e^3}-\ldots$$

```
[Out] (-8*b*d^4*n*Sqrt[d + e*x^2])/(315*e^3) - (8*b*d^3*n*(d + e*x^2)^(3/2))/(945
*e^3) - (8*b*d^2*n*(d + e*x^2)^(5/2))/(1575*e^3) + (11*b*d*n*(d + e*x^2)^(7
/2))/(441*e^3) - (b*n*(d + e*x^2)^(9/2))/(81*e^3) + (8*b*d^(9/2)*n*ArcTanh[
Sqrt[d + e*x^2]/Sqrt[d]])/(315*e^3) + (d^2*(d + e*x^2)^(5/2)*(a + b*Log[c*x
^n]))/(5*e^3) - (2*d*(d + e*x^2)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3) + ((d +
e*x^2)^(9/2)*(a + b*Log[c*x^n]))/(9*e^3)
```

Rubi [A] time = 0.276849, antiderivative size = 231, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 208}

$$\frac{d^2\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3}-\frac{2d\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3}+\frac{\left(d+ex^2\right)^{9/2}(a+b\log(cx^n))}{9e^3}-\frac{8bd^4n\sqrt{d+ex^2}}{315e^3}-\ldots$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```


```
[Out] (-8*b*d^4*n*Sqrt[d + e*x^2])/(315*e^3) - (8*b*d^3*n*(d + e*x^2)^(3/2))/(945
*e^3) - (8*b*d^2*n*(d + e*x^2)^(5/2))/(1575*e^3) + (11*b*d*n*(d + e*x^2)^(7
/2))/(441*e^3) - (b*n*(d + e*x^2)^(9/2))/(81*e^3) + (8*b*d^(9/2)*n*ArcTanh[
Sqrt[d + e*x^2]/Sqrt[d]])/(315*e^3) + (d^2*(d + e*x^2)^(5/2)*(a + b*Log[c*x
^n]))/(5*e^3) - (2*d*(d + e*x^2)^(7/2)*(a + b*Log[c*x^n]))/(7*e^3) + ((d +
e*x^2)^(9/2)*(a + b*Log[c*x^n]))/(9*e^3)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^5 \left(d+ex^2\right)^{3/2} (a+b\log(cx^n))\,dx = \frac{d^2\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{\left(d+ex^2\right)^{9/}}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{\left(d+ex^2\right)^{9/}}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{\left(d+ex^2\right)^{9/}}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{\left(d+ex^2\right)^{9/}}{}$$

$$= \frac{d^2\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3} - \frac{2d\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^3} + \frac{\left(d+ex^2\right)^{9/}}{}$$

$$= -\frac{8bd^4n\sqrt{d+ex^2}}{315e^3} - \frac{8bd^3n\left(d+ex^2\right)^{3/2}}{945e^3} - \frac{8bd^2n\left(d+ex^2\right)^{5/2}}{1575e^3} + \frac{11bdn\left(d+ex^2\right)^{7}}{441e^3}$$

$$= -\frac{8bd^4n\sqrt{d+ex^2}}{315e^3} - \frac{8bd^3n\left(d+ex^2\right)^{3/2}}{945e^3} - \frac{8bd^2n\left(d+ex^2\right)^{5/2}}{1575e^3} + \frac{11bdn\left(d+ex^2\right)^{7}}{441e^3}$$

Mathematica [A] time = 0.341419, size = 256, normalized size = 1.11

$$\frac{\sqrt{d+ex^2}\left(3d^2e^2x^4(315a+315b(\log(cx^n)-n\log(x))-143bn)-d^3ex^2(1260a+1260b(\log(cx^n)-n\log(x))-677bn)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2520*b*d^(9/2)*n*Log[x] + 315*b*n*(d + e*x^2)^(5/2)*(8*d^2 - 20*d*e*x^2 +
 35*e^2*x^4)*Log[x] + Sqrt[d + e*x^2]*(1225*e^4*x^8*(9*a - b*n - 9*b*n*Log[
x] + 9*b*Log[c*x^n]) + 3*d^2*e^2*x^4*(315*a - 143*b*n + 315*b*(-(n*Log[x])
+ Log[c*x^n])) + 25*d*e^3*x^6*(630*a - 97*b*n + 630*b*(-(n*Log[x]) + Log[c*
```

```
x^n])) + 2*d^4*(1260*a - 1307*b*n + 1260*b*(-(n*Log[x]) + Log[c*x^n])) - d^
3*e*x^2*(1260*a - 677*b*n + 1260*b*(-(n*Log[x]) + Log[c*x^n]))) + 2520*b*d^
(9/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(99225*e^3)
```

Maple [F] time = 0.474, size = 0, normalized size = 0.

$$\int x^5 \left(ex^2+d\right)^{\frac{3}{2}} (a+b\ln(cx^n))\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int(x^5*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),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(x^5*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.96075, size = 1246, normalized size = 5.39

$$\left[\frac{1260\, bd^{\frac{9}{2}} n \log\left(-\frac{ex^2+2\sqrt{ex^2+d}\sqrt{d}+2\,d}{x^2}\right) - \left(1225\left(be^4n - 9\,ae^4\right)x^8 + 25\left(97\,bde^3n - 630\,ade^3\right)x^6 + 2614\,bd^4n - 2520\,ad^4 + 3\left(\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [1/99225*(1260*b*d^(9/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x
^2) - (1225*(b*e^4*n - 9*a*e^4)*x^8 + 25*(97*b*d*e^3*n - 630*a*d*e^3)*x^6 +
```

```
 2614*b*d^4*n - 2520*a*d^4 + 3*(143*b*d^2*e^2*n - 315*a*d^2*e^2)*x^4 - (677
*b*d^3*e*n - 1260*a*d^3*e)*x^2 - 315*(35*b*e^4*x^8 + 50*b*d*e^3*x^6 + 3*b*d
^2*e^2*x^4 - 4*b*d^3*e*x^2 + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^8 + 50*b*d
*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 - 4*b*d^3*e*n*x^2 + 8*b*d^4*n)*log(x))*sqrt(
e*x^2 + d))/e^3, -1/99225*(2520*b*sqrt(-d)*d^4*n*arctan(sqrt(-d)/sqrt(e*x^2
 + d)) + (1225*(b*e^4*n - 9*a*e^4)*x^8 + 25*(97*b*d*e^3*n - 630*a*d*e^3)*x^
6 + 2614*b*d^4*n - 2520*a*d^4 + 3*(143*b*d^2*e^2*n - 315*a*d^2*e^2)*x^4 - (
677*b*d^3*e*n - 1260*a*d^3*e)*x^2 - 315*(35*b*e^4*x^8 + 50*b*d*e^3*x^6 + 3*
b*d^2*e^2*x^4 - 4*b*d^3*e*x^2 + 8*b*d^4)*log(c) - 315*(35*b*e^4*n*x^8 + 50*
b*d*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 - 4*b*d^3*e*n*x^2 + 8*b*d^4*n)*log(x))*sq
rt(e*x^2 + d))/e^3]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2+d\right)^{\frac{3}{2}}(b\log\left(cx^n\right)+a)x^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x^5, x)
```

3.264 $\int x^3 \left(d+ex^2\right)^{3/2} (a+b\log(cx^n))\,dx$

Optimal. Leaf size=177

$$-\frac{d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^2}+\frac{2bd^3n\sqrt{d+ex^2}}{35e^2}+\frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2}-\frac{2bd^{7/2}n\tanh^{-1}}{35e^2}$$

```
[Out] (2*b*d^3*n*Sqrt[d + e*x^2])/(35*e^2) + (2*b*d^2*n*(d + e*x^2)^(3/2))/(105*e
^2) + (2*b*d*n*(d + e*x^2)^(5/2))/(175*e^2) - (b*n*(d + e*x^2)^(7/2))/(49*e
^2) - (2*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(35*e^2) - (d*(d + e
*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2) + ((d + e*x^2)^(7/2)*(a + b*Log[c*x
^n]))/(7*e^2)
```

Rubi [A] time = 0.204717, antiderivative size = 177, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^2}+\frac{2bd^3n\sqrt{d+ex^2}}{35e^2}+\frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2}-\frac{2bd^{7/2}n\tanh^{-1}}{35e^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```


```
[Out] (2*b*d^3*n*Sqrt[d + e*x^2])/(35*e^2) + (2*b*d^2*n*(d + e*x^2)^(3/2))/(105*e
^2) + (2*b*d*n*(d + e*x^2)^(5/2))/(175*e^2) - (b*n*(d + e*x^2)^(7/2))/(49*e
^2) - (2*b*d^(7/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(35*e^2) - (d*(d + e
*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^2) + ((d + e*x^2)^(7/2)*(a + b*Log[c*x
^n]))/(7*e^2)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
```

```
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^{3/2} (a+b\log(cx^n))\,dx = -\frac{d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^2}-(bn)\int\frac{\left(d+ex\right.}{}$$

$$= -\frac{d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^2}-\frac{(bn)\int\frac{\left(d+ex^2\right)^{5/2}}{}}{35e}$$

$$= -\frac{d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^2}-\frac{(bn)\operatorname{Subst}\left(\int\right.}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{7/2}}{49e^2}-\frac{d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}(a+b\log(cx^n))}{7e^2}$$

$$= \frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2}-\frac{bn\left(d+ex^2\right)^{7/2}}{49e^2}-\frac{d\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^2}+\frac{\left(d+ex^2\right)}{}$$

$$= \frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2}+\frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2}-\frac{bn\left(d+ex^2\right)^{7/2}}{49e^2}-\frac{d\left(d+ex^2\right)^{5/2}(a+b\,l}{5e^2}$$

$$= \frac{2bd^3n\sqrt{d+ex^2}}{35e^2}+\frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2}+\frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2}-\frac{bn\left(d+ex^2\right)^{7/2}}{49e^2}-\frac{d\left(\right.}{}$$

$$= \frac{2bd^3n\sqrt{d+ex^2}}{35e^2}+\frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2}+\frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2}-\frac{bn\left(d+ex^2\right)^{7/2}}{49e^2}-\frac{d\left(\right.}{}$$

$$= \frac{2bd^3n\sqrt{d+ex^2}}{35e^2}+\frac{2bd^2n\left(d+ex^2\right)^{3/2}}{105e^2}+\frac{2bdn\left(d+ex^2\right)^{5/2}}{175e^2}-\frac{bn\left(d+ex^2\right)^{7/2}}{49e^2}-\frac{2b}{}$$

Mathematica [A] time = 0.192953, size = 227, normalized size = 1.28

$$\sqrt{d+ex^2}\left(-\frac{d^3(210a+210b(\log(cx^n)-n\log(x))-247bn)}{3675e^2}+\frac{d^2x^2(105a+105b(\log(cx^n)-n\log(x))-71bn)}{3675e}+\frac{dx^4(28}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (2*b*d^(7/2)*n*Log[x])/(35*e^2) - (b*n*(2*d - 5*e*x^2)*(d + e*x^2)^(5/2)*Lo
g[x])/(35*e^2) + Sqrt[d + e*x^2]*((e*x^6*(7*a - b*n + 7*b*(-(n*Log[x]) + Lo
g[c*x^n])))/49 + (d^2*x^2*(105*a - 71*b*n + 105*b*(-(n*Log[x]) + Log[c*x^n]
)))/(3675*e) - (d^3*(210*a - 247*b*n + 210*b*(-(n*Log[x]) + Log[c*x^n])))/(
3675*e^2) + (d*x^4*(280*a - 61*b*n + 280*b*(-(n*Log[x]) + Log[c*x^n])))/122
5) - (2*b*d^(7/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(35*e^2)
```

Maple [F] time = 0.441, size = 0, normalized size = 0.

$$\int x^3 \left(ex^2+d\right)^{\frac{3}{2}} \left(a+b\ln\left(cx^n\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int(x^3*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),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(x^3*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.69552, size = 983, normalized size = 5.55

$$\left[\frac{105\, bd^{\frac{7}{2}} n \log\left(-\frac{ex^2 - 2\,\sqrt{ex^2+d}\sqrt{d} + 2\,d}{x^2}\right) - \left(75\,\left(be^3 n - 7\,ae^3\right)x^6 - 247\,bd^3 n + 3\,\left(61\,bde^2 n - 280\,ade^2\right)x^4 + 210\,ad^3 + \left(71\,bd^2 e\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [1/3675*(105*b*d^(7/2)*n*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2
) - (75*(b*e^3*n - 7*a*e^3)*x^6 - 247*b*d^3*n + 3*(61*b*d*e^2*n - 280*a*d*e
^2)*x^4 + 210*a*d^3 + (71*b*d^2*e*n - 105*a*d^2*e)*x^2 - 105*(5*b*e^3*x^6 +
 8*b*d*e^2*x^4 + b*d^2*e*x^2 - 2*b*d^3)*log(c) - 105*(5*b*e^3*n*x^6 + 8*b*d
*e^2*n*x^4 + b*d^2*e*n*x^2 - 2*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^2, 1/367
5*(210*b*sqrt(-d)*d^3*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (75*(b*e^3*n - 7
*a*e^3)*x^6 - 247*b*d^3*n + 3*(61*b*d*e^2*n - 280*a*d*e^2)*x^4 + 210*a*d^3
+ (71*b*d^2*e*n - 105*a*d^2*e)*x^2 - 105*(5*b*e^3*x^6 + 8*b*d*e^2*x^4 + b*d
^2*e*x^2 - 2*b*d^3)*log(c) - 105*(5*b*e^3*n*x^6 + 8*b*d*e^2*n*x^4 + b*d^2*e
*n*x^2 - 2*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/e^2]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2+d\right)^{\frac{3}{2}}(b\log\left(cx^n\right)+a)x^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x^3, x)
```

3.265 $\int x\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))\,dx$

Optimal. Leaf size=125

$$\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e}-\frac{bd^2n\sqrt{d+ex^2}}{5e}+\frac{bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{5e}-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}$$

```
[Out] -(b*d^2*n*Sqrt[d + e*x^2])/(5*e) - (b*d*n*(d + e*x^2)^(3/2))/(15*e) - (b*n*
(d + e*x^2)^(5/2))/(25*e) + (b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/
(5*e) + ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e)
```

Rubi [A] time = 0.106275, antiderivative size = 125, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2338, 266, 50, 63, 208}

$$\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e}-\frac{bd^2n\sqrt{d+ex^2}}{5e}+\frac{bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{5e}-\frac{bdn\left(d+ex^2\right)^{3/2}}{15e}-\frac{bn\left(d+ex^2\right)^{5/2}}{25e}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*Sqrt[d + e*x^2])/(5*e) - (b*d*n*(d + e*x^2)^(3/2))/(15*e) - (b*n*
(d + e*x^2)^(5/2))/(25*e) + (b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/
(5*e) + ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e)
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int x\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))\,dx = \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e} - \frac{(bn)\int\frac{\left(d+ex^2\right)^{5/2}}{x}\,dx}{5e}$$

$$= \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e} - \frac{(bn)\,\text{Subst}\left(\int\frac{(d+ex)^{5/2}}{x}\,dx,x,x^2\right)}{10e}$$

$$= -\frac{bn\left(d+ex^2\right)^{5/2}}{25e} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e} - \frac{(bdn)\,\text{Subst}\left(\int\frac{(d+ex)^{3/2}}{x}\,dx,x,\right.}{10e}$$

$$= -\frac{bdn\left(d+ex^2\right)^{3/2}}{15e} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e} - \frac{\left(bd^2n\right)\text{Su}}{}$$

$$= -\frac{bd^2n\sqrt{d+ex^2}}{5e} - \frac{bdn\left(d+ex^2\right)^{3/2}}{15e} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(c}{5e}$$

$$= -\frac{bd^2n\sqrt{d+ex^2}}{5e} - \frac{bdn\left(d+ex^2\right)^{3/2}}{15e} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(c}{5e}$$

$$= -\frac{bd^2n\sqrt{d+ex^2}}{5e} - \frac{bdn\left(d+ex^2\right)^{3/2}}{15e} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e} + \frac{bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{5e}$$

Mathematica [A] time = 0.138715, size = 181, normalized size = 1.45

$$\sqrt{d+ex^2}\left(\frac{d^2(15a+15b(\log(cx^n)-n\log(x))-23bn)}{75e} + \frac{1}{75}dx^2(30a+30b(\log(cx^n)-n\log(x))-11bn) + \frac{1}{25}ex^4(5a+\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^(5/2)*n*Log[x])/(5*e) + (b*n*(d + e*x^2)^(5/2)*Log[x])/(5*e) + Sqrt[d
 + e*x^2]*((e*x^4*(5*a - b*n + 5*b*(-(n*Log[x]) + Log[c*x^n])))/25 + (d^2*(
15*a - 23*b*n + 15*b*(-(n*Log[x]) + Log[c*x^n])))/(75*e) + (d*x^2*(30*a - 1
1*b*n + 30*b*(-(n*Log[x]) + Log[c*x^n])))/75) + (b*d^(5/2)*n*Log[d + Sqrt[d
]*Sqrt[d + e*x^2]])/(5*e)
```

Maple [F] time = 0.459, size = 0, normalized size = 0.

$$\int x\left(ex^2+d\right)^{\frac{3}{2}}(a+b\ln(cx^n))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int(x*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),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(x*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.58339, size = 734, normalized size = 5.87

$$\left[\frac{15\,bd^{\frac{5}{2}}n\log\left(-\frac{ex^2+2\,\sqrt{ex^2+d}\sqrt{d}+2\,d}{x^2}\right)-2\left(3\left(be^2n-5\,ae^2\right)x^4+23\,bd^2n-15\,ad^2+(11\,bden-30\,ade)x^2-15\left(be^2x^4+2\,bdex^2\right.\right.}{150\,e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] [1/150*(15*b*d^(5/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2)
- 2*(3*(b*e^2*n - 5*a*e^2)*x^4 + 23*b*d^2*n - 15*a*d^2 + (11*b*d*e*n - 30*a
*d*e)*x^2 - 15*(b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*log(c) - 15*(b*e^2*n*x^4 +
 2*b*d*e*n*x^2 + b*d^2*n)*log(x))*sqrt(e*x^2 + d))/e, -1/75*(15*b*sqrt(-d)*
d^2*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (3*(b*e^2*n - 5*a*e^2)*x^4 + 23*b*
d^2*n - 15*a*d^2 + (11*b*d*e*n - 30*a*d*e)*x^2 - 15*(b*e^2*x^4 + 2*b*d*e*x^
2 + b*d^2)*log(c) - 15*(b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*log(x))*sqrt
(e*x^2 + d))/e]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2+d\right)^{\frac{3}{2}}(b\log\left(cx^n\right)+a)x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x, x)
```

3.266 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=260

$$-\frac{1}{2}bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)+\frac{1}{3}\left(-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}\right)(a+b\log(cx^n)$$

```
[Out] (-4*b*d*n*Sqrt[d + e*x^2])/3 - (b*n*(d + e*x^2)^(3/2))/9 + (4*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/3 + (b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/S
qrt[d]]^2)/2 + ((3*d*Sqrt[d + e*x^2] + (d + e*x^2)^(3/2) - 3*d^(3/2)*ArcTan
h[Sqrt[d + e*x^2]/Sqrt[d]])*(a + b*Log[c*x^n]))/3 - b*d^(3/2)*n*ArcTanh[Sqr
t[d + e*x^2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])] - (b*d^(
3/2)*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2
```

Rubi [A] time = 0.392062, antiderivative size = 260, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{1}{2}bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)+\frac{1}{3}\left(-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}\right)(a+b\log(cx^n)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-4*b*d*n*Sqrt[d + e*x^2])/3 - (b*n*(d + e*x^2)^(3/2))/9 + (4*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/3 + (b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/S
qrt[d]]^2)/2 + ((3*d*Sqrt[d + e*x^2] + (d + e*x^2)^(3/2) - 3*d^(3/2)*ArcTan
h[Sqrt[d + e*x^2]/Sqrt[d]])*(a + b*Log[c*x^n]))/3 - b*d^(3/2)*n*ArcTanh[Sqr
t[d + e*x^2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])] - (b*d^(
3/2)*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x}\,dx = \frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-(bn)$$

$$=\frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-\frac{1}{3}(bn$$

$$=\frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\right)(a+b\log(cx^n))-\frac{1}{6}(bn$$

$$=-bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{1}{3}\left(3d\sqrt{d+ex^2}+\left(d+ex^2\right)^{3/2}-3d^{3/2}\tanh^{-1}\right.$$

$$=-\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{1}{2}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2+\frac{1}{3}\left(3d\sqrt{d+\right.$$

$$=-\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}bd^{3/2}n\tanh^{-}$$

$$=-\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{4}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}bd^{3/2}n\tanh$$

$$=-\frac{4}{3}bdn\sqrt{d+ex^2}-\frac{1}{9}bn\left(d+ex^2\right)^{3/2}+\frac{4}{3}bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+\frac{1}{2}bd^{3/2}n\tanh$$

Mathematica [C] time = 0.767813, size = 301, normalized size = 1.16

$$\frac{benx^2\sqrt{d+ex^2}\left(\frac{d\log(x)\left(\left(\frac{ex^2}{d}+1\right)^{3/2}-1\right)}{3ex^2}-\frac{1}{4}\,{}_3F_2\left(-\frac{1}{2},1,1;2,2;-\frac{ex^2}{d}\right)\right)}{\sqrt{\frac{ex^2}{d}+1}}+\frac{bdn\sqrt{d+ex^2}\left(-\,{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{d}{ex^2}\right)+\log(x)\right.}{\sqrt{\frac{d}{ex^2}+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (b*e*n*x^2*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, 1, 1}, {2, 2}, -((e*x
^2)/d)]/4 + (d*(-1 + (1 + (e*x^2)/d)^(3/2))*Log[x])/(3*e*x^2)))/Sqrt[1 + (e
*x^2)/d] + (b*d*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {
1/2, 1/2}, -(d/(e*x^2))] + Sqrt[1 + d/(e*x^2)]*Log[x] - (Sqrt[d]*ArcSinh[Sq
rt[d]/(Sqrt[e]*x)]*Log[x])/(Sqrt[e]*x)))/Sqrt[1 + d/(e*x^2)] + (Sqrt[d + e*
x^2]*(4*d + e*x^2)*(a - b*n*Log[x] + b*Log[c*x^n]))/3 + d^(3/2)*Log[x]*(a -
 b*n*Log[x] + b*Log[c*x^n]) - d^(3/2)*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d
 + Sqrt[d]*Sqrt[d + e*x^2]]
```

Maple [F] time = 0.406, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x}\left(ex^2 + d\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x,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^2+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bex^2 + bd\right)\sqrt{ex^2 + d}\log\left(cx^n\right) + \left(aex^2 + ad\right)\sqrt{ex^2 + d}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))\left(d + ex^2\right)^{\frac{3}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2 + d\right)^{\frac{3}{2}}(b\log(cx^n) + a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x, x)
```

3.267 $\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=295

$$-\frac{3}{4}b\sqrt{d}en\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{2x^2}+\frac{3}{2}e\sqrt{d+ex^2}(a+b\log(cx^n))-\frac{3}{2}\sqrt{d}e\tanh^{-}$$

```
[Out] -(b*e*n*Sqrt[d + e*x^2]) - (b*d*n*Sqrt[d + e*x^2])/(4*x^2) + (3*b*Sqrt[d]*e
*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/4 + (3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d +
e*x^2]/Sqrt[d]]^2)/4 + (3*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 - ((d + e
*x^2)^(3/2)*(a + b*Log[c*x^n]))/(2*x^2) - (3*Sqrt[d]*e*ArcTanh[Sqrt[d + e*x
^2]/Sqrt[d]]*(a + b*Log[c*x^n]))/2 - (3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2 - (3*b*Sqrt[d]*
e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/4
```

Rubi [A] time = 0.44173, antiderivative size = 295, normalized size of antiderivative = 1., number of steps used = 18, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.48, Rules used = {266, 47, 50, 63, 208, 2350, 12, 14, 5984, 5918, 2402, 2315}

$$-\frac{3}{4}b\sqrt{d}en\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{2x^2}+\frac{3}{2}e\sqrt{d+ex^2}(a+b\log(cx^n))-\frac{3}{2}\sqrt{d}e\tanh^{-}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*e*n*Sqrt[d + e*x^2]) - (b*d*n*Sqrt[d + e*x^2])/(4*x^2) + (3*b*Sqrt[d]*e
*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/4 + (3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d +
e*x^2]/Sqrt[d]]^2)/4 + (3*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 - ((d + e
*x^2)^(3/2)*(a + b*Log[c*x^n]))/(2*x^2) - (3*Sqrt[d]*e*ArcTanh[Sqrt[d + e*x
^2]/Sqrt[d]]*(a + b*Log[c*x^n]))/2 - (3*b*Sqrt[d]*e*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/2 - (3*b*Sqrt[d]*
e*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/4
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^3}\,dx = \frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n)) - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3}{2}\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d\cdot}}{\sqrt{}}\right.$$

$$= \frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n)) - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3}{2}\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d\cdot}}{\sqrt{}}\right.$$

$$= \frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n)) - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3}{2}\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d\cdot}}{\sqrt{}}\right.$$

$$= \frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n)) - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3}{2}\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d\cdot}}{\sqrt{}}\right.$$

$$= \frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n)) - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{2x^2} - \frac{3}{2}\sqrt{d}e\tanh^{-1}\left(\frac{\sqrt{d\cdot}}{\sqrt{}}\right.$$

$$= -ben\sqrt{d+ex^2} - \frac{bdn\sqrt{d+ex^2}}{4x^2} + \frac{3}{2}e\sqrt{d+ex^2}\,(a+b\log(cx^n)) - \frac{\left(d+ex^2\right)^{3/2}(a+b}{2x^2}$$

$$= -ben\sqrt{d+ex^2} - \frac{bdn\sqrt{d+ex^2}}{4x^2} + \frac{3}{4}b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2 + \frac{3}{2}e\sqrt{d+ex^2}\,(a+$$

$$= -ben\sqrt{d+ex^2} - \frac{bdn\sqrt{d+ex^2}}{4x^2} + \frac{3}{4}b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right) + \frac{3}{4}b\sqrt{d}en\tanh^{-1}\Big($$

$$= -ben\sqrt{d+ex^2} - \frac{bdn\sqrt{d+ex^2}}{4x^2} + \frac{3}{4}b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right) + \frac{3}{4}b\sqrt{d}en\tanh^{-1}\Big($$

$$= -ben\sqrt{d+ex^2} - \frac{bdn\sqrt{d+ex^2}}{4x^2} + \frac{3}{4}b\sqrt{d}en\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right) + \frac{3}{4}b\sqrt{d}en\tanh^{-1}\Big($$

Mathematica [C] time = 0.969833, size = 349, normalized size = 1.18

$$\frac{ben\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{d}{ex^2}\right)+\log(x)\sqrt{\frac{d}{ex^2}+1}-\frac{\sqrt{d}\log(x)\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{e}x}\right)}{\sqrt{\frac{d}{ex^2}+1}}-\frac{b\sqrt{d}n\sqrt{d+ex^2}\left(2\sqrt{d}\,{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (b*e*n*Sqrt[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2},
-(d/(e*x^2))] + Sqrt[1 + d/(e*x^2)]*Log[x] - (Sqrt[d]*ArcSinh[Sqrt[d]/(Sqrt
[e]*x)]*Log[x])/(Sqrt[e]*x)))/Sqrt[1 + d/(e*x^2)] - (b*Sqrt[d]*n*Sqrt[d + e
*x^2]*(2*Sqrt[d]*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2}, -(d/(e*x^2)
)] + (Sqrt[d]*Sqrt[1 + d/(e*x^2)] + Sqrt[e]*x*ArcSinh[Sqrt[d]/(Sqrt[e]*x)])
*(1 + 2*Log[x])))/(4*Sqrt[1 + d/(e*x^2)]*x^2) - ((d - 2*e*x^2)*Sqrt[d + e*x
^2]*(a - b*n*Log[x] + b*Log[c*x^n]))/(2*x^2) + (3*Sqrt[d]*e*Log[x]*(a - b*n
*Log[x] + b*Log[c*x^n]))/2 - (3*Sqrt[d]*e*(a - b*n*Log[x] + b*Log[c*x^n])*L
og[d + Sqrt[d]*Sqrt[d + e*x^2]])/2
```

Maple [F] time = 0.401, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^3}\left(ex^2+d\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^3,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^3,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^2+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bex^2+bd\right)\sqrt{ex^2+d}\log\left(cx^n\right)+\left(aex^2+ad\right)\sqrt{ex^2+d}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x^3, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^3, x)
```

3.268 $\int x^2 \left(d+ex^2\right)^{3/2} (a+b\log(cx^n))\,dx$

Optimal. Leaf size=464

$$\frac{bd^{5/2}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{32e^{3/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^{5/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{16e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e}$$

```
[Out] (-11*b*d^2*n*x*Sqrt[d + e*x^2])/(192*e) - (23*b*d*n*x^3*Sqrt[d + e*x^2])/28
8 - (b*e*n*x^5*Sqrt[d + e*x^2])/36 - (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])/(192*e^(3/2)*Sqrt[1 + (e*x^2)/d]) - (b*d^(5/2)*n*Sqrt[
d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(32*e^(3/2)*Sqrt[1 + (e*x^2)/d])
 + (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*e^(3/2)*Sqrt[1 + (e*x^2)/d]) + (d^2*x*Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/(16*e) + (d*x^3*Sqrt[d + e*x^2]*(a + b*Lo
g[c*x^n]))/8 + (x^3*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/6 - (d^(5/2)*Sqrt
[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(16*e^(3/2)*Sq
rt[1 + (e*x^2)/d]) + (b*d^(5/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])])/(32*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Rubi [A] time = 0.59279, antiderivative size = 464, normalized size of antiderivative = 1., number of steps used = 19, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.52, Rules used = {2341, 279, 321, 215, 2350, 12, 14, 195, 5659, 3716, 2190, 2279, 2391}

$$\frac{bd^{5/2}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{32e^{3/2}\sqrt{\frac{ex^2}{d}+1}}-\frac{d^{5/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{16e^{3/2}\sqrt{\frac{ex^2}{d}+1}}+\frac{d^2x\sqrt{d+ex^2}\,(a+b\log(cx^n))}{16e}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```


```
[Out] (-11*b*d^2*n*x*Sqrt[d + e*x^2])/(192*e) - (23*b*d*n*x^3*Sqrt[d + e*x^2])/28
8 - (b*e*n*x^5*Sqrt[d + e*x^2])/36 - (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])/(192*e^(3/2)*Sqrt[1 + (e*x^2)/d]) - (b*d^(5/2)*n*Sqrt[
d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(32*e^(3/2)*Sqrt[1 + (e*x^2)/d])
 + (b*d^(5/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*e^(3/2)*Sqrt[1 + (e*x^2)/d]) + (d^2*x*Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/(16*e) + (d*x^3*Sqrt[d + e*x^2]*(a + b*Lo
```

```
g[c*x^n]))/8 + (x^3*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/6 - (d^(5/2)*Sqrt
[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(16*e^(3/2)*Sq
rt[1 + (e*x^2)/d]) + (b*d^(5/2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])])/(32*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 279

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + n*p + 1)), x] + Dist[(a*n*p)/(m + n*p +
1), Int[(c*x)^m*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c, m}, x] && IG
tQ[n, 0] && GtQ[p, 0] && NeQ[m + n*p + 1, 0] && IntBinomialQ[a, b, c, n, m,
 p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int x^2 \left(d+ex^2\right)^{3/2} \left(a+b\log\left(cx^n\right)\right)\,dx = \frac{\left(d\sqrt{d+ex^2}\right)\int x^2\left(1+\frac{ex^2}{d}\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}x^3\left(d+ex^2\right)^{3/}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}x^3\left(d+ex^2\right)^{3/}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}x^3\left(d+ex^2\right)^{3/}$$

$$= \frac{d^2x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{16e} + \frac{1}{8}dx^3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right) + \frac{1}{6}x^3\left(d+ex^2\right)^{3/}$$

$$= -\frac{bd^2nx\sqrt{d+ex^2}}{32e} - \frac{7}{96}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} + \frac{d^2x\sqrt{d+ex^2}\,(a+b}{16e}$$

$$= -\frac{13bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} - \frac{bd^{5/2}n\sqrt{d+ex^2}}{32e^{3/2}\sqrt{1}}$$

$$= -\frac{11bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} + \frac{bd^{5/2}n\sqrt{d+ex^2}}{192e^{3/2}\sqrt{}}$$

$$= -\frac{11bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} - \frac{bd^{5/2}n\sqrt{d+ex^2}}{192e^{3/2}\sqrt{}}$$

$$= -\frac{11bd^2nx\sqrt{d+ex^2}}{192e} - \frac{23}{288}bdnx^3\sqrt{d+ex^2} - \frac{1}{36}benx^5\sqrt{d+ex^2} - \frac{bd^{5/2}n\sqrt{d+ex^2}}{192e^{3/2}\sqrt{}}$$

Mathematica [C] time = 1.04213, size = 331, normalized size = 0.71

$$-144be^{5/2}nx^5\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{ex^2}{d}\right)-400bde^{3/2}nx^3\sqrt{d+ex^2}\,{}_3F_2\left(-\frac{1}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right)-75\left(\sqrt{\frac{ex^2}{d}+1}\left(3d^3 \mathrm{l}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-400*b*d*e^(3/2)*n*x^3*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 3/2, 3/2},
 {5/2, 5/2}, -((e*x^2)/d)] - 144*b*e^(5/2)*n*x^5*Sqrt[d + e*x^2]*Hypergeome
tricPFQ[{-1/2, 5/2, 5/2}, {7/2, 7/2}, -((e*x^2)/d)] - 75*(3*b*d^(5/2)*n*Sqr
t[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[x] + Sqrt[1 + (e*x^2)/d]*(-(a
*Sqrt[e]*x*Sqrt[d + e*x^2]*(3*d^2 + 14*d*e*x^2 + 8*e^2*x^4)) + 3*d^3*(a - b
*n*Log[x])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] - b*Log[c*x^n]*(Sqrt[e]*x*Sqr
t[d + e*x^2]*(3*d^2 + 14*d*e*x^2 + 8*e^2*x^4) - 3*d^3*Log[e*x + Sqrt[e]*Sqr
t[d + e*x^2]]))))/(3600*e^(3/2)*Sqrt[1 + (e*x^2)/d])
```

Maple [F] time = 0.414, size = 0, normalized size = 0.

$$\int x^2\left(ex^2+d\right)^{\frac{3}{2}}\left(a+b\ln\left(cx^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int(x^2*(e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),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(x^2*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bex^4 + bdx^2\right)\sqrt{ex^2 + d}\log\left(cx^n\right) + \left(aex^4 + adx^2\right)\sqrt{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral((b*e*x^4 + b*d*x^2)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^4 + a*d*x^
2)*sqrt(e*x^2 + d), 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(x**2*(e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2 + d\right)^{\frac{3}{2}} (b\log\left(cx^n\right) + a)x^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)*x^2, x)
```

3.269 $\int \left(d+ex^2\right)^{3/2} (a+b\log(cx^n))\,dx$

Optimal. Leaf size=378

$$-\frac{3bd^{5/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{16\sqrt{e}\sqrt{d+ex^2}}+\frac{3d^{5/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8\sqrt{e}\sqrt{d+ex^2}}+\frac{3}{8}dx\sqrt{d+ex^2}\,(a+b\log($$

```
[Out] (-9*b*d*n*x*Sqrt[d + e*x^2])/32 - (b*n*x*(d + e*x^2)^(3/2))/16 + (3*b*d^(5/
2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(16*Sqrt[e]*Sqrt[d
 + e*x^2]) - (9*b*d^2*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(32*Sqrt[e])
- (3*b*d^(5/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E
^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(8*Sqrt[e]*Sqrt[d + e*x^2]) + (3*d*x*Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/8 + (x*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n
]))/4 + (3*d^(5/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*
Log[c*x^n]))/(8*Sqrt[e]*Sqrt[d + e*x^2]) - (3*b*d^(5/2)*n*Sqrt[1 + (e*x^2)/
d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*Sqrt[e]*Sqrt[d + e*x
^2])
```

Rubi [A] time = 0.269006, antiderivative size = 378, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.5, Rules used = {2321, 195, 217, 206, 2327, 2325, 5659, 3716, 2190, 2279, 2391}

$$-\frac{3bd^{5/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{16\sqrt{e}\sqrt{d+ex^2}}+\frac{3d^{5/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{8\sqrt{e}\sqrt{d+ex^2}}+\frac{3}{8}dx\sqrt{d+ex^2}\,(a+b\log($$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```


```
[Out] (-9*b*d*n*x*Sqrt[d + e*x^2])/32 - (b*n*x*(d + e*x^2)^(3/2))/16 + (3*b*d^(5/
2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(16*Sqrt[e]*Sqrt[d
 + e*x^2]) - (9*b*d^2*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(32*Sqrt[e])
- (3*b*d^(5/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E
^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(8*Sqrt[e]*Sqrt[d + e*x^2]) + (3*d*x*Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/8 + (x*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n
]))/4 + (3*d^(5/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*
Log[c*x^n]))/(8*Sqrt[e]*Sqrt[d + e*x^2]) - (3*b*d^(5/2)*n*Sqrt[1 + (e*x^2)/
d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(16*Sqrt[e]*Sqrt[d + e*x
```

```
^2])
```

Rule 2321

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Sy
mbol] :> Simp[(x*(d + e*x^2)^q*(a + b*Log[c*x^n]))/(2*q + 1), x] + (-Dist[(
b*n)/(2*q + 1), Int[(d + e*x^2)^q, x], x] + Dist[(2*d*q)/(2*q + 1), Int[(d
+ e*x^2)^(q - 1)*(a + b*Log[c*x^n]), x], x]) /; FreeQ[{a, b, c, d, e, n}, x
] && GtQ[q, 0]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2327

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Dist[Sqrt[1 + (e*x^2)/d]/Sqrt[d + e*x^2], Int[(a + b*Log[c*x^n])/Sqr
t[1 + (e*x^2)/d], x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&  !GtQ[d, 0]
```

Rule 2325

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[e, 2], x]
 - Dist[(b*n)/Rt[e, 2], Int[ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]/x, x], x] /; Free
Q[{a, b, c, d, e, n}, x] && GtQ[d, 0] && PosQ[e]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)\,dx=\frac{1}{4}x\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}(3d)\int\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)\,dx-\frac{1}{4}(bn)\int$$

$$=-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}x\left(d+ex^2\right)^{3/2}\left(a+b\log\left(c\right.\right.$$

$$=-\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}x\left(d+\right.$$

$$=-\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3}{8}dx\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)+\frac{1}{4}x\left(d+\right.$$

$$=-\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}-\frac{9bd^2n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{32\sqrt{e}}+\frac{3}{8}dx\sqrt{d+ex^2}\,($$

$$=-\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}-\frac{9bd^2n}{}$$

$$=-\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}-\frac{9bd^2n}{}$$

$$=-\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}-\frac{9bd^2n}{}$$

$$=-\frac{9}{32}bdnx\sqrt{d+ex^2}-\frac{1}{16}bnx\left(d+ex^2\right)^{3/2}+\frac{3bd^{5/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{16\sqrt{e}\sqrt{d+ex^2}}-\frac{9bd^2n}{}$$

Mathematica [C] time = 0.899494, size = 314, normalized size = 0.83

$$\frac{9\left(-4bd\sqrt{e}nx\sqrt{d+ex^2}\,{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{ex^2}{d}\right)+\sqrt{\frac{ex^2}{d}+1}\left(3d^2\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(a-bn\log(x))+\sqrt{e}x\sqrt{d+ex^2}\left(5a\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]),x]
```

```
[Out] (-8*b*e^(3/2)*n*x^3*Sqrt[d + e*x^2]*HypergeometricPFQ[{-1/2, 3/2, 3/2}, {5/
2, 5/2}, -((e*x^2)/d)] + 9*(-4*b*d*Sqrt[e]*n*x*Sqrt[d + e*x^2]*Hypergeometr
icPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2}, -((e*x^2)/d)] + b*d^(3/2)*n*Sqrt[d + e*x
^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(-2 + 3*Log[x]) + Sqrt[1 + (e*x^2)/d]*(Sqr
t[e]*x*Sqrt[d + e*x^2]*(5*a*d - 2*b*d*n + 2*a*e*x^2) + 3*d^2*(a - b*n*Log[x
])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]] + b*Log[c*x^n]*(Sqrt[e]*x*Sqrt[d + e*
x^2]*(5*d + 2*e*x^2) + 3*d^2*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]]))))/(72*Sqr
t[e]*Sqrt[1 + (e*x^2)/d])
```

Maple [F] time = 0.478, size = 0, normalized size = 0.

$$\int \left(e x^{2}+d\right)^{\frac{3}{2}} \left(a +b \ln \left(c \,x^{n}\right)\right)d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n)),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^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(bex^{2}+bd\right)\sqrt{ex^{2}+d}\log\left(cx^{n}\right)+\left(aex^{2}+ad\right)\sqrt{ex^{2}+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt(
e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int (a + b\log (cx^n)) \left(d + ex^2\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n)),x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(ex^2 + d\right)^{\frac{3}{2}} (b\log (cx^n) + a)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a), x)
```

3.270 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=400

$$-\frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4\sqrt{\frac{ex^2}{d}+1}}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x}+\frac{3}{2}ex\sqrt{d+ex^2}\,(a+b\log(cx^n))+\frac{3\sqrt{d}\cdots}{\cdots}$$

```
[Out] -((b*d*n*Sqrt[d + e*x^2])/x) - (b*e*n*x*Sqrt[d + e*x^2])/4 + (3*b*Sqrt[d]*S
qrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(4*Sqrt[1 + (e*x^2)/
d]) + (3*b*Sqrt[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2
)/(4*Sqrt[1 + (e*x^2)/d]) - (3*b*Sqrt[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[1
 + (e*x^2)/d]) + (3*e*x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 - ((d + e*x^2
)^(3/2)*(a + b*Log[c*x^n]))/x + (3*Sqrt[d]*Sqrt[e]*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*Sqrt[1 + (e*x^2)/d]) - (3*b*Sqr
t[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]
)])/(4*Sqrt[1 + (e*x^2)/d])
```

Rubi [A] time = 0.480609, antiderivative size = 400, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.48, Rules used = {2341, 277, 195, 215, 2350, 12, 14, 5659, 3716, 2190, 2279, 2391}

$$-\frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\,\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4\sqrt{\frac{ex^2}{d}+1}}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x}+\frac{3}{2}ex\sqrt{d+ex^2}\,(a+b\log(cx^n))+\frac{3\sqrt{d}\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d*n*Sqrt[d + e*x^2])/x) - (b*e*n*x*Sqrt[d + e*x^2])/4 + (3*b*Sqrt[d]*S
qrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(4*Sqrt[1 + (e*x^2)/
d]) + (3*b*Sqrt[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2
)/(4*Sqrt[1 + (e*x^2)/d]) - (3*b*Sqrt[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[1
 + (e*x^2)/d]) + (3*e*x*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/2 - ((d + e*x^2
)^(3/2)*(a + b*Log[c*x^n]))/x + (3*Sqrt[d]*Sqrt[e]*Sqrt[d + e*x^2]*ArcSinh[
(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*Sqrt[1 + (e*x^2)/d]) - (3*b*Sqr
```

```
t[d]*Sqrt[e]*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]
)])/(4*Sqrt[1 + (e*x^2)/d])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx=\frac{\left(d\sqrt{d+ex^2}\right)\int \frac{\left(1+\frac{ex^2}{d}\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x^2}\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$=\frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3\sqrt{d}\sqrt{e}\sqrt{d+ex^2}\,\mathrm{sin}}{2}$$

$$=\frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3\sqrt{d}\sqrt{e}\sqrt{d+ex^2}\,\mathrm{sin}}{2}$$

$$=\frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3\sqrt{d}\sqrt{e}\sqrt{d+ex^2}\,\mathrm{sin}}{2}$$

$$=\frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{x}+\frac{3\sqrt{d}\sqrt{e}\sqrt{d+ex^2}\,\mathrm{sin}}{2}$$

$$=-\frac{bdn\sqrt{d+ex^2}}{x}-\frac{1}{4}benx\sqrt{d+ex^2}+\frac{3}{2}ex\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)-\frac{\left(d+ex^2\right)^{3/2}(a}{x}$$

$$=-\frac{bdn\sqrt{d+ex^2}}{x}-\frac{1}{4}benx\sqrt{d+ex^2}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{}}{}$$

$$=-\frac{bdn\sqrt{d+ex^2}}{x}-\frac{1}{4}benx\sqrt{d+ex^2}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{}}{}$$

$$=-\frac{bdn\sqrt{d+ex^2}}{x}-\frac{1}{4}benx\sqrt{d+ex^2}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{}}{}$$

$$=-\frac{bdn\sqrt{d+ex^2}}{x}-\frac{1}{4}benx\sqrt{d+ex^2}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4\sqrt{1+\frac{ex^2}{d}}}+\frac{3b\sqrt{d}\sqrt{e}n\sqrt{}}{}$$

Mathematica [C] time = 0.991153, size = 329, normalized size = 0.82

$$-\frac{b\sqrt{d}n\sqrt{d+ex^2}\left(\sqrt{d}\,{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{ex^2}{d}\right)+\log(x)\left(\sqrt{d}\sqrt{\frac{ex^2}{d}+1}-\sqrt{e}x\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\right)\right)}{x\sqrt{\frac{ex^2}{d}+1}}+\frac{b\sqrt{e}n\sqrt{d+ex^2}\left((2\log\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*Sqrt[d]*n*Sqrt[d + e*x^2]*(Sqrt[d]*HypergeometricPFQ[{-1/2, -1/2, -1/2
}, {1/2, 1/2}, -((e*x^2)/d)] + (Sqrt[d]*Sqrt[1 + (e*x^2)/d] - Sqrt[e]*x*Arc
Sinh[(Sqrt[e]*x)/Sqrt[d]])*Log[x]))/(x*Sqrt[1 + (e*x^2)/d])) + (b*Sqrt[e]*n
*Sqrt[d + e*x^2]*(-2*Sqrt[e]*x*HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2
}, -((e*x^2)/d)] + (Sqrt[e]*x*Sqrt[1 + (e*x^2)/d] + Sqrt[d]*ArcSinh[(Sqrt[e
]*x)/Sqrt[d]])*(-1 + 2*Log[x])))/(4*Sqrt[1 + (e*x^2)/d]) - ((2*d - e*x^2)*S
qrt[d + e*x^2]*(a - b*n*Log[x] + b*Log[c*x^n]))/(2*x) + (3*d*Sqrt[e]*(a - b
*n*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/2
```

Maple [F] time = 0.434, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^2}\left(ex^2+d\right)^{\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^2,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^2,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^2+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bex^2+bd\right)\sqrt{ex^2+d}\log\left(cx^n\right)+\left(aex^2+ad\right)\sqrt{ex^2+d}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x^2, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(a+b\log\left(cx^n\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x**2, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^2, x)
```

3.271 $\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=400

$$-\frac{be^{3/2}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}+\frac{e^{3/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n)}{3x^3}$$

```
[Out] (-4*b*e*n*Sqrt[d + e*x^2])/(3*x) - (b*n*(d + e*x^2)^(3/2))/(9*x^3) + (4*b*e
^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(3*Sqrt[d]*Sqrt[1 +
(e*x^2)/d]) + (b*e^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/
(2*Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*e^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqr
t[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(Sqrt[d]*Sqrt
[1 + (e*x^2)/d]) - (e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x - ((d + e*x^2)^
(3/2)*(a + b*Log[c*x^n]))/(3*x^3) + (e^(3/2)*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[
e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*e^(3/
2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqr
t[d]*Sqrt[1 + (e*x^2)/d])
```

Rubi [A] time = 0.444425, antiderivative size = 400, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2341, 277, 215, 2350, 451, 5659, 3716, 2190, 2279, 2391}

$$-\frac{be^{3/2}n\sqrt{d+ex^2}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}+\frac{e^{3/2}\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}}-\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n)}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^4,x]
```


```
[Out] (-4*b*e*n*Sqrt[d + e*x^2])/(3*x) - (b*n*(d + e*x^2)^(3/2))/(9*x^3) + (4*b*e
^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(3*Sqrt[d]*Sqrt[1 +
(e*x^2)/d]) + (b*e^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/
(2*Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*e^(3/2)*n*Sqrt[d + e*x^2]*ArcSinh[(Sqr
t[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(Sqrt[d]*Sqrt
[1 + (e*x^2)/d]) - (e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/x - ((d + e*x^2)^
(3/2)*(a + b*Log[c*x^n]))/(3*x^3) + (e^(3/2)*Sqrt[d + e*x^2]*ArcSinh[(Sqrt[
e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*Sqrt[1 + (e*x^2)/d]) - (b*e^(3/
```

```
2)*n*Sqrt[d + e*x^2]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqr
t[d]*Sqrt[1 + (e*x^2)/d])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^4}\,dx = \frac{\left(d\sqrt{d+ex^2}\right)\int \frac{\left(1+\frac{ex^2}{d}\right)^{3/2}(a+b\log(cx^n))}{x^4}\,dx}{\sqrt{1+\frac{ex^2}{d}}}$$

$$= -\frac{e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x} - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3x^3} + \frac{e^{3/2}\sqrt{d+ex^2}\sinh^{-1}(}{\sqrt{d}\sqrt{}}$$

$$= -\frac{e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x} - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3x^3} + \frac{e^{3/2}\sqrt{d+ex^2}\sinh^{-1}(}{\sqrt{d}\sqrt{}}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} - \frac{e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{x} - \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3x^3} + \frac{e^{3/2}}{}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} - \frac{e\sqrt{d+ex^2}\,(a+}{x}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{4be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{be^{3/2}n\sqrt{d+ex}}{2\sqrt{d}\sqrt{}}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{4be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{be^{3/2}n\sqrt{d+ex}}{2\sqrt{d}\sqrt{}}$$

$$= -\frac{4ben\sqrt{d+ex^2}}{3x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9x^3} + \frac{4be^{3/2}n\sqrt{d+ex^2}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3\sqrt{d}\sqrt{1+\frac{ex^2}{d}}} + \frac{be^{3/2}n\sqrt{d+ex}}{2\sqrt{d}\sqrt{}}$$

Mathematica [C] time = 0.756763, size = 269, normalized size = 0.67

$$\frac{ben\sqrt{d+ex^2}\left(-{}_3F_2\left(-\frac{1}{2},-\frac{1}{2},-\frac{1}{2};\frac{1}{2},\frac{1}{2};-\frac{ex^2}{d}\right)-\log(x)\sqrt{\frac{ex^2}{d}+1}+\frac{\sqrt{e}x\log(x)\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}}\right)}{x\sqrt{\frac{ex^2}{d}+1}} + e^{3/2}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)(a+b$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] (b*d*n*Sqrt[d + e*x^2]*(-Hypergeometric2F1[-3/2, -3/2, -1/2, -((e*x^2)/d)]
- 3*(1 + (e*x^2)/d)^(3/2)*Log[x]))/(9*x^3*Sqrt[1 + (e*x^2)/d]) + (b*e*n*Sqr
t[d + e*x^2]*(-HypergeometricPFQ[{-1/2, -1/2, -1/2}, {1/2, 1/2}, -((e*x^2)/
d)] - Sqrt[1 + (e*x^2)/d]*Log[x] + (Sqrt[e]*x*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*
Log[x])/Sqrt[d]))/(x*Sqrt[1 + (e*x^2)/d]) - (Sqrt[d + e*x^2]*(d + 4*e*x^2)*
(a - b*n*Log[x] + b*Log[c*x^n]))/(3*x^3) + e^(3/2)*(a - b*n*Log[x] + b*Log[
c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]]
```

Maple [F] time = 0.423, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{x^{4}}\left(ex^{2}+d\right)^{\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^4,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^4,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^2+d)^(3/2)*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\left(bex^{2}+bd\right)\sqrt{ex^{2}+d}\log\left(cx^{n}\right)+\left(aex^{2}+ad\right)\sqrt{ex^{2}+d}}{x^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] integral(((b*e*x^2 + b*d)*sqrt(e*x^2 + d)*log(c*x^n) + (a*e*x^2 + a*d)*sqrt
(e*x^2 + d))/x^4, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b \log{(cx^n)}) \left(d + ex^2\right)^{\frac{3}{2}}}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] Integral((a + b*log(c*x**n))*(d + e*x**2)**(3/2)/x**4, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2 + d\right)^{\frac{3}{2}} (b \log{(cx^n)} + a)}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^4, x)
```

3.272 $\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=138

$$-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5dx^5}-\frac{be^2n\sqrt{d+ex^2}}{5dx}+\frac{be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d}-\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}$$

```
[Out] -(b*e^2*n*Sqrt[d + e*x^2])/(5*d*x) - (b*e*n*(d + e*x^2)^(3/2))/(15*d*x^3) -
 (b*n*(d + e*x^2)^(5/2))/(25*d*x^5) + (b*e^(5/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt
[d + e*x^2]])/(5*d) - ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*d*x^5)
```

Rubi [A] time = 0.121985, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {2335, 277, 217, 206}

$$-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5dx^5}-\frac{be^2n\sqrt{d+ex^2}}{5dx}+\frac{be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d}-\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*e^2*n*Sqrt[d + e*x^2])/(5*d*x) - (b*e*n*(d + e*x^2)^(3/2))/(15*d*x^3) -
 (b*n*(d + e*x^2)^(5/2))/(25*d*x^5) + (b*e^(5/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt
[d + e*x^2]])/(5*d) - ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*d*x^5)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
```

```
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^6}\,dx = -\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5dx^5}+\frac{(bn)\int\frac{\left(d+ex^2\right)^{5/2}}{x^6}\,dx}{5d}$$

$$= -\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5dx^5}+\frac{(ben)\int\frac{\left(d+ex^2\right)^{3/2}}{x^4}\,dx}{5d}$$

$$= -\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5dx^5}+\frac{\left(be^2n\right)\int\frac{\sqrt{d+e}}{x^2}$$

$$= -\frac{be^2n\sqrt{d+ex^2}}{5dx}-\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5dx^5}$$

$$= -\frac{be^2n\sqrt{d+ex^2}}{5dx}-\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5dx^5}$$

$$= -\frac{be^2n\sqrt{d+ex^2}}{5dx}-\frac{ben\left(d+ex^2\right)^{3/2}}{15dx^3}-\frac{bn\left(d+ex^2\right)^{5/2}}{25dx^5}+\frac{be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d}-\frac{(d}{}$$

Mathematica [A] time = 0.182406, size = 114, normalized size = 0.83

$$-\frac{\sqrt{d+ex^2}\left(15a\left(d+ex^2\right)^2+bn\left(3d^2+11dex^2+23e^2x^4\right)\right)+15b\left(d+ex^2\right)^{5/2}\log(cx^n)-15be^{5/2}nx^5\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right.}{75dx^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(Sqrt[d + e*x^2]*(15*a*(d + e*x^2)^2 + b*n*(3*d^2 + 11*d*e*x^2 + 23*e^2*x^
4)) + 15*b*(d + e*x^2)^(5/2)*Log[c*x^n] - 15*b*e^(5/2)*n*x^5*Log[e*x + Sqrt
[e]*Sqrt[d + e*x^2]])/(75*d*x^5)
```

Maple [F] time = 0.48, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{x^{6}}\left(ex^{2}+d\right)^{\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^6,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^2+d)^(3/2)*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.56912, size = 761, normalized size = 5.51

$$\left[\frac{15\,be^{\frac{5}{2}}nx^{5}\log\left(-2\,ex^{2}-2\,\sqrt{ex^{2}+d}\sqrt{e}x-d\right)-2\left(\left(23\,be^{2}n+15\,ae^{2}\right)x^{4}+3\,bd^{2}n+15\,ad^{2}+\left(11\,bden+30\,ade\right)x^{2}+15\,(\ldots}{150\,dx^{5}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] [1/150*(15*b*e^(5/2)*n*x^5*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d)
- 2*((23*b*e^2*n + 15*a*e^2)*x^4 + 3*b*d^2*n + 15*a*d^2 + (11*b*d*e*n + 30*
```

```
a*d*e)*x^2 + 15*(b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*log(c) + 15*(b*e^2*n*x^4
+ 2*b*d*e*n*x^2 + b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d*x^5), -1/75*(15*b*sq
rt(-e)*e^2*n*x^5*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + ((23*b*e^2*n + 15*a*e
^2)*x^4 + 3*b*d^2*n + 15*a*d^2 + (11*b*d*e*n + 30*a*d*e)*x^2 + 15*(b*e^2*x^
4 + 2*b*d*e*x^2 + b*d^2)*log(c) + 15*(b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n
)*log(x))*sqrt(e*x^2 + d))/(d*x^5)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^6, x)
```

3.273 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=196

$$\frac{2e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}-\frac{2be^{7/2}n\tanh^{-1}}{35d^2}$$

```
[Out] (2*b*e^3*n*Sqrt[d + e*x^2])/(35*d^2*x) + (2*b*e^2*n*(d + e*x^2)^(3/2))/(105
*d^2*x^3) + (2*b*e*n*(d + e*x^2)^(5/2))/(175*d^2*x^5) - (b*n*(d + e*x^2)^(7
/2))/(49*d^2*x^7) - (2*b*e^(7/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3
5*d^2) - ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(7*d*x^7) + (2*e*(d + e*x^2
)^(5/2)*(a + b*Log[c*x^n]))/(35*d^2*x^5)
```

Rubi [A] time = 0.171883, antiderivative size = 196, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {271, 264, 2350, 12, 451, 277, 217, 206}

$$\frac{2e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{35d^2x^5}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{7dx^7}+\frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}-\frac{2be^{7/2}n\tanh^{-1}}{35d^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (2*b*e^3*n*Sqrt[d + e*x^2])/(35*d^2*x) + (2*b*e^2*n*(d + e*x^2)^(3/2))/(105
*d^2*x^3) + (2*b*e*n*(d + e*x^2)^(5/2))/(175*d^2*x^5) - (b*n*(d + e*x^2)^(7
/2))/(49*d^2*x^7) - (2*b*e^(7/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3
5*d^2) - ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(7*d*x^7) + (2*e*(d + e*x^2
)^(5/2)*(a + b*Log[c*x^n]))/(35*d^2*x^5)
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^8}\,dx = -\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{7dx^7}+\frac{2e\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{35d^2x^5}-(bn)\int \frac{\left(d+ex\right.}{}$$

$$=-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{7dx^7}+\frac{2e\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{35d^2x^5}-\frac{(bn)\int\frac{\left(d+ex^2\right)^{5/2}}{}}{35d}$$

$$=-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{7dx^7}+\frac{2e\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{35d^2x^5}$$

$$=\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{7dx^7}+\frac{2e\left(d+ex^2\right)}{3}$$

$$=\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log}{7dx^7}$$

$$=\frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{(d+}{}$$

$$=\frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{(d+}{}$$

$$=\frac{2be^3n\sqrt{d+ex^2}}{35d^2x}+\frac{2be^2n\left(d+ex^2\right)^{3/2}}{105d^2x^3}+\frac{2ben\left(d+ex^2\right)^{5/2}}{175d^2x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{49d^2x^7}-\frac{2be^{7}}{}$$

Mathematica [A] time = 0.222432, size = 145, normalized size = 0.74

$$-\frac{\sqrt{d+ex^2}\left(105a\left(5d-2ex^2\right)\left(d+ex^2\right)^2+bn\left(183d^2ex^2+75d^3+71de^2x^4-247e^3x^6\right)\right)+105b\left(5d-2ex^2\right)\left(d+ex^2\right)^{5/2}\mathrm{l}}{3675d^2x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(Sqrt[d + e*x^2]*(105*a*(5*d - 2*e*x^2)*(d + e*x^2)^2 + b*n*(75*d^3 + 183*
d^2*e*x^2 + 71*d*e^2*x^4 - 247*e^3*x^6)) + 105*b*(5*d - 2*e*x^2)*(d + e*x^2
)^(5/2)*Log[c*x^n] + 210*b*e^(7/2)*n*x^7*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]]
)/(3675*d^2*x^7)
```

Maple [F] time = 0.499, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^8} \left(ex^2 + d\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^8,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^8,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^2+d)^(3/2)*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.84193, size = 1013, normalized size = 5.17

$$\left[\frac{105\, be^{\frac{7}{2}} nx^7 \log\left(-2\, ex^2 + 2\, \sqrt{ex^2 + d}\sqrt{e}x - d\right) + \left(\left(247\, be^3 n + 210\, ae^3\right)x^6 - 75\, bd^3 n - \left(71\, bde^2 n + 105\, ade^2\right)x^4 - 525\, ad^3\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] [1/3675*(105*b*e^(7/2)*n*x^7*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d
) + ((247*b*e^3*n + 210*a*e^3)*x^6 - 75*b*d^3*n - (71*b*d*e^2*n + 105*a*d*e
^2)*x^4 - 525*a*d^3 - 3*(61*b*d^2*e*n + 280*a*d^2*e)*x^2 + 105*(2*b*e^3*x^6
 - b*d*e^2*x^4 - 8*b*d^2*e*x^2 - 5*b*d^3)*log(c) + 105*(2*b*e^3*n*x^6 - b*d
*e^2*n*x^4 - 8*b*d^2*e*n*x^2 - 5*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^7
), 1/3675*(210*b*sqrt(-e)*e^3*n*x^7*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + ((
```

```
247*b*e^3*n + 210*a*e^3)*x^6 - 75*b*d^3*n - (71*b*d*e^2*n + 105*a*d*e^2)*x^
4 - 525*a*d^3 - 3*(61*b*d^2*e*n + 280*a*d^2*e)*x^2 + 105*(2*b*e^3*x^6 - b*d
*e^2*x^4 - 8*b*d^2*e*x^2 - 5*b*d^3)*log(c) + 105*(2*b*e^3*n*x^6 - b*d*e^2*n
*x^4 - 8*b*d^2*e*n*x^2 - 5*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^7)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^8, x)
```

3.274 $\int \frac{(d+ex^2)^{3/2}(a+b\log(cx^n))}{x^{10}}\,dx$

Optimal. Leaf size=256

$$-\frac{8e^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{315d^3x^5}+\frac{4e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{63d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{9dx^9}-\frac{8be^4n\sqrt{d+ex^2}}{315d^3x}-\cdots$$

```
[Out] (-8*b*e^4*n*Sqrt[d + e*x^2])/(315*d^3*x) - (8*b*e^3*n*(d + e*x^2)^(3/2))/(9
45*d^3*x^3) - (8*b*e^2*n*(d + e*x^2)^(5/2))/(1575*d^3*x^5) - (b*n*(d + e*x^
2)^(7/2))/(81*d^2*x^9) + (50*b*e*n*(d + e*x^2)^(7/2))/(3969*d^3*x^7) + (8*b
*e^(9/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(315*d^3) - ((d + e*x^2)^(
5/2)*(a + b*Log[c*x^n]))/(9*d*x^9) + (4*e*(d + e*x^2)^(5/2)*(a + b*Log[c*x^
n]))/(63*d^2*x^7) - (8*e^2*(d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(315*d^3*x
^5)
```

Rubi [A] time = 0.220568, antiderivative size = 256, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {271, 264, 2350, 12, 1265, 451, 277, 217, 206}

$$-\frac{8e^2\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{315d^3x^5}+\frac{4e\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{63d^2x^7}-\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{9dx^9}-\frac{8be^4n\sqrt{d+ex^2}}{315d^3x}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] (-8*b*e^4*n*Sqrt[d + e*x^2])/(315*d^3*x) - (8*b*e^3*n*(d + e*x^2)^(3/2))/(9
45*d^3*x^3) - (8*b*e^2*n*(d + e*x^2)^(5/2))/(1575*d^3*x^5) - (b*n*(d + e*x^
2)^(7/2))/(81*d^2*x^9) + (50*b*e*n*(d + e*x^2)^(7/2))/(3969*d^3*x^7) + (8*b
*e^(9/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(315*d^3) - ((d + e*x^2)^(
5/2)*(a + b*Log[c*x^n]))/(9*d*x^9) + (4*e*(d + e*x^2)^(5/2)*(a + b*Log[c*x^
n]))/(63*d^2*x^7) - (8*e^2*(d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(315*d^3*x
^5)
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
```

```
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
```

```
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{x^{10}}\,dx = -\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{9dx^9}+\frac{4e\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{63d^2x^7}-\frac{8e^2\left(d+ex^2\right)^{5/2}(}{315d}$$

$$= -\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{9dx^9}+\frac{4e\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{63d^2x^7}-\frac{8e^2\left(d+ex^2\right)^{5/2}(}{315d}$$

$$= -\frac{bn\left(d+ex^2\right)^{7/2}}{81d^2x^9}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{9dx^9}+\frac{4e\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{63d^2x^7}-$$

$$= -\frac{bn\left(d+ex^2\right)^{7/2}}{81d^2x^9}+\frac{50ben\left(d+ex^2\right)^{7/2}}{3969d^3x^7}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{9dx^9}+\frac{4e\left(d+ex^2\right.}{}$$

$$= -\frac{8be^2n\left(d+ex^2\right)^{5/2}}{1575d^3x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{81d^2x^9}+\frac{50ben\left(d+ex^2\right)^{7/2}}{3969d^3x^7}-\frac{\left(d+ex^2\right)^{5/2}(a+b\log}{9dx^9}$$

$$= -\frac{8be^3n\left(d+ex^2\right)^{3/2}}{945d^3x^3}-\frac{8be^2n\left(d+ex^2\right)^{5/2}}{1575d^3x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{81d^2x^9}+\frac{50ben\left(d+ex^2\right)^{7/2}}{3969d^3x^7}-$$

$$= -\frac{8be^4n\sqrt{d+ex^2}}{315d^3x}-\frac{8be^3n\left(d+ex^2\right)^{3/2}}{945d^3x^3}-\frac{8be^2n\left(d+ex^2\right)^{5/2}}{1575d^3x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{81d^2x^9}+\frac{50b}{}$$

$$= -\frac{8be^4n\sqrt{d+ex^2}}{315d^3x}-\frac{8be^3n\left(d+ex^2\right)^{3/2}}{945d^3x^3}-\frac{8be^2n\left(d+ex^2\right)^{5/2}}{1575d^3x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{81d^2x^9}+\frac{50b}{}$$

$$= -\frac{8be^4n\sqrt{d+ex^2}}{315d^3x}-\frac{8be^3n\left(d+ex^2\right)^{3/2}}{945d^3x^3}-\frac{8be^2n\left(d+ex^2\right)^{5/2}}{1575d^3x^5}-\frac{bn\left(d+ex^2\right)^{7/2}}{81d^2x^9}+\frac{50b}{}$$

Mathematica [A] time = 0.268336, size = 178, normalized size = 0.7

$$-\frac{\sqrt{d+ex^2}\left(315a\left(35d^2-20dex^2+8e^2x^4\right)\left(d+ex^2\right)^2+bn\left(429d^2e^2x^4+2425d^3ex^2+1225d^4-677de^3x^6+2614e^4x^8\right)\right)}{99225d^3x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -(Sqrt[d + e*x^2]*(315*a*(d + e*x^2)^2*(35*d^2 - 20*d*e*x^2 + 8*e^2*x^4) +
b*n*(1225*d^4 + 2425*d^3*e*x^2 + 429*d^2*e^2*x^4 - 677*d*e^3*x^6 + 2614*e^4
*x^8)) + 315*b*(d + e*x^2)^(5/2)*(35*d^2 - 20*d*e*x^2 + 8*e^2*x^4)*Log[c*x^
n] - 2520*b*e^(9/2)*n*x^9*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(99225*d^3*x^
9)
```

Maple [F] time = 0.51, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x^{10}}\left(ex^2+d\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^10,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*ln(c*x^n))/x^10,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^2+d)^(3/2)*(a+b*log(c*x^n))/x^10,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.18455, size = 1287, normalized size = 5.03

$$\left[\frac{1260\,be^{\frac{9}{2}}nx^9\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\sqrt{e}x-d\right)-\left(2\left(1307\,be^4n+1260\,ae^4\right)x^8-\left(677\,bde^3n+1260\,ade^3\right)x^6+1225\,bd^4n\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^10,x, algorithm="fricas")
```

```
[Out] [1/99225*(1260*b*e^(9/2)*n*x^9*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x -
 d) - (2*(1307*b*e^4*n + 1260*a*e^4)*x^8 - (677*b*d*e^3*n + 1260*a*d*e^3)*x
^6 + 1225*b*d^4*n + 11025*a*d^4 + 3*(143*b*d^2*e^2*n + 315*a*d^2*e^2)*x^4 +
 25*(97*b*d^3*e*n + 630*a*d^3*e)*x^2 + 315*(8*b*e^4*x^8 - 4*b*d*e^3*x^6 + 3
*b*d^2*e^2*x^4 + 50*b*d^3*e*x^2 + 35*b*d^4)*log(c) + 315*(8*b*e^4*n*x^8 - 4
*b*d*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 + 50*b*d^3*e*n*x^2 + 35*b*d^4*n)*log(x))
*sqrt(e*x^2 + d))/(d^3*x^9), -1/99225*(2520*b*sqrt(-e)*e^4*n*x^9*arctan(sqr
t(-e)*x/sqrt(e*x^2 + d)) + (2*(1307*b*e^4*n + 1260*a*e^4)*x^8 - (677*b*d*e^
3*n + 1260*a*d*e^3)*x^6 + 1225*b*d^4*n + 11025*a*d^4 + 3*(143*b*d^2*e^2*n +
 315*a*d^2*e^2)*x^4 + 25*(97*b*d^3*e*n + 630*a*d^3*e)*x^2 + 315*(8*b*e^4*x^
8 - 4*b*d*e^3*x^6 + 3*b*d^2*e^2*x^4 + 50*b*d^3*e*x^2 + 35*b*d^4)*log(c) + 3
15*(8*b*e^4*n*x^8 - 4*b*d*e^3*n*x^6 + 3*b*d^2*e^2*n*x^4 + 50*b*d^3*e*n*x^2
+ 35*b*d^4*n)*log(x))*sqrt(e*x^2 + d))/(d^3*x^9)]
```

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**2+d)**(3/2)*(a+b*ln(c*x**n))/x**10,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(ex^2+d\right)^{\frac{3}{2}}\left(b\log\left(cx^n\right)+a\right)}{x^{10}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*log(c*x^n))/x^10,x, algorithm="giac")
```

```
[Out] integrate((e*x^2 + d)^(3/2)*(b*log(c*x^n) + a)/x^10, x)
```

3.275 $\int x\sqrt{4+x^2}\log(x)\,dx$

Optimal. Leaf size=60

$$-\frac{1}{9}\left(x^2+4\right)^{3/2}-\frac{4\sqrt{x^2+4}}{3}+\frac{1}{3}\left(x^2+4\right)^{3/2}\log(x)+\frac{8}{3}\tanh^{-1}\left(\frac{\sqrt{x^2+4}}{2}\right)$$

```
[Out] (-4*Sqrt[4 + x^2])/3 - (4 + x^2)^(3/2)/9 + (8*ArcTanh[Sqrt[4 + x^2]/2])/3 +
 ((4 + x^2)^(3/2)*Log[x])/3
```

Rubi [A] time = 0.0454512, antiderivative size = 60, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {2338, 266, 50, 63, 207}

$$-\frac{1}{9}\left(x^2+4\right)^{3/2}-\frac{4\sqrt{x^2+4}}{3}+\frac{1}{3}\left(x^2+4\right)^{3/2}\log(x)+\frac{8}{3}\tanh^{-1}\left(\frac{\sqrt{x^2+4}}{2}\right)$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[4 + x^2]*Log[x],x]
```

```
[Out] (-4*Sqrt[4 + x^2])/3 - (4 + x^2)^(3/2)/9 + (8*ArcTanh[Sqrt[4 + x^2]/2])/3 +
 ((4 + x^2)^(3/2)*Log[x])/3
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 207

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTanh[(Rt[b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (LtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$
\begin{aligned}
\int x\sqrt{4+x^2}\log(x)\,dx &= \frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{1}{3}\int\frac{\left(4+x^2\right)^{3/2}}{x}\,dx\\
&= \frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{1}{6}\operatorname{Subst}\left(\int\frac{(4+x)^{3/2}}{x}\,dx,x,x^2\right)\\
&= -\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{2}{3}\operatorname{Subst}\left(\int\frac{\sqrt{4+x}}{x}\,dx,x,x^2\right)\\
&= -\frac{4}{3}\sqrt{4+x^2}-\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{8}{3}\operatorname{Subst}\left(\int\frac{1}{x\sqrt{4+x}}\,dx,x,x^2\right)\\
&= -\frac{4}{3}\sqrt{4+x^2}-\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)-\frac{16}{3}\operatorname{Subst}\left(\int\frac{1}{-4+x^2}\,dx,x,\sqrt{4+x^2}\right)\\
&= -\frac{4}{3}\sqrt{4+x^2}-\frac{1}{9}\left(4+x^2\right)^{3/2}+\frac{8}{3}\tanh^{-1}\left(\frac{\sqrt{4+x^2}}{2}\right)+\frac{1}{3}\left(4+x^2\right)^{3/2}\log(x)
\end{aligned}
$$

Mathematica [A] time = 0.0436634, size = 53, normalized size = 0.88

$$
\frac{1}{3}\left(-\frac{1}{3}\left(x^2+16\right)\sqrt{x^2+4}+\left(x^2+4\right)^{3/2}\log(x)+8\log\left(\sqrt{x^2+4}+2\right)-8\log(x)\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[4 + x^2]*Log[x],x]
```

```
[Out] (-(Sqrt[4 + x^2]*(16 + x^2))/3 - 8*Log[x] + (4 + x^2)^(3/2)*Log[x] + 8*Log[
2 + Sqrt[4 + x^2]])/3
```

Maple [A] time = 0.306, size = 75, normalized size = 1.3

$$\left(-\frac{2}{9}\sqrt{1+\frac{x^2}{4}}+\frac{2\,\ln(x)}{3}\sqrt{1+\frac{x^2}{4}}\right)x^2+\frac{32}{9}-\frac{32}{9}\sqrt{1+\frac{x^2}{4}}+\ln(x)\left(-\frac{8}{3}+\frac{8}{3}\sqrt{1+\frac{x^2}{4}}\right)+\frac{8}{3}\ln\left(\frac{1}{2}+\frac{1}{2}\sqrt{1+\frac{x^2}{4}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x)*(x^2+4)^(1/2),x)
```

```
[Out] (-2/9*(1+1/4*x^2)^(1/2)+2/3*ln(x)*(1+1/4*x^2)^(1/2))*x^2+32/9-32/9*(1+1/4*x
^2)^(1/2)+ln(x)*(-8/3+8/3*(1+1/4*x^2)^(1/2))+8/3*ln(1/2+1/2*(1+1/4*x^2)^(1/
2))
```

Maxima [A] time = 1.73041, size = 53, normalized size = 0.88

$$\frac{1}{3}\left(x^2+4\right)^{\frac{3}{2}}\log(x)-\frac{1}{9}\left(x^2+4\right)^{\frac{3}{2}}-\frac{4}{3}\sqrt{x^2+4}+\frac{8}{3}\,\operatorname{arsinh}\left(\frac{2}{|x|}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)*(x^2+4)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*(x^2 + 4)^(3/2)*log(x) - 1/9*(x^2 + 4)^(3/2) - 4/3*sqrt(x^2 + 4) + 8/3*
arcsinh(2/abs(x))
```

Fricas [A] time = 1.33906, size = 162, normalized size = 2.7

$$-\frac{1}{9}\left(x^2-3\left(x^2+4\right)\log(x)+16\right)\sqrt{x^2+4}+\frac{8}{3}\,\log\left(-x+\sqrt{x^2+4}+2\right)-\frac{8}{3}\,\log\left(-x+\sqrt{x^2+4}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)*(x^2+4)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/9*(x^2 - 3*(x^2 + 4)*log(x) + 16)*sqrt(x^2 + 4) + 8/3*log(-x + sqrt(x^2
+ 4) + 2) - 8/3*log(-x + sqrt(x^2 + 4) - 2)
```

Sympy [A] time = 24.8481, size = 65, normalized size = 1.08

$$\frac{\left(x^2+4\right)^{\frac{3}{2}}\log\left(x\right)}{3}-\frac{\left(x^2+4\right)^{\frac{3}{2}}}{9}-\frac{4\sqrt{x^2+4}}{3}-\frac{4\log\left(\sqrt{x^2+4}-2\right)}{3}+\frac{4\log\left(\sqrt{x^2+4}+2\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x)*(x**2+4)**(1/2),x)
```

```
[Out] (x**2 + 4)**(3/2)*log(x)/3 - (x**2 + 4)**(3/2)/9 - 4*sqrt(x**2 + 4)/3 - 4*l
og(sqrt(x**2 + 4) - 2)/3 + 4*log(sqrt(x**2 + 4) + 2)/3
```

Giac [A] time = 1.29545, size = 73, normalized size = 1.22

$$\frac{1}{3}\left(x^2+4\right)^{\frac{3}{2}}\log\left(x\right)-\frac{1}{9}\left(x^2+4\right)^{\frac{3}{2}}-\frac{4}{3}\sqrt{x^2+4}+\frac{4}{3}\log\left(\sqrt{x^2+4}+2\right)-\frac{4}{3}\log\left(\sqrt{x^2+4}-2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)*(x^2+4)^(1/2),x, algorithm="giac")
```

```
[Out] 1/3*(x^2 + 4)^(3/2)*log(x) - 1/9*(x^2 + 4)^(3/2) - 4/3*sqrt(x^2 + 4) + 4/3*
log(sqrt(x^2 + 4) + 2) - 4/3*log(sqrt(x^2 + 4) - 2)
```

3.276 $\int \frac{x^5(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=182

$$\frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3}-\frac{2d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3}-\frac{8bd^2n\sqrt{d+ex^2}}{15e^3}+\frac{8bd^{5/2}}{}$$

```
[Out] (-8*b*d^2*n*Sqrt[d + e*x^2])/(15*e^3) + (7*b*d*n*(d + e*x^2)^(3/2))/(45*e^3
) - (b*n*(d + e*x^2)^(5/2))/(25*e^3) + (8*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]])/(15*e^3) + (d^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3 - (2*d
*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) + ((d + e*x^2)^(5/2)*(a + b*
Log[c*x^n]))/(5*e^3)
```

Rubi [A] time = 0.228303, antiderivative size = 182, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 208}

$$\frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3}-\frac{2d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3}+\frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n))}{5e^3}-\frac{8bd^2n\sqrt{d+ex^2}}{15e^3}+\frac{8bd^{5/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```


```
[Out] (-8*b*d^2*n*Sqrt[d + e*x^2])/(15*e^3) + (7*b*d*n*(d + e*x^2)^(3/2))/(45*e^3
) - (b*n*(d + e*x^2)^(5/2))/(25*e^3) + (8*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]])/(15*e^3) + (d^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3 - (2*d
*(d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3) + ((d + e*x^2)^(5/2)*(a + b*
Log[c*x^n]))/(5*e^3)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^5 (a + b\log(cx^n))}{\sqrt{d+ex^2}}\,dx = \frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n)}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n)}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n)}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n)}{5e^3}$$

$$= \frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{2d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} + \frac{\left(d+ex^2\right)^{5/2}(a+b\log(cx^n)}{5e^3}$$

$$= -\frac{8bd^2n\sqrt{d+ex^2}}{15e^3} + \frac{7bdn\left(d+ex^2\right)^{3/2}}{45e^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e^3} + \frac{d^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{2d\,(}{}$$

$$= -\frac{8bd^2n\sqrt{d+ex^2}}{15e^3} + \frac{7bdn\left(d+ex^2\right)^{3/2}}{45e^3} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e^3} + \frac{8bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{15e^3} + \frac{d^2\sqrt{d\,-}}{}$$

Mathematica [A] time = 0.190928, size = 204, normalized size = 1.12

$$\frac{120ad^2\sqrt{d+ex^2} + 45ae^2x^4\sqrt{d+ex^2} - 60adex^2\sqrt{d+ex^2} + 15b\sqrt{d+ex^2}\left(8d^2-4dex^2+3e^2x^4\right)\log(cx^n) - 94bd^2n\sqrt{d+ex}}{225e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (120*a*d^2*Sqrt[d + e*x^2] - 94*b*d^2*n*Sqrt[d + e*x^2] - 60*a*d*e*x^2*Sqrt
[d + e*x^2] + 17*b*d*e*n*x^2*Sqrt[d + e*x^2] + 45*a*e^2*x^4*Sqrt[d + e*x^2]
 - 9*b*e^2*n*x^4*Sqrt[d + e*x^2] - 120*b*d^(5/2)*n*Log[x] + 15*b*Sqrt[d + e
*x^2]*(8*d^2 - 4*d*e*x^2 + 3*e^2*x^4)*Log[c*x^n] + 120*b*d^(5/2)*n*Log[d +
Sqrt[d]*Sqrt[d + e*x^2]])/(225*e^3)
```

Maple [F] time = 0.434, size = 0, normalized size = 0.

$$\int x^5 (a + b \ln (c x^n)) \frac{1}{\sqrt{e x^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),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(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.57755, size = 764, normalized size = 4.2

$$\left[\frac{60\, b d^{\frac{5}{2}} n \log\left(-\frac{e x^2 + 2\, \sqrt{e x^2 + d} \sqrt{d} + 2\, d}{x^2}\right) - \left(9\left(b e^2 n - 5\, a e^2\right) x^4 + 94\, b d^2 n - 120\, a d^2 - (17\, b d e n - 60\, a d e) x^2 - 15\left(3\, b e^2 x^4 - 4\, b d\right.\right.}{225\, e^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/225*(60*b*d^(5/2)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2)
- (9*(b*e^2*n - 5*a*e^2)*x^4 + 94*b*d^2*n - 120*a*d^2 - (17*b*d*e*n - 60*a*
d*e)*x^2 - 15*(3*b*e^2*x^4 - 4*b*d*e*x^2 + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*
x^4 - 4*b*d*e*n*x^2 + 8*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/e^3, -1/225*(120*
b*sqrt(-d)*d^2*n*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (9*(b*e^2*n - 5*a*e^2)*
```

```
x^4 + 94*b*d^2*n - 120*a*d^2 - (17*b*d*e*n - 60*a*d*e)*x^2 - 15*(3*b*e^2*x^
4 - 4*b*d*e*x^2 + 8*b*d^2)*log(c) - 15*(3*b*e^2*n*x^4 - 4*b*d*e*n*x^2 + 8*b
*d^2*n)*log(x))*sqrt(e*x^2 + d))/e^3]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^5 \left(a + b \log \left(cx^n\right)\right)}{\sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**5*(a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log \left(cx^n\right) + a)x^5}{\sqrt{ex^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/sqrt(e*x^2 + d), x)
```

3.277 $\int \frac{x^3(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=129

$$-\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}-\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^2}+\frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right.}{9e^2}$$

```
[Out] (2*b*d*n*Sqrt[d + e*x^2])/(3*e^2) - (b*n*(d + e*x^2)^(3/2))/(9*e^2) - (2*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^2) - (d*Sqrt[d + e*x^2]*(a
 + b*Log[c*x^n]))/e^2 + ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2)
```

Rubi [A] time = 0.164337, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}-\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^2}+\frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right.}{9e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (2*b*d*n*Sqrt[d + e*x^2])/(3*e^2) - (b*n*(d + e*x^2)^(3/2))/(9*e^2) - (2*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^2) - (d*Sqrt[d + e*x^2]*(a
 + b*Log[c*x^n]))/e^2 + ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx = -\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}-(bn)\int\frac{\left(-2d+ex^2\right)\sqrt{d+ex}}{3e^2x}$$

$$= -\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}-\frac{(bn)\int\frac{\left(-2d+ex^2\right)\sqrt{d+ex^2}}{x}\,dx}{3e^2}$$

$$= -\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}-\frac{(bn)\,\mathrm{Subst}\left(\int\frac{(-2d+ex)\sqrt{d+ex}}{x}\right.}{6e^2}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^2}+\frac{(bdn)\,\mathrm{Sub}}{}$$

$$= \frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx}{3e^2}$$

$$= \frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx}{3e^2}$$

$$= \frac{2bdn\sqrt{d+ex^2}}{3e^2}-\frac{bn\left(d+ex^2\right)^{3/2}}{9e^2}-\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^2}-\frac{d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}$$

Mathematica [A] time = 0.15486, size = 145, normalized size = 1.12

$$\frac{3aex^2\sqrt{d+ex^2}-6ad\sqrt{d+ex^2}+3b\left(ex^2-2d\right)\sqrt{d+ex^2}\log(cx^n)-6bd^{3/2}n\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)+6bd^{3/2}n\log(x)-be}{9e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (-6*a*d*Sqrt[d + e*x^2] + 5*b*d*n*Sqrt[d + e*x^2] + 3*a*e*x^2*Sqrt[d + e*x^
2] - b*e*n*x^2*Sqrt[d + e*x^2] + 6*b*d^(3/2)*n*Log[x] + 3*b*(-2*d + e*x^2)*
```

```
Sqrt[d + e*x^2]*Log[c*x^n] - 6*b*d^(3/2)*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]
)/(9*e^2)
```

Maple [F] time = 0.419, size = 0, normalized size = 0.

$$\int x^{3}\left(a+b\ln\left(cx^{n}\right)\right)\frac{1}{\sqrt{ex^{2}+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),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(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.52923, size = 516, normalized size = 4.

$$\left[\frac{3\,bd^{\frac{3}{2}}n\log\left(-\frac{ex^{2}-2\,\sqrt{ex^{2}+d}\sqrt{d}+2\,d}{x^{2}}\right)+\left(5\,bdn-(ben-3\,ae)x^{2}-6\,ad+3\left(bex^{2}-2\,bd\right)\log\left(c\right)+3\left(benx^{2}-2\,bdn\right)\log\left(x\right)\right)\sqrt{e}}{9\,e^{2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/9*(3*b*d^(3/2)*n*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + (
5*b*d*n - (b*e*n - 3*a*e)*x^2 - 6*a*d + 3*(b*e*x^2 - 2*b*d)*log(c) + 3*(b*e
```

```
*n*x^2 - 2*b*d*n)*log(x))*sqrt(e*x^2 + d))/e^2, 1/9*(6*b*sqrt(-d)*d*n*arcta
n(sqrt(-d)/sqrt(e*x^2 + d)) + (5*b*d*n - (b*e*n - 3*a*e)*x^2 - 6*a*d + 3*(b
*e*x^2 - 2*b*d)*log(c) + 3*(b*e*n*x^2 - 2*b*d*n)*log(x))*sqrt(e*x^2 + d))/e
^2]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b\log(cx^n))}{\sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^3}{\sqrt{ex^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/sqrt(e*x^2 + d), x)
```

3.278 $\int \frac{x(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=73

$$\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e}-\frac{bn\sqrt{d+ex^2}}{e}+\frac{b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e}$$

```
[Out] -((b*n*Sqrt[d + e*x^2])/e) + (b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])
/e + (Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e
```

Rubi [A] time = 0.0778711, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2338, 266, 50, 63, 208}

$$\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e}-\frac{bn\sqrt{d+ex^2}}{e}+\frac{b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/e) + (b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])
/e + (Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{x(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx &= \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e}-\frac{(bn)\int\frac{\sqrt{d+ex^2}}{x}\,dx}{e}\\
&= \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e}-\frac{(bn)\,\mathrm{Subst}\left(\int\frac{\sqrt{d+ex}}{x}\,dx,x,x^2\right)}{2e}\\
&= -\frac{bn\sqrt{d+ex^2}}{e}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e}-\frac{(bdn)\,\mathrm{Subst}\left(\int\frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2e}\\
&= -\frac{bn\sqrt{d+ex^2}}{e}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e}-\frac{(bdn)\,\mathrm{Subst}\left(\int\frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{e^2}\\
&= -\frac{bn\sqrt{d+ex^2}}{e}+\frac{b\sqrt{d}\,n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e}
\end{aligned}$$

Mathematica [A] time = 0.0849266, size = 91, normalized size = 1.25

$$\frac{a\sqrt{d+ex^2}+b\sqrt{d+ex^2}\log\left(cx^n\right)-bn\sqrt{d+ex^2}+b\sqrt{d}n\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)-b\sqrt{d}n\log(x)}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] (a*Sqrt[d + e*x^2] - b*n*Sqrt[d + e*x^2] - b*Sqrt[d]*n*Log[x] + b*Sqrt[d +
e*x^2]*Log[c*x^n] + b*Sqrt[d]*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/e
```

Maple [F] time = 0.422, size = 0, normalized size = 0.

$$\int x\left(a+b\ln\left(cx^n\right)\right)\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),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(x*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.33309, size = 317, normalized size = 4.34

$$\left[\frac{b\sqrt{d}n\log\left(-\frac{ex^2+2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right)+2\sqrt{ex^2+d}(bn\log(x)-bn+b\log(c)+a)}{2e},-\frac{b\sqrt{-d}n\arctan\left(\frac{\sqrt{-d}}{\sqrt{ex^2+d}}\right)-\sqrt{ex^2+d}(bn\log\right.}{e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*(b*sqrt(d)*n*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*s
qrt(e*x^2 + d)*(b*n*log(x) - b*n + b*log(c) + a))/e, -(b*sqrt(-d)*n*arctan(
sqrt(-d)/sqrt(e*x^2 + d)) - sqrt(e*x^2 + d)*(b*n*log(x) - b*n + b*log(c) +
a))/e]
```

Sympy [A] time = 4.70787, size = 126, normalized size = 1.73

$$a\left(\begin{cases}\frac{x^2}{2\sqrt{d}} & \text{for } e=0\\ \frac{\sqrt{d+ex^2}}{e} & \text{otherwise}\end{cases}\right)-bn\left(\begin{cases}\frac{x^2}{4\sqrt{d}} & \text{for } e=0\\ -\frac{\sqrt{d}\operatorname{asinh}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{e}+\frac{d}{e^{\frac{3}{2}}x\sqrt{\frac{d}{ex^2}+1}}+\frac{x}{\sqrt{e}\sqrt{\frac{d}{ex^2}+1}} & \text{otherwise}\end{cases}\right)+b\left(\begin{cases}\frac{x^2}{2\sqrt{d}} & \text{for } e=0\\ \frac{\sqrt{d+ex^2}}{e} & \text{otherwise}\end{cases}\right)\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
```

```
[Out] a*Piecewise((x**2/(2*sqrt(d)), Eq(e, 0)), (sqrt(d + e*x**2)/e, True)) - b*n
*Piecewise((x**2/(4*sqrt(d)), Eq(e, 0)), (-sqrt(d)*asinh(sqrt(d)/(sqrt(e)*x
))/e + d/(e**(3/2)*x*sqrt(d/(e*x**2) + 1)) + x/(sqrt(e)*sqrt(d/(e*x**2) + 1
)), True)) + b*Piecewise((x**2/(2*sqrt(d)), Eq(e, 0)), (sqrt(d + e*x**2)/e,
 True))*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)x}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/sqrt(e*x^2 + d), x)
```

3.279 $\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=166

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2\sqrt{d}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)\tanh^{-1}}{\sqrt{d}}$$

```
[Out] (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(2*Sqrt[d]) - (ArcTanh[Sqrt[d + e*
x^2]/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[d] - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/Sqrt[d] - (b*n*PolyLog
[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*Sqrt[d])
```

Rubi [A] time = 0.262449, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 63, 208, 2348, 12, 5984, 5918, 2402, 2315}

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2\sqrt{d}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)\tanh^{-1}}{\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^2]),x]
```

```
[Out] (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(2*Sqrt[d]) - (ArcTanh[Sqrt[d + e*
x^2]/Sqrt[d]]*(a + b*Log[c*x^n]))/Sqrt[d] - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/Sqrt[d] - (b*n*PolyLog
[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*Sqrt[d])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
```

```
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x\sqrt{d+ex^2}}\,dx = -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}+(bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}x}\,dx$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}+\frac{(bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}}$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}+\frac{(bn)\,\text{Subst}\left(\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx,x,x^2\right)}{2\sqrt{d}}$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}+\frac{(bn)\,\text{Subst}\left(\int\frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx,x,\sqrt{d+ex^2}\right)}{\sqrt{d}}$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{(bn)\,\text{Subst}\left(\int\frac{\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{1-\frac{x}{\sqrt{d}}}\,dx,x,\sqrt{d+e\ldots}\right.}{d}$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{\sqrt{d}}+\ldots$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{\sqrt{d}}-\ldots$$

$$= \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2\sqrt{d}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{\sqrt{d}}-\ldots$$

Mathematica [C] time = 0.198194, size = 162, normalized size = 0.98

$$\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(-{}_3F_2\left(\frac{1}{2},\frac{1}{2},\frac{1}{2};\frac{3}{2},\frac{3}{2};-\frac{d}{ex^2}\right)-\frac{\sqrt{e}x\log(x)\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{d}}\right)}{\sqrt{d+ex^2}}+\frac{\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)\left(-a-b\left(\log\left(cx^n\right)-n\log(x)\right)\right)}{\sqrt{d}}-$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^2]),x]
```

```
[Out] (b*n*Sqrt[1 + d/(e*x^2)]*(-HypergeometricPFQ[{1/2, 1/2, 1/2}, {3/2, 3/2}, -
(d/(e*x^2))] - (Sqrt[e]*x*ArcSinh[Sqrt[d]/(Sqrt[e]*x)]*Log[x])/Sqrt[d]))/Sq
rt[d + e*x^2] - (Log[x]*(-a - b*(-(n*Log[x]) + Log[c*x^n])))/Sqrt[d] + ((-a
 - b*(-(n*Log[x]) + Log[c*x^n]))*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/Sqrt[d]
```

Maple [F] time = 0.411, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x}\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(e*x^2+d)^(1/2),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((a+b*log(c*x^n))/x/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log\left(cx^n\right)+\sqrt{ex^2+d}a}{ex^3+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e*x^3 + d*x),
x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\log\left(cx^n\right)}{x\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x*sqrt(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^n\right)+a}{\sqrt{ex^2+dx}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x), x)
```

3.280 $\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=258

$$\frac{benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{3/2}}+\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2}-\frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right.}{4d^{3/2}}$$

```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*d*x^2) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])
/(4*d^(3/2)) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*d^(3/2)) - (Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/(2*d*x^2) + (e*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*(a + b*Log[c*x^n]))/(2*d^(3/2)) + (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(3/2)) + (b*e*n*Po
lyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(3/2))
```

Rubi [A] time = 0.372716, antiderivative size = 258, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.48, Rules used = {266, 51, 63, 208, 2350, 12, 14, 47, 5984, 5918, 2402, 2315}

$$\frac{benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{3/2}}+\frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2}-\frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right.}{4d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x^2]),x]
```


```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*d*x^2) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])
/(4*d^(3/2)) - (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*d^(3/2)) - (Sq
rt[d + e*x^2]*(a + b*Log[c*x^n]))/(2*d*x^2) + (e*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*(a + b*Log[c*x^n]))/(2*d^(3/2)) + (b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(3/2)) + (b*e*n*Po
lyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(3/2))
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
```

```
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex^2}}\,dx = -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}} - (bn)\int \frac{-\frac{\sqrt{d+ex^2}}{d} + \frac{ex^2\tanh^{-1}\left(\frac{\sqrt{}}{}\right.}{d^{3/2}}}{2x^3}$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}} - \frac{1}{2}(bn)\int \frac{-\frac{\sqrt{d+ex^2}}{d} + \frac{ex^2\tanh^{-1}(}{d^{3/2}}}{x^3}$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}} - \frac{1}{2}(bn)\int\left(-\frac{\sqrt{d+ex^2}}{dx^3} + \frac{e\tan}{}\right.$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}} + \frac{(bn)\int\frac{\sqrt{d+ex^2}}{x^3}\,dx}{2d} - \frac{(ben)\int \frac{\tan}{}}{}$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}} + \frac{(bn)\,\mathrm{Subst}\left(\int\frac{\sqrt{d+ex}}{x^2}\,dx, x, x^2\right.}{4d}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{3/2}} - \frac{(ben)\,\mathrm{Subst}\left(\int\right.}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log}{2d^{3/2}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\,\mathrm{ta}}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\,\mathrm{ta}}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4dx^2} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{3/2}} - \frac{ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{3/2}} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2dx^2} + \frac{e\,\mathrm{ta}}{}$$

Mathematica [C] time = 1.06489, size = 229, normalized size = 0.89

$$\frac{\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(2d^{3/2}\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{d}{ex^2}\right)+9ex^2(2\log(x)+1)\left(\sqrt{e}x\sinh^{-1}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)-\sqrt{d}\sqrt{\frac{d}{ex^2}+1}\right)\right)}{x^2\sqrt{d+ex^2}}-\frac{18\sqrt{d}\sqrt{d+ex^2}(a+b\log(cx^n)-bn\log(x))}{x^2}+18e\log\left(\sqrt{d}\sqrt{d}\cdots\right.}{36d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*Sqrt[d + e*x^2]),x]
```

```
[Out] ((b*n*Sqrt[1 + d/(e*x^2)]*(2*d^(3/2)*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/
2, 5/2}, -(d/(e*x^2))] + 9*e*x^2*(-(Sqrt[d]*Sqrt[1 + d/(e*x^2)]) + Sqrt[e]*
x*ArcSinh[Sqrt[d]/(Sqrt[e]*x)])*(1 + 2*Log[x])))/(x^2*Sqrt[d + e*x^2]) - (1
8*Sqrt[d]*Sqrt[d + e*x^2]*(a - b*n*Log[x] + b*Log[c*x^n]))/x^2 - 18*e*Log[x
]*(a - b*n*Log[x] + b*Log[c*x^n]) + 18*e*(a - b*n*Log[x] + b*Log[c*x^n])*Lo
g[d + Sqrt[d]*Sqrt[d + e*x^2]])/(36*d^(3/2))
```

Maple [F] time = 0.413, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^3}\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^(1/2),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((a+b*log(c*x^n))/x^3/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log(cx^n)+\sqrt{ex^2+d}a}{ex^5+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e*x^5 + d*x^3)
, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\log(cx^n)}{x^3\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**3*sqrt(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n)+a}{\sqrt{ex^2+d}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^3), x)
```

3.281 $\int \frac{x^2(a+b\log(cx^n))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=359

$$\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4e^{3/2}\sqrt{d+ex^2}}-\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2e^{3/2}\sqrt{d+ex^2}}+\frac{x\sqrt{d+ex^2}(a+b\log(cx^n))}{2e}-$$

```
[Out] -(b*n*x*Sqrt[d + e*x^2])/(4*e) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])/(4*e^(3/2)*Sqrt[d + e*x^2]) - (b*d^(3/2)*n*Sqrt[1 + (e
*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(4*e^(3/2)*Sqrt[d + e*x^2]) + (b*d
^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcS
inh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(3/2)*Sqrt[d + e*x^2]) + (x*Sqrt[d + e*x^2
]*(a + b*Log[c*x^n]))/(2*e) - (d^(3/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]
*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(3/2)*Sqrt[d + e*x^2]) + (b*d^(3/2)*n
*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(4*e^(
3/2)*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.410335, antiderivative size = 359, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.48, Rules used = {2341, 321, 215, 2350, 12, 14, 195, 5659, 3716, 2190, 2279, 2391}

$$\frac{bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4e^{3/2}\sqrt{d+ex^2}}-\frac{d^{3/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2e^{3/2}\sqrt{d+ex^2}}+\frac{x\sqrt{d+ex^2}(a+b\log(cx^n))}{2e}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```


```
[Out] -(b*n*x*Sqrt[d + e*x^2])/(4*e) - (b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(
Sqrt[e]*x)/Sqrt[d]])/(4*e^(3/2)*Sqrt[d + e*x^2]) - (b*d^(3/2)*n*Sqrt[1 + (e
*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(4*e^(3/2)*Sqrt[d + e*x^2]) + (b*d
^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcS
inh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(3/2)*Sqrt[d + e*x^2]) + (x*Sqrt[d + e*x^2
]*(a + b*Log[c*x^n]))/(2*e) - (d^(3/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]
*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(3/2)*Sqrt[d + e*x^2]) + (b*d^(3/2)*n
*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(4*e^(
3/2)*Sqrt[d + e*x^2])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
```

```
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{1+\frac{ex^2}{d}}}\,dx}{\sqrt{d+ex^2}}$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} - \frac{\left(bn\sqrt{1+\frac{ex^2}{d}}\right)\int$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} - \frac{\left(bn\sqrt{1+\frac{ex^2}{d}}\right)\int}{2}$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} - \frac{\left(bn\sqrt{1+\frac{ex^2}{d}}\right)\int}{}$$

$$= \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} + \frac{\left(bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\right.}{2e^{3/2}\sqrt{d}}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} + \frac{x\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2e} - \frac{d^{3/2}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2e^{3/2}\sqrt{d+ex^2}} +$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}} + \frac{x\sqrt{d+ex^2}}{}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}} + \frac{bd^{3/2}n\sqrt{1}}{}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}} + \frac{bd^{3/2}n\sqrt{1}}{}$$

$$= -\frac{bnx\sqrt{d+ex^2}}{4e} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{4e^{3/2}\sqrt{d+ex^2}} - \frac{bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{3/2}\sqrt{d+ex^2}} + \frac{bd^{3/2}n\sqrt{1}}{}$$

Mathematica [C] time = 0.784351, size = 205, normalized size = 0.57

$$\frac{\frac{bn\sqrt{\frac{ex^2}{d}+1}\left(2e^2x^3\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right)+9d\sqrt{e}(2\log(x)-1)\left(\sqrt{e}x\sqrt{\frac{ex^2}{d}+1}-\sqrt{d}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\right)\right)}{\sqrt{d+ex^2}}+18ex\sqrt{d+ex^2}\,(a+b\log(cx^n)-bn\log(x))-1}{36e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/Sqrt[d + e*x^2],x]
```

```
[Out] ((b*n*Sqrt[1 + (e*x^2)/d]*(2*e^2*x^3*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/
2, 5/2}, -((e*x^2)/d)] + 9*d*Sqrt[e]*(Sqrt[e]*x*Sqrt[1 + (e*x^2)/d] - Sqrt[
d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])*(-1 + 2*Log[x])))/Sqrt[d + e*x^2] + 18*e*x
*Sqrt[d + e*x^2]*(a - b*n*Log[x] + b*Log[c*x^n]) - 18*d*Sqrt[e]*(a - b*n*Lo
g[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(36*e^2)
```

Maple [F] time = 0.406, size = 0, normalized size = 0.

$$\int x^2\left(a+b\ln\left(cx^n\right)\right)\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^(1/2),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(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{ex^2+d}bx^2\log\left(cx^n\right)+\sqrt{ex^2+d}ax^2}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^2*log(c*x^n) + sqrt(e*x^2 + d)*a*x^2)/(e*x^2
+ d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(b\log\left(cx^n\right)+a)x^2}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/sqrt(e*x^2 + d), x)
```

3.282 $\int \frac{a+b\log(cx^n)}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=250

$$-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{e}\sqrt{d+ex^2}}+\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{e}\sqrt{d+ex^2}}$$

```
[Out] (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*Sqrt[e]
*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sq
rt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(Sqrt[e]*Sqrt[d + e*x^2
]) + (Sqrt[d]*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c
*x^n]))/(Sqrt[e]*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*PolyLo
g[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[e]*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.139033, antiderivative size = 250, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {2327, 2325, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2\sqrt{e}\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{e}\sqrt{d+ex^2}}+\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{e}\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/Sqrt[d + e*x^2],x]
```

```
[Out] (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*Sqrt[e]
*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sq
rt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(Sqrt[e]*Sqrt[d + e*x^2
]) + (Sqrt[d]*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c
*x^n]))/(Sqrt[e]*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*PolyLo
g[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*Sqrt[e]*Sqrt[d + e*x^2])
```

Rule 2327

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Dist[Sqrt[1 + (e*x^2)/d]/Sqrt[d + e*x^2], Int[(a + b*Log[c*x^n])/Sqr
t[1 + (e*x^2)/d], x], x] /; FreeQ[{a, b, c, d, e, n}, x] &&  !GtQ[d, 0]
```

Rule 2325

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[e, 2], x]
 - Dist[(b*n)/Rt[e, 2], Int[ArcSinh[(Rt[e, 2]*x)/Sqrt[d]]/x, x], x] /; Free
Q[{a, b, c, d, e, n}, x] && GtQ[d, 0] && PosQ[e]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\sqrt{d+ex^2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{a+b\log(cx^n)}{\sqrt{1+\frac{ex^2}{d}}}\,dx}{\sqrt{d+ex^2}}$$

$$= \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{e}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\right)\int \frac{\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{e}\sqrt{d+ex^2}}$$

$$= \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{e}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\right)\text{Subst}\left(\int x\coth(x)\,dx, x, \sinh^{-1}\right.}{\sqrt{e}\sqrt{d+ex^2}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{e}\sqrt{d+ex^2}} + \frac{\left(2b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\right.}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\log\left(1-e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{\sqrt{e}\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+}}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\log\left(1-e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{\sqrt{e}\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+}}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2\sqrt{e}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\log\left(1-e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{\sqrt{e}\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+}}{}$$

Mathematica [A] time = 0.542951, size = 186, normalized size = 0.74

$$\frac{bn\sqrt{\frac{ex^2}{d}+1}\left(\text{PolyLog}\left(2,e^{-2\sinh^{-1}\left(x\sqrt{\frac{e}{d}}\right)}\right)+2\log(x)\log\left(\sqrt{\frac{ex^2}{d}+1}+x\sqrt{\frac{e}{d}}\right)-\sinh^{-1}\left(x\sqrt{\frac{e}{d}}\right)^2-2\sinh^{-1}\left(x\sqrt{\frac{e}{d}}\right)\log\left(1-\right.\right.}{2\sqrt{\frac{e}{d}}\sqrt{d+ex^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/Sqrt[d + e*x^2],x]
```

```
[Out] ((a - b*n*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/Sqrt[e
] + (b*n*Sqrt[1 + (e*x^2)/d]*(-ArcSinh[Sqrt[e/d]*x]^2 - 2*ArcSinh[Sqrt[e/d]
*x]*Log[1 - E^(-2*ArcSinh[Sqrt[e/d]*x])] + 2*Log[x]*Log[Sqrt[e/d]*x + Sqrt[
```

```
1 + (e*x^2)/d]] + PolyLog[2, E^(-2*ArcSinh[Sqrt[e/d]*x])]))/(2*Sqrt[e/d]*Sq
rt[d + e*x^2])
```

Maple [F] time = 0.402, size = 0, normalized size = 0.

$$\int (a + b\ln (cx^n))\frac{1}{\sqrt{ex^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/(e*x^2+d)^(1/2),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((a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2 + d}b\log (cx^n) + \sqrt{ex^2 + d}a}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e*x^2 + d), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\log(cx^n)}{\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/sqrt(d + e*x**2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n)+a}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/sqrt(e*x^2 + d), x)
```

3.283 $\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=81

$$-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{dx}-\frac{bn\sqrt{d+ex^2}}{dx}+\frac{b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d}$$

```
[Out] -((b*n*Sqrt[d + e*x^2])/(d*x)) + (b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + 
e*x^2]])/d - (Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(d*x)
```

Rubi [A] time = 0.0910108, antiderivative size = 81, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {2335, 277, 217, 206}

$$-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{dx}-\frac{bn\sqrt{d+ex^2}}{dx}+\frac{b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x^2]),x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/(d*x)) + (b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + 
e*x^2]])/d - (Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(d*x)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{x^2\sqrt{d+ex^2}}\,dx &= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{dx}+\frac{(bn)\int \frac{\sqrt{d+ex^2}}{x^2}\,dx}{d}\\
&= -\frac{bn\sqrt{d+ex^2}}{dx}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{dx}+\frac{(ben)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{d}\\
&= -\frac{bn\sqrt{d+ex^2}}{dx}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{dx}+\frac{(ben)\,\mathrm{Subst}\left(\int \frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{d}\\
&= -\frac{bn\sqrt{d+ex^2}}{dx}+\frac{b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{dx}
\end{aligned}$$

Mathematica [A] time = 0.102574, size = 77, normalized size = 0.95

$$\frac{(a+bn)\left(-\sqrt{d+ex^2}\right)-b\sqrt{d+ex^2}\log(cx^n)+b\sqrt{e}nx\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*Sqrt[d + e*x^2]),x]
```

```
[Out] (-((a + b*n)*Sqrt[d + e*x^2]) - b*Sqrt[d + e*x^2]*Log[c*x^n] + b*Sqrt[e]*n*
x*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(d*x)
```

Maple [F] time = 0.423, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^2}\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^(1/2),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((a+b*log(c*x^n))/x^2/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.44102, size = 331, normalized size = 4.09

$$\left[\frac{b\sqrt{e}nx\log\left(-2\,ex^2 - 2\,\sqrt{ex^2+d}\sqrt{e}x - d\right) - 2\,\sqrt{ex^2+d}(bn\log(x) + bn + b\log(c) + a)}{2\,dx}, -\frac{b\sqrt{-e}nx\arctan\left(\frac{\sqrt{-e}x}{\sqrt{ex^2+d}}\right) + \sqrt{ex}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/2*(b*sqrt(e)*n*x*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) - 2*sqr
t(e*x^2 + d)*(b*n*log(x) + b*n + b*log(c) + a))/(d*x), -(b*sqrt(-e)*n*x*arc
tan(sqrt(-e)*x/sqrt(e*x^2 + d)) + sqrt(e*x^2 + d)*(b*n*log(x) + b*n + b*log
(c) + a))/(d*x)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{x^2\sqrt{d + ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*sqrt(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex^{2}+d}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^2), x)
```

3.284 $\int \frac{a+b\log(cx^n)}{x^4\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=144

$$\frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3}-\frac{2be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2}+\frac{2ben\sqrt{d+ex^2}}{3d^2x}-\frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3}$$

```
[Out] (2*b*e*n*Sqrt[d + e*x^2])/(3*d^2*x) - (b*n*(d + e*x^2)^(3/2))/(9*d^2*x^3) -
 (2*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^2) - (Sqrt[d + e
*x^2]*(a + b*Log[c*x^n]))/(3*d*x^3) + (2*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n
]))/(3*d^2*x)
```

Rubi [A] time = 0.13297, antiderivative size = 144, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {271, 264, 2350, 12, 451, 277, 217, 206}

$$\frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3}-\frac{2be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2}+\frac{2ben\sqrt{d+ex^2}}{3d^2x}-\frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*Sqrt[d + e*x^2]),x]
```

```
[Out] (2*b*e*n*Sqrt[d + e*x^2])/(3*d^2*x) - (b*n*(d + e*x^2)^(3/2))/(9*d^2*x^3) -
 (2*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^2) - (Sqrt[d + e
*x^2]*(a + b*Log[c*x^n]))/(3*d*x^3) + (2*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n
]))/(3*d^2*x)
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\sqrt{d+ex^2}}\,dx = -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3} + \frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x} - (bn)\int \frac{\sqrt{d+ex^2}\left(-d+2ex^2\right)}{3d^2x^4}\,dx$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3} + \frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x} - \frac{(bn)\int \frac{\sqrt{d+ex^2}\left(-d+2ex^2\right)}{x^4}\,dx}{3d^2}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3} + \frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x} - \frac{(2ben)\int \frac{\sqrt{d+ex^2}}{x^2}\,dx}{3d^2}$$

$$= \frac{2ben\sqrt{d+ex^2}}{3d^2x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3} + \frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x} - \frac{(2}{}$$

$$= \frac{2ben\sqrt{d+ex^2}}{3d^2x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3} + \frac{2e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3d^2x} - \frac{(2}{}$$

$$= \frac{2ben\sqrt{d+ex^2}}{3d^2x} - \frac{bn\left(d+ex^2\right)^{3/2}}{9d^2x^3} - \frac{2be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2} - \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{3dx^3} + \frac{2e\sqrt{d}}{}$$

Mathematica [A] time = 0.142161, size = 110, normalized size = 0.76

$$\frac{\sqrt{d+ex^2}\left(-3ad+6aex^2-bdn+5benx^2\right)-3b\left(d-2ex^2\right)\sqrt{d+ex^2}\log(cx^n)-6be^{3/2}nx^3\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{9d^2x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*Sqrt[d + e*x^2]),x]
```

```
[Out] (Sqrt[d + e*x^2]*(-3*a*d - b*d*n + 6*a*e*x^2 + 5*b*e*n*x^2) - 3*b*(d - 2*e*
x^2)*Sqrt[d + e*x^2]*Log[c*x^n] - 6*b*e^(3/2)*n*x^3*Log[e*x + Sqrt[e]*Sqrt[
d + e*x^2]])/(9*d^2*x^3)
```

Maple [F] time = 0.434, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^4}\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^(1/2),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((a+b*log(c*x^n))/x^4/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.50646, size = 540, normalized size = 3.75

$$\left[\frac{3\,be^{\frac{3}{2}}nx^3\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\sqrt{e}x-d\right)-\left(bdn-(5\,ben+6\,ae)x^2+3\,ad-3\left(2\,bex^2-bd\right)\log\left(c\right)-3\left(2\,benx^2-bdr\right.\right.}{9\,d^2x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/9*(3*b*e^(3/2)*n*x^3*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) - (
b*d*n - (5*b*e*n + 6*a*e)*x^2 + 3*a*d - 3*(2*b*e*x^2 - b*d)*log(c) - 3*(2*b
*e*n*x^2 - b*d*n)*log(x))*sqrt(e*x^2 + d))/(d^2*x^3), 1/9*(6*b*sqrt(-e)*e*n
*x^3*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - (b*d*n - (5*b*e*n + 6*a*e)*x^2 +
3*a*d - 3*(2*b*e*x^2 - b*d)*log(c) - 3*(2*b*e*n*x^2 - b*d*n)*log(x))*sqrt(e
*x^2 + d))/(d^2*x^3)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\log\left(cx^n\right)}{x^4\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**4*sqrt(d + e*x**2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{\sqrt{ex^2 + d}x^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^4), x)
```

3.285 $\int \frac{a+b\log(cx^n)}{x^6\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=204

$$-\frac{8e^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^3x}+\frac{4e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^2x^3}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}-\frac{8be^2n\sqrt{d+ex^2}}{15d^3x}+\frac{8be^{5/2}n}{}$$

```
[Out] (-8*b*e^2*n*Sqrt[d + e*x^2])/(15*d^3*x) - (b*n*(d + e*x^2)^(3/2))/(25*d^2*x
^5) + (26*b*e*n*(d + e*x^2)^(3/2))/(225*d^3*x^3) + (8*b*e^(5/2)*n*ArcTanh[(
Sqrt[e]*x)/Sqrt[d + e*x^2]])/(15*d^3) - (Sqrt[d + e*x^2]*(a + b*Log[c*x^n])
)/(5*d*x^5) + (4*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(15*d^2*x^3) - (8*e^
2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(15*d^3*x)
```

Rubi [A] time = 0.177343, antiderivative size = 204, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {271, 264, 2350, 12, 1265, 451, 277, 217, 206}

$$-\frac{8e^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^3x}+\frac{4e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^2x^3}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}-\frac{8be^2n\sqrt{d+ex^2}}{15d^3x}+\frac{8be^{5/2}n}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^6*Sqrt[d + e*x^2]),x]
```

```
[Out] (-8*b*e^2*n*Sqrt[d + e*x^2])/(15*d^3*x) - (b*n*(d + e*x^2)^(3/2))/(25*d^2*x
^5) + (26*b*e*n*(d + e*x^2)^(3/2))/(225*d^3*x^3) + (8*b*e^(5/2)*n*ArcTanh[(
Sqrt[e]*x)/Sqrt[d + e*x^2]])/(15*d^3) - (Sqrt[d + e*x^2]*(a + b*Log[c*x^n])
)/(5*d*x^5) + (4*e*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(15*d^2*x^3) - (8*e^
2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/(15*d^3*x)
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
```

```
p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^6\sqrt{d+ex^2}}\,dx = -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}+\frac{4e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^2x^3}-\frac{8e^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^3x}-(b$$

$$= -\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}+\frac{4e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^2x^3}-\frac{8e^2\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^3x}-\frac{(b}{}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}+\frac{4e\sqrt{d+ex^2}\,(a+b\log(cx^n))}{15d^2x^3}-\frac{8e^2\sqrt{d+ex^2}\,(a+}{15d^3}$$

$$= -\frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5}+\frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}+\frac{4e\sqrt{d+ex^2}\,(a+b\log(cx^n}{15d^2x^3}$$

$$= -\frac{8be^2n\sqrt{d+ex^2}}{15d^3x}-\frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5}+\frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}+\frac{4e\sqrt{d+}{}$$

$$= -\frac{8be^2n\sqrt{d+ex^2}}{15d^3x}-\frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5}+\frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3}-\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{5dx^5}+\frac{4e\sqrt{d+}{}$$

$$= -\frac{8be^2n\sqrt{d+ex^2}}{15d^3x}-\frac{bn\left(d+ex^2\right)^{3/2}}{25d^2x^5}+\frac{26ben\left(d+ex^2\right)^{3/2}}{225d^3x^3}+\frac{8be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{15d^3}-\frac{\sqrt{d+ex^2}}{}$$

Mathematica [A] time = 0.224176, size = 147, normalized size = 0.72

$$-\frac{\sqrt{d+ex^2}\left(15a\left(3d^2-4dex^2+8e^2x^4\right)+bn\left(9d^2-17dex^2+94e^2x^4\right)\right)+15b\sqrt{d+ex^2}\left(3d^2-4dex^2+8e^2x^4\right)\log(cx^n)-}{225d^3x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^6*Sqrt[d + e*x^2]),x]
```

```
[Out] -(Sqrt[d + e*x^2]*(15*a*(3*d^2 - 4*d*e*x^2 + 8*e^2*x^4) + b*n*(9*d^2 - 17*d
*e*x^2 + 94*e^2*x^4)) + 15*b*Sqrt[d + e*x^2]*(3*d^2 - 4*d*e*x^2 + 8*e^2*x^4
```

```
)*Log[c*x^n] - 120*b*e^(5/2)*n*x^5*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(225
*d^3*x^5)
```

Maple [F] time = 0.444, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^6}\frac{1}{\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^6/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^6/(e*x^2+d)^(1/2),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((a+b*log(c*x^n))/x^6/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.62303, size = 794, normalized size = 3.89

$$\left[\frac{60\,be^{\frac{5}{2}}nx^5\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\sqrt{e}x-d\right)-\left(2\left(47\,be^2n+60\,ae^2\right)x^4+9\,bd^2n+45\,ad^2-(17\,bden+60\,ade)x^2+15\left(8\right.\right.}{225\,d^3x^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/225*(60*b*e^(5/2)*n*x^5*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d)
- (2*(47*b*e^2*n + 60*a*e^2)*x^4 + 9*b*d^2*n + 45*a*d^2 - (17*b*d*e*n + 60*
a*d*e)*x^2 + 15*(8*b*e^2*x^4 - 4*b*d*e*x^2 + 3*b*d^2)*log(c) + 15*(8*b*e^2*
```

```
n*x^4 - 4*b*d*e*n*x^2 + 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*x^5), -1/2
25*(120*b*sqrt(-e)*e^2*n*x^5*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (2*(47*b*
e^2*n + 60*a*e^2)*x^4 + 9*b*d^2*n + 45*a*d^2 - (17*b*d*e*n + 60*a*d*e)*x^2
+ 15*(8*b*e^2*x^4 - 4*b*d*e*x^2 + 3*b*d^2)*log(c) + 15*(8*b*e^2*n*x^4 - 4*b
*d*e*n*x^2 + 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*x^5)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**6/(e*x**2+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right) + a}{\sqrt{ex^2 + d}x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^2 + d)*x^6), x)
```

3.286 $\int \frac{x^7(a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=209

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-11$$

```
[Out] (-11*b*d^2*n*Sqrt[d + e*x^2])/(5*e^4) + (4*b*d*n*(d + e*x^2)^(3/2))/(15*e^4
) - (b*n*(d + e*x^2)^(5/2))/(25*e^4) + (16*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x
^2]/Sqrt[d]])/(5*e^4) + (d^3*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x^2]) + (3
*d^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^4 - (d*(d + e*x^2)^(3/2)*(a + b*
Log[c*x^n]))/e^4 + ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4)
```

Rubi [A] time = 0.295893, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 1799, 1620, 63, 208}

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}+\frac{3d^2\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\log\left(cx^n\right)\right)}{5e^4}-11$$

Antiderivative was successfully verified.

```
[In] Int[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (-11*b*d^2*n*Sqrt[d + e*x^2])/(5*e^4) + (4*b*d*n*(d + e*x^2)^(3/2))/(15*e^4
) - (b*n*(d + e*x^2)^(5/2))/(25*e^4) + (16*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x
^2]/Sqrt[d]])/(5*e^4) + (d^3*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x^2]) + (3
*d^2*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^4 - (d*(d + e*x^2)^(3/2)*(a + b*
Log[c*x^n]))/e^4 + ((d + e*x^2)^(5/2)*(a + b*Log[c*x^n]))/(5*e^4)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^7 (a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}dx = \frac{d^3(a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} + \frac{3d^2\sqrt{d+ex^2}(a+b\log(cx^n))}{e^4} - \frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{e^4} + \frac{(d+ e}{}$$

$$= \frac{d^3(a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} + \frac{3d^2\sqrt{d+ex^2}(a+b\log(cx^n))}{e^4} - \frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{e^4} + \frac{(d+ e}{}$$

$$= \frac{d^3(a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} + \frac{3d^2\sqrt{d+ex^2}(a+b\log(cx^n))}{e^4} - \frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{e^4} + \frac{(d+ e}{}$$

$$= \frac{d^3(a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} + \frac{3d^2\sqrt{d+ex^2}(a+b\log(cx^n))}{e^4} - \frac{d\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{e^4} + \frac{(d+ e}{}$$

$$= -\frac{11bd^2n\sqrt{d+ex^2}}{5e^4} + \frac{4bdn\left(d+ex^2\right)^{3/2}}{15e^4} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e^4} + \frac{d^3(a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} + \frac{3d^2\sqrt{d+ex}}{}$$

$$= -\frac{11bd^2n\sqrt{d+ex^2}}{5e^4} + \frac{4bdn\left(d+ex^2\right)^{3/2}}{15e^4} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e^4} + \frac{d^3(a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} + \frac{3d^2\sqrt{d+ex}}{}$$

$$= -\frac{11bd^2n\sqrt{d+ex^2}}{5e^4} + \frac{4bdn\left(d+ex^2\right)^{3/2}}{15e^4} - \frac{bn\left(d+ex^2\right)^{5/2}}{25e^4} + \frac{16bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{5e^4} + \frac{d^3(a}{e}$$

Mathematica [A] time = 0.208874, size = 195, normalized size = 0.93

$$\frac{120ad^2ex^2+240ad^3-30ade^2x^4+15ae^3x^6+15b\left(8d^2ex^2+16d^3-2de^2x^4+e^3x^6\right)\log(cx^n)-134bd^2enx^2-240bd^{5/2}n\log}{75e^4\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (240*a*d^3 - 148*b*d^3*n + 120*a*d^2*e*x^2 - 134*b*d^2*e*n*x^2 - 30*a*d*e^2
*x^4 + 11*b*d*e^2*n*x^4 + 15*a*e^3*x^6 - 3*b*e^3*n*x^6 - 240*b*d^(5/2)*n*Sq
rt[d + e*x^2]*Log[x] + 15*b*(16*d^3 + 8*d^2*e*x^2 - 2*d*e^2*x^4 + e^3*x^6)*
Log[c*x^n] + 240*b*d^(5/2)*n*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2
]])/(75*e^4*Sqrt[d + e*x^2])
```

Maple [F] time = 0.424, size = 0, normalized size = 0.

$$\int x^7 \left(a + b \ln \left(c x^n\right)\right) \left(e x^2 + d\right)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^7*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),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(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.80726, size = 1062, normalized size = 5.08

$$\left[\frac{120 \left(bd^2enx^2 + bd^3n\right)\sqrt{d}\log\left(-\frac{ex^2+2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right) - \left(3\left(be^3n - 5ae^3\right)x^6 + 148bd^3n - \left(11bde^2n - 30ade^2\right)x^4 - 240ad^3}{} \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/75*(120*(b*d^2*e*n*x^2 + b*d^3*n)*sqrt(d)*log(-(e*x^2 + 2*sqrt(e*x^2 + d
)*sqrt(d) + 2*d)/x^2) - (3*(b*e^3*n - 5*a*e^3)*x^6 + 148*b*d^3*n - (11*b*d*
e^2*n - 30*a*d*e^2)*x^4 - 240*a*d^3 + 2*(67*b*d^2*e*n - 60*a*d^2*e)*x^2 - 1
5*(b*e^3*x^6 - 2*b*d*e^2*x^4 + 8*b*d^2*e*x^2 + 16*b*d^3)*log(c) - 15*(b*e^3
*n*x^6 - 2*b*d*e^2*n*x^4 + 8*b*d^2*e*n*x^2 + 16*b*d^3*n)*log(x))*sqrt(e*x^2
 + d))/(e^5*x^2 + d*e^4), -1/75*(240*(b*d^2*e*n*x^2 + b*d^3*n)*sqrt(-d)*arc
tan(sqrt(-d)/sqrt(e*x^2 + d)) + (3*(b*e^3*n - 5*a*e^3)*x^6 + 148*b*d^3*n -
```

```
(11*b*d*e^2*n - 30*a*d*e^2)*x^4 - 240*a*d^3 + 2*(67*b*d^2*e*n - 60*a*d^2*e)
*x^2 - 15*(b*e^3*x^6 - 2*b*d*e^2*x^4 + 8*b*d^2*e*x^2 + 16*b*d^3)*log(c) - 1
5*(b*e^3*n*x^6 - 2*b*d*e^2*n*x^4 + 8*b*d^2*e*n*x^2 + 16*b*d^3*n)*log(x))*sq
rt(e*x^2 + d))/(e^5*x^2 + d*e^4)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^7}{\left(ex^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^7/(e*x^2 + d)^(3/2), x)
```

3.287 $\int \frac{x^5(a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=158

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3}+\frac{5bdn}{}$$

```
[Out] (5*b*d*n*Sqrt[d + e*x^2])/(3*e^3) - (b*n*(d + e*x^2)^(3/2))/(9*e^3) - (8*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^3) - (d^2*(a + b*Log[c*x^n
]))/(e^3*Sqrt[d + e*x^2]) - (2*d*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3 +
((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3)
```

Rubi [A] time = 0.218035, antiderivative size = 158, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 1251, 897, 1153, 208}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}-\frac{2d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^3}-\frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3}+\frac{5bdn}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (5*b*d*n*Sqrt[d + e*x^2])/(3*e^3) - (b*n*(d + e*x^2)^(3/2))/(9*e^3) - (8*b*
d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^3) - (d^2*(a + b*Log[c*x^n
]))/(e^3*Sqrt[d + e*x^2]) - (2*d*Sqrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3 +
((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^3)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1153

```
Int[((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x^2)^q*(a + b*x^2 + c*x^4)^p, x],
x] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e
 + a*e^2, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^5 (a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}dx = -\frac{d^2(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} - \frac{2d\sqrt{d+ex^2}(a+b\log(cx^n))}{e^3} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - (bn)$$

$$= -\frac{d^2(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} - \frac{2d\sqrt{d+ex^2}(a+b\log(cx^n))}{e^3} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{(bn)}{}$$

$$= -\frac{d^2(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} - \frac{2d\sqrt{d+ex^2}(a+b\log(cx^n))}{e^3} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{(bn)}{}$$

$$= -\frac{d^2(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} - \frac{2d\sqrt{d+ex^2}(a+b\log(cx^n))}{e^3} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{(bn)}{}$$

$$= -\frac{d^2(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} - \frac{2d\sqrt{d+ex^2}(a+b\log(cx^n))}{e^3} + \frac{\left(d+ex^2\right)^{3/2}(a+b\log(cx^n))}{3e^3} - \frac{(bn)}{}$$

$$= \frac{5bdn\sqrt{d+ex^2}}{3e^3} - \frac{bn\left(d+ex^2\right)^{3/2}}{9e^3} - \frac{d^2(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} - \frac{2d\sqrt{d+ex^2}(a+b\log(cx^n))}{e^3} + \frac{(d}{}$$

$$= \frac{5bdn\sqrt{d+ex^2}}{3e^3} - \frac{bn\left(d+ex^2\right)^{3/2}}{9e^3} - \frac{8bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3} - \frac{d^2(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} - \frac{2d\sqrt{d}}{}$$

Mathematica [A] time = 0.178271, size = 160, normalized size = 1.01

$$\frac{-24ad^2-12adex^2+3ae^2x^4-3b\left(8d^2+4dex^2-e^2x^4\right)\log(cx^n)+24bd^{3/2}n\log(x)\sqrt{d+ex^2}-24bd^{3/2}n\sqrt{d+ex^2}\log\left(\sqrt{d}\right.}{9e^3\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (-24*a*d^2 + 14*b*d^2*n - 12*a*d*e*x^2 + 13*b*d*e*n*x^2 + 3*a*e^2*x^4 - b*e
^2*n*x^4 + 24*b*d^(3/2)*n*Sqrt[d + e*x^2]*Log[x] - 3*b*(8*d^2 + 4*d*e*x^2 -
 e^2*x^4)*Log[c*x^n] - 24*b*d^(3/2)*n*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[
```

```
d + e*x^2]])/(9*e^3*Sqrt[d + e*x^2])
```

Maple [F] time = 0.408, size = 0, normalized size = 0.

$$\int x^5 (a + b \ln (cx^n)) \left(ex^2 + d\right)^{-\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),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(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.60782, size = 818, normalized size = 5.18

$$\left[\frac{12 \left(bdenx^2 + bd^2n\right)\sqrt{d} \log\left(-\frac{ex^2 - 2\sqrt{ex^2+d}\sqrt{d} + 2d}{x^2}\right) - \left(\left(be^2n - 3ae^2\right)x^4 - 14bd^2n + 24ad^2 - (13bden - 12ade)x^2 - 3\left(be^2x^4\right.\right.}{9\left(e^4x^2 + de^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/9*(12*(b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sq
rt(d) + 2*d)/x^2) - ((b*e^2*n - 3*a*e^2)*x^4 - 14*b*d^2*n + 24*a*d^2 - (13*
b*d*e*n - 12*a*d*e)*x^2 - 3*(b*e^2*x^4 - 4*b*d*e*x^2 - 8*b*d^2)*log(c) - 3*
```

```
(b*e^2*n*x^4 - 4*b*d*e*n*x^2 - 8*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(e^4*x^2
 + d*e^3), 1/9*(24*(b*d*e*n*x^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*
x^2 + d)) - ((b*e^2*n - 3*a*e^2)*x^4 - 14*b*d^2*n + 24*a*d^2 - (13*b*d*e*n
- 12*a*d*e)*x^2 - 3*(b*e^2*x^4 - 4*b*d*e*x^2 - 8*b*d^2)*log(c) - 3*(b*e^2*n
*x^4 - 4*b*d*e*n*x^2 - 8*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(e^4*x^2 + d*e^3
)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log{(cx^n)} + a)x^5}{\left(ex^2 + d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^(3/2), x)
```

3.288 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=100

$$\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{d\,(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e^2}$$

```
[Out] -((b*n*Sqrt[d + e*x^2])/e^2) + (2*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[
d]])/e^2 + (d*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*x^2]) + (Sqrt[d + e*x^2]*
(a + b*Log[c*x^n]))/e^2
```

Rubi [A] time = 0.160054, antiderivative size = 100, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 446, 80, 63, 208}

$$\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}+\frac{d\,(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((b*n*Sqrt[d + e*x^2])/e^2) + (2*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[
d]])/e^2 + (d*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*x^2]) + (Sqrt[d + e*x^2]*
(a + b*Log[c*x^n]))/e^2
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}\int \frac{x^3 (a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}\,dx &= \frac{d(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}-(bn)\int \frac{2d+ex^2}{e^2x\sqrt{d+ex^2}}\,dx\\
&= \frac{d(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}-\frac{(bn)\int \frac{2d+ex^2}{x\sqrt{d+ex^2}}\,dx}{e^2}\\
&= \frac{d(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}-\frac{(bn)\,\mathrm{Subst}\left(\int \frac{2d+ex}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2e^2}\\
&= -\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{d(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}-\frac{(bdn)\,\mathrm{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,\right.}{e^2}\\
&= -\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{d(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}-\frac{(2bdn)\,\mathrm{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx\right.}{e^3}\\
&= -\frac{bn\sqrt{d+ex^2}}{e^2}+\frac{2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{e^2}+\frac{d(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^2}\end{aligned}$$

Mathematica [A] time = 0.143372, size = 118, normalized size = 1.18

$$\frac{2ad+aex^2+b\left(2d+ex^2\right)\log(cx^n)-2b\sqrt{d}n\log(x)\sqrt{d+ex^2}+2b\sqrt{d}n\sqrt{d+ex^2}\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)-bdn-benx^2}{e^2\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (2*a*d - b*d*n + a*e*x^2 - b*e*n*x^2 - 2*b*Sqrt[d]*n*Sqrt[d + e*x^2]*Log[x]
 + b*(2*d + e*x^2)*Log[c*x^n] + 2*b*Sqrt[d]*n*Sqrt[d + e*x^2]*Log[d + Sqrt[
d]*Sqrt[d + e*x^2]])/(e^2*Sqrt[d + e*x^2])
```

Maple [F] time = 0.407, size = 0, normalized size = 0.

$$\int x^3(a+b\ln(cx^n))\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),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(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.44449, size = 560, normalized size = 5.6

$$\left[\frac{\left(benx^2 + bdn\right)\sqrt{d}\log\left(-\frac{ex^2+2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right) - \left(bdn + (ben - ae)x^2 - 2ad - \left(bex^2 + 2bd\right)\log(c) - \left(benx^2 + 2bdn\right)\log(\right.}{e^3x^2 + de^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [((b*e*n*x^2 + b*d*n)*sqrt(d)*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d
)/x^2) - (b*d*n + (b*e*n - a*e)*x^2 - 2*a*d - (b*e*x^2 + 2*b*d)*log(c) - (b
*e*n*x^2 + 2*b*d*n)*log(x))*sqrt(e*x^2 + d))/(e^3*x^2 + d*e^2), -(2*(b*e*n*
x^2 + b*d*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (b*d*n + (b*e*n -
a*e)*x^2 - 2*a*d - (b*e*x^2 + 2*b*d)*log(c) - (b*e*n*x^2 + 2*b*d*n)*log(x))
*sqrt(e*x^2 + d))/(e^3*x^2 + d*e^2)]
```

Sympy [A] time = 49.9151, size = 163, normalized size = 1.63

$$a\left(\begin{cases}\frac{x^4}{4d^{\frac{3}{2}}} & \text{for}\ e = 0\\ \frac{d}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}}{e^2} & \text{otherwise}\end{cases}\right) - bn\left(\begin{cases}\frac{x^4}{16d^{\frac{3}{2}}} & \text{for}\ e = 0\\ -\frac{2\sqrt{d}\,\operatorname{asinh}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{e^2} + \frac{d}{e^{\frac{5}{2}}x\sqrt{\frac{d}{ex^2}+1}} + \frac{x}{e^{\frac{3}{2}}\sqrt{\frac{d}{ex^2}+1}} & \text{otherwise}\end{cases}\right) + b\left(\begin{cases}\frac{x^4}{4d^{\frac{3}{2}}}\\ \frac{d}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d}}{}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] a*Piecewise((x**4/(4*d**(3/2)), Eq(e, 0)), (d/(e**2*sqrt(d + e*x**2)) + sqr
t(d + e*x**2)/e**2, True)) - b*n*Piecewise((x**4/(16*d**(3/2)), Eq(e, 0)),
(-2*sqrt(d)*asinh(sqrt(d)/(sqrt(e)*x))/e**2 + d/(e**(5/2)*x*sqrt(d/(e*x**2)
 + 1)) + x/(e**(3/2)*sqrt(d/(e*x**2) + 1)), True)) + b*Piecewise((x**4/(4*d
**(3/2)), Eq(e, 0)), (d/(e**2*sqrt(d + e*x**2)) + sqrt(d + e*x**2)/e**2, Tr
ue))*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log (cx^n) + a)x^3}{\left(ex^2 + d\right)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d)^(3/2), x)
```

3.289 $\int \frac{x(a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=57

$$-\frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}e}$$

```
[Out] -((b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(Sqrt[d]*e)) - (a + b*Log[c*x^n])/
(e*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.0778206, antiderivative size = 57, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {2338, 266, 63, 208}

$$-\frac{a+b\log\left(cx^n\right)}{e\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(Sqrt[d]*e)) - (a + b*Log[c*x^n])/
(e*Sqrt[d + e*x^2])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\begin{aligned}
\int \frac{x(a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}\,dx &= -\frac{a+b\log(cx^n)}{e\sqrt{d+ex^2}}+\frac{(bn)\int \frac{1}{x\sqrt{d+ex^2}}\,dx}{e}\\
&= -\frac{a+b\log(cx^n)}{e\sqrt{d+ex^2}}+\frac{(bn)\,\mathrm{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2e}\\
&= -\frac{a+b\log(cx^n)}{e\sqrt{d+ex^2}}+\frac{(bn)\,\mathrm{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{e^2}\\
&= -\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}e}-\frac{a+b\log(cx^n)}{e\sqrt{d+ex^2}}
\end{aligned}$$

Mathematica [A] time = 0.139274, size = 77, normalized size = 1.35

$$-\frac{\frac{a}{\sqrt{d+ex^2}}+\frac{b\log(cx^n)}{\sqrt{d+ex^2}}+\frac{bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)}{\sqrt{d}}-\frac{bn\log(x)}{\sqrt{d}}}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((a/Sqrt[d + e*x^2] - (b*n*Log[x])/Sqrt[d] + (b*Log[c*x^n])/Sqrt[d + e*x^2
] + (b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/Sqrt[d])/e)
```

Maple [F] time = 0.437, size = 0, normalized size = 0.

$$\int x(a+b\ln(cx^n))\left(ex^2+d\right)^{-\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),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(x*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.48694, size = 408, normalized size = 7.16

$$\left[\frac{\left(benx^2+bdn\right)\sqrt{d}\log\left(-\frac{ex^2-2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right)-2\left(bdn\log(x)+bd\log(c)+ad\right)\sqrt{ex^2+d}}{2\left(de^2x^2+d^2e\right)}, \frac{\left(benx^2+bdn\right)\sqrt{-d}\arctan\left(\frac{\sqrt{}}{\sqrt{ex}}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/2*((b*e*n*x^2 + b*d*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) +
 2*d)/x^2) - 2*(b*d*n*log(x) + b*d*log(c) + a*d)*sqrt(e*x^2 + d))/(d*e^2*x^
2 + d^2*e), ((b*e*n*x^2 + b*d*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d))
- (b*d*n*log(x) + b*d*log(c) + a*d)*sqrt(e*x^2 + d))/(d*e^2*x^2 + d^2*e)]
```

Sympy [A] time = 10.9603, size = 80, normalized size = 1.4

$$-\frac{a}{e\sqrt{d+ex^2}} - bn\left(\begin{cases}\frac{x^2}{4d^{\frac{3}{2}}} & \text{for } e=0\\ \frac{\operatorname{asinh}\left(\frac{\sqrt{d}}{\sqrt{e}x}\right)}{\sqrt{d}e} & \text{otherwise}\end{cases}\right) + b\left(\begin{cases}\frac{x^2}{2d^{\frac{3}{2}}} & \text{for } e=0\\ -\frac{1}{e\sqrt{d+ex^2}} & \text{otherwise}\end{cases}\right)\log\left(cx^n\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] -a/(e*sqrt(d + e*x**2)) - b*n*Piecewise((x**2/(4*d**(3/2)), Eq(e, 0)), (asi
nh(sqrt(d)/(sqrt(e)*x))/(sqrt(d)*e), True)) + b*Piecewise((x**2/(2*d**(3/2)
), Eq(e, 0)), (-1/(e*sqrt(d + e*x**2)), True))*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)x}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^2 + d)^(3/2), x)
```

3.290 $\int \frac{a+b\log(cx^n)}{x(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=209

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2d^{3/2}}+\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\frac{bn\tanh}{d}$$

```
[Out] (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/d^(3/2) + (b*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]^2)/(2*d^(3/2)) + (1/(d*Sqrt[d + e*x^2]) - ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]/d^(3/2))*(a + b*Log[c*x^n]) - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt
[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/d^(3/2) - (b*n*PolyLog[2
, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(3/2))
```

Rubi [A] time = 0.333954, antiderivative size = 209, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2d^{3/2}}+\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\frac{bn\tanh}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(3/2)),x]
```

```
[Out] (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/d^(3/2) + (b*n*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]^2)/(2*d^(3/2)) + (1/(d*Sqrt[d + e*x^2]) - ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]]/d^(3/2))*(a + b*Log[c*x^n]) - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt
[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/d^(3/2) - (b*n*PolyLog[2
, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(3/2))
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^{3/2}}\,dx = \left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))-(bn)\int\left(\frac{1}{dx\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}x}\right)dx$$

$$=\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))+\frac{(bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{x}\,dx}{d^{3/2}}-\frac{(bn)\int\frac{1}{x\sqrt{d+ex^2}}\,dx}{d}$$

$$=\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))+\frac{(bn)\,\text{Subst}\left(\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx,x,x^2\right)}{2d^{3/2}}-\frac{(bn)\,\text{S}}{}$$

$$=\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))+\frac{(bn)\,\text{Subst}\left(\int\frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx,x,\sqrt{d+ex^2}\right)}{d^{3/2}}-$$

$$=\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))-$$

$$=\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))-$$

$$=\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))-$$

$$=\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{3/2}}+\left(\frac{1}{d\sqrt{d+ex^2}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}\right)(a+b\log(cx^n))-$$

Mathematica [C] time = 0.377779, size = 241, normalized size = 1.15

$$\frac{9ex^2\left(\log(x)\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)+bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)\right)+\left(\sqrt{d}-\sqrt{d+ex^2}\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)\right)(a+b\log}{9d^{3/2}ex^2\sqrt{d+}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-(b*d^(3/2)*n*Sqrt[1 + d/(e*x^2)]*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/2,
 5/2}, -(d/(e*x^2))]) + 9*e*x^2*(-(b*Sqrt[e]*n*Sqrt[1 + d/(e*x^2)]*x*ArcSin
h[Sqrt[d]/(Sqrt[e]*x)]*Log[x]) - b*n*Sqrt[d + e*x^2]*Log[x]^2 + Sqrt[d + e*
x^2]*Log[x]*(a + b*Log[c*x^n] + b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]) + (a
+ b*Log[c*x^n])*(Sqrt[d] - Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]
)))/(9*d^(3/2)*e*x^2*Sqrt[d + e*x^2])
```

Maple [F] time = 0.404, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x}\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(e*x^2+d)^(3/2),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((a+b*log(c*x^n))/x/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log\left(cx^n\right)+\sqrt{ex^2+d}a}{e^2x^5+2\,dex^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^2*x^5 + 2*d*
e*x^3 + d^2*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\log\left(cx^n\right)}{x\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x*(d + e*x**2)**(3/2)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x), x)
```

3.291 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=287

$$\frac{3benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{5/2}}-\frac{3e\left(a+b\log\left(cx^n\right)\right)}{2d^2\sqrt{d+ex^2}}+\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{5/2}}-\frac{a+b\log\left(cx^n\right)}{2dx^2\sqrt{d+ex^2}}-\frac{bn\sqrt{d}}{4d}$$

```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*d^2*x^2) - (5*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[
d]])/(4*d^(5/2)) - (3*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*d^(5/2))
 - (3*e*(a + b*Log[c*x^n]))/(2*d^2*Sqrt[d + e*x^2]) - (a + b*Log[c*x^n])/(2
*d*x^2*Sqrt[d + e*x^2]) + (3*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]*(a + b*Log[
c*x^n]))/(2*d^(5/2)) + (3*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]*Log[(2*Sqr
t[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(5/2)) + (3*b*e*n*PolyLog[2, 1 - (
2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(5/2))
```

Rubi [A] time = 0.386355, antiderivative size = 286, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {266, 51, 63, 208, 2350, 446, 78, 5984, 5918, 2402, 2315}

$$\frac{3benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{5/2}}-\frac{3\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2}+\frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{5/2}}+\frac{a+b\log\left(cx^n\right)}{dx^2\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(3/2)),x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2])/(4*d^2*x^2) - (5*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[
d]])/(4*d^(5/2)) - (3*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(4*d^(5/2))
 + (a + b*Log[c*x^n])/(d*x^2*Sqrt[d + e*x^2]) - (3*Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/(2*d^2*x^2) + (3*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]*(a + b*Log[
c*x^n]))/(2*d^(5/2)) + (3*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]*Log[(2*Sqr
t[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(5/2)) + (3*b*e*n*PolyLog[2, 1 - (
2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(5/2))
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
```

```
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^{3/2}}\,dx = \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{5/2}} - (bn)\int \Bigg(-\frac{}{2}$$

$$= \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{5/2}} + \frac{(bn)\int \frac{d+3}{x^3\sqrt{}}}{2d^2}$$

$$= \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx^n))}{2d^{5/2}} + \frac{(bn)\,\mathrm{Subst}}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2d^2x^2} + \frac{3e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+b\log(cx}{2d^{5/2}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(a+b\log(cx^n))}{2d^2x^2} + \frac{3e\tanh}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(}{2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(}{2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^2x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{4d^{5/2}} - \frac{3ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{5/2}} + \frac{a+b\log(cx^n)}{dx^2\sqrt{d+ex^2}} - \frac{3\sqrt{d+ex^2}\,(}{2}$$

Mathematica [C] time = 0.311647, size = 218, normalized size = 0.76

$$\frac{3bd^{5/2}n\sqrt{\frac{d}{ex^2}+1}\,{}_3F_2\left(\frac{5}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{d}{ex^2}\right) - 25ex^2\left(\sqrt{d}\left(d+3ex^2\right)+3ex^2\log(x)\sqrt{d+ex^2}-3ex^2\sqrt{d+ex^2}\log\left(\sqrt{d}\sqrt{d+ex^2}\right.\right.}{50d^{5/2}ex^4\sqrt{d+ex^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(3/2)),x]
```

```
[Out] (3*b*d^(5/2)*n*Sqrt[1 + d/(e*x^2)]*HypergeometricPFQ[{5/2, 5/2, 5/2}, {7/2,
 7/2}, -(d/(e*x^2))] - 5*b*d^(5/2)*n*Sqrt[1 + d/(e*x^2)]*Hypergeometric2F1[
3/2, 5/2, 7/2, -(d/(e*x^2))]*(1 + 2*Log[x]) - 25*e*x^2*(a - b*n*Log[x] + b*
Log[c*x^n])*(Sqrt[d]*(d + 3*e*x^2) + 3*e*x^2*Sqrt[d + e*x^2]*Log[x] - 3*e*x
^2*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]]))/(50*d^(5/2)*e*x^4*Sqr
t[d + e*x^2])
```

Maple [F] time = 0.412, size = 0, normalized size = 0.

$$\int \frac{a + b\ln\left(cx^{n}\right)}{x^{3}}\left(ex^{2} + d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^(3/2),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((a+b*log(c*x^n))/x^3/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{ex^{2} + d}\,b\log\left(cx^{n}\right) + \sqrt{ex^{2} + d}\,a}{e^{2}x^{7} + 2\,dex^{5} + d^{2}x^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^2*x^7 + 2*d*
e*x^5 + d^2*x^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((a+b*ln(c*x**n))/x**3/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{\left(ex^2 + d\right)^{\frac{3}{2}} x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^3), x)
```

3.292 $\int \frac{x^2(a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=328

$$-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2e^{3/2}\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}\sqrt{d+ex^2}}-\frac{x(a+b\log(cx^n))}{e\sqrt{d+ex^2}}+\frac{b\sqrt{d}n\sqrt{\cdots}}{\cdots}$$

```
[Out] (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(e^(3/2)*Sqr
t[d + e*x^2]) + (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d
]]^2)/(2*e^(3/2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSin
h[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(e^(3/2
)*Sqrt[d + e*x^2]) - (x*(a + b*Log[c*x^n]))/(e*Sqrt[d + e*x^2]) + (Sqrt[d]*
Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(e^(3/
2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcS
inh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(3/2)*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.474172, antiderivative size = 328, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {2341, 288, 215, 2350, 14, 21, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2e^{3/2}\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}\sqrt{d+ex^2}}-\frac{x(a+b\log(cx^n))}{e\sqrt{d+ex^2}}+\frac{b\sqrt{d}n\sqrt{\cdots}}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(e^(3/2)*Sqr
t[d + e*x^2]) + (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d
]]^2)/(2*e^(3/2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSin
h[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(e^(3/2
)*Sqrt[d + e*x^2]) - (x*(a + b*Log[c*x^n]))/(e*Sqrt[d + e*x^2]) + (Sqrt[d]*
Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(e^(3/
2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcS
inh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(3/2)*Sqrt[d + e*x^2])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
```

```
0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a+b\log(cx^n))}{\left(d+ex^2\right)^{3/2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^2(a+b\log(cx^n))}{\left(1+\frac{ex^2}{d}\right)^{3/2}}\,dx}{d\sqrt{d+ex^2}}$$

$$= -\frac{x(a+b\log(cx^n))}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(bn\sqrt{1+\frac{ex^2}{d}}\right)\int \frac{-\frac{dx}{e\sqrt{1+\frac{ex^2}{d}}}}{}}{d\sqrt{d+ex}}$$

$$= -\frac{x(a+b\log(cx^n))}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(bn\sqrt{1+\frac{ex^2}{d}}\right)\int\left(\frac{d^2\sqrt{1+\frac{ex}{d}}}{e(-d-ex^2}\right.}{d\sqrt{d+}}$$

$$= -\frac{x(a+b\log(cx^n))}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\right)\int \frac{\sinh^{-1}}{x}}{e^{3/2}\sqrt{d+ex^2}}$$

$$= -\frac{x(a+b\log(cx^n))}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{3/2}\sqrt{d+ex^2}} - \frac{\left(b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\right)\text{Subst}\left(\right.}{e^{3/}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{x(a+b\log(cx^n))}{e\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+}}{}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\text{l}}{e^{3/2}\sqrt{d+e}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\text{l}}{e^{3/2}\sqrt{d+e}}$$

$$= \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{3/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\text{l}}{e^{3/2}\sqrt{d+e}}$$

Mathematica [C] time = 0.4827, size = 217, normalized size = 0.66

$$-\frac{bn\sqrt{\frac{ex^2}{d}+1}\left(e^{3/2}x^3\left(d+ex^2\right)\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};-\frac{ex^2}{d}\right)+9d^2\sqrt{e}x\log(x)\sqrt{\frac{ex^2}{d}+1}-9d^{3/2}\log(x)\left(d+ex^2\right)\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\right)}{9de^{3/2}\left(d+ex^2\right)^{3/2}}+$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -(b*n*Sqrt[1 + (e*x^2)/d]*(e^(3/2)*x^3*(d + e*x^2)*HypergeometricPFQ[{3/2,
3/2, 3/2}, {5/2, 5/2}, -((e*x^2)/d)] + 9*d^2*Sqrt[e]*x*Sqrt[1 + (e*x^2)/d]*
Log[x] - 9*d^(3/2)*(d + e*x^2)*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[x]))/(9*d*e
^(3/2)*(d + e*x^2)^(3/2)) - (x*(a - b*n*Log[x] + b*Log[c*x^n]))/(e*Sqrt[d +
 e*x^2]) + ((a - b*n*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^
2]])/e^(3/2)
```

Maple [F] time = 0.405, size = 0, normalized size = 0.

$$\int x^{2} \left(a+b\ln \left(c x^{n}\right)\right) \left(e x^{2}+d\right)^{-\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^(3/2),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(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\sqrt{e x^{2}+d} b x^{2} \log \left(c x^{n}\right)+\sqrt{e x^{2}+d} a x^{2}}{e^{2} x^{4}+2 \, d e x^{2}+d^{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^2*log(c*x^n) + sqrt(e*x^2 + d)*a*x^2)/(e^2*x^
4 + 2*d*e*x^2 + d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2 (a + b \log (cx^n))}{\left(d + ex^2\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**2)**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log (cx^n) + a)x^2}{\left(ex^2 + d\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^(3/2), x)
```

3.293 $\int \frac{a+b\log(cx^n)}{(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=58

$$\frac{x(a+b\log(cx^n))}{d\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

```
[Out] -((b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(d*Sqrt[e])) + (x*(a + b*Log[c
*x^n]))/(d*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.0340499, antiderivative size = 58, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {2314, 217, 206}

$$\frac{x(a+b\log(cx^n))}{d\sqrt{d+ex^2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^(3/2),x]
```

```
[Out] -((b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(d*Sqrt[e])) + (x*(a + b*Log[c
*x^n]))/(d*Sqrt[d + e*x^2])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\log\left(cx^n\right)}{\left(d+ex^2\right)^{3/2}}\,dx &= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}-\frac{(bn)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{d}\\ &= \frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}-\frac{(bn)\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{d}\\ &= -\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d\sqrt{e}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{d\sqrt{d+ex^2}}\end{aligned}$$

Mathematica [A] time = 0.0932741, size = 70, normalized size = 1.21

$$\frac{\frac{ax}{\sqrt{d+ex^2}}+\frac{bx\log(cx^n)}{\sqrt{d+ex^2}}-\frac{bn\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{\sqrt{e}}}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^(3/2),x]
```

```
[Out] ((a*x)/Sqrt[d + e*x^2] + (b*x*Log[c*x^n])/Sqrt[d + e*x^2] - (b*n*Log[e*x +
Sqrt[e]*Sqrt[d + e*x^2]])/Sqrt[e])/d
```

Maple [F] time = 0.395, size = 0, normalized size = 0.

$$\int (a+b\ln(cx^n))\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/(e*x^2+d)^(3/2),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((a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.46066, size = 421, normalized size = 7.26

$$\left[\frac{\left(benx^2+bdn\right)\sqrt{e}\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\sqrt{e}x-d\right)+2\left(benx\log\left(x\right)+bex\log\left(c\right)+aex\right)\sqrt{ex^2+d}}{2\left(de^2x^2+d^2e\right)}, \frac{\left(benx^2+bdn\right)\sqrt{-e}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/2*((b*e*n*x^2 + b*d*n)*sqrt(e)*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*
x - d) + 2*(b*e*n*x*log(x) + b*e*x*log(c) + a*e*x)*sqrt(e*x^2 + d))/(d*e^2*
x^2 + d^2*e), ((b*e*n*x^2 + b*d*n)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 +
d)) + (b*e*n*x*log(x) + b*e*x*log(c) + a*e*x)*sqrt(e*x^2 + d))/(d*e^2*x^2 +
 d^2*e)]
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\log\left(cx^n\right)}{\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**2)**(3/2), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^(3/2), x)
```

3.294 $\int \frac{a+b\log(cx^n)}{x^2\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=110

$$-\frac{2ex\left(a+b\log\left(cx^n\right)\right)}{d^2\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{dx\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{d^2x}+\frac{2b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d^2}$$

```
[Out] -((b*n*Sqrt[d + e*x^2])/(d^2*x)) + (2*b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[
d + e*x^2]])/d^2 - (a + b*Log[c*x^n])/(d*x*Sqrt[d + e*x^2]) - (2*e*x*(a + b
*Log[c*x^n]))/(d^2*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.129701, antiderivative size = 110, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28, Rules used = {271, 191, 2350, 12, 451, 217, 206}

$$-\frac{2ex\left(a+b\log\left(cx^n\right)\right)}{d^2\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{dx\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{d^2x}+\frac{2b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(3/2)),x]
```


```
[Out] -((b*n*Sqrt[d + e*x^2])/(d^2*x)) + (2*b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[
d + e*x^2]])/d^2 - (a + b*Log[c*x^n])/(d*x*Sqrt[d + e*x^2]) - (2*e*x*(a + b
*Log[c*x^n]))/(d^2*Sqrt[d + e*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^{3/2}}\,dx = -\frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}} - \frac{2ex(a+b\log(cx^n))}{d^2\sqrt{d+ex^2}} - (bn)\int \frac{-d-2ex^2}{d^2x^2\sqrt{d+ex^2}}\,dx$$

$$= -\frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}} - \frac{2ex(a+b\log(cx^n))}{d^2\sqrt{d+ex^2}} - \frac{(bn)\int \frac{-d-2ex^2}{x^2\sqrt{d+ex^2}}\,dx}{d^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{d^2x} - \frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}} - \frac{2ex(a+b\log(cx^n))}{d^2\sqrt{d+ex^2}} + \frac{(2ben)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{d^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{d^2x} - \frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}} - \frac{2ex(a+b\log(cx^n))}{d^2\sqrt{d+ex^2}} + \frac{(2ben)\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx, x, \frac{x}{\sqrt{d+ex^2}}\right)}{d^2}$$

$$= -\frac{bn\sqrt{d+ex^2}}{d^2x} + \frac{2b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{d^2} - \frac{a+b\log(cx^n)}{dx\sqrt{d+ex^2}} - \frac{2ex(a+b\log(cx^n))}{d^2\sqrt{d+ex^2}}$$

Mathematica [A] time = 0.12525, size = 103, normalized size = 0.94

$$\frac{-ad-2aex^2-b(d+2ex^2)\log(cx^n)+2b\sqrt{e}nx\sqrt{d+ex^2}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)-bdn-benx^2}{d^2x\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-(a*d) - b*d*n - 2*a*e*x^2 - b*e*n*x^2 - b*(d + 2*e*x^2)*Log[c*x^n] + 2*b*
Sqrt[e]*n*x*Sqrt[d + e*x^2]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(d^2*x*Sqrt
[d + e*x^2])
```

Maple [F] time = 0.406, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^2}\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^(3/2),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((a+b*log(c*x^n))/x^2/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.56251, size = 568, normalized size = 5.16

$$\left[\frac{\left(benx^3 + bdnx\right)\sqrt{e}\log\left(-2\,ex^2 - 2\,\sqrt{ex^2+d}\sqrt{e}x - d\right) - \left(bdn + (ben + 2\,ae)x^2 + ad + \left(2\,bex^2 + bd\right)\log(c) + \left(2\,benx^2 + b\right.\right.}{d^2ex^3 + d^3x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [((b*e*n*x^3 + b*d*n*x)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x
- d) - (b*d*n + (b*e*n + 2*a*e)*x^2 + a*d + (2*b*e*x^2 + b*d)*log(c) + (2*b
*e*n*x^2 + b*d*n)*log(x))*sqrt(e*x^2 + d))/(d^2*e*x^3 + d^3*x), -(2*(b*e*n*
x^3 + b*d*n*x)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (b*d*n + (b*e*
n + 2*a*e)*x^2 + a*d + (2*b*e*x^2 + b*d)*log(c) + (2*b*e*n*x^2 + b*d*n)*log
(x))*sqrt(e*x^2 + d))/(d^2*e*x^3 + d^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((a+b*ln(c*x**n))/x**2/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n)+a}{\left(ex^2+d\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^2), x)
```

3.295 $\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=176

$$\frac{8e^2x(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n))}{3d^2x\sqrt{d+ex^2}}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}-\frac{8be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{bn\sqrt{d+ex^2}}{9d^2x^3}$$

```
[Out] -(b*n*Sqrt[d + e*x^2])/(9*d^2*x^3) + (14*b*e*n*Sqrt[d + e*x^2])/(9*d^3*x) -
 (8*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^3) - (a + b*Log[
c*x^n])/(3*d*x^3*Sqrt[d + e*x^2]) + (4*e*(a + b*Log[c*x^n]))/(3*d^2*x*Sqrt[
d + e*x^2]) + (8*e^2*x*(a + b*Log[c*x^n]))/(3*d^3*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.166127, antiderivative size = 176, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {271, 191, 2350, 12, 1265, 451, 217, 206}

$$\frac{8e^2x(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n))}{3d^2x\sqrt{d+ex^2}}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}-\frac{8be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{bn\sqrt{d+ex^2}}{9d^2x^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(3/2)),x]
```

```
[Out] -(b*n*Sqrt[d + e*x^2])/(9*d^2*x^3) + (14*b*e*n*Sqrt[d + e*x^2])/(9*d^3*x) -
 (8*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^3) - (a + b*Log[
c*x^n])/(3*d*x^3*Sqrt[d + e*x^2]) + (4*e*(a + b*Log[c*x^n]))/(3*d^2*x*Sqrt[
d + e*x^2]) + (8*e^2*x*(a + b*Log[c*x^n]))/(3*d^3*Sqrt[d + e*x^2])
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\left(d+ex^2\right)^{3/2}}\,dx = -\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n))}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}-(bn)\int \frac{-d^2+4dex^2+8e^2x^4}{3d^3x^4\sqrt{d+ex^2}}\,dx$$

$$= -\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n))}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}-\frac{(bn)\int \frac{-d^2+4dex^2+8e^2x^4}{x^4\sqrt{d+ex^2}}\,dx}{3d^3}$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n))}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}+\frac{(bn)\int \frac{-14d^2e-24de}{x^2\sqrt{d+ex^2}}}{9d^4}$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n))}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}-$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n))}{3d^2x\sqrt{d+ex^2}}+\frac{8e^2x(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}-$$

$$= -\frac{bn\sqrt{d+ex^2}}{9d^2x^3}+\frac{14ben\sqrt{d+ex^2}}{9d^3x}-\frac{8be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}-\frac{a+b\log(cx^n)}{3dx^3\sqrt{d+ex^2}}+\frac{4e(a+b\log(cx^n)}{3d^2x\sqrt{d+ex^2}}$$

Mathematica [A] time = 0.158234, size = 144, normalized size = 0.82

$$\frac{-3ad^2+12adex^2+24ae^2x^4-3b\left(d^2-4dex^2-8e^2x^4\right)\log(cx^n)-bd^2n-24be^{3/2}nx^3\sqrt{d+ex^2}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)+13}{9d^3x^3\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-3*a*d^2 - b*d^2*n + 12*a*d*e*x^2 + 13*b*d*e*n*x^2 + 24*a*e^2*x^4 + 14*b*e
^2*n*x^4 - 3*b*(d^2 - 4*d*e*x^2 - 8*e^2*x^4)*Log[c*x^n] - 24*b*e^(3/2)*n*x^
3*Sqrt[d + e*x^2]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(9*d^3*x^3*Sqrt[d + e
*x^2])
```

Maple [F] time = 0.418, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^4}\left(ex^2+d\right)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^(3/2),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((a+b*log(c*x^n))/x^4/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.65842, size = 840, normalized size = 4.77

$$\left[\frac{12\left(be^2nx^5 + bdenx^3\right)\sqrt{e}\log\left(-2\,ex^2 + 2\,\sqrt{ex^2+d}\sqrt{e}x - d\right) + \left(2\left(7\,be^2n + 12\,ae^2\right)x^4 - bd^2n - 3\,ad^2 + (13\,bden + 12\,ade}{9\left(d^3ex^5 + d^4x^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/9*(12*(b*e^2*n*x^5 + b*d*e*n*x^3)*sqrt(e)*log(-2*e*x^2 + 2*sqrt(e*x^2 +
d)*sqrt(e)*x - d) + (2*(7*b*e^2*n + 12*a*e^2)*x^4 - b*d^2*n - 3*a*d^2 + (13
*b*d*e*n + 12*a*d*e)*x^2 + 3*(8*b*e^2*x^4 + 4*b*d*e*x^2 - b*d^2)*log(c) + 3
*(8*b*e^2*n*x^4 + 4*b*d*e*n*x^2 - b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*e*
x^5 + d^4*x^3), 1/9*(24*(b*e^2*n*x^5 + b*d*e*n*x^3)*sqrt(-e)*arctan(sqrt(-e
)*x/sqrt(e*x^2 + d)) + (2*(7*b*e^2*n + 12*a*e^2)*x^4 - b*d^2*n - 3*a*d^2 +
(13*b*d*e*n + 12*a*d*e)*x^2 + 3*(8*b*e^2*x^4 + 4*b*d*e*x^2 - b*d^2)*log(c)
+ 3*(8*b*e^2*n*x^4 + 4*b*d*e*n*x^2 - b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3
*e*x^5 + d^4*x^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{\left(ex^2 + d\right)^{\frac{3}{2}} x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^4), x)
```

3.296 $\int \frac{a+b\log(cx^n)}{x^6\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=236

$$-\frac{16e^3x\left(a+b\log\left(cx^n\right)\right)}{5d^4\sqrt{d+ex^2}}-\frac{8e^2\left(a+b\log\left(cx^n\right)\right)}{5d^3x\sqrt{d+ex^2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{5d^2x^3\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{5dx^5\sqrt{d+ex^2}}-\frac{148be^2n\sqrt{d+ex^2}}{75d^4x}+\frac{16be^{5/2}n\,\mathrm{t}}{}$$

```
[Out] -(b*n*Sqrt[d + e*x^2])/(25*d^2*x^5) + (14*b*e*n*Sqrt[d + e*x^2])/(75*d^3*x^
3) - (148*b*e^2*n*Sqrt[d + e*x^2])/(75*d^4*x) + (16*b*e^(5/2)*n*ArcTanh[(Sq
rt[e]*x)/Sqrt[d + e*x^2]])/(5*d^4) - (a + b*Log[c*x^n])/(5*d*x^5*Sqrt[d + e
*x^2]) + (2*e*(a + b*Log[c*x^n]))/(5*d^2*x^3*Sqrt[d + e*x^2]) - (8*e^2*(a +
 b*Log[c*x^n]))/(5*d^3*x*Sqrt[d + e*x^2]) - (16*e^3*x*(a + b*Log[c*x^n]))/(
5*d^4*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.270337, antiderivative size = 236, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {271, 191, 2350, 12, 1807, 1585, 1265, 451, 217, 206}

$$-\frac{16e^3x\left(a+b\log\left(cx^n\right)\right)}{5d^4\sqrt{d+ex^2}}-\frac{8e^2\left(a+b\log\left(cx^n\right)\right)}{5d^3x\sqrt{d+ex^2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{5d^2x^3\sqrt{d+ex^2}}-\frac{a+b\log\left(cx^n\right)}{5dx^5\sqrt{d+ex^2}}-\frac{148be^2n\sqrt{d+ex^2}}{75d^4x}+\frac{16be^{5/2}n\,\mathrm{t}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^6*(d + e*x^2)^(3/2)),x]
```


```
[Out] -(b*n*Sqrt[d + e*x^2])/(25*d^2*x^5) + (14*b*e*n*Sqrt[d + e*x^2])/(75*d^3*x^
3) - (148*b*e^2*n*Sqrt[d + e*x^2])/(75*d^4*x) + (16*b*e^(5/2)*n*ArcTanh[(Sq
rt[e]*x)/Sqrt[d + e*x^2]])/(5*d^4) - (a + b*Log[c*x^n])/(5*d*x^5*Sqrt[d + e
*x^2]) + (2*e*(a + b*Log[c*x^n]))/(5*d^2*x^3*Sqrt[d + e*x^2]) - (8*e^2*(a +
 b*Log[c*x^n]))/(5*d^3*x*Sqrt[d + e*x^2]) - (16*e^3*x*(a + b*Log[c*x^n]))/(
5*d^4*Sqrt[d + e*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1807

```
Int[(Pq_)*((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[{
Q = PolynomialQuotient[Pq, c*x, x], R = PolynomialRemainder[Pq, c*x, x]}, S
imp[(R*(c*x)^(m + 1)*(a + b*x^2)^(p + 1))/(a*c*(m + 1)), x] + Dist[1/(a*c*(
m + 1)), Int[(c*x)^(m + 1)*(a + b*x^2)^p*ExpandToSum[a*c*(m + 1)*Q - b*R*(m
 + 2*p + 3)*x, x], x], x]] /; FreeQ[{a, b, c, p}, x] && PolyQ[Pq, x] && LtQ
[m, -1] && (IntegerQ[2*p] || NeQ[Expon[Pq, x], 1])
```

Rule 1585

```
Int[(u_.)*(x_)^(m_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.) + (c_.)*(x_)^(r_.
))^(n_.), x_Symbol] :> Int[u*x^(m + n*p)*(a + b*x^(q - p) + c*x^(r - p))^n,
 x] /; FreeQ[{a, b, c, m, p, q, r}, x] && IntegerQ[n] && PosQ[q - p] && Pos
Q[r - p]
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^6\left(d+ex^2\right)^{3/2}}\,dx = -\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}}+\frac{2e(a+b\log(cx^n))}{5d^2x^3\sqrt{d+ex^2}}-\frac{8e^2(a+b\log(cx^n))}{5d^3x\sqrt{d+ex^2}}-\frac{16e^3x(a+b\log(cx^n))}{5d^4\sqrt{d+ex^2}}-(bn)\int$$

$$= -\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}}+\frac{2e(a+b\log(cx^n))}{5d^2x^3\sqrt{d+ex^2}}-\frac{8e^2(a+b\log(cx^n))}{5d^3x\sqrt{d+ex^2}}-\frac{16e^3x(a+b\log(cx^n))}{5d^4\sqrt{d+ex^2}}-\frac{(bn)\int}{}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5}-\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}}+\frac{2e(a+b\log(cx^n))}{5d^2x^3\sqrt{d+ex^2}}-\frac{8e^2(a+b\log(cx^n))}{5d^3x\sqrt{d+ex^2}}-\frac{16e^3x(a+b\log(c}{5d^4\sqrt{d+ex^2}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5}-\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}}+\frac{2e(a+b\log(cx^n))}{5d^2x^3\sqrt{d+ex^2}}-\frac{8e^2(a+b\log(cx^n))}{5d^3x\sqrt{d+ex^2}}-\frac{16e^3x(a+b\log(c}{5d^4\sqrt{d+ex^2}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5}+\frac{14ben\sqrt{d+ex^2}}{75d^3x^3}-\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}}+\frac{2e(a+b\log(cx^n))}{5d^2x^3\sqrt{d+ex^2}}-\frac{8e^2(a+b\log(cx^n))}{5d^3x\sqrt{d+ex^2}}-$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5}+\frac{14ben\sqrt{d+ex^2}}{75d^3x^3}-\frac{148be^2n\sqrt{d+ex^2}}{75d^4x}-\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}}+\frac{2e(a+b\log(cx^n))}{5d^2x^3\sqrt{d+ex^2}}-8e$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5}+\frac{14ben\sqrt{d+ex^2}}{75d^3x^3}-\frac{148be^2n\sqrt{d+ex^2}}{75d^4x}-\frac{a+b\log(cx^n)}{5dx^5\sqrt{d+ex^2}}+\frac{2e(a+b\log(cx^n))}{5d^2x^3\sqrt{d+ex^2}}-8e$$

$$= -\frac{bn\sqrt{d+ex^2}}{25d^2x^5}+\frac{14ben\sqrt{d+ex^2}}{75d^3x^3}-\frac{148be^2n\sqrt{d+ex^2}}{75d^4x}+\frac{16be^{5/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{5d^4}-\frac{a+b\log(cx^n}{5dx^5\sqrt{d+ex}}$$

Mathematica [A] time = 0.189937, size = 180, normalized size = 0.76

$$\frac{30ad^2ex^2-15ad^3-120ade^2x^4-240ae^3x^6-15b\left(-2d^2ex^2+d^3+8de^2x^4+16e^3x^6\right)\log(cx^n)+11bd^2enx^2-3bd^3n-134b}{75d^4x^5\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^6*(d + e*x^2)^(3/2)),x]
```

```
[Out] (-15*a*d^3 - 3*b*d^3*n + 30*a*d^2*e*x^2 + 11*b*d^2*e*n*x^2 - 120*a*d*e^2*x^
4 - 134*b*d*e^2*n*x^4 - 240*a*e^3*x^6 - 148*b*e^3*n*x^6 - 15*b*(d^3 - 2*d^2
*e*x^2 + 8*d*e^2*x^4 + 16*e^3*x^6)*Log[c*x^n] + 240*b*e^(5/2)*n*x^5*Sqrt[d
+ e*x^2]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(75*d^4*x^5*Sqrt[d + e*x^2])
```

Maple [F] time = 0.407, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(c x^{n}\right)}{x^{6}} \left(e x^{2}+d\right)^{-\frac{3}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^6/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^6/(e*x^2+d)^(3/2),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((a+b*log(c*x^n))/x^6/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.84014, size = 1084, normalized size = 4.59

$$\left[\frac{120\left(be^{3}nx^{7}+bde^{2}nx^{5}\right)\sqrt{e}\log\left(-2\,ex^{2}-2\,\sqrt{ex^{2}+d}\sqrt{e}x-d\right)-\left(4\left(37\,be^{3}n+60\,ae^{3}\right)x^{6}+3\,bd^{3}n+2\left(67\,bde^{2}n+60\,ad\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/75*(120*(b*e^3*n*x^7 + b*d*e^2*n*x^5)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^
2 + d)*sqrt(e)*x - d) - (4*(37*b*e^3*n + 60*a*e^3)*x^6 + 3*b*d^3*n + 2*(67*
b*d*e^2*n + 60*a*d*e^2)*x^4 + 15*a*d^3 - (11*b*d^2*e*n + 30*a*d^2*e)*x^2 +
15*(16*b*e^3*x^6 + 8*b*d*e^2*x^4 - 2*b*d^2*e*x^2 + b*d^3)*log(c) + 15*(16*b
*e^3*n*x^6 + 8*b*d*e^2*n*x^4 - 2*b*d^2*e*n*x^2 + b*d^3*n)*log(x))*sqrt(e*x^
2 + d))/(d^4*e*x^7 + d^5*x^5), -1/75*(240*(b*e^3*n*x^7 + b*d*e^2*n*x^5)*sqr
t(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (4*(37*b*e^3*n + 60*a*e^3)*x^6 +
 3*b*d^3*n + 2*(67*b*d*e^2*n + 60*a*d*e^2)*x^4 + 15*a*d^3 - (11*b*d^2*e*n +
```

```
 30*a*d^2*e)*x^2 + 15*(16*b*e^3*x^6 + 8*b*d*e^2*x^4 - 2*b*d^2*e*x^2 + b*d^3
)*log(c) + 15*(16*b*e^3*n*x^6 + 8*b*d*e^2*n*x^4 - 2*b*d^2*e*n*x^2 + b*d^3*n
)*log(x))*sqrt(e*x^2 + d))/(d^4*e*x^7 + d^5*x^5)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**6/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{2}+d\right)^{\frac{3}{2}}x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^6/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(3/2)*x^6), x)
```

3.297 $\int \frac{x^7(a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=212

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}-\frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}-\frac{bd^2n}{3e^4\sqrt{d+ex^2}}$$

```
[Out] -(b*d^2*n)/(3*e^4*Sqrt[d + e*x^2]) + (8*b*d*n*Sqrt[d + e*x^2])/(3*e^4) - (b
*n*(d + e*x^2)^(3/2))/(9*e^4) - (16*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]])/(3*e^4) + (d^3*(a + b*Log[c*x^n]))/(3*e^4*(d + e*x^2)^(3/2)) - (3*d^
2*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x^2]) - (3*d*Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/e^4 + ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^4)
```

Rubi [A] time = 0.323787, antiderivative size = 212, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 1799, 1619, 63, 208}

$$\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{3e^4\left(d+ex^2\right)^{3/2}}-\frac{3d^2\left(a+b\log\left(cx^n\right)\right)}{e^4\sqrt{d+ex^2}}-\frac{3d\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^4}+\frac{\left(d+ex^2\right)^{3/2}\left(a+b\log\left(cx^n\right)\right)}{3e^4}-\frac{bd^2n}{3e^4\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```


```
[Out] -(b*d^2*n)/(3*e^4*Sqrt[d + e*x^2]) + (8*b*d*n*Sqrt[d + e*x^2])/(3*e^4) - (b
*n*(d + e*x^2)^(3/2))/(9*e^4) - (16*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]])/(3*e^4) + (d^3*(a + b*Log[c*x^n]))/(3*e^4*(d + e*x^2)^(3/2)) - (3*d^
2*(a + b*Log[c*x^n]))/(e^4*Sqrt[d + e*x^2]) - (3*d*Sqrt[d + e*x^2]*(a + b*L
og[c*x^n]))/e^4 + ((d + e*x^2)^(3/2)*(a + b*Log[c*x^n]))/(3*e^4)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 1619

```
Int[((Px_)*((c_.) + (d_.)*(x_))^(n_.))/((a_.) + (b_.)*(x_)), x_Symbol] :> I
nt[ExpandIntegrand[1/Sqrt[c + d*x], (Px*(c + d*x)^(n + 1/2))/(a + b*x), x],
 x] /; FreeQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[n + 1/2, 0] && GtQ
[Expon[Px, x], 2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^7 (a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{d^3 (a+b\log(cx^n))}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2 (a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^4} + \frac{\left(d+ex^2\right)^{3/2} (a}{3e}$$

$$= \frac{d^3 (a+b\log(cx^n))}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2 (a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^4} + \frac{\left(d+ex^2\right)^{3/2} (a}{3e}$$

$$= \frac{d^3 (a+b\log(cx^n))}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2 (a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^4} + \frac{\left(d+ex^2\right)^{3/2} (a}{3e}$$

$$= \frac{d^3 (a+b\log(cx^n))}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2 (a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} - \frac{3d\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^4} + \frac{\left(d+ex^2\right)^{3/2} (a}{3e}$$

$$= -\frac{bd^2n}{3e^4\sqrt{d+ex^2}} + \frac{7bdn\sqrt{d+ex^2}}{3e^4} + \frac{d^3 (a+b\log(cx^n))}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2 (a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} - 3d\sqrt{d+ex^2}$$

$$= -\frac{bd^2n}{3e^4\sqrt{d+ex^2}} + \frac{7bdn\sqrt{d+ex^2}}{3e^4} + \frac{d^3 (a+b\log(cx^n))}{3e^4\left(d+ex^2\right)^{3/2}} - \frac{3d^2 (a+b\log(cx^n))}{e^4\sqrt{d+ex^2}} - 3d\sqrt{d+ex^2}$$

$$= -\frac{bd^2n}{3e^4\sqrt{d+ex^2}} + \frac{8bdn\sqrt{d+ex^2}}{3e^4} - \frac{bn\left(d+ex^2\right)^{3/2}}{9e^4} - \frac{16bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^4} + \frac{d^3 (a+b\,\mathrm{l}}{3e^4\left(d+\right.}$$

Mathematica [A] time = 0.249205, size = 240, normalized size = 1.13

$$\frac{-72ad^2ex^2 - 48ad^3 - 18ade^2x^4 + 3ae^3x^6 - 3b\left(24d^2ex^2 + 16d^3 + 6de^2x^4 - e^3x^6\right)\log(cx^n) + 42bd^2enx^2 - 48bd^{3/2}enx^2\sqrt{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^7*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (-48*a*d^3 + 20*b*d^3*n - 72*a*d^2*e*x^2 + 42*b*d^2*e*n*x^2 - 18*a*d*e^2*x^
4 + 21*b*d*e^2*n*x^4 + 3*a*e^3*x^6 - b*e^3*n*x^6 + 48*b*d^(3/2)*n*(d + e*x^
2)^(3/2)*Log[x] - 3*b*(16*d^3 + 24*d^2*e*x^2 + 6*d*e^2*x^4 - e^3*x^6)*Log[c
```

```
*x^n] - 48*b*d^(5/2)*n*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] - 4
8*b*d^(3/2)*e*n*x^2*Sqrt[d + e*x^2]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(9*e^
4*(d + e*x^2)^(3/2))
```

Maple [F] time = 0.406, size = 0, normalized size = 0.

$$\int x^7 (a + b\ln(cx^n)) \left(ex^2 + d\right)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^7*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^7*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),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(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.95926, size = 1134, normalized size = 5.35

$$\left[\frac{24\left(bde^2nx^4 + 2\,bd^2enx^2 + bd^3n\right)\sqrt{d}\log\left(-\frac{ex^2-2\sqrt{ex^2+d}\sqrt{d}+2\,d}{x^2}\right) - \left(\left(be^3n - 3\,ae^3\right)x^6 - 20\,bd^3n - 3\left(7\,bde^2n - 6\,ade^2\right)x^4 + 4\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/9*(24*(b*d*e^2*n*x^4 + 2*b*d^2*e*n*x^2 + b*d^3*n)*sqrt(d)*log(-(e*x^2 -
2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) - ((b*e^3*n - 3*a*e^3)*x^6 - 20*b*d^3
```

```
*n - 3*(7*b*d*e^2*n - 6*a*d*e^2)*x^4 + 48*a*d^3 - 6*(7*b*d^2*e*n - 12*a*d^2
*e)*x^2 - 3*(b*e^3*x^6 - 6*b*d*e^2*x^4 - 24*b*d^2*e*x^2 - 16*b*d^3)*log(c)
- 3*(b*e^3*n*x^6 - 6*b*d*e^2*n*x^4 - 24*b*d^2*e*n*x^2 - 16*b*d^3*n)*log(x))
*sqrt(e*x^2 + d))/(e^6*x^4 + 2*d*e^5*x^2 + d^2*e^4), 1/9*(48*(b*d*e^2*n*x^4
 + 2*b*d^2*e*n*x^2 + b*d^3*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (
(b*e^3*n - 3*a*e^3)*x^6 - 20*b*d^3*n - 3*(7*b*d*e^2*n - 6*a*d*e^2)*x^4 + 48
*a*d^3 - 6*(7*b*d^2*e*n - 12*a*d^2*e)*x^2 - 3*(b*e^3*x^6 - 6*b*d*e^2*x^4 -
24*b*d^2*e*x^2 - 16*b*d^3)*log(c) - 3*(b*e^3*n*x^6 - 6*b*d*e^2*n*x^4 - 24*b
*d^2*e*n*x^2 - 16*b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(e^6*x^4 + 2*d*e^5*x^2
+ d^2*e^4)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**7*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^7}{(ex^2 + d)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^7*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^7/(e*x^2 + d)^(5/2), x)
```

3.298 $\int \frac{x^5(a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=155

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{bdn}{3e^3\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^3}+\frac{8b\sqrt{d}n\tanh^{-1}\left(\right.}{3e^3}$$

```
[Out] (b*d*n)/(3*e^3*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/e^3 + (8*b*Sqrt[d]*
n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^3) - (d^2*(a + b*Log[c*x^n]))/(3*e
^3*(d + e*x^2)^(3/2)) + (2*d*(a + b*Log[c*x^n]))/(e^3*Sqrt[d + e*x^2]) + (S
qrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3
```

Rubi [A] time = 0.234636, antiderivative size = 155, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 1251, 897, 1261, 206}

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{3e^3\left(d+ex^2\right)^{3/2}}+\frac{2d\left(a+b\log\left(cx^n\right)\right)}{e^3\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{bdn}{3e^3\sqrt{d+ex^2}}-\frac{bn\sqrt{d+ex^2}}{e^3}+\frac{8b\sqrt{d}n\tanh^{-1}\left(\right.}{3e^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```


```
[Out] (b*d*n)/(3*e^3*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/e^3 + (8*b*Sqrt[d]*
n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*e^3) - (d^2*(a + b*Log[c*x^n]))/(3*e
^3*(d + e*x^2)^(3/2)) + (2*d*(a + b*Log[c*x^n]))/(e^3*Sqrt[d + e*x^2]) + (S
qrt[d + e*x^2]*(a + b*Log[c*x^n]))/e^3
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
```

```
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{x^5 (a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx = -\frac{d^2 (a+b\log(cx^n))}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - (bn)\int \frac{8d^2+12de}{3e^3x\left(d\right.}$$

$$= -\frac{d^2 (a+b\log(cx^n))}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{(bn)\int \frac{8d^2+12dex^2+3}{x\left(d+ex^2\right)^{3/}}}{3e^3}$$

$$= -\frac{d^2 (a+b\log(cx^n))}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{(bn)\,\mathrm{Subst}\left(\int \frac{8d^2}{}\right.}{6}$$

$$= -\frac{d^2 (a+b\log(cx^n))}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{(bn)\,\mathrm{Subst}\left(\int \frac{-d^2}{x^2}\right.}{}$$

$$= -\frac{d^2 (a+b\log(cx^n))}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\,(a+b\log(cx^n))}{e^3} - \frac{(bn)\,\mathrm{Subst}\left(\int \left(3e\right.\right.}{}$$

$$= \frac{bdn}{3e^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{e^3} - \frac{d^2 (a+b\log(cx^n))}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d(a+b\log(cx^n))}{e^3\sqrt{d+ex^2}} + \frac{\sqrt{d+ex^2}\,(a+b\log}{e^3}$$

$$= \frac{bdn}{3e^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{e^3} + \frac{8b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3e^3} - \frac{d^2 (a+b\log(cx^n))}{3e^3\left(d+ex^2\right)^{3/2}} + \frac{2d(a+b\log}{e^3\sqrt{d+e}}$$

Mathematica [A] time = 0.207138, size = 205, normalized size = 1.32

$$\sqrt{d+ex^2}\left(-\frac{d^2 (a+b(\log(cx^n)-n\log(x)))}{3e^3\left(d+ex^2\right)^2} + \frac{d(6a+6b(\log(cx^n)-n\log(x))+bn)}{3e^3\left(d+ex^2\right)} + \frac{a+b(\log(cx^n)-n\log(x))-bn}{e^3}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (-8*b*Sqrt[d]*n*Log[x])/(3*e^3) + (b*n*(8*d^2 + 12*d*e*x^2 + 3*e^2*x^4)*Log
[x])/(3*e^3*(d + e*x^2)^(3/2)) + Sqrt[d + e*x^2]*(-(d^2*(a + b*(-(n*Log[x])
 + Log[c*x^n])))/(3*e^3*(d + e*x^2)^2) + (a - b*n + b*(-(n*Log[x]) + Log[c*
x^n]))/e^3 + (d*(6*a + b*n + 6*b*(-(n*Log[x]) + Log[c*x^n])))/(3*e^3*(d + e
*x^2))) + (8*b*Sqrt[d]*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(3*e^3)
```

Maple [F] time = 0.41, size = 0, normalized size = 0.

$$\int x^5 (a + b\ln(cx^n)) \left(ex^2 + d\right)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^5*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),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(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.74264, size = 900, normalized size = 5.81

$$\left[\frac{4\left(be^2nx^4 + 2\,bdenx^2 + bd^2n\right)\sqrt{d}\log\left(-\frac{ex^2+2\sqrt{ex^2+d}\sqrt{d}+2\,d}{x^2}\right) - \left(3\left(be^2n - ae^2\right)x^4 + 2\,bd^2n - 8\,ad^2 + (5\,bden - 12\,ade)x^2 -}{3\left(e^5x^4 + 2\,de^4x^2 + d^2e^3\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*(4*(b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 + 2*sqr
t(e*x^2 + d)*sqrt(d) + 2*d)/x^2) - (3*(b*e^2*n - a*e^2)*x^4 + 2*b*d^2*n - 8
*a*d^2 + (5*b*d*e*n - 12*a*d*e)*x^2 - (3*b*e^2*x^4 + 12*b*d*e*x^2 + 8*b*d^2
)*log(c) - (3*b*e^2*n*x^4 + 12*b*d*e*n*x^2 + 8*b*d^2*n)*log(x))*sqrt(e*x^2
+ d))/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3), -1/3*(8*(b*e^2*n*x^4 + 2*b*d*e*n*x
^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (3*(b*e^2*n - a*e
^2)*x^4 + 2*b*d^2*n - 8*a*d^2 + (5*b*d*e*n - 12*a*d*e)*x^2 - (3*b*e^2*x^4 +
 12*b*d*e*x^2 + 8*b*d^2)*log(c) - (3*b*e^2*n*x^4 + 12*b*d*e*n*x^2 + 8*b*d^2
*n)*log(x))*sqrt(e*x^2 + d))/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log{(cx^n)} + a)x^5}{\left(ex^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^5/(e*x^2 + d)^(5/2), x)
```

3.299 $\int \frac{x^3(a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=108

$$-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{bn}{3e^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3\sqrt{d}e^2}$$

```
[Out] -(b*n)/(3*e^2*Sqrt[d + e*x^2]) - (2*b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
3*Sqrt[d]*e^2) + (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x^2)^(3/2)) - (a + b*
Log[c*x^n])/(e^2*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.160831, antiderivative size = 108, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {266, 43, 2350, 12, 446, 78, 63, 208}

$$-\frac{a+b\log\left(cx^n\right)}{e^2\sqrt{d+ex^2}}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{3e^2\left(d+ex^2\right)^{3/2}}-\frac{bn}{3e^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3\sqrt{d}e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*n)/(3*e^2*Sqrt[d + e*x^2]) - (2*b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
3*Sqrt[d]*e^2) + (d*(a + b*Log[c*x^n]))/(3*e^2*(d + e*x^2)^(3/2)) - (a + b*
Log[c*x^n])/(e^2*Sqrt[d + e*x^2])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{d(a+b\log(cx^n))}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}} - (bn)\int \frac{-2d-3ex^2}{3e^2x\left(d+ex^2\right)^{3/2}}\,dx$$

$$= \frac{d(a+b\log(cx^n))}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}} - \frac{(bn)\int \frac{-2d-3ex^2}{x\left(d+ex^2\right)^{3/2}}\,dx}{3e^2}$$

$$= \frac{d(a+b\log(cx^n))}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}} - \frac{(bn)\,\text{Subst}\left(\int \frac{-2d-3ex}{x(d+ex)^{3/2}}\,dx, x, x^2\right)}{6e^2}$$

$$= -\frac{bn}{3e^2\sqrt{d+ex^2}} + \frac{d(a+b\log(cx^n))}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}} + \frac{(bn)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx, x, x^2\right)}{3e^2}$$

$$= -\frac{bn}{3e^2\sqrt{d+ex^2}} + \frac{d(a+b\log(cx^n))}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}} + \frac{(2bn)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx, x, \sqrt{d+e\right.}{3e^3}$$

$$= -\frac{bn}{3e^2\sqrt{d+ex^2}} - \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3\sqrt{d}e^2} + \frac{d(a+b\log(cx^n))}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\log(cx^n)}{e^2\sqrt{d+ex^2}}$$

Mathematica [A] time = 0.268131, size = 137, normalized size = 1.27

$$\frac{\frac{d(a+b\log(cx^n)-bn\log(x))-\left(d+ex^2\right)(3a+3b\log(cx^n)-3bn\log(x)+bn)}{\left(d+ex^2\right)^{3/2}} - \frac{bn\log(x)\left(2d+3ex^2\right)}{\left(d+ex^2\right)^{3/2}} - \frac{2bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)}{\sqrt{d}} + \frac{2bn\log(x)}{\sqrt{d}}}{3e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] ((2*b*n*Log[x])/Sqrt[d] - (b*n*(2*d + 3*e*x^2)*Log[x])/(d + e*x^2)^(3/2) +
(d*(a - b*n*Log[x] + b*Log[c*x^n]) - (d + e*x^2)*(3*a + b*n - 3*b*n*Log[x]
+ 3*b*Log[c*x^n]))/(d + e*x^2)^(3/2) - (2*b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^
2]])/Sqrt[d])/(3*e^2)
```

Maple [F] time = 0.402, size = 0, normalized size = 0.

$$\int x^{3} \left(a + b \ln \left(c x^{n}\right)\right) \left(e x^{2} + d\right)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),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(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.6605, size = 737, normalized size = 6.82

$$\left[\frac{\left(b e^{2} n x^{4} + 2 \, b d e n x^{2} + b d^{2} n\right) \sqrt{d} \log\left(-\frac{e x^{2} - 2 \, \sqrt{e x^{2} + d} \sqrt{d} + 2 \, d}{x^{2}}\right) - \left(b d^{2} n + 2 \, a d^{2} + (b d e n + 3 \, a d e) x^{2} + \left(3 \, b d e x^{2} + 2 \, b d^{2}\right) \log\left(c\right) +}{3 \left(d e^{4} x^{4} + 2 \, d^{2} e^{3} x^{2} + d^{3} e^{2}\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(
e*x^2 + d)*sqrt(d) + 2*d)/x^2) - (b*d^2*n + 2*a*d^2 + (b*d*e*n + 3*a*d*e)*x
^2 + (3*b*d*e*x^2 + 2*b*d^2)*log(c) + (3*b*d*e*n*x^2 + 2*b*d^2*n)*log(x))*s
qrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^3*x^2 + d^3*e^2), 1/3*(2*(b*e^2*n*x^4
+ 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (b*d
^2*n + 2*a*d^2 + (b*d*e*n + 3*a*d*e)*x^2 + (3*b*d*e*x^2 + 2*b*d^2)*log(c) +
 (3*b*d*e*n*x^2 + 2*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^
```

```
3*x^2 + d^3*e^2)]
```

Sympy [A] time = 80.4278, size = 333, normalized size = 3.08

$$a\left(\begin{cases}\frac{x^4}{4d^{\frac{5}{2}}} & \text{for } e=0\\ \frac{d}{3e^2(d+ex^2)^{\frac{3}{2}}}-\frac{1}{e^2\sqrt{d+ex^2}} & \text{otherwise}\end{cases}\right)-bn\left(\left\{\begin{array}{l}\frac{x^4}{16d^{\frac{5}{2}}}\\ \frac{2d^4\sqrt{1+\frac{ex^2}{d}}}{6d^{\frac{9}{2}}e^2+6d^{\frac{7}{2}}e^3x^2}+\frac{d^4\log\left(\frac{ex^2}{d}\right)}{6d^{\frac{9}{2}}e^2+6d^{\frac{7}{2}}e^3x^2}-\frac{2d^4\log\left(\sqrt{1+\frac{ex^2}{d}}+1\right)}{6d^{\frac{9}{2}}e^2+6d^{\frac{7}{2}}e^3x^2}+\frac{d^3x^2\log\left(\frac{ex^2}{d}\right)}{6d^{\frac{9}{2}}e+6d^{\frac{7}{2}}e^2x^2}-\frac{2d^3x^2\,\mathrm{lo}}{6d^{\frac{9}{2}}}\end{array}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] a*Piecewise((x**4/(4*d**(5/2)), Eq(e, 0)), (d/(3*e**2*(d + e*x**2)**(3/2))
- 1/(e**2*sqrt(d + e*x**2)), True)) - b*n*Piecewise((x**4/(16*d**(5/2)), Eq
(e, 0)), (2*d**4*sqrt(1 + e*x**2/d)/(6*d**(9/2)*e**2 + 6*d**(7/2)*e**3*x**2
) + d**4*log(e*x**2/d)/(6*d**(9/2)*e**2 + 6*d**(7/2)*e**3*x**2) - 2*d**4*lo
g(sqrt(1 + e*x**2/d) + 1)/(6*d**(9/2)*e**2 + 6*d**(7/2)*e**3*x**2) + d**3*x
**2*log(e*x**2/d)/(6*d**(9/2)*e + 6*d**(7/2)*e**2*x**2) - 2*d**3*x**2*log(s
qrt(1 + e*x**2/d) + 1)/(6*d**(9/2)*e + 6*d**(7/2)*e**2*x**2) + asinh(sqrt(d
)/(sqrt(e)*x))/(sqrt(d)*e**2), True)) + b*Piecewise((x**4/(4*d**(5/2)), Eq(
e, 0)), (d/(3*e**2*(d + e*x**2)**(3/2)) - 1/(e**2*sqrt(d + e*x**2)), True))
*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{(b\log(cx^n)+a)x^3}{\left(ex^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^2 + d)^(5/2), x)
```

3.300 $\int \frac{x(a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}} dx$

Optimal. Leaf size=84

$$-\frac{a+b\log(cx^n)}{3e\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{3/2}e}+\frac{bn}{3de\sqrt{d+ex^2}}$$

```
[Out] (b*n)/(3*d*e*Sqrt[d + e*x^2]) - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*d
^(3/2)*e) - (a + b*Log[c*x^n])/(3*e*(d + e*x^2)^(3/2))
```

Rubi [A] time = 0.0879107, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2338, 266, 51, 63, 208}

$$-\frac{a+b\log(cx^n)}{3e\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{3/2}e}+\frac{bn}{3de\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*n)/(3*d*e*Sqrt[d + e*x^2]) - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*d
^(3/2)*e) - (a + b*Log[c*x^n])/(3*e*(d + e*x^2)^(3/2))
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x(a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx = -\frac{a+b\log(cx^n)}{3e(d+ex^2)^{3/2}} + \frac{(bn)\int \frac{1}{x(d+ex^2)^{3/2}}\,dx}{3e}$$

$$= -\frac{a+b\log(cx^n)}{3e(d+ex^2)^{3/2}} + \frac{(bn)\,\mathrm{Subst}\left(\int \frac{1}{x(d+ex)^{3/2}}\,dx, x, x^2\right)}{6e}$$

$$= \frac{bn}{3de\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{3e(d+ex^2)^{3/2}} + \frac{(bn)\,\mathrm{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx, x, x^2\right)}{6de}$$

$$= \frac{bn}{3de\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{3e(d+ex^2)^{3/2}} + \frac{(bn)\,\mathrm{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx, x, \sqrt{d+ex^2}\right)}{3de^2}$$

$$= \frac{bn}{3de\sqrt{d+ex^2}} - \frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{3/2}e} - \frac{a+b\log(cx^n)}{3e(d+ex^2)^{3/2}}$$

Mathematica [A] time = 0.230545, size = 97, normalized size = 1.15

$$-\frac{\frac{a}{(d+ex^2)^{3/2}} + \frac{b\log(cx^n)}{(d+ex^2)^{3/2}} + \frac{bn\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)}{d^{3/2}} - \frac{bn\log(x)}{d^{3/2}} - \frac{bn}{d\sqrt{d+ex^2}}}{3e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(a/(d + e*x^2)^(3/2) - (b*n)/(d*Sqrt[d + e*x^2]) - (b*n*Log[x])/d^(3/2) +
(b*Log[c*x^n])/(d + e*x^2)^(3/2) + (b*n*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/d
^(3/2))/(3*e)
```

Maple [F] time = 0.436, size = 0, normalized size = 0.

$$\int x(a+b\ln(cx^n))\left(ex^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),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(x*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.5408, size = 597, normalized size = 7.11

$$\left[\frac{\left(be^2nx^4 + 2\,bdenx^2 + bd^2n\right)\sqrt{d}\log\left(-\frac{ex^2 - 2\,\sqrt{ex^2+d}\sqrt{d} + 2\,d}{x^2}\right) + 2\left(bdenx^2 - bd^2n\log\left(x\right) + bd^2n - bd^2\log\left(c\right) - ad^2\right)\sqrt{ex^2 +}}{6\left(d^2e^3x^4 + 2\,d^3e^2x^2 + d^4e\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/6*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(d)*log(-(e*x^2 - 2*sqrt(
e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*(b*d*e*n*x^2 - b*d^2*n*log(x) + b*d^2*n
- b*d^2*log(c) - a*d^2)*sqrt(e*x^2 + d))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4
*e), 1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-d)*arctan(sqrt(-d)/
sqrt(e*x^2 + d)) + (b*d*e*n*x^2 - b*d^2*n*log(x) + b*d^2*n - b*d^2*log(c) -
 a*d^2)*sqrt(e*x^2 + d))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4*e)]
```

Sympy [B] time = 54.2549, size = 245, normalized size = 2.92

$$-\frac{a}{3e\left(d + ex^2\right)^{\frac{3}{2}}} + \frac{2bd^3n\sqrt{1 + \frac{ex^2}{d}}}{6d^{\frac{9}{2}}e + 6d^{\frac{7}{2}}e^2x^2} + \frac{bd^3n\log\left(\frac{ex^2}{d}\right)}{6d^{\frac{9}{2}}e + 6d^{\frac{7}{2}}e^2x^2} - \frac{2bd^3n\log\left(\sqrt{1 + \frac{ex^2}{d}} + 1\right)}{6d^{\frac{9}{2}}e + 6d^{\frac{7}{2}}e^2x^2} + \frac{bd^2nx^2\log\left(\frac{ex^2}{d}\right)}{3\left(2d^{\frac{9}{2}} + 2d^{\frac{7}{2}}ex^2\right)} - \frac{2bd^2nx^2\log\left(\right.}{3\left(2d^{\frac{9}{2}} +\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] -a/(3*e*(d + e*x**2)**(3/2)) + 2*b*d**3*n*sqrt(1 + e*x**2/d)/(6*d**(9/2)*e
+ 6*d**(7/2)*e**2*x**2) + b*d**3*n*log(e*x**2/d)/(6*d**(9/2)*e + 6*d**(7/2)
*e**2*x**2) - 2*b*d**3*n*log(sqrt(1 + e*x**2/d) + 1)/(6*d**(9/2)*e + 6*d**(
7/2)*e**2*x**2) + b*d**2*n*x**2*log(e*x**2/d)/(3*(2*d**(9/2) + 2*d**(7/2)*e
*x**2)) - 2*b*d**2*n*x**2*log(sqrt(1 + e*x**2/d) + 1)/(3*(2*d**(9/2) + 2*d*
*(7/2)*e*x**2)) - b*log(c*x**n)/(3*e*(d + e*x**2)**(3/2))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x}{(ex^2 + d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^2 + d)^(5/2), x)
```

3.301 $\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=251

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2d^{5/2}}+\frac{1}{3}\left(\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+\frac{1}{d\left(d+ex^2\right)^{3/2}}\right)(a+b\log(cx^n))-\frac{bn}{3d^2\sqrt{d+e\cdots}}$$

```
[Out] -(b*n)/(3*d^2*Sqrt[d + e*x^2]) + (4*b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
3*d^(5/2)) + (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(2*d^(5/2)) + ((1/(d*
(d + e*x^2)^(3/2)) + 3/(d^2*Sqrt[d + e*x^2]) - (3*ArcTanh[Sqrt[d + e*x^2]/S
qrt[d]])/d^(5/2))*(a + b*Log[c*x^n]))/3 - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt
[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/d^(5/2) - (b*n*PolyLog[2
, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(5/2))
```

Rubi [A] time = 0.403881, antiderivative size = 251, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{2d^{5/2}}+\frac{1}{3}\left(\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+\frac{1}{d\left(d+ex^2\right)^{3/2}}\right)(a+b\log(cx^n))-\frac{bn}{3d^2\sqrt{d+e\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(5/2)),x]
```

```
[Out] -(b*n)/(3*d^2*Sqrt[d + e*x^2]) + (4*b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(
3*d^(5/2)) + (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]]^2)/(2*d^(5/2)) + ((1/(d*
(d + e*x^2)^(3/2)) + 3/(d^2*Sqrt[d + e*x^2]) - (3*ArcTanh[Sqrt[d + e*x^2]/S
qrt[d]])/d^(5/2))*(a + b*Log[c*x^n]))/3 - (b*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt
[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/d^(5/2) - (b*n*PolyLog[2
, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(5/2))
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
```

```
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\left(d+ex^2\right)^{5/2}}\,dx = \frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)(a+b\log(cx^n))-(bn)\int\left(\frac{1}{3dx\left(d+ex^2\right)^{3/2}}\right.$$

$$=\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)(a+b\log(cx^n))+\frac{(bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{x}dx}{d^{5/2}}$$

$$=\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)(a+b\log(cx^n))+\frac{(bn)\,\mathrm{Subst}\left(\int\frac{\tanh^{-1}\left(\frac{\sqrt{d}}{\right.}\right.}{x}\right.}{2d^{5/2}}$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}\right)(a+b\log(cx^n))+\frac{(bn)\,\mathrm{S}}{}$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}-\right.$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}\right.$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}\right.$$

$$=-\frac{bn}{3d^2\sqrt{d+ex^2}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{5/2}}+\frac{bn\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{2d^{5/2}}+\frac{1}{3}\left(\frac{1}{d\left(d+ex^2\right)^{3/2}}+\frac{3}{d^2\sqrt{d+ex^2}}\right.$$

Mathematica [C] time = 0.447829, size = 273, normalized size = 1.09

$$\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(-3d^{5/2}\left(d+ex^2\right)^2\ {}_3F_2\left(\frac{5}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{d}{ex^2}\right)+25\sqrt{d}e^3x^6\log(x)\sqrt{\frac{d}{ex^2}+1}\left(4d+3ex^2\right)-75e^{5/2}x^5\log(x)\left(d+ex\right.\right.}{75d^{5/2}e^2x^4\left(d+ex^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^2)^(5/2)),x]
```

```
[Out] (b*n*Sqrt[1 + d/(e*x^2)]*(-3*d^(5/2)*(d + e*x^2)^2*HypergeometricPFQ[{5/2,
5/2, 5/2}, {7/2, 7/2}, -(d/(e*x^2))] + 25*Sqrt[d]*e^3*Sqrt[1 + d/(e*x^2)]*x
^6*(4*d + 3*e*x^2)*Log[x] - 75*e^(5/2)*x^5*(d + e*x^2)^2*ArcSinh[Sqrt[d]/(S
qrt[e]*x)]*Log[x]))/(75*d^(5/2)*e^2*x^4*(d + e*x^2)^(5/2)) + ((4*d + 3*e*x^
2)*(a - b*n*Log[x] + b*Log[c*x^n]))/(3*d^2*(d + e*x^2)^(3/2)) + (Log[x]*(a
- b*n*Log[x] + b*Log[c*x^n]))/d^(5/2) - ((a - b*n*Log[x] + b*Log[c*x^n])*Lo
g[d + Sqrt[d]*Sqrt[d + e*x^2]])/d^(5/2)
```

Maple [F] time = 0.413, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x}\left(ex^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(e*x^2+d)^(5/2),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((a+b*log(c*x^n))/x/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log\left(cx^n\right)+\sqrt{ex^2+d}a}{e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^3*x^7 + 3*d*
e^2*x^5 + 3*d^2*e*x^3 + d^3*x), 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*ln(c*x**n))/x/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x), x)
```

3.302 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=337

$$\frac{5benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{7/2}}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{2d^3\sqrt{d+ex^2}}-\frac{5e\left(a+b\log\left(cx^n\right)\right)}{6d^2\left(d+ex^2\right)^{3/2}}+\frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^{7/2}}-$$

```
[Out] (b*e*n)/(3*d^3*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/(4*d^3*x^2) - (31*b
*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(12*d^(7/2)) - (5*b*e*n*ArcTanh[Sqrt
[d + e*x^2]/Sqrt[d]]^2)/(4*d^(7/2)) - (5*e*(a + b*Log[c*x^n]))/(6*d^2*(d +
e*x^2)^(3/2)) - (a + b*Log[c*x^n])/(2*d*x^2*(d + e*x^2)^(3/2)) - (5*e*(a +
b*Log[c*x^n]))/(2*d^3*Sqrt[d + e*x^2]) + (5*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[
d]]*(a + b*Log[c*x^n]))/(2*d^(7/2)) + (5*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt
[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(7/2)) + (5*b*e*n*P
olyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(7/2))
```

Rubi [A] time = 0.487747, antiderivative size = 341, normalized size of antiderivative = 1.01, number of steps used = 13, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.52, Rules used = {266, 51, 63, 208, 2350, 1251, 897, 1259, 453, 5984, 5918, 2402, 2315}

$$\frac{5benPolyLog\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^2}}\right)}{4d^{7/2}}-\frac{5\sqrt{d+ex^2}\left(a+b\log\left(cx^n\right)\right)}{2d^3x^2}+\frac{5\left(a+b\log\left(cx^n\right)\right)}{3d^2x^2\sqrt{d+ex^2}}+\frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)\left(a+b\log\left(cx\right.\right.}{2d^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(5/2)),x]
```

```
[Out] (b*e*n)/(3*d^3*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/(4*d^3*x^2) - (31*b
*e*n*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(12*d^(7/2)) - (5*b*e*n*ArcTanh[Sqrt
[d + e*x^2]/Sqrt[d]]^2)/(4*d^(7/2)) + (a + b*Log[c*x^n])/(3*d*x^2*(d + e*x^
2)^(3/2)) + (5*(a + b*Log[c*x^n]))/(3*d^2*x^2*Sqrt[d + e*x^2]) - (5*Sqrt[d
+ e*x^2]*(a + b*Log[c*x^n]))/(2*d^3*x^2) + (5*e*ArcTanh[Sqrt[d + e*x^2]/Sqr
t[d]]*(a + b*Log[c*x^n]))/(2*d^(7/2)) + (5*b*e*n*ArcTanh[Sqrt[d + e*x^2]/Sq
rt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(2*d^(7/2)) + (5*b*e*n
*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^2])])/(4*d^(7/2))
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1259

```
Int[(x_)^(m_)*((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^
4)^(p_.), x_Symbol] :> Simp[((-d)^(m/2 - 1)*(c*d^2 - b*d*e + a*e^2)^p*x*(d
+ e*x^2)^(q + 1))/(2*e^(2*p + m/2)*(q + 1)), x] + Dist[(-d)^(m/2 - 1)/(2*e^
(2*p)*(q + 1)), Int[x^m*(d + e*x^2)^(q + 1)*ExpandToSum[Together[(1*(2*(-d)
^(-(m/2) + 1)*e^(2*p)*(q + 1)*(a + b*x^2 + c*x^4)^p - ((c*d^2 - b*d*e + a*e
^2)^p/(e^(m/2)*x^m))*(d + e*(2*q + 3)*x^2)))/(d + e*x^2)], x], x], x] /; Fr
eeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && IGtQ[p, 0] && ILtQ[q, -1]
 && ILtQ[m/2, 0]
```

Rule 453

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*e^n*(m + 1)), Int[(e*
x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[b*c
 - a*d, 0] && (IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (
LtQ[n, 0] && GtQ[m + n, -1])) &&  !ILtQ[p, -1]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^3\left(d+ex^2\right)^{5/2}}\,dx = \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+}{2d^{7/2}}$$

$$= \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+}{2d^{7/2}}$$

$$= \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+}{2d^{7/2}}$$

$$= \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\left(a+b\log(cx^n)\right)}{2d^3x^2} + \frac{5e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)(a+}{2d^{7/2}}$$

$$= -\frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}} - \frac{5\sqrt{d+ex^2}\,(}{2}$$

$$= \frac{ben}{3d^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a+b\log(cx^n)}{3dx^2\left(d+ex^2\right)^{3/2}} + \frac{5\left(a+b\log(cx^n)\right)}{3d^2x^2\sqrt{d+ex^2}}$$

$$= \frac{ben}{3d^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{31ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{12d^{7/2}} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a+b\log(c}{3dx^2\left(d+ex\right.}$$

$$= \frac{ben}{3d^3\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{4d^3x^2} - \frac{31ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{12d^{7/2}} - \frac{5ben\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)^2}{4d^{7/2}} + \frac{a+b\log(c}{3dx^2\left(d+ex\right.}$$

Mathematica [C] time = 0.308776, size = 227, normalized size = 0.67

$$\frac{bn\sqrt{\frac{d}{ex^2}+1}\left(5\,{}_3F_2\left(\frac{7}{2},\frac{7}{2},\frac{7}{2};\frac{9}{2},\frac{9}{2};-\frac{d}{ex^2}\right)-7(2\log(x)+1)\,{}_2F_1\left(\frac{5}{2},\frac{7}{2};\frac{9}{2};-\frac{d}{ex^2}\right)\right)}{98e^2x^6\sqrt{d+ex^2}}-\frac{\left(3d^2+20dex^2+15e^2x^4\right)(a+b\log(cx^n)-b}{6d^3x^2\left(d+ex^2\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^2)^(5/2)),x]
```

```
[Out] (b*n*Sqrt[1 + d/(e*x^2)]*(5*HypergeometricPFQ[{7/2, 7/2, 7/2}, {9/2, 9/2},
-(d/(e*x^2))] - 7*Hypergeometric2F1[5/2, 7/2, 9/2, -(d/(e*x^2))]*(1 + 2*Log
[x])))/(98*e^2*x^6*Sqrt[d + e*x^2]) - ((3*d^2 + 20*d*e*x^2 + 15*e^2*x^4)*(a
 - b*n*Log[x] + b*Log[c*x^n]))/(6*d^3*x^2*(d + e*x^2)^(3/2)) - (5*e*Log[x]*
(a - b*n*Log[x] + b*Log[c*x^n]))/(2*d^(7/2)) + (5*e*(a - b*n*Log[x] + b*Log
[c*x^n])*Log[d + Sqrt[d]*Sqrt[d + e*x^2]])/(2*d^(7/2))
```

Maple [F] time = 0.411, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^3}\left(ex^2+d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^3/(e*x^2+d)^(5/2),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((a+b*log(c*x^n))/x^3/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2+d}b\log(cx^n)+\sqrt{ex^2+d}a}{e^3x^9+3\,de^2x^7+3\,d^2ex^5+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*log(c*x^n) + sqrt(e*x^2 + d)*a)/(e^3*x^9 + 3*d*
e^2*x^7 + 3*d^2*e*x^5 + d^3*x^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((a+b*ln(c*x**n))/x**3/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log(cx^n)+a}{\left(ex^2+d\right)^{\frac{5}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x^3), x)
```

3.303 $\int \frac{x^6(a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=443

$$\frac{5bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4e^{7/2}\sqrt{d+ex^2}}-\frac{5d^{3/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2e^{7/2}\sqrt{d+ex^2}}-\frac{5x^3(a+b\log(cx^n))}{3e^2\sqrt{d+ex^2}}+\frac{5x\sqrt{}}{}$$

```
[Out] (b*d*n*x)/(3*e^3*Sqrt[d + e*x^2]) - (b*n*x*Sqrt[d + e*x^2])/(4*e^3) - (31*b
*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(12*e^(7/2)*Sq
rt[d + e*x^2]) - (5*b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqr
t[d]]^2)/(4*e^(7/2)*Sqrt[d + e*x^2]) + (5*b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2
*e^(7/2)*Sqrt[d + e*x^2]) - (x^5*(a + b*Log[c*x^n]))/(3*e*(d + e*x^2)^(3/2)
) - (5*x^3*(a + b*Log[c*x^n]))/(3*e^2*Sqrt[d + e*x^2]) + (5*x*Sqrt[d + e*x^
2]*(a + b*Log[c*x^n]))/(2*e^3) - (5*d^(3/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sq
rt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(7/2)*Sqrt[d + e*x^2]) + (5*b*d^
(3/2)*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])
/(4*e^(7/2)*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.539344, antiderivative size = 443, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.52, Rules used = {2341, 288, 321, 215, 2350, 21, 1157, 388, 5659, 3716, 2190, 2279, 2391}

$$\frac{5bd^{3/2}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{4e^{7/2}\sqrt{d+ex^2}}-\frac{5d^{3/2}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{2e^{7/2}\sqrt{d+ex^2}}-\frac{5x^3(a+b\log(cx^n))}{3e^2\sqrt{d+ex^2}}+\frac{5x\sqrt{}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^6*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*d*n*x)/(3*e^3*Sqrt[d + e*x^2]) - (b*n*x*Sqrt[d + e*x^2])/(4*e^3) - (31*b
*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])/(12*e^(7/2)*Sq
rt[d + e*x^2]) - (5*b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqr
t[d]]^2)/(4*e^(7/2)*Sqrt[d + e*x^2]) + (5*b*d^(3/2)*n*Sqrt[1 + (e*x^2)/d]*A
rcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2
*e^(7/2)*Sqrt[d + e*x^2]) - (x^5*(a + b*Log[c*x^n]))/(3*e*(d + e*x^2)^(3/2)
) - (5*x^3*(a + b*Log[c*x^n]))/(3*e^2*Sqrt[d + e*x^2]) + (5*x*Sqrt[d + e*x^
```

```
2]*(a + b*Log[c*x^n]))/(2*e^3) - (5*d^(3/2)*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sq
rt[e]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/(2*e^(7/2)*Sqrt[d + e*x^2]) + (5*b*d^
(3/2)*n*Sqrt[1 + (e*x^2)/d]*PolyLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])
/(4*e^(7/2)*Sqrt[d + e*x^2])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 1157

```
Int[((d_) + (e_.)*(x_)^2)^(q_)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(p_.),
x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 + c*x^4)^p, d + e*x^2
, x], R = Coeff[PolynomialRemainder[(a + b*x^2 + c*x^4)^p, d + e*x^2, x], x
, 0]}, -Simp[(R*x*(d + e*x^2)^(q + 1))/(2*d*(q + 1)), x] + Dist[1/(2*d*(q +
 1)), Int[(d + e*x^2)^(q + 1)*ExpandToSum[2*d*(q + 1)*Qx + R*(2*q + 3), x],
 x], x]] /; FreeQ[{a, b, c, d, e}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 -
 b*d*e + a*e^2, 0] && IGtQ[p, 0] && LtQ[q, -1]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^6 (a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^6(a+b\log(cx^n))}{\left(1+\frac{ex^2}{d}\right)^{5/2}}\,dx}{d^2\sqrt{d+ex^2}}$$

$$= -\frac{x^5(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{5x^3(a+b\log(cx^n))}{3e^2\sqrt{d+ex^2}} + \frac{5x\sqrt{d+ex^2}(a+b\log(cx^n))}{2e^3} - \frac{5d^{3/2}\sqrt{1+\frac{ex^2}{d}}\,\mathrm{s}}{}$$

$$= -\frac{x^5(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{5x^3(a+b\log(cx^n))}{3e^2\sqrt{d+ex^2}} + \frac{5x\sqrt{d+ex^2}(a+b\log(cx^n))}{2e^3} - \frac{5d^{3/2}\sqrt{1+\frac{ex^2}{d}}\,\mathrm{s}}{}$$

$$= -\frac{x^5(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{5x^3(a+b\log(cx^n))}{3e^2\sqrt{d+ex^2}} + \frac{5x\sqrt{d+ex^2}(a+b\log(cx^n))}{2e^3} - \frac{5d^{3/2}\sqrt{1+\frac{ex^2}{d}}\,\mathrm{s}}{}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{5bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{7/2}\sqrt{d+ex^2}} - \frac{x^5(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{5x^3(a+b\log(cx^n))}{3e^2\sqrt{d+ex^2}}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{bnx\sqrt{d+ex^2}}{4e^3} - \frac{5bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{4e^{7/2}\sqrt{d+ex^2}} + \frac{5bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{}}{\sqrt{}}\right.}{2e^{7/2}\sqrt{d}}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{bnx\sqrt{d+ex^2}}{4e^3} - \frac{31bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{12e^{7/2}\sqrt{d+ex^2}} - \frac{5bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{}}{\sqrt{}}\right.}{4e^{7/2}\sqrt{d+ex^2}}$$

$$= \frac{bdnx}{3e^3\sqrt{d+ex^2}} - \frac{bnx\sqrt{d+ex^2}}{4e^3} - \frac{31bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{12e^{7/2}\sqrt{d+ex^2}} - \frac{5bd^{3/2}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{}}{\sqrt{}}\right.}{4e^{7/2}\sqrt{d+ex^2}}$$

Mathematica [C] time = 0.287677, size = 199, normalized size = 0.45

$$\frac{bnx^7\sqrt{\frac{ex^2}{d}+1}\left(5\,{}_3F_2\left(\frac{7}{2},\frac{7}{2},\frac{7}{2};\frac{9}{2},\frac{9}{2};-\frac{ex^2}{d}\right)+7(2\log(x)-1)\,{}_2F_1\left(\frac{5}{2},\frac{7}{2};\frac{9}{2};-\frac{ex^2}{d}\right)\right)}{98d^2\sqrt{d+ex^2}} + \frac{x\left(15d^2+20dex^2+3e^2x^4\right)(a+b\log(cx^n}{6e^3(d+ex^2)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^6*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*n*x^7*Sqrt[1 + (e*x^2)/d]*(5*HypergeometricPFQ[{7/2, 7/2, 7/2}, {9/2, 9/
2}, -((e*x^2)/d)] + 7*Hypergeometric2F1[5/2, 7/2, 9/2, -((e*x^2)/d)]*(-1 +
2*Log[x])))/(98*d^2*Sqrt[d + e*x^2]) + (x*(15*d^2 + 20*d*e*x^2 + 3*e^2*x^4)
*(a - b*n*Log[x] + b*Log[c*x^n]))/(6*e^3*(d + e*x^2)^(3/2)) - (5*d*(a - b*n
*Log[x] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(2*e^(7/2))
```

Maple [F] time = 0.408, size = 0, normalized size = 0.

$$\int x^6 (a + b\ln(cx^n)) \left(ex^2 + d\right)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^6*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),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(x^6*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{ex^2 + d}bx^6 \log(cx^n) + \sqrt{ex^2 + d}ax^6}{e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^6*log(c*x^n) + sqrt(e*x^2 + d)*a*x^6)/(e^3*x^
6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^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(x**6*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^6}{\left(ex^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^6/(e*x^2 + d)^(5/2), x)
```

3.304 $\int \frac{x^4(a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=383

$$-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2e^{5/2}\sqrt{d+ex^2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}\sqrt{d+ex^2}}-\frac{x^3(a+}{3e\left(d\right.}$$

```
[Out] -(b*n*x)/(3*e^2*Sqrt[d + e*x^2]) + (4*b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSi
nh[(Sqrt[e]*x)/Sqrt[d]])/(3*e^(5/2)*Sqrt[d + e*x^2]) + (b*Sqrt[d]*n*Sqrt[1
+ (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*e^(5/2)*Sqrt[d + e*x^2]) -
(b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*
ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(e^(5/2)*Sqrt[d + e*x^2]) - (x^3*(a + b*Log
[c*x^n]))/(3*e*(d + e*x^2)^(3/2)) - (x*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*
x^2]) + (Sqrt[d]*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Lo
g[c*x^n]))/(e^(5/2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*Pol
yLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(5/2)*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.556751, antiderivative size = 383, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {2341, 288, 215, 2350, 21, 385, 5659, 3716, 2190, 2279, 2391}

$$-\frac{b\sqrt{d}n\sqrt{\frac{ex^2}{d}+1}\text{PolyLog}\left(2,e^{2\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}\right)}{2e^{5/2}\sqrt{d+ex^2}}-\frac{x\left(a+b\log\left(cx^n\right)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d}\sqrt{\frac{ex^2}{d}+1}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\log\left(cx^n\right)\right)}{e^{5/2}\sqrt{d+ex^2}}-\frac{x^3(a+}{3e\left(d\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```


```
[Out] -(b*n*x)/(3*e^2*Sqrt[d + e*x^2]) + (4*b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSi
nh[(Sqrt[e]*x)/Sqrt[d]])/(3*e^(5/2)*Sqrt[d + e*x^2]) + (b*Sqrt[d]*n*Sqrt[1
+ (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]^2)/(2*e^(5/2)*Sqrt[d + e*x^2]) -
(b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*Log[1 - E^(2*
ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(e^(5/2)*Sqrt[d + e*x^2]) - (x^3*(a + b*Log
[c*x^n]))/(3*e*(d + e*x^2)^(3/2)) - (x*(a + b*Log[c*x^n]))/(e^2*Sqrt[d + e*
x^2]) + (Sqrt[d]*Sqrt[1 + (e*x^2)/d]*ArcSinh[(Sqrt[e]*x)/Sqrt[d]]*(a + b*Lo
g[c*x^n]))/(e^(5/2)*Sqrt[d + e*x^2]) - (b*Sqrt[d]*n*Sqrt[1 + (e*x^2)/d]*Pol
```

```
yLog[2, E^(2*ArcSinh[(Sqrt[e]*x)/Sqrt[d]])])/(2*e^(5/2)*Sqrt[d + e*x^2])
```

Rule 2341

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^
(q_), x_Symbol] :> Dist[(d^IntPart[q]*(d + e*x^2)^FracPart[q])/(1 + (e*x^2)
/d)^FracPart[q], Int[x^m*(1 + (e*x^2)/d)^q*(a + b*Log[c*x^n]), x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && IntegerQ[m/2] && IntegerQ[q - 1/2] &&  !(LtQ[
m + 2*q, -2] || GtQ[d, 0])
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 21

```
Int[(u_.)*((a_) + (b_.)*(v_))^(m_.)*((c_) + (d_.)*(v_))^(n_.), x_Symbol] :>
 Dist[(b/d)^m, Int[u*(c + d*v)^(m + n), x], x] /; FreeQ[{a, b, c, d, n}, x]
 && EqQ[b*c - a*d, 0] && IntegerQ[m] && ( !IntegerQ[n] || SimplerQ[c + d*x,
 a + b*x])
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> -S
imp[((b*c - a*d)*x*(a + b*x^n)^(p + 1))/(a*b*n*(p + 1)), x] - Dist[(a*d - b
*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; Fre
eQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n +
```

```
p, 0])
```

Rule 5659

```
Int[((a_.) + ArcSinh[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[
(a + b*x)^n/Tanh[x], x], x, ArcSinh[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n,
 0]
```

Rule 3716

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (Complex[0, fz_])*(f_
.)*(x_)], x_Symbol] :> -Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] + Dist[2
*I, Int[((c + d*x)^m*E^(2*(-(I*e) + f*fz*x)))/(E^(2*I*k*Pi)*(1 + E^(2*(-(I*
e) + f*fz*x))/E^(2*I*k*Pi))), x], x] /; FreeQ[{c, d, e, f, fz}, x] && Integ
erQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^4 (a+b\log(cx^n))}{(d+ex^2)^{5/2}}\,dx = \frac{\sqrt{1+\frac{ex^2}{d}}\int \frac{x^4(a+b\log(cx^n))}{\left(1+\frac{ex^2}{d}\right)^{5/2}}\,dx}{d^2\sqrt{d+ex^2}}$$

$$= -\frac{x^3(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{x(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{5/2}\sqrt{d+ex^2}} - \frac{(bn}{}$$

$$= -\frac{x^3(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{x(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{5/2}\sqrt{d+ex^2}} - \frac{(b\sqrt{}}{}$$

$$= -\frac{x^3(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{x(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}} + \frac{\sqrt{d}\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)(a+b\log(cx^n))}{e^{5/2}\sqrt{d+ex^2}} - \frac{(b\sqrt{}}{}$$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} - \frac{x^3(a+b\log(cx^n))}{3e(d+ex^2)^{3/2}} - \frac{x(a+b\log(cx^n))}{e^2\sqrt{d+ex^2}} + $$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{4b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3e^{5/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+}}{}$$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{4b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3e^{5/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+}}{}$$

$$= -\frac{bnx}{3e^2\sqrt{d+ex^2}} + \frac{4b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{3e^{5/2}\sqrt{d+ex^2}} + \frac{b\sqrt{d}n\sqrt{1+\frac{ex^2}{d}}\sinh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)^2}{2e^{5/2}\sqrt{d+ex^2}} - \frac{b\sqrt{d}n\sqrt{1+}}{}$$

Mathematica [C] time = 0.862396, size = 244, normalized size = 0.64

$$-\frac{bn\sqrt{\frac{ex^2}{d}+1}\left(3e^{5/2}x^5(d+ex^2)^2\,{}_3F_2\left(\frac{5}{2},\frac{5}{2},\frac{5}{2};\frac{7}{2},\frac{7}{2};-\frac{ex^2}{d}\right)+25d^3\sqrt{e}x\log(x)(3d+4ex^2)\sqrt{\frac{ex^2}{d}+1}-75d^{5/2}\log(x)(d+ex^2)\right.}{75d^2e^{5/2}(d+ex^2)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*n*Sqrt[1 + (e*x^2)/d]*(3*e^(5/2)*x^5*(d + e*x^2)^2*HypergeometricPFQ[{5
/2, 5/2, 5/2}, {7/2, 7/2}, -((e*x^2)/d)] + 25*d^3*Sqrt[e]*x*(3*d + 4*e*x^2)
*Sqrt[1 + (e*x^2)/d]*Log[x] - 75*d^(5/2)*(d + e*x^2)^2*ArcSinh[(Sqrt[e]*x)/
Sqrt[d]]*Log[x]))/(75*d^2*e^(5/2)*(d + e*x^2)^(5/2)) - (x*(3*d + 4*e*x^2)*(
a - b*n*Log[x] + b*Log[c*x^n]))/(3*e^2*(d + e*x^2)^(3/2)) + ((a - b*n*Log[x
] + b*Log[c*x^n])*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/e^(5/2)
```

Maple [F] time = 0.406, size = 0, normalized size = 0.

$$\int x^{4} \left(a+b\ln \left(c x^{n}\right)\right) \left(e x^{2}+d\right)^{-\frac{5}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^4*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),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(x^4*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{\sqrt{e x^{2}+d} b x^{4} \log \left(c x^{n}\right)+\sqrt{e x^{2}+d} a x^{4}}{e^{3} x^{6}+3 \, d e^{2} x^{4}+3 \, d^{2} e x^{2}+d^{3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((sqrt(e*x^2 + d)*b*x^4*log(c*x^n) + sqrt(e*x^2 + d)*a*x^4)/(e^3*x^
6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^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(x**4*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^4}{\left(ex^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^4/(e*x^2 + d)^(5/2), x)
```

3.305 $\int \frac{x^2(a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=89

$$\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3de^{3/2}}+\frac{bnx}{3de\sqrt{d+ex^2}}$$

```
[Out] (b*n*x)/(3*d*e*Sqrt[d + e*x^2]) - (b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]]
)/(3*d*e^(3/2)) + (x^3*(a + b*Log[c*x^n]))/(3*d*(d + e*x^2)^(3/2))
```

Rubi [A] time = 0.108828, antiderivative size = 89, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {2335, 288, 217, 206}

$$\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3de^{3/2}}+\frac{bnx}{3de\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*n*x)/(3*d*e*Sqrt[d + e*x^2]) - (b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]]
)/(3*d*e^(3/2)) + (x^3*(a + b*Log[c*x^n]))/(3*d*(d + e*x^2)^(3/2))
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
```

```
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2 (a+b\log(cx^n))}{\left(d+ex^2\right)^{5/2}}\,dx &= \frac{x^3 (a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}} - \frac{(bn)\int \frac{x^2}{\left(d+ex^2\right)^{3/2}}\,dx}{3d} \\
&= \frac{bnx}{3de\sqrt{d+ex^2}} + \frac{x^3 (a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}} - \frac{(bn)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{3de} \\
&= \frac{bnx}{3de\sqrt{d+ex^2}} + \frac{x^3 (a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}} - \frac{(bn)\,\mathrm{Subst}\left(\int \frac{1}{1-ex^2}\,dx, x, \frac{x}{\sqrt{d+ex^2}}\right)}{3de} \\
&= \frac{bnx}{3de\sqrt{d+ex^2}} - \frac{bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3de^{3/2}} + \frac{x^3 (a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}}
\end{aligned}$$

Mathematica [A] time = 0.14489, size = 101, normalized size = 1.13

$$\frac{\sqrt{e}x\left(aex^2+bn\left(d+ex^2\right)\right)+be^{3/2}x^3\log(cx^n)-bn\left(d+ex^2\right)^{3/2}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{3de^{3/2}\left(d+ex^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (Sqrt[e]*x*(a*e*x^2 + b*n*(d + e*x^2)) + b*e^(3/2)*x^3*Log[c*x^n] - b*n*(d
+ e*x^2)^(3/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(3*d*e^(3/2)*(d + e*x^2)
```

```
^(3/2))
```

Maple [F] time = 0.411, size = 0, normalized size = 0.

$$\int x^{2} \left(a+b \ln \left(c x^{n}\right)\right) \left(e x^{2}+d \right)^{-\frac{5}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{3} \, a {\left(\frac{x}{{\left(e x^{2} + d\right)}^{\frac{3}{2}} e} - \frac{x}{\sqrt{e x^{2} + d} d e}\right)} + b \int \frac{x^{2} \log\left(c\right) + x^{2} \log\left(x^{n}\right)}{{\left(e^{2} x^{4} + 2 \, d e x^{2} + d^{2}\right)} \sqrt{e x^{2} + d}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*a*(x/((e*x^2 + d)^(3/2)*e) - x/(sqrt(e*x^2 + d)*d*e)) + b*integrate((x
^2*log(c) + x^2*log(x^n))/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

Fricas [A] time = 1.47416, size = 626, normalized size = 7.03

$$\left[\frac{{\left(b e^{2} n x^{4} + 2 \, b d e n x^{2} + b d^{2} n\right)} \sqrt{e} \log\left(-2 \, e x^{2} + 2 \, \sqrt{e x^{2} + d} \sqrt{e} x - d\right) + 2 \, {\left(b e^{2} n x^{3} \log\left(x\right) + b e^{2} x^{3} \log\left(c\right) + b d e n x + {\left(b e^{2} n +\right.}\right.}}{6 \, {\left(d e^{4} x^{4} + 2 \, d^{2} e^{3} x^{2} + d^{3} e^{2}\right)}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/6*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(e)*log(-2*e*x^2 + 2*sqrt
(e*x^2 + d)*sqrt(e)*x - d) + 2*(b*e^2*n*x^3*log(x) + b*e^2*x^3*log(c) + b*d
*e*n*x + (b*e^2*n + a*e^2)*x^3)*sqrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^3*x^2
 + d^3*e^2), 1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-e)*arctan(s
qrt(-e)*x/sqrt(e*x^2 + d)) + (b*e^2*n*x^3*log(x) + b*e^2*x^3*log(c) + b*d*e
*n*x + (b*e^2*n + a*e^2)*x^3)*sqrt(e*x^2 + d))/(d*e^4*x^4 + 2*d^2*e^3*x^2 +
 d^3*e^2)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^2}{(ex^2 + d)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^2 + d)^(5/2), x)
```

3.306 $\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=113

$$\frac{2x\left(a+b\log\left(cx^n\right)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bnx}{3d^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}$$

```
[Out] -(b*n*x)/(3*d^2*Sqrt[d + e*x^2]) - (2*b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^
2]])/(3*d^2*Sqrt[e]) + (x*(a + b*Log[c*x^n]))/(3*d*(d + e*x^2)^(3/2)) + (2*
x*(a + b*Log[c*x^n]))/(3*d^2*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.0694104, antiderivative size = 113, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {2323, 2314, 217, 206, 191}

$$\frac{2x\left(a+b\log\left(cx^n\right)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\log\left(cx^n\right)\right)}{3d\left(d+ex^2\right)^{3/2}}-\frac{bnx}{3d^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*n*x)/(3*d^2*Sqrt[d + e*x^2]) - (2*b*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^
2]])/(3*d^2*Sqrt[e]) + (x*(a + b*Log[c*x^n]))/(3*d*(d + e*x^2)^(3/2)) + (2*
x*(a + b*Log[c*x^n]))/(3*d^2*Sqrt[d + e*x^2])
```

Rule 2323

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Sym
bol] :> -Simp[(x*(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n]))/(2*d*(q + 1)), x]
+ (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*Log[c*x^n])
, x], x] + Dist[(b*n)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1), x], x]) /; Fr
eeQ[{a, b, c, d, e, n}, x] && LtQ[q, -1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
```

```
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\log(cx^n)}{\left(d+ex^2\right)^{5/2}}\,dx &= \frac{x(a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2\int\frac{a+b\log(cx^n)}{\left(d+ex^2\right)^{3/2}}\,dx}{3d}-\frac{(bn)\int\frac{1}{\left(d+ex^2\right)^{3/2}}\,dx}{3d}\\
&= -\frac{bnx}{3d^2\sqrt{d+ex^2}}+\frac{x(a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\log(cx^n))}{3d^2\sqrt{d+ex^2}}-\frac{(2bn)\int\frac{1}{\sqrt{d+ex^2}}\,dx}{3d^2}\\
&= -\frac{bnx}{3d^2\sqrt{d+ex^2}}+\frac{x(a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\log(cx^n))}{3d^2\sqrt{d+ex^2}}-\frac{(2bn)\,\text{Subst}\left(\int\frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{3d^2}\\
&= -\frac{bnx}{3d^2\sqrt{d+ex^2}}-\frac{2bn\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^2\sqrt{e}}+\frac{x(a+b\log(cx^n))}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x(a+b\log(cx^n))}{3d^2\sqrt{d+ex^2}}
\end{aligned}
$$

Mathematica [A] time = 0.132886, size = 116, normalized size = 1.03

$$
\frac{\sqrt{e}x\left(a\left(3d+2ex^2\right)-bn\left(d+ex^2\right)\right)+b\sqrt{e}x\left(3d+2ex^2\right)\log(cx^n)-2bn\left(d+ex^2\right)^{3/2}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{3d^2\sqrt{e}\left(d+ex^2\right)^{3/2}}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^2)^(5/2),x]
```

```
[Out] (Sqrt[e]*x*(-(b*n*(d + e*x^2)) + a*(3*d + 2*e*x^2)) + b*Sqrt[e]*x*(3*d + 2*
e*x^2)*Log[c*x^n] - 2*b*n*(d + e*x^2)^(3/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^
2]])/(3*d^2*Sqrt[e]*(d + e*x^2)^(3/2))
```

Maple [F] time = 0.407, size = 0, normalized size = 0.

$$\int (a + b\ln(cx^n))\left(ex^2 + d\right)^{-\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/(e*x^2+d)^(5/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}a\left(\frac{2\,x}{\sqrt{ex^2 + d}d^2} + \frac{x}{\left(ex^2 + d\right)^{\frac{3}{2}}d}\right) + b\int \frac{\log(c) + \log(x^n)}{\left(e^2x^4 + 2\,dex^2 + d^2\right)\sqrt{ex^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(2*x/(sqrt(e*x^2 + d)*d^2) + x/((e*x^2 + d)^(3/2)*d)) + b*integrate((
log(c) + log(x^n))/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

Fricas [A] time = 1.525, size = 756, normalized size = 6.69

$$\left[\frac{\left(be^2nx^4 + 2\,bdenx^2 + bd^2n\right)\sqrt{e}\log\left(-2\,ex^2 + 2\,\sqrt{ex^2 + d}\sqrt{e}x - d\right) - \left(\left(be^2n - 2\,ae^2\right)x^3 + (bden - 3\,ade)x - \left(2\,be^2x^3 + 3\right.\right.}{3\left(d^2e^3x^4 + 2\,d^3e^2x^2 + d^4e\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*((b*e^2*n*x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(e)*log(-2*e*x^2 + 2*sqrt
(e*x^2 + d)*sqrt(e)*x - d) - ((b*e^2*n - 2*a*e^2)*x^3 + (b*d*e*n - 3*a*d*e)
*x - (2*b*e^2*x^3 + 3*b*d*e*x)*log(c) - (2*b*e^2*n*x^3 + 3*b*d*e*n*x)*log(x
))*sqrt(e*x^2 + d))/(d^2*e^3*x^4 + 2*d^3*e^2*x^2 + d^4*e), 1/3*(2*(b*e^2*n*
x^4 + 2*b*d*e*n*x^2 + b*d^2*n)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d))
- ((b*e^2*n - 2*a*e^2)*x^3 + (b*d*e*n - 3*a*d*e)*x - (2*b*e^2*x^3 + 3*b*d*e
*x)*log(c) - (2*b*e^2*n*x^3 + 3*b*d*e*n*x)*log(x))*sqrt(e*x^2 + d))/(d^2*e^
3*x^4 + 2*d^3*e^2*x^2 + d^4*e)]
```

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*ln(c*x**n))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log (cx^n) + a}{\left(ex^2 + d\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^2 + d)^(5/2), x)
```

3.307 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=166

$$-\frac{8ex(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}-\frac{4ex(a+b\log(cx^n))}{3d^2(d+ex^2)^{3/2}}-\frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}}-\frac{2benx}{3d^3\sqrt{d+ex^2}}-\frac{bn}{d^2x\sqrt{d+ex^2}}+\frac{8b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}$$

```
[Out] -((b*n)/(d^2*x*Sqrt[d + e*x^2])) - (2*b*e*n*x)/(3*d^3*Sqrt[d + e*x^2]) + (8
*b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^3) - (a + b*Log[c*x
^n])/(d*x*(d + e*x^2)^(3/2)) - (4*e*x*(a + b*Log[c*x^n]))/(3*d^2*(d + e*x^2
)^(3/2)) - (8*e*x*(a + b*Log[c*x^n]))/(3*d^3*Sqrt[d + e*x^2])
```

Rubi [A] time = 0.168664, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {271, 192, 191, 2350, 12, 1265, 385, 217, 206}

$$-\frac{8ex(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}-\frac{4ex(a+b\log(cx^n))}{3d^2(d+ex^2)^{3/2}}-\frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}}-\frac{2benx}{3d^3\sqrt{d+ex^2}}-\frac{bn}{d^2x\sqrt{d+ex^2}}+\frac{8b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(5/2)),x]
```


```
[Out] -((b*n)/(d^2*x*Sqrt[d + e*x^2])) - (2*b*e*n*x)/(3*d^3*Sqrt[d + e*x^2]) + (8
*b*Sqrt[e]*n*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(3*d^3) - (a + b*Log[c*x
^n])/(d*x*(d + e*x^2)^(3/2)) - (4*e*x*(a + b*Log[c*x^n]))/(3*d^2*(d + e*x^2
)^(3/2)) - (8*e*x*(a + b*Log[c*x^n]))/(3*d^3*Sqrt[d + e*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
```

```
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 385

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> -S
imp[((b*c - a*d)*x*(a + b*x^n)^(p + 1))/(a*b*n*(p + 1)), x] - Dist[(a*d - b
*c*(n*(p + 1) + 1))/(a*b*n*(p + 1)), Int[(a + b*x^n)^(p + 1), x], x] /; Fre
eQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d, 0] && (LtQ[p, -1] || ILtQ[1/n +
 p, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^2)^{5/2}}\,dx = -\frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}} - \frac{4ex(a+b\log(cx^n))}{3d^2(d+ex^2)^{3/2}} - \frac{8ex(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}} - (bn)\int \frac{-3d^2-12dex^2-8e^2x^4}{3d^3x^2(d+ex^2)^{3/2}}$$

$$= -\frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}} - \frac{4ex(a+b\log(cx^n))}{3d^2(d+ex^2)^{3/2}} - \frac{8ex(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}} - \frac{(bn)\int \frac{-3d^2-12dex^2-8e^2x^4}{x^2(d+ex^2)^{3/2}}\,dx}{3d^3}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}} - \frac{4ex(a+b\log(cx^n))}{3d^2(d+ex^2)^{3/2}} - \frac{8ex(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}} + \frac{(bn)\int \frac{6d^2e+8de}{(d+ex^2)}}{3d^4}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{2benx}{3d^3\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}} - \frac{4ex(a+b\log(cx^n))}{3d^2(d+ex^2)^{3/2}} - \frac{8ex(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{2benx}{3d^3\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}} - \frac{4ex(a+b\log(cx^n))}{3d^2(d+ex^2)^{3/2}} - \frac{8ex(a+b\log(cx^n))}{3d^3\sqrt{d+ex^2}}$$

$$= -\frac{bn}{d^2x\sqrt{d+ex^2}} - \frac{2benx}{3d^3\sqrt{d+ex^2}} + \frac{8b\sqrt{e}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^3} - \frac{a+b\log(cx^n)}{dx(d+ex^2)^{3/2}} - \frac{4ex(a+b\log(cx^n}{3d^2(d+ex^2)^{3/2}}$$

Mathematica [A] time = 0.182835, size = 144, normalized size = 0.87

$$\frac{-3ad^2-12adex^2-8ae^2x^4-b\left(3d^2+12dex^2+8e^2x^4\right)\log(cx^n)-3bd^2n-5bdenx^2+8b\sqrt{e}nx\left(d+ex^2\right)^{3/2}\log\left(\sqrt{e}\sqrt{d+\right.}{3d^3x\left(d+ex^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^2)^(5/2)),x]
```

```
[Out] (-3*a*d^2 - 3*b*d^2*n - 12*a*d*e*x^2 - 5*b*d*e*n*x^2 - 8*a*e^2*x^4 - 2*b*e^
2*n*x^4 - b*(3*d^2 + 12*d*e*x^2 + 8*e^2*x^4)*Log[c*x^n] + 8*b*Sqrt[e]*n*x*(
```

```
d + e*x^2)^(3/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(3*d^3*x*(d + e*x^2)^(
3/2))
```

Maple [F] time = 0.412, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^2}\left(ex^2 + d\right)^{-\frac{5}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^2/(e*x^2+d)^(5/2),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((a+b*log(c*x^n))/x^2/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.78833, size = 914, normalized size = 5.51

$$\left[\frac{4\left(be^2nx^5 + 2\,bdenx^3 + bd^2nx\right)\sqrt{e}\log\left(-2\,ex^2 - 2\,\sqrt{ex^2 + d}\sqrt{e}x - d\right) - \left(2\left(be^2n + 4\,ae^2\right)x^4 + 3\,bd^2n + 3\,ad^2 + (5\,bden + 1\right.}{3\left(d^3e^2x^5 + 2\,d^4ex^3 + d^5\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/3*(4*(b*e^2*n*x^5 + 2*b*d*e*n*x^3 + b*d^2*n*x)*sqrt(e)*log(-2*e*x^2 - 2*
sqrt(e*x^2 + d)*sqrt(e)*x - d) - (2*(b*e^2*n + 4*a*e^2)*x^4 + 3*b*d^2*n + 3
*a*d^2 + (5*b*d*e*n + 12*a*d*e)*x^2 + (8*b*e^2*x^4 + 12*b*d*e*x^2 + 3*b*d^2
```

```
)*log(c) + (8*b*e^2*n*x^4 + 12*b*d*e*n*x^2 + 3*b*d^2*n)*log(x))*sqrt(e*x^2
+ d))/(d^3*e^2*x^5 + 2*d^4*e*x^3 + d^5*x), -1/3*(8*(b*e^2*n*x^5 + 2*b*d*e*n
*x^3 + b*d^2*n*x)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (2*(b*e^2*n
 + 4*a*e^2)*x^4 + 3*b*d^2*n + 3*a*d^2 + (5*b*d*e*n + 12*a*d*e)*x^2 + (8*b*e
^2*x^4 + 12*b*d*e*x^2 + 3*b*d^2)*log(c) + (8*b*e^2*n*x^4 + 12*b*d*e*n*x^2 +
 3*b*d^2*n)*log(x))*sqrt(e*x^2 + d))/(d^3*e^2*x^5 + 2*d^4*e*x^3 + d^5*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*ln(c*x**n))/x**2/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right) + a}{\left(ex^{2} + d\right)^{\frac{5}{2}}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x^2), x)
```

3.308 $\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=230

$$\frac{16e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^4\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{d^2x\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{3dx^3\left(d+ex^2\right)^{3/2}}-\frac{be^2nx}{3d^4\sqrt{d+ex^2}}-\frac{16be^{3/2}n\tanh}{3d}$$

```
[Out] -(b*e^2*n*x)/(3*d^4*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/(9*d^3*x^3) +
(23*b*e*n*Sqrt[d + e*x^2])/(9*d^4*x) - (16*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/
Sqrt[d + e*x^2]])/(3*d^4) - (a + b*Log[c*x^n])/(3*d*x^3*(d + e*x^2)^(3/2))
+ (2*e*(a + b*Log[c*x^n]))/(d^2*x*(d + e*x^2)^(3/2)) + (8*e^2*x*(a + b*Log[
c*x^n]))/(3*d^3*(d + e*x^2)^(3/2)) + (16*e^2*x*(a + b*Log[c*x^n]))/(3*d^4*S
qrt[d + e*x^2])
```

Rubi [A] time = 0.25889, antiderivative size = 230, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {271, 192, 191, 2350, 12, 1805, 1265, 451, 217, 206}

$$\frac{16e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^4\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\log\left(cx^n\right)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\log\left(cx^n\right)\right)}{d^2x\left(d+ex^2\right)^{3/2}}-\frac{a+b\log\left(cx^n\right)}{3dx^3\left(d+ex^2\right)^{3/2}}-\frac{be^2nx}{3d^4\sqrt{d+ex^2}}-\frac{16be^{3/2}n\tanh}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(5/2)),x]
```


```
[Out] -(b*e^2*n*x)/(3*d^4*Sqrt[d + e*x^2]) - (b*n*Sqrt[d + e*x^2])/(9*d^3*x^3) +
(23*b*e*n*Sqrt[d + e*x^2])/(9*d^4*x) - (16*b*e^(3/2)*n*ArcTanh[(Sqrt[e]*x)/
Sqrt[d + e*x^2]])/(3*d^4) - (a + b*Log[c*x^n])/(3*d*x^3*(d + e*x^2)^(3/2))
+ (2*e*(a + b*Log[c*x^n]))/(d^2*x*(d + e*x^2)^(3/2)) + (8*e^2*x*(a + b*Log[
c*x^n]))/(3*d^3*(d + e*x^2)^(3/2)) + (16*e^2*x*(a + b*Log[c*x^n]))/(3*d^4*S
qrt[d + e*x^2])
```


Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 1805

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_), x_Symbol] :> With[
{Q = PolynomialQuotient[(c*x)^m*Pq, a + b*x^2, x], f = Coeff[PolynomialRema
inder[(c*x)^m*Pq, a + b*x^2, x], x, 0], g = Coeff[PolynomialRemainder[(c*x)
^m*Pq, a + b*x^2, x], x, 1]}, Simp[((a*g - b*f*x)*(a + b*x^2)^(p + 1))/(2*a
*b*(p + 1)), x] + Dist[1/(2*a*(p + 1)), Int[(c*x)^m*(a + b*x^2)^(p + 1)*Exp
andToSum[(2*a*(p + 1)*Q)/(c*x)^m + (f*(2*p + 3))/(c*x)^m, x], x], x]] /; Fr
eeQ[{a, b, c}, x] && PolyQ[Pq, x] && LtQ[p, -1] && ILtQ[m, 0]
```

Rule 1265

```
Int[((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c
_.)*(x_)^4)^(p_.), x_Symbol] :> With[{Qx = PolynomialQuotient[(a + b*x^2 +
c*x^4)^p, f*x, x], R = PolynomialRemainder[(a + b*x^2 + c*x^4)^p, f*x, x]},
 Simp[(R*(f*x)^(m + 1)*(d + e*x^2)^(q + 1))/(d*f*(m + 1)), x] + Dist[1/(d*f
^2*(m + 1)), Int[(f*x)^(m + 2)*(d + e*x^2)^q*ExpandToSum[(d*f*(m + 1)*Qx)/x
 - e*R*(m + 2*q + 3), x], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ
```

```
[b^2 - 4*a*c, 0] && IGtQ[p, 0] && LtQ[m, -1]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4(d+ex^2)^{5/2}}\,dx = -\frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b\log(cx^n))}{3d^3(d+ex^2)^{3/2}} + \frac{16e^2x(a+b\log(cx^n))}{3d^4\sqrt{d+ex^2}} - (bn$$

$$= -\frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b\log(cx^n))}{3d^3(d+ex^2)^{3/2}} + \frac{16e^2x(a+b\log(cx^n))}{3d^4\sqrt{d+ex^2}} - \frac{(bn}{}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b\log(cx^n))}{3d^3(d+ex^2)^{3/2}} + \frac{16e^2x(a+b}{3d^4\sqrt{d}}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2x(a+b\log(cx^n))}{3d^3(d+ex^2)^{3/2}}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} + \frac{23ben\sqrt{d+ex^2}}{9d^4x} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2}{}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} + \frac{23ben\sqrt{d+ex^2}}{9d^4x} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}} + \frac{2e(a+b\log(cx^n))}{d^2x(d+ex^2)^{3/2}} + \frac{8e^2}{}$$

$$= -\frac{be^2nx}{3d^4\sqrt{d+ex^2}} - \frac{bn\sqrt{d+ex^2}}{9d^3x^3} + \frac{23ben\sqrt{d+ex^2}}{9d^4x} - \frac{16be^{3/2}n\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{3d^4} - \frac{a+b\log(cx^n)}{3dx^3(d+ex^2)^{3/2}}$$

Mathematica [A] time = 0.216622, size = 182, normalized size = 0.79

$$\frac{18ad^2ex^2 - 3ad^3 + 72ade^2x^4 + 48ae^3x^6 + 3b\left(6d^2ex^2 - d^3 + 24de^2x^4 + 16e^3x^6\right)\log(cx^n) + 21bd^2enx^2 - bd^3n + 42bde^2n}{9d^4x^3(d+ex^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*(d + e*x^2)^(5/2)),x]
```

```
[Out] (-3*a*d^3 - b*d^3*n + 18*a*d^2*e*x^2 + 21*b*d^2*e*n*x^2 + 72*a*d*e^2*x^4 +
42*b*d*e^2*n*x^4 + 48*a*e^3*x^6 + 20*b*e^3*n*x^6 + 3*b*(-d^3 + 6*d^2*e*x^2
+ 24*d*e^2*x^4 + 16*e^3*x^6)*Log[c*x^n] - 48*b*e^(3/2)*n*x^3*(d + e*x^2)^(3
/2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(9*d^4*x^3*(d + e*x^2)^(3/2))
```

Maple [F] time = 0.416, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^4} \left(ex^2 + d\right)^{-\frac{5}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^4/(e*x^2+d)^(5/2),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((a+b*log(c*x^n))/x^4/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 2.00739, size = 1156, normalized size = 5.03

$$\left[\frac{24\left(be^3nx^7 + 2\,bde^2nx^5 + bd^2enx^3\right)\sqrt{e}\log\left(-2\,ex^2 + 2\,\sqrt{ex^2 + d}\sqrt{e}x - d\right) + \left(4\left(5\,be^3n + 12\,ae^3\right)x^6 - bd^3n + 6\left(7\,bde^2n + \right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/9*(24*(b*e^3*n*x^7 + 2*b*d*e^2*n*x^5 + b*d^2*e*n*x^3)*sqrt(e)*log(-2*e*x
^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) + (4*(5*b*e^3*n + 12*a*e^3)*x^6 - b*d
^3*n + 6*(7*b*d*e^2*n + 12*a*d*e^2)*x^4 - 3*a*d^3 + 3*(7*b*d^2*e*n + 6*a*d^
2*e)*x^2 + 3*(16*b*e^3*x^6 + 24*b*d*e^2*x^4 + 6*b*d^2*e*x^2 - b*d^3)*log(c)
 + 3*(16*b*e^3*n*x^6 + 24*b*d*e^2*n*x^4 + 6*b*d^2*e*n*x^2 - b*d^3*n)*log(x)
)*sqrt(e*x^2 + d))/(d^4*e^2*x^7 + 2*d^5*e*x^5 + d^6*x^3), 1/9*(48*(b*e^3*n*
x^7 + 2*b*d*e^2*n*x^5 + b*d^2*e*n*x^3)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^
2 + d)) + (4*(5*b*e^3*n + 12*a*e^3)*x^6 - b*d^3*n + 6*(7*b*d*e^2*n + 12*a*d
```

```
*e^2)*x^4 - 3*a*d^3 + 3*(7*b*d^2*e*n + 6*a*d^2*e)*x^2 + 3*(16*b*e^3*x^6 + 2
4*b*d*e^2*x^4 + 6*b*d^2*e*x^2 - b*d^3)*log(c) + 3*(16*b*e^3*n*x^6 + 24*b*d*
e^2*n*x^4 + 6*b*d^2*e*n*x^2 - b*d^3*n)*log(x))*sqrt(e*x^2 + d))/(d^4*e^2*x^
7 + 2*d^5*e*x^5 + d^6*x^3)]
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^2+d\right)^{\frac{5}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^2 + d)^(5/2)*x^4), x)
```

3.309 $\int \frac{x^3(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=251

$$-\frac{d^2\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{\left(d^2-e^2x^2\right)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{2bd^2n\left(d^2-e^2x^2\right)}{3e^4\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}}-\frac{2bd^4n\sqrt{1}}{3}$$

```
[Out] (2*b*d^2*n*(d^2 - e^2*x^2))/(3*e^4*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*(d^2
 - e^2*x^2)^2)/(9*e^4*Sqrt[d - e*x]*Sqrt[d + e*x]) - (2*b*d^4*n*Sqrt[1 - (e
^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(3*e^4*Sqrt[d - e*x]*Sqrt[d
+ e*x]) - (d^2*(d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(e^4*Sqrt[d - e*x]*Sqrt[
d + e*x]) + ((d^2 - e^2*x^2)^2*(a + b*Log[c*x^n]))/(3*e^4*Sqrt[d - e*x]*Sqr
t[d + e*x])
```

Rubi [A] time = 0.519758, antiderivative size = 251, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 10, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.303, Rules used = {2342, 266, 43, 2350, 12, 446, 80, 50, 63, 208}

$$-\frac{d^2\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{\left(d^2-e^2x^2\right)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}}+\frac{2bd^2n\left(d^2-e^2x^2\right)}{3e^4\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}}-\frac{2bd^4n\sqrt{1}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```


```
[Out] (2*b*d^2*n*(d^2 - e^2*x^2))/(3*e^4*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*(d^2
 - e^2*x^2)^2)/(9*e^4*Sqrt[d - e*x]*Sqrt[d + e*x]) - (2*b*d^4*n*Sqrt[1 - (e
^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(3*e^4*Sqrt[d - e*x]*Sqrt[d
+ e*x]) - (d^2*(d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(e^4*Sqrt[d - e*x]*Sqrt[
d + e*x]) + ((d^2 - e^2*x^2)^2*(a + b*Log[c*x^n]))/(3*e^4*Sqrt[d - e*x]*Sqr
t[d + e*x])
```


Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
```

```
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 80

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> Simp[(b*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(d*f*(n + p
+ 2)), x] + Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f*(p + 1)))/(d*f*(
n + p + 2)), Int[(c + d*x)^n*(e + f*x)^p, x], x] /; FreeQ[{a, b, c, d, e, f
, n, p}, x] && NeQ[n + p + 2, 0]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x^3 (a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{x^3(a+b\log(cx^n))}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{d^2(-2d^2-\cdots}{\cdots}}{\sqrt{d-ex}\sqrt{d+\cdots}}$$

$$= -\frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{(-2d^2\cdots}{\cdots}}{3e^4\sqrt{d-ex}\sqrt{d\cdots}}$$

$$= -\frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\cdots}{6e^4\sqrt{d-\cdots}}$$

$$= -\frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2(a+b\log(cx^n))}{3e^4\sqrt{d-ex}\sqrt{d+ex}} + \cdots$$

$$= \frac{2bd^2n(d^2-e^2x^2)}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2\cdots}{3e^4\sqrt{d-\cdots}}$$

$$= \frac{2bd^2n(d^2-e^2x^2)}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{d^2(d^2-e^2x^2)(a+b\log(cx^n))}{e^4\sqrt{d-ex}\sqrt{d+ex}} + \frac{(d^2-e^2x^2)^2\cdots}{3e^4\sqrt{d-\cdots}}$$

$$= \frac{2bd^2n(d^2-e^2x^2)}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn(d^2-e^2x^2)^2}{9e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{2bd^4n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{3e^4\sqrt{d-ex}\sqrt{d+ex}} - \frac{d^2(d^2-\cdots}{e\cdots}$$

Mathematica [A] time = 0.391462, size = 163, normalized size = 0.65

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}\left(d^2(6a+6b\log(cx^n)-6bn\log(x)-5bn)+e^2x^2(3a+3b\log(cx^n)-3bn\log(x)-bn)\right)+3bn\log(x)\cdots}{9e^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -(-6*b*d^3*n*Log[x] + 3*b*n*Sqrt[d - e*x]*Sqrt[d + e*x]*(2*d^2 + e^2*x^2)*L
og[x] + Sqrt[d - e*x]*Sqrt[d + e*x]*(e^2*x^2*(3*a - b*n - 3*b*n*Log[x] + 3*
b*Log[c*x^n]) + d^2*(6*a - 5*b*n - 6*b*n*Log[x] + 6*b*Log[c*x^n])) + 6*b*d^
3*n*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/(9*e^4)
```

Maple [F] time = 0.707, size = 0, normalized size = 0.

$$\int x^3 (a + b\ln(cx^n)) \frac{1}{\sqrt{-ex+d}} \frac{1}{\sqrt{ex+d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

Maxima [A] time = 1.89477, size = 269, normalized size = 1.07

$$-\frac{1}{9}\,bn\left(\frac{3\,d^3\log\left(d+\sqrt{-e^2x^2+d^2}\right)}{e^4}-\frac{3\,d^3\log\left(-d+\sqrt{-e^2x^2+d^2}\right)}{e^4}-\frac{6\,\sqrt{-e^2x^2+d^2}d^2-\left(-e^2x^2+d^2\right)^{\frac{3}{2}}}{e^4}\right)-\frac{1}{3}\,b\left(\frac{\sqrt{-e^2x^2+}}{e^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] -1/9*b*n*(3*d^3*log(d + sqrt(-e^2*x^2 + d^2))/e^4 - 3*d^3*log(-d + sqrt(-e^
2*x^2 + d^2))/e^4 - (6*sqrt(-e^2*x^2 + d^2)*d^2 - (-e^2*x^2 + d^2)^(3/2))/e
^4) - 1/3*b*(sqrt(-e^2*x^2 + d^2)*x^2/e^2 + 2*sqrt(-e^2*x^2 + d^2)*d^2/e^4)
*log(c*x^n) - 1/3*a*(sqrt(-e^2*x^2 + d^2)*x^2/e^2 + 2*sqrt(-e^2*x^2 + d^2)*
d^2/e^4)
```

Fricas [A] time = 1.44386, size = 286, normalized size = 1.14

$$\frac{6\,bd^3n\log\left(\frac{\sqrt{ex+d}\sqrt{-ex+d}-d}{x}\right)+\left(5\,bd^2n-6\,ad^2+\left(be^2n-3\,ae^2\right)x^2-3\left(be^2x^2+2\,bd^2\right)\log\left(c\right)-3\left(be^2nx^2+2\,bd^2n\right)\log\left(x\right)\right)}{9\,e^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] 1/9*(6*b*d^3*n*log((sqrt(e*x + d)*sqrt(-e*x + d) - d)/x) + (5*b*d^2*n - 6*a
*d^2 + (b*e^2*n - 3*a*e^2)*x^2 - 3*(b*e^2*x^2 + 2*b*d^2)*log(c) - 3*(b*e^2*
n*x^2 + 2*b*d^2*n)*log(x))*sqrt(e*x + d)*sqrt(-e*x + d))/e^4
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^3}{\sqrt{ex+d}\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

3.310 $\int \frac{x(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=148

$$-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn(d^2-e^2x^2)}{e^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}}$$

```
[Out] (b*n*(d^2 - e^2*x^2))/(e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*d^2*n*Sqrt[1 -
 (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(e^2*Sqrt[d - e*x]*Sqrt[d
 + e*x]) - ((d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(e^2*Sqrt[d - e*x]*Sqrt[d +
 e*x])
```

Rubi [A] time = 0.295929, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.194, Rules used = {2342, 2338, 266, 50, 63, 208}

$$-\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn(d^2-e^2x^2)}{e^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*n*(d^2 - e^2*x^2))/(e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*d^2*n*Sqrt[1 -
 (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(e^2*Sqrt[d - e*x]*Sqrt[d
 + e*x]) - ((d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(e^2*Sqrt[d - e*x]*Sqrt[d +
 e*x])
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
```

```
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rubi steps

$$\int \frac{x(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{x(a+b\log(cx^n))}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\sqrt{1-\frac{e^2x^2}{d^2}}}{x}\,dx}{e^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{\sqrt{1-\frac{e^2x}{d^2}}}{x}\,dx, x, x^2\right)}{2e^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn(d^2-e^2x^2)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{1}{x\sqrt{1-\frac{e^2x}{d^2}}}\,dx, x, \ldots\right.}{2e^2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn(d^2-e^2x^2)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^4n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{1}{\frac{d^2}{e^2}-\frac{d^2x^2}{e^2}}\,dx, x, \ldots\right.}{e^4\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn(d^2-e^2x^2)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{(d^2-e^2x^2)(a+b\log(cx^n))}{e^2\sqrt{d-ex}\sqrt{d+ex}}$$

<u>Mathematica</u> [A] time = 0.177077, size = 113, normalized size = 0.76

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}(a+b(\log(cx^n)-n\log(x))-bn)}{e^2} + \frac{bdn\log(x)}{e^2} - \frac{bn\log(x)\sqrt{d-ex}\sqrt{d+ex}}{e^2} - \frac{bdn\log\left(\sqrt{d-ex}\sqrt{d+e\ldots\right.}{e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*d*n*Log[x])/e^2 - (b*n*Sqrt[d - e*x]*Sqrt[d + e*x]*Log[x])/e^2 - (Sqrt[d
 - e*x]*Sqrt[d + e*x]*(a - b*n + b*(-(n*Log[x]) + Log[c*x^n])))/e^2 - (b*d*
n*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/e^2
```

Maple [F] time = 0.648, size = 0, normalized size = 0.

$$\int x\left(a+b\ln\left(cx^{n}\right)\right)\frac{1}{\sqrt{-ex+d}}\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),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(x*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="max
ima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.64036, size = 162, normalized size = 1.09

$$\frac{bdn\log\left(\frac{\sqrt{ex+d}\sqrt{-ex+d}-d}{x}\right)-\left(bn\log\left(x\right)-bn+b\log\left(c\right)+a\right)\sqrt{ex+d}\sqrt{-ex+d}}{e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="fri
cas")
```

```
[Out] (b*d*n*log((sqrt(e*x + d)*sqrt(-e*x + d) - d)/x) - (b*n*log(x) - b*n + b*lo
g(c) + a)*sqrt(e*x + d)*sqrt(-e*x + d))/e^2
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))/(sqrt(d - e*x)*sqrt(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log\left(cx^{n}\right)+a)x}{\sqrt{ex+d}\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

3.311 $\int \frac{a+b\log(cx^n)}{x\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=301

$$-\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\operatorname{PolyLog}\left(2,-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}+1}{1-\sqrt{1-\frac{e^2x^2}{d^2}}}\right)}{2\sqrt{d-ex}\sqrt{d+ex}}-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\cdots}\right.}{2\sqrt{d-ex}\sqrt{d+ex}}$$

```
[Out] (b*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]^2)/(2*Sqrt[d
- e*x]*Sqrt[d + e*x]) - (Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)
/d^2]]*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*Sqrt[1 - (e
^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]*Log[2/(1 - Sqrt[1 - (e^2*x^2)
/d^2])])/(Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyL
og[2, -((1 + Sqrt[1 - (e^2*x^2)/d^2])/(1 - Sqrt[1 - (e^2*x^2)/d^2]))])/(2*S
qrt[d - e*x]*Sqrt[d + e*x])
```

Rubi [A] time = 0.604864, antiderivative size = 301, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 9, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2342, 266, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\operatorname{PolyLog}\left(2,-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}+1}{1-\sqrt{1-\frac{e^2x^2}{d^2}}}\right)}{2\sqrt{d-ex}\sqrt{d+ex}}-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}+\frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\cdots}\right.}{2\sqrt{d-ex}\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]^2)/(2*Sqrt[d
- e*x]*Sqrt[d + e*x]) - (Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)
/d^2]]*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*Sqrt[1 - (e
^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]*Log[2/(1 - Sqrt[1 - (e^2*x^2)
/d^2])])/(Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyL
og[2, -((1 + Sqrt[1 - (e^2*x^2)/d^2])/(1 - Sqrt[1 - (e^2*x^2)/d^2]))])/(2*S
qrt[d - e*x]*Sqrt[d + e*x])
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
```

```
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{x}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{\tanh^{-1}\left(\sqrt{1-\frac{e^2x}{d^2}}\right)}{x}\,dx,\right.}{2\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int \frac{x\tanh^{-1}(x)}{-1+x^2}\,dx,x,\sqrt{\right.}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\right.}{}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn\sqrt{1-}{}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn\sqrt{1-}{}$$

$$= \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn\sqrt{1-}{}$$

Mathematica [A] time = 1.75835, size = 310, normalized size = 1.03

$$\frac{bn\sqrt{e^2x^2-d^2}\left(\frac{\sqrt{1-\frac{e^2x^2}{d^2}}\left(-4\text{PolyLog}\left(2,\frac{1}{2}-\frac{1}{2}\sqrt{1-\frac{e^2x^2}{d^2}}\right)+\log^2\left(\frac{e^2x^2}{d^2}\right)+2\log^2\left(\frac{1}{2}\left(\sqrt{1-\frac{e^2x^2}{d^2}}+1\right)\right)-4\log\left(\frac{1}{2}\left(\sqrt{1-\frac{e^2x^2}{d^2}}+1\right)\right)\log\left(\frac{e^2x^2}{d^2}\right)\right)}{\sqrt{e^2x^2-d^2}} - \frac{4\left(2\log(x)-\log\left(\frac{e^2x^2}{d^2}\right.\right.}{\sqrt{}}\right.}{8\sqrt{d-ex}\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]))/d - ((a - b*n*Log[x] + b*Log[c*x^n
])*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/d + (b*n*Sqrt[-d^2 + e^2*x^2]*((-4
*ArcTanh[Sqrt[-d^2 + e^2*x^2]/Sqrt[-d^2]]*(2*Log[x] - Log[(e^2*x^2)/d^2]))/
Sqrt[-d^2] + (Sqrt[1 - (e^2*x^2)/d^2]*(Log[(e^2*x^2)/d^2]^2 - 4*Log[(e^2*x^
2)/d^2]*Log[(1 + Sqrt[1 - (e^2*x^2)/d^2])/2] + 2*Log[(1 + Sqrt[1 - (e^2*x^2
)/d^2])/2]^2 - 4*PolyLog[2, 1/2 - Sqrt[1 - (e^2*x^2)/d^2]/2]))/Sqrt[-d^2 +
e^2*x^2]))/(8*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Maple [F] time = 0.628, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x}\frac{1}{\sqrt{-ex+d}}\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),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((a+b*log(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="max
ima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{ex+d}\sqrt{-ex+d}b\log(cx^n)+\sqrt{ex+d}\sqrt{-ex+d}a}{e^2x^3-d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="fri
cas")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*sqrt(-
e*x + d)*a)/(e^2*x^3 - d^2*x), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log\left(cx^{n}\right)}{x\sqrt{d - ex}\sqrt{d + ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x*sqrt(d - e*x)*sqrt(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right) + a}{\sqrt{ex + d}\sqrt{-ex + d}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x), x)
```

3.312 $\int \frac{a+b\log(cx^n)}{x^3\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=489

$$-\frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\text{PolyLog}\left(2,-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}+1}{1-\sqrt{1-\frac{e^2x^2}{d^2}}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(c}{2d^2\sqrt{d-ex}\sqrt{d+ex}}$$

```
[Out] -(b*n*(d^2 - e^2*x^2))/(4*d^2*x^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (b*e^2*n*S
qrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(4*d^2*Sqrt[d - e*
x]*Sqrt[d + e*x]) + (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*
x^2)/d^2]]^2)/(4*d^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - ((d^2 - e^2*x^2)*(a + b
*Log[c*x^n]))/(2*d^2*x^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - (e^2*Sqrt[1 - (e^2*
x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]*(a + b*Log[c*x^n]))/(2*d^2*Sqrt[
d - e*x]*Sqrt[d + e*x]) - (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 -
 (e^2*x^2)/d^2]]*Log[2/(1 - Sqrt[1 - (e^2*x^2)/d^2])])/(2*d^2*Sqrt[d - e*x]
*Sqrt[d + e*x]) - (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, -((1 + Sqrt[1
 - (e^2*x^2)/d^2])/(1 - Sqrt[1 - (e^2*x^2)/d^2]))])/(4*d^2*Sqrt[d - e*x]*Sq
rt[d + e*x])
```

Rubi [A] time = 0.724349, antiderivative size = 489, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 11, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {2342, 266, 51, 63, 208, 2350, 47, 5984, 5918, 2402, 2315}

$$-\frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\text{PolyLog}\left(2,-\frac{\sqrt{1-\frac{e^2x^2}{d^2}}+1}{1-\sqrt{1-\frac{e^2x^2}{d^2}}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}}-\frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)(a+b\log(c}{2d^2\sqrt{d-ex}\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -(b*n*(d^2 - e^2*x^2))/(4*d^2*x^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (b*e^2*n*S
qrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]])/(4*d^2*Sqrt[d - e*
x]*Sqrt[d + e*x]) + (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*
x^2)/d^2]]^2)/(4*d^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - ((d^2 - e^2*x^2)*(a + b
*Log[c*x^n]))/(2*d^2*x^2*Sqrt[d - e*x]*Sqrt[d + e*x]) - (e^2*Sqrt[1 - (e^2*
x^2)/d^2]*ArcTanh[Sqrt[1 - (e^2*x^2)/d^2]]*(a + b*Log[c*x^n]))/(2*d^2*Sqrt[
d - e*x]*Sqrt[d + e*x]) - (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcTanh[Sqrt[1 -
```

```
(e^2*x^2)/d^2]]*Log[2/(1 - Sqrt[1 - (e^2*x^2)/d^2])])/(2*d^2*Sqrt[d - e*x]
*Sqrt[d + e*x]) - (b*e^2*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, -((1 + Sqrt[1
 - (e^2*x^2)/d^2])/(1 - Sqrt[1 - (e^2*x^2)/d^2]))])/(4*d^2*Sqrt[d - e*x]*Sq
rt[d + e*x])
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x^3\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x^3\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2\sqrt{d-ex}\sqrt{d+ex}} - \cdots$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2\sqrt{d-ex}\sqrt{d+ex}} + \cdots$$

$$= -\frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{e^2\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2\sqrt{d-ex}\sqrt{d+ex}} + \cdots$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} - \cdots$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)^2}{4d^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{2d^2x^2\sqrt{d-ex}\sqrt{d+ex}} \cdots$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}} + \cdots$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}} + \cdots$$

$$= -\frac{bn\left(d^2-e^2x^2\right)}{4d^2x^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\tanh^{-1}\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{4d^2\sqrt{d-ex}\sqrt{d+ex}} + \cdots$$

Mathematica [C] time = 0.858847, size = 255, normalized size = 0.52

$$\frac{\frac{bn(e^2x^2-d^2)\left(2d^3\,{}_3F_2\left(\frac{3}{2},\frac{3}{2},\frac{3}{2};\frac{5}{2},\frac{5}{2};\frac{d^2}{e^2x^2}\right)+9e^2x^2(2\log(x)+1)\left(d\sqrt{1-\frac{d^2}{e^2x^2}}-ex\sin^{-1}\left(\frac{d}{ex}\right)\right)\right)}{e^2x^4\sqrt{1-\frac{d^2}{e^2x^2}}\sqrt{d-ex}\sqrt{d+ex}}-18e^2\log\left(\sqrt{d-ex}\sqrt{d+ex}+d\right)\left(a+b\log\left(cx^n\right)-bn\right.}{36d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] ((b*n*(-d^2 + e^2*x^2)*(2*d^3*HypergeometricPFQ[{3/2, 3/2, 3/2}, {5/2, 5/2}
, d^2/(e^2*x^2)] + 9*e^2*x^2*(d*Sqrt[1 - d^2/(e^2*x^2)] - e*x*ArcSin[d/(e*x
)])*(1 + 2*Log[x])))/(e^2*Sqrt[1 - d^2/(e^2*x^2)]*x^4*Sqrt[d - e*x]*Sqrt[d
+ e*x]) - (18*d*Sqrt[d - e*x]*Sqrt[d + e*x]*(a - b*n*Log[x] + b*Log[c*x^n])
)/x^2 + 18*e^2*Log[x]*(a - b*n*Log[x] + b*Log[c*x^n]) - 18*e^2*(a - b*n*Log
[x] + b*Log[c*x^n])*Log[d + Sqrt[d - e*x]*Sqrt[d + e*x]])/(36*d^3)
```

Maple [F] time = 0.659, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^n\right)}{x^3}\frac{1}{\sqrt{-ex+d}}\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),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((a+b*log(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{ex+d}\sqrt{-ex+d}b\log\left(cx^{n}\right)+\sqrt{ex+d}\sqrt{-ex+d}a}{e^{2}x^{5}-d^{2}x^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*sqrt(-
e*x + d)*a)/(e^2*x^5 - d^2*x^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((a+b*ln(c*x**n))/x**3/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex+d}\sqrt{-ex+d}x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x^3), x)
```

3.313 $\int \frac{x^2(a+b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=406

$$\frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{x\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2e^2\sqrt{d-ex}\sqrt{d+ex}}+\frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{2e^3\sqrt{d-ex}\sqrt{d+ex}}+\frac{}{4e}$$

```
[Out] (b*n*x*(d^2 - e^2*x^2))/(4*e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (b*d^3*n*Sqrt
[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(4*e^3*Sqrt[d - e*x]*Sqrt[d + e*x]) +
((I/4)*b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]^2)/(e^3*Sqrt[d - e*x
]*Sqrt[d + e*x]) - (b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*Log[1 -
 E^((2*I)*ArcSin[(e*x)/d])])/(2*e^3*Sqrt[d - e*x]*Sqrt[d + e*x]) - (x*(d^2
- e^2*x^2)*(a + b*Log[c*x^n]))/(2*e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (d^3*S
qrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*(a + b*Log[c*x^n]))/(2*e^3*Sqrt[d -
e*x]*Sqrt[d + e*x]) + ((I/4)*b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, E^(
(2*I)*ArcSin[(e*x)/d])])/(e^3*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rubi [A] time = 0.612182, antiderivative size = 406, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 12, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {2342, 321, 216, 2350, 12, 14, 195, 4625, 3717, 2190, 2279, 2391}

$$\frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\,\text{PolyLog}\left(2,e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{x\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2e^2\sqrt{d-ex}\sqrt{d+ex}}+\frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{2e^3\sqrt{d-ex}\sqrt{d+ex}}+\frac{}{4e}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (b*n*x*(d^2 - e^2*x^2))/(4*e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (b*d^3*n*Sqrt
[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(4*e^3*Sqrt[d - e*x]*Sqrt[d + e*x]) +
((I/4)*b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]^2)/(e^3*Sqrt[d - e*x
]*Sqrt[d + e*x]) - (b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*Log[1 -
 E^((2*I)*ArcSin[(e*x)/d])])/(2*e^3*Sqrt[d - e*x]*Sqrt[d + e*x]) - (x*(d^2
- e^2*x^2)*(a + b*Log[c*x^n]))/(2*e^2*Sqrt[d - e*x]*Sqrt[d + e*x]) + (d^3*S
qrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*(a + b*Log[c*x^n]))/(2*e^3*Sqrt[d -
e*x]*Sqrt[d + e*x]) + ((I/4)*b*d^3*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, E^(
(2*I)*ArcSin[(e*x)/d])])/(e^3*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
```

```
 Denominator[p]])
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a + b\log(cx^n))}{\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{x^2(a+b\log(cx^n))}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{x\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int}{\sqrt{d}}$$

$$= -\frac{x\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{2e^3\sqrt{}}$$

$$= -\frac{x\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{2e}$$

$$= -\frac{x\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{2e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\right)}{2e^3\sqrt{d-ex}}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} - \frac{x\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{2e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{d^3\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n)}{2e^3\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{x\left(d^2-e^2x^2\right)}{2e^2\sqrt{d}}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd^3n\sqrt{1-\frac{e^2}{d}}}{}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd^3n\sqrt{1-\frac{e^2}{d}}}{}$$

$$= \frac{bnx\left(d^2-e^2x^2\right)}{4e^2\sqrt{d-ex}\sqrt{d+ex}} + \frac{bd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{4e^3\sqrt{d-ex}\sqrt{d+ex}} + \frac{ibd^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{4e^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{bd^3n\sqrt{1-\frac{e^2}{d}}}{}$$

Mathematica [A] time = 2.72016, size = 316, normalized size = 0.78

$$\frac{bn\left(\frac{e^3\sqrt{1-\frac{e^2x^2}{d^2}}\left(-\text{PolyLog}\left(2,e^{-2\sinh^{-1}\left(x\sqrt{-\frac{e^2}{d^2}}\right)}\right)-2\log(x)\log\left(\sqrt{1-\frac{e^2x^2}{d^2}}+x\sqrt{-\frac{e^2}{d^2}}\right)+\sinh^{-1}\left(x\sqrt{-\frac{e^2}{d^2}}\right)^2+2\sinh^{-1}\left(x\sqrt{-\frac{e^2}{d^2}}\right)\log\left(1-e^{-2\sinh^{-1}\left(x\sqrt{-\frac{e^2}{d^2}}\right)}\right)\right)}{\left(-\frac{e^2}{d^2}\right)^{3/2}}+ex(2\log(x)-1)(e^2x\right.}{\sqrt{d-ex}\sqrt{d+ex}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (-2*e*x*Sqrt[d - e*x]*Sqrt[d + e*x]*(a - b*n*Log[x] + b*Log[c*x^n]) + 2*d^2
*ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])]*(a - b*n*Log[x] + b*Log[c*x^n]
) + (b*n*(d^3*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d] + e*x*(-d^2 + e^2*x^2
)*(-1 + 2*Log[x]) + (e^3*Sqrt[1 - (e^2*x^2)/d^2]*(ArcSinh[Sqrt[-(e^2/d^2)]*
x]^2 + 2*ArcSinh[Sqrt[-(e^2/d^2)]*x]*Log[1 - E^(-2*ArcSinh[Sqrt[-(e^2/d^2)]
*x])] - 2*Log[x]*Log[Sqrt[-(e^2/d^2)]*x + Sqrt[1 - (e^2*x^2)/d^2]] - PolyLo
g[2, E^(-2*ArcSinh[Sqrt[-(e^2/d^2)]*x])]))/(-(e^2/d^2))^(3/2)))/(Sqrt[d - e
*x]*Sqrt[d + e*x]))/(4*e^3)
```

Maple [F] time = 0.643, size = 0, normalized size = 0.

$$\int x^2\left(a+b\ln\left(cx^n\right)\right)\frac{1}{\sqrt{-ex+d}}\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\,a\left(\frac{d^2\arcsin\left(\frac{e^2x}{\sqrt{d^2e^2}}\right)}{\sqrt{e^2}e^2}-\frac{\sqrt{-e^2x^2+d^2}x}{e^2}\right)+b\int\frac{x^2\log(c)+x^2\log(x^n)}{\sqrt{ex+d}\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] 1/2*a*(d^2*arcsin(e^2*x/sqrt(d^2*e^2))/(sqrt(e^2)*e^2) - sqrt(-e^2*x^2 + d^
2)*x/e^2) + b*integrate((x^2*log(c) + x^2*log(x^n))/(sqrt(e*x + d)*sqrt(-e*
x + d)), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{ex+d}\sqrt{-ex+d}bx^2\log\left(cx^n\right)+\sqrt{ex+d}\sqrt{-ex+d}ax^2}{e^2x^2-d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*x^2*log(c*x^n) + sqrt(e*x + d)*sq
rt(-e*x + d)*a*x^2)/(e^2*x^2 - d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/(sqrt(d - e*x)*sqrt(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{\left(b\log\left(cx^n\right)+a\right)x^2}{\sqrt{ex+d}\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

3.314 $\int \frac{a+b\log(cx^n)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=248

$$\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\text{PolyLog}\left(2,e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{2e\sqrt{d-ex}\sqrt{d+ex}}+\frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{e\sqrt{d-ex}\sqrt{d+ex}}+\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}}-\frac{bdn\sqrt{1-}}{}$$

```
[Out] ((I/2)*b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]^2)/(e*Sqrt[d - e*x]*Sq
rt[d + e*x]) - (b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*Log[1 - E^((2
*I)*ArcSin[(e*x)/d])])/(e*Sqrt[d - e*x]*Sqrt[d + e*x]) + (d*Sqrt[1 - (e^2*x
^2)/d^2]*ArcSin[(e*x)/d]*(a + b*Log[c*x^n]))/(e*Sqrt[d - e*x]*Sqrt[d + e*x]
) + ((I/2)*b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, E^((2*I)*ArcSin[(e*x)/d
])])/(e*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rubi [A] time = 0.216421, antiderivative size = 248, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {2328, 2326, 4625, 3717, 2190, 2279, 2391}

$$\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\text{PolyLog}\left(2,e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{2e\sqrt{d-ex}\sqrt{d+ex}}+\frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{e\sqrt{d-ex}\sqrt{d+ex}}+\frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}}-\frac{bdn\sqrt{1-}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```


```
[Out] ((I/2)*b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]^2)/(e*Sqrt[d - e*x]*Sq
rt[d + e*x]) - (b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d]*Log[1 - E^((2
*I)*ArcSin[(e*x)/d])])/(e*Sqrt[d - e*x]*Sqrt[d + e*x]) + (d*Sqrt[1 - (e^2*x
^2)/d^2]*ArcSin[(e*x)/d]*(a + b*Log[c*x^n]))/(e*Sqrt[d - e*x]*Sqrt[d + e*x]
) + ((I/2)*b*d*n*Sqrt[1 - (e^2*x^2)/d^2]*PolyLog[2, E^((2*I)*ArcSin[(e*x)/d
])])/(e*Sqrt[d - e*x]*Sqrt[d + e*x])
```


Rule 2328

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(Sqrt[(d1_) + (e1_.)*(x_)]*Sqrt[(
d2_) + (e2_.)*(x_)]), x_Symbol] :> Dist[Sqrt[1 + (e1*e2*x^2)/(d1*d2)]/(Sqrt
[d1 + e1*x]*Sqrt[d2 + e2*x]), Int[(a + b*Log[c*x^n])/Sqrt[1 + (e1*e2*x^2)/(
d1*d2)], x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*e1 + d1
*e2, 0]
```

Rule 2326

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symb
ol] :> Simp[(ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]*(a + b*Log[c*x^n]))/Rt[-e, 2], x
] - Dist[(b*n)/Rt[-e, 2], Int[ArcSin[(Rt[-e, 2]*x)/Sqrt[d]]/x, x], x] /; Fr
eeQ[{a, b, c, d, e, n}, x] && GtQ[d, 0] && NegQ[e]
```

Rule 4625

```
Int[((a_.) + ArcSin[(c_.)*(x_)]*(b_.))^(n_.)/(x_), x_Symbol] :> Subst[Int[(
a + b*x)^n/Tan[x], x], x, ArcSin[c*x]] /; FreeQ[{a, b, c}, x] && IGtQ[n, 0]
```

Rule 3717

```
Int[((c_.) + (d_.)*(x_))^(m_.)*tan[(e_.) + Pi*(k_.) + (f_.)*(x_)], x_Symbol
] :> Simp[(I*(c + d*x)^(m + 1))/(d*(m + 1)), x] - Dist[2*I, Int[((c + d*x)^
m*E^(2*I*k*Pi)*E^(2*I*(e + f*x)))/(1 + E^(2*I*k*Pi)*E^(2*I*(e + f*x))), x],
 x] /; FreeQ[{c, d, e, f}, x] && IntegerQ[4*k] && IGtQ[m, 0]
```

Rule 2190

```
Int[(((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)*((c_.) + (d_.)*(x_))^(m_.))/
((a_) + (b_.)*((F_)^((g_.)*((e_.) + (f_.)*(x_))))^(n_.)), x_Symbol] :> Simp
[((c + d*x)^m*Log[1 + (b*(F^(g*(e + f*x)))^n)/a])/(b*f*g*n*Log[F]), x] - Di
st[(d*m)/(b*f*g*n*Log[F]), Int[(c + d*x)^(m - 1)*Log[1 + (b*(F^(g*(e + f*x)
))^n)/a], x], x] /; FreeQ[{F, a, b, c, d, e, f, g, n}, x] && IGtQ[m, 0]
```

Rule 2279

```
Int[Log[(a_) + (b_.)*((F_)^((e_.)*((c_.) + (d_.)*(x_))))^(n_.)], x_Symbol]
:> Dist[1/(d*e*n*Log[F]), Subst[Int[Log[a + b*x]/x, x], x, (F^(e*(c + d*x))
)^n], x] /; FreeQ[{F, a, b, c, d, e, n}, x] && GtQ[a, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{e\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bdn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\sin^{-1}\left(\frac{ex}{d}\right)}{x}\,dx}{e\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{e\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bdn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\int x\cot(x)\,dx, x, \sin^{-1}\left(\frac{ex}{d}\right)\right)}{e\sqrt{d-ex}\sqrt{d+ex}}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)(a+b\log(cx^n))}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{\left(2ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\text{Subst}\left(\right.}{e\sqrt{d-ex}}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} - \frac{bdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\log\left(1-e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\right.}{e\sqrt{d-ex}}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} - \frac{bdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\log\left(1-e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\right.}{e\sqrt{d-ex}}$$

$$= \frac{ibdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)^2}{2e\sqrt{d-ex}\sqrt{d+ex}} - \frac{bdn\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)\log\left(1-e^{2i\sin^{-1}\left(\frac{ex}{d}\right)}\right)}{e\sqrt{d-ex}\sqrt{d+ex}} + \frac{d\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\right.}{e\sqrt{d-ex}}$$

Mathematica [A] time = 0.527691, size = 217, normalized size = 0.88

$$\frac{\tan^{-1}\left(\frac{ex}{\sqrt{d-ex}\sqrt{d+ex}}\right)(a+b\log(cx^n)-bn\log(x))}{e} - \frac{bn\sqrt{1-\frac{e^2x^2}{d^2}}\left(-\text{PolyLog}\left(2, e^{-2\sinh^{-1}\left(x\sqrt{-\frac{e^2}{d^2}}\right)}\right)-2\log(x)\log\left(\sqrt{1-\frac{e^2x^2}{d^2}}\right.\right.}{2\sqrt{-\frac{e^2}{d^2}}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] (ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])]*(a - b*n*Log[x] + b*Log[c*x^n]
))/e - (b*n*Sqrt[1 - (e^2*x^2)/d^2]*(ArcSinh[Sqrt[-(e^2/d^2)]*x]^2 + 2*ArcS
inh[Sqrt[-(e^2/d^2)]*x]*Log[1 - E^(-2*ArcSinh[Sqrt[-(e^2/d^2)]*x])] - 2*Log
[x]*Log[Sqrt[-(e^2/d^2)]*x + Sqrt[1 - (e^2*x^2)/d^2]] - PolyLog[2, E^(-2*Ar
cSinh[Sqrt[-(e^2/d^2)]*x])]))/(2*Sqrt[-(e^2/d^2)]*Sqrt[d - e*x]*Sqrt[d + e*
```

```
x])
```

Maple [F] time = 0.633, size = 0, normalized size = 0.

$$\int (a+b\ln(cx^n))\frac{1}{\sqrt{-ex+d}}\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),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((a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="maxim
a")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(-\frac{\sqrt{ex+d}\sqrt{-ex+d}b\log(cx^n)+\sqrt{ex+d}\sqrt{-ex+d}a}{e^2x^2-d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="frica
s")
```

```
[Out] integral(-(sqrt(e*x + d)*sqrt(-e*x + d)*b*log(c*x^n) + sqrt(e*x + d)*sqrt(-
e*x + d)*a)/(e^2*x^2 - d^2), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a+b\log\left(cx^{n}\right)}{\sqrt{d-ex}\sqrt{d+ex}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(sqrt(d - e*x)*sqrt(d + e*x)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex+d}\sqrt{-ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)), x)
```

3.315 $\int \frac{a+b\log(cx^n)}{x^2\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=142

$$-\frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{ben\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{d\sqrt{d-ex}\sqrt{d+ex}}$$

```
[Out] -((b*n*(d^2 - e^2*x^2))/(d^2*x*Sqrt[d - e*x]*Sqrt[d + e*x])) - (b*e*n*Sqrt[
1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(d*Sqrt[d - e*x]*Sqrt[d + e*x]) - ((d^2
 - e^2*x^2)*(a + b*Log[c*x^n]))/(d^2*x*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rubi [A] time = 0.399996, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.121, Rules used = {2342, 2335, 277, 216}

$$-\frac{\left(d^2-e^2x^2\right)\left(a+b\log\left(cx^n\right)\right)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{ben\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{d\sqrt{d-ex}\sqrt{d+ex}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -((b*n*(d^2 - e^2*x^2))/(d^2*x*Sqrt[d - e*x]*Sqrt[d + e*x])) - (b*e*n*Sqrt[
1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(d*Sqrt[d - e*x]*Sqrt[d + e*x]) - ((d^2
 - e^2*x^2)*(a + b*Log[c*x^n]))/(d^2*x*Sqrt[d - e*x]*Sqrt[d + e*x])
```

Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
```

```
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{x^2\sqrt{d-ex}\sqrt{d+ex}}\,dx &= \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x^2\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}\\
&= -\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}}+\frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\sqrt{1-\frac{e^2x^2}{d^2}}}{x^2}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}\\
&= -\frac{bn\left(d^2-e^2x^2\right)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{\left(be^2n\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{1}{\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{d^2\sqrt{d-ex}\sqrt{d+ex}}\\
&= -\frac{bn\left(d^2-e^2x^2\right)}{d^2x\sqrt{d-ex}\sqrt{d+ex}}-\frac{ben\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{d\sqrt{d-ex}\sqrt{d+ex}}-\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{d^2x\sqrt{d-ex}\sqrt{d+ex}}
\end{aligned}$$

Mathematica [A] time = 0.214314, size = 70, normalized size = 0.49

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}\,(a+b\log(cx^n)+bn)+benx\tan^{-1}\left(\frac{ex}{\sqrt{d-ex}\sqrt{d+ex}}\right)}{d^2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -((b*e*n*x*ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])] + Sqrt[d - e*x]*Sqrt
[d + e*x]*(a + b*n + b*Log[c*x^n]))/(d^2*x))
```

Maple [F] time = 0.657, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^2}\frac{1}{\sqrt{-ex+d}}\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),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((a+b*log(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.43258, size = 182, normalized size = 1.28

$$\frac{2\,benx\arctan\left(\frac{\sqrt{ex+d}\sqrt{-ex+d}-d}{ex}\right)-(bn\log(x)+bn+b\log(c)+a)\sqrt{ex+d}\sqrt{-ex+d}}{d^2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] (2*b*e*n*x*arctan((sqrt(e*x + d)*sqrt(-e*x + d) - d)/(e*x)) - (b*n*log(x) +
 b*n + b*log(c) + a)*sqrt(e*x + d)*sqrt(-e*x + d))/(d^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*ln(c*x**n))/x**2/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\sqrt{ex+d}\sqrt{-ex+d}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x^2), x)
```

3.316 $\int \frac{a+b\log(cx^n)}{x^4\sqrt{d-ex}\sqrt{d+ex}}\,dx$

Optimal. Leaf size=252

$$-\frac{2e^2\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{2be^2n\left(d^2-e^2x^2\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{2be}{3}$$

```
[Out] (-2*b*e^2*n*(d^2 - e^2*x^2))/(3*d^4*x*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*(
d^2 - e^2*x^2)^2)/(9*d^4*x^3*Sqrt[d - e*x]*Sqrt[d + e*x]) - (2*b*e^3*n*Sqrt
[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(3*d^3*Sqrt[d - e*x]*Sqrt[d + e*x]) -
((d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(3*d^2*x^3*Sqrt[d - e*x]*Sqrt[d + e*x]
) - (2*e^2*(d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(3*d^4*x*Sqrt[d - e*x]*Sqrt[
d + e*x])
```

Rubi [A] time = 0.475077, antiderivative size = 252, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 8, integrand size = 33, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.242, Rules used = {2342, 271, 264, 2350, 12, 451, 277, 216}

$$-\frac{2e^2\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{2be^2n\left(d^2-e^2x^2\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}}-\frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}}-\frac{2be}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x^4*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```


```
[Out] (-2*b*e^2*n*(d^2 - e^2*x^2))/(3*d^4*x*Sqrt[d - e*x]*Sqrt[d + e*x]) - (b*n*(
d^2 - e^2*x^2)^2)/(9*d^4*x^3*Sqrt[d - e*x]*Sqrt[d + e*x]) - (2*b*e^3*n*Sqrt
[1 - (e^2*x^2)/d^2]*ArcSin[(e*x)/d])/(3*d^3*Sqrt[d - e*x]*Sqrt[d + e*x]) -
((d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(3*d^2*x^3*Sqrt[d - e*x]*Sqrt[d + e*x]
) - (2*e^2*(d^2 - e^2*x^2)*(a + b*Log[c*x^n]))/(3*d^4*x*Sqrt[d - e*x]*Sqrt[
d + e*x])
```


Rule 2342

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d1_) + (e1_.)*(x_))^
(q_)*((d2_) + (e2_.)*(x_))^(q_), x_Symbol] :> Dist[((d1 + e1*x)^q*(d2 + e2*
x)^q)/(1 + (e1*e2*x^2)/(d1*d2))^q, Int[x^m*(1 + (e1*e2*x^2)/(d1*d2))^q*(a +
 b*Log[c*x^n]), x], x] /; FreeQ[{a, b, c, d1, e1, d2, e2, n}, x] && EqQ[d2*
e1 + d1*e2, 0] && IntegerQ[m] && IntegerQ[q - 1/2]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 451

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[d/e^n, Int[(e*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c
, d, e, m, n, p}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n*(p + 1) + 1, 0] && (
IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (LtQ[n, 0] && Gt
Q[m + n, -1]))
```

Rule 277

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^p)/(c*(m + 1)), x] - Dist[(b*n*p)/(c^n*(m + 1)), In
t[(c*x)^(m + n)*(a + b*x^n)^(p - 1), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[
n, 0] && GtQ[p, 0] && LtQ[m, -1] &&  !ILtQ[(m + n*p + n + 1)/n, 0] && IntBi
nomialQ[a, b, c, n, m, p, x]
```

Rule 216

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSin[(Rt[-b, 2]*x)/Sqr
t[a]]/Rt[-b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && NegQ[b]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^4\sqrt{d-ex}\sqrt{d+ex}}\,dx = \frac{\sqrt{1-\frac{e^2x^2}{d^2}}\int \frac{a+b\log(cx^n)}{x^4\sqrt{1-\frac{e^2x^2}{d^2}}}\,dx}{\sqrt{d-ex}\sqrt{d+ex}}$$

$$= -\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2e^2\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\left(-d^2-2e^2\right.}{3}}{\sqrt{d-ex}\sqrt{d+}}$$

$$= -\frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2e^2\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(bn\sqrt{1-\frac{e^2x^2}{d^2}}\right)\int \frac{\left(-d^2-2e^2\right.}{}}{3d^2\sqrt{d-ex}\sqrt{d-}}$$

$$= -\frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2e^2\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} +$$

$$= -\frac{2be^2n\left(d^2-e^2x^2\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)(a+b\log(cx^n))}{3d^2x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2e^2\left(d^2-e\right.}{3d^4x}$$

$$= -\frac{2be^2n\left(d^2-e^2x^2\right)}{3d^4x\sqrt{d-ex}\sqrt{d+ex}} - \frac{bn\left(d^2-e^2x^2\right)^2}{9d^4x^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{2be^3n\sqrt{1-\frac{e^2x^2}{d^2}}\sin^{-1}\left(\frac{ex}{d}\right)}{3d^3\sqrt{d-ex}\sqrt{d+ex}} - \frac{\left(d^2-e^2x^2\right)(}{3d^2x^3\sqrt{d}}$$

Mathematica [A] time = 0.295317, size = 116, normalized size = 0.46

$$-\frac{\sqrt{d-ex}\sqrt{d+ex}\left(3a\left(d^2+2e^2x^2\right)+3b\left(d^2+2e^2x^2\right)\log(cx^n)+bn\left(d^2+5e^2x^2\right)\right)+6be^3nx^3\tan^{-1}\left(\frac{ex}{\sqrt{d-ex}\sqrt{d+ex}}\right)}{9d^4x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^4*Sqrt[d - e*x]*Sqrt[d + e*x]),x]
```

```
[Out] -(6*b*e^3*n*x^3*ArcTan[(e*x)/(Sqrt[d - e*x]*Sqrt[d + e*x])] + Sqrt[d - e*x]
*Sqrt[d + e*x]*(3*a*(d^2 + 2*e^2*x^2) + b*n*(d^2 + 5*e^2*x^2) + 3*b*(d^2 +
2*e^2*x^2)*Log[c*x^n]))/(9*d^4*x^3)
```

Maple [F] time = 0.67, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{x^{4}}\frac{1}{\sqrt{-ex+d}}\frac{1}{\sqrt{ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),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((a+b*log(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="m
axima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.51681, size = 311, normalized size = 1.23

$$\frac{12\,be^{3}nx^{3}\arctan\left(\frac{\sqrt{ex+d}\sqrt{-ex+d}-d}{ex}\right)-\left(bd^{2}n+3\,ad^{2}+\left(5\,be^{2}n+6\,ae^{2}\right)x^{2}+3\left(2\,be^{2}x^{2}+bd^{2}\right)\log\left(c\right)+3\left(2\,be^{2}nx^{2}+bd^{2}n\right)\log\left(x\right)\cdots}{9\,d^{4}x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="f
ricas")
```

```
[Out] 1/9*(12*b*e^3*n*x^3*arctan((sqrt(e*x + d)*sqrt(-e*x + d) - d)/(e*x)) - (b*d
^2*n + 3*a*d^2 + (5*b*e^2*n + 6*a*e^2)*x^2 + 3*(2*b*e^2*x^2 + b*d^2)*log(c)
 + 3*(2*b*e^2*n*x^2 + b*d^2*n)*log(x))*sqrt(e*x + d)*sqrt(-e*x + d))/(d^4*x
^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**4/(-e*x+d)**(1/2)/(e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right)+a}{\sqrt{ex+d}\sqrt{-ex+d}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^4/(-e*x+d)^(1/2)/(e*x+d)^(1/2),x, algorithm="g
iac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x + d)*sqrt(-e*x + d)*x^4), x)
```

3.317 $\int \frac{x\log(x)}{\sqrt{-1+x^2}}\,dx$

Optimal. Leaf size=34

$$-\sqrt{x^2-1}+\sqrt{x^2-1}\log(x)+\tan^{-1}\left(\sqrt{x^2-1}\right)$$

```
[Out] -Sqrt[-1 + x^2] + ArcTan[Sqrt[-1 + x^2]] + Sqrt[-1 + x^2]*Log[x]
```

Rubi [A] time = 0.0397769, antiderivative size = 34, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {2338, 266, 50, 63, 203}

$$-\sqrt{x^2-1}+\sqrt{x^2-1}\log(x)+\tan^{-1}\left(\sqrt{x^2-1}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(x*Log[x])/Sqrt[-1 + x^2],x]
```

```
[Out] -Sqrt[-1 + x^2] + ArcTan[Sqrt[-1 + x^2]] + Sqrt[-1 + x^2]*Log[x]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
```

```
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x\log(x)}{\sqrt{-1+x^2}}\,dx &= \sqrt{-1+x^2}\log(x) - \int \frac{\sqrt{-1+x^2}}{x}\,dx\\
&= \sqrt{-1+x^2}\log(x) - \frac{1}{2}\operatorname{Subst}\left(\int \frac{\sqrt{-1+x}}{x}\,dx, x, x^2\right)\\
&= -\sqrt{-1+x^2} + \sqrt{-1+x^2}\log(x) + \frac{1}{2}\operatorname{Subst}\left(\int \frac{1}{\sqrt{-1+x}x}\,dx, x, x^2\right)\\
&= -\sqrt{-1+x^2} + \sqrt{-1+x^2}\log(x) + \operatorname{Subst}\left(\int \frac{1}{1+x^2}\,dx, x, \sqrt{-1+x^2}\right)\\
&= -\sqrt{-1+x^2} + \tan^{-1}\left(\sqrt{-1+x^2}\right) + \sqrt{-1+x^2}\log(x)
\end{aligned}$$

Mathematica [A] time = 0.0219083, size = 27, normalized size = 0.79

$$\sqrt{x^2-1}(\log(x)-1) - \tan^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*Log[x])/Sqrt[-1 + x^2],x]
```

```
[Out] -ArcTan[1/Sqrt[-1 + x^2]] + Sqrt[-1 + x^2]*(-1 + Log[x])
```

Maple [C] time = 0.264, size = 119, normalized size = 3.5

$$-\frac{1}{4}\sqrt{-\mathrm{signum}\left(x^2-1\right)}\left(2-2\sqrt{-x^2+1}\right)\frac{1}{\sqrt{\mathrm{signum}\left(x^2-1\right)}}+\frac{\ln\left(x\right)}{2}\sqrt{-\mathrm{signum}\left(x^2-1\right)}\left(2-2\sqrt{-x^2+1}\right)\frac{1}{\sqrt{\mathrm{signum}\left(x\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*ln(x)/(x^2-1)^(1/2),x)
```

```
[Out] -1/4/signum(x^2-1)^(1/2)*(-signum(x^2-1))^(1/2)*(2-2*(-x^2+1)^(1/2))+1/2/si
gnum(x^2-1)^(1/2)*(-signum(x^2-1))^(1/2)*ln(x)*(2-2*(-x^2+1)^(1/2))+1/32/si
gnum(x^2-1)^(1/2)*(-signum(x^2-1))^(1/2)*(-16+16*(-x^2+1)^(1/2)-32*ln(1/2+1
/2*(-x^2+1)^(1/2)))
```

Maxima [A] time = 1.81258, size = 36, normalized size = 1.06

$$\sqrt{x^2-1}\log\left(x\right)-\sqrt{x^2-1}-\arcsin\left(\frac{1}{|x|}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)/(x^2-1)^(1/2),x, algorithm="maxima")
```

```
[Out] sqrt(x^2 - 1)*log(x) - sqrt(x^2 - 1) - arcsin(1/abs(x))
```

Fricas [A] time = 1.33486, size = 80, normalized size = 2.35

$$\sqrt{x^2-1}(\log\left(x\right)-1)+2\arctan\left(-x+\sqrt{x^2-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)/(x^2-1)^(1/2),x, algorithm="fricas")
```

```
[Out] sqrt(x^2 - 1)*(log(x) - 1) + 2*arctan(-x + sqrt(x^2 - 1))
```

Sympy [A] time = 3.35487, size = 29, normalized size = 0.85

$$\sqrt{x^2-1}\log(x) - \begin{cases} \sqrt{x^2-1} - \operatorname{acos}\left(\frac{1}{x}\right) & \text{for}\ x > -1 \wedge x < 1 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*ln(x)/(x**2-1)**(1/2),x)
```

```
[Out] sqrt(x**2 - 1)*log(x) - Piecewise((sqrt(x**2 - 1) - acos(1/x), (x > -1) & (
x < 1)))
```

Giac [A] time = 1.27774, size = 38, normalized size = 1.12

$$\sqrt{x^2-1}\log(x) - \sqrt{x^2-1} + \arctan\left(\sqrt{x^2-1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*log(x)/(x^2-1)^(1/2),x, algorithm="giac")
```

```
[Out] sqrt(x^2 - 1)*log(x) - sqrt(x^2 - 1) + arctan(sqrt(x^2 - 1))
```

3.318 $\int (fx)^m \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=211

$$\frac{3d^2e(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3de^2(fx)^{m+5}(a+b\log(cx^n))}{f^5(m+5)}+\frac{e^3(fx)^{m+7}(a+b\log(cx^n))}{f^7(m+7)}$$

```
[Out] -((b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (3*b*d^2*e*n*(f*x)^(3 + m))/(f^3
*(3 + m)^2) - (3*b*d*e^2*n*(f*x)^(5 + m))/(f^5*(5 + m)^2) - (b*e^3*n*(f*x)^
(7 + m))/(f^7*(7 + m)^2) + (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m
)) + (3*d^2*e*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m)) + (3*d*e^2*(f
*x)^(5 + m)*(a + b*Log[c*x^n]))/(f^5*(5 + m)) + (e^3*(f*x)^(7 + m)*(a + b*L
og[c*x^n]))/(f^7*(7 + m))
```

Rubi [A] time = 1.6841, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12, Rules used = {270, 2350, 14}

$$\frac{3d^2e(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3de^2(fx)^{m+5}(a+b\log(cx^n))}{f^5(m+5)}+\frac{e^3(fx)^{m+7}(a+b\log(cx^n))}{f^7(m+7)}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```


```
[Out] -((b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (3*b*d^2*e*n*(f*x)^(3 + m))/(f^3
*(3 + m)^2) - (3*b*d*e^2*n*(f*x)^(5 + m))/(f^5*(5 + m)^2) - (b*e^3*n*(f*x)^
(7 + m))/(f^7*(7 + m)^2) + (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m
)) + (3*d^2*e*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f^3*(3 + m)) + (3*d*e^2*(f
*x)^(5 + m)*(a + b*Log[c*x^n]))/(f^5*(5 + m)) + (e^3*(f*x)^(7 + m)*(a + b*L
og[c*x^n]))/(f^7*(7 + m))
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
```

```
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^3 (a+b\log(cx^n))\,dx = \frac{d^3(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{3d^2e(fx)^{3+m}(a+b\log(cx^n))}{f^3(3+m)} + \frac{3de^2(fx)^{5+m}(a}{f^5(5}$$
$$= \frac{d^3(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{3d^2e(fx)^{3+m}(a+b\log(cx^n))}{f^3(3+m)} + \frac{3de^2(fx)^{5+m}(a}{f^5(5}$$
$$= -\frac{bd^3n(fx)^{1+m}}{f(1+m)^2} - \frac{3bd^2en(fx)^{3+m}}{f^3(3+m)^2} - \frac{3bde^2n(fx)^{5+m}}{f^5(5+m)^2} - \frac{be^3n(fx)^{7+m}}{f^7(7+m)^2} + \frac{d^3(fx)^{1}}{}$$

Mathematica [A] time = 0.227638, size = 156, normalized size = 0.74

$$x(fx)^m\left(\frac{3d^2ex^2(a+b\log(cx^n))}{m+3} + \frac{d^3(a+b\log(cx^n))}{m+1} + \frac{3de^2x^4(a+b\log(cx^n))}{m+5} + \frac{e^3x^6(a+b\log(cx^n))}{m+7} - \frac{3bd^2enx^2}{(m+3)^2} - \right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^3*n)/(1 + m)^2) - (3*b*d^2*e*n*x^2)/(3 + m)^2 - (3*b*d*e^
2*n*x^4)/(5 + m)^2 - (b*e^3*n*x^6)/(7 + m)^2 + (d^3*(a + b*Log[c*x^n]))/(1
+ m) + (3*d^2*e*x^2*(a + b*Log[c*x^n]))/(3 + m) + (3*d*e^2*x^4*(a + b*Log[c
*x^n]))/(5 + m) + (e^3*x^6*(a + b*Log[c*x^n]))/(7 + m))
```

Maple [C] time = 0.423, size = 5139, normalized size = 24.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^3*(a+b*ln(c*x^n)),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((f*x)^m*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.44943, size = 3047, normalized size = 14.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^3*m^7 + 25*a*e^3*m^6 + 253*a*e^3*m^5 + 1333*a*e^3*m^4 + 3907*a*e^3*m^
3 + 6283*a*e^3*m^2 + 5055*a*e^3*m + 1575*a*e^3 - (b*e^3*m^6 + 18*b*e^3*m^5
+ 127*b*e^3*m^4 + 444*b*e^3*m^3 + 799*b*e^3*m^2 + 690*b*e^3*m + 225*b*e^3)*
n)*x^7 + 3*(a*d*e^2*m^7 + 27*a*d*e^2*m^6 + 293*a*d*e^2*m^5 + 1639*a*d*e^2*m
^4 + 5043*a*d*e^2*m^3 + 8417*a*d*e^2*m^2 + 6951*a*d*e^2*m + 2205*a*d*e^2 -
(b*d*e^2*m^6 + 22*b*d*e^2*m^5 + 183*b*d*e^2*m^4 + 724*b*d*e^2*m^3 + 1423*b*
d*e^2*m^2 + 1302*b*d*e^2*m + 441*b*d*e^2)*n)*x^5 + 3*(a*d^2*e*m^7 + 29*a*d^
2*e*m^6 + 341*a*d^2*e*m^5 + 2081*a*d^2*e*m^4 + 6995*a*d^2*e*m^3 + 12647*a*d
^2*e*m^2 + 11095*a*d^2*e*m + 3675*a*d^2*e - (b*d^2*e*m^6 + 26*b*d^2*e*m^5 +
 263*b*d^2*e*m^4 + 1292*b*d^2*e*m^3 + 3119*b*d^2*e*m^2 + 3290*b*d^2*e*m + 1
225*b*d^2*e)*n)*x^3 + (a*d^3*m^7 + 31*a*d^3*m^6 + 397*a*d^3*m^5 + 2707*a*d^
3*m^4 + 10531*a*d^3*m^3 + 23101*a*d^3*m^2 + 25935*a*d^3*m + 11025*a*d^3 - (
b*d^3*m^6 + 30*b*d^3*m^5 + 367*b*d^3*m^4 + 2340*b*d^3*m^3 + 8191*b*d^3*m^2
+ 14910*b*d^3*m + 11025*b*d^3)*n)*x + ((b*e^3*m^7 + 25*b*e^3*m^6 + 253*b*e^
3*m^5 + 1333*b*e^3*m^4 + 3907*b*e^3*m^3 + 6283*b*e^3*m^2 + 5055*b*e^3*m + 1
575*b*e^3)*x^7 + 3*(b*d*e^2*m^7 + 27*b*d*e^2*m^6 + 293*b*d*e^2*m^5 + 1639*b
*d*e^2*m^4 + 5043*b*d*e^2*m^3 + 8417*b*d*e^2*m^2 + 6951*b*d*e^2*m + 2205*b*
```

```
d*e^2)*x^5 + 3*(b*d^2*e*m^7 + 29*b*d^2*e*m^6 + 341*b*d^2*e*m^5 + 2081*b*d^2
*e*m^4 + 6995*b*d^2*e*m^3 + 12647*b*d^2*e*m^2 + 11095*b*d^2*e*m + 3675*b*d^
2*e)*x^3 + (b*d^3*m^7 + 31*b*d^3*m^6 + 397*b*d^3*m^5 + 2707*b*d^3*m^4 + 105
31*b*d^3*m^3 + 23101*b*d^3*m^2 + 25935*b*d^3*m + 11025*b*d^3)*x)*log(c) + (
(b*e^3*m^7 + 25*b*e^3*m^6 + 253*b*e^3*m^5 + 1333*b*e^3*m^4 + 3907*b*e^3*m^3
 + 6283*b*e^3*m^2 + 5055*b*e^3*m + 1575*b*e^3)*n*x^7 + 3*(b*d*e^2*m^7 + 27*
b*d*e^2*m^6 + 293*b*d*e^2*m^5 + 1639*b*d*e^2*m^4 + 5043*b*d*e^2*m^3 + 8417*
b*d*e^2*m^2 + 6951*b*d*e^2*m + 2205*b*d*e^2)*n*x^5 + 3*(b*d^2*e*m^7 + 29*b*
d^2*e*m^6 + 341*b*d^2*e*m^5 + 2081*b*d^2*e*m^4 + 6995*b*d^2*e*m^3 + 12647*b
*d^2*e*m^2 + 11095*b*d^2*e*m + 3675*b*d^2*e)*n*x^3 + (b*d^3*m^7 + 31*b*d^3*
m^6 + 397*b*d^3*m^5 + 2707*b*d^3*m^4 + 10531*b*d^3*m^3 + 23101*b*d^3*m^2 +
25935*b*d^3*m + 11025*b*d^3)*n*x)*log(x))*e^(m*log(f) + m*log(x))/(m^8 + 32
*m^7 + 428*m^6 + 3104*m^5 + 13238*m^4 + 33632*m^3 + 49036*m^2 + 36960*m + 1
1025)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(e*x**2+d)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.33161, size = 747, normalized size = 3.54

$$\frac{bf^6f^mx^7x^me^3\log(c)}{f^6m+7f^6}+\frac{af^6f^mx^7x^me^3}{f^6m+7f^6}+\frac{3\,bdf^4f^mx^5x^me^2\log(c)}{f^4m+5f^4}+\frac{3\,adf^4f^mx^5x^me^2}{f^4m+5f^4}+\frac{bf^mmnx^7x^me^3\log(x)}{m^2+14\,m+49}+\frac{7\,bf^mn}{m^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^6*f^m*x^7*x^m*e^3*log(c)/(f^6*m + 7*f^6) + a*f^6*f^m*x^7*x^m*e^3/(f^6*m
 + 7*f^6) + 3*b*d*f^4*f^m*x^5*x^m*e^2*log(c)/(f^4*m + 5*f^4) + 3*a*d*f^4*f^
m*x^5*x^m*e^2/(f^4*m + 5*f^4) + b*f^m*m*n*x^7*x^m*e^3*log(x)/(m^2 + 14*m +
49) + 7*b*f^m*n*x^7*x^m*e^3*log(x)/(m^2 + 14*m + 49) + 3*b*d*f^m*m*n*x^5*x^
m*e^2*log(x)/(m^2 + 10*m + 25) - b*f^m*n*x^7*x^m*e^3/(m^2 + 14*m + 49) + 3*
```

```
b*d^2*f^2*f^m*x^3*x^m*e*log(c)/(f^2*m + 3*f^2) + 15*b*d*f^m*n*x^5*x^m*e^2*l
og(x)/(m^2 + 10*m + 25) + 3*b*d^2*f^m*m*n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9)
- 3*b*d*f^m*n*x^5*x^m*e^2/(m^2 + 10*m + 25) + 3*a*d^2*f^2*f^m*x^3*x^m*e/(f^
2*m + 3*f^2) + 9*b*d^2*f^m*n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9) - 3*b*d^2*f^m
*n*x^3*x^m*e/(m^2 + 6*m + 9) + b*d^3*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) +
 b*d^3*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) - b*d^3*f^m*n*x*x^m/(m^2 + 2*m +
1) + (f*x)^m*b*d^3*x*log(c)/(m + 1) + (f*x)^m*a*d^3*x/(m + 1)
```

3.319 $\int (fx)^m \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=153

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2de(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{e^2(fx)^{m+5}(a+b\log(cx^n))}{f^5(m+5)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden(fx)^{m+}}{f^3(m+3)^2}$$

```
[Out] -((b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (2*b*d*e*n*(f*x)^(3 + m))/(f^3*(
3 + m)^2) - (b*e^2*n*(f*x)^(5 + m))/(f^5*(5 + m)^2) + (d^2*(f*x)^(1 + m)*(a
 + b*Log[c*x^n]))/(f*(1 + m)) + (2*d*e*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f
^3*(3 + m)) + (e^2*(f*x)^(5 + m)*(a + b*Log[c*x^n]))/(f^5*(5 + m))
```

Rubi [A] time = 0.179994, antiderivative size = 153, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {270, 2350, 12, 14}

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2de(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}+\frac{e^2(fx)^{m+5}(a+b\log(cx^n))}{f^5(m+5)}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bden(fx)^{m+}}{f^3(m+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```


```
[Out] -((b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (2*b*d*e*n*(f*x)^(3 + m))/(f^3*(
3 + m)^2) - (b*e^2*n*(f*x)^(5 + m))/(f^5*(5 + m)^2) + (d^2*(f*x)^(1 + m)*(a
 + b*Log[c*x^n]))/(f*(1 + m)) + (2*d*e*(f*x)^(3 + m)*(a + b*Log[c*x^n]))/(f
^3*(3 + m)) + (e^2*(f*x)^(5 + m)*(a + b*Log[c*x^n]))/(f^5*(5 + m))
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
```

```
IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)^2 (a+b\log(cx^n))\,dx = \frac{d^2(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{2de(fx)^{3+m}(a+b\log(cx^n))}{f^3(3+m)} + \frac{e^2(fx)^{5+m}(a+b\,\mathrm{l}}{f^5(5+m)}$$

$$= \frac{d^2(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{2de(fx)^{3+m}(a+b\log(cx^n))}{f^3(3+m)} + \frac{e^2(fx)^{5+m}(a+b\,\mathrm{l}}{f^5(5+m)}$$

$$= \frac{d^2(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} + \frac{2de(fx)^{3+m}(a+b\log(cx^n))}{f^3(3+m)} + \frac{e^2(fx)^{5+m}(a+b\,\mathrm{l}}{f^5(5+m)}$$

$$= -\frac{bd^2n(fx)^{1+m}}{f(1+m)^2} - \frac{2bden(fx)^{3+m}}{f^3(3+m)^2} - \frac{be^2n(fx)^{5+m}}{f^5(5+m)^2} + \frac{d^2(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)} +$$

Mathematica [A] time = 0.134363, size = 112, normalized size = 0.73

$$x(fx)^m\left(\frac{d^2(a+b\log(cx^n))}{m+1}+\frac{2dex^2(a+b\log(cx^n))}{m+3}+\frac{e^2x^4(a+b\log(cx^n))}{m+5}-\frac{bd^2n}{(m+1)^2}-\frac{2bdenx^2}{(m+3)^2}-\frac{be^2nx^4}{(m+5)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^2*n)/(1 + m)^2) - (2*b*d*e*n*x^2)/(3 + m)^2 - (b*e^2*n*x^
4)/(5 + m)^2 + (d^2*(a + b*Log[c*x^n]))/(1 + m) + (2*d*e*x^2*(a + b*Log[c*x
^n]))/(3 + m) + (e^2*x^4*(a + b*Log[c*x^n]))/(5 + m))
```

Maple [C] time = 0.289, size = 2790, normalized size = 18.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] b*x*(e^2*m^2*x^4+4*e^2*m*x^4+2*d*e*m^2*x^2+3*e^2*x^4+12*d*e*m*x^2+d^2*m^2+1
0*d*e*x^2+8*d^2*m+15*d^2)/(1+m)/(3+m)/(5+m)*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+
I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*
csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))*ln(x^n)+1/2*x*(450*ln(c)*b*d^2+90*ln(
c)*b*e^2*x^4+17*I*Pi*b*d^2*m^4*csgn(I*c*x^n)^2*csgn(I*c)+465*I*Pi*b*d^2*m*c
sgn(I*x^n)*csgn(I*c*x^n)^2+465*I*Pi*b*d^2*m*csgn(I*c*x^n)^2*csgn(I*c)+450*a
*d^2+2*ln(c)*b*e^2*m^5*x^4+124*ln(c)*b*e^2*m^3*x^4+268*ln(c)*b*e^2*m^2*x^4+
258*ln(c)*b*e^2*m*x^4+26*ln(c)*b*e^2*m^4*x^4+300*a*d*e*x^2-I*Pi*b*d^2*m^5*c
sgn(I*c*x^n)^3-2*b*e^2*m^4*n*x^4+4*a*d*e*m^5*x^2+26*a*e^2*m^4*x^4-2*b*d^2*m
^4*n+334*I*Pi*b*d^2*m^2*csgn(I*c*x^n)^2*csgn(I*c)+17*I*Pi*b*d^2*m^4*csgn(I*
x^n)*csgn(I*c*x^n)^2+110*I*Pi*b*d^2*m^3*csgn(I*c*x^n)^2*csgn(I*c)+334*I*Pi*
b*d^2*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2+300*ln(c)*b*d*e*x^2-188*b*d^2*m^2*n-4
80*b*d^2*m*n-32*b*d^2*m^3*n-450*b*d^2*n+2*ln(c)*b*d^2*m^5+34*ln(c)*b*d^2*m^
4+220*ln(c)*b*d^2*m^3+668*ln(c)*b*d^2*m^2+930*ln(c)*b*d^2*m+2*a*e^2*m^5*x^4
+124*a*e^2*m^3*x^4+268*a*e^2*m^2*x^4+258*a*e^2*m*x^4+328*a*d*e*m^3*x^2+792*
a*d*e*m^2*x^2+820*a*d*e*m*x^2+90*a*e^2*x^4-16*b*e^2*m^3*n*x^4+60*a*d*e*m^4*
x^2+328*ln(c)*b*d*e*m^3*x^2+792*ln(c)*b*d*e*m^2*x^2+820*ln(c)*b*d*e*m*x^2+6
0*ln(c)*b*d*e*m^4*x^2+4*ln(c)*b*d*e*m^5*x^2+34*a*d^2*m^4-2*I*Pi*b*d*e*m^5*x
^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-30*I*Pi*b*d*e*m^4*x^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+150*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+150*I*
Pi*b*d*e*x^2*csgn(I*c*x^n)^2*csgn(I*c)-150*I*Pi*b*d*e*x^2*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)-225*I*Pi*b*d^2*csgn(I*c*x^n)^3+45*I*Pi*b*e^2*x^4*csgn(I*
x^n)*csgn(I*c*x^n)^2-62*I*Pi*b*e^2*m^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)-134*I*Pi*b*e^2*m^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e^2*m
^5*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+220*a*d^2*m^3+668*a*d^2*m^2+930*
a*d^2*m-48*b*d*e*m^3*n*x^2-184*b*d*e*m^2*n*x^2-240*b*d*e*m*n*x^2-44*b*e^2*m
^2*n*x^4-48*b*e^2*m*n*x^4+396*I*Pi*b*d*e*m^2*x^2*csgn(I*c*x^n)^2*csgn(I*c)+
410*I*Pi*b*d*e*m*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-410*I*Pi*b*d*e*m*x^2*csgn(
I*c*x^n)^3-334*I*Pi*b*d^2*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+129*I*Pi*
b*e^2*m*x^4*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e^2*m^5*x^4*csgn(I*c*x^n)^2*cs
gn(I*c)-17*I*Pi*b*d^2*m^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+134*I*Pi*b*e^
2*m^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)-465*I*Pi*b*d^2*m*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+13*I*Pi*b*e^2*m^4*x^4*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d*e*
m^5*x^2*csgn(I*c*x^n)^3-30*I*Pi*b*d*e*m^4*x^2*csgn(I*c*x^n)^3+I*Pi*b*e^2*m^
5*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+62*I*Pi*b*e^2*m^3*x^4*csgn(I*c*x^n)^2*csg
n(I*c)+134*I*Pi*b*e^2*m^2*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+13*I*Pi*b*e^2*m^4
```

```
*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2+129*I*Pi*b*e^2*m*x^4*csgn(I*x^n)*csgn(I*c*
x^n)^2+62*I*Pi*b*e^2*m^3*x^4*csgn(I*x^n)*csgn(I*c*x^n)^2-45*I*Pi*b*e^2*x^4*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-110*I*Pi*b*d^2*m^3*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)-164*I*Pi*b*d*e*m^3*x^2*csgn(I*c*x^n)^3-I*Pi*b*d^2*m^5*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)-396*I*Pi*b*d*e*m^2*x^2*csgn(I*c*x^n)^3+30*I*
Pi*b*d*e*m^4*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+30*I*Pi*b*d*e*m^4*x^2*csgn(I*c
*x^n)^2*csgn(I*c)+164*I*Pi*b*d*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi
*b*d*e*m^5*x^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d*e*m^5*x^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2-13*I*Pi*b*e^2*m^4*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-62
*I*Pi*b*e^2*m^3*x^4*csgn(I*c*x^n)^3-134*I*Pi*b*e^2*m^2*x^4*csgn(I*c*x^n)^3-
129*I*Pi*b*e^2*m*x^4*csgn(I*c*x^n)^3-I*Pi*b*e^2*m^5*x^4*csgn(I*c*x^n)^3+2*a
*d^2*m^5-13*I*Pi*b*e^2*m^4*x^4*csgn(I*c*x^n)^3-100*b*d*e*n*x^2-150*I*Pi*b*d
*e*x^2*csgn(I*c*x^n)^3-45*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^3-110*I*Pi*b*d^2*m^3
*csgn(I*c*x^n)^3-164*I*Pi*b*d*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
-396*I*Pi*b*d*e*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-334*I*Pi*b*d^2*
m^2*csgn(I*c*x^n)^3-465*I*Pi*b*d^2*m*csgn(I*c*x^n)^3+225*I*Pi*b*d^2*csgn(I*
x^n)*csgn(I*c*x^n)^2+225*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-17*I*Pi*b*d^2
*m^4*csgn(I*c*x^n)^3+I*Pi*b*d^2*m^5*csgn(I*c*x^n)^2*csgn(I*c)-4*b*d*e*m^4*n
*x^2+I*Pi*b*d^2*m^5*csgn(I*x^n)*csgn(I*c*x^n)^2+164*I*Pi*b*d*e*m^3*x^2*csgn
(I*c*x^n)^2*csgn(I*c)-129*I*Pi*b*e^2*m*x^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+396*I*Pi*b*d*e*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-410*I*Pi*b*d*e*m*x^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+410*I*Pi*b*d*e*m*x^2*csgn(I*c*x^n)^2*c
sgn(I*c)-18*b*e^2*n*x^4+45*I*Pi*b*e^2*x^4*csgn(I*c*x^n)^2*csgn(I*c)+110*I*P
i*b*d^2*m^3*csgn(I*x^n)*csgn(I*c*x^n)^2-225*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c))/(5+m)^2/(1+m)^2/(3+m)^2*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+I*P
i*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csg
n(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^m*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.37806, size = 1519, normalized size = 9.93

$$\frac{\left(\left(ae^2m^5+13\,ae^2m^4+62\,ae^2m^3+134\,ae^2m^2+129\,ae^2m+45\,ae^2-\left(be^2m^4+8\,be^2m^3+22\,be^2m^2+24\,be^2m+9\,be^2\right)n\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e^2*m^5 + 13*a*e^2*m^4 + 62*a*e^2*m^3 + 134*a*e^2*m^2 + 129*a*e^2*m + 4
5*a*e^2 - (b*e^2*m^4 + 8*b*e^2*m^3 + 22*b*e^2*m^2 + 24*b*e^2*m + 9*b*e^2)*n
)*x^5 + 2*(a*d*e*m^5 + 15*a*d*e*m^4 + 82*a*d*e*m^3 + 198*a*d*e*m^2 + 205*a*
d*e*m + 75*a*d*e - (b*d*e*m^4 + 12*b*d*e*m^3 + 46*b*d*e*m^2 + 60*b*d*e*m +
25*b*d*e)*n)*x^3 + (a*d^2*m^5 + 17*a*d^2*m^4 + 110*a*d^2*m^3 + 334*a*d^2*m^
2 + 465*a*d^2*m + 225*a*d^2 - (b*d^2*m^4 + 16*b*d^2*m^3 + 94*b*d^2*m^2 + 24
0*b*d^2*m + 225*b*d^2)*n)*x + ((b*e^2*m^5 + 13*b*e^2*m^4 + 62*b*e^2*m^3 + 1
34*b*e^2*m^2 + 129*b*e^2*m + 45*b*e^2)*x^5 + 2*(b*d*e*m^5 + 15*b*d*e*m^4 +
82*b*d*e*m^3 + 198*b*d*e*m^2 + 205*b*d*e*m + 75*b*d*e)*x^3 + (b*d^2*m^5 + 1
7*b*d^2*m^4 + 110*b*d^2*m^3 + 334*b*d^2*m^2 + 465*b*d^2*m + 225*b*d^2)*x)*l
og(c) + ((b*e^2*m^5 + 13*b*e^2*m^4 + 62*b*e^2*m^3 + 134*b*e^2*m^2 + 129*b*e
^2*m + 45*b*e^2)*n*x^5 + 2*(b*d*e*m^5 + 15*b*d*e*m^4 + 82*b*d*e*m^3 + 198*b
*d*e*m^2 + 205*b*d*e*m + 75*b*d*e)*n*x^3 + (b*d^2*m^5 + 17*b*d^2*m^4 + 110*
b*d^2*m^3 + 334*b*d^2*m^2 + 465*b*d^2*m + 225*b*d^2)*n*x)*log(x))*e^(m*log(
f) + m*log(x))/(m^6 + 18*m^5 + 127*m^4 + 444*m^3 + 799*m^2 + 690*m + 225)
```

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((f*x)**m*(e*x**2+d)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.43107, size = 535, normalized size = 3.5

$$\frac{bf^4f^mx^5x^me^2\log(c)}{f^4m+5\,f^4}+\frac{af^4f^mx^5x^me^2}{f^4m+5\,f^4}+\frac{bf^m mnx^5x^me^2\log(x)}{m^2+10\,m+25}+\frac{2\,bdf^2f^mx^3x^me\log(c)}{f^2m+3\,f^2}+\frac{5\,bf^mnx^5x^me^2\log(x)}{m^2+10\,m+25}+\frac{2\,bc}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^4*f^m*x^5*x^m*e^2*log(c)/(f^4*m + 5*f^4) + a*f^4*f^m*x^5*x^m*e^2/(f^4*m
 + 5*f^4) + b*f^m*m*n*x^5*x^m*e^2*log(x)/(m^2 + 10*m + 25) + 2*b*d*f^2*f^m*
x^3*x^m*e*log(c)/(f^2*m + 3*f^2) + 5*b*f^m*n*x^5*x^m*e^2*log(x)/(m^2 + 10*m
 + 25) + 2*b*d*f^m*m*n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9) - b*f^m*n*x^5*x^m*e
^2/(m^2 + 10*m + 25) + 2*a*d*f^2*f^m*x^3*x^m*e/(f^2*m + 3*f^2) + 6*b*d*f^m*
n*x^3*x^m*e*log(x)/(m^2 + 6*m + 9) - 2*b*d*f^m*n*x^3*x^m*e/(m^2 + 6*m + 9)
+ b*d^2*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*d^2*f^m*n*x*x^m*log(x)/(m^
2 + 2*m + 1) - b*d^2*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*d^2*x*log(c)/(
m + 1) + (f*x)^m*a*d^2*x/(m + 1)
```

3.320 $\int (fx)^m \left(d+ex^2\right)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=95

$$\frac{d(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{e(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+3}}{f^3(m+3)^2}$$

```
[Out] -((b*d*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (b*e*n*(f*x)^(3 + m))/(f^3*(3 + m)
^2) + (d*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m)) + (e*(f*x)^(3 + m)*(
a + b*Log[c*x^n]))/(f^3*(3 + m))
```

Rubi [A] time = 0.085458, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {14, 2350}

$$\frac{d(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{e(fx)^{m+3}(a+b\log(cx^n))}{f^3(m+3)}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{ben(fx)^{m+3}}{f^3(m+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d*n*(f*x)^(1 + m))/(f*(1 + m)^2)) - (b*e*n*(f*x)^(3 + m))/(f^3*(3 + m)
^2) + (d*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m)) + (e*(f*x)^(3 + m)*(
a + b*Log[c*x^n]))/(f^3*(3 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\int (fx)^m \left(d+ex^2\right)(a+b\log(cx^n))\,dx = \frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\log(cx^n))}{f^3(3+m)}-(bn)\int (fx)^m\left(\frac{d}{1+m}+\right.$$

$$=\frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\log(cx^n))}{f^3(3+m)}-(bn)\int\left(\frac{d(fx)^m}{1+m}+\frac{e(f}{f^2(}\right.$$

$$=-\frac{bdn(fx)^{1+m}}{f(1+m)^2}-\frac{ben(fx)^{3+m}}{f^3(3+m)^2}+\frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}+\frac{e(fx)^{3+m}(a+b\log}{f^3(3+m)}$$

Mathematica [A] time = 0.0723681, size = 68, normalized size = 0.72

$$x(fx)^m\left(\frac{d(a+b\log(cx^n))}{m+1}+\frac{ex^2(a+b\log(cx^n))}{m+3}-\frac{bdn}{(m+1)^2}-\frac{benx^2}{(m+3)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^2)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d*n)/(1 + m)^2) - (b*e*n*x^2)/(3 + m)^2 + (d*(a + b*Log[c*x
^n]))/(1 + m) + (e*x^2*(a + b*Log[c*x^n]))/(3 + m))
```

Maple [C] time = 0.175, size = 1180, normalized size = 12.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(e*x^2+d)*(a+b*ln(c*x^n)),x)
```

```
[Out] b*x*(e*m*x^2+e*x^2+d*m+3*d)/(1+m)/(3+m)*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+I*Pi
*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn
(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))*ln(x^n)-1/2*x*(-18*a*d-2*a*d*m^3-14*a*e*m
*x^2+18*b*d*n-30*a*d*m-I*Pi*b*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*
e*m^3*x^2*csgn(I*c*x^n)^2*csgn(I*c)+7*I*Pi*b*e*m*x^2*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+I*Pi*b*e*m^3*x^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*a*e*m^
3*x^2-10*a*e*m^2*x^2-6*a*e*x^2-14*ln(c)*b*d*m^2-30*ln(c)*b*d*m-2*ln(c)*b*d*
m^3+7*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3*I*Pi*b*e*x^2*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+5*I*Pi*b*e*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)
```

```
*csgn(I*c)-5*I*Pi*b*e*m^2*x^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d*m^3*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-7*I*Pi*b*e*m*x^2*csgn(I*x^n)*csgn(I*c*x^n)^
2+2*b*e*m^2*n*x^2+2*b*d*m^2*n+9*I*Pi*b*d*csgn(I*c*x^n)^3-18*ln(c)*b*d+15*I*
Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*ln(c)*b*e*m^3*x^2-10*ln(c)*b
*e*m^2*x^2-14*ln(c)*b*e*m*x^2+12*b*d*m*n-5*I*Pi*b*e*m^2*x^2*csgn(I*c*x^n)^2
*csgn(I*c)-7*I*Pi*b*e*m*x^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*m^3*csgn(I*c
*x^n)^3+15*I*Pi*b*d*m*csgn(I*c*x^n)^3-3*I*Pi*b*e*x^2*csgn(I*x^n)*csgn(I*c*x
^n)^2-6*ln(c)*b*e*x^2+4*b*e*m*n*x^2-14*a*d*m^2+7*I*Pi*b*e*m*x^2*csgn(I*c*x^
n)^3-7*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2-7*I*Pi*b*d*m^2*csgn(I*c*x^n
)^2*csgn(I*c)+I*Pi*b*e*m^3*x^2*csgn(I*c*x^n)^3-9*I*Pi*b*d*csgn(I*x^n)*csgn(
I*c*x^n)^2-9*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+7*I*Pi*b*d*m^2*csgn(I*c*x^n
)^3+3*I*Pi*b*e*x^2*csgn(I*c*x^n)^3+9*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+5*I*Pi*b*e*m^2*x^2*csgn(I*c*x^n)^3-3*I*Pi*b*e*x^2*csgn(I*c*x^n)^2*cs
gn(I*c)-15*I*Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)^2-15*I*Pi*b*d*m*csgn(I*c*x^
n)^2*csgn(I*c)-I*Pi*b*d*m^3*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*m^3*csgn(I
*c*x^n)^2*csgn(I*c)+2*b*e*n*x^2)/(3+m)^2/(1+m)^2*exp(1/2*m*(-I*Pi*csgn(I*f*
x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*
f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^m*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.36516, size = 562, normalized size = 5.92

$$\frac{\left(\left(aem^3 + 5\,aem^2 + 7\,aem + 3\,ae - \left(bem^2 + 2\,bem + be\right)n\right)x^3 + \left(adm^3 + 7\,adm^2 + 15\,adm + 9\,ad - \left(bdm^2 + 6\,bdm + 9\,bd\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((a*e*m^3 + 5*a*e*m^2 + 7*a*e*m + 3*a*e - (b*e*m^2 + 2*b*e*m + b*e)*n)*x^3
+ (a*d*m^3 + 7*a*d*m^2 + 15*a*d*m + 9*a*d - (b*d*m^2 + 6*b*d*m + 9*b*d)*n)*
```

```
x + ((b*e*m^3 + 5*b*e*m^2 + 7*b*e*m + 3*b*e)*x^3 + (b*d*m^3 + 7*b*d*m^2 + 1
5*b*d*m + 9*b*d)*x)*log(c) + ((b*e*m^3 + 5*b*e*m^2 + 7*b*e*m + 3*b*e)*n*x^3
 + (b*d*m^3 + 7*b*d*m^2 + 15*b*d*m + 9*b*d)*n*x)*log(x))*e^(m*log(f) + m*lo
g(x))/(m^4 + 8*m^3 + 22*m^2 + 24*m + 9)
```

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((f*x)**m*(e*x**2+d)*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.34681, size = 323, normalized size = 3.4

$$\frac{bf^2f^mx^3x^me\log(c)}{f^2m+3f^2}+\frac{bf^mmnx^3x^me\log(x)}{m^2+6m+9}+\frac{af^2f^mx^3x^me}{f^2m+3f^2}+\frac{3bf^mnx^3x^me\log(x)}{m^2+6m+9}-\frac{bf^mnx^3x^me}{m^2+6m+9}+\frac{bdf^mmnxx^m\log(x}{m^2+2m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(e*x^2+d)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^2*f^m*x^3*x^m*e*log(c)/(f^2*m + 3*f^2) + b*f^m*m*n*x^3*x^m*e*log(x)/(m^
2 + 6*m + 9) + a*f^2*f^m*x^3*x^m*e/(f^2*m + 3*f^2) + 3*b*f^m*n*x^3*x^m*e*lo
g(x)/(m^2 + 6*m + 9) - b*f^m*n*x^3*x^m*e/(m^2 + 6*m + 9) + b*d*f^m*m*n*x*x^
m*log(x)/(m^2 + 2*m + 1) + b*d*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) - b*d*f^m
*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*d*x*log(c)/(m + 1) + (f*x)^m*a*d*x/(m
+ 1)
```

3.321 $\int (fx)^m (a + b\log(cx^n))\,dx$

Optimal. Leaf size=46

$$\frac{(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)} - \frac{bn(fx)^{m+1}}{f(m+1)^2}$$

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rubi [A] time = 0.0165448, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2304}

$$\frac{(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)} - \frac{bn(fx)^{m+1}}{f(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^m (a+b\log(cx^n))\,dx = -\frac{bn(fx)^{1+m}}{f(1+m)^2} + \frac{(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}$$

Mathematica [A] time = 0.0130773, size = 32, normalized size = 0.7

$$\frac{x(fx)^m(am+a+b(m+1)\log(cx^n)-bn)}{(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(f*x)^m*(a + a*m - b*n + b*(1 + m)*Log[c*x^n]))/(1 + m)^2
```

Maple [C] time = 0.076, size = 371, normalized size = 8.1

$$\frac{bx\ln(x^n)}{1+m}e^{-\frac{m\left(i\pi\left(\mathrm{csgn}(ifx)\right)^3-i\pi\left(\mathrm{csgn}(ifx)\right)^2\mathrm{csgn}(if)-i\pi\left(\mathrm{csgn}(ifx)\right)^2\mathrm{csgn}(ix)+i\pi\,\mathrm{csgn}(ifx)\mathrm{csgn}(if)\mathrm{csgn}(ix)-2\ln(f)-2\ln(x)\right)}{2}} - \frac{\left(-i\pi\, b\mathrm{csgn}(ix^n)\left(\mathrm{csgn}(icx\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n)),x)
```

```
[Out] b/(1+m)*x*ln(x^n)*exp(-1/2*m*(I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*f*x)^2*csgn(I*
f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)-2*ln(f
)-2*ln(x)))-1/2*(-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2*m+I*Pi*b*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*m+I*Pi*b*csgn(I*c*x^n)^3*m-I*Pi*b*csgn(I*c*x^n)^2*cs
gn(I*c)*m-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+I*Pi*b*csgn(I*c*x^n)^3-I*Pi*b*csgn(I*c*x^n)^2*csgn(I*c)-2*b*ln
(c)*m-2*b*ln(c)-2*a*m+2*b*n-2*a)/(1+m)^2*x*exp(-1/2*m*(I*Pi*csgn(I*f*x)^3-I
*Pi*csgn(I*f*x)^2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*c
sgn(I*f)*csgn(I*x)-2*ln(f)-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((f*x)^m*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.23606, size = 142, normalized size = 3.09

$$\frac{((bm+b)nx\log(x)+(bm+b)x\log(c)+(am-bn+a)x)e^{\left(m\log(f)+m\log(x)\right)}}{m^2+2m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*m + b)*n*x*log(x) + (b*m + b)*x*log(c) + (a*m - b*n + a)*x)*e^(m*log(f)
 + m*log(x))/(m^2 + 2*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((f*x)**m*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.34001, size = 128, normalized size = 2.78

$$\frac{bf^m mnxx^m\log(x)}{m^2+2m+1}+\frac{bf^m nxx^m\log(x)}{m^2+2m+1}-\frac{bf^m nxx^m}{m^2+2m+1}+\frac{\left(fx\right)^m bx\log(c)}{m+1}+\frac{\left(fx\right)^m ax}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*x*log(c)/(m + 1) + (f*x)^m*a
*x/(m + 1)
```

3.322 $\int \frac{(fx)^m(a+b\log(cx^n))}{d+ex^2}\,dx$

Optimal. Leaf size=27

$$\text{Unintegrable}\left(\frac{(fx)^m\,(a+b\log(cx^n))}{d+ex^2},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2), x]
```

Rubi [A] time = 0.067045, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2), x]
```

Rubi steps

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{d+ex^2}\,dx=\int \frac{(fx)^m\,(a+b\log(cx^n))}{d+ex^2}\,dx$$

Mathematica [A] time = 0.199069, size = 108, normalized size = 4.

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)(a+b\log(cx^n))-bn\,{}_3F_2\left(1,\frac{m}{2}+\frac{1}{2},\frac{m}{2}+\frac{1}{2};\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};-\frac{ex^2}{d}\right)\right)}{d(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2),x]
```

```
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{1, 1/2 + m/2, 1/2 + m/2}, {3/2 + m/2,
3/2 + m/2}, -((e*x^2)/d)]) + (1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m
```

```
)/2, -((e*x^2)/d)]*(a + b*Log[c*x^n])))/(d*(1 + m)^2)
```

Maple [A] time = 0.625, size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b\ln(cx^n))}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))/(e*x^2+d),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)(fx)^m}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{(fx)^m b\log(cx^n) + (fx)^m a}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e*x^2 + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(e*x**2+d),x)
```

```
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x**2), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)\,(fx)^m}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d), x)
```

3.323 $\int \frac{(fx)^m(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=27

$$\text{Unintegrable}\left(\frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^2)^2},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2)^2, x]
```

Rubi [A] time = 0.0643994, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^2)^2}\,dx=\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^2)^2}\,dx$$

Mathematica [A] time = 0.120758, size = 108, normalized size = 4.

$$\frac{x(fx)^m\left((m+1)\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)(a+b\log(cx^n))-bn\,{}_3F_2\left(2,\frac{m}{2}+\frac{1}{2},\frac{m}{2}+\frac{1}{2};\frac{m}{2}+\frac{3}{2},\frac{m}{2}+\frac{3}{2};-\frac{ex^2}{d}\right)\right)}{d^2(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^2)^2,x]
```

```
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{2, 1/2 + m/2, 1/2 + m/2}, {3/2 + m/2,
3/2 + m/2}, -((e*x^2)/d)]) + (1 + m)*Hypergeometric2F1[2, (1 + m)/2, (3 + m
)/2, -((e*x^2)/d)]*(a + b*Log[c*x^n])))/(d^2*(1 + m)^2)
```

Maple [A] time = 0.705, size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{m} \left(a+b\ln \left(cx^{n}\right)\right)}{\left(ex^{2}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))/(e*x^2+d)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log \left(cx^{n}\right)+a\right)\left(fx\right)^{m}}{\left(ex^{2}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{\left(fx\right)^{m} b\log \left(cx^{n}\right)+\left(fx\right)^{m} a}{e^{2}x^{4}+2\,dex^{2}+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e^2*x^4 + 2*d*e*x^2 + d^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((f*x)**m*(a+b*ln(c*x**n))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)\left(fx\right)^m}{\left(ex^2 + d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^2 + d)^2, x)
```

3.324 $\int \frac{(a+b\log(cx^n))^3}{(d+ex^3)^2}\,dx$

Optimal. Leaf size=1198

result too large to display

[Out] (x*(a + b*Log[c*x^n])^3)/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*(a + b*Log[c*x^n])^3)/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(1/3)*x)) + (x*(a + b*Log[c*x^n])^3)/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x)) - (b*n*(a + b*Log[c*x^n])^2*Log[1 + (e^(1/3)*x)/d^(1/3)])/(3*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])^3*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*e^(1/3)) + (3*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*(a + b*Log[c*x^n])^3*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + ((-1)^(1/3)*b*n*(a + b*Log[c*x^n])^2*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/(3*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])^3*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (2*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) + (2*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) + (6*(-1)^(1/3)*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((6*I)*Sqrt[3]*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (2*(-1)^(1/3)*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) + (6*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (2*b^3*n^3*PolyLog[3, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - (4*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - (6*(-1)^(1/3)*b^3*n^3*PolyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + ((12*I)*Sqrt[3]*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) - (2*(-1)^(1/3)*b^3*n^3*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - (12*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (4*b^3*n^3*PolyLog[4, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - ((12*I)*Sqrt[3]*b^3*n^3*PolyLog[4, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (12*b^3*n^3*PolyLog[4, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3))

Rubi [A] time = 1.43498, antiderivative size = 1198, normalized size of antiderivative = 1., number of steps used = 26, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ =

0.273, Rules used = {2330, 2318, 2317, 2374, 6589, 2383}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^3/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^3)/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*
(a + b*Log[c*x^n])^3)/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(
1/3)*x)) + (x*(a + b*Log[c*x^n])^3)/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3
)*x)) - (b*n*(a + b*Log[c*x^n])^2*Log[1 + (e^(1/3)*x)/d^(1/3)])/(3*d^(5/3)*
e^(1/3)) + (2*(a + b*Log[c*x^n])^3*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)
*e^(1/3)) + (3*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])^2*Log[1 - ((-1)^(1/3)*e^(1
/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*(a +
 b*Log[c*x^n])^3*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))
^5*d^(5/3)*e^(1/3)) + ((-1)^(1/3)*b*n*(a + b*Log[c*x^n])^2*Log[1 + ((-1)^(2
/3)*e^(1/3)*x)/d^(1/3)])/(3*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])^3*Log[
1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) -
 (2*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/
3)*e^(1/3)) + (2*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))
])/(3*d^(5/3)*e^(1/3)) + (6*(-1)^(1/3)*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2
, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (
(6*I)*Sqrt[3]*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^
(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (2*(-1)^(1/3)*b^2*n^2*(a + b
*Log[c*x^n])*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1
/3)) + (6*b*n*(a + b*Log[c*x^n])^2*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1
/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (2*b^3*n^3*PolyLog[3, -((e^(1
/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - (4*b^2*n^2*(a + b*Log[c*x^n])*PolyL
og[3, -((e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - (6*(-1)^(1/3)*b^3*n^3*
PolyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(
1/3)) + ((12*I)*Sqrt[3]*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, ((-1)^(1/3)*e
^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) - (2*(-1)^(1/3)*b^
3*n^3*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) -
(12*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))
])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (4*b^3*n^3*PolyLog[4, -((e^(1/3)*
x)/d^(1/3))])/(3*d^(5/3)*e^(1/3)) - ((12*I)*Sqrt[3]*b^3*n^3*PolyLog[4, ((-1
)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (12*b^3
*n^3*PolyLog[4, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(
5/3)*e^(1/3))
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
```

```
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2383

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*PolyLog[k_, (e_.)*(x_)^(q_
.)])/(x_), x_Symbol] :> Simp[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^p)/q
, x] - Dist[(b*n*p)/q, Int[(PolyLog[k + 1, e*x^q]*(a + b*Log[c*x^n])^(p - 1
))/x, x], x] /; FreeQ[{a, b, c, e, k, n, q}, x] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^3}{(d+ex^3)^2}\,dx = \int\left(\frac{(a+b\log(cx^n))^3}{9d^{4/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2} + \frac{2(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}(a+b\log(cx^n))^3}{\left(1+\sqrt[3]{-1}\right)^4 d^{4/3}\left(-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x\right)^2} - \frac{2(-}{(1+\sqrt[3]{}}\right.$$

$$= \frac{2\int \frac{(a+b\log(cx^n))^3}{\sqrt[3]{d}+\sqrt[3]{e}x}dx}{9d^{5/3}} + \frac{2\int \frac{(a+b\log(cx^n))^3}{\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x}dx}{9d^{5/3}} - \frac{\left(2(-1)^{5/6}\sqrt{3}\right)\int \frac{(a+b\log(cx^n))^3}{-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x}dx}{\left(1+\sqrt[3]{-1}\right)^5 d^{5/3}} + \frac{\int \frac{(a+b\log(cx^n))^3}{\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2}}{9d^{4/3}}$$

$$= \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x(a+b\log(cx^n))^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} + \frac{2(a+b\log(cx}{9d}$$

$$= \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x(a+b\log(cx^n))^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{bn(a+b\log(c}{3d}$$

$$= \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x(a+b\log(cx^n))^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{bn(a+b\log(c}{3d}$$

$$= \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x(a+b\log(cx^n))^3}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x(a+b\log(cx^n))^3}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{bn(a+b\log(c}{3d}$$

Mathematica [A] time = 7.70651, size = 2215, normalized size = 1.85

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^3/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*(-(n*Log[x]) + Log[c*x^n]))^3)/(3*d*(d + e*x^3)) + (2*ArcTan[(-d^
(1/3) + 2*e^(1/3)*x)/(Sqrt[3]*d^(1/3))]*(a + b*(-(n*Log[x]) + Log[c*x^n]))^
3)/(3*Sqrt[3]*d^(5/3)*e^(1/3)) + (2*(a + b*(-(n*Log[x]) + Log[c*x^n]))^3*Lo
g[d^(1/3) + e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) - ((a + b*(-(n*Log[x]) + Log[c*
x^n]))^3*Log[d^(2/3) - d^(1/3)*e^(1/3)*x + e^(2/3)*x^2])/(9*d^(5/3)*e^(1/3)
) + 3*b*n*(a + b*(-(n*Log[x]) + Log[c*x^n]))^2*(-((-1 + (-1)^(1/3))*((-((-1
)^(1/3)/d^(1/3)) - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(-1))*Log[x] + ((-1)^(1
/3)*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x])/d^(1/3)))/(3*(1 + (-1)^(1/3))^2
*d^(4/3)*e^(1/3)) + ((-1)^(1/3)*((d^(-1/3) - (d^(1/3) + e^(1/3)*x)^(-1))*Lo
```

```
g[x] - Log[d^(1/3) + e^(1/3)*x]/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e^(
1/3)) - (Log[x]/(e^(1/3)*((-1)^(1/3)*d^(1/3) - e^(1/3)*x)) - (-(((-1)^(2/3)
*Log[x])/d^(1/3)) + ((-1)^(2/3)*Log[d^(1/3) + (-1)^(2/3)*e^(1/3)*x])/d^(1/3
))/e^(1/3))/(3*(1 + (-1)^(1/3))^2*d^(4/3)) + (2*(-1)^(1/3)*(Log[x]*Log[1 +
(e^(1/3)*x)/d^(1/3)] + PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1
/3))^2*d^(5/3)*e^(1/3)) - (2*(Log[x]*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)
] + PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1/3))^2*d^(5
/3)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/
d^(1/3)] + PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/
3))^2*d^(5/3)*e^(1/3))) + 3*b^2*n^2*(a + b*(-(n*Log[x]) + Log[c*x^n]))*(((-
1)^(1/3)*(Log[x]*((e^(1/3)*x*Log[x])/(d^(1/3) + e^(1/3)*x) - 2*Log[1 + (e^(
1/3)*x)/d^(1/3)]) - 2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/
3))^2*d^(5/3)*e^(1/3)) - ((-1 + (-1)^(1/3))*(Log[x]*((-((-1)^(1/3)/d^(1/3))
 - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(-1))*Log[x] + (2*(-1)^(1/3)*Log[1 - ((
-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3)) + (2*(-1)^(1/3)*PolyLog[2, ((-1)^(1
/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e^(1/3)) -
 (Log[x]*((-1)^(2/3)*e^(1/3)*x*Log[x] - 2*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x)*
Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)]) - 2*(d^(1/3) + (-1)^(2/3)*e^(1/3)*
x)*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(3*(1 + (-1)^(1/3))^2*d^(
4/3)*(-((-1)^(1/3)*d^(2/3)*e^(1/3)) + d^(1/3)*e^(2/3)*x)) + (2*(-1)^(1/3)*(
Log[x]^2*Log[1 + (e^(1/3)*x)/d^(1/3)] + 2*Log[x]*PolyLog[2, -((e^(1/3)*x)/d
^(1/3))] - 2*PolyLog[3, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(
5/3)*e^(1/3)) - (2*(Log[x]^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + 2*Lo
g[x]*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] - 2*PolyLog[3, ((-1)^(1/3)*
e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - (2*(-1 + (-1
)^(1/3))*(Log[x]^2*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)] + 2*Log[x]*PolyL
og[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))] - 2*PolyLog[3, -(((-1)^(2/3)*e^(1/
3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3))) + b^3*n^3*(((-1)^
(1/3)*(Log[x]^2*((d^(-1/3) - (d^(1/3) + e^(1/3)*x)^(-1))*Log[x] - (3*Log[1
+ (e^(1/3)*x)/d^(1/3)])/d^(1/3)) - (6*Log[x]*PolyLog[2, -((e^(1/3)*x)/d^(1/
3))])/d^(1/3) + (6*PolyLog[3, -((e^(1/3)*x)/d^(1/3))])/d^(1/3)))/(3*(1 + (-
1)^(1/3))^2*d^(4/3)*e^(1/3)) - ((-1 + (-1)^(1/3))*(-(((-1)^(1/3)*Log[x]^3)/
d^(1/3)) - Log[x]^3/((-1)^(2/3)*d^(1/3) + e^(1/3)*x) + (3*(-1)^(1/3)*Log[x]
^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3) + (6*(-1)^(1/3)*(Log[x]
*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] - PolyLog[3, ((-1)^(1/3)*e^(1/3
)*x)/d^(1/3)]))/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e^(1/3)) - (((-1)^(
2/3)*Log[x]^3)/d^(1/3) + Log[x]^3/((-1)^(1/3)*d^(1/3) - e^(1/3)*x) - (3*(-1
)^(2/3)*Log[x]^2*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3) - (6*(-1)
^(2/3)*(Log[x]*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))] - PolyLog[3, -
(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/d^(1/3))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*
e^(1/3)) + (2*(-1)^(1/3)*(Log[x]^3*Log[1 + (e^(1/3)*x)/d^(1/3)] + 3*Log[x]^
2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))] - 6*Log[x]*PolyLog[3, -((e^(1/3)*x)/d^
(1/3))] + 6*PolyLog[4, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(5
/3)*e^(1/3)) - (2*(Log[x]^3*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + 3*Log
[x]^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] - 6*Log[x]*PolyLog[3, ((-1
```

```
)^(1/3)*e^(1/3)*x)/d^(1/3)] + 6*PolyLog[4, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])
)/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]^3*L
og[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)] + 3*Log[x]^2*PolyLog[2, -(((-1)^(2/3
)*e^(1/3)*x)/d^(1/3))] - 6*Log[x]*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/
3))] + 6*PolyLog[4, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3)
)^2*d^(5/3)*e^(1/3)))
```

Maple [F] time = 4.75, size = 0, normalized size = 0.

$$\int \frac{\left(a+b\ln\left(cx^{n}\right)\right)^{3}}{\left(ex^{3}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^3/(e*x^3+d)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^3/(e*x^3+d)^2,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((a+b*log(c*x^n))^3/(e*x^3+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b^{3}\log\left(cx^{n}\right)^{3}+3\,ab^{2}\log\left(cx^{n}\right)^{2}+3\,a^{2}b\log\left(cx^{n}\right)+a^{3}}{e^{2}x^{6}+2\,dex^{3}+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^3+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^3*log(c*x^n)^3 + 3*a*b^2*log(c*x^n)^2 + 3*a^2*b*log(c*x^n) + a^
3)/(e^2*x^6 + 2*d*e*x^3 + d^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*ln(c*x**n))**3/(e*x**3+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)^3}{(ex^3+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^3/(e*x^3+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^3/(e*x^3 + d)^2, x)
```

3.325 $\int \frac{(a+b\log(cx^n))^2}{(d+ex^3)^2}\,dx$

Optimal. Leaf size=860

result too large to display

```
[Out] (x*(a + b*Log[c*x^n])^2)/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*
(a + b*Log[c*x^n])^2)/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(
1/3)*x)) + (x*(a + b*Log[c*x^n])^2)/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3
)*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*
e^(1/3)) + (2*(a + b*Log[c*x^n])^2*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)
*e^(1/3)) + (2*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])*Log[1 - ((-1)^(1/3)*e^(1/3
)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*(a + b
*Log[c*x^n])^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5
*d^(5/3)*e^(1/3)) + (2*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])*Log[1 + ((-1)^(2/3
)*e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])^2*Log[1
+ ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (
2*b^2*n^2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) + (4*b*n*
(a + b*Log[c*x^n])*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3))
+ (2*(-1)^(1/3)*b^2*n^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (
-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((4*I)*Sqrt[3]*b*n*(a + b*Log[c*x^n])*PolyL
og[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3))
 + (2*(-1)^(1/3)*b^2*n^2*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(9*
d^(5/3)*e^(1/3)) + (4*b*n*(a + b*Log[c*x^n])*PolyLog[2, -(((-1)^(2/3)*e^(1/
3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (4*b^2*n^2*PolyLog[
3, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) + ((4*I)*Sqrt[3]*b^2*n^2*Po
lyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/
3)) - (4*b^2*n^2*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^
(1/3))^4*d^(5/3)*e^(1/3))
```

Rubi [A] time = 0.771024, antiderivative size = 860, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {2330, 2318, 2317, 2391, 2374, 6589}

$$-\frac{2b^2\text{PolyLog}\left(2,-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{9d^{5/3}\sqrt[3]{e}}+\frac{2\sqrt[3]{-1}b^2\text{PolyLog}\left(2,\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{\left(1+\sqrt[3]{-1}\right)^4d^{5/3}\sqrt[3]{e}}+\frac{2\sqrt[3]{-1}b^2\text{PolyLog}\left(2,-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)n^2}{9d^{5/3}\sqrt[3]{e}}-\frac{4b^2\text{PolyLog}\left(\right.}{9d^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n])^2)/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*
(a + b*Log[c*x^n])^2)/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(
1/3)*x)) + (x*(a + b*Log[c*x^n])^2)/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3
)*x)) - (2*b*n*(a + b*Log[c*x^n])*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*
e^(1/3)) + (2*(a + b*Log[c*x^n])^2*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)
*e^(1/3)) + (2*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])*Log[1 - ((-1)^(1/3)*e^(1/3
)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*(a + b
*Log[c*x^n])^2*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5
*d^(5/3)*e^(1/3)) + (2*(-1)^(1/3)*b*n*(a + b*Log[c*x^n])*Log[1 + ((-1)^(2/3
)*e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])^2*Log[1
+ ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (
2*b^2*n^2*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) + (4*b*n*
(a + b*Log[c*x^n])*PolyLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3))
+ (2*(-1)^(1/3)*b^2*n^2*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (
-1)^(1/3))^4*d^(5/3)*e^(1/3)) - ((4*I)*Sqrt[3]*b*n*(a + b*Log[c*x^n])*PolyL
og[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3))
 + (2*(-1)^(1/3)*b^2*n^2*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/(9*
d^(5/3)*e^(1/3)) + (4*b*n*(a + b*Log[c*x^n])*PolyLog[2, -(((-1)^(2/3)*e^(1/
3)*x)/d^(1/3))])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) - (4*b^2*n^2*PolyLog[
3, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) + ((4*I)*Sqrt[3]*b^2*n^2*Po
lyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1/
3)) - (4*b^2*n^2*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^
(1/3))^4*d^(5/3)*e^(1/3))
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
```

```
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{\left(d+ex^3\right)^2}\,dx = \int \left(\frac{(a+b\log(cx^n))^2}{9d^{4/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2} + \frac{2\,(a+b\log(cx^n))^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}\,(a+b\log(cx^n))^2}{\left(1+\sqrt[3]{-1}\right)^4 d^{4/3}\left(-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x\right)^2} - \frac{2(-1)}{\left(1+\sqrt[3]{-\right.}} \right.$$

$$= \frac{2\int \frac{(a+b\log(cx^n))^2}{\sqrt[3]{d}+\sqrt[3]{e}x}dx}{9d^{5/3}} + \frac{2\int \frac{(a+b\log(cx^n))^2}{\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x}dx}{9d^{5/3}} - \frac{\left(2(-1)^{5/6}\sqrt{3}\right)\int \frac{(a+b\log(cx^n))^2}{-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x}dx}{\left(1+\sqrt[3]{-1}\right)^5 d^{5/3}} + \frac{\int \frac{(a+b\log(cx^n))^2}{\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2}}{9d^{4/3}}$$

$$= \frac{x\,(a+b\log(cx^n))^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\,(a+b\log(cx^n))^2}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\,(a+b\log(cx^n))^2}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} + \frac{2\,(a+b\log(cx^n}{9d^{5}}$$

$$= \frac{x\,(a+b\log(cx^n))^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\,(a+b\log(cx^n))^2}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\,(a+b\log(cx^n))^2}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{2bn\,(a+b\log(c}{9d^{5}}$$

$$= \frac{x\,(a+b\log(cx^n))^2}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{(-1)^{2/3}x\,(a+b\log(cx^n))^2}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)} + \frac{x\,(a+b\log(cx^n))^2}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)} - \frac{2bn\,(a+b\log(c}{9d^{5}}$$

Mathematica [A] time = 6.15188, size = 1379, normalized size = 1.6

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*(-(n*Log[x]) + Log[c*x^n]))^2)/(3*d*(d + e*x^3)) + (2*ArcTan[(-d^
(1/3) + 2*e^(1/3)*x)/(Sqrt[3]*d^(1/3))]*(a + b*(-(n*Log[x]) + Log[c*x^n]))^
2)/(3*Sqrt[3]*d^(5/3)*e^(1/3)) + (2*(a + b*(-(n*Log[x]) + Log[c*x^n]))^2*Lo
g[d^(1/3) + e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) - ((a + b*(-(n*Log[x]) + Log[c*
x^n]))^2*Log[d^(2/3) - d^(1/3)*e^(1/3)*x + e^(2/3)*x^2])/(9*d^(5/3)*e^(1/3)
) + 2*b*n*(a + b*(-(n*Log[x]) + Log[c*x^n]))*(-((-1 + (-1)^(1/3))*((-((-1)^
(1/3)/d^(1/3)) - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(-1))*Log[x] + ((-1)^(1/3
)*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x])/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d
^(4/3)*e^(1/3)) + ((-1)^(1/3)*((d^(-1/3) - (d^(1/3) + e^(1/3)*x)^(-1))*Log[
x] - Log[d^(1/3) + e^(1/3)*x]/d^(1/3)))/(3*(1 + (-1)^(1/3))^2*d^(4/3)*e^(1/
3)) - (Log[x]/(e^(1/3)*((-1)^(1/3)*d^(1/3) - e^(1/3)*x)) - (-(((-1)^(2/3)*L
og[x])/d^(1/3)) + ((-1)^(2/3)*Log[d^(1/3) + (-1)^(2/3)*e^(1/3)*x])/d^(1/3))
/e^(1/3))/(3*(1 + (-1)^(1/3))^2*d^(4/3)) + (2*(-1)^(1/3)*(Log[x]*Log[1 + (e
```

```
^(1/3)*x)/d^(1/3)] + PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3
))^2*d^(5/3)*e^(1/3)) - (2*(Log[x]*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)]
+ PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1/3))^2*d^(5/3
)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^
(1/3)] + PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3)
)^2*d^(5/3)*e^(1/3))) + b^2*n^2*(((-1)^(1/3)*(Log[x]*((e^(1/3)*x*Log[x])/(d
^(1/3) + e^(1/3)*x) - 2*Log[1 + (e^(1/3)*x)/d^(1/3)]) - 2*PolyLog[2, -((e^(
1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - ((-1 + (-1)^(1
/3))*(Log[x]*((-((-1)^(1/3)/d^(1/3)) - ((-1)^(2/3)*d^(1/3) + e^(1/3)*x)^(-1
))*Log[x] + (2*(-1)^(1/3)*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3))
 + (2*(-1)^(1/3)*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/d^(1/3)))/(3*(
1 + (-1)^(1/3))^2*d^(4/3)*e^(1/3)) - (Log[x]*((-1)^(2/3)*e^(1/3)*x*Log[x] -
 2*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x)*Log[1 + ((-1)^(2/3)*e^(1/3)*x)/d^(1/3)]
) - 2*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x)*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/
d^(1/3))])/(3*(1 + (-1)^(1/3))^2*d^(4/3)*(-((-1)^(1/3)*d^(2/3)*e^(1/3)) + d
^(1/3)*e^(2/3)*x)) + (2*(-1)^(1/3)*(Log[x]^2*Log[1 + (e^(1/3)*x)/d^(1/3)] +
 2*Log[x]*PolyLog[2, -((e^(1/3)*x)/d^(1/3))] - 2*PolyLog[3, -((e^(1/3)*x)/d
^(1/3))]))/(3*(1 + (-1)^(1/3))^2*d^(5/3)*e^(1/3)) - (2*(Log[x]^2*Log[1 - ((
-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + 2*Log[x]*PolyLog[2, ((-1)^(1/3)*e^(1/3)*x)/
d^(1/3)] - 2*PolyLog[3, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)]))/(3*(1 + (-1)^(1/3
))^2*d^(5/3)*e^(1/3)) - (2*(-1 + (-1)^(1/3))*(Log[x]^2*Log[1 + ((-1)^(2/3)*
e^(1/3)*x)/d^(1/3)] + 2*Log[x]*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))
] - 2*PolyLog[3, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))]))/(3*(1 + (-1)^(1/3))^2
*d^(5/3)*e^(1/3)))
```

Maple [F] time = 4.986, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{(ex^3+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/(e*x^3+d)^2,x)

[Out] int((a+b*ln(c*x^n))^2/(e*x^3+d)^2,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((a+b*log(c*x^n))^2/(e*x^3+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b^2\log\left(cx^n\right)^2+2\,ab\log\left(cx^n\right)+a^2}{e^2x^6+2\,dex^3+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^3+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*log(c*x^n)^2 + 2*a*b*log(c*x^n) + a^2)/(e^2*x^6 + 2*d*e*x^3 +
 d^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*ln(c*x**n))**2/(e*x**3+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2}{\left(ex^3+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/(e*x^3+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/(e*x^3 + d)^2, x)
```

3.326 $\int \frac{a+b\log(cx^n)}{(d+ex^3)^2}\,dx$

Optimal. Leaf size=520

$$\frac{2bn\text{PolyLog}\left(2,-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{9d^{5/3}\sqrt[3]{e}}-\frac{2i\sqrt{3}bn\text{PolyLog}\left(2,\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{\left(1+\sqrt[3]{-1}\right)^5d^{5/3}\sqrt[3]{e}}+\frac{2bn\text{PolyLog}\left(2,-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{\left(1+\sqrt[3]{-1}\right)^4d^{5/3}\sqrt[3]{e}}+\frac{2\log\left(\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}+1\right)(a+b\log(cx^n}{9d^{5/3}\sqrt[3]{e}}$$

```
[Out] (x*(a + b*Log[c*x^n]))/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*(a
 + b*Log[c*x^n]))/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(1/3)
*x)) + (x*(a + b*Log[c*x^n]))/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x))
+ ((-1)^(1/3)*b*n*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x])/((1 + (-1)^(1/3))
^4*d^(5/3)*e^(1/3)) - (b*n*Log[d^(1/3) + e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) +
((-1)^(1/3)*b*n*Log[d^(1/3) + (-1)^(2/3)*e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) +
(2*(a + b*Log[c*x^n])*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*e^(1/3)) - (
(2*I)*Sqrt[3]*(a + b*Log[c*x^n])*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/(
(1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])*Log[1 + ((-1)^(
2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (2*b*n*Pol
yLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*b*n*P
olyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1
/3)) + (2*b*n*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/
3))^4*d^(5/3)*e^(1/3))
```

Rubi [A] time = 0.45713, antiderivative size = 520, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.55, Rules used = {199, 200, 31, 634, 617, 204, 628, 2330, 2314, 2317, 2391}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{9d^{5/3}\sqrt[3]{e}}-\frac{2i\sqrt{3}bn\text{PolyLog}\left(2,\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{\left(1+\sqrt[3]{-1}\right)^5d^{5/3}\sqrt[3]{e}}+\frac{2bn\text{PolyLog}\left(2,-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)}{\left(1+\sqrt[3]{-1}\right)^4d^{5/3}\sqrt[3]{e}}+\frac{2\log\left(\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}+1\right)(a+b\log(cx^n}{9d^{5/3}\sqrt[3]{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^3)^2,x]
```

```
[Out] (x*(a + b*Log[c*x^n]))/(9*d^(5/3)*(d^(1/3) + e^(1/3)*x)) - ((-1)^(1/3)*x*(a
 + b*Log[c*x^n]))/((1 + (-1)^(1/3))^4*d^(5/3)*((-1)^(2/3)*d^(1/3) + e^(1/3)
*x)) + (x*(a + b*Log[c*x^n]))/(9*d^(5/3)*(d^(1/3) + (-1)^(2/3)*e^(1/3)*x))
+ ((-1)^(1/3)*b*n*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x])/((1 + (-1)^(1/3))
```

```
^4*d^(5/3)*e^(1/3)) - (b*n*Log[d^(1/3) + e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) +
((-1)^(1/3)*b*n*Log[d^(1/3) + (-1)^(2/3)*e^(1/3)*x])/(9*d^(5/3)*e^(1/3)) +
(2*(a + b*Log[c*x^n])*Log[1 + (e^(1/3)*x)/d^(1/3)])/(9*d^(5/3)*e^(1/3)) - (
(2*I)*Sqrt[3]*(a + b*Log[c*x^n])*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/(
(1 + (-1)^(1/3))^5*d^(5/3)*e^(1/3)) + (2*(a + b*Log[c*x^n])*Log[1 + ((-1)^(
2/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^4*d^(5/3)*e^(1/3)) + (2*b*n*Pol
yLog[2, -((e^(1/3)*x)/d^(1/3))])/(9*d^(5/3)*e^(1/3)) - ((2*I)*Sqrt[3]*b*n*P
olyLog[2, ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)])/((1 + (-1)^(1/3))^5*d^(5/3)*e^(1
/3)) + (2*b*n*PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3))])/((1 + (-1)^(1/
3))^4*d^(5/3)*e^(1/3))
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 200

```
Int[((a_) + (b_.)*(x_)^3)^(-1), x_Symbol] :> Dist[1/(3*Rt[a, 3]^2), Int[1/(
Rt[a, 3] + Rt[b, 3]*x), x], x] + Dist[1/(3*Rt[a, 3]^2), Int[(2*Rt[a, 3] - R
t[b, 3]*x)/(Rt[a, 3]^2 - Rt[a, 3]*Rt[b, 3]*x + Rt[b, 3]^2*x^2), x], x] /; F
reeQ[{a, b}, x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^3)^2}\,dx = \int\left(\frac{a+b\log(cx^n)}{9d^{4/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2}+\frac{2(a+b\log(cx^n))}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{(-1)^{2/3}(a+b\log(cx^n))}{\left(1+\sqrt[3]{-1}\right)^4 d^{4/3}\left(-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x\right)^2}-\frac{2(-1)^{5/}}{\left(1+\sqrt[3]{-1}\right)}\right.$$

$$=\frac{2\int\frac{a+b\log(cx^n)}{\sqrt[3]{d}+\sqrt[3]{e}x}dx}{9d^{5/3}}+\frac{2\int\frac{a+b\log(cx^n)}{\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x}dx}{9d^{5/3}}-\frac{\left(2(-1)^{5/6}\sqrt{3}\right)\int\frac{a+b\log(cx^n)}{-\sqrt[3]{d}+\sqrt[3]{-1}\sqrt[3]{e}x}dx}{\left(1+\sqrt[3]{-1}\right)^5 d^{5/3}}+\frac{\int\frac{a+b\log(cx^n)}{\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)^2}dx}{9d^{4/3}}+$$

$$=\frac{x(a+b\log(cx^n))}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{(-1)^{2/3}x(a+b\log(cx^n))}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{x(a+b\log(cx^n))}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)}+\frac{2(a+b\log(cx^n))\,\mathrm{l}}{9d^{5/3}\sqrt[3]{}}$$

$$=\frac{x(a+b\log(cx^n))}{9d^{5/3}\left(\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{(-1)^{2/3}x(a+b\log(cx^n))}{9d^{5/3}\left((-1)^{2/3}\sqrt[3]{d}+\sqrt[3]{e}x\right)}+\frac{x(a+b\log(cx^n))}{9d^{5/3}\left(\sqrt[3]{d}+(-1)^{2/3}\sqrt[3]{e}x\right)}-\frac{(-1)^{2/3}bn\log\left(-(-1\right.}{9d^{5/3}\sqrt[3]{}}$$

Mathematica [A] time = 2.14886, size = 571, normalized size = 1.1

$$\frac{3bn\left(\frac{2\sqrt[3]{-1}\left(\mathrm{PolyLog}\left(2,-\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}\right)+\log(x)\log\left(\frac{\sqrt[3]{e}x}{\sqrt[3]{d}}+1\right)\right)}{\sqrt[3]{e}}-\frac{2\left(\mathrm{PolyLog}\left(2,\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)+\log(x)\log\left(1-\frac{\sqrt[3]{-1}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)\right)}{\sqrt[3]{e}}-\frac{2\left(\sqrt[3]{-1}-1\right)\left(\mathrm{PolyLog}\left(2,-\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}\right)+\log(x)\log\left(\frac{(-1)^{2/3}\sqrt[3]{e}x}{\sqrt[3]{d}}+1\right)\right)}{\sqrt[3]{e}}+\cdots\right.}{\left(1+\sqrt[3]{-1}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^3)^2,x]
```

```
[Out] ((3*d^(2/3)*x*(a - b*n*Log[x] + b*Log[c*x^n]))/(d + e*x^3) - (2*Sqrt[3]*Arc
Tan[(1 - (2*e^(1/3)*x)/d^(1/3))/Sqrt[3]]*(a - b*n*Log[x] + b*Log[c*x^n]))/e
^(1/3) + (2*(a - b*n*Log[x] + b*Log[c*x^n])*Log[d^(1/3) + e^(1/3)*x])/e^(1/
3) - ((a - b*n*Log[x] + b*Log[c*x^n])*Log[d^(2/3) - d^(1/3)*e^(1/3)*x + e^(
2/3)*x^2])/e^(1/3) + (3*b*n*(((-1 + (-1)^(1/3))*((-1)^(1/3)*e^(1/3)*x*Log[x
] + (d^(1/3) - (-1)^(1/3)*e^(1/3)*x)*Log[-((-1)^(2/3)*d^(1/3)) - e^(1/3)*x]
))/((-1)^(2/3)*d^(1/3)*e^(1/3) + e^(2/3)*x) + (-1)^(1/3)*((x*Log[x])/(d^(1/
3) + e^(1/3)*x) - Log[d^(1/3) + e^(1/3)*x]/e^(1/3)) + (-((-1)^(2/3)*e^(1/3)
*x*Log[x]) + (d^(1/3) + (-1)^(2/3)*e^(1/3)*x)*Log[d^(1/3) + (-1)^(2/3)*e^(1
/3)*x])/(-((-1)^(1/3)*d^(1/3)*e^(1/3)) + e^(2/3)*x) + (2*(-1)^(1/3)*(Log[x]
*Log[1 + (e^(1/3)*x)/d^(1/3)] + PolyLog[2, -((e^(1/3)*x)/d^(1/3))]))/e^(1/3
) - (2*(Log[x]*Log[1 - ((-1)^(1/3)*e^(1/3)*x)/d^(1/3)] + PolyLog[2, ((-1)^(
1/3)*e^(1/3)*x)/d^(1/3)]))/e^(1/3) - (2*(-1 + (-1)^(1/3))*(Log[x]*Log[1 + (
```

```
(-1)^(2/3)*e^(1/3)*x)/d^(1/3)] + PolyLog[2, -(((-1)^(2/3)*e^(1/3)*x)/d^(1/3
))]))/e^(1/3)))/(1 + (-1)^(1/3))^2)/(9*d^(5/3))
```

Maple [C] time = 0.352, size = 1388, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(e*x^3+d)^2,x)
```

```
[Out] -1/9*b/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))*ln(x^n)+2/9*b/d/e/
(d/e)^(2/3)*ln(x+(d/e)^(1/3))*ln(x^n)+1/9*b/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1
/3)*x+(d/e)^(2/3))*n*ln(x)-1/9*b*n/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/
2)*(2/(d/e)^(1/3)*x-1))+2/9*b*ln(c)/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1
/2)*(2/(d/e)^(1/3)*x-1))-2/9*b/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(
2/(d/e)^(1/3)*x-1))*n*ln(x)-1/9*I*b*Pi*csgn(I*c*x^n)^3/d/e/(d/e)^(2/3)*ln(x
+(d/e)^(1/3))+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*x/d/(e*x^3+d)+1/18*I*b*P
i*csgn(I*c*x^n)^3/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))+1/6*I*b
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*x/d/(e*x^3+d)+1/3*a*x/d/(e*x^3+d)-1/9*b*ln(
c)/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))+2/9*a/d/e/(d/e)^(2/3)*
3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))+2/9*b*ln(c)/d/e/(d/e)^(2/3)
*ln(x+(d/e)^(1/3))-1/9*b*n/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1/3))+1/18*b*n/d/e/(
d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))-2/9*b/d/e/(d/e)^(2/3)*ln(x+(d/
e)^(1/3))*n*ln(x)-1/18*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/e/(d/e)^(2/3)*l
n(x^2-(d/e)^(1/3)*x+(d/e)^(2/3))+1/3*b*x/d/(e*x^3+d)*ln(x^n)+2/9*a/d/e/(d/e
)^(2/3)*ln(x+(d/e)^(1/3))-1/9*a/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e)^
(2/3))+1/3*b*ln(c)*x/d/(e*x^3+d)-1/9*I*b*Pi*csgn(I*c*x^n)^3/d/e/(d/e)^(2/3)
*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))+1/9*I*b*Pi*csgn(I*c*x^n)^2
*csgn(I*c)/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))-
1/9*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/e/(d/e)^(2/3)*ln(x+(d/e)^(
1/3))+1/18*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d/e/(d/e)^(2/3)*ln(x^
2-(d/e)^(1/3)*x+(d/e)^(2/3))-1/6*I*b*Pi*csgn(I*c*x^n)^3*x/d/(e*x^3+d)+2/9*b
/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))*ln(x^n)+1/
9*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1/3))-1/18
*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/e/(d/e)^(2/3)*ln(x^2-(d/e)^(1/3)*x+(d/e
)^(2/3))+1/9*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/e/(d/e)^(2/3)*ln(x+(d/e)^(1
/3))-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x/d/(e*x^3+d)+2/9*b*n/e
/d*sum(1/_R1^2*(ln(x)*ln((_R1-x)/_R1)+dilog((_R1-x)/_R1)),_R1=RootOf(_Z^3*e
+d))+1/9*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/e/(d/e)^(2/3)*3^(1/2)*arctan(
1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))-1/9*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)/d/e/(d/e)^(2/3)*3^(1/2)*arctan(1/3*3^(1/2)*(2/(d/e)^(1/3)*x-1))
```

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((a+b*log(c*x^n))/(e*x^3+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{e^2x^6+2\,dex^3+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^3+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^6 + 2*d*e*x^3 + d^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*ln(c*x**n))/(e*x**3+d)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx^n\right)+a}{\left(ex^3+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(e*x^3+d)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^3 + d)^2, x)
```

3.327 $\int \frac{1}{\left(d+ex^3\right)^2(a+b\log(cx^n))}\,dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{\left(d+ex^3\right)^2(a+b\log(cx^n))},x\right)$$

```
[Out] Unintegrable[1/((d + e*x^3)^2*(a + b*Log[c*x^n])), x]
```

Rubi [A] time = 0.0324842, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{\left(d+ex^3\right)^2(a+b\log(cx^n))}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^3)^2*(a + b*Log[c*x^n])),x]
```

```
[Out] Defer[Int][1/((d + e*x^3)^2*(a + b*Log[c*x^n])), x]
```

Rubi steps

$$\int \frac{1}{\left(d+ex^3\right)^2(a+b\log(cx^n))}\,dx=\int \frac{1}{\left(d+ex^3\right)^2(a+b\log(cx^n))}\,dx$$

Mathematica [A] time = 5.56559, size = 0, normalized size = 0.

$$\int \frac{1}{\left(d+ex^3\right)^2(a+b\log(cx^n))}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])),x]
```

```
[Out] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])), x]
```

Maple [A] time = 0.59, size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^3+d\right)^2 (a+b\ln (cx^n))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^3+d)^2/(a+b*ln(c*x^n)),x)
```

```
[Out] int(1/(e*x^3+d)^2/(a+b*ln(c*x^n)),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^3+d\right)^2 (b\log (cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate(1/((e*x^3 + d)^2*(b*log(c*x^n) + a)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{ae^2x^6+2\,adex^3+ad^2+\left(be^2x^6+2\,bdex^3+bd^2\right)\log (cx^n)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral(1/(a*e^2*x^6 + 2*a*d*e*x^3 + a*d^2 + (b*e^2*x^6 + 2*b*d*e*x^3 + b*
d^2)*log(c*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(1/(e*x**3+d)**2/(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{(ex^3+d)^2(b\log(cx^n)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^3 + d)^2*(b*log(c*x^n) + a)), x)
```

3.328 $\int \frac{1}{(d+ex^3)^2 (a+b\log(cx^n))^2} dx$

Optimal. Leaf size=24

$$\text{Unintegrable}\left(\frac{1}{(d+ex^3)^2 (a+b\log(cx^n))^2}, x\right)$$

```
[Out] Unintegrable[1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2), x]
```

Rubi [A] time = 0.0301049, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{1}{(d+ex^3)^2 (a+b\log(cx^n))^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2),x]
```

```
[Out] Defer[Int][1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2), x]
```

Rubi steps

$$\int \frac{1}{(d+ex^3)^2 (a+b\log(cx^n))^2} dx = \int \frac{1}{(d+ex^3)^2 (a+b\log(cx^n))^2} dx$$

Mathematica [A] time = 25.5766, size = 0, normalized size = 0.

$$\int \frac{1}{(d+ex^3)^2 (a+b\log(cx^n))^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2),x]
```

```
[Out] Integrate[1/((d + e*x^3)^2*(a + b*Log[c*x^n])^2), x]
```

Maple [A] time = 2.035, size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^{3}+d\right)^{2}\left(a+b\ln\left(cx^{n}\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x^3+d)^2/(a+b*ln(c*x^n))^2,x)
```

```
[Out] int(1/(e*x^3+d)^2/(a+b*ln(c*x^n))^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$-\frac{x}{\left(b^{2}e^{2}n\log\left(c\right)+abe^{2}n\right)x^{6}+b^{2}d^{2}n\log\left(c\right)+abd^{2}n+2\left(b^{2}den\log\left(c\right)+abden\right)x^{3}+\left(b^{2}e^{2}nx^{6}+2\,b^{2}denx^{3}+b^{2}d^{2}n\right)\log\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] -x/((b^2*e^2*n*log(c) + a*b*e^2*n)*x^6 + b^2*d^2*n*log(c) + a*b*d^2*n + 2*(
b^2*d*e*n*log(c) + a*b*d*e*n)*x^3 + (b^2*e^2*n*x^6 + 2*b^2*d*e*n*x^3 + b^2*
d^2*n)*log(x^n)) - integrate((5*e*x^3 - d)/((b^2*e^3*n*log(c) + a*b*e^3*n)*
x^9 + 3*(b^2*d*e^2*n*log(c) + a*b*d*e^2*n)*x^6 + b^2*d^3*n*log(c) + a*b*d^3
*n + 3*(b^2*d^2*e*n*log(c) + a*b*d^2*e*n)*x^3 + (b^2*e^3*n*x^9 + 3*b^2*d*e^
2*n*x^6 + 3*b^2*d^2*e*n*x^3 + b^2*d^3*n)*log(x^n)), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{1}{a^{2}e^{2}x^{6}+2\,a^{2}dex^{3}+a^{2}d^{2}+\left(b^{2}e^{2}x^{6}+2\,b^{2}dex^{3}+b^{2}d^{2}\right)\log\left(cx^{n}\right)^{2}+2\left(abe^{2}x^{6}+2\,abdex^{3}+abd^{2}\right)\log\left(cx^{n}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] integral(1/(a^2*e^2*x^6 + 2*a^2*d*e*x^3 + a^2*d^2 + (b^2*e^2*x^6 + 2*b^2*d*
e*x^3 + b^2*d^2)*log(c*x^n)^2 + 2*(a*b*e^2*x^6 + 2*a*b*d*e*x^3 + a*b*d^2)*l
og(c*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(1/(e*x**3+d)**2/(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{1}{\left(ex^3 + d\right)^2 (b\log\left(cx^n\right) + a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x^3+d)^2/(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*x^3 + d)^2*(b*log(c*x^n) + a)^2), x)
```

3.329 $\int \frac{x^3(a+b\log(cx^n))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=185

$$\frac{be^4n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^5}+\frac{e^4\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d^5}+\frac{e^2x^2(a+b\log(cx^n))}{2d^3}-\frac{ex^3(a+b\log(cx^n))}{3d^2}+\frac{x^4(a+b\log$$

```
[Out] -((a*e^3*x)/d^4) + (b*e^3*n*x)/d^4 - (b*e^2*n*x^2)/(4*d^3) + (b*e*n*x^3)/(9
*d^2) - (b*n*x^4)/(16*d) - (b*e^3*x*Log[c*x^n])/d^4 + (e^2*x^2*(a + b*Log[c
*x^n]))/(2*d^3) - (e*x^3*(a + b*Log[c*x^n]))/(3*d^2) + (x^4*(a + b*Log[c*x^
n]))/(4*d) + (e^4*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d^5 + (b*e^4*n*PolyL
og[2, -((d*x)/e)])/d^5
```

Rubi [A] time = 0.199915, antiderivative size = 185, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^4n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^5}+\frac{e^4\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d^5}+\frac{e^2x^2(a+b\log(cx^n))}{2d^3}-\frac{ex^3(a+b\log(cx^n))}{3d^2}+\frac{x^4(a+b\log$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] -((a*e^3*x)/d^4) + (b*e^3*n*x)/d^4 - (b*e^2*n*x^2)/(4*d^3) + (b*e*n*x^3)/(9
*d^2) - (b*n*x^4)/(16*d) - (b*e^3*x*Log[c*x^n])/d^4 + (e^2*x^2*(a + b*Log[c
*x^n]))/(2*d^3) - (e*x^3*(a + b*Log[c*x^n]))/(3*d^2) + (x^4*(a + b*Log[c*x^
n]))/(4*d) + (e^4*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d^5 + (b*e^4*n*PolyL
og[2, -((d*x)/e)])/d^5
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3 (a + b \log (cx^n))}{d + \frac{e}{x}} dx = \int \left(-\frac{e^3 (a + b \log (cx^n))}{d^4} + \frac{e^2 x (a + b \log (cx^n))}{d^3} - \frac{ex^2 (a + b \log (cx^n))}{d^2} + \frac{x^3 (a + b \log (cx^n)}{d}\right.$$

$$= \frac{\int x^3 (a + b \log (cx^n)) \, dx}{d} - \frac{e \int x^2 (a + b \log (cx^n)) \, dx}{d^2} + \frac{e^2 \int x (a + b \log (cx^n)) \, dx}{d^3} - \frac{e^3 \int (a}{}$$

$$= -\frac{ae^3 x}{d^4} - \frac{be^2 nx^2}{4d^3} + \frac{benx^3}{9d^2} - \frac{bnx^4}{16d} + \frac{e^2 x^2 (a + b \log (cx^n))}{2d^3} - \frac{ex^3 (a + b \log (cx^n))}{3d^2} + \frac{x^4 (a + b}{}$$

$$= -\frac{ae^3 x}{d^4} + \frac{be^3 nx}{d^4} - \frac{be^2 nx^2}{4d^3} + \frac{benx^3}{9d^2} - \frac{bnx^4}{16d} - \frac{be^3 x \log (cx^n)}{d^4} + \frac{e^2 x^2 (a + b \log (cx^n))}{2d^3} - \frac{ex^3 (a}{}$$

Mathematica [A] time = 0.101681, size = 171, normalized size = 0.92

$$\frac{144be^4 n \text{PolyLog}\left(2, -\frac{dx}{e}\right) + 72d^2 e^2 x^2 (a + b \log (cx^n)) - 48d^3 ex^3 (a + b \log (cx^n)) + 36d^4 x^4 (a + b \log (cx^n)) + 144e^4 \log}{144d^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (-144*a*d*e^3*x + 144*b*d*e^3*n*x - 36*b*d^2*e^2*n*x^2 + 16*b*d^3*e*n*x^3 -
 9*b*d^4*n*x^4 - 144*b*d*e^3*x*Log[c*x^n] + 72*d^2*e^2*x^2*(a + b*Log[c*x^n
]) - 48*d^3*e*x^3*(a + b*Log[c*x^n]) + 36*d^4*x^4*(a + b*Log[c*x^n]) + 144*
e^4*(a + b*Log[c*x^n])*Log[1 + (d*x)/e] + 144*b*e^4*n*PolyLog[2, -((d*x)/e)
])/(144*d^5)
```

Maple [C] time = 0.183, size = 867, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(d+e/x),x)
```

```
[Out] -1/8*I*b*Pi*csgn(I*c*x^n)^3/d*x^4+1/6*I*b*Pi*csgn(I*c*x^n)^3/d^2*e*x^3-1/4*
I*b*Pi*csgn(I*c*x^n)^3/d^3*x^2*e^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^4
/d^5*ln(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^4/d^5*ln(d*x+e)-1/8*I*b*Pi*csgn
```

```
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*x^4+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/
d^3*x^2*e^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*e*x^3+1/4*b*ln(x^n)/
d*x^4-b*n*e^4/d^5*ln(d*x+e)*ln(-d*x/e)+a*e^4/d^5*ln(d*x+e)-1/3*a/d^2*e*x^3+
1/2*a/d^3*x^2*e^2+1/4*b*ln(c)/d*x^4+205/144*b*n*e^4/d^5+1/8*I*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/d*x^4-1/3*b*ln(x^n)/d^2*e*x^3+1/2*b*ln(x^n)/d^3*x^2*e^2-b
*ln(x^n)/d^4*x*e^3+b*ln(x^n)*e^4/d^5*ln(d*x+e)-1/4*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)/d^3*x^2*e^2+1/8*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*x^4
-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^4/d^5*ln(d*x+e)+1/4*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*x^2*e^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x
^n)^2/d^4*x*e^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e^4/d^5*ln(d*x+e)-1/
6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*e*x^3+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)/d^4*x*e^3+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d
^2*e*x^3-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^4*x*e^3+1/2*I*b*Pi*csgn(I*c
*x^n)^3/d^4*x*e^3-b*n*e^4/d^5*dilog(-d*x/e)-1/3*b*ln(c)/d^2*e*x^3+1/2*b*ln(
c)/d^3*x^2*e^2-b*ln(c)/d^4*x*e^3+b*ln(c)*e^4/d^5*ln(d*x+e)+1/4*a/d*x^4-a*e^
3*x/d^4-1/4*b*e^2*n*x^2/d^3+1/9*b*e*n*x^3/d^2-1/16*b*n*x^4/d+b*e^3*n*x/d^4
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{12}\,a\left(\frac{12\,e^4\log\left(dx+e\right)}{d^5}+\frac{3\,d^3x^4-4\,d^2ex^3+6\,de^2x^2-12\,e^3x}{d^4}\right)+b\int\frac{x^4\log\left(c\right)+x^4\log\left(x^n\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] 1/12*a*(12*e^4*log(d*x + e)/d^5 + (3*d^3*x^4 - 4*d^2*e*x^3 + 6*d*e^2*x^2 -
12*e^3*x)/d^4) + b*integrate((x^4*log(c) + x^4*log(x^n))/(d*x + e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^4\log\left(cx^n\right)+ax^4}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x^n) + a*x^4)/(d*x + e), x)
```

Sympy [A] time = 135.23, size = 298, normalized size = 1.61

$$\frac{ax^4}{4d} - \frac{aex^3}{3d^2} + \frac{ae^2x^2}{2d^3} + \frac{ae^4\left(\begin{cases}\frac{x}{e} & \text{for } d = 0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^4} - \frac{ae^3x}{d^4} - \frac{bnx^4}{16d} + \frac{bx^4\log(cx^n)}{4d} + \frac{benx^3}{9d^2} - \frac{bex^3\log(cx^n)}{3d^2} - \frac{be^2nx^2}{4d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] a*x**4/(4*d) - a*e*x**3/(3*d**2) + a*e**2*x**2/(2*d**3) + a*e**4*Piecewise(
(x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d**4 - a*e**3*x/d**4 - b*n*x**4/(1
6*d) + b*x**4*log(c*x**n)/(4*d) + b*e*n*x**3/(9*d**2) - b*e*x**3*log(c*x**n
)/(3*d**2) - b*e**2*n*x**2/(4*d**3) + b*e**2*x**2*log(c*x**n)/(2*d**3) - b*
e**4*n*Piecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*
x*exp_polar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_p
olar(I*pi)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(
e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_pol
ar(I*pi)/e), True))/d, True))/d**4 + b*e**4*Piecewise((x/e, Eq(d, 0)), (log
(d*x + e)/d, True))*log(c*x**n)/d**4 + b*e**3*n*x/d**4 - b*e**3*x*log(c*x**
n)/d**4
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^3}{d + \frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(d + e/x), x)
```

3.330 $\int \frac{x^2(a+b\log(cx^n))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=148

$$-\frac{be^3n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^4}-\frac{e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d^4}-\frac{ex^2(a+b\log(cx^n))}{2d^2}+\frac{x^3(a+b\log(cx^n))}{3d}+\frac{ae^2x}{d^3}+\frac{be^2x\log}{d}$$

```
[Out] (a*e^2*x)/d^3 - (b*e^2*n*x)/d^3 + (b*e*n*x^2)/(4*d^2) - (b*n*x^3)/(9*d) + (
b*e^2*x*Log[c*x^n])/d^3 - (e*x^2*(a + b*Log[c*x^n]))/(2*d^2) + (x^3*(a + b*
Log[c*x^n]))/(3*d) - (e^3*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d^4 - (b*e^3
*n*PolyLog[2, -((d*x)/e)])/d^4
```

Rubi [A] time = 0.168242, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$-\frac{be^3n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^4}-\frac{e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d^4}-\frac{ex^2(a+b\log(cx^n))}{2d^2}+\frac{x^3(a+b\log(cx^n))}{3d}+\frac{ae^2x}{d^3}+\frac{be^2x\log}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (a*e^2*x)/d^3 - (b*e^2*n*x)/d^3 + (b*e*n*x^2)/(4*d^2) - (b*n*x^3)/(9*d) + (
b*e^2*x*Log[c*x^n])/d^3 - (e*x^2*(a + b*Log[c*x^n]))/(2*d^2) + (x^3*(a + b*
Log[c*x^n]))/(3*d) - (e^3*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d^4 - (b*e^3
*n*PolyLog[2, -((d*x)/e)])/d^4
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2 (a + b\log(cx^n))}{d + \frac{e}{x}}\,dx = \int \left(\frac{e^2 (a + b\log(cx^n))}{d^3} - \frac{ex (a + b\log(cx^n))}{d^2} + \frac{x^2 (a + b\log(cx^n))}{d} - \frac{e^3 (a + b\log(cx^n))}{d^3(e + dx)}\right) dx$$

$$= \frac{\int x^2 (a + b\log(cx^n))\,dx}{d} - \frac{e\int x (a + b\log(cx^n))\,dx}{d^2} + \frac{e^2\int (a + b\log(cx^n))\,dx}{d^3} - \frac{e^3\int \frac{a+b\log}{e+d}}{d^3}$$

$$= \frac{ae^2x}{d^3} + \frac{benx^2}{4d^2} - \frac{bnx^3}{9d} - \frac{ex^2 (a + b\log(cx^n))}{2d^2} + \frac{x^3 (a + b\log(cx^n))}{3d} - \frac{e^3 (a + b\log(cx^n))\log(}{d^4}$$

$$= \frac{ae^2x}{d^3} - \frac{be^2nx}{d^3} + \frac{benx^2}{4d^2} - \frac{bnx^3}{9d} + \frac{be^2x\log(cx^n)}{d^3} - \frac{ex^2 (a + b\log(cx^n))}{2d^2} + \frac{x^3 (a + b\log(cx^n))}{3d}$$

Mathematica [A] time = 0.0694653, size = 142, normalized size = 0.96

$$\frac{-36be^3n\text{PolyLog}\left(2,-\frac{dx}{e}\right) - 18ad^2ex^2 + 12ad^3x^3 + 36ade^2x - 36ae^3\log\left(\frac{dx}{e}+1\right) + 6b\log(cx^n)\left(dx\left(2d^2x^2 - 3dex + 6e^2\right)\right.}{36d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (36*a*d*e^2*x - 36*b*d*e^2*n*x - 18*a*d^2*e*x^2 + 9*b*d^2*e*n*x^2 + 12*a*d^
3*x^3 - 4*b*d^3*n*x^3 - 36*a*e^3*Log[1 + (d*x)/e] + 6*b*Log[c*x^n]*(d*x*(6*
e^2 - 3*d*e*x + 2*d^2*x^2) - 6*e^3*Log[1 + (d*x)/e]) - 36*b*e^3*n*PolyLog[2
, -((d*x)/e)])/(36*d^4)
```

Maple [C] time = 0.174, size = 693, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(d+e/x),x)
```

```
[Out] 1/2*I*b*Pi*csgn(I*c*x^n)^3*e^3/d^4*ln(d*x+e)+1/6*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2/d*x^3+1/3*b*ln(x^n)/d*x^3-1/2*a/d^2*e*x^2-a*e^3/d^4*ln(d*x+e)+1/3*
b*ln(c)/d*x^3-1/6*I*b*Pi*csgn(I*c*x^n)^3/d*x^3-49/36*b*n*e^3/d^4+b*n*e^3/d^
4*ln(d*x+e)*ln(-d*x/e)+b*ln(x^n)/d^3*x*e^2-b*ln(x^n)*e^3/d^4*ln(d*x+e)-1/2*
```

```
b*ln(x^n)/d^2*e*x^2+1/6*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*x^3+1/4*I*b*Pi*c
sgn(I*c*x^n)^3/d^2*e*x^2-1/2*I*b*Pi*csgn(I*c*x^n)^3/d^3*x*e^2+1/2*I*b*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^3/d^4*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*
csgn(I*c*x^n)^2/d^3*x*e^2+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*x*e^2-1/
2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*e^3/d^4*ln(d*x+e)-1/2*I*b*Pi*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)/d^3*x*e^2+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)/d^2*e*x^2+1/3*a/d*x^3+b*ln(c)/d^3*x*e^2-b*ln(c)*e^3/d^4*ln(d*x+e)+b*
n*e^3/d^4*dilog(-d*x/e)-1/2*b*ln(c)/d^2*e*x^2-1/6*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)/d*x^3-1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*e*x^2-1/4*
I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*e*x^2-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*
c*x^n)^2*e^3/d^4*ln(d*x+e)+a*e^2*x/d^3+1/4*b*e*n*x^2/d^2-1/9*b*n*x^3/d-b*e^
2*n*x/d^3
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{6}\,a\left(\frac{6\,e^3\log\left(dx+e\right)}{d^4}-\frac{2\,d^2x^3-3\,dex^2+6\,e^2x}{d^3}\right)+b\int\frac{x^3\log\left(c\right)+x^3\log\left(x^n\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] -1/6*a*(6*e^3*log(d*x + e)/d^4 - (2*d^2*x^3 - 3*d*e*x^2 + 6*e^2*x)/d^3) + b
*integrate((x^3*log(c) + x^3*log(x^n))/(d*x + e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^3\log\left(cx^n\right)+ax^3}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(d*x + e), x)
```

Sympy [A] time = 109.785, size = 248, normalized size = 1.68

$$\frac{ax^3}{3d} - \frac{aex^2}{2d^2} - \frac{ae^3\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^3} + \frac{ae^2x}{d^3} - \frac{bnx^3}{9d} + \frac{bx^3\log(cx^n)}{3d} + \frac{benx^2}{4d^2} - \frac{bex^2\log(cx^n)}{2d^2} + \frac{be^3n\left(\left(\begin{cases}\frac{x}{e}\\ \begin{cases}\log(e)\,\mathrm{l}\ldots\\ -\log(e\ldots\\ -G_{2,2}^{2,0}(\ldots\end{cases}\end{cases}\right.\right.}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] a*x**3/(3*d) - a*e*x**2/(2*d**2) - a*e**3*Piecewise((x/e, Eq(d, 0)), (log(d
*x + e)/d, True))/d**3 + a*e**2*x/d**3 - b*n*x**3/(9*d) + b*x**3*log(c*x**n
)/(3*d) + b*e*n*x**2/(4*d**2) - b*e*x**2*log(c*x**n)/(2*d**2) + b*e**3*n*Pi
ecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_pol
ar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi
)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meij
erg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/
e), True))/d, True))/d**3 - b*e**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)
/d, True))*log(c*x**n)/d**3 - b*e**2*n*x/d**3 + b*e**2*x*log(c*x**n)/d**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^2}{d + \frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(d + e/x), x)
```

3.331 $\int \frac{x(a+b\log(cx^n))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=107

$$\frac{be^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^3}+\frac{e^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d}-\frac{aex}{d^2}-\frac{bex\log\left(cx^n\right)}{d^2}+\frac{benx}{d^2}-\frac{bnx^2}{4d}$$

```
[Out] -((a*e*x)/d^2) + (b*e*n*x)/d^2 - (b*n*x^2)/(4*d) - (b*e*x*Log[c*x^n])/d^2 +
 (x^2*(a + b*Log[c*x^n]))/(2*d) + (e^2*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])
/d^3 + (b*e^2*n*PolyLog[2, -((d*x)/e)])/d^3
```

Rubi [A] time = 0.120086, antiderivative size = 107, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^3}+\frac{e^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3}+\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{2d}-\frac{aex}{d^2}-\frac{bex\log\left(cx^n\right)}{d^2}+\frac{benx}{d^2}-\frac{bnx^2}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] -((a*e*x)/d^2) + (b*e*n*x)/d^2 - (b*n*x^2)/(4*d) - (b*e*x*Log[c*x^n])/d^2 +
 (x^2*(a + b*Log[c*x^n]))/(2*d) + (e^2*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])
/d^3 + (b*e^2*n*PolyLog[2, -((d*x)/e)])/d^3
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x(a+b\log(cx^n))}{d+\frac{e}{x}}\,dx=\int\left(-\frac{e(a+b\log(cx^n))}{d^2}+\frac{x(a+b\log(cx^n))}{d}+\frac{e^2(a+b\log(cx^n))}{d^2(e+dx)}\right)dx$$

$$=\frac{\int x(a+b\log(cx^n))\,dx}{d}-\frac{e\int(a+b\log(cx^n))\,dx}{d^2}+\frac{e^2\int\frac{a+b\log(cx^n)}{e+dx}\,dx}{d^2}$$

$$=-\frac{aex}{d^2}-\frac{bnx^2}{4d}+\frac{x^2(a+b\log(cx^n))}{2d}+\frac{e^2(a+b\log(cx^n))\log\left(1+\frac{dx}{e}\right)}{d^3}-\frac{(be)\int\log(cx^n)\,dx}{d^2}-$$

$$=-\frac{aex}{d^2}+\frac{benx}{d^2}-\frac{bnx^2}{4d}-\frac{bex\log(cx^n)}{d^2}+\frac{x^2(a+b\log(cx^n))}{2d}+\frac{e^2(a+b\log(cx^n))\log\left(1+\frac{dx}{e}\right)}{d^3}$$

Mathematica [A] time = 0.0482638, size = 105, normalized size = 0.98

$$\frac{4be^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right)+2ad^2x^2+4ae^2\log\left(\frac{dx}{e}+1\right)-4adex+2b\log\left(cx^n\right)\left(2e^2\log\left(\frac{dx}{e}+1\right)+dx(dx-2e)\right)-bd^2nx^2}{4d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e/x),x]
```

```
[Out] (-4*a*d*e*x + 4*b*d*e*n*x + 2*a*d^2*x^2 - b*d^2*n*x^2 + 4*a*e^2*Log[1 + (d*
x)/e] + 2*b*Log[c*x^n]*(d*x*(-2*e + d*x) + 2*e^2*Log[1 + (d*x)/e]) + 4*b*e^
2*n*PolyLog[2, -((d*x)/e)])/(4*d^3)
```

Maple [C] time = 0.169, size = 521, normalized size = 4.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(d+e/x),x)
```

```
[Out] -1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^2/d+b*ln(c)*e^2/d^3*ln(d*
x+e)-b*ln(c)/d^2*x*e-1/4*I*b*Pi*csgn(I*c*x^n)^3*x^2/d+1/2*b*ln(x^n)*x^2/d+a
*e^2/d^3*ln(d*x+e)+1/2*b*ln(c)*x^2/d+5/4*b*n*e^2/d^3-b*n*e^2/d^3*ln(d*x+e)*
ln(-d*x/e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*x*e+1/4*I*b*P
i*csgn(I*x^n)*csgn(I*c*x^n)^2*x^2/d+1/4*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*x^
2/d-1/2*I*b*Pi*csgn(I*c*x^n)^3*e^2/d^3*ln(d*x+e)+1/2*I*b*Pi*csgn(I*c*x^n)^3
/d^2*x*e-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e^2/d^3*ln(d*x+e)+1
/2*a*x^2/d-b*n*e^2/d^3*dilog(-d*x/e)-b*ln(x^n)/d^2*x*e+b*ln(x^n)*e^2/d^3*ln
(d*x+e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*x*e+1/2*I*b*Pi*csgn(I*c*
x^n)^2*csgn(I*c)*e^2/d^3*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*e
^2/d^3*ln(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*x*e-a*e*x/d^2-1/4
*b*n*x^2/d+b*e*n*x/d^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\,a\left(\frac{2\,e^2\log\left(dx+e\right)}{d^3}+\frac{dx^2-2\,ex}{d^2}\right)+b\int\frac{x^2\log\left(c\right)+x^2\log\left(x^n\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] 1/2*a*(2*e^2*log(d*x + e)/d^3 + (d*x^2 - 2*e*x)/d^2) + b*integrate((x^2*log
(c) + x^2*log(x^n))/(d*x + e), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^2\log\left(cx^n\right)+ax^2}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(d*x + e), x)
```

Sympy [A] time = 87.3856, size = 199, normalized size = 1.86

$$\frac{ax^2}{2d}+\frac{ae^2\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^2}-\frac{aex}{d^2}-\frac{bnx^2}{4d}+\frac{bx^2\log\left(cx^n\right)}{2d}-\frac{be^2n\left(\left(\begin{cases}\frac{x}{e}\\ \frac{\begin{cases}\log(e)\log(x)-\text{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -\log(e)\log\left(\frac{1}{x}\right)-\text{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,\end{matrix}\right.\end{cases}}{d}\end{cases}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] a*x**2/(2*d) + a*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d*
*2 - a*e*x/d**2 - b*n*x**2/(4*d) + b*x**2*log(c*x**n)/(2*d) - b*e**2*n*Piec
ewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar
(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/
e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijer
g(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e)
, True))/d, True))/d**2 + b*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d
```

```
, True))*log(c*x**n)/d**2 + b*e*n*x/d**2 - b*e*x*log(c*x**n)/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x}{d + \frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(d + e/x), x)
```

3.332 $\int \frac{a+b\log(cx^n)}{d+\frac{e}{x}} dx$

Optimal. Leaf size=69

$$-\frac{ben\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^2}-\frac{e\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx^n)}{d}-\frac{bnx}{d}$$

```
[Out] (a*x)/d - (b*n*x)/d + (b*x*Log[c*x^n])/d - (e*(a + b*Log[c*x^n])*Log[1 + (d
*x)/e])/d^2 - (b*e*n*PolyLog[2, -((d*x)/e)])/d^2
```

Rubi [A] time = 0.0780385, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.3, Rules used = {193, 43, 2330, 2295, 2317, 2391}

$$-\frac{ben\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^2}-\frac{e\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx^n)}{d}-\frac{bnx}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(d + e/x),x]
```

```
[Out] (a*x)/d - (b*n*x)/d + (b*x*Log[c*x^n])/d - (e*(a + b*Log[c*x^n])*Log[1 + (d
*x)/e])/d^2 - (b*e*n*PolyLog[2, -((d*x)/e)])/d^2
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
```

```
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log\left(cx^n\right)}{d+\frac{e}{x}}\,dx &= \int \left(\frac{a+b\log\left(cx^n\right)}{d}-\frac{e\left(a+b\log\left(cx^n\right)\right)}{d(e+dx)}\right)dx\\
&= \frac{\int \left(a+b\log\left(cx^n\right)\right)\,dx}{d}-\frac{e\int \frac{a+b\log\left(cx^n\right)}{e+dx}\,dx}{d}\\
&= \frac{ax}{d}-\frac{e\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx}{e}\right)}{d^2}+\frac{b\int \log\left(cx^n\right)\,dx}{d}+\frac{(ben)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d^2}\\
&= \frac{ax}{d}-\frac{bnx}{d}+\frac{bx\log\left(cx^n\right)}{d}-\frac{e\left(a+b\log\left(cx^n\right)\right)\log\left(1+\frac{dx}{e}\right)}{d^2}-\frac{ben\text{Li}_2\left(-\frac{dx}{e}\right)}{d^2}
\end{aligned}$$

Mathematica [A] time = 0.0324424, size = 66, normalized size = 0.96

$$\frac{-ben\text{PolyLog}\left(2,-\frac{dx}{e}\right)-ae\log\left(\frac{dx}{e}+1\right)+adx+b\log\left(cx^n\right)\left(dx-e\log\left(\frac{dx}{e}+1\right)\right)-bdnx}{d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e/x),x]
```

```
[Out] (a*d*x - b*d*n*x - a*e*Log[1 + (d*x)/e] + b*Log[c*x^n]*(d*x - e*Log[1 + (d*
x)/e]) - b*e*n*PolyLog[2, -((d*x)/e)])/d^2
```

Maple [C] time = 0.193, size = 343, normalized size = 5.

$$\frac{b\ln\left(x^{n}\right)x}{d}-\frac{b\ln\left(x^{n}\right)e\ln\left(dx+e\right)}{d^{2}}-\frac{bnx}{d}-\frac{enb}{d^{2}}+\frac{enb\ln\left(dx+e\right)}{d^{2}}\ln\left(-\frac{dx}{e}\right)+\frac{enb}{d^{2}}\mathrm{dilog}\left(-\frac{dx}{e}\right)+\frac{\frac{i}{2}b\pi\left(\mathrm{csgn}\left(icx^{n}\right)\right)^{3}e\ln}{d^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(d+e/x),x)
```

```
[Out] b*ln(x^n)/d*x-b*ln(x^n)*e/d^2*ln(d*x+e)-b*n*x/d-b*n*e/d^2+b*n*e/d^2*ln(d*x+
e)*ln(-d*x/e)+b*n*e/d^2*dilog(-d*x/e)+1/2*I*b*Pi*csgn(I*c*x^n)^3*e/d^2*ln(d
*x+e)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2*e/d^2*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*x-1/2*I
*b*Pi*csgn(I*c*x^n)^3/d*x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*
x+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*e/d^2*ln(d*x+e)-1/2*I*b*Pi
*csgn(I*c*x^n)^2*csgn(I*c)*e/d^2*ln(d*x+e)+b*ln(c)/d*x-b*ln(c)*e/d^2*ln(d*x
+e)+a*x/d-a*e/d^2*ln(d*x+e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a\left(\frac{x}{d}-\frac{e\log\left(dx+e\right)}{d^{2}}\right)+b\int\frac{x\log\left(c\right)+x\log\left(x^{n}\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x),x, algorithm="maxima")
```

```
[Out] a*(x/d - e*log(d*x + e)/d^2) + b*integrate((x*log(c) + x*log(x^n))/(d*x + e
), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx\log\left(cx^{n}\right)+ax}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x*log(c*x^n) + a*x)/(d*x + e), x)
```

Sympy [A] time = 59.7241, size = 144, normalized size = 2.09

$$-\frac{ae\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d}+\frac{ax}{d}+\frac{ben\left(\begin{cases}\frac{x}{e} \\ \frac{\begin{cases}\log(e)\log(x)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{for}\\ -\log(e)\log\left(\frac{1}{x}\right)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{for}\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)\log(e)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{oth}\end{cases}}{d}\end{cases}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x),x)
```

```
[Out] -a*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d + a*x/d + b*e*n*P
iecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_po
lar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*p
i)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + mei
jerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)
/e), True))/d, True))/d - b*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, T
rue))*log(c*x**n)/d - b*n*x/d + b*x*log(c*x**n)/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n)+a}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(d + e/x), x)
```

3.333 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x} dx$

Optimal. Leaf size=39

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d}+\frac{\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d}$$

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d + (b*n*PolyLog[2, -((d*x)/e)])/d
```

Rubi [A] time = 0.0750483, antiderivative size = 39, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {2333, 2317, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d}+\frac{\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x),x]
```

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (d*x)/e])/d + (b*n*PolyLog[2, -((d*x)/e)])/d
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x}\,dx = \int \frac{a+b\log(cx^n)}{e+dx}\,dx$$
$$= \frac{(a+b\log(cx^n))\log\left(1+\frac{dx}{e}\right)}{d} - \frac{(bn)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d}$$
$$= \frac{(a+b\log(cx^n))\log\left(1+\frac{dx}{e}\right)}{d} + \frac{bn\text{Li}_2\left(-\frac{dx}{e}\right)}{d}$$

Mathematica [A] time = 0.0070959, size = 37, normalized size = 0.95

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx}{e}\right)+\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x),x]
```

```
[Out] ((a + b*Log[c*x^n])*Log[1 + (d*x)/e] + b*n*PolyLog[2, -((d*x)/e)])/d
```

Maple [C] time = 0.135, size = 195, normalized size = 5.

$$\frac{b\ln(dx+e)\ln(x^n)}{d} - \frac{bn\ln(dx+e)}{d}\ln\left(-\frac{dx}{e}\right) - \frac{bn}{d}\text{dilog}\left(-\frac{dx}{e}\right) + \frac{\frac{i}{2}\ln(dx+e)\,b\pi\,\text{csgn}(ix^n)(\text{csgn}(icx^n))^2}{d} - \frac{\frac{i}{2}\ln(dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(d+e/x)/x,x)
```

```
[Out] b*ln(d*x+e)/d*ln(x^n)-b/d*n*ln(d*x+e)*ln(-d*x/e)-b/d*n*dilog(-d*x/e)+1/2*I*
ln(d*x+e)/d*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(d*x+e)/d*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*ln(d*x+e)/d*b*Pi*csgn(I*c*x^n)^3+1/2*I*l
n(d*x+e)/d*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)+ln(d*x+e)/d*b*ln(c)+a*ln(d*x+e)/d
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$b\int \frac{\log(c) + \log(x^n)}{dx + e}\,dx + \frac{a\log(dx + e)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x,x, algorithm="maxima")
```

```
[Out] b*integrate((log(c) + log(x^n))/(d*x + e), x) + a*log(d*x + e)/d
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx^n) + a}{dx + e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(d*x + e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{dx + e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d*x + e), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{\left(d + \frac{e}{x}\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x), x)
```

3.334 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^2}\,dx$

Optimal. Leaf size=44

$$\frac{bn\text{PolyLog}\left(2,-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)(a+b\log(cx^n))}{e}$$

```
[Out] -((Log[1 + e/(d*x)]*(a + b*Log[c*x^n]))/e) + (b*n*PolyLog[2, -(e/(d*x))])/e
```

Rubi [A] time = 0.0660136, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2337, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)(a+b\log(cx^n))}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x^2),x]
```



```
[Out] -((Log[1 + e/(d*x)]*(a + b*Log[c*x^n]))/e) + (b*n*PolyLog[2, -(e/(d*x))])/e
```


Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^2}\,dx = -\frac{\log\left(1+\frac{e}{dx}\right)(a+b\log(cx^n))}{e} + \frac{(bn)\int \frac{\log\left(1+\frac{e}{dx}\right)}{x}\,dx}{e}$$
$$= -\frac{\log\left(1+\frac{e}{dx}\right)(a+b\log(cx^n))}{e} + \frac{bn\mathrm{Li}_2\left(-\frac{e}{dx}\right)}{e}$$

Mathematica [A] time = 0.0349509, size = 63, normalized size = 1.43

$$\frac{(a+b\log(cx^n))\left(a+b\log(cx^n)-2bn\log\left(\frac{dx}{e}+1\right)\right)}{2ben} - \frac{bn\mathrm{PolyLog}\left(2,-\frac{dx}{e}\right)}{e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x^2),x]
```

```
[Out] ((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 + (d*x)/e]))/(2*b*e*n)
- (b*n*PolyLog[2, -((d*x)/e)])/e
```

Maple [C] time = 0.134, size = 336, normalized size = 7.6

$$\frac{b\ln(x^n)\ln(x)}{e} - \frac{b\ln(x^n)\ln(dx+e)}{e} - \frac{bn(\ln(x))^2}{2e} + \frac{bn\ln(dx+e)}{e}\ln\left(-\frac{dx}{e}\right) + \frac{bn}{e}\mathrm{dilog}\left(-\frac{dx}{e}\right) - \frac{\frac{i}{2}b\pi\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(d+e/x)/x^2,x)
```

```
[Out] b*ln(x^n)/e*ln(x)-b*ln(x^n)/e*ln(d*x+e)-1/2*b*n/e*ln(x)^2+b*n/e*ln(d*x+e)*l
n(-d*x/e)+b*n/e*dilog(-d*x/e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)/e*ln(x)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e*ln(d*x+e)+1/2*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e*ln(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^3/e*l
n(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3/e*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c
*x^n)^2/e*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e*ln(x)-1/2*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)/e*ln(d*x+e)+b*ln(c)/e*ln(x)-b*ln(c)/e*ln(d*x+e)+a/e*
ln(x)-a/e*ln(d*x+e)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-a\left(\frac{\log(dx+e)}{e} - \frac{\log(x)}{e}\right) + b\int \frac{\log(c) + \log(x^n)}{dx^2 + ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^2,x, algorithm="maxima")
```

```
[Out] -a*(log(d*x + e)/e - log(x)/e) + b*integrate((log(c) + log(x^n))/(d*x^2 + e
*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx^n) + a}{dx^2 + ex}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(d*x^2 + e*x), x)
```

Sympy [C] time = 11.2964, size = 156, normalized size = 3.55

$$\frac{2ad\left(\begin{cases}-\frac{x}{e} - \frac{1}{2d} & \text{for } d = 0\\ \frac{\log(2dx)}{2d} & \text{otherwise}\end{cases}\right)}{e} - \frac{2ad\left(\begin{cases}\frac{x}{e} + \frac{1}{2d} & \text{for } d = 0\\ \frac{\log(2dx+2e)}{2d} & \text{otherwise}\end{cases}\right)}{e} + bn\left(\left(\begin{cases}-\frac{1}{dx}\\ \log(d)\log(x) + \mathrm{Li}_2\left(\frac{ee^{i\pi}}{dx}\right)\\ -\log(d)\log\left(\frac{1}{x}\right) + \mathrm{Li}_2\left(\frac{ee^{i\pi}}{dx}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d) + G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right.\end{cases}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x**2,x)
```

```
[Out] 2*a*d*Piecewise((-x/e - 1/(2*d), Eq(d, 0)), (log(2*d*x)/(2*d), True))/e - 2
*a*d*Piecewise((x/e + 1/(2*d), Eq(d, 0)), (log(2*d*x + 2*e)/(2*d), True))/e
```

```
 + b*n*Piecewise((-1/(d*x), Eq(e, 0)), (Piecewise((log(d)*log(x) + polylog(
2, e*exp_polar(I*pi)/(d*x)), Abs(x) < 1), (-log(d)*log(1/x) + polylog(2, e*
exp_polar(I*pi)/(d*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ())
, x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) + polylog(2, e*
exp_polar(I*pi)/(d*x)), True))/e, True)) - b*Piecewise((1/(d*x), Eq(e, 0)),
 (log(d + e/x)/e, True))*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{\left(d + \frac{e}{x}\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x^2), x)
```

3.335 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^3}\,dx$

Optimal. Leaf size=95

$$\frac{bdn\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^2}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2be^2n}+\frac{d\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{a+b\log\left(cx^n\right)}{ex}-\frac{bn}{ex}$$

```
[Out] -((b*n)/(e*x)) - (a + b*Log[c*x^n])/(e*x) - (d*(a + b*Log[c*x^n])^2)/(2*b*e
^2*n) + (d*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/e^2 + (b*d*n*PolyLog[2, -((
d*x)/e)])/e^2
```

Rubi [A] time = 0.147336, antiderivative size = 95, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$\frac{bdn\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^2}-\frac{d\left(a+b\log\left(cx^n\right)\right)^2}{2be^2n}+\frac{d\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^2}-\frac{a+b\log\left(cx^n\right)}{ex}-\frac{bn}{ex}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x^3),x]
```

```
[Out] -((b*n)/(e*x)) - (a + b*Log[c*x^n])/(e*x) - (d*(a + b*Log[c*x^n])^2)/(2*b*e
^2*n) + (d*(a + b*Log[c*x^n])*Log[1 + (d*x)/e])/e^2 + (b*d*n*PolyLog[2, -((
d*x)/e)])/e^2
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^3}\,dx &= \int \left(\frac{a+b\log(cx^n)}{ex^2}-\frac{d\,(a+b\log(cx^n))}{e^2x}+\frac{d^2\,(a+b\log(cx^n))}{e^2(e+dx)}\right)dx\\
&= -\frac{d\int \frac{a+b\log(cx^n)}{x}\,dx}{e^2}+\frac{d^2\int \frac{a+b\log(cx^n)}{e+dx}\,dx}{e^2}+\frac{\int \frac{a+b\log(cx^n)}{x^2}\,dx}{e}\\
&= -\frac{bn}{ex}-\frac{a+b\log(cx^n)}{ex}-\frac{d\,(a+b\log(cx^n))^2}{2be^2n}+\frac{d\,(a+b\log(cx^n))\log\left(1+\frac{dx}{e}\right)}{e^2}-\frac{(bdn)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}}{e^2}\\
&= -\frac{bn}{ex}-\frac{a+b\log(cx^n)}{ex}-\frac{d\,(a+b\log(cx^n))^2}{2be^2n}+\frac{d\,(a+b\log(cx^n))\log\left(1+\frac{dx}{e}\right)}{e^2}+\frac{bdn\mathrm{Li}_2\left(-\frac{dx}{e}\right)}{e^2}
\end{aligned}$$

Mathematica [A] time = 0.0894441, size = 88, normalized size = 0.93

$$-\frac{-2bdn\text{PolyLog}\left(2,-\frac{dx}{e}\right)-2d\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n))+\frac{d(a+b\log(cx^n))^2}{bn}+\frac{2e(a+b\log(cx^n))}{x}+\frac{2ben}{x}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x^3),x]
```

```
[Out] -((2*b*e*n)/x + (2*e*(a + b*Log[c*x^n]))/x + (d*(a + b*Log[c*x^n])^2)/(b*n)
 - 2*d*(a + b*Log[c*x^n])*Log[1 + (d*x)/e] - 2*b*d*n*PolyLog[2, -((d*x)/e)]
)/(2*e^2)
```

Maple [C] time = 0.146, size = 504, normalized size = 5.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(d+e/x)/x^3,x)
```

```
[Out] -b*ln(x^n)/e/x-a*d/e^2*ln(x)+a*d/e^2*ln(d*x+e)-b*ln(c)/e/x+1/2*I*b*Pi*csgn(
I*c*x^n)^3/e/x-b*n*d/e^2*ln(d*x+e)*ln(-d*x/e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I
*c*x^n)^2/e/x+b*ln(x^n)*d/e^2*ln(d*x+e)-b*ln(x^n)*d/e^2*ln(x)-1/2*I*b*Pi*cs
gn(I*c*x^n)^2*csgn(I*c)/e/x-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
d/e^2*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2*ln(x)+
b*ln(c)*d/e^2*ln(d*x+e)-b*ln(c)*d/e^2*ln(x)+1/2*I*b*Pi*csgn(I*c*x^n)^3*d/e^
2*ln(x)-b*n*d/e^2*dilog(-d*x/e)+1/2*b*n*d/e^2*ln(x)^2-a/e/x-1/2*I*b*Pi*csgn
(I*c*x^n)^3*d/e^2*ln(d*x+e)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2*ln(x
)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2*ln(d*x+e)+1/2*I*b*Pi*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)/e/x+1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d/e^2
*ln(d*x+e)-1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2*ln(x)-b*n/e/x
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a\left(\frac{d\log(dx+e)}{e^2}-\frac{d\log(x)}{e^2}-\frac{1}{ex}\right)+b\int\frac{\log(c)+\log(x^n)}{dx^3+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^3,x, algorithm="maxima")
```

```
[Out] a*(d*log(d*x + e)/e^2 - d*log(x)/e^2 - 1/(e*x)) + b*integrate((log(c) + log
(x^n))/(d*x^3 + e*x^2), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{dx^{3}+ex^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(d*x^3 + e*x^2), x)
```

Sympy [A] time = 53.9945, size = 197, normalized size = 2.07

$$\frac{ad^{2}\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log\left(dx+e\right)}{d} & \text{otherwise}\end{cases}\right)}{e^{2}}-\frac{ad\log\left(x\right)}{e^{2}}-\frac{a}{ex}-\frac{bd^{2}n\left(\begin{cases}\frac{x}{e}\\ \frac{\begin{cases}\log\left(e\right)\log\left(x\right)-\mathrm{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right)\\ -\log\left(e\right)\log\left(\frac{1}{x}\right)-\mathrm{Li}_{2}\left(\frac{dxe^{i\pi}}{e}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log\left(e\right)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)\log\left(e\right)-\mathrm{Li}_{2}\end{cases}}{d}\end{cases}\right)}{e^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x**3,x)
```

```
[Out] a*d**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**2 - a*d*log(x)
/e**2 - a/(e*x) - b*d**2*n*Piecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*lo
g(x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) -
polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), (
(0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - po
lylog(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e**2 + b*d**2*Piecewise((
x/e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x**n)/e**2 + b*d*n*log(x)**2/
```

```
(2*e**2) - b*d*log(x)*log(c*x**n)/e**2 - b*n/(e*x) - b*log(c*x**n)/(e*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{\left(d + \frac{e}{x}\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x^3), x)
```

3.336 $\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^4}\,dx$

Optimal. Leaf size=135

$$-\frac{bd^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^3}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2be^3n}-\frac{d^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2x}-\frac{a+b\log\left(cx^n\right)}{2ex^2}$$

```
[Out] -(b*n)/(4*e*x^2) + (b*d*n)/(e^2*x) - (a + b*Log[c*x^n])/(2*e*x^2) + (d*(a +
 b*Log[c*x^n]))/(e^2*x) + (d^2*(a + b*Log[c*x^n])^2)/(2*b*e^3*n) - (d^2*(a
+ b*Log[c*x^n])*Log[1 + (d*x)/e])/e^3 - (b*d^2*n*PolyLog[2, -((d*x)/e)])/e^
3
```

Rubi [A] time = 0.176522, antiderivative size = 135, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$-\frac{bd^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^3}+\frac{d^2\left(a+b\log\left(cx^n\right)\right)^2}{2be^3n}-\frac{d^2\log\left(\frac{dx}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{e^3}+\frac{d\left(a+b\log\left(cx^n\right)\right)}{e^2x}-\frac{a+b\log\left(cx^n\right)}{2ex^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/((d + e/x)*x^4),x]
```


```
[Out] -(b*n)/(4*e*x^2) + (b*d*n)/(e^2*x) - (a + b*Log[c*x^n])/(2*e*x^2) + (d*(a +
 b*Log[c*x^n]))/(e^2*x) + (d^2*(a + b*Log[c*x^n])^2)/(2*b*e^3*n) - (d^2*(a
+ b*Log[c*x^n])*Log[1 + (d*x)/e])/e^3 - (b*d^2*n*PolyLog[2, -((d*x)/e)])/e^
3
```


Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{\left(d+\frac{e}{x}\right)x^4}\,dx = \int \left(\frac{a+b\log(cx^n)}{ex^3} - \frac{d(a+b\log(cx^n))}{e^2x^2} + \frac{d^2(a+b\log(cx^n))}{e^3x} - \frac{d^3(a+b\log(cx^n))}{e^3(e+dx)}\right)dx$$

$$= \frac{d^2\int \frac{a+b\log(cx^n)}{x}\,dx}{e^3} - \frac{d^3\int \frac{a+b\log(cx^n)}{e+dx}\,dx}{e^3} - \frac{d\int \frac{a+b\log(cx^n)}{x^2}\,dx}{e^2} + \frac{\int \frac{a+b\log(cx^n)}{x^3}\,dx}{e}$$

$$= -\frac{bn}{4ex^2} + \frac{bdn}{e^2x} - \frac{a+b\log(cx^n)}{2ex^2} + \frac{d(a+b\log(cx^n))}{e^2x} + \frac{d^2(a+b\log(cx^n))^2}{2be^3n} - \frac{d^2(a+b\log(cx^n)}{e^3}$$

$$= -\frac{bn}{4ex^2} + \frac{bdn}{e^2x} - \frac{a+b\log(cx^n)}{2ex^2} + \frac{d(a+b\log(cx^n))}{e^2x} + \frac{d^2(a+b\log(cx^n))^2}{2be^3n} - \frac{d^2(a+b\log(cx^n)}{e^3}$$

Mathematica [A] time = 0.200894, size = 124, normalized size = 0.92

$$-\frac{4bd^2n\text{PolyLog}\left(2,-\frac{dx}{e}\right) + 4d^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx^n)) - \frac{2d^2(a+b\log(cx^n))^2}{bn} - \frac{4de(a+b\log(cx^n))}{x} + \frac{2e^2(a+b\log(cx^n))}{x^2} - \frac{4bden}{x}}{4e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/((d + e/x)*x^4),x]
```

```
[Out] -((b*e^2*n)/x^2 - (4*b*d*e*n)/x + (2*e^2*(a + b*Log[c*x^n]))/x^2 - (4*d*e*(
a + b*Log[c*x^n]))/x - (2*d^2*(a + b*Log[c*x^n])^2)/(b*n) + 4*d^2*(a + b*Lo
g[c*x^n])*Log[1 + (d*x)/e] + 4*b*d^2*n*PolyLog[2, -((d*x)/e)])/(4*e^3)
```

Maple [C] time = 0.151, size = 689, normalized size = 5.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(d+e/x)/x^4,x)
```

```
[Out] a*d^2/e^3*ln(x)+a*d/e^2/x-a*d^2/e^3*ln(d*x+e)-1/2*b*ln(c)/e/x^2+1/4*I*b*Pi*
csgn(I*c*x^n)^3/e/x^2+b*n*d^2/e^3*ln(d*x+e)*ln(-d*x/e)+b*ln(x^n)*d^2/e^3*ln
(x)+b*ln(x^n)*d/e^2/x-b*ln(x^n)*d^2/e^3*ln(d*x+e)-1/2*a/e/x^2-1/2*b*n*d^2/e
^3*ln(x)^2+b*n*d^2/e^3*dilog(-d*x/e)+b*ln(c)*d^2/e^3*ln(x)+b*ln(c)*d/e^2/x-
b*ln(c)*d^2/e^3*ln(d*x+e)-1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/e/x^2-1/4*
```

```
I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/e/x^2-1/2*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3*l
n(x)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3*ln(d*x+e)-1/2*I
*b*Pi*csgn(I*c*x^n)^3*d/e^2/x+1/2*I*b*Pi*csgn(I*c*x^n)^3*d^2/e^3*ln(d*x+e)-
1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d^2/e^3*ln(x)-1/2*I*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*d/e^2/x-1/2*b*ln(x^n)/e/x^2+1/2*I*b*Pi*csg
n(I*c*x^n)^2*csgn(I*c)*d^2/e^3*ln(x)-1/2*I*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)*d
^2/e^3*ln(d*x+e)+1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3*ln(x)-1/2*I
*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d^2/e^3*ln(d*x+e)+1/2*I*b*Pi*csgn(I*c*x^n
)^2*csgn(I*c)*d/e^2/x+1/4*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/e/x^2+
1/2*I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2*d/e^2/x+b*d*n/e^2/x-1/4*b*n/e/x^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$-\frac{1}{2}\,a\left(\frac{2\,d^2\log\left(dx+e\right)}{e^3}-\frac{2\,d^2\log\left(x\right)}{e^3}-\frac{2\,dx-e}{e^2x^2}\right)+b\int\frac{\log\left(c\right)+\log\left(x^n\right)}{dx^4+ex^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^4,x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*d^2*log(d*x + e)/e^3 - 2*d^2*log(x)/e^3 - (2*d*x - e)/(e^2*x^2))
+ b*integrate((log(c) + log(x^n))/(d*x^4 + e*x^3), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx^n\right)+a}{dx^4+ex^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(d*x^4 + e*x^3), x)
```

Sympy [A] time = 72.1526, size = 246, normalized size = 1.82

$$-\frac{ad^3\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{ad^2\log(x)}{e^3}+\frac{ad}{e^2x}-\frac{a}{2ex^2}+\frac{bd^3n\left(\left(\begin{cases}\frac{x}{e} \\ \frac{\begin{cases}\log(e)\log(x)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -\log(e)\log\left(\frac{1}{x}\right)-\mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(e)\end{cases}}{d}\end{cases}\right)\right)}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e/x)/x**4,x)
```

```
[Out] -a*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**3 + a*d**2*lo
g(x)/e**3 + a*d/(e**2*x) - a/(2*e*x**2) + b*d**3*n*Piecewise((x/e, Eq(d, 0)
), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) <
1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (
-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((),
 (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e
**3 - b*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x**n)
/e**3 - b*d**2*n*log(x)**2/(2*e**3) + b*d**2*log(x)*log(c*x**n)/e**3 + b*d*
n/(e**2*x) + b*d*log(c*x**n)/(e**2*x) - b*n/(4*e*x**2) - b*log(c*x**n)/(2*e
*x**2)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n)+a}{\left(d+\frac{e}{x}\right)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e/x)/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((d + e/x)*x^4), x)
```

3.337 $\int \frac{x^3(a+b\log(cx))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=170

$$\frac{be^4\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^5}+\frac{e^2x^2(a+b\log(cx))}{2d^3}+\frac{e^4\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^5}-\frac{ex^3(a+b\log(cx))}{3d^2}+\frac{x^4(a+b\log(cx))}{4d}-$$

```
[Out] -((a*e^3*x)/d^4) + (b*e^3*x)/d^4 - (b*e^2*x^2)/(4*d^3) + (b*e*x^3)/(9*d^2)
- (b*x^4)/(16*d) - (b*e^3*x*Log[c*x])/d^4 + (e^2*x^2*(a + b*Log[c*x]))/(2*d
^3) - (e*x^3*(a + b*Log[c*x]))/(3*d^2) + (x^4*(a + b*Log[c*x]))/(4*d) + (e^
4*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^5 + (b*e^4*PolyLog[2, -((d*x)/e)])/d
^5
```

Rubi [A] time = 0.180993, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^4\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^5}+\frac{e^2x^2(a+b\log(cx))}{2d^3}+\frac{e^4\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^5}-\frac{ex^3(a+b\log(cx))}{3d^2}+\frac{x^4(a+b\log(cx))}{4d}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] -((a*e^3*x)/d^4) + (b*e^3*x)/d^4 - (b*e^2*x^2)/(4*d^3) + (b*e*x^3)/(9*d^2)
- (b*x^4)/(16*d) - (b*e^3*x*Log[c*x])/d^4 + (e^2*x^2*(a + b*Log[c*x]))/(2*d
^3) - (e*x^3*(a + b*Log[c*x]))/(3*d^2) + (x^4*(a + b*Log[c*x]))/(4*d) + (e^
4*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^5 + (b*e^4*PolyLog[2, -((d*x)/e)])/d
^5
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
```

```
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^3(a+b\log(cx))}{d+\frac{e}{x}}\,dx = \int \left(-\frac{e^3(a+b\log(cx))}{d^4}+\frac{e^2x(a+b\log(cx))}{d^3}-\frac{ex^2(a+b\log(cx))}{d^2}+\frac{x^3(a+b\log(cx))}{d}+\frac{e^4(a+b\right.$$
$$=\frac{\int x^3(a+b\log(cx))\,dx}{d}-\frac{e\int x^2(a+b\log(cx))\,dx}{d^2}+\frac{e^2\int x(a+b\log(cx))\,dx}{d^3}-\frac{e^3\int(a+b\log(cx}{d^4}$$
$$=-\frac{ae^3x}{d^4}-\frac{be^2x^2}{4d^3}+\frac{bex^3}{9d^2}-\frac{bx^4}{16d}+\frac{e^2x^2(a+b\log(cx))}{2d^3}-\frac{ex^3(a+b\log(cx))}{3d^2}+\frac{x^4(a+b\log(cx))}{4d}+$$
$$=-\frac{ae^3x}{d^4}+\frac{be^3x}{d^4}-\frac{be^2x^2}{4d^3}+\frac{bex^3}{9d^2}-\frac{bx^4}{16d}-\frac{be^3x\log(cx)}{d^4}+\frac{e^2x^2(a+b\log(cx))}{2d^3}-\frac{ex^3(a+b\log(cx))}{3d^2}$$

Mathematica [A] time = 0.0810033, size = 156, normalized size = 0.92

$$\frac{144be^4\text{PolyLog}\left(2,-\frac{dx}{e}\right)+72d^2e^2x^2(a+b\log(cx))-48d^3ex^3(a+b\log(cx))+36d^4x^4(a+b\log(cx))+144e^4\log\left(\frac{dx}{e}+1\right.}{144d^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] (-144*a*d*e^3*x + 144*b*d*e^3*x - 36*b*d^2*e^2*x^2 + 16*b*d^3*e*x^3 - 9*b*d
^4*x^4 - 144*b*d*e^3*x*Log[c*x] + 72*d^2*e^2*x^2*(a + b*Log[c*x]) - 48*d^3*
e*x^3*(a + b*Log[c*x]) + 36*d^4*x^4*(a + b*Log[c*x]) + 144*e^4*(a + b*Log[c
*x])*Log[1 + (d*x)/e] + 144*b*e^4*PolyLog[2, -((d*x)/e)])/(144*d^5)
```

Maple [A] time = 0.08, size = 209, normalized size = 1.2

$$\frac{ax^4}{4\,d}-\frac{aex^3}{3\,d^2}+\frac{ae^2x^2}{2\,d^3}-\frac{ae^3x}{d^4}+\frac{ae^4\ln(cdx+ce)}{d^5}+\frac{bx^4\ln(cx)}{4\,d}-\frac{bx^4}{16\,d}-\frac{ebx^3\ln(cx)}{3\,d^2}+\frac{ebx^3}{9\,d^2}+\frac{be^2x^2\ln(cx)}{2\,d^3}-\frac{be^2x^2}{4\,d^3}-\frac{be^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] 1/4*a/d*x^4-1/3*a/d^2*e*x^3+1/2*a/d^3*x^2*e^2-a*e^3*x/d^4+a*e^4/d^5*ln(c*d*
x+c*e)+1/4*b/d*x^4*ln(c*x)-1/16*b*x^4/d-1/3*b/d^2*e*x^3*ln(c*x)+1/9*b*e*x^3
/d^2+1/2*b/d^3*e^2*x^2*ln(c*x)-1/4*b*e^2*x^2/d^3-b*e^3*x*ln(c*x)/d^4+b*e^3*
```

```
x/d^4+b*e^4/d^5*dilog((c*d*x+c*e)/c/e)+b*e^4/d^5*ln(c*x)*ln((c*d*x+c*e)/c/e
)
```

Maxima [A] time = 1.40444, size = 284, normalized size = 1.67

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log\left(x\right)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)be^4}{d^5}+\frac{9\left(4\,ad^3+\left(4\,d^3\log\left(c\right)-d^3\right)b\right)x^4-16\left(3\,ad^2e+\left(3\,d^2e\log\left(c\right)-d^2e\right)b\right)x^3+36\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e^4/d^5 + 1/144*(9*(4*a*d^3 + (4*
d^3*log(c) - d^3)*b)*x^4 - 16*(3*a*d^2*e + (3*d^2*e*log(c) - d^2*e)*b)*x^3
+ 36*(2*a*d*e^2 + (2*d*e^2*log(c) - d*e^2)*b)*x^2 - 144*(a*e^3 + (e^3*log(c
) - e^3)*b)*x + 12*(3*b*d^3*x^4 - 4*b*d^2*e*x^3 + 6*b*d*e^2*x^2 - 12*b*e^3*
x)*log(x))/d^4 + (b*e^4*log(c) + a*e^4)*log(d*x + e)/d^5
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^4\log\left(cx\right)+ax^4}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*log(c*x) + a*x^4)/(d*x + e), x)
```

Sympy [A] time = 130.083, size = 280, normalized size = 1.65

$$\frac{ax^4}{4d}-\frac{aex^3}{3d^2}+\frac{ae^2x^2}{2d^3}+\frac{ae^4\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log\left(dx+e\right)}{d} & \text{otherwise}\end{cases}\right)}{d^4}-\frac{ae^3x}{d^4}+\frac{bx^4\log\left(cx\right)}{4d}-\frac{bx^4}{16d}-\frac{bex^3\log\left(cx\right)}{3d^2}+\frac{bex^3}{9d^2}+\frac{be^2x^2\log\left(\right.}{2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] a*x**4/(4*d) - a*e*x**3/(3*d**2) + a*e**2*x**2/(2*d**3) + a*e**4*Piecewise(
(x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d**4 - a*e**3*x/d**4 + b*x**4*log(
c*x)/(4*d) - b*x**4/(16*d) - b*e*x**3*log(c*x)/(3*d**2) + b*e*x**3/(9*d**2)
 + b*e**2*x**2*log(c*x)/(2*d**3) - b*e**2*x**2/(4*d**3) - b*e**4*Piecewise(
(x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)
/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/
Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1,
 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True
))/d, True))/d**4 + b*e**4*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True
))*log(c*x)/d**4 - b*e**3*x*log(c*x)/d**4 + b*e**3*x/d**4
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx) + a)x^3}{d + \frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)*x^3/(d + e/x), x)
```

3.338 $\int \frac{x^2(a+b\log(cx))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=136

$$-\frac{be^3\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^4}-\frac{e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^4}-\frac{ex^2(a+b\log(cx))}{2d^2}+\frac{x^3(a+b\log(cx))}{3d}+\frac{ae^2x}{d^3}+\frac{be^2x\log(cx)}{d^3}$$

```
[Out] (a*e^2*x)/d^3 - (b*e^2*x)/d^3 + (b*e*x^2)/(4*d^2) - (b*x^3)/(9*d) + (b*e^2*
x*Log[c*x])/d^3 - (e*x^2*(a + b*Log[c*x]))/(2*d^2) + (x^3*(a + b*Log[c*x]))
/(3*d) - (e^3*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^4 - (b*e^3*PolyLog[2, -(
(d*x)/e)])/d^4
```

Rubi [A] time = 0.151627, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$-\frac{be^3\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^4}-\frac{e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^4}-\frac{ex^2(a+b\log(cx))}{2d^2}+\frac{x^3(a+b\log(cx))}{3d}+\frac{ae^2x}{d^3}+\frac{be^2x\log(cx)}{d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] (a*e^2*x)/d^3 - (b*e^2*x)/d^3 + (b*e*x^2)/(4*d^2) - (b*x^3)/(9*d) + (b*e^2*
x*Log[c*x])/d^3 - (e*x^2*(a + b*Log[c*x]))/(2*d^2) + (x^3*(a + b*Log[c*x]))
/(3*d) - (e^3*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^4 - (b*e^3*PolyLog[2, -(
(d*x)/e)])/d^4
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x^2(a+b\log(cx))}{d+\frac{e}{x}}\,dx = \int \left(\frac{e^2(a+b\log(cx))}{d^3} - \frac{ex(a+b\log(cx))}{d^2} + \frac{x^2(a+b\log(cx))}{d} - \frac{e^3(a+b\log(cx))}{d^3(e+dx)}\right)dx$$

$$= \frac{\int x^2(a+b\log(cx))\,dx}{d} - \frac{e\int x(a+b\log(cx))\,dx}{d^2} + \frac{e^2\int(a+b\log(cx))\,dx}{d^3} - \frac{e^3\int \frac{a+b\log(cx)}{e+dx}\,dx}{d^3}$$

$$= \frac{ae^2x}{d^3} + \frac{bex^2}{4d^2} - \frac{bx^3}{9d} - \frac{ex^2(a+b\log(cx))}{2d^2} + \frac{x^3(a+b\log(cx))}{3d} - \frac{e^3(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^4}$$

$$= \frac{ae^2x}{d^3} - \frac{be^2x}{d^3} + \frac{bex^2}{4d^2} - \frac{bx^3}{9d} + \frac{be^2x\log(cx)}{d^3} - \frac{ex^2(a+b\log(cx))}{2d^2} + \frac{x^3(a+b\log(cx))}{3d} - \frac{e^3(a+b}{}$$

Mathematica [A] time = 0.0658093, size = 125, normalized size = 0.92

$$\frac{-36be^3\text{PolyLog}\left(2,-\frac{dx}{e}\right) - 18d^2ex^2(a+b\log(cx)) + 12d^3x^3(a+b\log(cx)) - 36e^3\log\left(\frac{dx}{e}+1\right)(a+b\log(cx)) + 36ade^2x}{36d^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] (36*a*d*e^2*x - 36*b*d*e^2*x + 9*b*d^2*e*x^2 - 4*b*d^3*x^3 + 36*b*d*e^2*x*L
og[c*x] - 18*d^2*e*x^2*(a + b*Log[c*x]) + 12*d^3*x^3*(a + b*Log[c*x]) - 36*
e^3*(a + b*Log[c*x])*Log[1 + (d*x)/e] - 36*b*e^3*PolyLog[2, -((d*x)/e)])/(3
6*d^4)
```

Maple [A] time = 0.043, size = 171, normalized size = 1.3

$$\frac{ax^3}{3d} - \frac{aex^2}{2d^2} + \frac{ae^2x}{d^3} - \frac{ae^3\ln(cdx+ce)}{d^4} + \frac{bx^3\ln(cx)}{3d} - \frac{bx^3}{9d} - \frac{ebx^2\ln(cx)}{2d^2} + \frac{ebx^2}{4d^2} + \frac{be^2x\ln(cx)}{d^3} - \frac{be^2x}{d^3} - \frac{be^3}{d^4}\text{dilog}\left(\frac{cd}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] 1/3*a/d*x^3-1/2*a/d^2*e*x^2+a*e^2*x/d^3-a*e^3/d^4*ln(c*d*x+c*e)+1/3*b/d*x^3
*ln(c*x)-1/9*b*x^3/d-1/2*b/d^2*e*x^2*ln(c*x)+1/4*b*e*x^2/d^2+b*e^2*x*ln(c*x
)/d^3-b*e^2*x/d^3-b*e^3/d^4*dilog((c*d*x+c*e)/c/e)-b*e^3/d^4*ln(c*x)*ln((c*
```

```
d*x+c*e)/c/e)
```

Maxima [A] time = 1.60506, size = 221, normalized size = 1.62

$$-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)be^3}{d^4}+\frac{4\left(3\,ad^2+\left(3\,d^2\log(c)-d^2\right)b\right)x^3-9\left(2\,ade+\left(2\,de\log(c)-de\right)b\right)x^2+36\left(ae^2+\right.}{36\,d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] -(log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e^3/d^4 + 1/36*(4*(3*a*d^2 + (3*
d^2*log(c) - d^2)*b)*x^3 - 9*(2*a*d*e + (2*d*e*log(c) - d*e)*b)*x^2 + 36*(a
*e^2 + (e^2*log(c) - e^2)*b)*x + 6*(2*b*d^2*x^3 - 3*b*d*e*x^2 + 6*b*e^2*x)*
log(x))/d^3 - (b*e^3*log(c) + a*e^3)*log(d*x + e)/d^4
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^3\log(cx)+ax^3}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x) + a*x^3)/(d*x + e), x)
```

Sympy [A] time = 108.016, size = 235, normalized size = 1.73

$$\frac{ax^3}{3d}-\frac{aex^2}{2d^2}-\frac{ae^3\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^3}+\frac{ae^2x}{d^3}+\frac{bx^3\log(cx)}{3d}-\frac{bx^3}{9d}-\frac{bex^2\log(cx)}{2d^2}+\frac{bex^2}{4d^2}+\frac{be^3\left(\left(\begin{cases}\frac{x}{e}\\ \log(e)\log(x)\\ -\log(e)\log(\\ -G_{2,2}^{2,0}\left(\begin{matrix}1\\0,0\end{matrix}\right.\end{cases}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] a*x**3/(3*d) - a*e*x**2/(2*d**2) - a*e**3*Piecewise((x/e, Eq(d, 0)), (log(d
*x + e)/d, True))/d**3 + a*e**2*x/d**3 + b*x**3*log(c*x)/(3*d) - b*x**3/(9*
d) - b*e*x**2*log(c*x)/(2*d**2) + b*e*x**2/(4*d**2) + b*e**3*Piecewise((x/e
, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/e),
 Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(
x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1),
 ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True))/d
, True))/d**3 - b*e**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))*l
og(c*x)/d**3 + b*e**2*x*log(c*x)/d**3 - b*e**2*x/d**3
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx)+a)x^2}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)*x^2/(d + e/x), x)
```

3.339 $\int \frac{x(a+b\log(cx))}{d+\frac{e}{x}}\,dx$

Optimal. Leaf size=98

$$\frac{be^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^3}+\frac{e^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^3}+\frac{x^2(a+b\log(cx))}{2d}-\frac{aex}{d^2}-\frac{bex\log(cx)}{d^2}+\frac{bex}{d^2}-\frac{bx^2}{4d}$$

```
[Out] -((a*e*x)/d^2) + (b*e*x)/d^2 - (b*x^2)/(4*d) - (b*e*x*Log[c*x])/d^2 + (x^2*
(a + b*Log[c*x]))/(2*d) + (e^2*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^3 + (b*
e^2*PolyLog[2, -((d*x)/e)])/d^3
```

Rubi [A] time = 0.110443, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {263, 43, 2351, 2295, 2304, 2317, 2391}

$$\frac{be^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^3}+\frac{e^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^3}+\frac{x^2(a+b\log(cx))}{2d}-\frac{aex}{d^2}-\frac{bex\log(cx)}{d^2}+\frac{bex}{d^2}-\frac{bx^2}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] -((a*e*x)/d^2) + (b*e*x)/d^2 - (b*x^2)/(4*d) - (b*e*x*Log[c*x])/d^2 + (x^2*
(a + b*Log[c*x]))/(2*d) + (e^2*(a + b*Log[c*x])*Log[1 + (d*x)/e])/d^3 + (b*
e^2*PolyLog[2, -((d*x)/e)])/d^3
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{x(a+b\log(cx))}{d+\frac{e}{x}}\,dx = \int \left(-\frac{e(a+b\log(cx))}{d^2}+\frac{x(a+b\log(cx))}{d}+\frac{e^2(a+b\log(cx))}{d^2(e+dx)}\right)dx$$

$$= \frac{\int x(a+b\log(cx))\,dx}{d}-\frac{e\int(a+b\log(cx))\,dx}{d^2}+\frac{e^2\int\frac{a+b\log(cx)}{e+dx}\,dx}{d^2}$$

$$= -\frac{aex}{d^2}-\frac{bx^2}{4d}+\frac{x^2(a+b\log(cx))}{2d}+\frac{e^2(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^3}-\frac{(be)\int\log(cx)\,dx}{d^2}-\frac{\left(be^2\right)\int}{}$$

$$= -\frac{aex}{d^2}+\frac{bex}{d^2}-\frac{bx^2}{4d}-\frac{bex\log(cx)}{d^2}+\frac{x^2(a+b\log(cx))}{2d}+\frac{e^2(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^3}+\frac{be^2\mathrm{Li}}{d}$$

Mathematica [A] time = 0.0439753, size = 99, normalized size = 1.01

$$\frac{be^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^3}+\frac{e^2\log\left(\frac{dx+e}{e}\right)(a+b\log(cx))}{d^3}+\frac{x^2(a+b\log(cx))}{2d}-\frac{aex}{d^2}-\frac{bex\log(cx)}{d^2}+\frac{bex}{d^2}-\frac{bx^2}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*Log[c*x]))/(d + e/x),x]
```

```
[Out] -((a*e*x)/d^2) + (b*e*x)/d^2 - (b*x^2)/(4*d) - (b*e*x*Log[c*x])/d^2 + (x^2*
(a + b*Log[c*x]))/(2*d) + (e^2*(a + b*Log[c*x])*Log[(e + d*x)/e])/d^3 + (b*
e^2*PolyLog[2, -((d*x)/e)])/d^3
```

Maple [A] time = 0.044, size = 129, normalized size = 1.3

$$\frac{ax^2}{2\,d}-\frac{aex}{d^2}+\frac{ae^2\ln(cdx+ce)}{d^3}+\frac{bx^2\ln(cx)}{2\,d}-\frac{bx^2}{4\,d}-\frac{bex\ln(cx)}{d^2}+\frac{bex}{d^2}+\frac{be^2}{d^3}\text{dilog}\left(\frac{cdx+ce}{ce}\right)+\frac{be^2\ln(cx)}{d^3}\ln\left(\frac{cdx+ce}{ce}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] 1/2*a*x^2/d-a*e*x/d^2+a*e^2/d^3*ln(c*d*x+c*e)+1/2*b/d*x^2*ln(c*x)-1/4*b*x^2
/d-b*e*x*ln(c*x)/d^2+b*e*x/d^2+b*e^2/d^3*dilog((c*d*x+c*e)/c/e)+b*e^2/d^3*l
n(c*x)*ln((c*d*x+c*e)/c/e)
```

Maxima [A] time = 1.55321, size = 151, normalized size = 1.54

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\text{Li}_2\left(-\frac{dx}{e}\right)\right)be^2}{d^3}+\frac{((2\,d\log(c)-d)b+2\,ad)x^2-4\,((e\log(c)-e)b+ae)x+2\left(bdx^2-2\,bex\right)\log(x)}{4\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e^2/d^3 + 1/4*(((2*d*log(c) - d)*
b + 2*a*d)*x^2 - 4*((e*log(c) - e)*b + a*e)*x + 2*(b*d*x^2 - 2*b*e*x)*log(x
))/d^2 + (b*e^2*log(c) + a*e^2)*log(d*x + e)/d^3
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^2\log(cx) + ax^2}{dx + e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x) + a*x^2)/(d*x + e), x)
```

Sympy [A] time = 86.6934, size = 189, normalized size = 1.93

$$\frac{ax^2}{2d} + \frac{ae^2\left(\begin{cases}\frac{x}{e} & \text{for } d = 0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d^2} - \frac{aex}{d^2} + \frac{bx^2\log(cx)}{2d} - \frac{bx^2}{4d} - \frac{be^2\left(\begin{cases}\frac{x}{e} \\ \frac{\begin{cases}\log(e)\log(x) - \mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -\log(e)\log\left(\frac{1}{x}\right) - \mathrm{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(e) + G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| \right.\end{cases}}{d}\end{cases}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] a*x**2/(2*d) + a*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d*
*2 - a*e*x/d**2 + b*x**2*log(c*x)/(2*d) - b*x**2/(4*d) - b*e**2*Piecewise((
x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/
e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/A
bs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1,
1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True)
)/d, True))/d**2 + b*e**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True)
)*log(c*x)/d**2 - b*e*x*log(c*x)/d**2 + b*e*x/d**2
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx) + a)x}{d + \frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)*x/(d + e/x), x)
```

3.340 $\int \frac{a+b\log(cx)}{d+\frac{e}{x}} dx$

Optimal. Leaf size=63

$$-\frac{be\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^2}-\frac{e\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx)}{d}-\frac{bx}{d}$$

```
[Out] (a*x)/d - (b*x)/d + (b*x*Log[c*x])/d - (e*(a + b*Log[c*x])*Log[1 + (d*x)/e]
)/d^2 - (b*e*PolyLog[2, -((d*x)/e)])/d^2
```

Rubi [A] time = 0.0700568, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {193, 43, 2330, 2295, 2317, 2391}

$$-\frac{be\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^2}-\frac{e\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx)}{d}-\frac{bx}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/(d + e/x),x]
```

```
[Out] (a*x)/d - (b*x)/d + (b*x*Log[c*x])/d - (e*(a + b*Log[c*x])*Log[1 + (d*x)/e]
)/d^2 - (b*e*PolyLog[2, -((d*x)/e)])/d^2
```

Rule 193

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(n*p)*(b + a/x^n)^p,
x] /; FreeQ[{a, b}, x] && LtQ[n, 0] && IntegerQ[p]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2330

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^(
q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[c*x^n])^p, (d + e*x
```

```
^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e, n, p, q, r}, x]
&& IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0] && IntegerQ[r]))
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx)}{d+\frac{e}{x}}\,dx &= \int\left(\frac{a+b\log(cx)}{d}-\frac{e(a+b\log(cx))}{d(e+dx)}\right)dx\\
&= \frac{\int(a+b\log(cx))\,dx}{d}-\frac{e\int\frac{a+b\log(cx)}{e+dx}\,dx}{d}\\
&= \frac{ax}{d}-\frac{e(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^2}+\frac{b\int\log(cx)\,dx}{d}+\frac{(be)\int\frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d^2}\\
&= \frac{ax}{d}-\frac{bx}{d}+\frac{bx\log(cx)}{d}-\frac{e(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d^2}-\frac{be\mathrm{Li}_2\left(-\frac{dx}{e}\right)}{d^2}
\end{aligned}$$

Mathematica [A] time = 0.0283437, size = 64, normalized size = 1.02

$$-\frac{be\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d^2}-\frac{e\log\left(\frac{dx+e}{e}\right)(a+b\log(cx))}{d^2}+\frac{ax}{d}+\frac{bx\log(cx)}{d}-\frac{bx}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/(d + e/x),x]
```

```
[Out] (a*x)/d - (b*x)/d + (b*x*Log[c*x])/d - (e*(a + b*Log[c*x])*Log[(e + d*x)/e]
)/d^2 - (b*e*PolyLog[2, -((d*x)/e)])/d^2
```

Maple [A] time = 0.046, size = 91, normalized size = 1.4

$$\frac{ax}{d}-\frac{ae\ln\left(cdx+ce\right)}{d^2}+\frac{bx\ln\left(cx\right)}{d}-\frac{bx}{d}-\frac{be}{d^2}\mathrm{dilog}\left(\frac{cdx+ce}{ce}\right)-\frac{\ln\left(cx\right)be}{d^2}\ln\left(\frac{cdx+ce}{ce}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] a*x/d-a*e/d^2*ln(c*d*x+c*e)+b*x*ln(c*x)/d-b*x/d-b*e/d^2*dilog((c*d*x+c*e)/c
/e)-b*e/d^2*ln(c*x)*ln((c*d*x+c*e)/c/e)
```

Maxima [A] time = 1.35473, size = 93, normalized size = 1.48

$$-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log\left(x\right)+\mathrm{Li}_2\left(-\frac{dx}{e}\right)\right)be}{d^2}+\frac{bx\log\left(x\right)+\left(b(\log\left(c\right)-1)+a\right)x}{d}-\frac{\left(be\log\left(c\right)+ae\right)\log\left(dx+e\right)}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x),x, algorithm="maxima")
```

```
[Out] -(log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*e/d^2 + (b*x*log(x) + (b*(log(c)
 - 1) + a)*x)/d - (b*e*log(c) + a*e)*log(d*x + e)/d^2
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx\log\left(cx\right)+ax}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x),x, algorithm="fricas")
```

```
[Out] integral((b*x*log(c*x) + a*x)/(d*x + e), x)
```

Sympy [A] time = 57.9305, size = 138, normalized size = 2.19

$$-\frac{ae\left(\begin{cases}\frac{x}{e} & \text{for}\ d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{d}+\frac{ax}{d}+\frac{be\left(\begin{cases}\frac{x}{e} & \\ \frac{\begin{cases}\log(e)\log(x)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{for}\ |x \\ -\log(e)\log\left(\frac{1}{x}\right)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{for}\ \frac{1}{|x|} \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log(e)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) & \text{other}\end{cases}}{d} & \end{cases}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x),x)
```

```
[Out] -a*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/d + a*x/d + b*e*Pie
cewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_pola
r(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)
/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meije
rg(((1, 1), ()), ((), (0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e
), True))/d, True))/d - b*e*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, Tru
e))*log(c*x)/d + b*x*log(c*x)/d - b*x/d
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx)+a}{d+\frac{e}{x}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)/(d + e/x), x)
```

3.341 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x}\,dx$

Optimal. Leaf size=36

$$\frac{b\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d}+\frac{\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d}$$

```
[Out] ((a + b*Log[c*x])*Log[1 + (d*x)/e])/d + (b*PolyLog[2, -((d*x)/e)])/d
```

Rubi [A] time = 0.0707699, antiderivative size = 36, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {2333, 2317, 2391}

$$\frac{b\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{d}+\frac{\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x),x]
```

```
[Out] ((a + b*Log[c*x])*Log[1 + (d*x)/e])/d + (b*PolyLog[2, -((d*x)/e)])/d
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x}\,dx=\int \frac{a+b\log(cx)}{e+dx}\,dx$$

$$=\frac{(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d}-\frac{b\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{d}$$

$$=\frac{(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{d}+\frac{b\text{Li}_2\left(-\frac{dx}{e}\right)}{d}$$

Mathematica [A] time = 0.0067497, size = 34, normalized size = 0.94

$$\frac{b\text{PolyLog}\left(2,-\frac{dx}{e}\right)+\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x),x]
```

```
[Out] ((a + b*Log[c*x])*Log[1 + (d*x)/e] + b*PolyLog[2, -((d*x)/e)])/d
```

Maple [A] time = 0.043, size = 62, normalized size = 1.7

$$\frac{a\ln(cdx+ce)}{d}+\frac{b}{d}\text{dilog}\left(\frac{cdx+ce}{ce}\right)+\frac{b\ln(cx)}{d}\ln\left(\frac{cdx+ce}{ce}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x))/(d+e/x)/x,x)
```

```
[Out] a*ln(c*d*x+c*e)/d+b*dilog((c*d*x+c*e)/c/e)/d+b*ln(c*x)*ln((c*d*x+c*e)/c/e)/
d
```

Maxima [A] time = 1.35111, size = 58, normalized size = 1.61

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\text{Li}_2\left(-\frac{dx}{e}\right)\right)b}{d}+\frac{(b\log(c)+a)\log(dx+e)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x,x, algorithm="maxima")
```

```
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b/d + (b*log(c) + a)*log(d*x + e)/d
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log\left(cx\right)+a}{dx+e},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x) + a)/(d*x + e), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{a+b\log\left(cx\right)}{dx+e}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x)/x,x)
```

```
[Out] Integral((a + b*log(c*x))/(d*x + e), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log\left(cx\right)+a}{\left(d+\frac{e}{x}\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)/((d + e/x)*x), x)
```

3.342 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^2}\,dx$

Optimal. Leaf size=41

$$\frac{b\text{PolyLog}\left(2,-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)(a+b\log(cx))}{e}$$

```
[Out] -((Log[1 + e/(d*x)]*(a + b*Log[c*x]))/e) + (b*PolyLog[2, -(e/(d*x))])/e
```

Rubi [A] time = 0.0617503, antiderivative size = 41, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {2337, 2391}

$$\frac{b\text{PolyLog}\left(2,-\frac{e}{dx}\right)}{e}-\frac{\log\left(\frac{e}{dx}+1\right)(a+b\log(cx))}{e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x^2),x]
```

```
[Out] -((Log[1 + e/(d*x)]*(a + b*Log[c*x]))/e) + (b*PolyLog[2, -(e/(d*x))])/e
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^2}\,dx = -\frac{\log\left(1+\frac{e}{dx}\right)(a+b\log(cx))}{e} + \frac{b\int \frac{\log\left(1+\frac{e}{dx}\right)}{x}\,dx}{e}$$
$$= -\frac{\log\left(1+\frac{e}{dx}\right)(a+b\log(cx))}{e} + \frac{b\text{Li}_2\left(-\frac{e}{dx}\right)}{e}$$

Mathematica [A] time = 0.0244508, size = 54, normalized size = 1.32

$$\frac{(a+b\log(cx))\left(a+b\log(cx)-2b\log\left(\frac{dx}{e}+1\right)\right)-2b^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{2be}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x^2),x]
```

```
[Out] ((a + b*Log[c*x])*(a + b*Log[c*x] - 2*b*Log[1 + (d*x)/e]) - 2*b^2*PolyLog[2
, -((d*x)/e)])/(2*b*e)
```

Maple [B] time = 0.05, size = 86, normalized size = 2.1

$$-\frac{a\ln(cdx+ce)}{e}+\frac{a\ln(cx)}{e}-\frac{b}{e}\text{dilog}\left(\frac{cdx+ce}{ce}\right)-\frac{b\ln(cx)}{e}\ln\left(\frac{cdx+ce}{ce}\right)+\frac{b(\ln(cx))^2}{2e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x))/(d+e/x)/x^2,x)
```

```
[Out] -a/e*ln(c*d*x+c*e)+a/e*ln(c*x)-b/e*dilog((c*d*x+c*e)/c/e)-b/e*ln(c*x)*ln((c
*d*x+c*e)/c/e)+1/2*b/e*ln(c*x)^2
```

Maxima [A] time = 1.30043, size = 90, normalized size = 2.2

$$\frac{b\log(x)^2}{2e}-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\text{Li}_2\left(-\frac{dx}{e}\right)\right)b}{e}-\frac{(b\log(c)+a)\log(dx+e)}{e}+\frac{(b\log(c)+a)\log(x)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^2,x, algorithm="maxima")
```

```
[Out] 1/2*b*log(x)^2/e - (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b/e - (b*log(c)
+ a)*log(d*x + e)/e + (b*log(c) + a)*log(x)/e
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx)+a}{dx^2+ex},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x) + a)/(d*x^2 + e*x), x)
```

Sympy [C] time = 10.5388, size = 153, normalized size = 3.73

$$\frac{2ad\left(\begin{cases}-\frac{x}{e}-\frac{1}{2d} & \text{for } d=0\\ \frac{\log(2dx)}{2d} & \text{otherwise}\end{cases}\right)}{e}-\frac{2ad\left(\begin{cases}\frac{x}{e}+\frac{1}{2d} & \text{for } d=0\\ \frac{\log(2dx+2e)}{2d} & \text{otherwise}\end{cases}\right)}{e}+b\left(\begin{cases}-\frac{1}{dx}\\ \frac{\begin{cases}\log(d)\log(x)+\operatorname{Li}_2\left(\frac{ee^{i\pi}}{dx}\right)\\ -\log(d)\log\left(\frac{1}{x}\right)+\operatorname{Li}_2\left(\frac{ee^{i\pi}}{dx}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle| x\right)\log(d)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\ldots\end{cases}}{e}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x)/x**2,x)
```

```
[Out] 2*a*d*Piecewise((-x/e - 1/(2*d), Eq(d, 0)), (log(2*d*x)/(2*d), True))/e - 2
*a*d*Piecewise((x/e + 1/(2*d), Eq(d, 0)), (log(2*d*x + 2*e)/(2*d), True))/e
 + b*Piecewise((-1/(d*x), Eq(e, 0)), (Piecewise((log(d)*log(x) + polylog(2,
 e*exp_polar(I*pi)/(d*x)), Abs(x) < 1), (-log(d)*log(1/x) + polylog(2, e*ex
p_polar(I*pi)/(d*x)), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0, 0), ()),
x)*log(d) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(d) + polylog(2, e*ex
p_polar(I*pi)/(d*x)), True))/e, True)) - b*Piecewise((1/(d*x), Eq(e, 0)), (
log(d + e/x)/e, True))*log(c*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx) + a}{\left(d + \frac{e}{x}\right)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)/((d + e/x)*x^2), x)
```

3.343 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^3}\,dx$

Optimal. Leaf size=84

$$\frac{bd\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^2}-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^2}-\frac{a+b\log(cx)}{ex}-\frac{b}{ex}$$

```
[Out] -(b/(e*x)) - (a + b*Log[c*x])/(e*x) - (d*(a + b*Log[c*x])^2)/(2*b*e^2) + (d
*(a + b*Log[c*x])*Log[1 + (d*x)/e])/e^2 + (b*d*PolyLog[2, -((d*x)/e)])/e^2
```

Rubi [A] time = 0.131292, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$\frac{bd\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^2}-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^2}-\frac{a+b\log(cx)}{ex}-\frac{b}{ex}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x^3),x]
```

```
[Out] -(b/(e*x)) - (a + b*Log[c*x])/(e*x) - (d*(a + b*Log[c*x])^2)/(2*b*e^2) + (d
*(a + b*Log[c*x])*Log[1 + (d*x)/e])/e^2 + (b*d*PolyLog[2, -((d*x)/e)])/e^2
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
```

```
(f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^3}\,dx &= \int \left(\frac{a+b\log(cx)}{ex^2}-\frac{d(a+b\log(cx))}{e^2x}+\frac{d^2(a+b\log(cx))}{e^2(e+dx)}\right)dx\\
&= -\frac{d\int \frac{a+b\log(cx)}{x}\,dx}{e^2}+\frac{d^2\int \frac{a+b\log(cx)}{e+dx}\,dx}{e^2}+\frac{\int \frac{a+b\log(cx)}{x^2}\,dx}{e}\\
&= -\frac{b}{ex}-\frac{a+b\log(cx)}{ex}-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{e^2}-\frac{(bd)\int \frac{\log\left(1+\frac{dx}{e}\right)}{x}\,dx}{e^2}\\
&= -\frac{b}{ex}-\frac{a+b\log(cx)}{ex}-\frac{d(a+b\log(cx))^2}{2be^2}+\frac{d(a+b\log(cx))\log\left(1+\frac{dx}{e}\right)}{e^2}+\frac{bd\operatorname{Li}_2\left(-\frac{dx}{e}\right)}{e^2}
\end{aligned}$$

Mathematica [A] time = 0.0883366, size = 77, normalized size = 0.92

$$-\frac{-2bd\text{PolyLog}\left(2,-\frac{dx}{e}\right)-2d\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))+\frac{d(a+b\log(cx))^2}{b}+\frac{2e(a+b\log(cx))}{x}+\frac{2be}{x}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x^3),x]
```

```
[Out] -((2*b*e)/x + (2*e*(a + b*Log[c*x]))/x + (d*(a + b*Log[c*x])^2)/b - 2*d*(a
+ b*Log[c*x])*Log[1 + (d*x)/e] - 2*b*d*PolyLog[2, -((d*x)/e)])/(2*e^2)
```

Maple [A] time = 0.076, size = 120, normalized size = 1.4

$$\frac{ad\ln(cdx+ce)}{e^2}-\frac{a}{ex}-\frac{ad\ln(cx)}{e^2}+\frac{bd}{e^2}\text{dilog}\left(\frac{cdx+ce}{ce}\right)+\frac{bd\ln(cx)}{e^2}\ln\left(\frac{cdx+ce}{ce}\right)-\frac{bd(\ln(cx))^2}{2e^2}-\frac{b\ln(cx)}{ex}-\frac{b}{ex}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x))/(d+e/x)/x^3,x)
```

```
[Out] a/e^2*d*ln(c*d*x+c*e)-a/e/x-a/e^2*d*ln(c*x)+b/e^2*d*dilog((c*d*x+c*e)/c/e)+
b/e^2*d*ln(c*x)*ln((c*d*x+c*e)/c/e)-1/2*b/e^2*d*ln(c*x)^2-b/e/x*ln(c*x)-b/e
/x
```

Maxima [A] time = 1.36649, size = 130, normalized size = 1.55

$$\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\text{Li}_2\left(-\frac{dx}{e}\right)\right)bd}{e^2}+\frac{(bd\log(c)+ad)\log(dx+e)}{e^2}-\frac{bdx\log(x)^2+2(e\log(c)+e)b+2ae+2(be+(b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^3,x, algorithm="maxima")
```

```
[Out] (log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*d/e^2 + (b*d*log(c) + a*d)*log(d*
x + e)/e^2 - 1/2*(b*d*x*log(x)^2 + 2*(e*log(c) + e)*b + 2*a*e + 2*(b*e + (b
*d*log(c) + a*d)*x)*log(x))/(e^2*x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx)+a}{dx^3+ex^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x) + a)/(d*x^3 + e*x^2), x)
```

Sympy [A] time = 52.3139, size = 187, normalized size = 2.23

$$\frac{ad^2\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{e^2}-\frac{ad\log(x)}{e^2}-\frac{a}{ex}-\frac{bd^2\left(\left(\begin{cases}\frac{x}{e}\\ \frac{\begin{cases}\log(e)\log(x)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -\log(e)\log\left(\frac{1}{x}\right)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right)\\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)\log(e)-\operatorname{Li}_2\left(\right.\end{cases}}{d}\end{cases}\right.\right.}{e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x)/x**3,x)
```

```
[Out] a*d**2*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**2 - a*d*log(x)
/e**2 - a/(e*x) - b*d**2*Piecewise((x/e, Eq(d, 0)), (Piecewise((log(e)*log(
x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) < 1), (-log(e)*log(1/x) - po
lylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (-meijerg(((), (1, 1)), ((0
, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (0, 0)), x)*log(e) - poly
log(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e**2 + b*d**2*Piecewise((x/
e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x)/e**2 + b*d*log(x)**2/(2*e**2
) - b*d*log(x)*log(c*x)/e**2 - b*log(c*x)/(e*x) - b/(e*x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int\frac{b\log(cx)+a}{\left(d+\frac{e}{x}\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)/((d + e/x)*x^3), x)
```

3.344 $\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^4}\,dx$

Optimal. Leaf size=121

$$-\frac{bd^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^3}+\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^3}+\frac{d(a+b\log(cx))}{e^2x}-\frac{a+b\log(cx)}{2ex^2}+\frac{bd}{e^2x}$$

```
[Out] -b/(4*e*x^2) + (b*d)/(e^2*x) - (a + b*Log[c*x])/(2*e*x^2) + (d*(a + b*Log[c
*x]))/(e^2*x) + (d^2*(a + b*Log[c*x])^2)/(2*b*e^3) - (d^2*(a + b*Log[c*x])*
Log[1 + (d*x)/e])/e^3 - (b*d^2*PolyLog[2, -((d*x)/e)])/e^3
```

Rubi [A] time = 0.155915, antiderivative size = 121, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {263, 44, 2351, 2304, 2301, 2317, 2391}

$$-\frac{bd^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)}{e^3}+\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))}{e^3}+\frac{d(a+b\log(cx))}{e^2x}-\frac{a+b\log(cx)}{2ex^2}+\frac{bd}{e^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x])/((d + e/x)*x^4),x]
```

```
[Out] -b/(4*e*x^2) + (b*d)/(e^2*x) - (a + b*Log[c*x])/(2*e*x^2) + (d*(a + b*Log[c
*x]))/(e^2*x) + (d^2*(a + b*Log[c*x])^2)/(2*b*e^3) - (d^2*(a + b*Log[c*x])*
Log[1 + (d*x)/e])/e^3 - (b*d^2*PolyLog[2, -((d*x)/e)])/e^3
```

Rule 263

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[x^(m + n*p)*
(b + a/x^n)^p, x] /; FreeQ[{a, b, m, n}, x] && IntegerQ[p] && NegQ[n]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\log(cx)}{\left(d+\frac{e}{x}\right)x^4}\,dx &= \int\left(\frac{a+b\log(cx)}{ex^3}-\frac{d(a+b\log(cx))}{e^2x^2}+\frac{d^2(a+b\log(cx))}{e^3x}-\frac{d^3(a+b\log(cx))}{e^3(e+dx)}\right)dx\\
&= \frac{d^2\int\frac{a+b\log(cx)}{x}\,dx}{e^3}-\frac{d^3\int\frac{a+b\log(cx)}{e+dx}\,dx}{e^3}-\frac{d\int\frac{a+b\log(cx)}{x^2}\,dx}{e^2}+\frac{\int\frac{a+b\log(cx)}{x^3}\,dx}{e}\\
&= -\frac{b}{4ex^2}+\frac{bd}{e^2x}-\frac{a+b\log(cx)}{2ex^2}+\frac{d(a+b\log(cx))}{e^2x}+\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2(a+b\log(cx))\log\left(1+\right.}{e^3}\\
&= -\frac{b}{4ex^2}+\frac{bd}{e^2x}-\frac{a+b\log(cx)}{2ex^2}+\frac{d(a+b\log(cx))}{e^2x}+\frac{d^2(a+b\log(cx))^2}{2be^3}-\frac{d^2(a+b\log(cx))\log\left(1+\right.}{e^3}
\end{aligned}
$$

Mathematica [A] time = 0.151095, size = 110, normalized size = 0.91

$$-\frac{4bd^2\text{PolyLog}\left(2,-\frac{dx}{e}\right)+4d^2\log\left(\frac{dx}{e}+1\right)(a+b\log(cx))-\frac{2d^2(a+b\log(cx))^2}{b}-\frac{4de(a+b\log(cx))}{x}+\frac{2e^2(a+b\log(cx))}{x^2}-\frac{4bde}{x}+\frac{be^2}{x^2}}{4e^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x])/((d + e/x)*x^4),x]
```

```
[Out] -((b*e^2)/x^2 - (4*b*d*e)/x + (2*e^2*(a + b*Log[c*x]))/x^2 - (4*d*e*(a + b*
Log[c*x]))/x - (2*d^2*(a + b*Log[c*x])^2)/b + 4*d^2*(a + b*Log[c*x])*Log[1
+ (d*x)/e] + 4*b*d^2*PolyLog[2, -((d*x)/e)])/(4*e^3)
```

Maple [A] time = 0.055, size = 163, normalized size = 1.4

$$-\frac{ad^2\ln(cdx+ce)}{e^3}-\frac{a}{2ex^2}+\frac{ad^2\ln(cx)}{e^3}+\frac{ad}{e^2x}-\frac{bd^2}{e^3}\text{dilog}\left(\frac{cdx+ce}{ce}\right)-\frac{bd^2\ln(cx)}{e^3}\ln\left(\frac{cdx+ce}{ce}\right)+\frac{bd^2(\ln(cx))^2}{2e^3}+\frac{bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x))/(d+e/x)/x^4,x)
```

```
[Out] -a/e^3*d^2*ln(c*d*x+c*e)-1/2*a/e/x^2+a/e^3*d^2*ln(c*x)+a*d/e^2/x-b/e^3*d^2*
dilog((c*d*x+c*e)/c/e)-b/e^3*d^2*ln(c*x)*ln((c*d*x+c*e)/c/e)+1/2*b/e^3*d^2*
ln(c*x)^2+b/e^2*d/x*ln(c*x)+b*d/e^2/x-1/2*b/e/x^2*ln(c*x)-1/4*b/e/x^2
```

Maxima [A] time = 1.38922, size = 204, normalized size = 1.69

$$-\frac{\left(\log\left(\frac{dx}{e}+1\right)\log(x)+\text{Li}_2\left(-\frac{dx}{e}\right)\right)bd^2}{e^3}-\frac{\left(bd^2\log(c)+ad^2\right)\log(dx+e)}{e^3}+\frac{2\,bd^2x^2\log(x)^2-2\,ae^2-\left(2\,e^2\log(c)+e^2\right)b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^4,x, algorithm="maxima")
```

```
[Out] -(log(d*x/e + 1)*log(x) + dilog(-d*x/e))*b*d^2/e^3 - (b*d^2*log(c) + a*d^2)
*log(d*x + e)/e^3 + 1/4*(2*b*d^2*x^2*log(x)^2 - 2*a*e^2 - (2*e^2*log(c) + e
^2)*b + 4*(a*d*e + (d*e*log(c) + d*e)*b)*x + 2*(2*b*d*e*x - b*e^2 + 2*(b*d^
```

```
2*log(c) + a*d^2)*x^2)*log(x))/(e^3*x^2)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx)+a}{dx^4+ex^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^4,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x) + a)/(d*x^4 + e*x^3), x)
```

Sympy [A] time = 68.6833, size = 233, normalized size = 1.93

$$-\frac{ad^3\left(\begin{cases}\frac{x}{e} & \text{for } d=0\\ \frac{\log(dx+e)}{d} & \text{otherwise}\end{cases}\right)}{e^3}+\frac{ad^2\log(x)}{e^3}+\frac{ad}{e^2x}-\frac{a}{2ex^2}+\frac{bd^3\left(\begin{cases}\frac{x}{e} \\ \frac{\begin{cases}\log(e)\log(x)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -\log(e)\log\left(\frac{1}{x}\right)-\operatorname{Li}_2\left(\frac{dxe^{i\pi}}{e}\right) \\ -G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)\log(e)+G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle| x\right)\log\end{cases}}{d}\end{cases}\right)}{e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x))/(d+e/x)/x**4,x)
```

```
[Out] -a*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))/e**3 + a*d**2*lo
g(x)/e**3 + a*d/(e**2*x) - a/(2*e*x**2) + b*d**3*Piecewise((x/e, Eq(d, 0)),
 (Piecewise((log(e)*log(x) - polylog(2, d*x*exp_polar(I*pi)/e), Abs(x) < 1)
, (-log(e)*log(1/x) - polylog(2, d*x*exp_polar(I*pi)/e), 1/Abs(x) < 1), (-m
eijerg(((), (1, 1)), ((0, 0), ()), x)*log(e) + meijerg(((1, 1), ()), ((), (
0, 0)), x)*log(e) - polylog(2, d*x*exp_polar(I*pi)/e), True))/d, True))/e**
3 - b*d**3*Piecewise((x/e, Eq(d, 0)), (log(d*x + e)/d, True))*log(c*x)/e**3
 - b*d**2*log(x)**2/(2*e**3) + b*d**2*log(x)*log(c*x)/e**3 + b*d*log(c*x)/(
e**2*x) + b*d/(e**2*x) - b*log(c*x)/(2*e*x**2) - b/(4*e*x**2)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx) + a}{\left(d + \frac{e}{x}\right)x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x))/(d+e/x)/x^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x) + a)/((d + e/x)*x^4), x)
```

3.345 $\int \frac{x^{-1+n}\log(ex^n)}{1-ex^n}\,dx$

Optimal. Leaf size=17

$$\frac{\text{PolyLog}(2,1-ex^n)}{en}$$

```
[Out] PolyLog[2, 1 - e*x^n]/(e*n)
```

Rubi [A] time = 0.0651177, antiderivative size = 17, 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 = {2336, 2315}

$$\frac{\text{PolyLog}(2,1-ex^n)}{en}$$

Antiderivative was successfully verified.

```
[In] Int[(x^(-1 + n)*Log[e*x^n])/(1 - e*x^n),x]
```

```
[Out] PolyLog[2, 1 - e*x^n]/(e*n)
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{x^{-1+n}\log(ex^n)}{1-ex^n}\,dx &= \frac{\text{Subst}\left(\int \frac{\log(ex)}{1-ex}\,dx, x, x^n\right)}{n}\\ &= \frac{\text{Li}_2(1-ex^n)}{en}\end{aligned}$$

Mathematica [A] time = 0.0106647, size = 17, normalized size = 1.

$$\frac{\text{PolyLog}(2,1-ex^n)}{en}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^(-1 + n)*Log[e*x^n])/(1 - e*x^n),x]
```

```
[Out] PolyLog[2, 1 - e*x^n]/(e*n)
```

Maple [A] time = 0.041, size = 14, normalized size = 0.8

$$\frac{\text{dilog}(ex^n)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)*ln(e*x^n)/(1-e*x^n),x)
```

```
[Out] 1/e/n*dilog(e*x^n)
```

Maxima [B] time = 1.84436, size = 70, normalized size = 4.12

$$-\frac{\log(e)\log\left(\frac{ex^n-1}{e}\right)}{en}-\frac{\log(-ex^n+1)\log(x^n)+\text{Li}_2(ex^n)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(e*x^n)/(1-e*x^n),x, algorithm="maxima")
```

```
[Out] -log(e)*log((e*x^n - 1)/e)/(e*n) - (log(-e*x^n + 1)*log(x^n) + dilog(e*x^n)
)/(e*n)
```

Fricas [B] time = 1.29888, size = 100, normalized size = 5.88

$$-\frac{n\log(-ex^n+1)\log(x)+\log(ex^n-1)\log(e)+\text{Li}_2(ex^n)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(e*x^n)/(1-e*x^n),x, algorithm="fricas")
```

```
[Out] -(n*log(-e*x^n + 1)*log(x) + log(e*x^n - 1)*log(e) + dilog(e*x^n))/(e*n)
```

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(x**(-1+n)*ln(e*x**n)/(1-e*x**n),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{x^{n-1} \log\left(ex^{n}\right)}{ex^{n} - 1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(e*x^n)/(1-e*x^n),x, algorithm="giac")
```

```
[Out] integrate(-x^(n - 1)*log(e*x^n)/(e*x^n - 1), x)
```

3.346 $\int \frac{x^{-1+n} \log\left(\frac{x^n}{d}\right)}{d-x^n} dx$

Optimal. Leaf size=16

$$\frac{\text{PolyLog}\left(2,1-\frac{x^n}{d}\right)}{n}$$

```
[Out] PolyLog[2, 1 - x^n/d]/n
```

Rubi [A] time = 0.0631588, antiderivative size = 16, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2336, 2315}

$$\frac{\text{PolyLog}\left(2,1-\frac{x^n}{d}\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Int[(x^(-1 + n)*Log[x^n/d])/(d - x^n),x]
```

```
[Out] PolyLog[2, 1 - x^n/d]/n
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{x^{-1+n}\log\left(\frac{x^n}{d}\right)}{d-x^n}\,dx = \frac{\text{Subst}\left(\int \frac{\log\left(\frac{x}{d}\right)}{d-x}\,dx, x, x^n\right)}{n}$$
$$= \frac{\text{Li}_2\left(1-\frac{x^n}{d}\right)}{n}$$

Mathematica [A] time = 0.0092833, size = 17, normalized size = 1.06

$$\frac{\text{PolyLog}\left(2, \frac{d-x^n}{d}\right)}{n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^(-1 + n)*Log[x^n/d])/(d - x^n),x]
```

```
[Out] PolyLog[2, (d - x^n)/d]/n
```

Maple [A] time = 0.043, size = 13, normalized size = 0.8

$$\frac{1}{n}\text{dilog}\left(\frac{x^n}{d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)*ln(x^n/d)/(d-x^n),x)
```

```
[Out] 1/n*dilog(x^n/d)
```

Maxima [B] time = 1.7504, size = 61, normalized size = 3.81

$$\frac{\log(d)\log(-d+x^n)}{n} - \frac{\log(x^n)\log\left(-\frac{x^n}{d}+1\right)+\text{Li}_2\left(\frac{x^n}{d}\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(x^n/d)/(d-x^n),x, algorithm="maxima")
```

```
[Out] log(d)*log(-d + x^n)/n - (log(x^n)*log(-x^n/d + 1) + dilog(x^n/d))/n
```

Fricas [B] time = 1.28396, size = 112, normalized size = 7.

$$-\frac{n\log\left(x\right)\log\left(\frac{d-x^{n}}{d}\right)+\log\left(-d+x^{n}\right)\log\left(\frac{1}{d}\right)+\mathrm{Li}_{2}\left(-\frac{d-x^{n}}{d}+1\right)}{n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(x^n/d)/(d-x^n),x, algorithm="fricas")
```

```
[Out] -(n*log(x)*log((d - x^n)/d) + log(-d + x^n)*log(1/d) + dilog(-(d - x^n)/d +
 1))/n
```

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(x**(-1+n)*ln(x**n/d)/(d-x**n),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{n-1}\log\left(\frac{x^{n}}{d}\right)}{d-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(x^n/d)/(d-x^n),x, algorithm="giac")
```

```
[Out] integrate(x^(n - 1)*log(x^n/d)/(d - x^n), x)
```

3.347 $\int \frac{x^{-1+n}\log\left(-\frac{ex^n}{d}\right)}{d+ex^n}\,dx$

Optimal. Leaf size=20

$$-\frac{\text{PolyLog}\left(2,\frac{ex^n}{d}+1\right)}{en}$$

```
[Out] -(PolyLog[2, 1 + (e*x^n)/d]/(e*n))
```

Rubi [A] time = 0.0685046, antiderivative size = 20, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.08, Rules used = {2336, 2315}

$$-\frac{\text{PolyLog}\left(2,\frac{ex^n}{d}+1\right)}{en}$$

Antiderivative was successfully verified.

```
[In] Int[(x^(-1 + n)*Log[-((e*x^n)/d)])/(d + e*x^n),x]
```

```
[Out] -(PolyLog[2, 1 + (e*x^n)/d]/(e*n))
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{x^{-1+n}\log\left(-\frac{ex^n}{d}\right)}{d+ex^n}\,dx = \frac{\text{Subst}\left(\int \frac{\log\left(-\frac{ex}{d}\right)}{d+ex}\,dx, x, x^n\right)}{n}$$
$$= -\frac{\text{Li}_2\left(1+\frac{ex^n}{d}\right)}{en}$$

Mathematica [A] time = 0.0101116, size = 21, normalized size = 1.05

$$-\frac{\text{PolyLog}\left(2, \frac{d+ex^n}{d}\right)}{en}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^(-1 + n)*Log[-((e*x^n)/d)])/(d + e*x^n),x]
```

```
[Out] -(PolyLog[2, (d + e*x^n)/d]/(e*n))
```

Maple [A] time = 0.042, size = 19, normalized size = 1.

$$-\frac{1}{en}\text{dilog}\left(-\frac{ex^n}{d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-1+n)*ln(-e*x^n/d)/(d+e*x^n),x)
```

```
[Out] -1/n/e*dilog(-e*x^n/d)
```

Maxima [B] time = 1.822, size = 86, normalized size = 4.3

$$-\frac{(\log(d)-\log(e))\log\left(\frac{ex^n+d}{e}\right)}{en}+\frac{\log\left(\frac{ex^n}{d}+1\right)\log(-x^n)+\text{Li}_2\left(-\frac{ex^n}{d}\right)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(-e*x^n/d)/(d+e*x^n),x, algorithm="maxima")
```

```
[Out] -(log(d) - log(e))*log((e*x^n + d)/e)/(e*n) + (log(e*x^n/d + 1)*log(-x^n) +
 dilog(-e*x^n/d))/(e*n)
```

Fricas [B] time = 1.26075, size = 124, normalized size = 6.2

$$\frac{n\log(x)\log\left(\frac{ex^n+d}{d}\right)+\log(ex^n+d)\log\left(-\frac{e}{d}\right)+\mathrm{Li}_2\left(-\frac{ex^n+d}{d}+1\right)}{en}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(-e*x^n/d)/(d+e*x^n),x, algorithm="fricas")
```

```
[Out] (n*log(x)*log((e*x^n + d)/d) + log(e*x^n + d)*log(-e/d) + dilog(-(e*x^n + d
)/d + 1))/(e*n)
```

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(x**(-1+n)*ln(-e*x**n/d)/(d+e*x**n),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^{n-1}\log\left(-\frac{ex^n}{d}\right)}{ex^n+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-1+n)*log(-e*x^n/d)/(d+e*x^n),x, algorithm="giac")
```

```
[Out] integrate(x^(n - 1)*log(-e*x^n/d)/(e*x^n + d), x)
```

3.348 $\int \frac{\log\left(\frac{a}{x}\right)}{ax-x^2}\,dx$

Optimal. Leaf size=14

$$\frac{\text{PolyLog}\left(2,1-\frac{a}{x}\right)}{a}$$

```
[Out] PolyLog[2, 1 - a/x]/a
```

Rubi [A] time = 0.0767902, antiderivative size = 14, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {1593, 2343, 2333, 2315}

$$\frac{\text{PolyLog}\left(2,1-\frac{a}{x}\right)}{a}$$

Antiderivative was successfully verified.

```
[In] Int[Log[a/x]/(a*x - x^2),x]
```

```
[Out] PolyLog[2, 1 - a/x]/a
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\log\left(\frac{a}{x}\right)}{ax-x^2}\,dx &= \int \frac{\log\left(\frac{a}{x}\right)}{(a-x)x}\,dx\\
&= -\operatorname{Subst}\left(\int \frac{\log(ax)}{\left(a-\frac{1}{x}\right)x}\,dx, x, \frac{1}{x}\right)\\
&= -\operatorname{Subst}\left(\int \frac{\log(ax)}{-1+ax}\,dx, x, \frac{1}{x}\right)\\
&= \frac{\operatorname{Li}_2\left(1-\frac{a}{x}\right)}{a}
\end{aligned}
$$

Mathematica [A] time = 0.0037964, size = 16, normalized size = 1.14

$$
\frac{\operatorname{PolyLog}\left(2,-\frac{a-x}{x}\right)}{a}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[a/x]/(a*x - x^2),x]
```

```
[Out] PolyLog[2, -((a - x)/x)]/a
```

Maple [A] time = 0.04, size = 11, normalized size = 0.8

$$
\frac{1}{a}\operatorname{dilog}\left(\frac{a}{x}\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(a/x)/(a*x-x^2),x)
```

```
[Out] 1/a*dilog(a/x)
```

Maxima [B] time = 1.16487, size = 97, normalized size = 6.93

$$-\left(\frac{\log(-a+x)}{a}-\frac{\log(x)}{a}\right)\log\left(\frac{a}{x}\right)-\frac{2\log(-a+x)\log(x)-\log(x)^2}{2a}+\frac{\log(x)\log\left(-\frac{x}{a}+1\right)+\mathrm{Li}_2\left(\frac{x}{a}\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x)/(a*x-x^2),x, algorithm="maxima")
```

```
[Out] -(log(-a + x)/a - log(x)/a)*log(a/x) - 1/2*(2*log(-a + x)*log(x) - log(x)^2
)/a + (log(x)*log(-x/a + 1) + dilog(x/a))/a
```

Fricas [A] time = 1.25383, size = 26, normalized size = 1.86

$$\frac{\mathrm{Li}_2\left(-\frac{a}{x}+1\right)}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x)/(a*x-x^2),x, algorithm="fricas")
```

```
[Out] dilog(-a/x + 1)/a
```

Sympy [C] time = 7.58479, size = 71, normalized size = 5.07

$$-\left(\begin{cases}-\frac{1}{x} & \text{for}\ a=0\\ \frac{\log\left(\frac{a}{x}-1\right)}{a} & \text{otherwise}\end{cases}\right)\log\left(\frac{a}{x}\right)-\begin{cases}\frac{1}{x} & \text{for}\ a=\\ \frac{\begin{cases}i\pi\log(x)+\mathrm{Li}_2\left(\frac{a}{x}\right) & \text{for}\ |x|<1\\ -i\pi\log\left(\frac{1}{x}\right)+\mathrm{Li}_2\left(\frac{a}{x}\right) & \text{for}\ \frac{1}{|x|}<1\\ -i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1\\ 0,0 & \end{matrix}\middle|x\right)+i\pi G_{2,2}^{0,2}\left(\begin{matrix}1,1 & \\ & 0,0\end{matrix}\middle|x\right)+\mathrm{Li}_2\left(\frac{a}{x}\right) & \text{otherwise}\end{cases}}{a} & \text{otherv}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(a/x)/(a*x-x**2),x)
```

```
[Out] -Piecewise((-1/x, Eq(a, 0)), (log(a/x - 1)/a, True))*log(a/x) - Piecewise((
1/x, Eq(a, 0)), (Piecewise((I*pi*log(x) + polylog(2, a/x), Abs(x) < 1), (-I
*pi*log(1/x) + polylog(2, a/x), 1/Abs(x) < 1), (-I*pi*meijerg(((), (1, 1)),
 ((0, 0), ()), x) + I*pi*meijerg(((1, 1), ()), ((), (0, 0)), x) + polylog(2
, a/x), True))/a, True))
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(\frac{a}{x}\right)}{ax - x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x)/(a*x-x^2),x, algorithm="giac")
```

```
[Out] integrate(log(a/x)/(a*x - x^2), x)
```

3.349 $\int \frac{\log\left(\frac{a}{x^2}\right)}{ax-x^3}\,dx$

Optimal. Leaf size=17

$$\frac{\text{PolyLog}\left(2,1-\frac{a}{x^2}\right)}{2a}$$

```
[Out] PolyLog[2, 1 - a/x^2]/(2*a)
```

Rubi [A] time = 0.0868039, antiderivative size = 17, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {1593, 2343, 2333, 2315}

$$\frac{\text{PolyLog}\left(2,1-\frac{a}{x^2}\right)}{2a}$$

Antiderivative was successfully verified.

```
[In] Int[Log[a/x^2]/(a*x - x^3),x]
```

```
[Out] PolyLog[2, 1 - a/x^2]/(2*a)
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\log\left(\frac{a}{x^2}\right)}{ax-x^3}\,dx &= \int \frac{\log\left(\frac{a}{x^2}\right)}{x\left(a-x^2\right)}\,dx \\
&= -\left(\frac{1}{2}\operatorname{Subst}\left(\int \frac{\log(ax)}{\left(a-\frac{1}{x}\right)x}\,dx, x, \frac{1}{x^2}\right)\right) \\
&= -\left(\frac{1}{2}\operatorname{Subst}\left(\int \frac{\log(ax)}{-1+ax}\,dx, x, \frac{1}{x^2}\right)\right) \\
&= \frac{\operatorname{Li}_2\left(1-\frac{a}{x^2}\right)}{2a}
\end{aligned}
$$

Mathematica [A] time = 0.0044375, size = 21, normalized size = 1.24

$$
\frac{\operatorname{PolyLog}\left(2,-\frac{a-x^2}{x^2}\right)}{2a}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[a/x^2]/(a*x - x^3),x]
```

```
[Out] PolyLog[2, -((a - x^2)/x^2)]/(2*a)
```

Maple [A] time = 0.044, size = 12, normalized size = 0.7

$$
\frac{1}{2\,a}\operatorname{dilog}\left(\frac{a}{x^2}\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(a/x^2)/(-x^3+a*x),x)
```

```
[Out] 1/2/a*dilog(a/x^2)
```

Maxima [B] time = 1.14337, size = 109, normalized size = 6.41

$$-\frac{1}{2}\left(\frac{\log\left(x^2-a\right)}{a}-\frac{2\log\left(x\right)}{a}\right)\log\left(\frac{a}{x^2}\right)-\frac{\log\left(x^2-a\right)\log\left(x\right)-\log\left(x\right)^2}{a}+\frac{2\log\left(x\right)\log\left(-\frac{x^2}{a}+1\right)+\mathrm{Li}_2\left(\frac{x^2}{a}\right)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x^2)/(-x^3+a*x),x, algorithm="maxima")
```

```
[Out] -1/2*(log(x^2 - a)/a - 2*log(x)/a)*log(a/x^2) - (log(x^2 - a)*log(x) - log(
x)^2)/a + 1/2*(2*log(x)*log(-x^2/a + 1) + dilog(x^2/a))/a
```

Fricas [A] time = 1.27114, size = 34, normalized size = 2.

$$\frac{\mathrm{Li}_2\left(-\frac{a}{x^2}+1\right)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x^2)/(-x^3+a*x),x, algorithm="fricas")
```

```
[Out] 1/2*dilog(-a/x^2 + 1)/a
```

Sympy [C] time = 10.5159, size = 78, normalized size = 4.59

$$-\frac{\begin{cases} i\pi\log\left(x\right)+\frac{\mathrm{Li}_2\left(\frac{a}{x^2}\right)}{2} & \text{for } |x|<1 \\ -i\pi\log\left(\frac{1}{x}\right)+\frac{\mathrm{Li}_2\left(\frac{a}{x^2}\right)}{2} & \text{for } \frac{1}{|x|}<1 \\ -i\pi G_{2,2}^{2,0}\left(\begin{matrix} & 1,1 \\ 0,0 & \end{matrix}\middle| x\right)+i\pi G_{2,2}^{0,2}\left(\begin{matrix} 1,1 & \\ & 0,0 \end{matrix}\middle| x\right)+\frac{\mathrm{Li}_2\left(\frac{a}{x^2}\right)}{2} & \text{otherwise} \end{cases}}{a}-\frac{\log\left(\frac{a}{x^2}\right)\log\left(\frac{a}{x^2}-1\right)}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(a/x**2)/(-x**3+a*x),x)
```

```
[Out] -Piecewise((I*pi*log(x) + polylog(2, a/x**2)/2, Abs(x) < 1), (-I*pi*log(1/x
) + polylog(2, a/x**2)/2, 1/Abs(x) < 1), (-I*pi*meijerg(((), (1, 1)), ((0,
0), ()), x) + I*pi*meijerg(((1, 1), ()), ((), (0, 0)), x) + polylog(2, a/x*
*2)/2, True))/a - log(a/x**2)*log(a/x**2 - 1)/(2*a)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int -\frac{\log\left(\frac{a}{x^2}\right)}{x^3 - ax}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a/x^2)/(-x^3+a*x),x, algorithm="giac")
```

```
[Out] integrate(-log(a/x^2)/(x^3 - a*x), x)
```

3.350 $\int \frac{\log\left(ax^{1-n}\right)}{ax-x^n}\,dx$

Optimal. Leaf size=26

$$-\frac{\text{PolyLog}\left(2,1-ax^{1-n}\right)}{a(1-n)}$$

```
[Out] -(PolyLog[2, 1 - a*x^(1 - n)]/(a*(1 - n)))
```

Rubi [A] time = 0.0903546, antiderivative size = 26, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {1593, 2336, 2315}

$$-\frac{\text{PolyLog}\left(2,1-ax^{1-n}\right)}{a(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[Log[a*x^(1 - n)]/(a*x - x^n),x]
```

```
[Out] -(PolyLog[2, 1 - a*x^(1 - n)]/(a*(1 - n)))
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2336

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[f^m/n, Subst[Int[(d + e*x)^q*(a +
b*Log[c*x])^p, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x]
&& EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && EqQ[r, n]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\log\left(ax^{1-n}\right)}{ax-x^n}\,dx &= \int \frac{x^{-n}\log\left(ax^{1-n}\right)}{-1+ax^{1-n}}\,dx\\
&= \frac{\text{Subst}\left(\int \frac{\log(ax)}{-1+ax}\,dx, x, x^{1-n}\right)}{1-n}\\
&= -\frac{\text{Li}_2\left(1-ax^{1-n}\right)}{a(1-n)}
\end{aligned}
$$

Mathematica [A] time = 0.0095532, size = 23, normalized size = 0.88

$$
\frac{\text{PolyLog}\left(2,1-ax^{1-n}\right)}{a(n-1)}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Log[a*x^(1 - n)]/(a*x - x^n),x]
```

```
[Out] PolyLog[2, 1 - a*x^(1 - n)]/(a*(-1 + n))
```

Maple [F] time = 0.823, size = 0, normalized size = 0.

$$
\int \frac{\ln\left(ax^{1-n}\right)}{ax-x^n}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(ln(a*x^(1-n))/(a*x-x^n),x)
```

```
[Out] int(ln(a*x^(1-n))/(a*x-x^n),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$
\int \frac{\log\left(ax^{-n+1}\right)}{ax-x^n}\,dx
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a*x^(1-n))/(a*x-x^n),x, algorithm="maxima")
```

```
[Out] integrate(log(a*x^(-n + 1))/(a*x - x^n), x)
```

Fricas [B] time = 1.28845, size = 236, normalized size = 9.08

$$\frac{2\,(n-1)\log\left(a\right)\log\left(x\right)-\left(n^{2}-2\,n+1\right)\log\left(x\right)^{2}+2\,(n-1)\log\left(x\right)\log\left(\frac{a-x^{n-1}}{a}\right)-2\,\log\left(a\right)\log\left(-a+x^{n-1}\right)+2\,\mathrm{Li}_{2}\left(-\frac{a-x}{a}\right.}{2\,(an-a)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a*x^(1-n))/(a*x-x^n),x, algorithm="fricas")
```

```
[Out] 1/2*(2*(n - 1)*log(a)*log(x) - (n^2 - 2*n + 1)*log(x)^2 + 2*(n - 1)*log(x)*
log((a - x^(n - 1))/a) - 2*log(a)*log(-a + x^(n - 1)) + 2*dilog(-(a - x^(n
- 1))/a + 1))/(a*n - a)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(axx^{-n}\right)}{ax-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(ln(a*x**(1-n))/(a*x-x**n),x)
```

```
[Out] Integral(log(a*x*x**(-n))/(a*x - x**n), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\log\left(ax^{-n+1}\right)}{ax-x^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(log(a*x^(1-n))/(a*x-x^n),x, algorithm="giac")
```

```
[Out] integrate(log(a*x^(-n + 1))/(a*x - x^n), x)
```

3.351 $\int (fx)^{-1+m} (d+ex^m)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=171

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^4(a+b\log(cx^n))}{4em}-\frac{3bd^2enx^{m+1}(fx)^{m-1}}{4m^2}-\frac{bd^4nx^{1-m}\log(x)(fx)^{m-1}}{4em}-\frac{bd^3nx(fx)^{m-1}}{m^2}-\frac{bde^2nx^{2m}}{3}$$

```
[Out] -((b*d^3*n*x*(f*x)^(-1 + m))/m^2) - (3*b*d^2*e*n*x^(1 + m)*(f*x)^(-1 + m))/
(4*m^2) - (b*d*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m))/(3*m^2) - (b*e^3*n*x^(1 +
3*m)*(f*x)^(-1 + m))/(16*m^2) - (b*d^4*n*x^(1 - m)*(f*x)^(-1 + m)*Log[x])/(
4*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^4*(a + b*Log[c*x^n]))/(4*e*m
)
```

Rubi [A] time = 0.21477, antiderivative size = 171, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2339, 2338, 266, 43}

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^4(a+b\log(cx^n))}{4em}-\frac{3bd^2enx^{m+1}(fx)^{m-1}}{4m^2}-\frac{bd^4nx^{1-m}\log(x)(fx)^{m-1}}{4em}-\frac{bd^3nx(fx)^{m-1}}{m^2}-\frac{bde^2nx^{2m}}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n]),x]
```


```
[Out] -((b*d^3*n*x*(f*x)^(-1 + m))/m^2) - (3*b*d^2*e*n*x^(1 + m)*(f*x)^(-1 + m))/
(4*m^2) - (b*d*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m))/(3*m^2) - (b*e^3*n*x^(1 +
3*m)*(f*x)^(-1 + m))/(16*m^2) - (b*d^4*n*x^(1 - m)*(f*x)^(-1 + m)*Log[x])/(
4*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^4*(a + b*Log[c*x^n]))/(4*e*m
)
```


Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
```

```
e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)^3(a+b\log(cx^n))\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)^3(a+b\log(cx^n))\,dx$$

$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4(a+b\log(cx^n))}{4em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{(d+ex^m)^4}{x}\,dx}{4em}$$

$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4(a+b\log(cx^n))}{4em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\text{Subst}\left(\int \frac{(d\cdots}{}\right)}{4em^2}$$

$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4(a+b\log(cx^n))}{4em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\text{Subst}\left(\int\left(4\cdots\right)\right)}{}$$

$$= -\frac{bd^3nx(fx)^{-1+m}}{m^2} - \frac{3bd^2enx^{1+m}(fx)^{-1+m}}{4m^2} - \frac{bde^2nx^{1+2m}(fx)^{-1+m}}{3m^2} - \frac{be^3nx^{1+\cdots}}{1\cdots}$$

Mathematica [A] time = 0.155689, size = 140, normalized size = 0.82

$$\frac{(fx)^m\left(12am\left(6d^2ex^m+4d^3+4de^2x^{2m}+e^3x^{3m}\right)+12bm\log(cx^n)\left(6d^2ex^m+4d^3+4de^2x^{2m}+e^3x^{3m}\right)-bn\left(36d^2ex^m+48\cdots\right.\right.}{48fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(12*a*m*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m)) - b*
n*(48*d^3 + 36*d^2*e*x^m + 16*d*e^2*x^(2*m) + 3*e^3*x^(3*m)) + 12*b*m*(4*d^
3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m))*Log[c*x^n]))/(48*f*m^2)
```

Maple [C] time = 0.242, size = 806, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/4*b*(e^3*(x^m)^3+4*d*e^2*(x^m)^2+6*d^2*e*x^m+4*d^3)*x/m*exp(-1/2*(-1+m)*(
I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*f*x)^2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*csgn(I*x
)+I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)-2*ln(f)-2*ln(x)))*ln(x^n)+1/48*(48*l
n(c)*b*d^3*m+48*a*d*e^2*(x^m)^2*m+24*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)
*(x^m)^2*m+72*a*d^2*e*x^m*m-16*b*d*e^2*n*(x^m)^2-36*b*d^2*e*n*x^m+12*ln(c)*
b*e^3*(x^m)^3*m+48*a*d^3*m-24*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*m+6*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3*m-6*I*Pi*b*e^3*csgn(I*
c*x^n)^3*(x^m)^3*m-3*b*e^3*n*(x^m)^3+12*a*e^3*(x^m)^3*m-48*b*d^3*n+36*I*Pi*
b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m+6*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn
(I*c)*(x^m)^3*m-24*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^m)^2*m-24*I*Pi*b*d^3*csg
n(I*c*x^n)^3*m+48*ln(c)*b*d*e^2*(x^m)^2*m+72*ln(c)*b*d^2*e*x^m*m-36*I*Pi*b*
d^2*e*csgn(I*c*x^n)^3*x^m*m-24*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^m)^2*m-36*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m+24
*I*Pi*b*d^3*m*csgn(I*x^n)*csgn(I*c*x^n)^2+24*I*Pi*b*d^3*m*csgn(I*c*x^n)^2*c
sgn(I*c)+24*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m-6*I*Pi*b*e^3
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m+36*I*Pi*b*d^2*e*csgn(I*c*x^n
)^2*csgn(I*c)*x^m*m)*x/m^2*exp(-1/2*(-1+m)*(I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*
f*x)^2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*csgn(I*f)*cs
gn(I*x)-2*ln(f)-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((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.38314, size = 479, normalized size = 2.8

$$\frac{3\left(4\,be^3mn\log\left(x\right)+4\,be^3m\log\left(c\right)+4\,ae^3m-be^3n\right)f^{m-1}x^{4\,m}+16\left(3\,bde^2mn\log\left(x\right)+3\,bde^2m\log\left(c\right)+3\,ade^2m-bde^2n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/48*(3*(4*b*e^3*m*n*log(x) + 4*b*e^3*m*log(c) + 4*a*e^3*m - b*e^3*n)*f^(m
- 1)*x^(4*m) + 16*(3*b*d*e^2*m*n*log(x) + 3*b*d*e^2*m*log(c) + 3*a*d*e^2*m
- b*d*e^2*n)*f^(m - 1)*x^(3*m) + 36*(2*b*d^2*e*m*n*log(x) + 2*b*d^2*e*m*log
(c) + 2*a*d^2*e*m - b*d^2*e*n)*f^(m - 1)*x^(2*m) + 48*(b*d^3*m*n*log(x) + b
*d^3*m*log(c) + a*d^3*m - b*d^3*n)*f^(m - 1)*x^m)/m^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.47814, size = 452, normalized size = 2.64

$$\frac{bd^3f^mnx^m\log\left(x\right)}{fm}+\frac{3\,bd^2f^mnx^{2\,m}e\log\left(x\right)}{2\,fm}+\frac{bd^3f^mx^m\log\left(c\right)}{fm}+\frac{3\,bd^2f^mx^{2\,m}e\log\left(c\right)}{2\,fm}+\frac{bdf^mnx^{3\,m}e^2\log\left(x\right)}{fm}+\frac{ad^3f^mx^m}{fm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*d^3*f^m*n*x^m*log(x)/(f*m) + 3/2*b*d^2*f^m*n*x^(2*m)*e*log(x)/(f*m) + b*d
^3*f^m*x^m*log(c)/(f*m) + 3/2*b*d^2*f^m*x^(2*m)*e*log(c)/(f*m) + b*d*f^m*n*
```

```
x^(3*m)*e^2*log(x)/(f*m) + a*d^3*f^m*x^m/(f*m) - b*d^3*f^m*n*x^m/(f*m^2) +
3/2*a*d^2*f^m*x^(2*m)*e/(f*m) - 3/4*b*d^2*f^m*n*x^(2*m)*e/(f*m^2) + b*d*f^m
*x^(3*m)*e^2*log(c)/(f*m) + 1/4*b*f^m*n*x^(4*m)*e^3*log(x)/(f*m) + a*d*f^m*
x^(3*m)*e^2/(f*m) - 1/3*b*d*f^m*n*x^(3*m)*e^2/(f*m^2) + 1/4*b*f^m*x^(4*m)*e
^3*log(c)/(f*m) + 1/4*a*f^m*x^(4*m)*e^3/(f*m) - 1/16*b*f^m*n*x^(4*m)*e^3/(f
*m^2)
```

3.352 $\int (fx)^{-1+m}(d+ex^m)^2(a+b\log(cx^n))\,dx$

Optimal. Leaf size=142

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^3(a+b\log(cx^n))}{3em}-\frac{bd^3nx^{1-m}\log(x)(fx)^{m-1}}{3em}-\frac{bd^2nx(fx)^{m-1}}{m^2}-\frac{bdenx^{m+1}(fx)^{m-1}}{2m^2}-\frac{be^2nx^{2m+1}(f}{9m^2}$$

```
[Out] -((b*d^2*n*x*(f*x)^(-1 + m))/m^2) - (b*d*e*n*x^(1 + m)*(f*x)^(-1 + m))/(2*m
^2) - (b*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m))/(9*m^2) - (b*d^3*n*x^(1 - m)*(f*
x)^(-1 + m)*Log[x])/(3*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^3*(a +
b*Log[c*x^n]))/(3*e*m)
```

Rubi [A] time = 0.195021, antiderivative size = 142, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2339, 2338, 266, 43}

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^3(a+b\log(cx^n))}{3em}-\frac{bd^3nx^{1-m}\log(x)(fx)^{m-1}}{3em}-\frac{bd^2nx(fx)^{m-1}}{m^2}-\frac{bdenx^{m+1}(fx)^{m-1}}{2m^2}-\frac{be^2nx^{2m+1}(f}{9m^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d^2*n*x*(f*x)^(-1 + m))/m^2) - (b*d*e*n*x^(1 + m)*(f*x)^(-1 + m))/(2*m
^2) - (b*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m))/(9*m^2) - (b*d^3*n*x^(1 - m)*(f*
x)^(-1 + m)*Log[x])/(3*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^3*(a +
b*Log[c*x^n]))/(3*e*m)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
```

```
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (fx)^{-1+m}\left(d+ex^m\right)^2\left(a+b\log\left(cx^n\right)\right)\,dx=\left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}\left(d+ex^m\right)^2\left(a+b\log\left(cx^n\right)\right)\,dx$$

$$=\frac{x^{1-m}(fx)^{-1+m}\left(d+ex^m\right)^3\left(a+b\log\left(cx^n\right)\right)}{3em}-\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int\frac{\left(d+ex^m\right)^3}{x}\,d}{3em}$$

$$=\frac{x^{1-m}(fx)^{-1+m}\left(d+ex^m\right)^3\left(a+b\log\left(cx^n\right)\right)}{3em}-\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\operatorname{Subst}\left(\int\right.}{3em^2}$$

$$=\frac{x^{1-m}(fx)^{-1+m}\left(d+ex^m\right)^3\left(a+b\log\left(cx^n\right)\right)}{3em}-\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\operatorname{Subst}\left(\int\left(\right.\right.}{}$$

$$=-\frac{bd^2nx(fx)^{-1+m}}{m^2}-\frac{bdenx^{1+m}(fx)^{-1+m}}{2m^2}-\frac{be^2nx^{1+2m}(fx)^{-1+m}}{9m^2}-\frac{bd^3nx^{1-m}}{}$$

Mathematica [A] time = 0.111714, size = 101, normalized size = 0.71

$$\frac{(fx)^m\left(6am\left(3d^2+3dex^m+e^2x^{2m}\right)+6bm\log\left(cx^n\right)\left(3d^2+3dex^m+e^2x^{2m}\right)-bn\left(18d^2+9dex^m+2e^2x^{2m}\right)\right)}{18fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(6*a*m*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m)) - b*n*(18*d^2 + 9*d*e*x^m
 + 2*e^2*x^(2*m)) + 6*b*m*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m))*Log[c*x^n]))/(1
```

```
8*f*m^2)
```

Maple [C] time = 0.184, size = 616, normalized size = 4.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/3*b*(e^2*(x^m)^2+3*d*e*x^m+3*d^2)*x/m*exp(-1/2*(-1+m)*(I*Pi*csgn(I*f*x)^3
-I*Pi*csgn(I*f*x)^2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)
*csgn(I*f)*csgn(I*x)-2*ln(f)-2*ln(x)))*ln(x^n)+1/18*(-9*I*Pi*b*d^2*m*csgn(I
*c*x^n)^3+9*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m-9*I*Pi*b*d*e*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m-9*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^m*m+9*I*P
i*b*d^2*m*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^m)^2*m-3*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^m)^2*m+9*I*Pi*b*d*e*csg
n(I*x^n)*csgn(I*c*x^n)^2*x^m*m+3*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^
m)^2*m+9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*m+3*I*Pi*b*e^2*csgn(I*c*x^n
)^2*csgn(I*c)*(x^m)^2*m-9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m+
6*ln(c)*b*e^2*(x^m)^2*m+18*ln(c)*b*d*e*x^m*m+6*a*e^2*(x^m)^2*m-2*b*e^2*n*(x
^m)^2+18*ln(c)*b*d^2*m+18*a*d*e*x^m*m-9*b*d*e*n*x^m+18*a*d^2*m-18*b*d^2*n)*
x/m^2*exp(-1/2*(-1+m)*(I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*f*x)^2*csgn(I*f)-I*Pi
*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)-2*ln(f)-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((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.31994, size = 342, normalized size = 2.41

$$\frac{2\left(3\,be^2mn\log\left(x\right)+3\,be^2m\log\left(c\right)+3\,ae^2m-be^2n\right)f^{m-1}x^{3\,m}+9\left(2\,bdemn\log\left(x\right)+2\,bdem\log\left(c\right)+2\,adem-bden\right)f^{m}}{18\,m^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/18*(2*(3*b*e^2*m*n*log(x) + 3*b*e^2*m*log(c) + 3*a*e^2*m - b*e^2*n)*f^(m
- 1)*x^(3*m) + 9*(2*b*d*e*m*n*log(x) + 2*b*d*e*m*log(c) + 2*a*d*e*m - b*d*e
*n)*f^(m - 1)*x^(2*m) + 18*(b*d^2*m*n*log(x) + b*d^2*m*log(c) + a*d^2*m - b
*d^2*n)*f^(m - 1)*x^m)/m^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.46307, size = 325, normalized size = 2.29

$$\frac{bd^2f^mnx^m\log\left(x\right)}{fm}+\frac{bdf^mnx^{2\,m}e\log\left(x\right)}{fm}+\frac{bd^2f^mx^m\log\left(c\right)}{fm}+\frac{bdf^mx^{2\,m}e\log\left(c\right)}{fm}+\frac{bf^mnx^{3\,m}e^2\log\left(x\right)}{3\,fm}+\frac{ad^2f^mx^m}{fm}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*d^2*f^m*n*x^m*log(x)/(f*m) + b*d*f^m*n*x^(2*m)*e*log(x)/(f*m) + b*d^2*f^m
*x^m*log(c)/(f*m) + b*d*f^m*x^(2*m)*e*log(c)/(f*m) + 1/3*b*f^m*n*x^(3*m)*e^
2*log(x)/(f*m) + a*d^2*f^m*x^m/(f*m) - b*d^2*f^m*n*x^m/(f*m^2) + a*d*f^m*x^
(2*m)*e/(f*m) - 1/2*b*d*f^m*n*x^(2*m)*e/(f*m^2) + 1/3*b*f^m*x^(3*m)*e^2*log
(c)/(f*m) + 1/3*a*f^m*x^(3*m)*e^2/(f*m) - 1/9*b*f^m*n*x^(3*m)*e^2/(f*m^2)
```

3.353 $\int (fx)^{-1+m}(d+ex^m)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=90

$$\frac{d(fx)^m(a+b\log(cx^n))}{fm}+\frac{ex^m(fx)^m(a+b\log(cx^n))}{2fm}-\frac{bdn(fx)^m}{fm^2}-\frac{benx^m(fx)^m}{4fm^2}$$

```
[Out] -((b*d*n*(f*x)^m)/(f*m^2)) - (b*e*n*x^m*(f*x)^m)/(4*f*m^2) + (d*(f*x)^m*(a
+ b*Log[c*x^n]))/(f*m) + (e*x^m*(f*x)^m*(a + b*Log[c*x^n]))/(2*f*m)
```

Rubi [A] time = 0.116969, antiderivative size = 113, normalized size of antiderivative = 1.26, number of steps used = 5, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {2339, 2338, 266, 43}

$$\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^2(a+b\log(cx^n))}{2em}-\frac{bd^2nx^{1-m}\log(x)(fx)^{m-1}}{2em}-\frac{bdnx(fx)^{m-1}}{m^2}-\frac{benx^{m+1}(fx)^{m-1}}{4m^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*d*n*x*(f*x)^(-1 + m))/m^2) - (b*e*n*x^(1 + m)*(f*x)^(-1 + m))/(4*m^2)
- (b*d^2*n*x^(1 - m)*(f*x)^(-1 + m)*Log[x])/(2*e*m) + (x^(1 - m)*(f*x)^(-1
+ m)*(d + e*x^m)^2*(a + b*Log[c*x^n]))/(2*e*m)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rubi steps

$$\int (fx)^{-1+m}\left(d+ex^m\right)\left(a+b\log\left(cx^n\right)\right)\,dx=\left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}\left(d+ex^m\right)\left(a+b\log\left(cx^n\right)\right)\,dx$$

$$=\frac{x^{1-m}(fx)^{-1+m}\left(d+ex^m\right)^2\left(a+b\log\left(cx^n\right)\right)}{2em}-\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int\frac{(d+ex^m)^2}{x}\,dx}{2em}$$

$$=\frac{x^{1-m}(fx)^{-1+m}\left(d+ex^m\right)^2\left(a+b\log\left(cx^n\right)\right)}{2em}-\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\mathrm{Subst}\left(\int\frac{(d}{}\right.}{2em^2}$$

$$=\frac{x^{1-m}(fx)^{-1+m}\left(d+ex^m\right)^2\left(a+b\log\left(cx^n\right)\right)}{2em}-\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\mathrm{Subst}\left(\int\left(2\right.\right.}{2em^2}$$

$$=-\frac{bdnx(fx)^{-1+m}}{m^2}-\frac{benx^{1+m}(fx)^{-1+m}}{4m^2}-\frac{bd^2nx^{1-m}(fx)^{-1+m}\log(x)}{2em}+\frac{x^{1-m}(f}{}$$

Mathematica [A] time = 0.063729, size = 61, normalized size = 0.68

$$\frac{(fx)^m\left(2am\left(2d+ex^m\right)+2bm\log\left(cx^n\right)\left(2d+ex^m\right)-bn\left(4d+ex^m\right)\right)}{4fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(2*a*m*(2*d + e*x^m) - b*n*(4*d + e*x^m) + 2*b*m*(2*d + e*x^m)*Log
[c*x^n]))/(4*f*m^2)
```

Maple [C] time = 0.165, size = 426, normalized size = 4.7

$$\frac{b\left(e x^{m}+2 d\right) x \ln\left(x^{n}\right)}{2 m} e^{\frac{(-1+m)\left(-i\pi\left(\operatorname{csgn}(ifx)\right)^{3}+i\pi\left(\operatorname{csgn}(ifx)\right)^{2}\operatorname{csgn}(if)+i\pi\left(\operatorname{csgn}(ifx)\right)^{2}\operatorname{csgn}(ix)-i\pi\operatorname{csgn}(ifx)\operatorname{csgn}(if)\operatorname{csgn}(ix)+2\ln(f)+2\ln(x)\right)}{2}} + \frac{\left(i\pi\, be\operatorname{csgn}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(d+e*x^m)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/2*b*(e*x^m+2*d)*x/m*ln(x^n)*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn
(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)
*csgn(I*x)+2*ln(f)+2*ln(x)))+1/4*(I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*
m-I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m-I*Pi*b*e*csgn(I*c*x^n)
^3*x^m*m+I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m+2*I*Pi*b*d*m*csgn(I*x^n)*
csgn(I*c*x^n)^2-2*I*Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*d
*m*csgn(I*c*x^n)^3+2*I*Pi*b*d*m*csgn(I*c*x^n)^2*csgn(I*c)+2*ln(c)*b*e*x^m*m
+4*ln(c)*b*d*m+2*x^m*a*e*m-x^m*b*e*n+4*a*d*m-4*b*d*n)*x/m^2*exp(1/2*(-1+m)*
(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I
*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.32975, size = 201, normalized size = 2.23

$$\frac{\left(2 bemn\log(x)+2 bem\log(c)+2 aem-ben\right)f^{m-1}x^{2m}+4\left(bdmn\log(x)+bdm\log(c)+adm-bdn\right)f^{m-1}x^{m}}{4 m^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*((2*b*e*m*n*log(x) + 2*b*e*m*log(c) + 2*a*e*m - b*e*n)*f^(m - 1)*x^(2*m
) + 4*(b*d*m*n*log(x) + b*d*m*log(c) + a*d*m - b*d*n)*f^(m - 1)*x^m)/m^2
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [A] time = 1.33761, size = 203, normalized size = 2.26

$$\frac{bdf^m nx^m \log(x)}{fm} + \frac{bf^m nx^{2m} e \log(x)}{2fm} + \frac{bdf^m x^m \log(c)}{fm} + \frac{bf^m x^{2m} e \log(c)}{2fm} + \frac{adf^m x^m}{fm} - \frac{bdf^m nx^m}{fm^2} + \frac{af^m x^{2m} e}{2fm} - \frac{bf^m}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*d*f^m*n*x^m*log(x)/(f*m) + 1/2*b*f^m*n*x^(2*m)*e*log(x)/(f*m) + b*d*f^m*x
^m*log(c)/(f*m) + 1/2*b*f^m*x^(2*m)*e*log(c)/(f*m) + a*d*f^m*x^m/(f*m) - b*
d*f^m*n*x^m/(f*m^2) + 1/2*a*f^m*x^(2*m)*e/(f*m) - 1/4*b*f^m*n*x^(2*m)*e/(f*
m^2)
```

3.354 $\int (fx)^{-1+m}(a+b\log(cx^n))\,dx$

Optimal. Leaf size=38

$$\frac{(fx)^m(a+b\log(cx^n))}{fm}-\frac{bn(fx)^m}{fm^2}$$

```
[Out] -((b*n*(f*x)^m)/(f*m^2)) + ((f*x)^m*(a + b*Log[c*x^n]))/(f*m)
```

Rubi [A] time = 0.0173125, antiderivative size = 38, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {2304}

$$\frac{(fx)^m(a+b\log(cx^n))}{fm}-\frac{bn(fx)^m}{fm^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^m)/(f*m^2)) + ((f*x)^m*(a + b*Log[c*x^n]))/(f*m)
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^{-1+m}(a+b\log(cx^n))\,dx=-\frac{bn(fx)^m}{fm^2}+\frac{(fx)^m(a+b\log(cx^n))}{fm}$$

Mathematica [A] time = 0.0094612, size = 29, normalized size = 0.76

$$\frac{(fx)^m(am+bm\log(cx^n)-bn)}{fm^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(a + b*Log[c*x^n]),x]
```

```
[Out] ((f*x)^m*(a*m - b*n + b*m*Log[c*x^n]))/(f*m^2)
```

Maple [C] time = 0.102, size = 281, normalized size = 7.4

$$\frac{bx\ln(x^n)}{m}\mathrm{e}^{\frac{(-1+m)\left(-i\pi(\mathrm{csgn}(ifx))^3+i\pi(\mathrm{csgn}(ifx))^2\mathrm{csgn}(if)+i\pi(\mathrm{csgn}(ifx))^2\mathrm{csgn}(ix)-i\pi\,\mathrm{csgn}(ifx)\mathrm{csgn}(if)\mathrm{csgn}(ix)+2\ln(f)+2\ln(x)\right)}{2}}+\frac{\left(i\pi\,b\mathrm{csgn}(ix^n)\,(\mathrm{csgn}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n)),x)
```

```
[Out] b/m*x*ln(x^n)*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I
*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(
f)+2*ln(x)))+1/2*(I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2*m-I*Pi*b*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*m-I*Pi*b*csgn(I*c*x^n)^3*m+I*Pi*b*csgn(I*c*x^n)^2*cs
gn(I*c)*m+2*b*ln(c)*m+2*a*m-2*b*n)/m^2*x*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^
3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x
)*csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^(-1+m)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.27176, size = 120, normalized size = 3.16

$$\frac{(bmnx\log(x)+bmx\log(c)+(am-bn)x)e^{\left((m-1)\log(f)+(m-1)\log(x)\right)}}{m^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (b*m*n*x*log(x) + b*m*x*log(c) + (a*m - b*n)*x)*e^((m - 1)*log(f) + (m - 1)
*log(x))/m^2
```

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((f*x)**(-1+m)*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.3117, size = 86, normalized size = 2.26

$$\frac{bf^m nx^m \log(x)}{fm} + \frac{bf^m x^m \log(c)}{fm} + \frac{af^m x^m}{fm} - \frac{bf^m nx^m}{fm^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*n*x^m*log(x)/(f*m) + b*f^m*x^m*log(c)/(f*m) + a*f^m*x^m/(f*m) - b*f^m
*n*x^m/(f*m^2)
```

3.355 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{d+ex^m}\,dx$

Optimal. Leaf size=77

$$\frac{bnx^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{ex^m}{d}\right)}{em^2}+\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{ex^m}{d}+1\right)(a+b\log(cx^n))}{em}$$

```
[Out] (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + (e*x^m)/d])/(e*m) + (b
*n*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[2, -((e*x^m)/d)])/(e*m^2)
```

Rubi [A] time = 0.191445, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2339, 2337, 2391}

$$\frac{bnx^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{ex^m}{d}\right)}{em^2}+\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{ex^m}{d}+1\right)(a+b\log(cx^n))}{em}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m),x]
```

```
[Out] (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + (e*x^m)/d])/(e*m) + (b
*n*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[2, -((e*x^m)/d)])/(e*m^2)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{d+ex^m}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}(a+b\log(cx^n))}{d+ex^m}\,dx$$

$$= \frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))\log\left(1+\frac{ex^m}{d}\right)}{em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{\log\left(1+\frac{ex^m}{d}\right)}{x}\,dx}{em}$$

$$= \frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))\log\left(1+\frac{ex^m}{d}\right)}{em} + \frac{bnx^{1-m}(fx)^{-1+m}\text{Li}_2\left(-\frac{ex^m}{d}\right)}{em^2}$$

Mathematica [A] time = 0.141644, size = 141, normalized size = 1.83

$$\frac{x^{-m}(fx)^m\left(-bn\text{PolyLog}\left(2,\frac{ex^m}{d}+1\right)+m\log(x)\left(am+bm\log\left(cx^n\right)+bn\log\left(d+ex^m\right)-bn\log\left(d-dx^m\right)\right)+am\log(d-\right.}{efm^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m),x]
```

```
[Out] ((f*x)^m*(-(b*m^2*n*Log[x]^2) + a*m*Log[d - d*x^m] + b*m*Log[c*x^n]*Log[d -
 d*x^m] - b*n*Log[-((e*x^m)/d)]*Log[d + e*x^m] + m*Log[x]*(a*m + b*m*Log[c*
x^n] - b*n*Log[d - d*x^m] + b*n*Log[d + e*x^m]) - b*n*PolyLog[2, 1 + (e*x^m
)/d]))/(e*f*m^2*x^m)
```

Maple [F] time = 0.98, size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{-1+m}(a+b\ln(cx^n))}{d+ex^m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m),x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$b \int \frac{f^m x^m \log(c) + f^m x^m \log(x^n)}{efxx^m + dfx}\, dx + \frac{af^{m-1} \log\left(\frac{ex^m+d}{e}\right)}{em}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m),x, algorithm="maxima")
```

```
[Out] b*integrate((f^m*x^m*log(c) + f^m*x^m*log(x^n))/(e*f*x*x^m + d*f*x), x) + a
*f^(m - 1)*log((e*x^m + d)/e)/(e*m)
```

Fricas [A] time = 1.34501, size = 190, normalized size = 2.47

$$\frac{bf^{m-1}mn \log(x) \log\left(\frac{ex^m+d}{d}\right) + bf^{m-1}n\mathrm{Li}_2\left(-\frac{ex^m+d}{d} + 1\right) + (bm \log(c) + am)f^{m-1} \log(ex^m + d)}{em^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m),x, algorithm="fricas")
```

```
[Out] (b*f^(m - 1)*m*n*log(x)*log((e*x^m + d)/d) + b*f^(m - 1)*n*dilog(-(e*x^m +
d)/d + 1) + (b*m*log(c) + a*m)*f^(m - 1)*log(e*x^m + d))/(e*m^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)(fx)^{m-1}}{ex^m + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^(m - 1)/(e*x^m + d), x)
```

3.356 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^2}\,dx$

Optimal. Leaf size=69

$$\frac{(fx)^m (a+b\log(cx^n))}{dfm(d+ex^m)} - \frac{bnx^{-m}(fx)^m \log(d+ex^m)}{defm^2}$$

```
[Out] ((f*x)^m*(a + b*Log[c*x^n]))/(d*f*m*(d + e*x^m)) - (b*n*(f*x)^m*Log[d + e*x
^m])/(d*e*f*m^2*x^m)
```

Rubi [A] time = 0.107119, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2335, 268, 260}

$$\frac{(fx)^m (a+b\log(cx^n))}{dfm(d+ex^m)} - \frac{bnx^{-m}(fx)^m \log(d+ex^m)}{defm^2}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^2,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n]))/(d*f*m*(d + e*x^m)) - (b*n*(f*x)^m*Log[d + e*x
^m])/(d*e*f*m^2*x^m)
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 268

```
Int[((c_)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(c^In
tPart[m]*(c*x)^FracPart[m])/x^FracPart[m], Int[x^m*(a + b*x^n)^p, x], x] /;
 FreeQ[{a, b, c, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^2}\,dx &= \frac{(fx)^m(a+b\log(cx^n))}{dfm(d+ex^m)} - \frac{(bn)\int\frac{(fx)^{-1+m}}{d+ex^m}\,dx}{dm}\\
&= \frac{(fx)^m(a+b\log(cx^n))}{dfm(d+ex^m)} - \frac{\left(bnx^{-m}(fx)^m\right)\int\frac{x^{-1+m}}{d+ex^m}\,dx}{dfm}\\
&= \frac{(fx)^m(a+b\log(cx^n))}{dfm(d+ex^m)} - \frac{bnx^{-m}(fx)^m\log(d+ex^m)}{defm^2}
\end{aligned}$$

Mathematica [A] time = 0.121435, size = 89, normalized size = 1.29

$$-\frac{x^{-m}(fx)^m\left(adm+bdm\log(cx^n)+benx^m\log(d+ex^m)-bmn\log(x)(d+ex^m)+bdn\log(d+ex^m)\right)}{defm^2(d+ex^m)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^2,x]
```

```
[Out] -(((f*x)^m*(a*d*m - b*m*n*(d + e*x^m)*Log[x] + b*d*m*Log[c*x^n] + b*d*n*Log
[d + e*x^m] + b*e*n*x^m*Log[d + e*x^m]))/(d*e*f*m^2*x^m*(d + e*x^m)))
```

Maple [F] time = 1.158, size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{-1+m}(a+b\ln(cx^n))}{(d+ex^m)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m)^2,x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m)^2,x)
```

Maxima [A] time = 1.19838, size = 131, normalized size = 1.9

$$bf^m n\left(\frac{\log(x)}{defm} - \frac{\log(ex^m + d)}{defm^2}\right) - \frac{bf^m \log(cx^n)}{e^2fmx^m + defm} - \frac{af^m}{e^2fmx^m + defm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^2,x, algorithm="maxima")
```

```
[Out] b*f^m*n*(log(x)/(d*e*f*m) - log(e*x^m + d)/(d*e*f*m^2)) - b*f^m*log(c*x^n)/
(e^2*f*m*x^m + d*e*f*m) - a*f^m/(e^2*f*m*x^m + d*e*f*m)
```

Fricas [A] time = 1.36141, size = 205, normalized size = 2.97

$$\frac{bef^{m-1}mnx^m \log(x) - (bdm\log(c) + adm)f^{m-1} - \left(bef^{m-1}nx^m + bdf^{m-1}n\right)\log(ex^m + d)}{de^2m^2x^m + d^2em^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^2,x, algorithm="fricas")
```

```
[Out] (b*e*f^(m - 1)*m*n*x^m*log(x) - (b*d*m*log(c) + a*d*m)*f^(m - 1) - (b*e*f^(
m - 1)*n*x^m + b*d*f^(m - 1)*n)*log(e*x^m + d))/(d*e^2*m^2*x^m + d^2*e*m^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m)**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.36732, size = 278, normalized size = 4.03

$$\frac{bf^m mnxx^m e\log(x)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{bf^m nxx^m e\log(x^me + d)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{bdf^m nx\log(x^me + d)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{bdf^m mx\log(c)}{dfm^2xx^me^2 + d^2fm^2xe} - \frac{adf^m}{dfm^2xx^me^2 +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^2,x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*e*log(x)/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e) - b*f^m*n*x*x^
m*e*log(x^m*e + d)/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e) - b*d*f^m*n*x*log(x^
m*e + d)/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e) - b*d*f^m*m*x*log(c)/(d*f*m^2*
x*x^m*e^2 + d^2*f*m^2*x*e) - a*d*f^m*m*x/(d*f*m^2*x*x^m*e^2 + d^2*f*m^2*x*e
)
```

3.357 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^3}\,dx$

Optimal. Leaf size=150

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{2d^2em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{2d^2em}+\frac{bnx^{1-m}(fx)^{m-1}}{2dem^2\left(d+ex^m\right)}$$

```
[Out] (b*n*x^(1 - m)*(f*x)^(-1 + m))/(2*d*e*m^2*(d + e*x^m)) + (b*n*x^(1 - m)*(f*
x)^(-1 + m)*Log[x])/(2*d^2*e*m) - (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^
n]))/(2*e*m*(d + e*x^m)^2) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/
(2*d^2*e*m^2)
```

Rubi [A] time = 0.215251, antiderivative size = 150, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2339, 2338, 266, 44}

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{2d^2em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{2d^2em}+\frac{bnx^{1-m}(fx)^{m-1}}{2dem^2\left(d+ex^m\right)}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^3,x]
```

```
[Out] (b*n*x^(1 - m)*(f*x)^(-1 + m))/(2*d*e*m^2*(d + e*x^m)) + (b*n*x^(1 - m)*(f*
x)^(-1 + m)*Log[x])/(2*d^2*e*m) - (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^
n]))/(2*e*m*(d + e*x^m)^2) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/
(2*d^2*e*m^2)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
```

```
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^m\right)^3}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^m\right)^3}\,dx$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{1}{x\left(d+ex^m\right)^2}\,dx}{2em}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\operatorname{Subst}\left(\int \frac{1}{x(d+ex)^2}\,dx, x, x^m\right)}{2em^2}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\operatorname{Subst}\left(\int \left(\frac{1}{d^2x} - \frac{e}{d(d+ex)^2} - \frac{e}{d^2(d+e}\right.\right.}{2em^2}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}}{2dem^2\left(d+ex^m\right)} + \frac{bnx^{1-m}(fx)^{-1+m}\log(x)}{2d^2em} - \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{2em\left(d+ex^m\right)^2} - \frac{bnx^{1-}}{}$$

Mathematica [A] time = 0.147099, size = 137, normalized size = 0.91

$$\frac{x^{-m}(fx)^m\left(-ad^2m - bd^2m\log\left(cx^n\right) - bd^2n\log\left(d+ex^m\right) + bd^2n - be^2nx^{2m}\log\left(d+ex^m\right) + bdenx^m - 2bdenx^m\log\left(d+ex\right.\right.}{2d^2efm^2\left(d+ex^m\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^3,x]
```

```
[Out] ((f*x)^m*(-(a*d^2*m) + b*d^2*n + b*d*e*n*x^m + b*m*n*(d + e*x^m)^2*Log[x] -
 b*d^2*m*Log[c*x^n] - b*d^2*n*Log[d + e*x^m] - 2*b*d*e*n*x^m*Log[d + e*x^m]
 - b*e^2*n*x^(2*m)*Log[d + e*x^m]))/(2*d^2*e*f*m^2*x^m*(d + e*x^m)^2)
```

Maple [F] time = 1.147, size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{-1+m} \left(a + b\ln\left(cx^{n}\right)\right)}{\left(d + ex^{m}\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m)^3,x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m)^3,x)
```

Maxima [A] time = 1.23201, size = 205, normalized size = 1.37

$$\frac{1}{2}\, bf^{m}n\left(\frac{1}{\left(de^{2}fmx^{m} + d^{2}efm\right)m} + \frac{\log\left(x\right)}{d^{2}efm} - \frac{\log\left(ex^{m} + d\right)}{d^{2}efm^{2}}\right) - \frac{bf^{m}\log\left(cx^{n}\right)}{2\left(e^{3}fmx^{2m} + 2\,de^{2}fmx^{m} + d^{2}efm\right)} - \frac{af}{2\left(e^{3}fmx^{2m} + 2\,d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*f^m*n*(1/((d*e^2*f*m*x^m + d^2*e*f*m)*m) + log(x)/(d^2*e*f*m) - log(e
*x^m + d)/(d^2*e*f*m^2)) - 1/2*b*f^m*log(c*x^n)/(e^3*f*m*x^(2*m) + 2*d*e^2*
f*m*x^m + d^2*e*f*m) - 1/2*a*f^m/(e^3*f*m*x^(2*m) + 2*d*e^2*f*m*x^m + d^2*e
*f*m)
```

Fricas [A] time = 1.62013, size = 382, normalized size = 2.55

$$\frac{be^{2}f^{m-1}mnx^{2m}\log\left(x\right) + \left(2\,bdemn\log\left(x\right) + bden\right)f^{m-1}x^{m} - \left(bd^{2}m\log\left(c\right) + ad^{2}m - bd^{2}n\right)f^{m-1} - \left(be^{2}f^{m-1}nx^{2m} + 2\,bd\right.}{2\left(d^{2}e^{3}m^{2}x^{2m} + 2\,d^{3}e^{2}m^{2}x^{m} + d^{4}em^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*e^2*f^(m - 1)*m*n*x^(2*m)*log(x) + (2*b*d*e*m*n*log(x) + b*d*e*n)*f^
(m - 1)*x^m - (b*d^2*m*log(c) + a*d^2*m - b*d^2*n)*f^(m - 1) - (b*e^2*f^(m
- 1)*n*x^(2*m) + 2*b*d*e*f^(m - 1)*n*x^m + b*d^2*f^(m - 1)*n)*log(e*x^m + d
))/(d^2*e^3*m^2*x^(2*m) + 2*d^3*e^2*m^2*x^m + d^4*e*m^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m)**3,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.31322, size = 848, normalized size = 5.65

$$\frac{bdf^m mnx^2x^me\log(x)}{2\,d^3fm^2x^2x^me^2+d^4fm^2x^2e+d^2fm^2x^2x^{2\,m}e^3}-\frac{bdf^m nx^2x^me\log(x^me+d)}{2\,d^3fm^2x^2x^me^2+d^4fm^2x^2e+d^2fm^2x^2x^{2\,m}e^3}+\frac{bf^m mnx^2}{2\left(2\,d^3fm^2x^2x^me^2+d^4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^3,x, algorithm="giac")
```

```
[Out] b*d*f^m*m*n*x^2*x^m*e*log(x)/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d
^2*f*m^2*x^2*x^(2*m)*e^3) - b*d*f^m*n*x^2*x^m*e*log(x^m*e + d)/(2*d^3*f*m^2
*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) + 1/2*b*f^m*m*n
*x^2*x^(2*m)*e^2*log(x)/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*
m^2*x^2*x^(2*m)*e^3) + 1/2*b*d*f^m*n*x^2*x^m*e/(2*d^3*f*m^2*x^2*x^m*e^2 + d
^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) - 1/2*b*d^2*f^m*n*x^2*log(x^m*e
 + d)/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^
3) - 1/2*b*f^m*n*x^2*x^(2*m)*e^2*log(x^m*e + d)/(2*d^3*f*m^2*x^2*x^m*e^2 +
d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) - 1/2*b*d^2*f^m*m*x^2*log(c)/(
2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3) - 1/
2*a*d^2*f^m*m*x^2/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x^2*e + d^2*f*m^2*x^
2*x^(2*m)*e^3) + 1/2*b*d^2*f^m*n*x^2/(2*d^3*f*m^2*x^2*x^m*e^2 + d^4*f*m^2*x
^2*e + d^2*f*m^2*x^2*x^(2*m)*e^3)
```

3.358 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^4}\,dx$

Optimal. Leaf size=188

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{3em\left(d+ex^m\right)^3}+\frac{bnx^{1-m}(fx)^{m-1}}{3d^2em^2\left(d+ex^m\right)}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{3d^3em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{3d^3em}+\frac{bnx^{1-m}}{6dem^2\left(\right.}$$

```
[Out] (b*n*x^(1 - m)*(f*x)^(-1 + m))/(6*d*e*m^2*(d + e*x^m)^2) + (b*n*x^(1 - m)*(
f*x)^(-1 + m))/(3*d^2*e*m^2*(d + e*x^m)) + (b*n*x^(1 - m)*(f*x)^(-1 + m)*Lo
g[x])/(3*d^3*e*m) - (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(3*e*m*(d
 + e*x^m)^3) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/(3*d^3*e*m^2)
```

Rubi [A] time = 0.23405, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2339, 2338, 266, 44}

$$-\frac{x^{1-m}(fx)^{m-1}\left(a+b\log\left(cx^n\right)\right)}{3em\left(d+ex^m\right)^3}+\frac{bnx^{1-m}(fx)^{m-1}}{3d^2em^2\left(d+ex^m\right)}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(d+ex^m\right)}{3d^3em^2}+\frac{bnx^{1-m}\log(x)(fx)^{m-1}}{3d^3em}+\frac{bnx^{1-m}}{6dem^2\left(\right.}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^4,x]
```

```
[Out] (b*n*x^(1 - m)*(f*x)^(-1 + m))/(6*d*e*m^2*(d + e*x^m)^2) + (b*n*x^(1 - m)*(
f*x)^(-1 + m))/(3*d^2*e*m^2*(d + e*x^m)) + (b*n*x^(1 - m)*(f*x)^(-1 + m)*Lo
g[x])/(3*d^3*e*m) - (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(3*e*m*(d
 + e*x^m)^3) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/(3*d^3*e*m^2)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
```

```
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{(fx)^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^4}\,dx &= \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^4}\,dx\\
&= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))}{3em(d+ex^m)^3}+\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{1}{x(d+ex^m)^3}\,dx}{3em}\\
&= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))}{3em(d+ex^m)^3}+\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\mathrm{Subst}\left(\int \frac{1}{x(d+ex)^3}\,dx,x,x^m\right)}{3em^2}\\
&= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))}{3em(d+ex^m)^3}+\frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\mathrm{Subst}\left(\int\left(\frac{1}{d^3x}-\frac{e}{d(d+ex)^3}-\frac{e}{d^2(d+e}\right.\right.}{3em^2}\\
&= \frac{bnx^{1-m}(fx)^{-1+m}}{6dem^2(d+ex^m)^2}+\frac{bnx^{1-m}(fx)^{-1+m}}{3d^2em^2(d+ex^m)}+\frac{bnx^{1-m}(fx)^{-1+m}\log(x)}{3d^3em}-\frac{x^{1-m}(fx)^{-1+m}(a+}{3em(d+e}\end{aligned}$$

Mathematica [A] time = 0.153825, size = 178, normalized size = 0.95

$$\frac{x^{-m}(fx)^m\left(-2ad^3m-2bd^3m\log(cx^n)+5bd^2enx^m-6bd^2enx^m\log(d+ex^m)-2bd^3n\log(d+ex^m)+3bd^3n+2bde^2nx^{2m}\right.}{6d^3efm^2(d+ex^m)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d + e*x^m)^4,x]
```

```
[Out] ((f*x)^m*(-2*a*d^3*m + 3*b*d^3*n + 5*b*d^2*e*n*x^m + 2*b*d*e^2*n*x^(2*m) +
2*b*m*n*(d + e*x^m)^3*Log[x] - 2*b*d^3*m*Log[c*x^n] - 2*b*d^3*n*Log[d + e*x
^m] - 6*b*d^2*e*n*x^m*Log[d + e*x^m] - 6*b*d*e^2*n*x^(2*m)*Log[d + e*x^m] -
 2*b*e^3*n*x^(3*m)*Log[d + e*x^m]))/(6*d^3*e*f*m^2*x^m*(d + e*x^m)^3)
```

Maple [F] time = 0.951, size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{-1+m}\left(a+b\ln\left(cx^{n}\right)\right)}{\left(d+ex^{m}\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m)^4,x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))/(d+e*x^m)^4,x)
```

Maxima [A] time = 1.22851, size = 284, normalized size = 1.51

$$\frac{1}{6}\,bf^{m}n\left(\frac{2\,ex^{m}+3\,d}{\left(d^{2}e^{3}fmx^{2\,m}+2\,d^{3}e^{2}fmx^{m}+d^{4}efm\right)m}+\frac{2\,\log\left(x\right)}{d^{3}efm}-\frac{2\,\log\left(ex^{m}+d\right)}{d^{3}efm^{2}}\right)-\frac{bf^{m}\log\left(cx^{n}\right)}{3\left(e^{4}fmx^{3\,m}+3\,de^{3}fmx^{2\,m}+3\,d^{2}e^{2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^4,x, algorithm="maxima")
```

```
[Out] 1/6*b*f^m*n*((2*e*x^m + 3*d)/((d^2*e^3*f*m*x^(2*m) + 2*d^3*e^2*f*m*x^m + d^
4*e*f*m)*m) + 2*log(x)/(d^3*e*f*m) - 2*log(e*x^m + d)/(d^3*e*f*m^2)) - 1/3*
b*f^m*log(c*x^n)/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d^2*e^2*f*m*x^m
 + d^3*e*f*m) - 1/3*a*f^m/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d^2*e^
2*f*m*x^m + d^3*e*f*m)
```

Fricas [A] time = 1.63029, size = 559, normalized size = 2.97

$$\frac{2\,be^{3}f^{m-1}mnx^{3\,m}\log\left(x\right)+2\left(3\,bde^{2}mn\log\left(x\right)+bde^{2}n\right)f^{m-1}x^{2\,m}+\left(6\,bd^{2}emn\log\left(x\right)+5\,bd^{2}en\right)f^{m-1}x^{m}-\left(2\,bd^{3}m\log\left(\right.\right.}{6\left(d^{3}e^{4}m^{2}x^{3\,m}+3\,d^{4}e^{3}m^{2}x^{2\,m}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^4,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b*e^3*f^(m - 1)*m*n*x^(3*m)*log(x) + 2*(3*b*d*e^2*m*n*log(x) + b*d*e
^2*n)*f^(m - 1)*x^(2*m) + (6*b*d^2*e*m*n*log(x) + 5*b*d^2*e*n)*f^(m - 1)*x^
m - (2*b*d^3*m*log(c) + 2*a*d^3*m - 3*b*d^3*n)*f^(m - 1) - 2*(b*e^3*f^(m -
1)*n*x^(3*m) + 3*b*d*e^2*f^(m - 1)*n*x^(2*m) + 3*b*d^2*e*f^(m - 1)*n*x^m +
b*d^3*f^(m - 1)*n)*log(e*x^m + d))/(d^3*e^4*m^2*x^(3*m) + 3*d^4*e^3*m^2*x^(
2*m) + 3*d^5*e^2*m^2*x^m + d^6*e*m^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))/(d+e*x**m)**4,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.42465, size = 1458, normalized size = 7.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))/(d+e*x^m)^4,x, algorithm="giac")
```

```
[Out] b*d^2*f^m*m*n*x^3*x^m*e*log(x)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e +
 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) - b*d^2*f^m*n*x^3
*x^m*e*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*
m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + b*d*f^m*m*n*x^3*x^(2*m)*
e^2*log(x)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(
2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + 5/6*b*d^2*f^m*n*x^3*x^m*e/(3*d^5*f*
m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2
*x^3*x^(3*m)*e^4) - 1/3*b*d^3*f^m*n*x^3*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m
*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m
)*e^4) - b*d*f^m*n*x^3*x^(2*m)*e^2*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m*e^2
+ d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4
) - 1/3*b*d^3*f^m*m*x^3*log(c)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e +
```

```
 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + 1/3*b*f^m*m*n*x
^3*x^(3*m)*e^3*log(x)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*
m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) - 1/3*a*d^3*f^m*m*x^3/(3*d
^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*
f*m^2*x^3*x^(3*m)*e^4) + 1/2*b*d^3*f^m*n*x^3/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6
*f*m^2*x^3*e + 3*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) + 1
/3*b*d*f^m*n*x^3*x^(2*m)*e^2/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3
*d^4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4) - 1/3*b*f^m*n*x^3*x
^(3*m)*e^3*log(x^m*e + d)/(3*d^5*f*m^2*x^3*x^m*e^2 + d^6*f*m^2*x^3*e + 3*d^
4*f*m^2*x^3*x^(2*m)*e^3 + d^3*f*m^2*x^3*x^(3*m)*e^4)
```

3.359 $\int (fx)^{-1+m}(d+ex^m)^3(a+b\log(cx^n))^2\,dx$

Optimal. Leaf size=372

$$-\frac{3bd^2enx^{m+1}(fx)^{m-1}(a+b\log(cx^n))}{2m^2}-\frac{bd^4nx^{1-m}\log(x)(fx)^{m-1}(a+b\log(cx^n))}{2em}-\frac{2bd^3nx(fx)^{m-1}(a+b\log(cx^n))}{m^2}-2$$

```
[Out] (2*b^2*d^3*n^2*x*(f*x)^(-1 + m))/m^3 + (3*b^2*d^2*e*n^2*x^(1 + m)*(f*x)^(-1
 + m))/(4*m^3) + (2*b^2*d*e^2*n^2*x^(1 + 2*m)*(f*x)^(-1 + m))/(9*m^3) + (b^
2*e^3*n^2*x^(1 + 3*m)*(f*x)^(-1 + m))/(32*m^3) + (b^2*d^4*n^2*x^(1 - m)*(f*
x)^(-1 + m)*Log[x]^2)/(4*e*m) - (2*b*d^3*n*x*(f*x)^(-1 + m)*(a + b*Log[c*x^
n]))/m^2 - (3*b*d^2*e*n*x^(1 + m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(2*m^2
) - (2*b*d*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(3*m^2) - (
b*e^3*n*x^(1 + 3*m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(8*m^2) - (b*d^4*n*x
^(1 - m)*(f*x)^(-1 + m)*Log[x]*(a + b*Log[c*x^n]))/(2*e*m) + (x^(1 - m)*(f*
x)^(-1 + m)*(d + e*x^m)^4*(a + b*Log[c*x^n])^2)/(4*e*m)
```

Rubi [A] time = 0.480505, antiderivative size = 294, normalized size of antiderivative = 0.79, number of steps used = 7, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {2339, 2338, 266, 43, 2334, 14, 2301}

$$-\frac{bnx^{1-m}(fx)^{m-1}\left(\frac{36d^2e^2x^{2m}}{m}+\frac{48d^3ex^m}{m}+12d^4\log(x)+\frac{16de^3x^{3m}}{m}+\frac{3e^4x^{4m}}{m}\right)(a+b\log(cx^n))}{24em}+\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^4(a+b}{4em}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d^3*n^2*x*(f*x)^(-1 + m))/m^3 + (3*b^2*d^2*e*n^2*x^(1 + m)*(f*x)^(-1
 + m))/(4*m^3) + (2*b^2*d*e^2*n^2*x^(1 + 2*m)*(f*x)^(-1 + m))/(9*m^3) + (b^
2*e^3*n^2*x^(1 + 3*m)*(f*x)^(-1 + m))/(32*m^3) + (b^2*d^4*n^2*x^(1 - m)*(f*
x)^(-1 + m)*Log[x]^2)/(4*e*m) - (b*n*x^(1 - m)*(f*x)^(-1 + m)*((48*d^3*e*x^
m)/m + (36*d^2*e^2*x^(2*m))/m + (16*d*e^3*x^(3*m))/m + (3*e^4*x^(4*m))/m +
12*d^4*Log[x])*(a + b*Log[c*x^n]))/(24*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d
+ e*x^m)^4*(a + b*Log[c*x^n])^2)/(4*e*m)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
```

```
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)^3(a+b\log(cx^n))^2\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)^3(a+b\log(cx^n))^2\,dx$$
$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^4(a+b\log(cx^n))^2}{4em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int\frac{(d+ex^m)^4(\cdots}{}}{2em}$$
$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{48d^3ex^m}{m}+\frac{36d^2e^2x^{2m}}{m}+\frac{16de^3x^{3m}}{m}+\frac{3e^4x^{4m}}{m}+12d^4\log(x)\right)(a\cdots}{24em}$$
$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{48d^3ex^m}{m}+\frac{36d^2e^2x^{2m}}{m}+\frac{16de^3x^{3m}}{m}+\frac{3e^4x^{4m}}{m}+12d^4\log(x)\right)(a\cdots}{24em}$$
$$= \frac{b^2d^4n^2x^{1-m}(fx)^{-1+m}\log^2(x)}{4em} - \frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{48d^3ex^m}{m}+\frac{36d^2e^2x^{2m}}{m}+\frac{16de^3\cdots}{m}\cdots}{24\cdots}$$
$$= \frac{2b^2d^3n^2x(fx)^{-1+m}}{m^3}+\frac{3b^2d^2en^2x^{1+m}(fx)^{-1+m}}{4m^3}+\frac{2b^2de^2n^2x^{1+2m}(fx)^{-1+m}}{9m^3}+\cdots$$

Mathematica [A] time = 0.252766, size = 285, normalized size = 0.77

$$\frac{(fx)^m\left(72a^2m^2\left(6d^2ex^m+4d^3+4de^2x^{2m}+e^3x^{3m}\right)+12bm\log(cx^n)\left(12am\left(6d^2ex^m+4d^3+4de^2x^{2m}+e^3x^{3m}\right)-bn\left(36d^2\cdots\right.\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(72*a^2*m^2*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m))
- 12*a*b*m*n*(48*d^3 + 36*d^2*e*x^m + 16*d*e^2*x^(2*m) + 3*e^3*x^(3*m)) + b
^2*n^2*(576*d^3 + 216*d^2*e*x^m + 64*d*e^2*x^(2*m) + 9*e^3*x^(3*m)) + 12*b*
m*(12*a*m*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m)) - b*n*(48*d
^3 + 36*d^2*e*x^m + 16*d*e^2*x^(2*m) + 3*e^3*x^(3*m)))*Log[c*x^n] + 72*b^2*
m^2*(4*d^3 + 6*d^2*e*x^m + 4*d*e^2*x^(2*m) + e^3*x^(3*m))*Log[c*x^n]^2))/(2
88*f*m^3)
```

Maple [C] time = 0.493, size = 4156, normalized size = 11.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*ln(c*x^n))^2,x)

[Out] 1/4*b^2*(e^3*(x^m)^3+4*d*e^2*(x^m)^2+6*d^2*e*x^m+4*d^3)*x/m*ln(x^n)^2*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))+1/24*b*(48*ln(c)*b*d^3*m+48*a*d*e^2*(x^m)^2*m+24*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m+72*a*d^2*e*x^m*m-16*b*d*e^2*n*(x^m)^2-36*b*d^2*e*n*x^m+12*ln(c)*b*e^3*(x^m)^3*m+48*a*d^3*m-24*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m+6*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3*m-6*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^m)^3*m-3*b*e^3*n*(x^m)^3+12*a*e^3*(x^m)^3*m-48*b*d^3*n+36*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m+6*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3*m-24*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^m)^2*m-24*I*Pi*b*d^3*csgn(I*c*x^n)^3*m+48*ln(c)*b*d*e^2*(x^m)^2*m+72*ln(c)*b*d^2*e*x^m*m-36*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^m*m-24*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m-36*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m+24*I*Pi*b*d^3*m*csgn(I*x^n)*csgn(I*c*x^n)^2+24*I*Pi*b*d^3*m*csgn(I*c*x^n)^2*csgn(I*c)+24*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m-6*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m+36*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m)*x/m^2*ln(x^n)*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))+1/288*(72*a^2*e^3*(x^m)^3*m^2+9*b^2*e^3*n^2*(x^m)^3+288*ln(c)^2*b^2*d^3*m^2+288*I*ln(c)*Pi*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m^2+288*I*ln(c)*Pi*b^2*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m^2-72*I*Pi*a*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m^2+64*b^2*d*e^2*n^2*(x^m)^2+216*b^2*d^2*e*n^2*x^m+72*ln(c)^2*b^2*e^3*(x^m)^3*m^2-72*Pi^2*b^2*d^3*csgn(I*c*x^n)^6*m^2+288*a^2*d*e^2*(x^m)^2*m^2+432*a^2*d^2*e*x^m*m^2-72*Pi^2*b^2*d*e^2*csgn(I*c*x^n)^6*(x^m)^2*m^2-108*Pi^2*b^2*d^2*e*csgn(I*c*x^n)^6*x^m*m^2-18*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^m)^3*m^2+36*Pi^2*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^m)^3*m^2-576*a*b*d^3*m*n-96*I*Pi*b^2*d*e^2*m*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2+432*I*Pi*a*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2+432*I*Pi*a*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2+288*a^2*d^3*m^2+576*b^2*d^3*n^2-72*I*ln(c)*Pi*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3*m^2+18*I*Pi*b^2*e^3*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^3+432*I*ln(c)*Pi*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2+432*I*ln(c)*Pi*b^2*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2+72*I*ln(c)*Pi*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3*m^2+72*I*ln(c)*Pi*b^2*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3*m^2-288*I*ln(c)*Pi*b^2*d*e^2*csgn(I*c*x^n)^3*(x^m)^2*m^2+72*I*Pi*a*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3*m^2+72*I*Pi*a*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3*m^2-18*I*Pi*b^2*e^3*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^3-18*I*Pi*b^2*e^3*m*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^3-432*I*ln(c)*Pi*b^2*d^2*e*csgn(I*c*x^n)^3*x^m*m^2-216*I*Pi*b^2*d^2*e*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m-216*I*Pi*b^2*d^2*e*m*n*csgn(I*c*x^n)^2*csgn(I*c)*x^m-18*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*(x^m)^3*m^2-72*Pi^2*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^

n)^4*csgn(I*c)*(x^m)^3*m^2+36*Pi^2*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn
(I*c)^2*(x^m)^3*m^2-72*Pi^2*b^2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^m)^2
*m^2+144*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^m)^2*m^2+144*Pi^2*b^
2*d*e^2*csgn(I*c*x^n)^5*csgn(I*c)*(x^m)^2*m^2-288*I*Pi*a*b*d*e^2*csgn(I*c*x
^n)^3*(x^m)^2*m^2+96*I*Pi*b^2*d*e^2*m*n*csgn(I*c*x^n)^3*(x^m)^2+288*I*Pi*a*
b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m^2+288*I*Pi*a*b*d*e^2*csgn(I*c
*x^n)^2*csgn(I*c)*(x^m)^2*m^2-96*I*Pi*b^2*d*e^2*m*n*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^m)^2+576*ln(c)*a*b*d^3*m^2-576*ln(c)*b^2*d^3*m*n-18*Pi^2*b^2*e^3*cs
gn(I*c*x^n)^6*(x^m)^3*m^2-288*I*ln(c)*Pi*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*(x^m)^2*m^2+36*Pi^2*b^2*e^3*csgn(I*c*x^n)^5*csgn(I*c)*(x^m)^3*m
^2-288*I*ln(c)*Pi*b^2*d^3*csgn(I*c*x^n)^3*m^2-288*I*Pi*a*b*d^3*csgn(I*c*x^n
)^3*m^2+288*I*Pi*b^2*d^3*m*n*csgn(I*c*x^n)^3-108*Pi^2*b^2*d^2*e*csgn(I*x^n)
^2*csgn(I*c*x^n)^4*x^m*m^2+216*Pi^2*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x
^m*m^2+216*Pi^2*b^2*d^2*e*csgn(I*c*x^n)^5*csgn(I*c)*x^m*m^2-108*Pi^2*b^2*d^
2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x^m*m^2+36*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(
I*c*x^n)^3*csgn(I*c)*(x^m)^3*m^2-192*a*b*d*e^2*m*n*(x^m)^2-432*a*b*d^2*e*m*
n*x^m-192*ln(c)*b^2*d*e^2*m*n*(x^m)^2-432*ln(c)*b^2*d^2*e*m*n*x^m-288*Pi^2*
b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*m^2+144*Pi^2*b^2*d^3*csgn(I*x
^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*m^2-18*Pi^2*b^2*e^3*csgn(I*c*x^n)^4*csgn(I*
c)^2*(x^m)^3*m^2-432*I*Pi*a*b*d^2*e*csgn(I*c*x^n)^3*x^m*m^2+216*I*Pi*b^2*d^
2*e*m*n*csgn(I*c*x^n)^3*x^m-288*I*ln(c)*Pi*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*m^2-288*I*Pi*a*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m^2+28
8*I*Pi*a*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)*m^2-288*I*Pi*b^2*d^3*m*n*csgn(I*x^
n)*csgn(I*c*x^n)^2-288*I*Pi*b^2*d^3*m*n*csgn(I*c*x^n)^2*csgn(I*c)-432*I*Pi*
a*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m^2+216*I*Pi*b^2*d^2*e*m*
n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m-72*I*ln(c)*Pi*b^2*e^3*csgn(I*c*x^
n)^3*(x^m)^3*m^2-72*I*Pi*a*b*e^3*csgn(I*c*x^n)^3*(x^m)^3*m^2+18*I*Pi*b^2*e^
3*m*n*csgn(I*c*x^n)^3*(x^m)^3-36*a*b*e^3*m*n*(x^m)^3-72*Pi^2*b^2*d*e^2*csgn
(I*c*x^n)^4*csgn(I*c)^2*(x^m)^2*m^2+288*I*ln(c)*Pi*b^2*d^3*csgn(I*x^n)*csgn
(I*c*x^n)^2*m^2+288*I*ln(c)*Pi*b^2*d^3*csgn(I*c*x^n)^2*csgn(I*c)*m^2+288*I*
Pi*a*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2*m^2-432*I*ln(c)*Pi*b^2*d^2*e*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m^2-288*I*Pi*a*b*d*e^2*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*(x^m)^2*m^2+96*I*Pi*b^2*d*e^2*m*n*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*(x^m)^2+576*ln(c)*a*b*d*e^2*(x^m)^2*m^2+864*ln(c)*a*b*d^2*e*x^m
*m^2+144*Pi^2*b^2*d^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*m^2-72*Pi^2*b
^2*d^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*m^2+144*ln(c)*a*b*e^3*(x^m
)^3*m^2+432*ln(c)^2*b^2*d^2*e*x^m*m^2-36*ln(c)*b^2*e^3*m*n*(x^m)^3+288*ln(c
)^2*b^2*d*e^2*(x^m)^2*m^2-72*Pi^2*b^2*d^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4*m^2
+144*Pi^2*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n)^5*m^2+144*Pi^2*b^2*d^3*csgn(I*c
*x^n)^5*csgn(I*c)*m^2-72*Pi^2*b^2*d^3*csgn(I*c*x^n)^4*csgn(I*c)^2*m^2+288*I
*Pi*b^2*d^3*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+144*Pi^2*b^2*d*e^2*csgn
(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*(x^m)^2*m^2-72*Pi^2*b^2*d*e^2*csgn(I*x^
n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*(x^m)^2*m^2+144*Pi^2*b^2*d*e^2*csgn(I*x^n)
*csgn(I*c*x^n)^3*csgn(I*c)^2*(x^m)^2*m^2+216*Pi^2*b^2*d^2*e*csgn(I*x^n)^2*c
sgn(I*c*x^n)^3*csgn(I*c)*x^m*m^2-108*Pi^2*b^2*d^2*e*csgn(I*x^n)^2*csgn(I*c*

```
x^n)^2*csgn(I*c)^2*x^m*m^2-432*Pi^2*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^4*c
sgn(I*c)*x^m*m^2+216*Pi^2*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2
*x^m*m^2-288*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^m)^2*m
^2)*x/m^3*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+
I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.63913, size = 1318, normalized size = 3.54

$$\frac{9\left(8\,b^2e^3m^2n^2\log\left(x\right)^2+8\,b^2e^3m^2\log\left(c\right)^2+8\,a^2e^3m^2-4\,abe^3mn+b^2e^3n^2+4\left(4\,abe^3m^2-b^2e^3mn\right)\log\left(c\right)+4\left(4\,b^2e^3n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n))^2,x, algorithm="fricas"
)
```

```
[Out] 1/288*(9*(8*b^2*e^3*m^2*n^2*log(x)^2 + 8*b^2*e^3*m^2*log(c)^2 + 8*a^2*e^3*m
^2 - 4*a*b*e^3*m*n + b^2*e^3*n^2 + 4*(4*a*b*e^3*m^2 - b^2*e^3*m*n)*log(c) +
 4*(4*b^2*e^3*m^2*n*log(c) + 4*a*b*e^3*m^2*n - b^2*e^3*m*n^2)*log(x))*f^(m
- 1)*x^(4*m) + 32*(9*b^2*d*e^2*m^2*n^2*log(x)^2 + 9*b^2*d*e^2*m^2*log(c)^2
+ 9*a^2*d*e^2*m^2 - 6*a*b*d*e^2*m*n + 2*b^2*d*e^2*n^2 + 6*(3*a*b*d*e^2*m^2
- b^2*d*e^2*m*n)*log(c) + 6*(3*b^2*d*e^2*m^2*n*log(c) + 3*a*b*d*e^2*m^2*n -
 b^2*d*e^2*m*n^2)*log(x))*f^(m - 1)*x^(3*m) + 216*(2*b^2*d^2*e*m^2*n^2*log(
x)^2 + 2*b^2*d^2*e*m^2*log(c)^2 + 2*a^2*d^2*e*m^2 - 2*a*b*d^2*e*m*n + b^2*d
^2*e*n^2 + 2*(2*a*b*d^2*e*m^2 - b^2*d^2*e*m*n)*log(c) + 2*(2*b^2*d^2*e*m^2*
n*log(c) + 2*a*b*d^2*e*m^2*n - b^2*d^2*e*m*n^2)*log(x))*f^(m - 1)*x^(2*m) +
 288*(b^2*d^3*m^2*n^2*log(x)^2 + b^2*d^3*m^2*log(c)^2 + a^2*d^3*m^2 - 2*a*b
*d^3*m*n + 2*b^2*d^3*n^2 + 2*(a*b*d^3*m^2 - b^2*d^3*m*n)*log(c) + 2*(b^2*d^
```

```
3*m^2*n*log(c) + a*b*d^3*m^2*n - b^2*d^3*m*n^2)*log(x))*f^(m - 1)*x^m)/m^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**3*(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.53804, size = 1330, normalized size = 3.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^3*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*d^3*f^m*n^2*x^m*log(x)^2/(f*m) + 3/2*b^2*d^2*f^m*n^2*x^(2*m)*e*log(x)^2
/(f*m) + 2*b^2*d^3*f^m*n*x^m*log(c)*log(x)/(f*m) + 3*b^2*d^2*f^m*n*x^(2*m)*
e*log(c)*log(x)/(f*m) + b^2*d*f^m*n^2*x^(3*m)*e^2*log(x)^2/(f*m) + b^2*d^3*
f^m*x^m*log(c)^2/(f*m) + 3/2*b^2*d^2*f^m*x^(2*m)*e*log(c)^2/(f*m) + 2*a*b*d
^3*f^m*n*x^m*log(x)/(f*m) - 2*b^2*d^3*f^m*n^2*x^m*log(x)/(f*m^2) + 3*a*b*d^
2*f^m*n*x^(2*m)*e*log(x)/(f*m) - 3/2*b^2*d^2*f^m*n^2*x^(2*m)*e*log(x)/(f*m^
2) + 2*b^2*d*f^m*n*x^(3*m)*e^2*log(c)*log(x)/(f*m) + 1/4*b^2*f^m*n^2*x^(4*m
)*e^3*log(x)^2/(f*m) + 2*a*b*d^3*f^m*x^m*log(c)/(f*m) - 2*b^2*d^3*f^m*n*x^m
*log(c)/(f*m^2) + 3*a*b*d^2*f^m*x^(2*m)*e*log(c)/(f*m) - 3/2*b^2*d^2*f^m*n*
x^(2*m)*e*log(c)/(f*m^2) + b^2*d*f^m*x^(3*m)*e^2*log(c)^2/(f*m) + 2*a*b*d*f
^m*n*x^(3*m)*e^2*log(x)/(f*m) - 2/3*b^2*d*f^m*n^2*x^(3*m)*e^2*log(x)/(f*m^2
) + 1/2*b^2*f^m*n*x^(4*m)*e^3*log(c)*log(x)/(f*m) + a^2*d^3*f^m*x^m/(f*m) -
 2*a*b*d^3*f^m*n*x^m/(f*m^2) + 2*b^2*d^3*f^m*n^2*x^m/(f*m^3) + 3/2*a^2*d^2*
f^m*x^(2*m)*e/(f*m) - 3/2*a*b*d^2*f^m*n*x^(2*m)*e/(f*m^2) + 3/4*b^2*d^2*f^m
*n^2*x^(2*m)*e/(f*m^3) + 2*a*b*d*f^m*x^(3*m)*e^2*log(c)/(f*m) - 2/3*b^2*d*f
^m*n*x^(3*m)*e^2*log(c)/(f*m^2) + 1/4*b^2*f^m*x^(4*m)*e^3*log(c)^2/(f*m) +
1/2*a*b*f^m*n*x^(4*m)*e^3*log(x)/(f*m) - 1/8*b^2*f^m*n^2*x^(4*m)*e^3*log(x)
/(f*m^2) + a^2*d*f^m*x^(3*m)*e^2/(f*m) - 2/3*a*b*d*f^m*n*x^(3*m)*e^2/(f*m^2
) + 2/9*b^2*d*f^m*n^2*x^(3*m)*e^2/(f*m^3) + 1/2*a*b*f^m*x^(4*m)*e^3*log(c)/
```

```
(f*m) - 1/8*b^2*f^m*n*x^(4*m)*e^3*log(c)/(f*m^2) + 1/4*a^2*f^m*x^(4*m)*e^3/
(f*m) - 1/8*a*b*f^m*n*x^(4*m)*e^3/(f*m^2) + 1/32*b^2*f^m*n^2*x^(4*m)*e^3/(f
*m^3)
```

3.360 $\int (fx)^{-1+m}(d+ex^m)^2(a+b\log(cx^n))^2\,dx$

Optimal. Leaf size=298

$$-\frac{2bd^3nx^{1-m}\log(x)(fx)^{m-1}(a+b\log(cx^n))}{3em}-\frac{2bd^2nx(fx)^{m-1}(a+b\log(cx^n))}{m^2}-\frac{bdenx^{m+1}(fx)^{m-1}(a+b\log(cx^n))}{m^2}+\frac{x^1}{}$$

```
[Out] (2*b^2*d^2*n^2*x*(f*x)^(-1 + m))/m^3 + (b^2*d*e*n^2*x^(1 + m)*(f*x)^(-1 + m
))/(2*m^3) + (2*b^2*e^2*n^2*x^(1 + 2*m)*(f*x)^(-1 + m))/(27*m^3) + (b^2*d^3
*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[x]^2)/(3*e*m) - (2*b*d^2*n*x*(f*x)^(-1 +
m)*(a + b*Log[c*x^n]))/m^2 - (b*d*e*n*x^(1 + m)*(f*x)^(-1 + m)*(a + b*Log[c
*x^n]))/m^2 - (2*b*e^2*n*x^(1 + 2*m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(9*
m^2) - (2*b*d^3*n*x^(1 - m)*(f*x)^(-1 + m)*Log[x]*(a + b*Log[c*x^n]))/(3*e*
m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^3*(a + b*Log[c*x^n])^2)/(3*e*m)
```

Rubi [A] time = 0.439831, antiderivative size = 245, normalized size of antiderivative = 0.82, number of steps used = 7, number of rules used = 8, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.276, Rules used = {2339, 2338, 266, 43, 2334, 12, 14, 2301}

$$-\frac{bnx^{1-m}(fx)^{m-1}\left(\frac{18d^2ex^m}{m}+6d^3\log(x)+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}\right)(a+b\log(cx^n))}{9em}+\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^3(a+b\log(cx^n))^2}{3em}+$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d^2*n^2*x*(f*x)^(-1 + m))/m^3 + (b^2*d*e*n^2*x^(1 + m)*(f*x)^(-1 + m
))/(2*m^3) + (2*b^2*e^2*n^2*x^(1 + 2*m)*(f*x)^(-1 + m))/(27*m^3) + (b^2*d^3
*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[x]^2)/(3*e*m) - (b*n*x^(1 - m)*(f*x)^(-1
+ m)*((18*d^2*e*x^m)/m + (9*d*e^2*x^(2*m))/m + (2*e^3*x^(3*m))/m + 6*d^3*Lo
g[x])*(a + b*Log[c*x^n]))/(9*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^3
*(a + b*Log[c*x^n])^2)/(3*e*m)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (fx)^{-1+m}(d+ex^m)^2(a+b\log(cx^n))^2\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int x^{-1+m}(d+ex^m)^2(a+b\log(cx^n))^2\,dx$$

$$= \frac{x^{1-m}(fx)^{-1+m}(d+ex^m)^3(a+b\log(cx^n))^2}{3em} - \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{(d+ex^m)^3}{}}{3em}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{18d^2ex^m}{m}+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}+6d^3\log(x)\right)(a+b\log(cx^n)}{9em}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{18d^2ex^m}{m}+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}+6d^3\log(x)\right)(a+b\log(cx^n)}{9em}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m}\left(\frac{18d^2ex^m}{m}+\frac{9de^2x^{2m}}{m}+\frac{2e^3x^{3m}}{m}+6d^3\log(x)\right)(a+b\log(cx^n)}{9em}$$

$$= \frac{2b^2d^2n^2x(fx)^{-1+m}}{m^3} + \frac{b^2den^2x^{1+m}(fx)^{-1+m}}{2m^3} + \frac{2b^2e^2n^2x^{1+2m}(fx)^{-1+m}}{27m^3} - \frac{bn}{}$$

$$= \frac{2b^2d^2n^2x(fx)^{-1+m}}{m^3} + \frac{b^2den^2x^{1+m}(fx)^{-1+m}}{2m^3} + \frac{2b^2e^2n^2x^{1+2m}(fx)^{-1+m}}{27m^3} + \frac{b^2}{}$$

Mathematica [A] time = 0.200529, size = 207, normalized size = 0.69

$$\frac{(fx)^m\left(18a^2m^2\left(3d^2+3dex^m+e^2x^{2m}\right)+6bm\log(cx^n)\left(6am\left(3d^2+3dex^m+e^2x^{2m}\right)-bn\left(18d^2+9dex^m+2e^2x^{2m}\right)\right)-6a}{54fm^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(18*a^2*m^2*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m)) - 6*a*b*m*n*(18*d^2
+ 9*d*e*x^m + 2*e^2*x^(2*m)) + b^2*n^2*(108*d^2 + 27*d*e*x^m + 4*e^2*x^(2*m
)) + 6*b*m*(6*a*m*(3*d^2 + 3*d*e*x^m + e^2*x^(2*m)) - b*n*(18*d^2 + 9*d*e*x
^m + 2*e^2*x^(2*m)))*Log[c*x^n] + 18*b^2*m^2*(3*d^2 + 3*d*e*x^m + e^2*x^(2*
m))*Log[c*x^n]^2))/(54*f*m^3)
```

Maple [C] time = 0.387, size = 3038, normalized size = 10.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*ln(c*x^n))^2,x)
```

```
[Out] 1/3*b^2*(e^2*(x^m)^2+3*d*e*x^m+3*d^2)*x/m*ln(x^n)^2*exp(1/2*(-1+m)*(-I*Pi*c
sgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi
*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))+1/9*b*(9*I*Pi*b*d^2*csgn
(I*x^n)*csgn(I*c*x^n)^2*m+3*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*
m-9*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m-3*I*Pi*b*e^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m-9*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*x^m*m-9*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^m*m+9*I*Pi*b*d^2*m*csgn(I*c
*x^n)^2*csgn(I*c)+9*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m-9*I*Pi*b*d^2
*m*csgn(I*c*x^n)^3-3*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^m)^2*m+3*I*Pi*b*e^2*csgn
(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m+9*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^
m*m+6*ln(c)*b*e^2*(x^m)^2*m+18*ln(c)*b*d*e*x^m*m+6*a*e^2*(x^m)^2*m-2*b*e^2*
n*(x^m)^2+18*ln(c)*b*d^2*m+18*a*d*e*x^m*m-9*b*d*e*n*x^m+18*a*d^2*m-18*b*d^2
*n)*x/m^2*ln(x^n)*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*cs
gn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2
*ln(f)+2*ln(x)))+1/108*(-27*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*m^2+
54*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^5*m^2+54*Pi^2*b^2*d^2*csgn(I*c*x^
n)^5*csgn(I*c)*m^2-27*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c)^2*m^2-9*Pi^2*b
^2*e^2*csgn(I*c*x^n)^6*(x^m)^2*m^2+216*b^2*d^2*n^2-36*I*Pi*a*b*e^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^2*m^2+12*I*Pi*b^2*e^2*m*n*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*(x^m)^2+108*I*Pi*a*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x
^m*m^2-108*a*b*d*e*m*n*x^m+108*a^2*d^2*m^2+36*a^2*e^2*(x^m)^2*m^2+8*b^2*e^2
*n^2*(x^m)^2+108*ln(c)^2*b^2*d^2*m^2+36*I*ln(c)*Pi*b^2*e^2*csgn(I*c*x^n)^2*
csgn(I*c)*(x^m)^2*m^2-108*I*ln(c)*Pi*b^2*d*e*csgn(I*c*x^n)^3*x^m*m^2+36*I*P
i*a*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m^2-27*Pi^2*b^2*d*e*csgn(I*c*
x^n)^6*x^m*m^2+54*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*m^2-
27*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*m^2-108*Pi^2*b^2*
d^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*m^2-36*I*ln(c)*Pi*b^2*e^2*csgn(I*
c*x^n)^3*(x^m)^2*m^2+18*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c
)*(x^m)^2*m^2-9*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*(x^m
)^2*m^2-27*Pi^2*b^2*d^2*csgn(I*c*x^n)^6*m^2+36*ln(c)^2*b^2*e^2*(x^m)^2*m^2+
108*a^2*d*e*x^m*m^2+54*b^2*d*e*n^2*x^m-216*ln(c)*b^2*d^2*m*n+216*ln(c)*a*b*
d^2*m^2-216*a*b*d^2*m*n+108*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*
m^2+108*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)*m^2+36*I*Pi*a*b*e^2*cs
gn(I*c*x^n)^2*csgn(I*c)*(x^m)^2*m^2-12*I*Pi*b^2*e^2*m*n*csgn(I*x^n)*csgn(I*
c*x^n)^2*(x^m)^2-12*I*Pi*b^2*e^2*m*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^m)^2-108*
I*Pi*a*b*d*e*csgn(I*c*x^n)^3*x^m*m^2+108*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*
x^n)^2*m^2+108*I*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)*m^2-108*I*Pi*b^2*d^2*
m*n*csgn(I*x^n)*csgn(I*c*x^n)^2-108*I*Pi*b^2*d^2*m*n*csgn(I*c*x^n)^2*csgn(I
*c)-108*I*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m^2+54*Pi^2*
b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*m^2-9*Pi^2*b^2*e^2*csgn(I*x
```

```
^n)^2*csgn(I*c*x^n)^4*(x^m)^2*m^2+18*Pi^2*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)
^5*(x^m)^2*m^2-108*I*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3*m^2+54*Pi^2*b^2*d*e*c
sgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x^m*m^2+108*I*Pi*b^2*d^2*m*n*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+54*I*Pi*b^2*d*e*m*n*csgn(I*c*x^n)^3*x^m+36*I*l
n(c)*Pi*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^m)^2*m^2-108*I*ln(c)*Pi*b^2*
d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m^2-108*I*Pi*a*b*d*e*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*x^m*m^2-36*I*Pi*a*b*e^2*csgn(I*c*x^n)^3*(x^m)^2*m
^2+12*I*Pi*b^2*e^2*m*n*csgn(I*c*x^n)^3*(x^m)^2-36*Pi^2*b^2*e^2*csgn(I*x^n)*
csgn(I*c*x^n)^4*csgn(I*c)*(x^m)^2*m^2+18*Pi^2*b^2*e^2*csgn(I*x^n)*csgn(I*c*
x^n)^3*csgn(I*c)^2*(x^m)^2*m^2-27*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^
4*x^m*m^2+54*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x^m*m^2+54*Pi^2*b^2*d
*e*csgn(I*c*x^n)^5*csgn(I*c)*x^m*m^2-27*Pi^2*b^2*d*e*csgn(I*c*x^n)^4*csgn(I
*c)^2*x^m*m^2-108*I*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m^2+54*P
i^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^m*m^2-27*Pi^2*b^2*d*e
*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^m*m^2-108*Pi^2*b^2*d*e*csgn(I*
x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^m*m^2-108*I*Pi*a*b*d^2*csgn(I*c*x^n)^3*m^2
+216*ln(c)*a*b*d*e*x^m*m^2-108*ln(c)*b^2*d*e*m*n*x^m+108*I*Pi*a*b*d*e*csgn(
I*c*x^n)^2*csgn(I*c)*x^m*m^2-54*I*Pi*b^2*d*e*m*n*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^m-54*I*Pi*b^2*d*e*m*n*csgn(I*c*x^n)^2*csgn(I*c)*x^m+108*I*Pi*b^2*d^2*m*
n*csgn(I*c*x^n)^3+18*Pi^2*b^2*e^2*csgn(I*c*x^n)^5*csgn(I*c)*(x^m)^2*m^2-9*P
i^2*b^2*e^2*csgn(I*c*x^n)^4*csgn(I*c)^2*(x^m)^2*m^2-24*a*b*e^2*m*n*(x^m)^2-
24*ln(c)*b^2*e^2*m*n*(x^m)^2+108*ln(c)^2*b^2*d*e*x^m*m^2+72*ln(c)*a*b*e^2*(
x^m)^2*m^2-36*I*ln(c)*Pi*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^m)^
2*m^2+108*I*ln(c)*Pi*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2+108*I*ln(c
)*Pi*b^2*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2+54*I*Pi*b^2*d*e*m*n*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*x^m)*x/m^3*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+
I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*
csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.67419, size = 944, normalized size = 3.17

$$\frac{2\left(9\,b^2e^2m^2n^2\log\left(x\right)^2+9\,b^2e^2m^2\log\left(c\right)^2+9\,a^2e^2m^2-6\,abe^2mn+2\,b^2e^2n^2+6\left(3\,abe^2m^2-b^2e^2mn\right)\log\left(c\right)+6\left(3\,b^2e^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n))^2,x, algorithm="fricas"
)
```

```
[Out] 1/54*(2*(9*b^2*e^2*m^2*n^2*log(x)^2 + 9*b^2*e^2*m^2*log(c)^2 + 9*a^2*e^2*m^
2 - 6*a*b*e^2*m*n + 2*b^2*e^2*n^2 + 6*(3*a*b*e^2*m^2 - b^2*e^2*m*n)*log(c)
+ 6*(3*b^2*e^2*m^2*n*log(c) + 3*a*b*e^2*m^2*n - b^2*e^2*m*n^2)*log(x))*f^(m
 - 1)*x^(3*m) + 27*(2*b^2*d*e*m^2*n^2*log(x)^2 + 2*b^2*d*e*m^2*log(c)^2 + 2
*a^2*d*e*m^2 - 2*a*b*d*e*m*n + b^2*d*e*n^2 + 2*(2*a*b*d*e*m^2 - b^2*d*e*m*n
)*log(c) + 2*(2*b^2*d*e*m^2*n*log(c) + 2*a*b*d*e*m^2*n - b^2*d*e*m*n^2)*log
(x))*f^(m - 1)*x^(2*m) + 54*(b^2*d^2*m^2*n^2*log(x)^2 + b^2*d^2*m^2*log(c)^
2 + a^2*d^2*m^2 - 2*a*b*d^2*m*n + 2*b^2*d^2*n^2 + 2*(a*b*d^2*m^2 - b^2*d^2*
m*n)*log(c) + 2*(b^2*d^2*m^2*n*log(c) + a*b*d^2*m^2*n - b^2*d^2*m*n^2)*log(
x))*f^(m - 1)*x^m)/m^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)**2*(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.60514, size = 965, normalized size = 3.24

$$\frac{b^2d^2f^mn^2x^m\log\left(x\right)^2}{fm}+\frac{b^2df^mn^2x^{2\,m}e\log\left(x\right)^2}{fm}+\frac{2\,b^2d^2f^mnx^m\log\left(c\right)\log\left(x\right)}{fm}+\frac{2\,b^2df^mnx^{2\,m}e\log\left(c\right)\log\left(x\right)}{fm}+\frac{b^2f^mn^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)^2*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*d^2*f^m*n^2*x^m*log(x)^2/(f*m) + b^2*d*f^m*n^2*x^(2*m)*e*log(x)^2/(f*m)
 + 2*b^2*d^2*f^m*n*x^m*log(c)*log(x)/(f*m) + 2*b^2*d*f^m*n*x^(2*m)*e*log(c)
*log(x)/(f*m) + 1/3*b^2*f^m*n^2*x^(3*m)*e^2*log(x)^2/(f*m) + b^2*d^2*f^m*x^
m*log(c)^2/(f*m) + b^2*d*f^m*x^(2*m)*e*log(c)^2/(f*m) + 2*a*b*d^2*f^m*n*x^m
*log(x)/(f*m) - 2*b^2*d^2*f^m*n^2*x^m*log(x)/(f*m^2) + 2*a*b*d*f^m*n*x^(2*m
)*e*log(x)/(f*m) - b^2*d*f^m*n^2*x^(2*m)*e*log(x)/(f*m^2) + 2/3*b^2*f^m*n*x
^(3*m)*e^2*log(c)*log(x)/(f*m) + 2*a*b*d^2*f^m*x^m*log(c)/(f*m) - 2*b^2*d^2
*f^m*n*x^m*log(c)/(f*m^2) + 2*a*b*d*f^m*x^(2*m)*e*log(c)/(f*m) - b^2*d*f^m*
n*x^(2*m)*e*log(c)/(f*m^2) + 1/3*b^2*f^m*x^(3*m)*e^2*log(c)^2/(f*m) + 2/3*a
*b*f^m*n*x^(3*m)*e^2*log(x)/(f*m) - 2/9*b^2*f^m*n^2*x^(3*m)*e^2*log(x)/(f*m
^2) + a^2*d^2*f^m*x^m/(f*m) - 2*a*b*d^2*f^m*n*x^m/(f*m^2) + 2*b^2*d^2*f^m*n
^2*x^m/(f*m^3) + a^2*d*f^m*x^(2*m)*e/(f*m) - a*b*d*f^m*n*x^(2*m)*e/(f*m^2)
+ 1/2*b^2*d*f^m*n^2*x^(2*m)*e/(f*m^3) + 2/3*a*b*f^m*x^(3*m)*e^2*log(c)/(f*m
) - 2/9*b^2*f^m*n*x^(3*m)*e^2*log(c)/(f*m^2) + 1/3*a^2*f^m*x^(3*m)*e^2/(f*m
) - 2/9*a*b*f^m*n*x^(3*m)*e^2/(f*m^2) + 2/27*b^2*f^m*n^2*x^(3*m)*e^2/(f*m^3
)
```

3.361 $\int (fx)^{-1+m}(d+ex^m)(a+b\log(cx^n))^2\,dx$

Optimal. Leaf size=226

$$-\frac{bd^2nx^{1-m}\log(x)(fx)^{m-1}(a+b\log(cx^n))}{em}+\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^2(a+b\log(cx^n))^2}{2em}-\frac{2bdnx(fx)^{m-1}(a+b\log(cx^n)}{m^2}$$

```
[Out] (2*b^2*d*n^2*x*(f*x)^(-1 + m))/m^3 + (b^2*e*n^2*x^(1 + m)*(f*x)^(-1 + m))/(
4*m^3) + (b^2*d^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[x]^2)/(2*e*m) - (2*b*d*n
*x*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/m^2 - (b*e*n*x^(1 + m)*(f*x)^(-1 + m)
*(a + b*Log[c*x^n]))/(2*m^2) - (b*d^2*n*x^(1 - m)*(f*x)^(-1 + m)*Log[x]*(a
+ b*Log[c*x^n]))/(e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Log
[c*x^n])^2)/(2*e*m)
```

Rubi [A] time = 0.302762, antiderivative size = 195, normalized size of antiderivative = 0.86, number of steps used = 7, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.296, Rules used = {2339, 2338, 266, 43, 2334, 12, 14, 2301}

$$-\frac{bnx^{1-m}(fx)^{m-1}\left(2d^2\log(x)+\frac{4dex^m}{m}+\frac{e^2x^{2m}}{m}\right)(a+b\log(cx^n))}{2em}+\frac{x^{1-m}(fx)^{m-1}(d+ex^m)^2(a+b\log(cx^n))^2}{2em}+\frac{b^2d^2n^2x^{1-}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*d*n^2*x*(f*x)^(-1 + m))/m^3 + (b^2*e*n^2*x^(1 + m)*(f*x)^(-1 + m))/(
4*m^3) + (b^2*d^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[x]^2)/(2*e*m) - (b*n*x^(
1 - m)*(f*x)^(-1 + m)*((4*d*e*x^m)/m + (e^2*x^(2*m))/m + 2*d^2*Log[x])*(a +
 b*Log[c*x^n]))/(2*e*m) + (x^(1 - m)*(f*x)^(-1 + m)*(d + e*x^m)^2*(a + b*Lo
g[c*x^n])^2)/(2*e*m)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
```

```
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int (fx)^{-1+m} (d+ex^m) (a+b\log(cx^n))^2 \, dx = \left(x^{1-m}(fx)^{-1+m}\right) \int x^{-1+m} (d+ex^m) (a+b\log(cx^n))^2 \, dx$$

$$= \frac{x^{1-m}(fx)^{-1+m} (d+ex^m)^2 (a+b\log(cx^n))^2}{2em} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right) \int \frac{(d+ex^m)^2(}{}}{em}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m} \left(\frac{4dex^m}{m} + \frac{e^2x^{2m}}{m} + 2d^2\log(x)\right) (a+b\log(cx^n))}{2em} + \frac{x^{1-m}(f}{}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m} \left(\frac{4dex^m}{m} + \frac{e^2x^{2m}}{m} + 2d^2\log(x)\right) (a+b\log(cx^n))}{2em} + \frac{x^{1-m}(f}{}$$

$$= -\frac{bnx^{1-m}(fx)^{-1+m} \left(\frac{4dex^m}{m} + \frac{e^2x^{2m}}{m} + 2d^2\log(x)\right) (a+b\log(cx^n))}{2em} + \frac{x^{1-m}(f}{}$$

$$= \frac{2b^2dn^2x(fx)^{-1+m}}{m^3} + \frac{b^2en^2x^{1+m}(fx)^{-1+m}}{4m^3} - \frac{bnx^{1-m}(fx)^{-1+m} \left(\frac{4dex^m}{m} + \frac{e^2x^{2m}}{m}\right.}{2e}$$

$$= \frac{2b^2dn^2x(fx)^{-1+m}}{m^3} + \frac{b^2en^2x^{1+m}(fx)^{-1+m}}{4m^3} + \frac{b^2d^2n^2x^{1-m}(fx)^{-1+m}\log^2(x)}{2em} -$$

Mathematica [A] time = 0.13111, size = 125, normalized size = 0.55

$$\frac{(fx)^m \left(2a^2m^2(2d+ex^m) - 2bm\log(cx^n)(bn(4d+ex^m) - 2am(2d+ex^m)) - 2abmn(4d+ex^m) + 2b^2m^2\log^2(cx^n)(2d\right.}{4fm^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(d + e*x^m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(2*a^2*m^2*(2*d + e*x^m) - 2*a*b*m*n*(4*d + e*x^m) + b^2*n^2*(8*d
+ e*x^m) - 2*b*m*(-2*a*m*(2*d + e*x^m) + b*n*(4*d + e*x^m))*Log[c*x^n] + 2*
b^2*m^2*(2*d + e*x^m)*Log[c*x^n]^2))/(4*f*m^3)
```

Maple [C] time = 0.291, size = 1920, normalized size = 8.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(d+e*x^m)*(a+b*ln(c*x^n))^2,x)
```

```
[Out] 1/2*b^2*(e*x^m+2*d)*x/m*exp(-1/2*(-1+m)*(I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*f*x
)^2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(
I*x)-2*ln(f)-2*ln(x)))*ln(x^n)^2+1/2*b*(I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^m*m-I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m-I*Pi*b*e*csgn(I*
c*x^n)^3*x^m*m+I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m+2*I*Pi*b*d*m*csgn(I
*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*
Pi*b*d*m*csgn(I*c*x^n)^3+2*I*Pi*b*d*m*csgn(I*c*x^n)^2*csgn(I*c)+2*ln(c)*b*e
*x^m*m+4*ln(c)*b*d*m+2*x^m*a*e*m-x^m*b*e*n+4*a*d*m-4*b*d*n)*x/m^2*exp(-1/2*
(-1+m)*(I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*f*x)^2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*
csgn(I*x)+I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)-2*ln(f)-2*ln(x)))*ln(x^n)+1/
8*(8*a^2*d*m^2+2*I*Pi*b^2*e*m*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m-4*I
*Pi*ln(c)*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m^2-4*I*Pi*a*b*e*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^m*m^2+8*ln(c)^2*b^2*d*m^2+4*a^2*e*x^m*m
^2+2*b^2*e*n^2*x^m-16*ln(c)*b^2*d*m*n+16*ln(c)*a*b*d*m^2+16*b^2*d*n^2-4*a*b
*e*m*n*x^m-4*ln(c)*b^2*e*m*n*x^m+8*ln(c)*a*b*e*x^m*m^2-16*a*b*d*m*n-4*I*Pi*
ln(c)*b^2*e*csgn(I*c*x^n)^3*x^m*m^2+2*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n
)^3*csgn(I*c)*x^m*m^2-Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*
x^m*m^2-4*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^m*m^2-2*Pi^2*b
^2*d*csgn(I*c*x^n)^6*m^2+4*ln(c)^2*b^2*e*x^m*m^2-Pi^2*b^2*e*csgn(I*c*x^n)^6
*x^m*m^2-2*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4*m^2+4*Pi^2*b^2*d*csgn(I
*x^n)*csgn(I*c*x^n)^5*m^2+4*Pi^2*b^2*d*csgn(I*c*x^n)^5*csgn(I*c)*m^2-2*Pi^2
*b^2*d*csgn(I*c*x^n)^4*csgn(I*c)^2*m^2-4*I*Pi*a*b*e*csgn(I*c*x^n)^3*x^m*m^2
+4*I*Pi*ln(c)*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m*m^2+4*I*Pi*ln(c)*b^2*e*
csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2+4*I*Pi*a*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*
x^m*m^2+2*I*Pi*b^2*e*m*n*csgn(I*c*x^n)^3*x^m+8*I*Pi*ln(c)*b^2*d*csgn(I*x^n)
*csgn(I*c*x^n)^2*m^2+8*I*Pi*ln(c)*b^2*d*csgn(I*c*x^n)^2*csgn(I*c)*m^2-8*I*P
i*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*m^2+8*I*Pi*b^2*d*m*n*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-8*I*Pi*ln(c)*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*m^2+8*I*Pi*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*m^2+8*I*Pi*a*b*d*csgn(I*
c*x^n)^2*csgn(I*c)*m^2-8*I*Pi*b^2*d*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2-8*I*Pi*
b^2*d*m*n*csgn(I*c*x^n)^2*csgn(I*c)+2*Pi^2*b^2*e*csgn(I*c*x^n)^5*csgn(I*c)*
x^m*m^2-Pi^2*b^2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x^m*m^2-Pi^2*b^2*e*csgn(I*x^
n)^2*csgn(I*c*x^n)^4*x^m*m^2+2*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x^m*m
^2-8*I*Pi*ln(c)*b^2*d*csgn(I*c*x^n)^3*m^2-8*I*Pi*a*b*d*csgn(I*c*x^n)^3*m^2+
8*I*Pi*b^2*d*m*n*csgn(I*c*x^n)^3+2*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^3*c
sgn(I*c)^2*x^m*m^2+4*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*m^2
-2*Pi^2*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*m^2-8*Pi^2*b^2*d*cs
gn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*m^2+4*Pi^2*b^2*d*csgn(I*x^n)*csgn(I*c*x
^n)^3*csgn(I*c)^2*m^2+4*I*Pi*a*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^m*m^2-2*I*Pi
*b^2*e*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^m-2*I*Pi*b^2*e*m*n*csgn(I*c*x^n)^2
*csgn(I*c)*x^m)*x/m^3*exp(-1/2*(-1+m)*(I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*f*x)^
2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*
x)-2*ln(f)-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((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.45839, size = 566, normalized size = 2.5

$$\frac{\left(2\,b^{2}em^{2}n^{2}\log\left(x\right)^{2}+2\,b^{2}em^{2}\log\left(c\right)^{2}+2\,a^{2}em^{2}-2\,abemn+b^{2}en^{2}+2\left(2\,abem^{2}-b^{2}emn\right)\log\left(c\right)+2\left(2\,b^{2}em^{2}n\log\left(c\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] 1/4*((2*b^2*e*m^2*n^2*log(x)^2 + 2*b^2*e*m^2*log(c)^2 + 2*a^2*e*m^2 - 2*a*b
*e*m*n + b^2*e*n^2 + 2*(2*a*b*e*m^2 - b^2*e*m*n)*log(c) + 2*(2*b^2*e*m^2*n*
log(c) + 2*a*b*e*m^2*n - b^2*e*m*n^2)*log(x))*f^(m - 1)*x^(2*m) + 4*(b^2*d*
m^2*n^2*log(x)^2 + b^2*d*m^2*log(c)^2 + a^2*d*m^2 - 2*a*b*d*m*n + 2*b^2*d*n
^2 + 2*(a*b*d*m^2 - b^2*d*m*n)*log(c) + 2*(b^2*d*m^2*n*log(c) + a*b*d*m^2*n
 - b^2*d*m*n^2)*log(x))*f^(m - 1)*x^m)/m^3
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(d+e*x**m)*(a+b*ln(c*x**n))**2,x)
```

```
[Out] Timed out
```

Giac [B] time = 1.42363, size = 601, normalized size = 2.66

$$\frac{b^2df^mn^2x^m\log(x)^2}{fm}+\frac{b^2f^mn^2x^{2m}e\log(x)^2}{2fm}+\frac{2b^2df^mnx^m\log(c)\log(x)}{fm}+\frac{b^2f^mnx^{2m}e\log(c)\log(x)}{fm}+\frac{b^2df^mx^m\log(c)}{fm}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(d+e*x^m)*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*d*f^m*n^2*x^m*log(x)^2/(f*m) + 1/2*b^2*f^m*n^2*x^(2*m)*e*log(x)^2/(f*m)
 + 2*b^2*d*f^m*n*x^m*log(c)*log(x)/(f*m) + b^2*f^m*n*x^(2*m)*e*log(c)*log(x
)/(f*m) + b^2*d*f^m*x^m*log(c)^2/(f*m) + 1/2*b^2*f^m*x^(2*m)*e*log(c)^2/(f*
m) + 2*a*b*d*f^m*n*x^m*log(x)/(f*m) - 2*b^2*d*f^m*n^2*x^m*log(x)/(f*m^2) +
a*b*f^m*n*x^(2*m)*e*log(x)/(f*m) - 1/2*b^2*f^m*n^2*x^(2*m)*e*log(x)/(f*m^2)
 + 2*a*b*d*f^m*x^m*log(c)/(f*m) - 2*b^2*d*f^m*n*x^m*log(c)/(f*m^2) + a*b*f^
m*x^(2*m)*e*log(c)/(f*m) - 1/2*b^2*f^m*n*x^(2*m)*e*log(c)/(f*m^2) + a^2*d*f
^m*x^m/(f*m) - 2*a*b*d*f^m*n*x^m/(f*m^2) + 2*b^2*d*f^m*n^2*x^m/(f*m^3) + 1/
2*a^2*f^m*x^(2*m)*e/(f*m) - 1/2*a*b*f^m*n*x^(2*m)*e/(f*m^2) + 1/4*b^2*f^m*n
^2*x^(2*m)*e/(f*m^3)
```

3.362 $\int (fx)^{-1+m} (a + b\log(cx^n))^2 \, dx$

Optimal. Leaf size=69

$$-\frac{2bn(fx)^m (a + b\log(cx^n))}{fm^2} + \frac{(fx)^m (a + b\log(cx^n))^2}{fm} + \frac{2b^2n^2(fx)^m}{fm^3}$$

```
[Out] (2*b^2*n^2*(f*x)^m)/(f*m^3) - (2*b*n*(f*x)^m*(a + b*Log[c*x^n]))/(f*m^2) +
((f*x)^m*(a + b*Log[c*x^n])^2)/(f*m)
```

Rubi [A] time = 0.0495456, antiderivative size = 69, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {2305, 2304}

$$-\frac{2bn(fx)^m (a + b\log(cx^n))}{fm^2} + \frac{(fx)^m (a + b\log(cx^n))^2}{fm} + \frac{2b^2n^2(fx)^m}{fm^3}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] (2*b^2*n^2*(f*x)^m)/(f*m^3) - (2*b*n*(f*x)^m*(a + b*Log[c*x^n]))/(f*m^2) +
((f*x)^m*(a + b*Log[c*x^n])^2)/(f*m)
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^{-1+m}(a+b\log(cx^n))^2\,dx = \frac{(fx)^m(a+b\log(cx^n))^2}{fm} - \frac{(2bn)\int (fx)^{-1+m}(a+b\log(cx^n))\,dx}{m}$$
$$= \frac{2b^2n^2(fx)^m}{fm^3} - \frac{2bn(fx)^m(a+b\log(cx^n))}{fm^2} + \frac{(fx)^m(a+b\log(cx^n))^2}{fm}$$

Mathematica [A] time = 0.0221567, size = 67, normalized size = 0.97

$$\frac{(fx)^m\left(a^2m^2+2bm(am-bn)\log(cx^n)-2abmn+b^2m^2\log^2(cx^n)+2b^2n^2\right)}{fm^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2,x]
```

```
[Out] ((f*x)^m*(a^2*m^2 - 2*a*b*m*n + 2*b^2*n^2 + 2*b*m*(a*m - b*n)*Log[c*x^n] +
b^2*m^2*Log[c*x^n]^2))/(f*m^3)
```

Maple [C] time = 0.148, size = 1008, normalized size = 14.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2,x)
```

```
[Out] b^2/m*x*ln(x^n)^2*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*cs
gn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2
*ln(f)+2*ln(x)))+b*(I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2*m-I*Pi*b*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*m-I*Pi*b*csgn(I*c*x^n)^3*m+I*Pi*b*csgn(I*c*x^n)^2*
csgn(I*c)*m+2*b*ln(c)*m+2*a*m-2*b*n)/m^2*x*ln(x^n)*exp(1/2*(-1+m)*(-I*Pi*cs
gn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*
csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))+1/4*(-8*a*b*m*n+4*a^2*m^2
+8*b^2*n^2+4*ln(c)^2*b^2*m^2-Pi^2*b^2*m^2*csgn(I*c*x^n)^6+4*I*Pi*b^2*m*n*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-Pi^2*b^2*m^2*csgn(I*c*x^n)^4*csgn(I*c)^2-
Pi^2*b^2*m^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+2*Pi^2*b^2*m^2*csgn(I*x^n)*csgn(
I*c*x^n)^5+2*Pi^2*b^2*m^2*csgn(I*c*x^n)^5*csgn(I*c)-4*I*Pi*ln(c)*b^2*m^2*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*a*b*m^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+8*ln(c)*a*b*m^2-8*ln(c)*b^2*m*n+2*Pi^2*b^2*m^2*csgn(I*x^n)*csgn(I
```

```
*c*x^n)^3*csgn(I*c)^2-4*I*Pi*a*b*m^2*csgn(I*c*x^n)^3+4*I*Pi*b^2*m*n*csgn(I*
c*x^n)^3+2*Pi^2*b^2*m^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-Pi^2*b^2*m^
2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-4*Pi^2*b^2*m^2*csgn(I*x^n)*csgn
(I*c*x^n)^4*csgn(I*c)-4*I*Pi*ln(c)*b^2*m^2*csgn(I*c*x^n)^3+4*I*Pi*ln(c)*b^2
*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b^2*m*n*csgn(I*x^n)*csgn(I*c*x^n)^2
-4*I*Pi*b^2*m*n*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*ln(c)*b^2*m^2*csgn(I*c*x^n
)^2*csgn(I*c)+4*I*Pi*a*b*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2+4*I*Pi*a*b*m^2*csg
n(I*c*x^n)^2*csgn(I*c))/m^3*x*exp(1/2*(-1+m)*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn
(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)
*csgn(I*x)+2*ln(f)+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((f*x)^(-1+m)*(a+b*log(c*x^n))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.36628, size = 294, normalized size = 4.26

$$\frac{\left(b^2m^2n^2x\log(x)^2 + b^2m^2x\log(c)^2 + 2\left(abm^2 - b^2mn\right)x\log(c) + \left(a^2m^2 - 2\,abmn + 2\,b^2n^2\right)x + 2\left(b^2m^2nx\log(c) + \left(ab\right.\right.\right.}{m^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2,x, algorithm="fricas")
```

```
[Out] (b^2*m^2*n^2*x*log(x)^2 + b^2*m^2*x*log(c)^2 + 2*(a*b*m^2 - b^2*m*n)*x*log(
c) + (a^2*m^2 - 2*a*b*m*n + 2*b^2*n^2)*x + 2*(b^2*m^2*n*x*log(c) + (a*b*m^2
*n - b^2*m*n^2)*x)*log(x))*e^((m - 1)*log(f) + (m - 1)*log(x))/m^3
```

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((f*x)**(-1+m)*(a+b*ln(c*x**n))**2,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.40299, size = 267, normalized size = 3.87

$$\frac{b^2 f^m n^2 x^m \log(x)^2}{fm} + \frac{2\,b^2 f^m n x^m \log(c)\log(x)}{fm} + \frac{b^2 f^m x^m \log(c)^2}{fm} + \frac{2\,abf^m n x^m \log(x)}{fm} - \frac{2\,b^2 f^m n^2 x^m \log(x)}{fm^2} + \frac{2\,abf^m x}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2,x, algorithm="giac")
```

```
[Out] b^2*f^m*n^2*x^m*log(x)^2/(f*m) + 2*b^2*f^m*n*x^m*log(c)*log(x)/(f*m) + b^2*
f^m*x^m*log(c)^2/(f*m) + 2*a*b*f^m*n*x^m*log(x)/(f*m) - 2*b^2*f^m*n^2*x^m*l
og(x)/(f*m^2) + 2*a*b*f^m*x^m*log(c)/(f*m) - 2*b^2*f^m*n*x^m*log(c)/(f*m^2)
 + a^2*f^m*x^m/(f*m) - 2*a*b*f^m*n*x^m/(f*m^2) + 2*b^2*f^m*n^2*x^m/(f*m^3)
```

3.363 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))^2}{d+ex^m}\,dx$

Optimal. Leaf size=129

$$\frac{2bnx^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{ex^m}{d}\right)(a+b\log(cx^n))}{em^2}-\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(3,-\frac{ex^m}{d}\right)}{em^3}+\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{ex^m}{d}+\right.}{em}$$

```
[Out] (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2*Log[1 + (e*x^m)/d])/(e*m) +
(2*b*n*x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*PolyLog[2, -((e*x^m)/d)]
)/(e*m^2) - (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[3, -((e*x^m)/d)])/(
e*m^3)
```

Rubi [A] time = 0.301131, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used = {2339, 2337, 2374, 6589}

$$\frac{2bnx^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{ex^m}{d}\right)(a+b\log(cx^n))}{em^2}-\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(3,-\frac{ex^m}{d}\right)}{em^3}+\frac{x^{1-m}(fx)^{m-1}\log\left(\frac{ex^m}{d}+\right.}{em}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m),x]
```

```
[Out] (x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2*Log[1 + (e*x^m)/d])/(e*m) +
(2*b*n*x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*PolyLog[2, -((e*x^m)/d)]
)/(e*m^2) - (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[3, -((e*x^m)/d)])/(
e*m^3)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2337

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_)
+ (e_.)*(x_)^(r_)), x_Symbol] :> Simp[(f^m*Log[1 + (e*x^r)/d]*(a + b*Log[c*
x^n])^p)/(e*r), x] - Dist[(b*f^m*n*p)/(e*r), Int[(Log[1 + (e*x^r)/d]*(a + b
```

```
*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, r}, x] &&
 EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || GtQ[f, 0]) && NeQ[r, n]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{d+ex^m}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{d+ex^m}\,dx$$

$$= \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex^m}{d}\right)}{em} - \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{(a+b\log(cx^n))\log(}{x}}{em}$$

$$= \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex^m}{d}\right)}{em} + \frac{2bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)\mathrm{Li}}{em^2}$$

$$= \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2\log\left(1+\frac{ex^m}{d}\right)}{em} + \frac{2bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)\mathrm{Li}}{em^2}$$

Mathematica [B] time = 0.250461, size = 502, normalized size = 3.89

$$\frac{x^{-m}(fx)^m\left(-6bmn\mathrm{PolyLog}\left(2,\frac{ex^m}{d}+1\right)\left(a+b\log\left(cx^n\right)-bn\log(x)\right)-6b^2n^2\mathrm{PolyLog}\left(3,-\frac{dx^{-m}}{e}\right)-6b^2mn^2\log(x)\mathrm{PolyL}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m),x]
```

```
[Out] ((f*x)^m*(3*a^2*m^3*Log[x] - 6*a*b*m^3*n*Log[x]^2 + 4*b^2*m^3*n^2*Log[x]^3
+ 6*a*b*m^3*Log[x]*Log[c*x^n] - 6*b^2*m^3*n*Log[x]^2*Log[c*x^n] + 3*b^2*m^3
```

```
*Log[x]*Log[c*x^n]^2 + 3*b^2*m^2*n^2*Log[x]^2*Log[1 + d/(e*x^m)] + 3*a^2*m^
2*Log[d - d*x^m] - 6*a*b*m^2*n*Log[x]*Log[d - d*x^m] + 3*b^2*m^2*n^2*Log[x]
^2*Log[d - d*x^m] + 6*a*b*m^2*Log[c*x^n]*Log[d - d*x^m] - 6*b^2*m^2*n*Log[x
]*Log[c*x^n]*Log[d - d*x^m] + 3*b^2*m^2*Log[c*x^n]^2*Log[d - d*x^m] + 6*a*b
*m^2*n*Log[x]*Log[d + e*x^m] - 6*b^2*m^2*n^2*Log[x]^2*Log[d + e*x^m] - 6*a*
b*m*n*Log[-((e*x^m)/d)]*Log[d + e*x^m] + 6*b^2*m*n^2*Log[x]*Log[-((e*x^m)/d
)]*Log[d + e*x^m] + 6*b^2*m^2*n*Log[x]*Log[c*x^n]*Log[d + e*x^m] - 6*b^2*m*
n*Log[-((e*x^m)/d)]*Log[c*x^n]*Log[d + e*x^m] - 6*b^2*m*n^2*Log[x]*PolyLog[
2, -(d/(e*x^m))] - 6*b*m*n*(a - b*n*Log[x] + b*Log[c*x^n])*PolyLog[2, 1 + (
e*x^m)/d] - 6*b^2*n^2*PolyLog[3, -(d/(e*x^m))]))/(3*e*f*m^3*x^m)
```

Maple [F] time = 1.033, size = 0, normalized size = 0.

$$\int \frac{\left(fx\right)^{-1+m} \left(a+b\ln\left(cx^{n}\right)\right)^{2}}{d+ex^{m}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m),x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{a^{2} f^{m-1} \log\left(\frac{ex^{m}+d}{e}\right)}{em} + \int \frac{b^{2} f^{m} x^{m} \log\left(x^{n}\right)^{2} + 2\left(b^{2} f^{m} \log\left(c\right) + abf^{m}\right)x^{m} \log\left(x^{n}\right) + \left(b^{2} f^{m} \log\left(c\right)^{2} + 2\,abf^{m} \log\left(c\right)\right)x^{m}}{efxx^{m} + dfx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m),x, algorithm="maxima")
```

```
[Out] a^2*f^(m - 1)*log((e*x^m + d)/e)/(e*m) + integrate((b^2*f^m*x^m*log(x^n)^2
+ 2*(b^2*f^m*log(c) + a*b*f^m)*x^m*log(x^n) + (b^2*f^m*log(c)^2 + 2*a*b*f^m
*log(c))*x^m)/(e*f*x*x^m + d*f*x), x)
```

Fricas [C] time = 1.39031, size = 419, normalized size = 3.25

$$-\frac{2\,b^2f^{m-1}n^2\mathrm{polylog}\left(3,-\frac{ex^m}{d}\right)-2\left(b^2mn^2\log\left(x\right)+b^2mn\log\left(c\right)+abmn\right)f^{m-1}\mathrm{Li}_2\left(-\frac{ex^m+d}{d}+1\right)-\left(b^2m^2\log\left(c\right)^2+2\,abm}{em^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m),x, algorithm="fricas")
```

```
[Out] -(2*b^2*f^(m - 1)*n^2*polylog(3, -e*x^m/d) - 2*(b^2*m*n^2*log(x) + b^2*m*n*
log(c) + a*b*m*n)*f^(m - 1)*dilog(-(e*x^m + d)/d + 1) - (b^2*m^2*log(c)^2 +
 2*a*b*m^2*log(c) + a^2*m^2)*f^(m - 1)*log(e*x^m + d) - (b^2*m^2*n^2*log(x)
^2 + 2*(b^2*m^2*n*log(c) + a*b*m^2*n)*log(x))*f^(m - 1)*log((e*x^m + d)/d))
/(e*m^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^n\right)+a\right)^2\left(fx\right)^{m-1}}{ex^m+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d), x)
```

3.364 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))^2}{(d+ex^m)^2}\,dx$

Optimal. Leaf size=138

$$\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{dem^3}-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)(a+b\log(cx^n))}{dem^2}-\frac{x^{1-m}(fx)^{m-1}(a+b\log(cx^n))^2}{em(d+ex^m)}$$

```
[Out] -((x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(e*m*(d + e*x^m))) - (2*b
*n*x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(d*e*m^2
) + (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[2, -(d/(e*x^m))])/(d*e*m^3)
```

Rubi [A] time = 0.340103, antiderivative size = 138, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138, Rules used = {2339, 2338, 2345, 2391}

$$\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{dem^3}-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)(a+b\log(cx^n))}{dem^2}-\frac{x^{1-m}(fx)^{m-1}(a+b\log(cx^n))^2}{em(d+ex^m)}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^2,x]
```



```
[Out] -((x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(e*m*(d + e*x^m))) - (2*b
*n*x^(1 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(d*e*m^2
) + (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*PolyLog[2, -(d/(e*x^m))])/(d*e*m^3)
```


Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
```

```
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}(a+b\log(cx^n))^2}{(d+ex^m)^2}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}(a+b\log(cx^n))^2}{(d+ex^m)^2}\,dx$$
$$= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))^2}{em(d+ex^m)} + \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{a+b\log(cx^n)}{x(d+ex^m)}\,dx}{em}$$
$$= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))^2}{em(d+ex^m)} - \frac{2bnx^{1-m}(fx)^{-1+m}(a+b\log(cx^n))\log\left(1+\frac{dx^{-m}}{e}\right)}{dem^2}$$
$$= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))^2}{em(d+ex^m)} - \frac{2bnx^{1-m}(fx)^{-1+m}(a+b\log(cx^n))\log\left(1+\frac{dx^{-m}}{e}\right)}{dem^2}$$

Mathematica [A] time = 0.445255, size = 157, normalized size = 1.14

$$\frac{x^{-m}(fx)^m\left(\frac{2b^2n^2\left(\text{PolyLog}\left(2,\frac{ex^m}{d}+1\right)+\left(\log\left(-\frac{ex^m}{d}\right)-m\log(x)\right)\log(d+ex^m)+\frac{1}{2}m^2\log^2(x)\right)}{d} - \frac{m^2(a+b\log(cx^n))^2}{d+ex^m} - \frac{2abmn\log(d-dx^m)}{d} + \frac{2b^2mn(n\log(x)-}{}\right.}{efm^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^2,x]
```

```
[Out] ((f*x)^m*(-((m^2*(a + b*Log[c*x^n])^2)/(d + e*x^m)) - (2*a*b*m*n*Log[d - d*
x^m])/d + (2*b^2*m*n*(n*Log[x] - Log[c*x^n])*Log[d - d*x^m])/d + (2*b^2*n^2
```

```
*((m^2*Log[x]^2)/2 + (-(m*Log[x]) + Log[-((e*x^m)/d)])*Log[d + e*x^m] + Pol
yLog[2, 1 + (e*x^m)/d]))/d))/(e*f*m^3*x^m)
```

Maple [F] time = 0.911, size = 0, normalized size = 0.

$$\int \frac{(fx)^{-1+m}(a+b\ln(cx^n))^2}{(d+ex^m)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m)^2,x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$2\,abf^m n\left(\frac{\log(x)}{defm}-\frac{\log(ex^m+d)}{defm^2}\right)-\left(\frac{f^m\log(x^n)^2}{e^2fmx^m+defm}-\int\frac{ef^m mx^m\log(c)^2+2\left(df^m n+\left(ef^m m\log(c)+ef^m n\right)x^m\right)\mathrm{lo}}{e^3fmxx^{2m}+2\,de^2fmxx^m+d^2efmx}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^2,x, algorithm="maxima"
)
```

```
[Out] 2*a*b*f^m*n*(log(x)/(d*e*f*m) - log(e*x^m + d)/(d*e*f*m^2)) - (f^m*log(x^n)
^2/(e^2*f*m*x^m + d*e*f*m) - integrate((e*f^m*m*x^m*log(c)^2 + 2*(d*f^m*n +
 (e*f^m*m*log(c) + e*f^m*n)*x^m)*log(x^n))/(e^3*f*m*x*x^(2*m) + 2*d*e^2*f*m
*x*x^m + d^2*e*f*m*x), x))*b^2 - 2*a*b*f^m*log(c*x^n)/(e^2*f*m*x^m + d*e*f*
m) - a^2*f^m/(e^2*f*m*x^m + d*e*f*m)
```

Fricas [A] time = 1.35616, size = 618, normalized size = 4.48

$$\frac{\left(b^2em^2n^2\log(x)^2+2\left(b^2em^2n\log(c)+abem^2n\right)\log(x)\right)f^{m-1}x^m-\left(b^2dm^2\log(c)^2+2\,abdm^2\log(c)+a^2dm^2\right)f^{m-1}-2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^2,x, algorithm="fricas"
)
```

```
[Out] ((b^2*e*m^2*n^2*log(x)^2 + 2*(b^2*e*m^2*n*log(c) + a*b*e*m^2*n)*log(x))*f^(
m - 1)*x^m - (b^2*d*m^2*log(c)^2 + 2*a*b*d*m^2*log(c) + a^2*d*m^2)*f^(m - 1
) - 2*(b^2*e*f^(m - 1)*n^2*x^m + b^2*d*f^(m - 1)*n^2)*dilog(-(e*x^m + d)/d
+ 1) - 2*((b^2*e*m*n*log(c) + a*b*e*m*n)*f^(m - 1)*x^m + (b^2*d*m*n*log(c)
+ a*b*d*m*n)*f^(m - 1))*log(e*x^m + d) - 2*(b^2*e*f^(m - 1)*m*n^2*x^m*log(x
) + b^2*d*f^(m - 1)*m*n^2*log(x))*log((e*x^m + d)/d))/(d*e^2*m^3*x^m + d^2*
e*m^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)^2(fx)^{m-1}}{(ex^m+d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d)^2, x)
```

3.365 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))^2}{(d+ex^m)^3}\,dx$

Optimal. Leaf size=214

$$\frac{b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{d^2em^3}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)(a+b\log(cx^n))}{d^2em^2}-\frac{bnx(fx)^{m-1}(a+b\log(cx^n))}{d^2m^2(d+ex^m)}$$

```
[Out] -((b*n*x*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d^2*m^2*(d + e*x^m))) - (x^(1
- m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(2*e*m*(d + e*x^m)^2) - (b*n*x^(1
 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(d^2*e*m^2) + (
b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/(d^2*e*m^3) + (b^2*n^2*x^(
1 - m)*(f*x)^(-1 + m)*PolyLog[2, -(d/(e*x^m))])/(d^2*e*m^3)
```

Rubi [A] time = 0.512463, antiderivative size = 214, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 7, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.241, Rules used = {2339, 2338, 2349, 2345, 2391, 2335, 260}

$$\frac{b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{d^2em^3}-\frac{bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)(a+b\log(cx^n))}{d^2em^2}-\frac{bnx(fx)^{m-1}(a+b\log(cx^n))}{d^2m^2(d+ex^m)}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^3,x]
```

```
[Out] -((b*n*x*(f*x)^(-1 + m)*(a + b*Log[c*x^n]))/(d^2*m^2*(d + e*x^m))) - (x^(1
- m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(2*e*m*(d + e*x^m)^2) - (b*n*x^(1
 - m)*(f*x)^(-1 + m)*(a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(d^2*e*m^2) + (
b^2*n^2*x^(1 - m)*(f*x)^(-1 + m)*Log[d + e*x^m])/(d^2*e*m^3) + (b^2*n^2*x^(
1 - m)*(f*x)^(-1 + m)*PolyLog[2, -(d/(e*x^m))])/(d^2*e*m^3)
```

Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{(fx)^{-1+m}(a+b\log(cx^n))^2}{(d+ex^m)^3}dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}(a+b\log(cx^n))^2}{(d+ex^m)^3}dx$$
$$= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))^2}{2em(d+ex^m)^2} + \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{a+b\log(cx^n)}{x(d+ex^m)^2}dx}{em}$$
$$= -\frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))^2}{2em(d+ex^m)^2} - \frac{\left(bnx^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^2}dx}{dm} + \frac{(bn}{}$$
$$= -\frac{bnx(fx)^{-1+m}(a+b\log(cx^n))}{d^2m^2(d+ex^m)} - \frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))^2}{2em(d+ex^m)^2} - \frac{bnx^{1-m}(fx)^{-1+}}{}$$
$$= -\frac{bnx(fx)^{-1+m}(a+b\log(cx^n))}{d^2m^2(d+ex^m)} - \frac{x^{1-m}(fx)^{-1+m}(a+b\log(cx^n))^2}{2em(d+ex^m)^2} - \frac{bnx^{1-m}(fx)^{-1+}}{}$$

Mathematica [A] time = 0.358638, size = 207, normalized size = 0.97

$$\frac{x^{-m}(fx)^m\left(\frac{2b^2n^2\left(\text{PolyLog}\left(2,\frac{ex^m}{d}+1\right)+\left(\log\left(-\frac{ex^m}{d}\right)-m\log(x)\right)\log(d+ex^m)+\frac{1}{2}m^2\log^2(x)\right)}{d^2} - \frac{m^2(a+b\log(cx^n))^2}{(d+ex^m)^2} + \frac{2bmn(a+b\log(cx^n))}{d(d+ex^m)} - \frac{2abmn\log(d-}{d^2}\right.}{2efm^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^3,x]
```

```
[Out] ((f*x)^m*((2*b*m*n*(a + b*Log[c*x^n]))/(d*(d + e*x^m)) - (m^2*(a + b*Log[c*
x^n])^2)/(d + e*x^m)^2 - (2*a*b*m*n*Log[d - d*x^m])/d^2 + (2*b^2*n^2*Log[d
- d*x^m])/d^2 + (2*b^2*m*n*(n*Log[x] - Log[c*x^n])*Log[d - d*x^m])/d^2 + (2
*b^2*n^2*((m^2*Log[x]^2)/2 + (-(m*Log[x]) + Log[-((e*x^m)/d)])*Log[d + e*x^
m] + PolyLog[2, 1 + (e*x^m)/d]))/d^2))/(2*e*f*m^3*x^m)
```

Maple [F] time = 0.922, size = 0, normalized size = 0.

$$\int \frac{(fx)^{-1+m}(a+b\ln(cx^n))^2}{(d+ex^m)^3}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m)^3,x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$abf^m n\left(\frac{1}{(de^2 fmx^m + d^2 efm)m} + \frac{\log(x)}{d^2 efm} - \frac{\log(ex^m + d)}{d^2 efm^2}\right) - \frac{1}{2}\left(\frac{f^m \log(x^n)^2}{e^3 fmx^{2m} + 2\,de^2 fmx^m + d^2 efm} - 2\int \frac{ef^m mx^m \log(c)^2}{e^4 fmxx^{3m}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^3,x, algorithm="maxima"
)
```

```
[Out] a*b*f^m*n*(1/((d*e^2*f*m*x^m + d^2*e*f*m)*m) + log(x)/(d^2*e*f*m) - log(e*x
^m + d)/(d^2*e*f*m^2)) - 1/2*(f^m*log(x^n)^2/(e^3*f*m*x^(2*m) + 2*d*e^2*f*m
*x^m + d^2*e*f*m) - 2*integrate((e*f^m*m*x^m*log(c)^2 + (d*f^m*n + (2*e*f^m
*m*log(c) + e*f^m*n)*x^m)*log(x^n))/(e^4*f*m*x*x^(3*m) + 3*d*e^3*f*m*x*x^(2
*m) + 3*d^2*e^2*f*m*x*x^m + d^3*e*f*m*x), x))*b^2 - a*b*f^m*log(c*x^n)/(e^3
*f*m*x^(2*m) + 2*d*e^2*f*m*x^m + d^2*e*f*m) - 1/2*a^2*f^m/(e^3*f*m*x^(2*m)
+ 2*d*e^2*f*m*x^m + d^2*e*f*m)
```

Fricas [B] time = 1.38674, size = 1204, normalized size = 5.63

$$\frac{\left(b^2e^2m^2n^2\log(x)^2 + 2\left(b^2e^2m^2n\log(c) + abe^2m^2n - b^2e^2mn^2\right)\log(x)\right)f^{m-1}x^{2m} + 2\left(b^2dem^2n^2\log(x)^2 + b^2demn\log(c)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^3,x, algorithm="fricas"
)
```

```
[Out] 1/2*((b^2*e^2*m^2*n^2*log(x)^2 + 2*(b^2*e^2*m^2*n*log(c) + a*b*e^2*m^2*n -
b^2*e^2*m*n^2)*log(x))*f^(m - 1)*x^(2*m) + 2*(b^2*d*e*m^2*n^2*log(x)^2 + b^
2*d*e*m*n*log(c) + a*b*d*e*m*n + (2*b^2*d*e*m^2*n*log(c) + 2*a*b*d*e*m^2*n
- b^2*d*e*m*n^2)*log(x))*f^(m - 1)*x^m - (b^2*d^2*m^2*log(c)^2 + a^2*d^2*m^
2 - 2*a*b*d^2*m*n + 2*(a*b*d^2*m^2 - b^2*d^2*m*n)*log(c))*f^(m - 1) - 2*(b^
2*e^2*f^(m - 1)*n^2*x^(2*m) + 2*b^2*d*e*f^(m - 1)*n^2*x^m + b^2*d^2*f^(m -
```

```
1)*n^2)*dilog(-(e*x^m + d)/d + 1) - 2*((b^2*e^2*m*n*log(c) + a*b*e^2*m*n -
b^2*e^2*n^2)*f^(m - 1)*x^(2*m) + 2*(b^2*d*e*m*n*log(c) + a*b*d*e*m*n - b^2*
d*e*n^2)*f^(m - 1)*x^m + (b^2*d^2*m*n*log(c) + a*b*d^2*m*n - b^2*d^2*n^2)*f
^(m - 1))*log(e*x^m + d) - 2*(b^2*e^2*f^(m - 1)*m*n^2*x^(2*m)*log(x) + 2*b^
2*d*e*f^(m - 1)*m*n^2*x^m*log(x) + b^2*d^2*f^(m - 1)*m*n^2*log(x))*log((e*x
^m + d)/d))/(d^2*e^3*m^3*x^(2*m) + 2*d^3*e^2*m^3*x^m + d^4*e*m^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2 (fx)^{m-1}}{(ex^m + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d)^3, x)
```

3.366 $\int \frac{(fx)^{-1+m}(a+b\log(cx^n))^2}{(d+ex^m)^4}\,dx$

Optimal. Leaf size=346

$$\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{3d^3em^3}-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)(a+b\log(cx^n))}{3d^3em^2}-\frac{2bnx(fx)^{m-1}(a+b\log(cx^n)}{3d^3m^2(d+ex^m)}$$

```
[Out] -(b^2*n^2*x^(1 - m)*(f*x)^(-1 + m))/(3*d^2*e*m^3*(d + e*x^m)) - (b^2*n^2*x^
(1 - m)*(f*x)^(-1 + m)*Log[x])/(3*d^3*e*m^2) + (b*n*x^(1 - m)*(f*x)^(-1 + m
)*(a + b*Log[c*x^n]))/(3*d*e*m^2*(d + e*x^m)^2) - (2*b*n*x*(f*x)^(-1 + m)*(
a + b*Log[c*x^n]))/(3*d^3*m^2*(d + e*x^m)) - (x^(1 - m)*(f*x)^(-1 + m)*(a +
 b*Log[c*x^n])^2)/(3*e*m*(d + e*x^m)^3) - (2*b*n*x^(1 - m)*(f*x)^(-1 + m)*(
a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(3*d^3*e*m^2) + (b^2*n^2*x^(1 - m)*(f
*x)^(-1 + m)*Log[d + e*x^m])/(d^3*e*m^3) + (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 +
 m)*PolyLog[2, -(d/(e*x^m))])/(3*d^3*e*m^3)
```

Rubi [A] time = 0.714242, antiderivative size = 346, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.31, Rules used = {2339, 2338, 2349, 2345, 2391, 2335, 260, 266, 44}

$$\frac{2b^2n^2x^{1-m}(fx)^{m-1}\text{PolyLog}\left(2,-\frac{dx^{-m}}{e}\right)}{3d^3em^3}-\frac{2bnx^{1-m}(fx)^{m-1}\log\left(\frac{dx^{-m}}{e}+1\right)(a+b\log(cx^n))}{3d^3em^2}-\frac{2bnx(fx)^{m-1}(a+b\log(cx^n)}{3d^3m^2(d+ex^m)}$$

Antiderivative was successfully verified.

```
[In] Int[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^4,x]
```


```
[Out] -(b^2*n^2*x^(1 - m)*(f*x)^(-1 + m))/(3*d^2*e*m^3*(d + e*x^m)) - (b^2*n^2*x^
(1 - m)*(f*x)^(-1 + m)*Log[x])/(3*d^3*e*m^2) + (b*n*x^(1 - m)*(f*x)^(-1 + m
)*(a + b*Log[c*x^n]))/(3*d*e*m^2*(d + e*x^m)^2) - (2*b*n*x*(f*x)^(-1 + m)*(
a + b*Log[c*x^n]))/(3*d^3*m^2*(d + e*x^m)) - (x^(1 - m)*(f*x)^(-1 + m)*(a +
 b*Log[c*x^n])^2)/(3*e*m*(d + e*x^m)^3) - (2*b*n*x^(1 - m)*(f*x)^(-1 + m)*(
a + b*Log[c*x^n])*Log[1 + d/(e*x^m)])/(3*d^3*e*m^2) + (b^2*n^2*x^(1 - m)*(f
*x)^(-1 + m)*Log[d + e*x^m])/(d^3*e*m^3) + (2*b^2*n^2*x^(1 - m)*(f*x)^(-1 +
 m)*PolyLog[2, -(d/(e*x^m))])/(3*d^3*e*m^3)
```


Rule 2339

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_)*(x_))^(m_.)*((d_) + (
e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Dist[(f*x)^m/x^m, Int[x^m*(d + e*x^r)^q
```

```
*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &
& EqQ[m, r - 1] && IGtQ[p, 0] &&  !(IntegerQ[m] || GtQ[f, 0])
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
 + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^m\right)^4}\,dx = \left(x^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{\left(d+ex^m\right)^4}\,dx$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{3em\left(d+ex^m\right)^3} + \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{a+b\log(cx^n)}{x(d+ex^m)^3}\,dx}{3em}$$

$$= -\frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{3em\left(d+ex^m\right)^3} - \frac{\left(2bnx^{1-m}(fx)^{-1+m}\right)\int \frac{x^{-1+m}(a+b\log(cx^n))}{(d+ex^m)^3}\,dx}{3dm} + \frac{\left(2bn\right.}{}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3dem^2\left(d+ex^m\right)^2} - \frac{x^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)^2}{3em\left(d+ex^m\right)^3} - \frac{\left(2bnx^{1-m}(fx)\right.}{}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3dem^2\left(d+ex^m\right)^2} - \frac{2bnx(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3d^3m^2\left(d+ex^m\right)} - \frac{x^{1-m}(fx)^{-1+m}\,(}{3em\,(d}$$

$$= \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3dem^2\left(d+ex^m\right)^2} - \frac{2bnx(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3d^3m^2\left(d+ex^m\right)} - \frac{x^{1-m}(fx)^{-1+m}\,(}{3em\,(d}$$

$$= -\frac{b^2n^2x^{1-m}(fx)^{-1+m}}{3d^2em^3\left(d+ex^m\right)} - \frac{b^2n^2x^{1-m}(fx)^{-1+m}\log(x)}{3d^3em^2} + \frac{bnx^{1-m}(fx)^{-1+m}\left(a+b\log\left(cx^n\right)\right)}{3dem^2\left(d+ex^m\right)^2}$$

Mathematica [A] time = 0.53747, size = 240, normalized size = 0.69

$$\frac{x^{-m}(fx)^m\left(\frac{2b^2n^2\left(\text{PolyLog}\left(2,\frac{ex^m}{d}+1\right)+\left(\log\left(-\frac{ex^m}{d}\right)-m\log(x)\right)\log(d+ex^m)+\frac{1}{2}m^2\log^2(x)\right)}{d^3} + \frac{bn(2am+2bm\log(cx^n)-bn)}{d^2(d+ex^m)} - \frac{m^2(a+b\log(cx^n))^2}{(d+ex^m)^3} + \frac{bmn(a+}{d(d+}\right.}{3efm^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^(-1 + m)*(a + b*Log[c*x^n])^2)/(d + e*x^m)^4,x]
```

```
[Out] ((f*x)^m*((b*m*n*(a + b*Log[c*x^n]))/(d*(d + e*x^m)^2) - (m^2*(a + b*Log[c*
x^n])^2)/(d + e*x^m)^3 + (b*n*(2*a*m - b*n + 2*b*m*Log[c*x^n]))/(d^2*(d + e
*x^m)) - (2*a*b*m*n*Log[d - d*x^m])/d^3 + (3*b^2*n^2*Log[d - d*x^m])/d^3 +
(2*b^2*m*n*(n*Log[x] - Log[c*x^n])*Log[d - d*x^m])/d^3 + (2*b^2*n^2*((m^2*L
og[x]^2)/2 + (-(m*Log[x]) + Log[-((e*x^m)/d)])*Log[d + e*x^m] + PolyLog[2,
1 + (e*x^m)/d]))/d^3))/(3*e*f*m^3*x^m)
```

Maple [F] time = 0.921, size = 0, normalized size = 0.

$$\int \frac{(fx)^{-1+m} (a + b\ln(cx^n))^2}{(d + ex^m)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m)^4,x)
```

```
[Out] int((f*x)^(-1+m)*(a+b*ln(c*x^n))^2/(d+e*x^m)^4,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{3}abf^m n\left(\frac{2ex^m + 3d}{\left(d^2e^3fmx^{2m} + 2d^3e^2fmx^m + d^4efm\right)m} + \frac{2\log(x)}{d^3efm} - \frac{2\log(ex^m + d)}{d^3efm^2}\right) - \frac{1}{3}\left(\frac{f^m\log(x^n)^2}{e^4fmx^{3m} + 3de^3fmx^{2m} + 3d^2e\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^4,x, algorithm="maxima"
)
```

```
[Out] 1/3*a*b*f^m*n*((2*e*x^m + 3*d)/((d^2*e^3*f*m*x^(2*m) + 2*d^3*e^2*f*m*x^m +
d^4*e*f*m)*m) + 2*log(x)/(d^3*e*f*m) - 2*log(e*x^m + d)/(d^3*e*f*m^2)) - 1/
3*(f^m*log(x^n)^2/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d^2*e^2*f*m*x^
m + d^3*e*f*m) - 3*integrate(1/3*(3*e*f^m*m*x^m*log(c)^2 + 2*(d*f^m*n + (3*
e*f^m*m*log(c) + e*f^m*n)*x^m)*log(x^n))/(e^5*f*m*x*x^(4*m) + 4*d*e^4*f*m*x
*x^(3*m) + 6*d^2*e^3*f*m*x*x^(2*m) + 4*d^3*e^2*f*m*x*x^m + d^4*e*f*m*x), x)
```

```
)*b^2 - 2/3*a*b*f^m*log(c*x^n)/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^(2*m) + 3*d
^2*e^2*f*m*x^m + d^3*e*f*m) - 1/3*a^2*f^m/(e^4*f*m*x^(3*m) + 3*d*e^3*f*m*x^
(2*m) + 3*d^2*e^2*f*m*x^m + d^3*e*f*m)
```

Fricas [B] time = 1.46645, size = 1823, normalized size = 5.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^4,x, algorithm="fricas"
)
```

```
[Out] 1/3*((b^2*e^3*m^2*n^2*log(x)^2 + (2*b^2*e^3*m^2*n*log(c) + 2*a*b*e^3*m^2*n
- 3*b^2*e^3*m*n^2)*log(x))*f^(m - 1)*x^(3*m) + (3*b^2*d*e^2*m^2*n^2*log(x)^
2 + 2*b^2*d*e^2*m*n*log(c) + 2*a*b*d*e^2*m*n - b^2*d*e^2*n^2 + (6*b^2*d*e^2
*m^2*n*log(c) + 6*a*b*d*e^2*m^2*n - 7*b^2*d*e^2*m*n^2)*log(x))*f^(m - 1)*x^
(2*m) + (3*b^2*d^2*e*m^2*n^2*log(x)^2 + 5*b^2*d^2*e*m*n*log(c) + 5*a*b*d^2*
e*m*n - 2*b^2*d^2*e*n^2 + 2*(3*b^2*d^2*e*m^2*n*log(c) + 3*a*b*d^2*e*m^2*n -
 2*b^2*d^2*e*m*n^2)*log(x))*f^(m - 1)*x^m - (b^2*d^3*m^2*log(c)^2 + a^2*d^3
*m^2 - 3*a*b*d^3*m*n + b^2*d^3*n^2 + (2*a*b*d^3*m^2 - 3*b^2*d^3*m*n)*log(c)
)*f^(m - 1) - 2*(b^2*e^3*f^(m - 1)*n^2*x^(3*m) + 3*b^2*d*e^2*f^(m - 1)*n^2*
x^(2*m) + 3*b^2*d^2*e*f^(m - 1)*n^2*x^m + b^2*d^3*f^(m - 1)*n^2)*dilog(-(e*
x^m + d)/d + 1) - ((2*b^2*e^3*m*n*log(c) + 2*a*b*e^3*m*n - 3*b^2*e^3*n^2)*f
^(m - 1)*x^(3*m) + 3*(2*b^2*d*e^2*m*n*log(c) + 2*a*b*d*e^2*m*n - 3*b^2*d*e^
2*n^2)*f^(m - 1)*x^(2*m) + 3*(2*b^2*d^2*e*m*n*log(c) + 2*a*b*d^2*e*m*n - 3*
b^2*d^2*e*n^2)*f^(m - 1)*x^m + (2*b^2*d^3*m*n*log(c) + 2*a*b*d^3*m*n - 3*b^
2*d^3*n^2)*f^(m - 1))*log(e*x^m + d) - 2*(b^2*e^3*f^(m - 1)*m*n^2*x^(3*m)*l
og(x) + 3*b^2*d*e^2*f^(m - 1)*m*n^2*x^(2*m)*log(x) + 3*b^2*d^2*e*f^(m - 1)*
m*n^2*x^m*log(x) + b^2*d^3*f^(m - 1)*m*n^2*log(x))*log((e*x^m + d)/d))/(d^3
*e^4*m^3*x^(3*m) + 3*d^4*e^3*m^3*x^(2*m) + 3*d^5*e^2*m^3*x^m + d^6*e*m^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(-1+m)*(a+b*ln(c*x**n))**2/(d+e*x**m)**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2 (fx)^{m-1}}{(ex^m + d)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1+m)*(a+b*log(c*x^n))^2/(d+e*x^m)^4,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2*(f*x)^(m - 1)/(e*x^m + d)^4, x)
```

3.367 $\int x^5 (d + ex^r) (a + b \log (cx^n)) \, dx$

Optimal. Leaf size=59

$$\frac{1}{6}\left(dx^6+\frac{6ex^{r+6}}{r+6}\right)(a+b\log(cx^n))-\frac{1}{36}bdnx^6-\frac{benx^{r+6}}{(r+6)^2}$$

```
[Out] -(b*d*n*x^6)/36 - (b*e*n*x^(6 + r))/(6 + r)^2 + ((d*x^6 + (6*e*x^(6 + r))/(
6 + r))*(a + b*Log[c*x^n]))/6
```

Rubi [A] time = 0.0790428, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{6}\left(dx^6+\frac{6ex^{r+6}}{r+6}\right)(a+b\log(cx^n))-\frac{1}{36}bdnx^6-\frac{benx^{r+6}}{(r+6)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^6)/36 - (b*e*n*x^(6 + r))/(6 + r)^2 + ((d*x^6 + (6*e*x^(6 + r))/(
6 + r))*(a + b*Log[c*x^n]))/6
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}\int x^5 (d+ex^r)(a+b\log(cx^n))\,dx &= \frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{6}x^5\left(d+\frac{6ex^r}{6+r}\right)dx\\ &= \frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)(a+b\log(cx^n))-\frac{1}{6}(bn)\int x^5\left(d+\frac{6ex^r}{6+r}\right)dx\\ &= \frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)(a+b\log(cx^n))-\frac{1}{6}(bn)\int \left(dx^5+\frac{6ex^{5+r}}{6+r}\right)dx\\ &= -\frac{1}{36}bdnx^6-\frac{benx^{6+r}}{(6+r)^2}+\frac{1}{6}\left(dx^6+\frac{6ex^{6+r}}{6+r}\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0985877, size = 73, normalized size = 1.24

$$\frac{x^6\left(6a(r+6)(d(r+6)+6ex^r)+6b(r+6)\log(cx^n)(d(r+6)+6ex^r)-bn\left(d(r+6)^2+36ex^r\right)\right)}{36(r+6)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(6*a*(6 + r)*(d*(6 + r) + 6*e*x^r) - b*n*(d*(6 + r)^2 + 36*e*x^r) + 6*
b*(6 + r)*(d*(6 + r) + 6*e*x^r)*Log[c*x^n]))/(36*(6 + r)^2)
```

Maple [C] time = 0.24, size = 613, normalized size = 10.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d+e*x^r)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/6*x^6*b*(d*r+6*e*x^r+6*d)/(6+r)*ln(x^n)-1/36*x^6*(-216*a*d-36*x^r*a*e*r+3
6*x^r*b*e*n+18*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+12*b*d*n*
r+36*b*d*n-216*x^r*a*e-72*ln(c)*b*d*r-6*ln(c)*b*d*r^2-36*ln(c)*b*e*x^r*r+10
8*I*Pi*b*d*csgn(I*c*x^n)^3-18*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+108*
I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-216*ln(c)*b*e*x^r-6*a*d*r^
2-18*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r+36*I*Pi*b*d*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*r+3*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2
```

```
16*ln(c)*b*d-72*a*d*r+b*d*n*r^2+36*I*Pi*b*d*csgn(I*c*x^n)^3*r-108*I*Pi*b*d*
csgn(I*c*x^n)^2*csgn(I*c)-108*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+3*I*Pi*b
*d*r^2*csgn(I*c*x^n)^3+108*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+108*I*Pi*b*d*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)-36*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r-36*
I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r-3*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-3*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b*e*csgn(I*c*x^n)^3*x
^r*r-108*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-108*I*Pi*b*e*csgn(I*x^n)*cs
gn(I*c*x^n)^2*x^r)/(6+r)^2
```

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(x^5*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.32415, size = 396, normalized size = 6.71

$$\frac{6\left(bdr^2+12\,bdr+36\,bd\right)x^6\log\left(c\right)+6\left(bdnr^2+12\,bdnr+36\,bdn\right)x^6\log\left(x\right)-\left(36\,bdn+\left(bdn-6\,ad\right)r^2-216\,ad+12\,(bd}{36\left(r^2+12\,r+36\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/36*(6*(b*d*r^2 + 12*b*d*r + 36*b*d)*x^6*log(c) + 6*(b*d*n*r^2 + 12*b*d*n*
r + 36*b*d*n)*x^6*log(x) - (36*b*d*n + (b*d*n - 6*a*d)*r^2 - 216*a*d + 12*(
b*d*n - 6*a*d)*r)*x^6 + 36*((b*e*r + 6*b*e)*x^6*log(c) + (b*e*n*r + 6*b*e*n
)*x^6*log(x) - (b*e*n - a*e*r - 6*a*e)*x^6)*x^r)/(r^2 + 12*r + 36)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.31339, size = 185, normalized size = 3.14

$$\frac{bnrx^6x^re\log(x)}{r^2+12r+36}+\frac{1}{6}bdnx^6\log(x)+\frac{6bnx^6x^re\log(x)}{r^2+12r+36}-\frac{1}{36}bdnx^6-\frac{bnx^6x^re}{r^2+12r+36}+\frac{1}{6}bdx^6\log(c)+\frac{bx^6x^re\log(c)}{r+6}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^6*x^r*e*log(x)/(r^2 + 12*r + 36) + 1/6*b*d*n*x^6*log(x) + 6*b*n*x^6
*x^r*e*log(x)/(r^2 + 12*r + 36) - 1/36*b*d*n*x^6 - b*n*x^6*x^r*e/(r^2 + 12*
r + 36) + 1/6*b*d*x^6*log(c) + b*x^6*x^r*e*log(c)/(r + 6) + 1/6*a*d*x^6 + a
*x^6*x^r*e/(r + 6)
```

3.368 $\int x^3 (d + ex^r) (a + b \log (cx^n)) \, dx$

Optimal. Leaf size=59

$$\frac{1}{4}\left(dx^4 + \frac{4ex^{r+4}}{r+4}\right)(a + b\log(cx^n)) - \frac{1}{16}bdnx^4 - \frac{benx^{r+4}}{(r+4)^2}$$

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^(4 + r))/(4 + r)^2 + ((d*x^4 + (4*e*x^(4 + r))/(
4 + r))*(a + b*Log[c*x^n]))/4
```

Rubi [A] time = 0.0796116, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{4}\left(dx^4 + \frac{4ex^{r+4}}{r+4}\right)(a + b\log(cx^n)) - \frac{1}{16}bdnx^4 - \frac{benx^{r+4}}{(r+4)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^4)/16 - (b*e*n*x^(4 + r))/(4 + r)^2 + ((d*x^4 + (4*e*x^(4 + r))/(
4 + r))*(a + b*Log[c*x^n]))/4
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}\int x^3 (d+ex^r)(a+b\log(cx^n))\,dx &= \frac{1}{4}\left(dx^4+\frac{4ex^{4+r}}{4+r}\right)(a+b\log(cx^n))-(bn)\int\frac{1}{4}x^3\left(d+\frac{4ex^r}{4+r}\right)dx\\ &= \frac{1}{4}\left(dx^4+\frac{4ex^{4+r}}{4+r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int x^3\left(d+\frac{4ex^r}{4+r}\right)dx\\ &= \frac{1}{4}\left(dx^4+\frac{4ex^{4+r}}{4+r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\left(dx^3+\frac{4ex^{3+r}}{4+r}\right)dx\\ &= -\frac{1}{16}bdnx^4-\frac{benx^{4+r}}{(4+r)^2}+\frac{1}{4}\left(dx^4+\frac{4ex^{4+r}}{4+r}\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0899306, size = 73, normalized size = 1.24

$$\frac{x^4\left(4a(r+4)\left(d(r+4)+4ex^r\right)+4b(r+4)\log(cx^n)\left(d(r+4)+4ex^r\right)-bn\left(d(r+4)^2+16ex^r\right)\right)}{16(r+4)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(4*a*(4 + r)*(d*(4 + r) + 4*e*x^r) - b*n*(d*(4 + r)^2 + 16*e*x^r) + 4*
b*(4 + r)*(d*(4 + r) + 4*e*x^r)*Log[c*x^n]))/(16*(4 + r)^2)
```

Maple [C] time = 0.237, size = 613, normalized size = 10.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+e*x^r)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/4*b*x^4*(d*r+4*e*x^r+4*d)/(4+r)*ln(x^n)-1/16*x^4*(-64*a*d-16*x^r*a*e*r+16
*x^r*b*e*n+8*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+8*b*d*n*r+3
2*I*Pi*b*d*csgn(I*c*x^n)^3+16*b*d*n-64*x^r*a*e-32*ln(c)*b*d*r-4*ln(c)*b*d*r
^2-16*ln(c)*b*e*x^r*r-64*ln(c)*b*e*x^r-8*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)
*x^r*r-4*a*d*r^2-8*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r+16*I*Pi*b*d*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r-64*ln(c)*b*d+32*I*Pi*b*e*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*x^r-32*a*d*r+2*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n
```

```
)*csgn(I*c)+b*d*n*r^2+32*I*Pi*b*e*csgn(I*c*x^n)^3*x^r-32*I*Pi*b*d*csgn(I*c*
x^n)^2*csgn(I*c)-32*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b*d*r^2*csg
n(I*c*x^n)^3+16*I*Pi*b*d*csgn(I*c*x^n)^3*r-16*I*Pi*b*d*csgn(I*x^n)*csgn(I*c
*x^n)^2*r-16*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r-2*I*Pi*b*d*r^2*csgn(I*x^n
)*csgn(I*c*x^n)^2-2*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)-32*I*Pi*b*e*csgn
(I*c*x^n)^2*csgn(I*c)*x^r-32*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+8*I*P
i*b*e*csgn(I*c*x^n)^3*x^r*r+32*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
)/(4+r)^2
```

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(x^3*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.29177, size = 389, normalized size = 6.59

$$\frac{4\left(bdr^2+8\,bdr+16\,bd\right)x^4\log\left(c\right)+4\left(bdnr^2+8\,bdnr+16\,bdn\right)x^4\log\left(x\right)-\left(16\,bdn+\left(bdn-4\,ad\right)r^2-64\,ad+8\,(bdn-4}{16\left(r^2+8\,r+16\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/16*(4*(b*d*r^2 + 8*b*d*r + 16*b*d)*x^4*log(c) + 4*(b*d*n*r^2 + 8*b*d*n*r
+ 16*b*d*n)*x^4*log(x) - (16*b*d*n + (b*d*n - 4*a*d)*r^2 - 64*a*d + 8*(b*d*
n - 4*a*d)*r)*x^4 + 16*((b*e*r + 4*b*e)*x^4*log(c) + (b*e*n*r + 4*b*e*n)*x^
4*log(x) - (b*e*n - a*e*r - 4*a*e)*x^4)*x^r)/(r^2 + 8*r + 16)
```

Sympy [A] time = 43.3819, size = 525, normalized size = 8.9

$$\begin{cases} \frac{4adr^2x^4}{16r^2+128r+256}+\frac{32adrx^4}{16r^2+128r+256}+\frac{64adx^4}{16r^2+128r+256}+\frac{16aerx^4x^r}{16r^2+128r+256}+\frac{64aex^4x^r}{16r^2+128r+256}+\frac{4bdnr^2x^4\log\left(x\right)}{16r^2+128r+256}-\frac{bdnr^2x^4}{16r^2+128r+256}+\frac{32bdnrx^4\log\left(x\right)}{16r^2+128r+256} \\ \frac{adx^4}{4}+ae\log\left(x\right)+\frac{bdnx^4\log\left(x\right)}{4}-\frac{bdnx^4}{16}+\frac{bdx^4\log\left(c\right)}{4}+\frac{ben\log\left(x\right)^2}{2}+be\log\left(c\right)\log\left(x\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((4*a*d*r**2*x**4/(16*r**2 + 128*r + 256) + 32*a*d*r*x**4/(16*r**2
 + 128*r + 256) + 64*a*d*x**4/(16*r**2 + 128*r + 256) + 16*a*e*r*x**4*x**r/
(16*r**2 + 128*r + 256) + 64*a*e*x**4*x**r/(16*r**2 + 128*r + 256) + 4*b*d*
n*r**2*x**4*log(x)/(16*r**2 + 128*r + 256) - b*d*n*r**2*x**4/(16*r**2 + 128
*r + 256) + 32*b*d*n*r*x**4*log(x)/(16*r**2 + 128*r + 256) - 8*b*d*n*r*x**4
/(16*r**2 + 128*r + 256) + 64*b*d*n*x**4*log(x)/(16*r**2 + 128*r + 256) - 1
6*b*d*n*x**4/(16*r**2 + 128*r + 256) + 4*b*d*r**2*x**4*log(c)/(16*r**2 + 12
8*r + 256) + 32*b*d*r*x**4*log(c)/(16*r**2 + 128*r + 256) + 64*b*d*x**4*log
(c)/(16*r**2 + 128*r + 256) + 16*b*e*n*r*x**4*x**r*log(x)/(16*r**2 + 128*r
+ 256) + 64*b*e*n*x**4*x**r*log(x)/(16*r**2 + 128*r + 256) - 16*b*e*n*x**4*
x**r/(16*r**2 + 128*r + 256) + 16*b*e*r*x**4*x**r*log(c)/(16*r**2 + 128*r +
 256) + 64*b*e*x**4*x**r*log(c)/(16*r**2 + 128*r + 256), Ne(r, -4)), (a*d*x
**4/4 + a*e*log(x) + b*d*n*x**4*log(x)/4 - b*d*n*x**4/16 + b*d*x**4*log(c)/
4 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

Giac [B] time = 1.27836, size = 185, normalized size = 3.14

$$\frac{bnrx^4x^re\log(x)}{r^2+8r+16}+\frac{1}{4}bdnx^4\log(x)+\frac{4bnx^4x^re\log(x)}{r^2+8r+16}-\frac{1}{16}bdnx^4-\frac{bnx^4x^re}{r^2+8r+16}+\frac{1}{4}bdx^4\log(c)+\frac{bx^4x^re\log(c)}{r+4}+\frac{1}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^4*x^r*e*log(x)/(r^2 + 8*r + 16) + 1/4*b*d*n*x^4*log(x) + 4*b*n*x^4*
x^r*e*log(x)/(r^2 + 8*r + 16) - 1/16*b*d*n*x^4 - b*n*x^4*x^r*e/(r^2 + 8*r +
 16) + 1/4*b*d*x^4*log(c) + b*x^4*x^r*e*log(c)/(r + 4) + 1/4*a*d*x^4 + a*x^
4*x^r*e/(r + 4)
```

3.369 $\int x\left(d+ex^r\right)\left(a+b\log\left(cx^n\right)\right)\,dx$

Optimal. Leaf size=59

$$\frac{1}{2}\left(dx^2+\frac{2ex^{r+2}}{r+2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{benx^{r+2}}{(r+2)^2}$$

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^(2 + r))/(2 + r)^2 + ((d*x^2 + (2*e*x^(2 + r))/(2
 + r))*(a + b*Log[c*x^n]))/2
```

Rubi [A] time = 0.0634667, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {14, 2334, 12}

$$\frac{1}{2}\left(dx^2+\frac{2ex^{r+2}}{r+2}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{4}bdnx^2-\frac{benx^{r+2}}{(r+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^2)/4 - (b*e*n*x^(2 + r))/(2 + r)^2 + ((d*x^2 + (2*e*x^(2 + r))/(2
 + r))*(a + b*Log[c*x^n]))/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}\int x\left(d+ex^r\right)\left(a+b\log\left(cx^n\right)\right)\,dx&=\frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{2}x\left(d+\frac{2ex^r}{2+r}\right)\,dx\\&=\frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int x\left(d+\frac{2ex^r}{2+r}\right)\,dx\\&=\frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\left(dx+\frac{2ex^{1+r}}{2+r}\right)\,dx\\&=-\frac{1}{4}bdnx^2-\frac{benx^{2+r}}{(2+r)^2}+\frac{1}{2}\left(dx^2+\frac{2ex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)\end{aligned}$$

Mathematica [A] time = 0.0895245, size = 73, normalized size = 1.24

$$\frac{x^2\left(2a(r+2)\left(d(r+2)+2ex^r\right)+2b(r+2)\log\left(cx^n\right)\left(d(r+2)+2ex^r\right)-bn\left(d(r+2)^2+4ex^r\right)\right)}{4(r+2)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(2*a*(2 + r)*(d*(2 + r) + 2*e*x^r) - b*n*(d*(2 + r)^2 + 4*e*x^r) + 2*b
*(2 + r)*(d*(2 + r) + 2*e*x^r)*Log[c*x^n]))/(4*(2 + r)^2)
```

Maple [C] time = 0.234, size = 613, normalized size = 10.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+e*x^r)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/2*b*x^2*(d*r+2*e*x^r+2*d)/(2+r)*ln(x^n)-1/4*x^2*(-8*a*d-4*x^r*a*e*r+4*x^r
*b*e*n+2*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+4*b*d*n*r+4*I*P
i*b*d*csgn(I*c*x^n)^3+4*b*d*n-8*x^r*a*e-8*ln(c)*b*d*r-2*ln(c)*b*d*r^2-4*ln(
c)*b*e*x^r*r+I*Pi*b*d*r^2*csgn(I*c*x^n)^3+4*I*Pi*b*d*csgn(I*c*x^n)^3*r+4*I*
Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2*I*Pi*b*e*csgn(I*x^n)*csgn(
I*c*x^n)^2*x^r*r-8*ln(c)*b*e*x^r-2*a*d*r^2+4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*r-2*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r-8*ln(c)*b*d-8*a
```

```
*d*r+I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+b*d*n*r^2-4*I*Pi*b*d*
csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*e
*csgn(I*c*x^n)^3*x^r-I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*r^2*
csgn(I*c*x^n)^2*csgn(I*c)-4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r-4*I*Pi*b
*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-4*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r
+2*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r-4*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r+4*
I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))/(2+r)^2
```

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(x*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.34566, size = 379, normalized size = 6.42

$$\frac{2\left(bdr^2+4\,bdr+4\,bd\right)x^2\log\left(c\right)+2\left(bdnr^2+4\,bdnr+4\,bdn\right)x^2\log\left(x\right)-\left(4\,bdn+\left(bdn-2\,ad\right)r^2-8\,ad+4\left(bdn-2\,ad\right)r\right.}{4\left(r^2+4\,r+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(b*d*r^2 + 4*b*d*r + 4*b*d)*x^2*log(c) + 2*(b*d*n*r^2 + 4*b*d*n*r +
4*b*d*n)*x^2*log(x) - (4*b*d*n + (b*d*n - 2*a*d)*r^2 - 8*a*d + 4*(b*d*n - 2
*a*d)*r)*x^2 + 4*((b*e*r + 2*b*e)*x^2*log(c) + (b*e*n*r + 2*b*e*n)*x^2*log(
x) - (b*e*n - a*e*r - 2*a*e)*x^2)*x^r)/(r^2 + 4*r + 4)
```

Sympy [A] time = 7.41702, size = 525, normalized size = 8.9

$$\begin{cases}\frac{2adr^2x^2}{4r^2+16r+16}+\frac{8adrx^2}{4r^2+16r+16}+\frac{8adx^2}{4r^2+16r+16}+\frac{4aerx^2x^r}{4r^2+16r+16}+\frac{8aex^2x^r}{4r^2+16r+16}+\frac{2bdnr^2x^2\log\left(x\right)}{4r^2+16r+16}-\frac{bdnr^2x^2}{4r^2+16r+16}+\frac{8bdnrx^2\log\left(x\right)}{4r^2+16r+16}-\frac{4bdnrx^2}{4r^2+16r+16}+\ldots \\ \frac{adx^2}{2}+ae\log\left(x\right)+\frac{bdnx^2\log\left(x\right)}{2}-\frac{bdnx^2}{4}+\frac{bdx^2\log\left(c\right)}{2}+\frac{ben\log\left(x\right)^2}{2}+be\log\left(c\right)\log\left(x\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((2*a*d*r**2*x**2/(4*r**2 + 16*r + 16) + 8*a*d*r*x**2/(4*r**2 + 16
*r + 16) + 8*a*d*x**2/(4*r**2 + 16*r + 16) + 4*a*e*r*x**2*x**r/(4*r**2 + 16
*r + 16) + 8*a*e*x**2*x**r/(4*r**2 + 16*r + 16) + 2*b*d*n*r**2*x**2*log(x)/
(4*r**2 + 16*r + 16) - b*d*n*r**2*x**2/(4*r**2 + 16*r + 16) + 8*b*d*n*r*x**
2*log(x)/(4*r**2 + 16*r + 16) - 4*b*d*n*r*x**2/(4*r**2 + 16*r + 16) + 8*b*d
*n*x**2*log(x)/(4*r**2 + 16*r + 16) - 4*b*d*n*x**2/(4*r**2 + 16*r + 16) + 2
*b*d*r**2*x**2*log(c)/(4*r**2 + 16*r + 16) + 8*b*d*r*x**2*log(c)/(4*r**2 +
16*r + 16) + 8*b*d*x**2*log(c)/(4*r**2 + 16*r + 16) + 4*b*e*n*r*x**2*x**r*l
og(x)/(4*r**2 + 16*r + 16) + 8*b*e*n*x**2*x**r*log(x)/(4*r**2 + 16*r + 16)
- 4*b*e*n*x**2*x**r/(4*r**2 + 16*r + 16) + 4*b*e*r*x**2*x**r*log(c)/(4*r**2
 + 16*r + 16) + 8*b*e*x**2*x**r*log(c)/(4*r**2 + 16*r + 16), Ne(r, -2)), (a
*d*x**2/2 + a*e*log(x) + b*d*n*x**2*log(x)/2 - b*d*n*x**2/4 + b*d*x**2*log(
c)/2 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

Giac [B] time = 1.32026, size = 185, normalized size = 3.14

$$\frac{bnrx^2x^re\log(x)}{r^2+4r+4}+\frac{1}{2}bdnx^2\log(x)+\frac{2bnx^2x^re\log(x)}{r^2+4r+4}-\frac{1}{4}bdnx^2-\frac{bnx^2x^re}{r^2+4r+4}+\frac{1}{2}bdx^2\log(c)+\frac{bx^2x^re\log(c)}{r+2}+\frac{1}{2}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^2*x^r*e*log(x)/(r^2 + 4*r + 4) + 1/2*b*d*n*x^2*log(x) + 2*b*n*x^2*x
^r*e*log(x)/(r^2 + 4*r + 4) - 1/4*b*d*n*x^2 - b*n*x^2*x^r*e/(r^2 + 4*r + 4)
 + 1/2*b*d*x^2*log(c) + b*x^2*x^r*e*log(c)/(r + 2) + 1/2*a*d*x^2 + a*x^2*x^
r*e/(r + 2)
```

3.370 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=53

$$\frac{d(a+b\log(cx^n))^2}{2bn}+\frac{ex^r(a+b\log(cx^n))}{r}-\frac{benx^r}{r^2}$$

```
[Out] -((b*e*n*x^r)/r^2) + (e*x^r*(a + b*Log[c*x^n]))/r + (d*(a + b*Log[c*x^n])^2
)/(2*b*n)
```

Rubi [A] time = 0.0880529, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {14, 2351, 2301, 2304}

$$\frac{d(a+b\log(cx^n))^2}{2bn}+\frac{ex^r(a+b\log(cx^n))}{r}-\frac{benx^r}{r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -((b*e*n*x^r)/r^2) + (e*x^r*(a + b*Log[c*x^n]))/r + (d*(a + b*Log[c*x^n])^2
)/(2*b*n)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)(a+b\log(cx^n))}{x}\,dx &= \int \left(\frac{d(a+b\log(cx^n))}{x}+ex^{-1+r}(a+b\log(cx^n))\right)dx\\ &= d\int \frac{a+b\log(cx^n)}{x}\,dx+e\int x^{-1+r}(a+b\log(cx^n))\,dx\\ &= -\frac{benx^r}{r^2}+\frac{ex^r(a+b\log(cx^n))}{r}+\frac{d(a+b\log(cx^n))^2}{2bn}\end{aligned}$$

Mathematica [A] time = 0.0877378, size = 54, normalized size = 1.02

$$\frac{ex^r(ar-bn)}{r^2}+ad\log(x)+\frac{bd\log^2(cx^n)}{2n}+\frac{bex^r\log(cx^n)}{r}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (e*(-(b*n) + a*r)*x^r)/r^2 + a*d*Log[x] + (b*e*x^r*Log[c*x^n])/r + (b*d*Log
[c*x^n]^2)/(2*n)
```

Maple [C] time = 0.175, size = 278, normalized size = 5.3

$$\frac{b(dr\ln(x)+ex^r)\ln(x^n)}{r}+\frac{i}{2}\pi\,\ln(x)\,bd\mathrm{csgn}(ix^n)(\mathrm{csgn}(icx^n))^2-\frac{i}{2}\pi\,\ln(x)\,bd\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)-\frac{i}{2}\pi\,\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] b*(d*r*ln(x)+e*x^r)/r*ln(x^n)+1/2*I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)^
2-1/2*I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I*Pi*ln(x)*b*d
*csgn(I*c*x^n)^3+1/2*I*Pi*ln(x)*b*d*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/r*Pi*b*
```

```
e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1/2*I/r*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*x^r-1/2*I/r*Pi*b*e*csgn(I*c*x^n)^3*x^r+1/2*I/r*Pi*b*e*csgn(I*c*x^
n)^2*csgn(I*c)*x^r-1/2*b*d*n*ln(x)^2+ln(x)*ln(c)*b*d+1/r*ln(c)*b*e*x^r+ln(x
)*a*d+1/r*x^r*a*e-b*e*n*x^r/r^2
```

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((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.32992, size = 167, normalized size = 3.15

$$\frac{bdnr^2\log(x)^2 + 2\,(benr\log(x) + ber\log(c) - ben + aer)x^r + 2\left(bdr^2\log(c) + adr^2\right)\log(x)}{2\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*(b*e*n*r*log(x) + b*e*r*log(c) - b*e*n + a*e*r)
*x^r + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x))/r^2
```

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((d+e*x**r)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.30248, size = 93, normalized size = 1.75

$$\frac{1}{2}\,bdn\log\left(x\right)^{2}+\frac{bnx^{r}e\log\left(x\right)}{r}+bd\log\left(c\right)\log\left(x\right)+\frac{bx^{r}e\log\left(c\right)}{r}+ad\log\left(x\right)-\frac{bnx^{r}e}{r^{2}}+\frac{ax^{r}e}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d*n*log(x)^2 + b*n*x^r*e*log(x)/r + b*d*log(c)*log(x) + b*x^r*e*log(c
)/r + a*d*log(x) - b*n*x^r*e/r^2 + a*x^r*e/r
```

3.371 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=71

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{ex^{r-2}\left(a+b\log\left(cx^n\right)\right)}{2-r}-\frac{bdn}{4x^2}-\frac{benx^{r-2}}{(2-r)^2}$$

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n*x^(-2 + r))/(2 - r)^2 - (d*(a + b*Log[c*x^n]))/(2
*x^2) - (e*x^(-2 + r)*(a + b*Log[c*x^n]))/(2 - r)
```

Rubi [A] time = 0.0743005, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{2}\left(\frac{d}{x^2}+\frac{2ex^{r-2}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{4x^2}-\frac{benx^{r-2}}{(2-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d*n)/(4*x^2) - (b*e*n*x^(-2 + r))/(2 - r)^2 - ((d/x^2 + (2*e*x^(-2 + r)
)/(2 - r))*(a + b*Log[c*x^n]))/2
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^3}\,dx = -\frac{1}{2}\left(\frac{d}{x^2}+\frac{2ex^{-2+r}}{2-r}\right)(a+b\log(cx^n)) - (bn)\int\left(-\frac{d}{2x^3}+\frac{ex^{-3+r}}{-2+r}\right)dx$$
$$= -\frac{bdn}{4x^2} - \frac{benx^{-2+r}}{(2-r)^2} - \frac{1}{2}\left(\frac{d}{x^2}+\frac{2ex^{-2+r}}{2-r}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.108623, size = 72, normalized size = 1.01

$$-\frac{2a(r-2)(d(r-2)-2ex^r)+2b(r-2)\log(cx^n)(d(r-2)-2ex^r)+bn\left(d(r-2)^2+4ex^r\right)}{4(r-2)^2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(2*a*(-2 + r)*(d*(-2 + r) - 2*e*x^r) + b*n*(d*(-2 + r)^2 + 4*e*x^r) + 2*b*
(-2 + r)*(d*(-2 + r) - 2*e*x^r)*Log[c*x^n])/(4*(-2 + r)^2*x^2)
```

Maple [C] time = 0.158, size = 613, normalized size = 8.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))/x^3,x)
```

```
[Out] -1/2*b*(d*r-2*e*x^r-2*d)/(-2+r)/x^2*ln(x^n)-1/4*(8*a*d-4*x^r*a*e*r+4*x^r*b*
e*n+2*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r-4*b*d*n*r+4*b*d*n+
8*x^r*a*e-8*ln(c)*b*d*r+2*ln(c)*b*d*r^2-4*ln(c)*b*e*x^r*r-I*Pi*b*d*r^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*Pi*b*d*csgn(I*c*x^n)^3*r-2*I*Pi*b*e*csg
n(I*x^n)*csgn(I*c*x^n)^2*x^r*r+8*ln(c)*b*e*x^r+2*a*d*r^2+4*I*Pi*b*d*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*r-2*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+8
*ln(c)*b*d-8*a*d*r+b*d*n*r^2-4*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*x^r+4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*e*csgn(I*c*x^n)^3*x^r-
4*I*Pi*b*d*csgn(I*c*x^n)^3-4*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r+4*I*Pi*
b*d*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d*r^2*csgn(I*c*x^n)^3-4*I*Pi*b*d*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+4*I
*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r-4*
I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r+I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)
```

```
+I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2)/(-2+r)^2/x^2
```

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((d+e*x^r)*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.4095, size = 351, normalized size = 4.94

$$-\frac{4\,bdn + (bdn + 2\,ad)r^2 + 8\,ad - 4\,(bdn + 2\,ad)r + 4\,(ben - aer + 2\,ae - (ber - 2\,be)\log\left(c\right) - (benr - 2\,ben)\log\left(x\right))x^r + 2}{4\left(r^2 - 4\,r + 4\right)x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(4*b*d*n + (b*d*n + 2*a*d)*r^2 + 8*a*d - 4*(b*d*n + 2*a*d)*r + 4*(b*e*
n - a*e*r + 2*a*e - (b*e*r - 2*b*e)*log(c) - (b*e*n*r - 2*b*e*n)*log(x))*x^
r + 2*(b*d*r^2 - 4*b*d*r + 4*b*d)*log(c) + 2*(b*d*n*r^2 - 4*b*d*n*r + 4*b*d
*n)*log(x))/((r^2 - 4*r + 4)*x^2)
```

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((d+e*x**r)*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.37193, size = 535, normalized size = 7.54

$$-\frac{bdnr^2\log(x)}{2\left(r^2-4r+4\right)x^2}+\frac{bnrx^re\log(x)}{\left(r^2-4r+4\right)x^2}-\frac{bdnr^2}{4\left(r^2-4r+4\right)x^2}-\frac{bdr^2\log(c)}{2\left(r^2-4r+4\right)x^2}+\frac{brx^re\log(c)}{\left(r^2-4r+4\right)x^2}+\frac{2\,bdnr\log(x)}{\left(r^2-4r+4\right)x^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] -1/2*b*d*n*r^2*log(x)/((r^2 - 4*r + 4)*x^2) + b*n*r*x^r*e*log(x)/((r^2 - 4*
r + 4)*x^2) - 1/4*b*d*n*r^2/((r^2 - 4*r + 4)*x^2) - 1/2*b*d*r^2*log(c)/((r^
2 - 4*r + 4)*x^2) + b*r*x^r*e*log(c)/((r^2 - 4*r + 4)*x^2) + 2*b*d*n*r*log(
x)/((r^2 - 4*r + 4)*x^2) - 2*b*n*x^r*e*log(x)/((r^2 - 4*r + 4)*x^2) + b*d*n
*r/((r^2 - 4*r + 4)*x^2) - 1/2*a*d*r^2/((r^2 - 4*r + 4)*x^2) - b*n*x^r*e/((
r^2 - 4*r + 4)*x^2) + a*r*x^r*e/((r^2 - 4*r + 4)*x^2) + 2*b*d*r*log(c)/((r^
2 - 4*r + 4)*x^2) - 2*b*x^r*e*log(c)/((r^2 - 4*r + 4)*x^2) - 2*b*d*n*log(x)
/((r^2 - 4*r + 4)*x^2) - b*d*n/((r^2 - 4*r + 4)*x^2) + 2*a*d*r/((r^2 - 4*r
+ 4)*x^2) - 2*a*x^r*e/((r^2 - 4*r + 4)*x^2) - 2*b*d*log(c)/((r^2 - 4*r + 4)
*x^2) - 2*a*d/((r^2 - 4*r + 4)*x^2)
```

3.372 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=71

$$-\frac{d\,(a+b\log(cx^n))}{4x^4}-\frac{ex^{r-4}\,(a+b\log(cx^n))}{4-r}-\frac{bdn}{16x^4}-\frac{benx^{r-4}}{(4-r)^2}$$

```
[Out] -(b*d*n)/(16*x^4) - (b*e*n*x^(-4 + r))/(4 - r)^2 - (d*(a + b*Log[c*x^n]))/(
4*x^4) - (e*x^(-4 + r)*(a + b*Log[c*x^n]))/(4 - r)
```

Rubi [A] time = 0.0741268, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{4}\left(\frac{d}{x^4}+\frac{4ex^{r-4}}{4-r}\right)(a+b\log(cx^n))-\frac{bdn}{16x^4}-\frac{benx^{r-4}}{(4-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d*n)/(16*x^4) - (b*e*n*x^(-4 + r))/(4 - r)^2 - ((d/x^4 + (4*e*x^(-4 + r
))/(4 - r))*(a + b*Log[c*x^n]))/4
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^5}\,dx = -\frac{1}{4}\left(\frac{d}{x^4}+\frac{4ex^{-4+r}}{4-r}\right)(a+b\log(cx^n)) - (bn)\int\left(-\frac{d}{4x^5}+\frac{ex^{-5+r}}{-4+r}\right)dx$$
$$= -\frac{bdn}{16x^4} - \frac{benx^{-4+r}}{(4-r)^2} - \frac{1}{4}\left(\frac{d}{x^4}+\frac{4ex^{-4+r}}{4-r}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.111571, size = 72, normalized size = 1.01

$$-\frac{4a(r-4)(d(r-4)-4ex^r)+4b(r-4)\log(cx^n)(d(r-4)-4ex^r)+bn\left(d(r-4)^2+16ex^r\right)}{16(r-4)^2x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(4*a*(-4 + r)*(d*(-4 + r) - 4*e*x^r) + b*n*(d*(-4 + r)^2 + 16*e*x^r) + 4*b
*(-4 + r)*(d*(-4 + r) - 4*e*x^r)*Log[c*x^n])/(16*(-4 + r)^2*x^4)
```

Maple [C] time = 0.164, size = 613, normalized size = 8.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/4*b*(d*r-4*e*x^r-4*d)/(-4+r)/x^4*ln(x^n)-1/16*(64*a*d-16*x^r*a*e*r+16*x^
r*b*e*n+8*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r-8*b*d*n*r+16*b
*d*n+64*x^r*a*e-32*ln(c)*b*d*r+4*ln(c)*b*d*r^2+32*I*Pi*b*d*csgn(I*x^n)*csgn
(I*c*x^n)^2-32*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+32*I*Pi*b*d*csgn(I*c*x^n)^2*csg
n(I*c)-2*I*Pi*b*d*r^2*csgn(I*c*x^n)^3-16*ln(c)*b*e*x^r*r+64*ln(c)*b*e*x^r-8
*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+4*a*d*r^2-8*I*Pi*b*e*csgn(I*x^n)*
csgn(I*c*x^n)^2*x^r*r+16*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r+64*
ln(c)*b*d-32*a*d*r+b*d*n*r^2+16*I*Pi*b*d*csgn(I*c*x^n)^3*r-16*I*Pi*b*d*csgn
(I*x^n)*csgn(I*c*x^n)^2*r-16*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)*r-2*I*Pi*b*
d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-32*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r-32*I*Pi*b*d*csgn(I*c*x^n)^3+8*I*Pi*b*e*csgn(I*c*x^n)^3*x
^r*r+2*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d*r^2*csgn(I*x^n)*cs
gn(I*c*x^n)^2+32*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+32*I*Pi*b*e*csgn(I*
```

```
x^n)*csgn(I*c*x^n)^2*x^r-32*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c))/(
-4+r)^2/x^4
```

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((d+e*x^r)*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.33431, size = 360, normalized size = 5.07

$$-\frac{16\,bdn + (bdn + 4\,ad)r^2 + 64\,ad - 8\,(bdn + 4\,ad)r + 16\,(ben - aer + 4\,ae - (ber - 4\,be)\log{(c)} - (benr - 4\,ben)\log{(x)})x^r}{16\left(r^2 - 8\,r + 16\right)x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*(16*b*d*n + (b*d*n + 4*a*d)*r^2 + 64*a*d - 8*(b*d*n + 4*a*d)*r + 16*(
b*e*n - a*e*r + 4*a*e - (b*e*r - 4*b*e)*log(c) - (b*e*n*r - 4*b*e*n)*log(x)
)*x^r + 4*(b*d*r^2 - 8*b*d*r + 16*b*d)*log(c) + 4*(b*d*n*r^2 - 8*b*d*n*r +
16*b*d*n)*log(x))/((r^2 - 8*r + 16)*x^4)
```

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((d+e*x**r)*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.33008, size = 536, normalized size = 7.55

$$-\frac{bdnr^2\log(x)}{4\,(r^2-8\,r+16)x^4}+\frac{bnrx^re\log(x)}{(r^2-8\,r+16)x^4}-\frac{bdnr^2}{16\,(r^2-8\,r+16)x^4}-\frac{bdr^2\log(c)}{4\,(r^2-8\,r+16)x^4}+\frac{brx^re\log(c)}{(r^2-8\,r+16)x^4}+\frac{2\,bdnr\log}{(r^2-8\,r+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] -1/4*b*d*n*r^2*log(x)/((r^2 - 8*r + 16)*x^4) + b*n*r*x^r*e*log(x)/((r^2 - 8
*r + 16)*x^4) - 1/16*b*d*n*r^2/((r^2 - 8*r + 16)*x^4) - 1/4*b*d*r^2*log(c)/
((r^2 - 8*r + 16)*x^4) + b*r*x^r*e*log(c)/((r^2 - 8*r + 16)*x^4) + 2*b*d*n*
r*log(x)/((r^2 - 8*r + 16)*x^4) - 4*b*n*x^r*e*log(x)/((r^2 - 8*r + 16)*x^4)
 + 1/2*b*d*n*r/((r^2 - 8*r + 16)*x^4) - 1/4*a*d*r^2/((r^2 - 8*r + 16)*x^4)
- b*n*x^r*e/((r^2 - 8*r + 16)*x^4) + a*r*x^r*e/((r^2 - 8*r + 16)*x^4) + 2*b
*d*r*log(c)/((r^2 - 8*r + 16)*x^4) - 4*b*x^r*e*log(c)/((r^2 - 8*r + 16)*x^4
) - 4*b*d*n*log(x)/((r^2 - 8*r + 16)*x^4) - b*d*n/((r^2 - 8*r + 16)*x^4) +
2*a*d*r/((r^2 - 8*r + 16)*x^4) - 4*a*x^r*e/((r^2 - 8*r + 16)*x^4) - 4*b*d*l
og(c)/((r^2 - 8*r + 16)*x^4) - 4*a*d/((r^2 - 8*r + 16)*x^4)
```

3.373 $\int x^4 (d + ex^r) (a + b \log (cx^n)) \, dx$

Optimal. Leaf size=59

$$\frac{1}{5}\left(dx^5 + \frac{5ex^{r+5}}{r+5}\right)(a + b\log(cx^n)) - \frac{1}{25}bdnx^5 - \frac{benx^{r+5}}{(r+5)^2}$$

```
[Out] -(b*d*n*x^5)/25 - (b*e*n*x^(5 + r))/(5 + r)^2 + ((d*x^5 + (5*e*x^(5 + r))/(
5 + r))*(a + b*Log[c*x^n]))/5
```

Rubi [A] time = 0.0802939, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{5}\left(dx^5 + \frac{5ex^{r+5}}{r+5}\right)(a + b\log(cx^n)) - \frac{1}{25}bdnx^5 - \frac{benx^{r+5}}{(r+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^5)/25 - (b*e*n*x^(5 + r))/(5 + r)^2 + ((d*x^5 + (5*e*x^(5 + r))/(
5 + r))*(a + b*Log[c*x^n]))/5
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}
\int x^4\left(d+ex^r\right)\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{5}x^4\left(d+\frac{5ex^r}{5+r}\right)dx\\
&= \frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int x^4\left(d+\frac{5ex^r}{5+r}\right)dx\\
&= \frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{5}(bn)\int\left(dx^4+\frac{5ex^{4+r}}{5+r}\right)dx\\
&= -\frac{1}{25}bdnx^5-\frac{benx^{5+r}}{(5+r)^2}+\frac{1}{5}\left(dx^5+\frac{5ex^{5+r}}{5+r}\right)\left(a+b\log\left(cx^n\right)\right)
\end{aligned}$$

Mathematica [A] time = 0.0890465, size = 73, normalized size = 1.24

$$\frac{x^5\left(5a(r+5)\left(d(r+5)+5ex^r\right)+5b(r+5)\log\left(cx^n\right)\left(d(r+5)+5ex^r\right)-bn\left(d(r+5)^2+25ex^r\right)\right)}{25(r+5)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^5*(5*a*(5 + r)*(d*(5 + r) + 5*e*x^r) - b*n*(d*(5 + r)^2 + 25*e*x^r) + 5*
b*(5 + r)*(d*(5 + r) + 5*e*x^r)*Log[c*x^n]))/(25*(5 + r)^2)
```

Maple [C] time = 0.233, size = 614, normalized size = 10.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d+e*x^r)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/5*x^5*b*(d*r+5*e*x^r+5*d)/(5+r)*ln(x^n)-1/50*x^5*(-250*a*d+125*I*Pi*b*e*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-50*x^r*a*e*r+50*x^r*b*e*n-25*I*Pi*b*
e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r-25*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x
^r*r+5*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+50*I*Pi*b*d*r*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+20*b*d*n*r+50*b*d*n-250*x^r*a*e-100*ln(c)*b*
d*r-10*ln(c)*b*d*r^2-50*ln(c)*b*e*x^r*r+125*I*Pi*b*d*csgn(I*c*x^n)^3-250*ln
(c)*b*e*x^r-10*a*d*r^2-250*ln(c)*b*d-100*a*d*r+2*b*d*n*r^2+50*I*Pi*b*d*csgn
```

```
(I*c*x^n)^3*r-125*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+125*I*Pi*b*e*csgn(I*
c*x^n)^3*x^r-125*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+5*I*Pi*b*d*r^2*csgn(I*c
*x^n)^3+25*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r-50*I*Pi*b*d*r
*csgn(I*c*x^n)^2*csgn(I*c)+125*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
-50*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)^2-125*I*Pi*b*e*csgn(I*c*x^n)^2*csg
n(I*c)*x^r-125*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-5*I*Pi*b*d*r^2*csgn
(I*c*x^n)^2*csgn(I*c)+25*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r-5*I*Pi*b*d*r^2*csgn
(I*x^n)*csgn(I*c*x^n)^2)/(5+r)^2
```

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(x^4*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.36311, size = 396, normalized size = 6.71

$$\frac{5\left(bdr^2+10\,bdr+25\,bd\right)x^5\log(c)+5\left(bdnr^2+10\,bdnr+25\,bdn\right)x^5\log(x)-\left(25\,bdn+(bdn-5\,ad)r^2-125\,ad+10\,(bd\right.}{25\left(r^2+10\,r+25\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/25*(5*(b*d*r^2 + 10*b*d*r + 25*b*d)*x^5*log(c) + 5*(b*d*n*r^2 + 10*b*d*n*
r + 25*b*d*n)*x^5*log(x) - (25*b*d*n + (b*d*n - 5*a*d)*r^2 - 125*a*d + 10*(
b*d*n - 5*a*d)*r)*x^5 + 25*((b*e*r + 5*b*e)*x^5*log(c) + (b*e*n*r + 5*b*e*n
)*x^5*log(x) - (b*e*n - a*e*r - 5*a*e)*x^5)*x^r)/(r^2 + 10*r + 25)
```

Sympy [A] time = 97.2254, size = 525, normalized size = 8.9

$$\begin{cases} \frac{5adr^2x^5}{25r^2+250r+625}+\frac{50adrx^5}{25r^2+250r+625}+\frac{125adx^5}{25r^2+250r+625}+\frac{25aerx^5x^r}{25r^2+250r+625}+\frac{125aex^5x^r}{25r^2+250r+625}+\frac{5bdnr^2x^5\log(x)}{25r^2+250r+625}-\frac{bdnr^2x^5}{25r^2+250r+625}+\frac{50bdnrx^5\log(x)}{25r^2+250r+625} \\ \frac{adx^5}{5}+ae\log(x)+\frac{bdnx^5\log(x)}{5}-\frac{bdnx^5}{25}+\frac{bdx^5\log(c)}{5}+\frac{ben\log(x)^2}{2}+be\log(c)\log(x) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((5*a*d*r**2*x**5/(25*r**2 + 250*r + 625) + 50*a*d*r*x**5/(25*r**2
 + 250*r + 625) + 125*a*d*x**5/(25*r**2 + 250*r + 625) + 25*a*e*r*x**5*x**r
/(25*r**2 + 250*r + 625) + 125*a*e*x**5*x**r/(25*r**2 + 250*r + 625) + 5*b*
d*n*r**2*x**5*log(x)/(25*r**2 + 250*r + 625) - b*d*n*r**2*x**5/(25*r**2 + 2
50*r + 625) + 50*b*d*n*r*x**5*log(x)/(25*r**2 + 250*r + 625) - 10*b*d*n*r*x
**5/(25*r**2 + 250*r + 625) + 125*b*d*n*x**5*log(x)/(25*r**2 + 250*r + 625)
 - 25*b*d*n*x**5/(25*r**2 + 250*r + 625) + 5*b*d*r**2*x**5*log(c)/(25*r**2
+ 250*r + 625) + 50*b*d*r*x**5*log(c)/(25*r**2 + 250*r + 625) + 125*b*d*x**
5*log(c)/(25*r**2 + 250*r + 625) + 25*b*e*n*r*x**5*x**r*log(x)/(25*r**2 + 2
50*r + 625) + 125*b*e*n*x**5*x**r*log(x)/(25*r**2 + 250*r + 625) - 25*b*e*n
*x**5*x**r/(25*r**2 + 250*r + 625) + 25*b*e*r*x**5*x**r*log(c)/(25*r**2 + 2
50*r + 625) + 125*b*e*x**5*x**r*log(c)/(25*r**2 + 250*r + 625), Ne(r, -5)),
 (a*d*x**5/5 + a*e*log(x) + b*d*n*x**5*log(x)/5 - b*d*n*x**5/25 + b*d*x**5*
log(c)/5 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

Giac [B] time = 1.31001, size = 185, normalized size = 3.14

$$\frac{bnrx^5x^re\log(x)}{r^2+10\,r+25}+\frac{1}{5}\,bdnx^5\log(x)+\frac{5\,bnx^5x^re\log(x)}{r^2+10\,r+25}-\frac{1}{25}\,bdnx^5-\frac{bnx^5x^re}{r^2+10\,r+25}+\frac{1}{5}\,bdx^5\log(c)+\frac{bx^5x^re\log(c)}{r+5}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^5*x^r*e*log(x)/(r^2 + 10*r + 25) + 1/5*b*d*n*x^5*log(x) + 5*b*n*x^5
*x^r*e*log(x)/(r^2 + 10*r + 25) - 1/25*b*d*n*x^5 - b*n*x^5*x^r*e/(r^2 + 10*
r + 25) + 1/5*b*d*x^5*log(c) + b*x^5*x^r*e*log(c)/(r + 5) + 1/5*a*d*x^5 + a
*x^5*x^r*e/(r + 5)
```

3.374 $\int x^2 (d+ex^r) (a+b\log(cx^n)) \, dx$

Optimal. Leaf size=59

$$\frac{1}{3}\left(dx^3+\frac{3ex^{r+3}}{r+3}\right)(a+b\log(cx^n))-\frac{1}{9}bdnx^3-\frac{benx^{r+3}}{(r+3)^2}$$

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^(3 + r))/(3 + r)^2 + ((d*x^3 + (3*e*x^(3 + r))/(3
 + r))*(a + b*Log[c*x^n]))/3
```

Rubi [A] time = 0.0804727, antiderivative size = 59, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$\frac{1}{3}\left(dx^3+\frac{3ex^{r+3}}{r+3}\right)(a+b\log(cx^n))-\frac{1}{9}bdnx^3-\frac{benx^{r+3}}{(r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x^3)/9 - (b*e*n*x^(3 + r))/(3 + r)^2 + ((d*x^3 + (3*e*x^(3 + r))/(3
 + r))*(a + b*Log[c*x^n]))/3
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}\int x^2 (d+ex^r)(a+b\log(cx^n))\,dx &= \frac{1}{3}\left(dx^3+\frac{3ex^{3+r}}{3+r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{3}x^2\left(d+\frac{3ex^r}{3+r}\right)dx\\ &= \frac{1}{3}\left(dx^3+\frac{3ex^{3+r}}{3+r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int x^2\left(d+\frac{3ex^r}{3+r}\right)dx\\ &= \frac{1}{3}\left(dx^3+\frac{3ex^{3+r}}{3+r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int \left(dx^2+\frac{3ex^{2+r}}{3+r}\right)dx\\ &= -\frac{1}{9}bdnx^3-\frac{benx^{3+r}}{(3+r)^2}+\frac{1}{3}\left(dx^3+\frac{3ex^{3+r}}{3+r}\right)(a+b\log(cx^n))\end{aligned}$$

Mathematica [A] time = 0.0881946, size = 73, normalized size = 1.24

$$\frac{x^3\left(3a(r+3)(d(r+3)+3ex^r)+3b(r+3)\log(cx^n)(d(r+3)+3ex^r)-bn\left(d(r+3)^2+9ex^r\right)\right)}{9(r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(3*a*(3 + r)*(d*(3 + r) + 3*e*x^r) - b*n*(d*(3 + r)^2 + 9*e*x^r) + 3*b
*(3 + r)*(d*(3 + r) + 3*e*x^r)*Log[c*x^n]))/(9*(3 + r)^2)
```

Maple [C] time = 0.237, size = 614, normalized size = 10.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+e*x^r)*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/3*b*x^3*(d*r+3*e*x^r+3*d)/(3+r)*ln(x^n)-1/18*x^3*(-54*a*d+18*I*Pi*b*d*r*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*x^r*a*e*r+18*x^r*b*e*n-9*I*Pi*b*e*csg
n(I*c*x^n)^2*csgn(I*c)*x^r*r-9*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r+1
2*b*d*n*r+18*b*d*n-54*x^r*a*e-36*ln(c)*b*d*r-6*ln(c)*b*d*r^2-18*ln(c)*b*e*x
^r*r-54*ln(c)*b*e*x^r+27*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-6
*a*d*r^2-54*ln(c)*b*d-36*a*d*r+27*I*Pi*b*d*csgn(I*c*x^n)^3+2*b*d*n*r^2+3*I*
Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-27*I*Pi*b*d*csgn(I*c*x^n)^2*
```

```
csgn(I*c)+3*I*Pi*b*d*r^2*csgn(I*c*x^n)^3+18*I*Pi*b*d*csgn(I*c*x^n)^3*r-27*I
*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2+27*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+9*I*Pi*
b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r-18*I*Pi*b*d*r*csgn(I*x^n)*csg
n(I*c*x^n)^2-18*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(I*c)+9*I*Pi*b*e*csgn(I*c*x^
n)^3*x^r*r-27*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+27*I*Pi*b*d*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)-3*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)-27*I*Pi*
b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n
)^2)/(3+r)^2
```

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(x^2*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.32176, size = 381, normalized size = 6.46

$$\frac{3\left(bdr^2+6\,bdr+9\,bd\right)x^3\log\left(c\right)+3\left(bdnr^2+6\,bdnr+9\,bdn\right)x^3\log\left(x\right)-\left(9\,bdn+\left(bdn-3\,ad\right)r^2-27\,ad+6\,(bdn-3\,ad\right.}{9\left(r^2+6\,r+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*(b*d*r^2 + 6*b*d*r + 9*b*d)*x^3*log(c) + 3*(b*d*n*r^2 + 6*b*d*n*r +
9*b*d*n)*x^3*log(x) - (9*b*d*n + (b*d*n - 3*a*d)*r^2 - 27*a*d + 6*(b*d*n -
3*a*d)*r)*x^3 + 9*((b*e*r + 3*b*e)*x^3*log(c) + (b*e*n*r + 3*b*e*n)*x^3*log
(x) - (b*e*n - a*e*r - 3*a*e)*x^3)*x^r)/(r^2 + 6*r + 9)
```

Sympy [A] time = 19.1895, size = 525, normalized size = 8.9

$$\begin{cases} \frac{3adr^2x^3}{9r^2+54r+81}+\frac{18adrx^3}{9r^2+54r+81}+\frac{27adx^3}{9r^2+54r+81}+\frac{9aerx^3x^r}{9r^2+54r+81}+\frac{27aex^3x^r}{9r^2+54r+81}+\frac{3bdnr^2x^3\log\left(x\right)}{9r^2+54r+81}-\frac{bdnr^2x^3}{9r^2+54r+81}+\frac{18bdnrx^3\log\left(x\right)}{9r^2+54r+81}-\frac{6bdnrx^3}{9r^2+54r+81}+ \\ \frac{adx^3}{3}+ae\log\left(x\right)+\frac{bdnx^3\log\left(x\right)}{3}-\frac{bdnx^3}{9}+\frac{bdx^3\log\left(c\right)}{3}+\frac{ben\log\left(x\right)^2}{2}+be\log\left(c\right)\log\left(x\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((3*a*d*r**2*x**3/(9*r**2 + 54*r + 81) + 18*a*d*r*x**3/(9*r**2 + 5
4*r + 81) + 27*a*d*x**3/(9*r**2 + 54*r + 81) + 9*a*e*r*x**3*x**r/(9*r**2 +
54*r + 81) + 27*a*e*x**3*x**r/(9*r**2 + 54*r + 81) + 3*b*d*n*r**2*x**3*log(
x)/(9*r**2 + 54*r + 81) - b*d*n*r**2*x**3/(9*r**2 + 54*r + 81) + 18*b*d*n*r
*x**3*log(x)/(9*r**2 + 54*r + 81) - 6*b*d*n*r*x**3/(9*r**2 + 54*r + 81) + 2
7*b*d*n*x**3*log(x)/(9*r**2 + 54*r + 81) - 9*b*d*n*x**3/(9*r**2 + 54*r + 81
) + 3*b*d*r**2*x**3*log(c)/(9*r**2 + 54*r + 81) + 18*b*d*r*x**3*log(c)/(9*r
**2 + 54*r + 81) + 27*b*d*x**3*log(c)/(9*r**2 + 54*r + 81) + 9*b*e*n*r*x**3
*x**r*log(x)/(9*r**2 + 54*r + 81) + 27*b*e*n*x**3*x**r*log(x)/(9*r**2 + 54*
r + 81) - 9*b*e*n*x**3*x**r/(9*r**2 + 54*r + 81) + 9*b*e*r*x**3*x**r*log(c)
/(9*r**2 + 54*r + 81) + 27*b*e*x**3*x**r*log(c)/(9*r**2 + 54*r + 81), Ne(r,
 -3)), (a*d*x**3/3 + a*e*log(x) + b*d*n*x**3*log(x)/3 - b*d*n*x**3/9 + b*d*
x**3*log(c)/3 + b*e*n*log(x)**2/2 + b*e*log(c)*log(x), True))
```

Giac [B] time = 1.31582, size = 185, normalized size = 3.14

$$\frac{bnrx^3x^re\log(x)}{r^2+6r+9}+\frac{1}{3}bdnx^3\log(x)+\frac{3bnx^3x^re\log(x)}{r^2+6r+9}-\frac{1}{9}bdnx^3-\frac{bnx^3x^re}{r^2+6r+9}+\frac{1}{3}bdx^3\log(c)+\frac{bx^3x^re\log(c)}{r+3}+\frac{1}{3}a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x^3*x^r*e*log(x)/(r^2 + 6*r + 9) + 1/3*b*d*n*x^3*log(x) + 3*b*n*x^3*x
^r*e*log(x)/(r^2 + 6*r + 9) - 1/9*b*d*n*x^3 - b*n*x^3*x^r*e/(r^2 + 6*r + 9)
 + 1/3*b*d*x^3*log(c) + b*x^3*x^r*e*log(c)/(r + 3) + 1/3*a*d*x^3 + a*x^3*x^
r*e/(r + 3)
```

3.375 $\int (d+ex^r)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=57

$$dx(a+b\log(cx^n))+\frac{ex^{r+1}(a+b\log(cx^n))}{r+1}-bdnx-\frac{benx^{r+1}}{(r+1)^2}$$

```
[Out] -(b*d*n*x) - (b*e*n*x^(1 + r))/(1 + r)^2 + d*x*(a + b*Log[c*x^n]) + (e*x^(1
 + r)*(a + b*Log[c*x^n]))/(1 + r)
```

Rubi [A] time = 0.0339829, antiderivative size = 49, normalized size of antiderivative = 0.86, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2313, 12}

$$\left(dx+\frac{ex^{r+1}}{r+1}\right)(a+b\log(cx^n))-bdnx-\frac{benx^{r+1}}{(r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d*n*x) - (b*e*n*x^(1 + r))/(1 + r)^2 + (d*x + (e*x^(1 + r))/(1 + r))*(a
 + b*Log[c*x^n])
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\int (d+ex^r)(a+b\log(cx^n))\,dx = \left(dx+\frac{ex^{1+r}}{1+r}\right)(a+b\log(cx^n))-(bn)\int\frac{d+dr+ex^r}{1+r}dx$$
$$=\left(dx+\frac{ex^{1+r}}{1+r}\right)(a+b\log(cx^n))-\frac{(bn)\int(d+dr+ex^r)\,dx}{1+r}$$
$$=-bdnx-\frac{benx^{1+r}}{(1+r)^2}+\left(dx+\frac{ex^{1+r}}{1+r}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.121995, size = 53, normalized size = 0.93

$$x\left(\frac{ex^r(a+b\log(cx^n))}{r+1}+ad+bd\log(cx^n)-bdn-\frac{benx^r}{(r+1)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(a*d - b*d*n - (b*e*n*x^r)/(1 + r)^2 + b*d*Log[c*x^n] + (e*x^r*(a + b*Log
[c*x^n]))/(1 + r))
```

Maple [C] time = 0.236, size = 606, normalized size = 10.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n)),x)
```

```
[Out] b*x*(d*r+e*x^r+d)/(1+r)*ln(x^n)-1/2*x*(-2*a*d-2*x^r*a*e*r+2*x^r*b*e*n+4*b*d
*n*r+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+2*b*d*n-2*x^r*a*e-4
*ln(c)*b*d*r-2*ln(c)*b*d*r^2-2*ln(c)*b*e*x^r*r+I*Pi*b*e*csgn(I*c*x^n)^3*x^r
+2*I*Pi*b*d*csgn(I*c*x^n)^3*r-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d
*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*csgn(I*c*x^n)^3+I*Pi*b*e*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x^r-I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r+I*Pi*b
*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*ln(c)*b*e*x^r-2*a*d*r^2-2*ln(c
)*b*d-4*a*d*r+2*b*d*n*r^2+2*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+I*Pi*b*d*r^2*csgn(I*c*x^n)^3-I*Pi*
b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)-
2*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(
```

```
I*c)+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e*csgn(I*x^n)*csgn
(I*c*x^n)^2*x^r+I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r-I*Pi*b*e*csgn(I*c*x^n)^2*csg
n(I*c)*x^r)/(1+r)^2
```

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((d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.37304, size = 325, normalized size = 5.7

$$\frac{\left(bdr^2+2\,bdr+bd\right)x\log\left(c\right)+\left(bdnr^2+2\,bdnr+bdn\right)x\log\left(x\right)-\left(bdn+\left(bdn-ad\right)r^2-ad+2\left(bdn-ad\right)r\right)x+\left(\left(ber+be\right)\right.}{r^2+2\,r+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*d*r^2 + 2*b*d*r + b*d)*x*log(c) + (b*d*n*r^2 + 2*b*d*n*r + b*d*n)*x*log
(x) - (b*d*n + (b*d*n - a*d)*r^2 - a*d + 2*(b*d*n - a*d)*r)*x + ((b*e*r + b
*e)*x*log(c) + (b*e*n*r + b*e*n)*x*log(x) - (b*e*n - a*e*r - a*e)*x)*x^r)/(
r^2 + 2*r + 1)
```

Sympy [A] time = 2.8793, size = 423, normalized size = 7.42

$$\begin{cases}\frac{adr^2x}{r^2+2r+1}+\frac{2adrx}{r^2+2r+1}+\frac{adx}{r^2+2r+1}+\frac{aerxx^r}{r^2+2r+1}+\frac{aexx^r}{r^2+2r+1}+\frac{bdnr^2x\log\left(x\right)}{r^2+2r+1}-\frac{bdnr^2x}{r^2+2r+1}+\frac{2bdnrx\log\left(x\right)}{r^2+2r+1}-\frac{2bdnrx}{r^2+2r+1}+\frac{bdnx\log\left(x\right)}{r^2+2r+1}-\frac{bdnx}{r^2+2r+1}+ \\ adx+ae\log\left(x\right)+bdnx\log\left(x\right)-bdnx+bdx\log\left(c\right)+\frac{ben\log\left(x\right)^2}{2}+be\log\left(c\right)\log\left(x\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*d*r**2*x/(r**2 + 2*r + 1) + 2*a*d*r*x/(r**2 + 2*r + 1) + a*d*x
/(r**2 + 2*r + 1) + a*e*r*x*x**r/(r**2 + 2*r + 1) + a*e*x*x**r/(r**2 + 2*r
+ 1) + b*d*n*r**2*x*log(x)/(r**2 + 2*r + 1) - b*d*n*r**2*x/(r**2 + 2*r + 1)
 + 2*b*d*n*r*x*log(x)/(r**2 + 2*r + 1) - 2*b*d*n*r*x/(r**2 + 2*r + 1) + b*d
*n*x*log(x)/(r**2 + 2*r + 1) - b*d*n*x/(r**2 + 2*r + 1) + b*d*r**2*x*log(c)
/(r**2 + 2*r + 1) + 2*b*d*r*x*log(c)/(r**2 + 2*r + 1) + b*d*x*log(c)/(r**2
+ 2*r + 1) + b*e*n*r*x*x**r*log(x)/(r**2 + 2*r + 1) + b*e*n*x*x**r*log(x)/(
r**2 + 2*r + 1) - b*e*n*x*x**r/(r**2 + 2*r + 1) + b*e*r*x*x**r*log(c)/(r**2
 + 2*r + 1) + b*e*x*x**r*log(c)/(r**2 + 2*r + 1), Ne(r, -1)), (a*d*x + a*e*
log(x) + b*d*n*x*log(x) - b*d*n*x + b*d*x*log(c) + b*e*n*log(x)**2/2 + b*e*
log(c)*log(x), True))
```

Giac [B] time = 1.3116, size = 155, normalized size = 2.72

$$\frac{bnrxx^{r}e\log(x)}{r^{2}+2r+1}+bdnx\log(x)+\frac{bnxx^{r}e\log(x)}{r^{2}+2r+1}-bdnx-\frac{bnxx^{r}e}{r^{2}+2r+1}+bdx\log(c)+\frac{bxx^{r}e\log(c)}{r+1}+adx+\frac{axx^{r}e}{r+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*n*r*x*x^r*e*log(x)/(r^2 + 2*r + 1) + b*d*n*x*log(x) + b*n*x*x^r*e*log(x)/
(r^2 + 2*r + 1) - b*d*n*x - b*n*x*x^r*e/(r^2 + 2*r + 1) + b*d*x*log(c) + b*
x*x^r*e*log(c)/(r + 1) + a*d*x + a*x*x^r*e/(r + 1)
```

3.376 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=67

$$-\frac{d\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{ex^{r-1}\left(a+b\log\left(cx^n\right)\right)}{1-r}-\frac{bdn}{x}-\frac{benx^{r-1}}{(1-r)^2}$$

```
[Out] -((b*d*n)/x) - (b*e*n*x^(-1 + r))/(1 - r)^2 - (d*(a + b*Log[c*x^n]))/x - (e
*x^(-1 + r)*(a + b*Log[c*x^n]))/(1 - r)
```

Rubi [A] time = 0.0766622, antiderivative size = 58, normalized size of antiderivative = 0.87, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {14, 2334, 12}

$$-\left(\frac{d}{x}+\frac{ex^{r-1}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bdn}{x}-\frac{benx^{r-1}}{(1-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d*n)/x) - (b*e*n*x^(-1 + r))/(1 - r)^2 - (d/x + (e*x^(-1 + r))/(1 - r)
)*(a + b*Log[c*x^n])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^2}\,dx &= -\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d+dr-ex^r}{(1-r)x^2}\,dx\\
&= -\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)(a+b\log(cx^n))-\frac{(bn)\int \frac{-d+dr-ex^r}{x^2}\,dx}{1-r}\\
&= -\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)(a+b\log(cx^n))-\frac{(bn)\int \left(\frac{d(-1+r)}{x^2}-ex^{-2+r}\right)dx}{1-r}\\
&= -\frac{bdn}{x}-\frac{benx^{-1+r}}{(1-r)^2}-\left(\frac{d}{x}+\frac{ex^{-1+r}}{1-r}\right)(a+b\log(cx^n))
\end{aligned}$$

Mathematica [A] time = 0.103402, size = 67, normalized size = 1.

$$-\frac{a(r-1)(d(r-1)-ex^r)+b(r-1)\log(cx^n)(d(r-1)-ex^r)+bn\left(d(r-1)^2+ex^r\right)}{(r-1)^2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((a*(-1 + r)*(d*(-1 + r) - e*x^r) + b*n*(d*(-1 + r)^2 + e*x^r) + b*(-1 + r
)*(d*(-1 + r) - e*x^r)*Log[c*x^n])/((-1 + r)^2*x))
```

Maple [C] time = 0.152, size = 614, normalized size = 9.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))/x^2,x)
```

```
[Out] -b*(d*r-e*x^r-d)/(-1+r)/x*ln(x^n)-1/2*(2*a*d-2*x^r*a*e*r+2*x^r*b*e*n-4*b*d*
n*r+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+2*b*d*n+2*x^r*a*e-4*
```

```
ln(c)*b*d*r+2*ln(c)*b*d*r^2-2*ln(c)*b*e*x^r*r+2*I*Pi*b*d*csgn(I*c*x^n)^3*r-
I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e*csgn(I*x^n)*csgn(
I*c*x^n)^2*x^r*r+2*ln(c)*b*e*x^r+2*a*d*r^2+2*ln(c)*b*d-4*a*d*r+2*b*d*n*r^2+
2*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*e*csgn(I*c*x^n)^2*c
sgn(I*c)*x^r*r-I*Pi*b*d*csgn(I*c*x^n)^3-I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*x^r-I*Pi*b*d*r^2*csgn(I*c*x^n)^3-2*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*
c*x^n)^2-2*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e*csgn(I*c*x^n)^3*x^
r*r-I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e*csgn(I*c*x^n)^2*c
sgn(I*c)*x^r+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+I*Pi*b*d*r^2*csgn(I*c
*x^n)^2*csgn(I*c)+I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d*csgn(I*
x^n)*csgn(I*c*x^n)^2+I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*e*csgn(I*c*x
^n)^3*x^r)/(-1+r)^2/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((d+e*x^r)*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.28411, size = 311, normalized size = 4.64

$$-\frac{bdn + (bdn + ad)r^2 + ad - 2(bdn + ad)r + (ben - aer + ae - (ber - be)\log(c) - (benr - ben)\log(x))x^r + \left(bdr^2 - 2bdr +\right.}{\left(r^2 - 2r + 1\right)x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(b*d*n + (b*d*n + a*d)*r^2 + a*d - 2*(b*d*n + a*d)*r + (b*e*n - a*e*r + a*
e - (b*e*r - b*e)*log(c) - (b*e*n*r - b*e*n)*log(x))*x^r + (b*d*r^2 - 2*b*d
*r + b*d)*log(c) + (b*d*n*r^2 - 2*b*d*n*r + b*d*n)*log(x))/((r^2 - 2*r + 1)
*x)
```

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((d+e*x**r)*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.32393, size = 261, normalized size = 3.9

$$\frac{bnrx^re\log(x)}{(r^2-2r+1)x}+\frac{brx^re\log(c)}{(r^2-2r+1)x}-\frac{bdn\log(x)}{x}-\frac{bnx^re\log(x)}{(r^2-2r+1)x}-\frac{bdn}{x}-\frac{bnx^re}{(r^2-2r+1)x}+\frac{arx^re}{(r^2-2r+1)x}-\frac{bd\log(c)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] b*n*r*x^r*e*log(x)/((r^2 - 2*r + 1)*x) + b*r*x^r*e*log(c)/((r^2 - 2*r + 1)*
x) - b*d*n*log(x)/x - b*n*x^r*e*log(x)/((r^2 - 2*r + 1)*x) - b*d*n/x - b*n*
x^r*e/((r^2 - 2*r + 1)*x) + a*r*x^r*e/((r^2 - 2*r + 1)*x) - b*d*log(c)/x -
b*x^r*e*log(c)/((r^2 - 2*r + 1)*x) - a*d/x - a*x^r*e/((r^2 - 2*r + 1)*x)
```

3.377 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=71

$$-\frac{d\,(a+b\log\left(cx^n\right))}{3x^3}-\frac{ex^{r-3}\,(a+b\log\left(cx^n\right))}{3-r}-\frac{bdn}{9x^3}-\frac{benx^{r-3}}{(3-r)^2}$$

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n*x^(-3 + r))/(3 - r)^2 - (d*(a + b*Log[c*x^n]))/(3
*x^3) - (e*x^(-3 + r)*(a + b*Log[c*x^n]))/(3 - r)
```

Rubi [A] time = 0.0732404, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{3}\left(\frac{d}{x^3}+\frac{3ex^{r-3}}{3-r}\right)(a+b\log\left(cx^n\right))-\frac{bdn}{9x^3}-\frac{benx^{r-3}}{(3-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d*n)/(9*x^3) - (b*e*n*x^(-3 + r))/(3 - r)^2 - ((d/x^3 + (3*e*x^(-3 + r)
)/(3 - r))*(a + b*Log[c*x^n]))/3
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^4}\,dx = -\frac{1}{3}\left(\frac{d}{x^3}+\frac{3ex^{-3+r}}{3-r}\right)(a+b\log(cx^n)) - (bn)\int\left(-\frac{d}{3x^4}+\frac{ex^{-4+r}}{-3+r}\right)dx$$
$$= -\frac{bdn}{9x^3} - \frac{benx^{-3+r}}{(3-r)^2} - \frac{1}{3}\left(\frac{d}{x^3}+\frac{3ex^{-3+r}}{3-r}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.113142, size = 72, normalized size = 1.01

$$-\frac{3a(r-3)(d(r-3)-3ex^r)+3b(r-3)\log(cx^n)(d(r-3)-3ex^r)+bn\left(d(r-3)^2+9ex^r\right)}{9(r-3)^2x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(3*a*(-3 + r)*(d*(-3 + r) - 3*e*x^r) + b*n*(d*(-3 + r)^2 + 9*e*x^r) + 3*b*
(-3 + r)*(d*(-3 + r) - 3*e*x^r)*Log[c*x^n])/(9*(-3 + r)^2*x^3)
```

Maple [C] time = 0.159, size = 614, normalized size = 8.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))/x^4,x)
```

```
[Out] -1/3*b*(d*r-3*e*x^r-3*d)/(-3+r)/x^3*ln(x^n)-1/18*(54*a*d+18*I*Pi*b*d*r*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-18*x^r*a*e*r+18*x^r*b*e*n-9*I*Pi*b*e*csgn(I
*c*x^n)^2*csgn(I*c)*x^r*r-9*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r-12*b
*d*n*r+18*b*d*n+54*x^r*a*e-36*ln(c)*b*d*r+6*ln(c)*b*d*r^2-18*ln(c)*b*e*x^r*
r+54*ln(c)*b*e*x^r+6*a*d*r^2+54*ln(c)*b*d-36*a*d*r+2*b*d*n*r^2+18*I*Pi*b*d*
csgn(I*c*x^n)^3*r-3*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-27*I*P
i*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+9*I*Pi*b*e*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*x^r*r+27*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2-27*I*Pi*b*e
*csgn(I*c*x^n)^3*x^r+27*I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*d*r^2*c
sgn(I*c*x^n)^3+3*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*d*r*csgn(
I*x^n)*csgn(I*c*x^n)^2-18*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(I*c)-27*I*Pi*b*d*
csgn(I*c*x^n)^3+9*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r+3*I*Pi*b*d*r^2*csgn(I*x^n)
*csgn(I*c*x^n)^2+27*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+27*I*Pi*b*e*csgn
```

```
(I*x^n)*csgn(I*c*x^n)^2*x^r-27*I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
)/(-3+r)^2/x^3
```

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((d+e*x^r)*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.40798, size = 352, normalized size = 4.96

$$-\frac{9\,bdn + (bdn + 3\,ad)r^2 + 27\,ad - 6\,(bdn + 3\,ad)r + 9\,(ben - aer + 3\,ae - (ber - 3\,be)\log(c) - (benr - 3\,ben)\log(x))x^r + \cdots}{9\left(r^2 - 6\,r + 9\right)x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(9*b*d*n + (b*d*n + 3*a*d)*r^2 + 27*a*d - 6*(b*d*n + 3*a*d)*r + 9*(b*e
*n - a*e*r + 3*a*e - (b*e*r - 3*b*e)*log(c) - (b*e*n*r - 3*b*e*n)*log(x))*x
^r + 3*(b*d*r^2 - 6*b*d*r + 9*b*d)*log(c) + 3*(b*d*n*r^2 - 6*b*d*n*r + 9*b*
d*n)*log(x))/((r^2 - 6*r + 9)*x^3)
```

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((d+e*x**r)*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.25464, size = 536, normalized size = 7.55

$$-\frac{bdnr^2\log(x)}{3(r^2-6r+9)x^3}+\frac{bnrx^re\log(x)}{(r^2-6r+9)x^3}-\frac{bdnr^2}{9(r^2-6r+9)x^3}-\frac{bdr^2\log(c)}{3(r^2-6r+9)x^3}+\frac{brx^re\log(c)}{(r^2-6r+9)x^3}+\frac{2bdnr\log(x)}{(r^2-6r+9)x^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] -1/3*b*d*n*r^2*log(x)/((r^2 - 6*r + 9)*x^3) + b*n*r*x^r*e*log(x)/((r^2 - 6*
r + 9)*x^3) - 1/9*b*d*n*r^2/((r^2 - 6*r + 9)*x^3) - 1/3*b*d*r^2*log(c)/((r^
2 - 6*r + 9)*x^3) + b*r*x^r*e*log(c)/((r^2 - 6*r + 9)*x^3) + 2*b*d*n*r*log(
x)/((r^2 - 6*r + 9)*x^3) - 3*b*n*x^r*e*log(x)/((r^2 - 6*r + 9)*x^3) + 2/3*b
*d*n*r/((r^2 - 6*r + 9)*x^3) - 1/3*a*d*r^2/((r^2 - 6*r + 9)*x^3) - b*n*x^r*
e/((r^2 - 6*r + 9)*x^3) + a*r*x^r*e/((r^2 - 6*r + 9)*x^3) + 2*b*d*r*log(c)/
((r^2 - 6*r + 9)*x^3) - 3*b*x^r*e*log(c)/((r^2 - 6*r + 9)*x^3) - 3*b*d*n*lo
g(x)/((r^2 - 6*r + 9)*x^3) - b*d*n/((r^2 - 6*r + 9)*x^3) + 2*a*d*r/((r^2 -
6*r + 9)*x^3) - 3*a*x^r*e/((r^2 - 6*r + 9)*x^3) - 3*b*d*log(c)/((r^2 - 6*r
+ 9)*x^3) - 3*a*d/((r^2 - 6*r + 9)*x^3)
```

3.378 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=71

$$-\frac{d(a+b\log(cx^n))}{5x^5}-\frac{ex^{r-5}(a+b\log(cx^n))}{5-r}-\frac{bdn}{25x^5}-\frac{benx^{r-5}}{(5-r)^2}$$

```
[Out] -(b*d*n)/(25*x^5) - (b*e*n*x^(-5 + r))/(5 - r)^2 - (d*(a + b*Log[c*x^n]))/(
5*x^5) - (e*x^(-5 + r)*(a + b*Log[c*x^n]))/(5 - r)
```

Rubi [A] time = 0.0721168, antiderivative size = 63, normalized size of antiderivative = 0.89, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {14, 2334}

$$-\frac{1}{5}\left(\frac{d}{x^5}+\frac{5ex^{r-5}}{5-r}\right)(a+b\log(cx^n))-\frac{bdn}{25x^5}-\frac{benx^{r-5}}{(5-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d*n)/(25*x^5) - (b*e*n*x^(-5 + r))/(5 - r)^2 - ((d/x^5 + (5*e*x^(-5 + r
))/(5 - r))*(a + b*Log[c*x^n]))/5
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rubi steps

$$\int \frac{(d+ex^r)(a+b\log(cx^n))}{x^6}\,dx = -\frac{1}{5}\left(\frac{d}{x^5}+\frac{5ex^{-5+r}}{5-r}\right)(a+b\log(cx^n)) - (bn)\int\left(-\frac{d}{5x^6}+\frac{ex^{-6+r}}{-5+r}\right)dx$$
$$= -\frac{bdn}{25x^5} - \frac{benx^{-5+r}}{(5-r)^2} - \frac{1}{5}\left(\frac{d}{x^5}+\frac{5ex^{-5+r}}{5-r}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.093609, size = 72, normalized size = 1.01

$$-\frac{5a(r-5)(d(r-5)-5ex^r)+5b(r-5)\log(cx^n)(d(r-5)-5ex^r)+bn\left(d(r-5)^2+25ex^r\right)}{25(r-5)^2x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(5*a*(-5 + r)*(d*(-5 + r) - 5*e*x^r) + b*n*(d*(-5 + r)^2 + 25*e*x^r) + 5*b
*(-5 + r)*(d*(-5 + r) - 5*e*x^r)*Log[c*x^n])/(25*(-5 + r)^2*x^5)
```

Maple [C] time = 0.167, size = 614, normalized size = 8.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/5*b*(d*r-5*e*x^r-5*d)/(-5+r)/x^5*ln(x^n)-1/50*(250*a*d-50*x^r*a*e*r+50*x
^r*b*e*n-25*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r-25*I*Pi*b*e*csgn(I*x^n
)*csgn(I*c*x^n)^2*x^r*r+50*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2
0*b*d*n*r-5*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-125*I*Pi*b*e*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+50*b*d*n+250*x^r*a*e-100*ln(c)*b*d*r
+10*ln(c)*b*d*r^2-50*ln(c)*b*e*x^r*r+250*ln(c)*b*e*x^r+10*a*d*r^2+250*ln(c)
*b*d-100*a*d*r+2*b*d*n*r^2+50*I*Pi*b*d*csgn(I*c*x^n)^3*r+25*I*Pi*b*e*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+5*I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*c
)+5*I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-125*I*Pi*b*d*csgn(I*c*x^n)^3-5
0*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn(I*c)+125*I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*
c)*x^r+125*I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-50*I*Pi*b*d*r*csgn(I*x^
n)*csgn(I*c*x^n)^2+25*I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r+125*I*Pi*b*d*csgn(I*x^
n)*csgn(I*c*x^n)^2-125*I*Pi*b*e*csgn(I*c*x^n)^3*x^r+125*I*Pi*b*d*csgn(I*c*x
```

```
^n)^2*csgn(I*c)-5*I*Pi*b*d*r^2*csgn(I*c*x^n)^3-125*I*Pi*b*d*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c))/(-5+r)^2/x^5
```

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((d+e*x^r)*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.33956, size = 367, normalized size = 5.17

$$-\frac{25\,bdn + (bdn + 5\,ad)r^2 + 125\,ad - 10\,(bdn + 5\,ad)r + 25\,(ben - aer + 5\,ae - (ber - 5\,be)\log{(c)} - (benr - 5\,ben)\log{(x)})}{25\left(r^2 - 10\,r + 25\right)x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/25*(25*b*d*n + (b*d*n + 5*a*d)*r^2 + 125*a*d - 10*(b*d*n + 5*a*d)*r + 25
*(b*e*n - a*e*r + 5*a*e - (b*e*r - 5*b*e)*log(c) - (b*e*n*r - 5*b*e*n)*log(
x))*x^r + 5*(b*d*r^2 - 10*b*d*r + 25*b*d)*log(c) + 5*(b*d*n*r^2 - 10*b*d*n*
r + 25*b*d*n)*log(x))/((r^2 - 10*r + 25)*x^5)
```

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((d+e*x**r)*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.2723, size = 536, normalized size = 7.55

$$-\frac{bdnr^2\log(x)}{5\left(r^2-10\,r+25\right)x^5}+\frac{bnrx^re\log(x)}{\left(r^2-10\,r+25\right)x^5}-\frac{bdnr^2}{25\left(r^2-10\,r+25\right)x^5}-\frac{bdr^2\log(c)}{5\left(r^2-10\,r+25\right)x^5}+\frac{brx^re\log(c)}{\left(r^2-10\,r+25\right)x^5}+\frac{2\,bc}{\left(r^2-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] -1/5*b*d*n*r^2*log(x)/((r^2 - 10*r + 25)*x^5) + b*n*r*x^r*e*log(x)/((r^2 -
10*r + 25)*x^5) - 1/25*b*d*n*r^2/((r^2 - 10*r + 25)*x^5) - 1/5*b*d*r^2*log(
c)/((r^2 - 10*r + 25)*x^5) + b*r*x^r*e*log(c)/((r^2 - 10*r + 25)*x^5) + 2*b
*d*n*r*log(x)/((r^2 - 10*r + 25)*x^5) - 5*b*n*x^r*e*log(x)/((r^2 - 10*r + 2
5)*x^5) + 2/5*b*d*n*r/((r^2 - 10*r + 25)*x^5) - 1/5*a*d*r^2/((r^2 - 10*r +
25)*x^5) - b*n*x^r*e/((r^2 - 10*r + 25)*x^5) + a*r*x^r*e/((r^2 - 10*r + 25)
*x^5) + 2*b*d*r*log(c)/((r^2 - 10*r + 25)*x^5) - 5*b*x^r*e*log(c)/((r^2 - 1
0*r + 25)*x^5) - 5*b*d*n*log(x)/((r^2 - 10*r + 25)*x^5) - b*d*n/((r^2 - 10*
r + 25)*x^5) + 2*a*d*r/((r^2 - 10*r + 25)*x^5) - 5*a*x^r*e/((r^2 - 10*r + 2
5)*x^5) - 5*b*d*log(c)/((r^2 - 10*r + 25)*x^5) - 5*a*d/((r^2 - 10*r + 25)*x
^5)
```

3.379 $\int x^5 (d+ex^r)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=103

$$\frac{1}{6}\left(d^2x^6+\frac{12dex^{r+6}}{r+6}+\frac{3e^2x^{2(r+3)}}{r+3}\right)(a+b\log(cx^n))-\frac{1}{36}bd^2nx^6-\frac{2bdenx^{r+6}}{(r+6)^2}-\frac{be^2nx^{2(r+3)}}{4(r+3)^2}$$

```
[Out] -(b*d^2*n*x^6)/36 - (b*e^2*n*x^(2*(3 + r)))/(4*(3 + r)^2) - (2*b*d*e*n*x^(6
 + r))/(6 + r)^2 + ((d^2*x^6 + (3*e^2*x^(2*(3 + r)))/(3 + r) + (12*d*e*x^(6
 + r))/(6 + r))*(a + b*Log[c*x^n]))/6
```

Rubi [A] time = 0.156101, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{6}\left(d^2x^6+\frac{12dex^{r+6}}{r+6}+\frac{3e^2x^{2(r+3)}}{r+3}\right)(a+b\log(cx^n))-\frac{1}{36}bd^2nx^6-\frac{2bdenx^{r+6}}{(r+6)^2}-\frac{be^2nx^{2(r+3)}}{4(r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^6)/36 - (b*e^2*n*x^(2*(3 + r)))/(4*(3 + r)^2) - (2*b*d*e*n*x^(6
 + r))/(6 + r)^2 + ((d^2*x^6 + (3*e^2*x^(2*(3 + r)))/(3 + r) + (12*d*e*x^(6
 + r))/(6 + r))*(a + b*Log[c*x^n]))/6
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^5 (d+ex^r)^2 (a+b\log(cx^n))\,dx = \frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{6}x^5\left(d^2+\frac{12dex^r}{6+r}+\right.$$
$$=\frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right)(a+b\log(cx^n))-\frac{1}{6}(bn)\int x^5\left(d^2+\frac{12dex^r}{6+r}+\right.$$
$$=\frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right)(a+b\log(cx^n))-\frac{1}{6}(bn)\int \left(d^2x^5+\frac{12dex^{5+r}}{6+r}+\right.$$
$$=-\frac{1}{36}bd^2nx^6-\frac{be^2nx^{2(3+r)}}{4(3+r)^2}-\frac{2bdenx^{6+r}}{(6+r)^2}+\frac{1}{6}\left(d^2x^6+\frac{3e^2x^{2(3+r)}}{3+r}+\frac{12dex^{6+r}}{6+r}\right)(a+b$$

Mathematica [A] time = 0.28463, size = 118, normalized size = 1.15

$$\frac{1}{36}x^6\left(6a\left(d^2+\frac{12dex^r}{r+6}+\frac{3e^2x^{2r}}{r+3}\right)+6b\log(cx^n)\left(d^2+\frac{12dex^r}{r+6}+\frac{3e^2x^{2r}}{r+3}\right)+bn\left(-d^2-\frac{72dex^r}{(r+6)^2}-\frac{9e^2x^{2r}}{(r+3)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(b*n*(-d^2 - (72*d*e*x^r)/(6 + r)^2 - (9*e^2*x^(2*r))/(3 + r)^2) + 6*a
*(d^2 + (12*d*e*x^r)/(6 + r) + (3*e^2*x^(2*r))/(3 + r)) + 6*b*(d^2 + (12*d*
e*x^r)/(6 + r) + (3*e^2*x^(2*r))/(3 + r))*Log[c*x^n]))/36
```

Maple [C] time = 0.299, size = 1924, normalized size = 18.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d+e*x^r)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/6*x^6*b*(3*e^2*(x^r)^2*r+d^2*r^2+12*d*e*x^r*r+18*e^2*(x^r)^2+9*d^2*r+36*d
*e*x^r+18*d^2)/(3+r)/(6+r)*ln(x^n)-1/36*x^6*(b*d^2*n*r^4+18*b*d^2*n*r^3-162
0*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1620*I*Pi*b*d*e*r*csgn(I*c*x
^n)^2*csgn(I*c)*x^r-36*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1944*
ln(c)*b*d^2+1620*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+117*b
*d^2*n*r^2+324*b*d^2*n*r-18*a*e^2*r^3*(x^r)^2-270*a*e^2*r^2*(x^r)^2-1944*a*
d^2+972*I*Pi*b*d^2*csgn(I*c*x^n)^3-135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(
I*c)*(x^r)^2+432*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-3888*a*d*e*x^r+1620*I*P
i*b*d*e*r*csgn(I*c*x^n)^3*x^r+972*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^2+3*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+54*I*Pi*
b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+135*I*Pi*b*e^2*r^2*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+648*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-
648*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-648*I*Pi*b*e^2*r*csgn(
I*c*x^n)^2*csgn(I*c)*(x^r)^2-1944*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^
r-1944*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-135*I*Pi*b*e^2*r^2*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^2-9*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x
^r)^2-9*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+36*I*Pi*b*d*e*r^3*
csgn(I*c*x^n)^3*x^r-1296*a*e^2*r*(x^r)^2-702*a*d^2*r^2-1944*a*d^2*r-6*a*d^2
*r^4-108*a*d^2*r^3+324*b*d^2*n+648*b*d*e*n*x^r-18*ln(c)*b*e^2*r^3*(x^r)^2-3
888*ln(c)*b*d*e*x^r-270*ln(c)*b*e^2*r^2*(x^r)^2-1296*ln(c)*b*e^2*r*(x^r)^2-
1944*ln(c)*b*e^2*(x^r)^2+324*b*e^2*n*(x^r)^2-702*ln(c)*b*d^2*r^2-1944*ln(c)
*b*d^2*r-1944*a*e^2*(x^r)^2-6*ln(c)*b*d^2*r^4-108*ln(c)*b*d^2*r^3-54*I*Pi*b
*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2+9*b*e^2*n*r^2*(x^r)^2-72*a*d*e*r^3*x^r
-864*a*d*e*r^2*x^r-3240*a*d*e*r*x^r+108*b*e^2*n*r*(x^r)^2+972*I*Pi*b*d^2*r*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+351*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)+1944*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+3*I*Pi*b*d^2*r^4*csgn(I
*c*x^n)^3+54*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+972*I*Pi*b*e^2*csgn(I*c*x^n)^3*
(x^r)^2-36*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+9*I*Pi*b*e^2*r^3*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-432*I*Pi*b*d*e*r^2*csgn(I*x^n)*cs
gn(I*c*x^n)^2*x^r-972*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-351*I*Pi*b*d
^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-432*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(
I*c)*x^r+1944*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+648*I*Pi*b
*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-972*I*Pi*b*e^2*csgn(I*x^
n)*csgn(I*c*x^n)^2*(x^r)^2-972*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2
-54*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)-864*ln(c)*b*d*e*r^2*x^r-3240*l
n(c)*b*d*e*r*x^r-72*ln(c)*b*d*e*r^3*x^r+351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+
972*I*Pi*b*d^2*r*csgn(I*c*x^n)^3-972*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2
-972*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^
3*(x^r)^2+36*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+432*I*P
i*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-972*I*Pi*b*d^2*r*csgn(I
*c*x^n)^2*csgn(I*c)+972*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3*I*
Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+432*b*d*e*n*r*x^r+72*b*d*e*n*r^2*x
```

```
^r-3*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)+9*I*Pi*b*e^2*r^3*csgn(I*c*x^n
)^3*(x^r)^2-351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c))/(3+r)^2/(6+r)^2
```

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(x^5*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.32667, size = 1168, normalized size = 11.34

$$\frac{6\left(bd^2r^4+18\,bd^2r^3+117\,bd^2r^2+324\,bd^2r+324\,bd^2\right)x^6\log\left(c\right)+6\left(bd^2nr^4+18\,bd^2nr^3+117\,bd^2nr^2+324\,bd^2nr+32\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/36*(6*(b*d^2*r^4 + 18*b*d^2*r^3 + 117*b*d^2*r^2 + 324*b*d^2*r + 324*b*d^2
)*x^6*log(c) + 6*(b*d^2*n*r^4 + 18*b*d^2*n*r^3 + 117*b*d^2*n*r^2 + 324*b*d^
2*n*r + 324*b*d^2*n)*x^6*log(x) - ((b*d^2*n - 6*a*d^2)*r^4 + 324*b*d^2*n +
18*(b*d^2*n - 6*a*d^2)*r^3 - 1944*a*d^2 + 117*(b*d^2*n - 6*a*d^2)*r^2 + 324
*(b*d^2*n - 6*a*d^2)*r)*x^6 + 9*(2*(b*e^2*r^3 + 15*b*e^2*r^2 + 72*b*e^2*r +
 108*b*e^2)*x^6*log(c) + 2*(b*e^2*n*r^3 + 15*b*e^2*n*r^2 + 72*b*e^2*n*r + 1
08*b*e^2*n)*x^6*log(x) + (2*a*e^2*r^3 - 36*b*e^2*n + 216*a*e^2 - (b*e^2*n -
 30*a*e^2)*r^2 - 12*(b*e^2*n - 12*a*e^2)*r)*x^6)*x^(2*r) + 72*((b*d*e*r^3 +
 12*b*d*e*r^2 + 45*b*d*e*r + 54*b*d*e)*x^6*log(c) + (b*d*e*n*r^3 + 12*b*d*e
*n*r^2 + 45*b*d*e*n*r + 54*b*d*e*n)*x^6*log(x) + (a*d*e*r^3 - 9*b*d*e*n + 5
4*a*d*e - (b*d*e*n - 12*a*d*e)*r^2 - 3*(2*b*d*e*n - 15*a*d*e)*r)*x^6)*x^r)/
(r^4 + 18*r^3 + 117*r^2 + 324*r + 324)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.30689, size = 1004, normalized size = 9.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/36*(6*b*d^2*n*r^4*x^6*log(x) + 72*b*d*n*r^3*x^6*x^r*e*log(x) - b*d^2*n*r^
4*x^6 + 6*b*d^2*r^4*x^6*log(c) + 72*b*d*r^3*x^6*x^r*e*log(c) + 108*b*d^2*n*
r^3*x^6*log(x) + 18*b*n*r^3*x^6*x^(2*r)*e^2*log(x) + 864*b*d*n*r^2*x^6*x^r*
e*log(x) - 18*b*d^2*n*r^3*x^6 + 6*a*d^2*r^4*x^6 - 72*b*d*n*r^2*x^6*x^r*e +
72*a*d*r^3*x^6*x^r*e + 108*b*d^2*r^3*x^6*log(c) + 18*b*r^3*x^6*x^(2*r)*e^2*
log(c) + 864*b*d*r^2*x^6*x^r*e*log(c) + 702*b*d^2*n*r^2*x^6*log(x) + 270*b*
n*r^2*x^6*x^(2*r)*e^2*log(x) + 3240*b*d*n*r*x^6*x^r*e*log(x) - 117*b*d^2*n*
r^2*x^6 + 108*a*d^2*r^3*x^6 - 9*b*n*r^2*x^6*x^(2*r)*e^2 + 18*a*r^3*x^6*x^(2
*r)*e^2 - 432*b*d*n*r*x^6*x^r*e + 864*a*d*r^2*x^6*x^r*e + 702*b*d^2*r^2*x^6
*log(c) + 270*b*r^2*x^6*x^(2*r)*e^2*log(c) + 3240*b*d*r*x^6*x^r*e*log(c) +
1944*b*d^2*n*r*x^6*log(x) + 1296*b*n*r*x^6*x^(2*r)*e^2*log(x) + 3888*b*d*n*
x^6*x^r*e*log(x) - 324*b*d^2*n*r*x^6 + 702*a*d^2*r^2*x^6 - 108*b*n*r*x^6*x^
(2*r)*e^2 + 270*a*r^2*x^6*x^(2*r)*e^2 - 648*b*d*n*x^6*x^r*e + 3240*a*d*r*x^
6*x^r*e + 1944*b*d^2*r*x^6*log(c) + 1296*b*r*x^6*x^(2*r)*e^2*log(c) + 3888*
b*d*x^6*x^r*e*log(c) + 1944*b*d^2*n*x^6*log(x) + 1944*b*n*x^6*x^(2*r)*e^2*l
og(x) - 324*b*d^2*n*x^6 + 1944*a*d^2*r*x^6 - 324*b*n*x^6*x^(2*r)*e^2 + 1296
*a*r*x^6*x^(2*r)*e^2 + 3888*a*d*x^6*x^r*e + 1944*b*d^2*x^6*log(c) + 1944*b*
x^6*x^(2*r)*e^2*log(c) + 1944*a*d^2*x^6 + 1944*a*x^6*x^(2*r)*e^2)/(r^4 + 18
*r^3 + 117*r^2 + 324*r + 324)
```

3.380 $\int x^3 (d+ex^r)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=103

$$\frac{1}{4}\left(d^2x^4+\frac{8dex^{r+4}}{r+4}+\frac{2e^2x^{2(r+2)}}{r+2}\right)(a+b\log(cx^n))-\frac{1}{16}bd^2nx^4-\frac{2bdenx^{r+4}}{(r+4)^2}-\frac{be^2nx^{2(r+2)}}{4(r+2)^2}$$

```
[Out] -(b*d^2*n*x^4)/16 - (b*e^2*n*x^(2*(2 + r)))/(4*(2 + r)^2) - (2*b*d*e*n*x^(4
 + r))/(4 + r)^2 + ((d^2*x^4 + (2*e^2*x^(2*(2 + r)))/(2 + r) + (8*d*e*x^(4
+ r))/(4 + r))*(a + b*Log[c*x^n]))/4
```

Rubi [A] time = 0.154336, antiderivative size = 103, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{4}\left(d^2x^4+\frac{8dex^{r+4}}{r+4}+\frac{2e^2x^{2(r+2)}}{r+2}\right)(a+b\log(cx^n))-\frac{1}{16}bd^2nx^4-\frac{2bdenx^{r+4}}{(r+4)^2}-\frac{be^2nx^{2(r+2)}}{4(r+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^4)/16 - (b*e^2*n*x^(2*(2 + r)))/(4*(2 + r)^2) - (2*b*d*e*n*x^(4
 + r))/(4 + r)^2 + ((d^2*x^4 + (2*e^2*x^(2*(2 + r)))/(2 + r) + (8*d*e*x^(4
+ r))/(4 + r))*(a + b*Log[c*x^n]))/4
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^3 (d+ex^r)^2 (a+b\log(cx^n))\,dx &= \frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{4}x^3\left(d^2+\frac{8dex^r}{4+r}+\frac{2e^2x\ldots}{2+\ldots}\right.\\ &= \frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int x^3\left(d^2+\frac{8dex^r}{4+r}+\frac{2e^2x\ldots}{2+\ldots}\right.\\ &= \frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\left(d^2x^3+\frac{8dex^{3+r}}{4+r}+\frac{2e\ldots}{\ldots}\right.\\ &= -\frac{1}{16}bd^2nx^4-\frac{be^2nx^{2(2+r)}}{4(2+r)^2}-\frac{2bdenx^{4+r}}{(4+r)^2}+\frac{1}{4}\left(d^2x^4+\frac{2e^2x^{2(2+r)}}{2+r}+\frac{8dex^{4+r}}{4+r}\right)(a+b\,\mathrm{lo}\ldots\end{aligned}$$

Mathematica [A] time = 0.240593, size = 118, normalized size = 1.15

$$\frac{1}{16}x^4\left(4a\left(d^2+\frac{8dex^r}{r+4}+\frac{2e^2x^{2r}}{r+2}\right)+4b\log(cx^n)\left(d^2+\frac{8dex^r}{r+4}+\frac{2e^2x^{2r}}{r+2}\right)+bn\left(-d^2-\frac{32dex^r}{(r+4)^2}-\frac{4e^2x^{2r}}{(r+2)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(b*n*(-d^2 - (32*d*e*x^r)/(4 + r)^2 - (4*e^2*x^(2*r))/(2 + r)^2) + 4*a
*(d^2 + (8*d*e*x^r)/(4 + r) + (2*e^2*x^(2*r))/(2 + r)) + 4*b*(d^2 + (8*d*e*
x^r)/(4 + r) + (2*e^2*x^(2*r))/(2 + r))*Log[c*x^n]))/16
```

Maple [C] time = 0.293, size = 1924, normalized size = 18.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+e*x^r)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/4*b*x^4*(2*e^2*(x^r)^2*r+d^2*r^2+8*d*e*x^r*r+8*e^2*(x^r)^2+6*d^2*r+16*d*e
*x^r+8*d^2)/(2+r)/(4+r)*ln(x^n)-1/16*x^4*(b*d^2*n*r^4+12*b*d^2*n*r^3-256*ln
(c)*b*d^2+128*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+52*b*d
^2*n*r^2+96*b*d^2*n*r-128*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-8*
a*e^2*r^3*(x^r)^2-80*a*e^2*r^2*(x^r)^2-256*a*d^2-512*a*d*e*x^r+320*I*Pi*b*d
*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+16*I*Pi*b*d*e*r^3*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*x^r+24*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+192*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+104*I*Pi*b*d^2*
r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(
I*c*x^n)^2-24*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)-128*I*Pi*b*e^2*r*csg
n(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+256*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+40*I*Pi
*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+4*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2
+320*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r+128*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*(x^r)^2+2*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+
128*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-40*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I
*c*x^n)^2*(x^r)^2-40*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+16*I*
Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r-256*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2
*x^r-256*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-256*a*e^2*r*(x^r)^2-208*a
*d^2*r^2-384*a*d^2*r-4*a*d^2*r^4-48*a*d^2*r^3+128*I*Pi*b*d^2*csgn(I*c*x^n)^
3+64*b*d^2*n+128*b*d*e*n*x^r-8*ln(c)*b*e^2*r^3*(x^r)^2-512*ln(c)*b*d*e*x^r-
80*ln(c)*b*e^2*r^2*(x^r)^2-256*ln(c)*b*e^2*r*(x^r)^2-256*ln(c)*b*e^2*(x^r)^
2+64*b*e^2*n*(x^r)^2-208*ln(c)*b*d^2*r^2-384*ln(c)*b*d^2*r-256*a*e^2*(x^r)^
2-4*ln(c)*b*d^2*r^4-48*ln(c)*b*d^2*r^3+4*b*e^2*n*r^2*(x^r)^2-32*a*d*e*r^3*x
^r-256*a*d*e*r^2*x^r-640*a*d*e*r*x^r+32*b*e^2*n*r*(x^r)^2-4*I*Pi*b*e^2*r^3*
csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-4*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I
*c)*(x^r)^2-320*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+4*I*Pi*b*e^2*r
^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-128*I*Pi*b*d*e*r^2*csgn(I*x^
n)*csgn(I*c*x^n)^2*x^r+128*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-128*I*Pi*b*
e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-128*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^2+104*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+192*I*Pi*b*d^2*r*csgn(I*c*
x^n)^3-256*ln(c)*b*d*e*r^2*x^r-640*ln(c)*b*d*e*r*x^r-32*ln(c)*b*d*e*r^3*x^r
-192*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-192*I*Pi*b*d^2*r*csgn(I*c*x^n
)^2*csgn(I*c)-128*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+256*I*Pi*b*d
*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+128*b*d*e*n*r*x^r+32*b*d*e*n*r^2
*x^r+128*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*I*Pi*b*d^2*r^4*cs
gn(I*x^n)*csgn(I*c*x^n)^2-2*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-104*I*
Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-104*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2
*csgn(I*c)+128*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+40*
I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-320*I*Pi*b*d*e*r
*csgn(I*c*x^n)^2*csgn(I*c)*x^r-16*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^r-16*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+128*I*Pi*b*e^2*csgn(I
*c*x^n)^3*(x^r)^2-128*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-128*I*Pi*b*d^2
```

```
*csgn(I*c*x^n)^2*csgn(I*c)+2*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3+24*I*Pi*b*d^2*r
^3*csgn(I*c*x^n)^3)/(2+r)^2/(4+r)^2
```

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(x^3*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.3785, size = 1135, normalized size = 11.02

$$\frac{4\left(bd^2r^4 + 12\,bd^2r^3 + 52\,bd^2r^2 + 96\,bd^2r + 64\,bd^2\right)x^4\log\left(c\right) + 4\left(bd^2nr^4 + 12\,bd^2nr^3 + 52\,bd^2nr^2 + 96\,bd^2nr + 64\,bd^2n\right)x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/16*(4*(b*d^2*r^4 + 12*b*d^2*r^3 + 52*b*d^2*r^2 + 96*b*d^2*r + 64*b*d^2)*x
^4*log(c) + 4*(b*d^2*n*r^4 + 12*b*d^2*n*r^3 + 52*b*d^2*n*r^2 + 96*b*d^2*n*r
 + 64*b*d^2*n)*x^4*log(x) - ((b*d^2*n - 4*a*d^2)*r^4 + 64*b*d^2*n + 12*(b*d
^2*n - 4*a*d^2)*r^3 - 256*a*d^2 + 52*(b*d^2*n - 4*a*d^2)*r^2 + 96*(b*d^2*n
- 4*a*d^2)*r)*x^4 + 4*(2*(b*e^2*r^3 + 10*b*e^2*r^2 + 32*b*e^2*r + 32*b*e^2)
*x^4*log(c) + 2*(b*e^2*n*r^3 + 10*b*e^2*n*r^2 + 32*b*e^2*n*r + 32*b*e^2*n)*
x^4*log(x) + (2*a*e^2*r^3 - 16*b*e^2*n + 64*a*e^2 - (b*e^2*n - 20*a*e^2)*r^
2 - 8*(b*e^2*n - 8*a*e^2)*r)*x^4)*x^(2*r) + 32*((b*d*e*r^3 + 8*b*d*e*r^2 +
20*b*d*e*r + 16*b*d*e)*x^4*log(c) + (b*d*e*n*r^3 + 8*b*d*e*n*r^2 + 20*b*d*e
*n*r + 16*b*d*e*n)*x^4*log(x) + (a*d*e*r^3 - 4*b*d*e*n + 16*a*d*e - (b*d*e*
n - 8*a*d*e)*r^2 - 4*(b*d*e*n - 5*a*d*e)*r)*x^4)*x^r)/(r^4 + 12*r^3 + 52*r^
2 + 96*r + 64)
```

Sympy [A] time = 138.113, size = 2162, normalized size = 20.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Piecewise((a*d**2*x**4/4 + 2*a*d*e*log(x) - a*e**2/(4*x**4) + b*d**2*n*x**4
*log(x)/4 - b*d**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + b*d*e*n*log(x)**2 + 2
*b*d*e*log(c)*log(x) - b*e**2*n*log(x)/(4*x**4) - b*e**2*n/(16*x**4) - b*e*
*2*log(c)/(4*x**4), Eq(r, -4)), (a*d**2*x**4/4 + a*d*e*x**2 + a*e**2*log(x)
 + b*d**2*n*x**4*log(x)/4 - b*d**2*n*x**4/16 + b*d**2*x**4*log(c)/4 + b*d*e
*n*x**2*log(x) - b*d*e*n*x**2/2 + b*d*e*x**2*log(c) + b*e**2*n*log(x)**2/2
+ b*e**2*log(c)*log(x), Eq(r, -2)), (4*a*d**2*r**4*x**4/(16*r**4 + 192*r**3
 + 832*r**2 + 1536*r + 1024) + 48*a*d**2*r**3*x**4/(16*r**4 + 192*r**3 + 83
2*r**2 + 1536*r + 1024) + 208*a*d**2*r**2*x**4/(16*r**4 + 192*r**3 + 832*r*
*2 + 1536*r + 1024) + 384*a*d**2*r*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 15
36*r + 1024) + 256*a*d**2*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 32*a*d*e*r**3*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 102
4) + 256*a*d*e*r**2*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 102
4) + 640*a*d*e*r*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
+ 512*a*d*e*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 8*a
*e**2*r**3*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) +
80*a*e**2*r**2*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024
) + 256*a*e**2*r*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 256*a*e**2*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 4*b*d**2*n*r**4*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r +
 1024) - b*d**2*n*r**4*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
 + 48*b*d**2*n*r**3*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1
024) - 12*b*d**2*n*r**3*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024
) + 208*b*d**2*n*r**2*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r +
 1024) - 52*b*d**2*n*r**2*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 384*b*d**2*n*r*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r +
1024) - 96*b*d**2*n*r*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
+ 256*b*d**2*n*x**4*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024)
- 64*b*d**2*n*x**4/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 4*b*d*
*2*r**4*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 48*b*
d**2*r**3*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 208
*b*d**2*r**2*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) +
384*b*d**2*r*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) +
256*b*d**2*x**4*log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 32
*b*d*e*n*r**3*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 10
24) + 256*b*d*e*n*r**2*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 15
36*r + 1024) - 32*b*d*e*n*r**2*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**2 + 1
536*r + 1024) + 640*b*d*e*n*r*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832*r*
*2 + 1536*r + 1024) - 128*b*d*e*n*r*x**4*x**r/(16*r**4 + 192*r**3 + 832*r**
2 + 1536*r + 1024) + 512*b*d*e*n*x**4*x**r*log(x)/(16*r**4 + 192*r**3 + 832
```

```
*r**2 + 1536*r + 1024) - 128*b*d*e*n*x**4*x**r/(16*r**4 + 192*r**3 + 832*r*
*2 + 1536*r + 1024) + 32*b*d*e*r**3*x**4*x**r*log(c)/(16*r**4 + 192*r**3 +
832*r**2 + 1536*r + 1024) + 256*b*d*e*r**2*x**4*x**r*log(c)/(16*r**4 + 192*
r**3 + 832*r**2 + 1536*r + 1024) + 640*b*d*e*r*x**4*x**r*log(c)/(16*r**4 +
192*r**3 + 832*r**2 + 1536*r + 1024) + 512*b*d*e*x**4*x**r*log(c)/(16*r**4
+ 192*r**3 + 832*r**2 + 1536*r + 1024) + 8*b*e**2*n*r**3*x**4*x**(2*r)*log(
x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 80*b*e**2*n*r**2*x**4*
x**(2*r)*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) - 4*b*e**2*
n*r**2*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 256*
b*e**2*n*r*x**4*x**(2*r)*log(x)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1
024) - 32*b*e**2*n*r*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r
+ 1024) + 256*b*e**2*n*x**4*x**(2*r)*log(x)/(16*r**4 + 192*r**3 + 832*r**2
+ 1536*r + 1024) - 64*b*e**2*n*x**4*x**(2*r)/(16*r**4 + 192*r**3 + 832*r**2
 + 1536*r + 1024) + 8*b*e**2*r**3*x**4*x**(2*r)*log(c)/(16*r**4 + 192*r**3
+ 832*r**2 + 1536*r + 1024) + 80*b*e**2*r**2*x**4*x**(2*r)*log(c)/(16*r**4
+ 192*r**3 + 832*r**2 + 1536*r + 1024) + 256*b*e**2*r*x**4*x**(2*r)*log(c)/
(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024) + 256*b*e**2*x**4*x**(2*r)*
log(c)/(16*r**4 + 192*r**3 + 832*r**2 + 1536*r + 1024), True))
```

Giac [B] time = 1.31919, size = 1004, normalized size = 9.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/16*(4*b*d^2*n*r^4*x^4*log(x) + 32*b*d*n*r^3*x^4*x^r*e*log(x) - b*d^2*n*r^
4*x^4 + 4*b*d^2*r^4*x^4*log(c) + 32*b*d*r^3*x^4*x^r*e*log(c) + 48*b*d^2*n*r
^3*x^4*log(x) + 8*b*n*r^3*x^4*x^(2*r)*e^2*log(x) + 256*b*d*n*r^2*x^4*x^r*e*
log(x) - 12*b*d^2*n*r^3*x^4 + 4*a*d^2*r^4*x^4 - 32*b*d*n*r^2*x^4*x^r*e + 32
*a*d*r^3*x^4*x^r*e + 48*b*d^2*r^3*x^4*log(c) + 8*b*r^3*x^4*x^(2*r)*e^2*log(
c) + 256*b*d*r^2*x^4*x^r*e*log(c) + 208*b*d^2*n*r^2*x^4*log(x) + 80*b*n*r^2
*x^4*x^(2*r)*e^2*log(x) + 640*b*d*n*r*x^4*x^r*e*log(x) - 52*b*d^2*n*r^2*x^4
 + 48*a*d^2*r^3*x^4 - 4*b*n*r^2*x^4*x^(2*r)*e^2 + 8*a*r^3*x^4*x^(2*r)*e^2 -
 128*b*d*n*r*x^4*x^r*e + 256*a*d*r^2*x^4*x^r*e + 208*b*d^2*r^2*x^4*log(c) +
 80*b*r^2*x^4*x^(2*r)*e^2*log(c) + 640*b*d*r*x^4*x^r*e*log(c) + 384*b*d^2*n
*r*x^4*log(x) + 256*b*n*r*x^4*x^(2*r)*e^2*log(x) + 512*b*d*n*x^4*x^r*e*log(
x) - 96*b*d^2*n*r*x^4 + 208*a*d^2*r^2*x^4 - 32*b*n*r*x^4*x^(2*r)*e^2 + 80*a
*r^2*x^4*x^(2*r)*e^2 - 128*b*d*n*x^4*x^r*e + 640*a*d*r*x^4*x^r*e + 384*b*d^
2*r*x^4*log(c) + 256*b*r*x^4*x^(2*r)*e^2*log(c) + 512*b*d*x^4*x^r*e*log(c)
+ 256*b*d^2*n*x^4*log(x) + 256*b*n*x^4*x^(2*r)*e^2*log(x) - 64*b*d^2*n*x^4
```

```
+ 384*a*d^2*r*x^4 - 64*b*n*x^4*x^(2*r)*e^2 + 256*a*r*x^4*x^(2*r)*e^2 + 512*
a*d*x^4*x^r*e + 256*b*d^2*x^4*log(c) + 256*b*x^4*x^(2*r)*e^2*log(c) + 256*a
*d^2*x^4 + 256*a*x^4*x^(2*r)*e^2)/(r^4 + 12*r^3 + 52*r^2 + 96*r + 64)
```

3.381 $\int x(d+ex^r)^2(a+b\log(cx^n))\,dx$

Optimal. Leaf size=102

$$\frac{1}{2}\left(d^2x^2+\frac{4dex^{r+2}}{r+2}+\frac{e^2x^{2(r+1)}}{r+1}\right)(a+b\log(cx^n))-\frac{1}{4}bd^2nx^2-\frac{2bdenx^{r+2}}{(r+2)^2}-\frac{be^2nx^{2(r+1)}}{4(r+1)^2}$$

```
[Out] -(b*d^2*n*x^2)/4 - (b*e^2*n*x^(2*(1 + r)))/(4*(1 + r)^2) - (2*b*d*e*n*x^(2
+ r))/(2 + r)^2 + ((d^2*x^2 + (e^2*x^(2*(1 + r)))/(1 + r) + (4*d*e*x^(2 + r
))/(2 + r))*(a + b*Log[c*x^n]))/2
```

Rubi [A] time = 0.131601, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {270, 2334, 12, 14}

$$\frac{1}{2}\left(d^2x^2+\frac{4dex^{r+2}}{r+2}+\frac{e^2x^{2(r+1)}}{r+1}\right)(a+b\log(cx^n))-\frac{1}{4}bd^2nx^2-\frac{2bdenx^{r+2}}{(r+2)^2}-\frac{be^2nx^{2(r+1)}}{4(r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^2)/4 - (b*e^2*n*x^(2*(1 + r)))/(4*(1 + r)^2) - (2*b*d*e*n*x^(2
+ r))/(2 + r)^2 + ((d^2*x^2 + (e^2*x^(2*(1 + r)))/(1 + r) + (4*d*e*x^(2 + r
))/(2 + r))*(a + b*Log[c*x^n]))/2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x\left(d+ex^r\right)^2\left(a+b\log\left(cx^n\right)\right)\,dx &= \frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{2}x\left(d^2+\frac{4dex^r}{2+r}+\frac{e^2x^{2r}}{1+r}\right.\\
&= \frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int x\left(d^2+\frac{4dex^r}{2+r}+\frac{e^2x^{2r}}{1+r}\right.\\
&= \frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\left(d^2x+\frac{4dex^{1+r}}{2+r}+\frac{e^2x^{1}}{1+}\right.\\
&= -\frac{1}{4}bd^2nx^2-\frac{be^2nx^{2(1+r)}}{4(1+r)^2}-\frac{2bdenx^{2+r}}{(2+r)^2}+\frac{1}{2}\left(d^2x^2+\frac{e^2x^{2(1+r)}}{1+r}+\frac{4dex^{2+r}}{2+r}\right)\left(a+b\log\right.\end{aligned}$$

Mathematica [A] time = 0.235334, size = 116, normalized size = 1.14

$$\frac{1}{4}x^2\left(2a\left(d^2+\frac{4dex^r}{r+2}+\frac{e^2x^{2r}}{r+1}\right)+2b\log\left(cx^n\right)\left(d^2+\frac{4dex^r}{r+2}+\frac{e^2x^{2r}}{r+1}\right)+bn\left(-d^2-\frac{8dex^r}{(r+2)^2}-\frac{e^2x^{2r}}{(r+1)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(b*n*(-d^2 - (8*d*e*x^r)/(2 + r)^2 - (e^2*x^(2*r))/(1 + r)^2) + 2*a*(d
^2 + (4*d*e*x^r)/(2 + r) + (e^2*x^(2*r))/(1 + r)) + 2*b*(d^2 + (4*d*e*x^r)/
(2 + r) + (e^2*x^(2*r))/(1 + r))*Log[c*x^n]))/4
```

Maple [C] time = 0.296, size = 1922, normalized size = 18.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+e*x^r)^2*(a+b*ln(c*x^n)),x)

[Out] 1/2*b*x^2*(e^2*(x^r)^2*r+d^2*r^2+4*d*e*x^r*r+2*e^2*(x^r)^2+3*d^2*r+4*d*e*x^
r+2*d^2)/(1+r)/(2+r)*ln(x^n)-1/4*x^2*(b*d^2*n*r^4+6*b*d^2*n*r^3-8*ln(c)*b*d
^2+20*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+13*b*d^2*n*r^2+1
2*b*d^2*n*r+13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2*a*e^2*r
^3*(x^r)^2-10*a*e^2*r^2*(x^r)^2-8*a*d^2+4*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*x^r-16*a*d*e*x^r+16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*x^r+4*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r-8*I*Pi*b*d*e*csgn(I*
x^n)*csgn(I*c*x^n)^2*x^r-8*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+6*I*Pi*
b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*b*d^2*r*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+4*I*Pi*b*d^2*csgn(I*c*x^n)^3-I*Pi*b*e^2*r^3*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^2-I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
2-8*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+16*I*Pi*b*d*e*r^2*csgn(I
*c*x^n)^3*x^r+I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*I*Pi*b*e
^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-16*a*e^2*r*(x^r)^2-26*a*d^2*r^2-24
*a*d^2*r-2*a*d^2*r^4-12*a*d^2*r^3+4*b*d^2*n+8*b*d*e*n*x^r-2*ln(c)*b*e^2*r^3
*(x^r)^2-16*ln(c)*b*d*e*x^r-10*ln(c)*b*e^2*r^2*(x^r)^2-16*ln(c)*b*e^2*r*(x^
r)^2-8*ln(c)*b*e^2*(x^r)^2+4*b*e^2*n*(x^r)^2-26*ln(c)*b*d^2*r^2-24*ln(c)*b*
d^2*r-8*a*e^2*(x^r)^2-2*ln(c)*b*d^2*r^4-12*ln(c)*b*d^2*r^3+b*e^2*n*r^2*(x^r
)^2-8*a*d*e*r^3*x^r-32*a*d*e*r^2*x^r-40*a*d*e*r*x^r+4*b*e^2*n*r*(x^r)^2-5*I
*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-5*I*Pi*b*e^2*r^2*csgn(I*c
*x^n)^2*csgn(I*c)*(x^r)^2+20*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r+4*I*Pi*b*e^2*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-16*I*Pi*b*d*e*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2*x^r-16*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+I*Pi*b*e
^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+5*I*Pi*b*e^2*r^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-12*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x
^n)^2-12*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)-13*I*Pi*b*d^2*r^2*csgn(I*x^
n)*csgn(I*c*x^n)^2+I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3-32*ln(c)*b*d*e*r^2*x^r-40
*ln(c)*b*d*e*r*x^r-8*ln(c)*b*d*e*r^3*x^r-4*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*
x^n)^2*(x^r)^2-4*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-13*I*Pi*b*d^2
*r^2*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)-I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d^2*r^4*csgn(I*c*x^n
)^2*csgn(I*c)-20*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-20*I*Pi*b*d*e
*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+16*b*d*e*n*r*x^r+8*b*d*e*n*r^2*x^r+8*I*Pi*
b*d*e*csgn(I*c*x^n)^3*x^r+5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+I*Pi*b*e
^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-6*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2
-6*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+8*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*
(x^r)^2-4*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-4*I*Pi*b*d*e*r^3*c
sgn(I*c*x^n)^2*csgn(I*c)*x^r+8*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^r+8*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+6*I*Pi*b*
d^2*r^3*csgn(I*c*x^n)^3+4*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+13*I*Pi*b*d^2*
r^2*csgn(I*c*x^n)^3+12*I*Pi*b*d^2*r*csgn(I*c*x^n)^3-4*I*Pi*b*d^2*csgn(I*x^n
)*csgn(I*c*x^n)^2-4*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c))/(1+r)^2/(2+r)^2
```

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(x*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.41032, size = 1096, normalized size = 10.75

$$\frac{2\left(bd^2r^4 + 6\,bd^2r^3 + 13\,bd^2r^2 + 12\,bd^2r + 4\,bd^2\right)x^2\log\left(c\right) + 2\left(bd^2nr^4 + 6\,bd^2nr^3 + 13\,bd^2nr^2 + 12\,bd^2nr + 4\,bd^2n\right)x^2\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(b*d^2*r^4 + 6*b*d^2*r^3 + 13*b*d^2*r^2 + 12*b*d^2*r + 4*b*d^2)*x^2*
log(c) + 2*(b*d^2*n*r^4 + 6*b*d^2*n*r^3 + 13*b*d^2*n*r^2 + 12*b*d^2*n*r + 4
*b*d^2*n)*x^2*log(x) - ((b*d^2*n - 2*a*d^2)*r^4 + 4*b*d^2*n + 6*(b*d^2*n -
2*a*d^2)*r^3 - 8*a*d^2 + 13*(b*d^2*n - 2*a*d^2)*r^2 + 12*(b*d^2*n - 2*a*d^2
)*r)*x^2 + (2*(b*e^2*r^3 + 5*b*e^2*r^2 + 8*b*e^2*r + 4*b*e^2)*x^2*log(c) +
2*(b*e^2*n*r^3 + 5*b*e^2*n*r^2 + 8*b*e^2*n*r + 4*b*e^2*n)*x^2*log(x) + (2*a
*e^2*r^3 - 4*b*e^2*n + 8*a*e^2 - (b*e^2*n - 10*a*e^2)*r^2 - 4*(b*e^2*n - 4*
a*e^2)*r)*x^2)*x^(2*r) + 8*((b*d*e*r^3 + 4*b*d*e*r^2 + 5*b*d*e*r + 2*b*d*e)
*x^2*log(c) + (b*d*e*n*r^3 + 4*b*d*e*n*r^2 + 5*b*d*e*n*r + 2*b*d*e*n)*x^2*l
og(x) + (a*d*e*r^3 - b*d*e*n + 2*a*d*e - (b*d*e*n - 4*a*d*e)*r^2 - (2*b*d*e
*n - 5*a*d*e)*r)*x^2)*x^r)/(r^4 + 6*r^3 + 13*r^2 + 12*r + 4)
```

Sympy [A] time = 21.608, size = 2159, normalized size = 21.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)

[Out] Piecewise((a*d**2*x**2/2 + 2*a*d*e*log(x) - a*e**2/(2*x**2) + b*d**2*n*x**2
*log(x)/2 - b*d**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + b*d*e*n*log(x)**2 + 2*
b*d*e*log(c)*log(x) - b*e**2*n*log(x)/(2*x**2) - b*e**2*n/(4*x**2) - b*e**2
*log(c)/(2*x**2), Eq(r, -2)), (a*d**2*x**2/2 + 2*a*d*e*x + a*e**2*log(x) +
b*d**2*n*x**2*log(x)/2 - b*d**2*n*x**2/4 + b*d**2*x**2*log(c)/2 + 2*b*d*e*n
*x*log(x) - 2*b*d*e*n*x + 2*b*d*e*x*log(c) + b*e**2*n*log(x)**2/2 + b*e**2*
log(c)*log(x), Eq(r, -1)), (2*a*d**2*r**4*x**2/(4*r**4 + 24*r**3 + 52*r**2
+ 48*r + 16) + 12*a*d**2*r**3*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16)
 + 26*a*d**2*r**2*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 24*a*d**2
*r*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*a*d**2*x**2/(4*r**4 +
24*r**3 + 52*r**2 + 48*r + 16) + 8*a*d*e*r**3*x**2*x**r/(4*r**4 + 24*r**3 +
 52*r**2 + 48*r + 16) + 32*a*d*e*r**2*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2
 + 48*r + 16) + 40*a*d*e*r*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 1
6) + 16*a*d*e*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 2*a*e**2
*r**3*x**2*x**(2*r)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 10*a*e**2*r*
*2*x**2*x**(2*r)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 16*a*e**2*r*x**
2*x**(2*r)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*a*e**2*x**2*x**(2*r
)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 2*b*d**2*n*r**4*x**2*log(x)/(4
*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - b*d**2*n*r**4*x**2/(4*r**4 + 24*r*
*3 + 52*r**2 + 48*r + 16) + 12*b*d**2*n*r**3*x**2*log(x)/(4*r**4 + 24*r**3
+ 52*r**2 + 48*r + 16) - 6*b*d**2*n*r**3*x**2/(4*r**4 + 24*r**3 + 52*r**2 +
 48*r + 16) + 26*b*d**2*n*r**2*x**2*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48
*r + 16) - 13*b*d**2*n*r**2*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) +
 24*b*d**2*n*r*x**2*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 12*b*
d**2*n*r*x**2/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*b*d**2*n*x**2*lo
g(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 4*b*d**2*n*x**2/(4*r**4 + 2
4*r**3 + 52*r**2 + 48*r + 16) + 2*b*d**2*r**4*x**2*log(c)/(4*r**4 + 24*r**3
 + 52*r**2 + 48*r + 16) + 12*b*d**2*r**3*x**2*log(c)/(4*r**4 + 24*r**3 + 52
*r**2 + 48*r + 16) + 26*b*d**2*r**2*x**2*log(c)/(4*r**4 + 24*r**3 + 52*r**2
 + 48*r + 16) + 24*b*d**2*r*x**2*log(c)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r
+ 16) + 8*b*d**2*x**2*log(c)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*b
*d*e*n*r**3*x**2*x**r*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 32*
b*d*e*n*r**2*x**2*x**r*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 8*
b*d*e*n*r**2*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 40*b*d*e*
n*r*x**2*x**r*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 16*b*d*e*n*
r*x**2*x**r/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 16*b*d*e*n*x**2*x**r
*log(x)/(4*r**4 + 24*r**3 + 52*r**2 + 48*r + 16) - 8*b*d*e*n*x**2*x**r/(4*r
**4 + 24*r**3 + 52*r**2 + 48*r + 16) + 8*b*d*e*r**3*x**2*x**r*log(c)/(4*r**
4 + 24*r**3 + 52*r**2 + 48*r + 16) + 32*b*d*e*r**2*x**2*x**r*log(c)/(4*r**4
 + 24*r**3 + 52*r**2 + 48*r + 16) + 40*b*d*e*r*x**2*x**r*log(c)/(4*r**4 + 2
4*r**3 + 52*r**2 + 48*r + 16) + 16*b*d*e*x**2*x**r*log(c)/(4*r**4 + 24*r**3
 + 52*r**2 + 48*r + 16) + 2*b*e**2*n*r**3*x**2*x**(2*r)*log(x)/(4*r**4 + 24
```

```
*r**3 + 52*r**2 + 48*r + 16) + 10*b*e**2*n*r**2*x**2*x**(2*r)*log(x)/(4*r**
4 + 24*r**3 + 52*r**2 + 48*r + 16) - b*e**2*n*r**2*x**2*x**(2*r)/(4*r**4 +
24*r**3 + 52*r**2 + 48*r + 16) + 16*b*e**2*n*r*x**2*x**(2*r)*log(x)/(4*r**4
 + 24*r**3 + 52*r**2 + 48*r + 16) - 4*b*e**2*n*r*x**2*x**(2*r)/(4*r**4 + 24
*r**3 + 52*r**2 + 48*r + 16) + 8*b*e**2*n*x**2*x**(2*r)*log(x)/(4*r**4 + 24
*r**3 + 52*r**2 + 48*r + 16) - 4*b*e**2*n*x**2*x**(2*r)/(4*r**4 + 24*r**3 +
 52*r**2 + 48*r + 16) + 2*b*e**2*r**3*x**2*x**(2*r)*log(c)/(4*r**4 + 24*r**
3 + 52*r**2 + 48*r + 16) + 10*b*e**2*r**2*x**2*x**(2*r)*log(c)/(4*r**4 + 24
*r**3 + 52*r**2 + 48*r + 16) + 16*b*e**2*r*x**2*x**(2*r)*log(c)/(4*r**4 + 2
4*r**3 + 52*r**2 + 48*r + 16) + 8*b*e**2*x**2*x**(2*r)*log(c)/(4*r**4 + 24*
r**3 + 52*r**2 + 48*r + 16), True))
```

Giac [B] time = 1.32063, size = 1004, normalized size = 9.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/4*(2*b*d^2*n*r^4*x^2*log(x) + 8*b*d*n*r^3*x^2*x^r*e*log(x) - b*d^2*n*r^4*
x^2 + 2*b*d^2*r^4*x^2*log(c) + 8*b*d*r^3*x^2*x^r*e*log(c) + 12*b*d^2*n*r^3*
x^2*log(x) + 2*b*n*r^3*x^2*x^(2*r)*e^2*log(x) + 32*b*d*n*r^2*x^2*x^r*e*log(
x) - 6*b*d^2*n*r^3*x^2 + 2*a*d^2*r^4*x^2 - 8*b*d*n*r^2*x^2*x^r*e + 8*a*d*r^
3*x^2*x^r*e + 12*b*d^2*r^3*x^2*log(c) + 2*b*r^3*x^2*x^(2*r)*e^2*log(c) + 32
*b*d*r^2*x^2*x^r*e*log(c) + 26*b*d^2*n*r^2*x^2*log(x) + 10*b*n*r^2*x^2*x^(2
*r)*e^2*log(x) + 40*b*d*n*r*x^2*x^r*e*log(x) - 13*b*d^2*n*r^2*x^2 + 12*a*d^
2*r^3*x^2 - b*n*r^2*x^2*x^(2*r)*e^2 + 2*a*r^3*x^2*x^(2*r)*e^2 - 16*b*d*n*r*
x^2*x^r*e + 32*a*d*r^2*x^2*x^r*e + 26*b*d^2*r^2*x^2*log(c) + 10*b*r^2*x^2*x
^(2*r)*e^2*log(c) + 40*b*d*r*x^2*x^r*e*log(c) + 24*b*d^2*n*r*x^2*log(x) + 1
6*b*n*r*x^2*x^(2*r)*e^2*log(x) + 16*b*d*n*x^2*x^r*e*log(x) - 12*b*d^2*n*r*x
^2 + 26*a*d^2*r^2*x^2 - 4*b*n*r*x^2*x^(2*r)*e^2 + 10*a*r^2*x^2*x^(2*r)*e^2
- 8*b*d*n*x^2*x^r*e + 40*a*d*r*x^2*x^r*e + 24*b*d^2*r*x^2*log(c) + 16*b*r*x
^2*x^(2*r)*e^2*log(c) + 16*b*d*x^2*x^r*e*log(c) + 8*b*d^2*n*x^2*log(x) + 8*
b*n*x^2*x^(2*r)*e^2*log(x) - 4*b*d^2*n*x^2 + 24*a*d^2*r*x^2 - 4*b*n*x^2*x^(
2*r)*e^2 + 16*a*r*x^2*x^(2*r)*e^2 + 16*a*d*x^2*x^r*e + 8*b*d^2*x^2*log(c) +
 8*b*x^2*x^(2*r)*e^2*log(c) + 8*a*d^2*x^2 + 8*a*x^2*x^(2*r)*e^2)/(r^4 + 6*r
^3 + 13*r^2 + 12*r + 4)
```

3.382 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=104

$$d^2\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{2dex^r\left(a+b\log\left(cx^n\right)\right)}{r}+\frac{e^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r}-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

```
[Out] (-2*b*d*e*n*x^r)/r^2 - (b*e^2*n*x^(2*r))/(4*r^2) - (b*d^2*n*Log[x]^2)/2 + (
2*d*e*x^r*(a + b*Log[c*x^n]))/r + (e^2*x^(2*r)*(a + b*Log[c*x^n]))/(2*r) +
d^2*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.133859, antiderivative size = 87, normalized size of antiderivative = 0.84, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{2}\left(2d^2\log(x)+\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-2*b*d*e*n*x^r)/r^2 - (b*e^2*n*x^(2*r))/(4*r^2) - (b*d^2*n*Log[x]^2)/2 + (
((4*d*e*x^r)/r + (e^2*x^(2*r))/r + 2*d^2*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)^2\left(a+b\log\left(cx^n\right)\right)}{x}\,dx &= \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int \frac{ex^r\left(4d+ex^r\right)+2d^2r\log(\\
&= \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int \frac{ex^r(4d+ex^r)+2d^2r\log(x)}{x}\,dx}{2r}\\
&= \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\frac{(bn)\int\left(4dex^{-1+r}+e^2x^{-1+2r}+\frac{2d^2}{}\right.}{2r}\\
&= -\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log\left(cx^n\right)\right)-\left(bd^2n\right)\int\\
&= -\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)\left(a+b\log(\right.\end{aligned}$$

Mathematica [A] time = 0.209372, size = 90, normalized size = 0.87

$$\frac{1}{4}\left(\frac{ex^r\left(2ar\left(4d+ex^r\right)-bn\left(8d+ex^r\right)\right)}{r^2}+4ad^2\log(x)+\frac{2bd^2\log^2\left(cx^n\right)}{n}+\frac{2bex^r\log\left(cx^n\right)\left(4d+ex^r\right)}{r}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] ((e*x^r*(2*a*r*(4*d + e*x^r) - b*n*(8*d + e*x^r)))/r^2 + 4*a*d^2*Log[x] + (
2*b*e*x^r*(4*d + e*x^r)*Log[c*x^n])/r + (2*b*d^2*Log[c*x^n]^2)/n)/4
```

Maple [C] time = 0.139, size = 487, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x,x)
```

```
[Out] 1/2*b*(2*d^2*ln(x)*r+e^2*(x^r)^2+4*d*e*x^r)/r*ln(x^n)-1/4*I/r*Pi*b*e^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+1/4*I/r*Pi*b*e^2*csgn(I*c*x^n)^2*cs
gn(I*c)*(x^r)^2-I/r*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+I/r*Pi
*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+1/2*I*ln(x)*Pi*b*d^2*csgn(I*x^n)*csg
n(I*c*x^n)^2-1/2*I*ln(x)*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I
/r*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+I/r*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*
x^r-1/2*I*ln(x)*Pi*b*d^2*csgn(I*c*x^n)^3-I/r*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+1
/4*I/r*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1/2*I*ln(x)*Pi*b*d^2*cs
gn(I*c*x^n)^2*csgn(I*c)-1/2*b*d^2*n*ln(x)^2+1/2/r*ln(c)*b*e^2*(x^r)^2+ln(x)
*ln(c)*b*d^2+1/2/r*a*e^2*(x^r)^2-1/4/r^2*b*e^2*n*(x^r)^2+2/r*ln(c)*b*d*e*x^
r+ln(x)*a*d^2+2/r*a*d*e*x^r-2*b*d*e*n*x^r/r^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.37679, size = 286, normalized size = 2.75

$$\frac{2\,bd^2nr^2\log\left(x\right)^2 + \left(2\,be^2nr\log\left(x\right) + 2\,be^2r\log\left(c\right) - be^2n + 2\,ae^2r\right)x^{2\,r} + 8\left(bdenr\log\left(x\right) + bder\log\left(c\right) - bden + ader\right)x^r -}{4\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*d^2*n*r^2*log(x)^2 + (2*b*e^2*n*r*log(x) + 2*b*e^2*r*log(c) - b*e^
2*n + 2*a*e^2*r)*x^(2*r) + 8*(b*d*e*n*r*log(x) + b*d*e*r*log(c) - b*d*e*n +
 a*d*e*r)*x^r + 4*(b*d^2*r^2*log(c) + a*d^2*r^2)*log(x))/r^2
```

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((d+e*x**r)**2*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.31555, size = 189, normalized size = 1.82

$$\frac{1}{2}\,bd^2n\log\left(x\right)^2+\frac{2\,bdnx^re\log\left(x\right)}{r}+bd^2\log\left(c\right)\log\left(x\right)+\frac{2\,bdx^re\log\left(c\right)}{r}+ad^2\log\left(x\right)+\frac{bnx^{2\,r}e^2\log\left(x\right)}{2\,r}-\frac{2\,bdnx^re}{r^2}+\frac{2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^2*n*log(x)^2 + 2*b*d*n*x^r*e*log(x)/r + b*d^2*log(c)*log(x) + 2*b*d
*x^r*e*log(c)/r + a*d^2*log(x) + 1/2*b*n*x^(2*r)*e^2*log(x)/r - 2*b*d*n*x^r
*e/r^2 + 2*a*d*x^r*e/r + 1/2*b*x^(2*r)*e^2*log(c)/r - 1/4*b*n*x^(2*r)*e^2/r
^2 + 1/2*a*x^(2*r)*e^2/r
```

3.383 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=135

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{2dex^{r-2}\left(a+b\log\left(cx^n\right)\right)}{2-r}-\frac{e^2x^{-2(1-r)}\left(a+b\log\left(cx^n\right)\right)}{2(1-r)}-\frac{bd^2n}{4x^2}-\frac{2bdenx^{r-2}}{(2-r)^2}-\frac{be^2nx^{-2(1-r)}}{4(1-r)^2}$$

```
[Out] -(b*d^2*n)/(4*x^2) - (b*e^2*n)/(4*(1 - r)^2*x^(2*(1 - r))) - (2*b*d*e*n*x^(
-2 + r))/(2 - r)^2 - (d^2*(a + b*Log[c*x^n]))/(2*x^2) - (e^2*(a + b*Log[c*x
^n]))/(2*(1 - r)*x^(2*(1 - r))) - (2*d*e*x^(-2 + r)*(a + b*Log[c*x^n]))/(2
- r)
```

Rubi [A] time = 0.162812, antiderivative size = 114, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{4dex^{r-2}}{2-r}+\frac{e^2x^{-2(1-r)}}{1-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{4x^2}-\frac{2bdenx^{r-2}}{(2-r)^2}-\frac{be^2nx^{-2(1-r)}}{4(1-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^2*n)/(4*x^2) - (b*e^2*n)/(4*(1 - r)^2*x^(2*(1 - r))) - (2*b*d*e*n*x^(
-2 + r))/(2 - r)^2 - ((d^2/x^2 + e^2/((1 - r)*x^(2*(1 - r))) + (4*d*e*x^(-2
 + r))/(2 - r))*(a + b*Log[c*x^n]))/2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)(a+b\log(cx^n))-(bn)\int\frac{-d^2\left(2-3r+r^2\right)+4de\cdots}{2(1-r)\cdots}$$

$$= -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)(a+b\log(cx^n))-\frac{(bn)\int\frac{-d^2\left(2-3r+r^2\right)+4de(-1+r)x^r+e^2\cdots}{x^3}}{2\left(2-3r+r^2\right)}$$

$$= -\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)(a+b\log(cx^n))-\frac{(bn)\int\left(-\frac{d^2(-2+r)(-1+r)}{x^3}+4de(-1\cdots\right)}{2\left(2-\cdots\right)}$$

$$= -\frac{bd^2n}{4x^2}-\frac{be^2nx^{-2(1-r)}}{4(1-r)^2}-\frac{2bdenx^{-2+r}}{(2-r)^2}-\frac{1}{2}\left(\frac{d^2}{x^2}+\frac{e^2x^{-2(1-r)}}{1-r}+\frac{4dex^{-2+r}}{2-r}\right)(a+b\log(cx\cdots$$

Mathematica [A] time = 0.304391, size = 120, normalized size = 0.89

$$\frac{a\left(-2d^2+\frac{8dex^r}{r-2}+\frac{2e^2x^{2r}}{r-1}\right)+2b\log(cx^n)\left(-d^2+\frac{4dex^r}{r-2}+\frac{e^2x^{2r}}{r-1}\right)+bn\left(-d^2-\frac{8dex^r}{(r-2)^2}-\frac{e^2x^{2r}}{(r-1)^2}\right)}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (b*n*(-d^2 - (8*d*e*x^r)/(-2 + r)^2 - (e^2*x^(2*r))/(-1 + r)^2) + a*(-2*d^2
 + (8*d*e*x^r)/(-2 + r) + (2*e^2*x^(2*r))/(-1 + r)) + 2*b*(-d^2 + (4*d*e*x^
r)/(-2 + r) + (e^2*x^(2*r))/(-1 + r))*Log[c*x^n])/(4*x^2)
```

Maple [C] time = 0.24, size = 1923, normalized size = 14.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x^3,x)
```

```
[Out] -1/2*b*(-e^2*(x^r)^2*r+d^2*r^2-4*d*e*x^r*r+2*e^2*(x^r)^2-3*d^2*r+4*d*e*x^r+
2*d^2)/x^2/(-1+r)/(-2+r)*ln(x^n)-1/4*(b*d^2*n*r^4-6*b*d^2*n*r^3+8*ln(c)*b*d
^2+20*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+13*b*d^2*n*r^2-1
2*b*d^2*n*r-2*a*e^2*r^3*(x^r)^2+10*a*e^2*r^2*(x^r)^2+8*a*d^2+4*I*Pi*b*d*e*r
^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+16*a*d*e*x^r+4*I*Pi*b*d*e*r^3*cs
gn(I*c*x^n)^3*x^r+6*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I
*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*I*Pi*b*d^2*csgn(I*c*x^n)^
3-I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-I*Pi*b*e^2*r^3*csgn(I*
c*x^n)^2*csgn(I*c)*(x^r)^2-8*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2
-8*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-16*a*e^2*r*(x^r)^2+26*a
*d^2*r^2-24*a*d^2*r+2*a*d^2*r^4-12*a*d^2*r^3+4*b*d^2*n+8*b*d*e*n*x^r-2*ln(c
)*b*e^2*r^3*(x^r)^2+16*ln(c)*b*d*e*x^r+10*ln(c)*b*e^2*r^2*(x^r)^2-16*ln(c)*
b*e^2*r*(x^r)^2+8*ln(c)*b*e^2*(x^r)^2+4*b*e^2*n*(x^r)^2+26*ln(c)*b*d^2*r^2-
24*ln(c)*b*d^2*r+8*a*e^2*(x^r)^2+2*ln(c)*b*d^2*r^4-12*ln(c)*b*d^2*r^3-5*I*P
i*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+b*e^2*n*r^2*(x^r)^2
-8*a*d*e*r^3*x^r+32*a*d*e*r^2*x^r-40*a*d*e*r*x^r-4*b*e^2*n*r*(x^r)^2+20*I*P
i*b*d*e*r*csgn(I*c*x^n)^3*x^r+8*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+
5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+5*I*Pi*b*e^2*r^2*csgn(
I*c*x^n)^2*csgn(I*c)*(x^r)^2+8*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-16*
I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)-4*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-I*Pi
*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*I*Pi*b*d*e*csgn(I*c*x^n)^3
*x^r-4*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-13*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3
+4*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+4*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn
(I*c)-I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3+16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c
*x^n)^2*x^r+16*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-8*I*Pi*b*d*e*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*(x^r)^2+13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi
*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I
*c)+I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)+32*ln(c)*b*d*e*r^2*x^r-40*ln(c
)*b*d*e*r*x^r-8*ln(c)*b*d*e*r^3*x^r-20*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^
n)^2*x^r-20*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-16*b*d*e*n*r*x^r+8*b
*d*e*n*r^2*x^r+I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-6*I*Pi*b*d^2*r^3*csgn
(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+8*I*Pi*b
*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-4*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2
*x^r-4*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+13*I*Pi*b*d^2*r^2*csgn(
```

```
I*c*x^n)^2*csgn(I*c)-4*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*I*P
i*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*
(x^r)^2+4*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+I*Pi*b*d^2*r^4*csg
n(I*x^n)*csgn(I*c*x^n)^2-16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*x^r+8*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+6*I*Pi*b
*d^2*r^3*csgn(I*c*x^n)^3+12*I*Pi*b*d^2*r*csgn(I*c*x^n)^3)/(-1+r)^2/x^2/(-2+
r)^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.43618, size = 1049, normalized size = 7.77

$$-\frac{\left(bd^2n+2\,ad^2\right)r^4+4\,bd^2n-6\left(bd^2n+2\,ad^2\right)r^3+8\,ad^2+13\left(bd^2n+2\,ad^2\right)r^2-12\left(bd^2n+2\,ad^2\right)r-\left(2\,ae^2r^3-4\,be^2n\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*((b*d^2*n + 2*a*d^2)*r^4 + 4*b*d^2*n - 6*(b*d^2*n + 2*a*d^2)*r^3 + 8*a
*d^2 + 13*(b*d^2*n + 2*a*d^2)*r^2 - 12*(b*d^2*n + 2*a*d^2)*r - (2*a*e^2*r^3
 - 4*b*e^2*n - 8*a*e^2 - (b*e^2*n + 10*a*e^2)*r^2 + 4*(b*e^2*n + 4*a*e^2)*r
 + 2*(b*e^2*r^3 - 5*b*e^2*r^2 + 8*b*e^2*r - 4*b*e^2)*log(c) + 2*(b*e^2*n*r^
3 - 5*b*e^2*n*r^2 + 8*b*e^2*n*r - 4*b*e^2*n)*log(x))*x^(2*r) - 8*(a*d*e*r^3
 - b*d*e*n - 2*a*d*e - (b*d*e*n + 4*a*d*e)*r^2 + (2*b*d*e*n + 5*a*d*e)*r +
(b*d*e*r^3 - 4*b*d*e*r^2 + 5*b*d*e*r - 2*b*d*e)*log(c) + (b*d*e*n*r^3 - 4*b
*d*e*n*r^2 + 5*b*d*e*n*r - 2*b*d*e*n)*log(x))*x^r + 2*(b*d^2*r^4 - 6*b*d^2*
r^3 + 13*b*d^2*r^2 - 12*b*d^2*r + 4*b*d^2)*log(c) + 2*(b*d^2*n*r^4 - 6*b*d^
2*n*r^3 + 13*b*d^2*n*r^2 - 12*b*d^2*n*r + 4*b*d^2*n)*log(x))/((r^4 - 6*r^3
+ 13*r^2 - 12*r + 4)*x^2)
```

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((d+e*x**r)**2*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^2 (b \log(cx^n) + a)}{x^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^3, x)
```

3.384 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=135

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{2dex^{r-4}\left(a+b\log\left(cx^n\right)\right)}{4-r}-\frac{e^2x^{-2(2-r)}\left(a+b\log\left(cx^n\right)\right)}{2(2-r)}-\frac{bd^2n}{16x^4}-\frac{2bdenx^{r-4}}{(4-r)^2}-\frac{be^2nx^{-2(2-r)}}{4(2-r)^2}$$

```
[Out] -(b*d^2*n)/(16*x^4) - (b*e^2*n)/(4*(2 - r)^2*x^(2*(2 - r))) - (2*b*d*e*n*x^
(-4 + r))/(4 - r)^2 - (d^2*(a + b*Log[c*x^n]))/(4*x^4) - (e^2*(a + b*Log[c*
x^n]))/(2*(2 - r)*x^(2*(2 - r))) - (2*d*e*x^(-4 + r)*(a + b*Log[c*x^n]))/(4
 - r)
```

Rubi [A] time = 0.163582, antiderivative size = 115, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{8dex^{r-4}}{4-r}+\frac{2e^2x^{-2(2-r)}}{2-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{16x^4}-\frac{2bdenx^{r-4}}{(4-r)^2}-\frac{be^2nx^{-2(2-r)}}{4(2-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^2*n)/(16*x^4) - (b*e^2*n)/(4*(2 - r)^2*x^(2*(2 - r))) - (2*b*d*e*n*x^
(-4 + r))/(4 - r)^2 - ((d^2/x^4 + (2*e^2)/((2 - r)*x^(2*(2 - r))) + (8*d*e*
x^(-4 + r))/(4 - r))*(a + b*Log[c*x^n]))/4
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^2 (a+b\log(cx^n))}{x^5}\,dx = -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^2\left(8-6r+r^2\right)+8de(}{4(2-r}$$

$$= -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)(a+b\log(cx^n))-\frac{(bn)\int \frac{-d^2\left(8-6r+r^2\right)+8de(-2+r)x^r+2e^2}{x^5}}{4\left(8-6r+r^2\right)}$$

$$= -\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)(a+b\log(cx^n))-\frac{(bn)\int\left(-\frac{d^2(-4+r)(-2+r)}{x^5}+8de(-2\right.}{4\left(8-\right.}$$

$$= -\frac{bd^2n}{16x^4}-\frac{be^2nx^{-2(2-r)}}{4(2-r)^2}-\frac{2bdenx^{-4+r}}{(4-r)^2}-\frac{1}{4}\left(\frac{d^2}{x^4}+\frac{2e^2x^{-2(2-r)}}{2-r}+\frac{8dex^{-4+r}}{4-r}\right)(a+b\log(cx$$

Mathematica [A] time = 0.302773, size = 121, normalized size = 0.9

$$\frac{a\left(-4d^2+\frac{32dex^r}{r-4}+\frac{8e^2x^{2r}}{r-2}\right)+4b\log(cx^n)\left(-d^2+\frac{8dex^r}{r-4}+\frac{2e^2x^{2r}}{r-2}\right)+bn\left(-d^2-\frac{32dex^r}{(r-4)^2}-\frac{4e^2x^{2r}}{(r-2)^2}\right)}{16x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (b*n*(-d^2 - (32*d*e*x^r)/(-4 + r)^2 - (4*e^2*x^(2*r))/(-2 + r)^2) + a*(-4*
d^2 + (32*d*e*x^r)/(-4 + r) + (8*e^2*x^(2*r))/(-2 + r)) + 4*b*(-d^2 + (8*d*
e*x^r)/(-4 + r) + (2*e^2*x^(2*r))/(-2 + r))*Log[c*x^n])/(16*x^4)
```

Maple [C] time = 0.234, size = 1924, normalized size = 14.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/4*b*(-2*e^2*(x^r)^2*r+d^2*r^2-8*d*e*x^r*r+8*e^2*(x^r)^2-6*d^2*r+16*d*e*x
^r+8*d^2)/x^4/(-2+r)/(-4+r)*ln(x^n)-1/16*(b*d^2*n*r^4-12*b*d^2*n*r^3+256*ln
(c)*b*d^2+52*b*d^2*n*r^2-96*b*d^2*n*r-128*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^2-8*a*e^2*r^3*(x^r)^2+80*a*e^2*r^2*(x^r)^2+256*a*d^2+512*a*d*e*
x^r+320*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+16*I*Pi*b*d*e*
r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-128*I*Pi*b*d^2*csgn(I*c*x^n)^3+
24*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+192*I*Pi*b*d^2*r*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-24*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)
^2-24*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)-128*I*Pi*b*e^2*r*csgn(I*x^n)
*csgn(I*c*x^n)^2*(x^r)^2+4*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+320*I*Pi*
b*d*e*r*csgn(I*c*x^n)^3*x^r+16*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r-256*a*e^2
*r*(x^r)^2+208*a*d^2*r^2-384*a*d^2*r+4*a*d^2*r^4-48*a*d^2*r^3+64*b*d^2*n+12
8*b*d*e*n*x^r-8*ln(c)*b*e^2*r^3*(x^r)^2+512*ln(c)*b*d*e*x^r+80*ln(c)*b*e^2*
r^2*(x^r)^2-256*ln(c)*b*e^2*r*(x^r)^2+256*ln(c)*b*e^2*(x^r)^2+64*b*e^2*n*(x
^r)^2+208*ln(c)*b*d^2*r^2-384*ln(c)*b*d^2*r+256*a*e^2*(x^r)^2+4*ln(c)*b*d^2
*r^4-48*ln(c)*b*d^2*r^3-40*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*(x^r)^2+4*b*e^2*n*r^2*(x^r)^2-32*a*d*e*r^3*x^r+256*a*d*e*r^2*x^r-640*a*d
*e*r*x^r-32*b*e^2*n*r*(x^r)^2-4*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*
(x^r)^2-4*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+40*I*Pi*b*e^2*r^
2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+40*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csg
n(I*c)*(x^r)^2-128*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-1
04*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+256*I*Pi*b*d*e*csgn(I
*x^n)*csgn(I*c*x^n)^2*x^r-2*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)+256*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-128*I*Pi*b*d*e*r^2*csgn(I*
c*x^n)^3*x^r+2*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I*Pi*b*d^2*r^4*
csgn(I*c*x^n)^2*csgn(I*c)+128*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-
128*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-104*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+1
28*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2-320*I*Pi*b*d*e*r*csgn(I*x^n)*csgn
(I*c*x^n)^2*x^r+128*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+128*I*Pi
*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+4*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*(x^r)^2-256*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^r+128*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d^2*r^4*csgn(I*c*x
^n)^3+128*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+192*I*Pi*b*d^2*r*csgn(I*c*x^
n)^3+256*ln(c)*b*d*e*r^2*x^r-640*ln(c)*b*d*e*r*x^r-32*ln(c)*b*d*e*r^3*x^r-1
92*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-192*I*Pi*b*d^2*r*csgn(I*c*x^n)^
2*csgn(I*c)-128*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-128*
```

```
b*d*e*n*r*x^r+32*b*d*e*n*r^2*x^r+128*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^2+104*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+104*I*Pi*
b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)-128*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-256*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r-40*I*Pi*b*e^2*r^2*csgn(I*c*x
^n)^3*(x^r)^2+128*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-320*I*Pi*b
*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-16*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c
*x^n)^2*x^r-16*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+24*I*Pi*b*d^2*r
^3*csgn(I*c*x^n)^3)/(-2+r)^2/x^4/(-4+r)^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.40894, size = 1088, normalized size = 8.06

$$-\frac{\left(bd^2n+4\,ad^2\right)r^4+64\,bd^2n-12\left(bd^2n+4\,ad^2\right)r^3+256\,ad^2+52\left(bd^2n+4\,ad^2\right)r^2-96\left(bd^2n+4\,ad^2\right)r-4\left(2\,ae^2r^3-1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*((b*d^2*n + 4*a*d^2)*r^4 + 64*b*d^2*n - 12*(b*d^2*n + 4*a*d^2)*r^3 +
256*a*d^2 + 52*(b*d^2*n + 4*a*d^2)*r^2 - 96*(b*d^2*n + 4*a*d^2)*r - 4*(2*a*
e^2*r^3 - 16*b*e^2*n - 64*a*e^2 - (b*e^2*n + 20*a*e^2)*r^2 + 8*(b*e^2*n + 8
*a*e^2)*r + 2*(b*e^2*r^3 - 10*b*e^2*r^2 + 32*b*e^2*r - 32*b*e^2)*log(c) + 2
*(b*e^2*n*r^3 - 10*b*e^2*n*r^2 + 32*b*e^2*n*r - 32*b*e^2*n)*log(x))*x^(2*r)
 - 32*(a*d*e*r^3 - 4*b*d*e*n - 16*a*d*e - (b*d*e*n + 8*a*d*e)*r^2 + 4*(b*d*
e*n + 5*a*d*e)*r + (b*d*e*r^3 - 8*b*d*e*r^2 + 20*b*d*e*r - 16*b*d*e)*log(c)
 + (b*d*e*n*r^3 - 8*b*d*e*n*r^2 + 20*b*d*e*n*r - 16*b*d*e*n)*log(x))*x^r +
4*(b*d^2*r^4 - 12*b*d^2*r^3 + 52*b*d^2*r^2 - 96*b*d^2*r + 64*b*d^2)*log(c)
+ 4*(b*d^2*n*r^4 - 12*b*d^2*n*r^3 + 52*b*d^2*n*r^2 - 96*b*d^2*n*r + 64*b*d^
2*n)*log(x))/((r^4 - 12*r^3 + 52*r^2 - 96*r + 64)*x^4)
```

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((d+e*x**r)**2*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^2 (b \log(cx^n) + a)}{x^5} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^5, x)
```

3.385 $\int x^4 (d + ex^r)^2 (a + b \log (cx^n)) \, dx$

Optimal. Leaf size=105

$$\frac{1}{5}\left(d^2x^5 + \frac{10dex^{r+5}}{r+5} + \frac{5e^2x^{2r+5}}{2r+5}\right)(a + b\log(cx^n)) - \frac{1}{25}bd^2nx^5 - \frac{2bdenx^{r+5}}{(r+5)^2} - \frac{be^2nx^{2r+5}}{(2r+5)^2}$$

```
[Out] -(b*d^2*n*x^5)/25 - (2*b*d*e*n*x^(5 + r))/(5 + r)^2 - (b*e^2*n*x^(5 + 2*r))
/(5 + 2*r)^2 + ((d^2*x^5 + (10*d*e*x^(5 + r))/(5 + r) + (5*e^2*x^(5 + 2*r))
/(5 + 2*r))*(a + b*Log[c*x^n]))/5
```

Rubi [A] time = 0.160261, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{5}\left(d^2x^5 + \frac{10dex^{r+5}}{r+5} + \frac{5e^2x^{2r+5}}{2r+5}\right)(a + b\log(cx^n)) - \frac{1}{25}bd^2nx^5 - \frac{2bdenx^{r+5}}{(r+5)^2} - \frac{be^2nx^{2r+5}}{(2r+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^5)/25 - (2*b*d*e*n*x^(5 + r))/(5 + r)^2 - (b*e^2*n*x^(5 + 2*r))
/(5 + 2*r)^2 + ((d^2*x^5 + (10*d*e*x^(5 + r))/(5 + r) + (5*e^2*x^(5 + 2*r))
/(5 + 2*r))*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^4 (d+ex^r)^2 (a+b\log(cx^n))\,dx = \frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{5}x^4\left(d^2+\frac{10dex^r}{5+r}+\frac{5}{5}\right.$$
$$=\frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int x^4\left(d^2+\frac{10dex^r}{5+r}+\frac{5}{5}\right.$$
$$=\frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int\left(d^2x^4+\frac{5e^2x^{2(2+r)}}{5+2r}+\right.$$
$$=-\frac{1}{25}bd^2nx^5-\frac{2bdenx^{5+r}}{(5+r)^2}-\frac{be^2nx^{5+2r}}{(5+2r)^2}+\frac{1}{5}\left(d^2x^5+\frac{10dex^{5+r}}{5+r}+\frac{5e^2x^{5+2r}}{5+2r}\right)(a+b\log$$

Mathematica [A] time = 0.255053, size = 124, normalized size = 1.18

$$\frac{1}{25}x^5\left(5a\left(d^2+\frac{10dex^r}{r+5}+\frac{5e^2x^{2r}}{2r+5}\right)+5b\log(cx^n)\left(d^2+\frac{10dex^r}{r+5}+\frac{5e^2x^{2r}}{2r+5}\right)+bn\left(-d^2-\frac{50dex^r}{(r+5)^2}-\frac{25e^2x^{2r}}{(2r+5)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^5*(b*n*(-d^2 - (50*d*e*x^r)/(5 + r)^2 - (25*e^2*x^(2*r))/(5 + 2*r)^2) +
5*a*(d^2 + (10*d*e*x^r)/(5 + r) + (5*e^2*x^(2*r))/(5 + 2*r)) + 5*b*(d^2 + (
10*d*e*x^r)/(5 + r) + (5*e^2*x^(2*r))/(5 + 2*r))*Log[c*x^n]))/25
```

Maple [C] time = 0.294, size = 1930, normalized size = 18.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(d+e*x^r)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/5*b*x^5*(5*e^2*(x^r)^2*r+2*d^2*r^2+20*d*e*x^r*r+25*e^2*(x^r)^2+15*d^2*r+5
0*d*e*x^r+25*d^2)/(5+2*r)/(5+r)*ln(x^n)-1/50*x^5*(8*b*d^2*n*r^4+120*b*d^2*n
*r^3-6250*ln(c)*b*d^2+200*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*x^r+650*b*d^2*n*r^2+1500*b*d^2*n*r-100*a*e^2*r^3*(x^r)^2-1250*a*e^2*r^2*(
x^r)^2-6250*a*d^2-12500*a*d*e*x^r+2000*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r+6250*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^
r-3750*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)+3125*I*Pi*b*d^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)-20*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+3125*I
*Pi*b*d^2*csgn(I*c*x^n)^3-625*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r
)^2-2500*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2500*I*Pi*b*e^2*r
*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-6250*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n
)^2*x^r+6250*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r+3125*I*Pi*b*e^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*(x^r)^2+300*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-5000*a*e^2*r*(x^r)^2-3250*a*d^2*r^2-7500*a*d^2*r-40*a*d^2*r^4-60
0*a*d^2*r^3+3750*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+20*I*Pi*b
*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-50*I*Pi*b*e^2*r^3*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^2+1250*b*d^2*n+2500*b*d*e*n*x^r-100*ln(c)*b*e^2*r^3*(x^
r)^2-12500*ln(c)*b*d*e*x^r-1250*ln(c)*b*e^2*r^2*(x^r)^2-5000*ln(c)*b*e^2*r*
(x^r)^2-50*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-625*I*Pi*b*e^
2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6250*ln(c)*b*e^2*(x^r)^2+1250*b*e
^2*n*(x^r)^2-3250*ln(c)*b*d^2*r^2-7500*ln(c)*b*d^2*r-6250*a*e^2*(x^r)^2-40*
ln(c)*b*d^2*r^4-600*ln(c)*b*d^2*r^3+2500*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)
^2+200*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r-6250*I*Pi*b*d*e*csgn(I*c*x^n)^2*c
sgn(I*c)*x^r+2000*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r+1625*I*Pi*b*d^2*r^2*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1625*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3-3125*
I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+300*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+5
0*b*e^2*n*r^2*(x^r)^2-400*a*d*e*r^3*x^r-4000*a*d*e*r^2*x^r-12500*a*d*e*r*x^
r+500*b*e^2*n*r*(x^r)^2-300*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-300*
I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)-1625*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^
2*csgn(I*c)-3750*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-6250*I*Pi*b*d*e*r
*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-6250*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c
)*x^r-200*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+50*I*Pi*b*e^2*r^3*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+3750*I*Pi*b*d^2*r*csgn(I*c*x^n)^3
-3125*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+20*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^
3+3125*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-2000*I*Pi*b*d*e*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2*x^r-4000*ln(c)*b*d*e*r^2*x^r-12500*ln(c)*b*d*e*r*x^r-400*ln(
c)*b*d*e*r^3*x^r+2500*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r
)^2+2000*b*d*e*n*r*x^r+400*b*d*e*n*r^2*x^r-20*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^
2*csgn(I*c)+50*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+625*I*Pi*b*e^2*r^2*cs
gn(I*c*x^n)^3*(x^r)^2-3125*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-1
625*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-3125*I*Pi*b*e^2*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^2+6250*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r-200*I*Pi*b*d*e*r^
```

```
3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+625*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*(x^r)^2-2000*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+625
0*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r)/(5+2*r)^2/(5+r)^2
```

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(x^4*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.38302, size = 1202, normalized size = 11.45

$$\frac{5\left(4\,bd^2r^4+60\,bd^2r^3+325\,bd^2r^2+750\,bd^2r+625\,bd^2\right)x^5\log\left(c\right)+5\left(4\,bd^2nr^4+60\,bd^2nr^3+325\,bd^2nr^2+750\,bd^2nr+\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/25*(5*(4*b*d^2*r^4 + 60*b*d^2*r^3 + 325*b*d^2*r^2 + 750*b*d^2*r + 625*b*d
^2)*x^5*log(c) + 5*(4*b*d^2*n*r^4 + 60*b*d^2*n*r^3 + 325*b*d^2*n*r^2 + 750*
b*d^2*n*r + 625*b*d^2*n)*x^5*log(x) - (4*(b*d^2*n - 5*a*d^2)*r^4 + 625*b*d^
2*n + 60*(b*d^2*n - 5*a*d^2)*r^3 - 3125*a*d^2 + 325*(b*d^2*n - 5*a*d^2)*r^2
 + 750*(b*d^2*n - 5*a*d^2)*r)*x^5 + 25*((2*b*e^2*r^3 + 25*b*e^2*r^2 + 100*b
*e^2*r + 125*b*e^2)*x^5*log(c) + (2*b*e^2*n*r^3 + 25*b*e^2*n*r^2 + 100*b*e^
2*n*r + 125*b*e^2*n)*x^5*log(x) + (2*a*e^2*r^3 - 25*b*e^2*n + 125*a*e^2 - (
b*e^2*n - 25*a*e^2)*r^2 - 10*(b*e^2*n - 10*a*e^2)*r)*x^5)*x^(2*r) + 50*((4*
b*d*e*r^3 + 40*b*d*e*r^2 + 125*b*d*e*r + 125*b*d*e)*x^5*log(c) + (4*b*d*e*n
*r^3 + 40*b*d*e*n*r^2 + 125*b*d*e*n*r + 125*b*d*e*n)*x^5*log(x) + (4*a*d*e*
r^3 - 25*b*d*e*n + 125*a*d*e - 4*(b*d*e*n - 10*a*d*e)*r^2 - 5*(4*b*d*e*n -
25*a*d*e)*r)*x^5)*x^r)/(4*r^4 + 60*r^3 + 325*r^2 + 750*r + 625)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.37321, size = 1007, normalized size = 9.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/25*(20*b*d^2*n*r^4*x^5*log(x) + 200*b*d*n*r^3*x^5*x^r*e*log(x) - 4*b*d^2*
n*r^4*x^5 + 20*b*d^2*r^4*x^5*log(c) + 200*b*d*r^3*x^5*x^r*e*log(c) + 300*b*
d^2*n*r^3*x^5*log(x) + 50*b*n*r^3*x^5*x^(2*r)*e^2*log(x) + 2000*b*d*n*r^2*x
^5*x^r*e*log(x) - 60*b*d^2*n*r^3*x^5 + 20*a*d^2*r^4*x^5 - 200*b*d*n*r^2*x^5
*x^r*e + 200*a*d*r^3*x^5*x^r*e + 300*b*d^2*r^3*x^5*log(c) + 50*b*r^3*x^5*x^
(2*r)*e^2*log(c) + 2000*b*d*r^2*x^5*x^r*e*log(c) + 1625*b*d^2*n*r^2*x^5*log
(x) + 625*b*n*r^2*x^5*x^(2*r)*e^2*log(x) + 6250*b*d*n*r*x^5*x^r*e*log(x) -
325*b*d^2*n*r^2*x^5 + 300*a*d^2*r^3*x^5 - 25*b*n*r^2*x^5*x^(2*r)*e^2 + 50*a
*r^3*x^5*x^(2*r)*e^2 - 1000*b*d*n*r*x^5*x^r*e + 2000*a*d*r^2*x^5*x^r*e + 16
25*b*d^2*r^2*x^5*log(c) + 625*b*r^2*x^5*x^(2*r)*e^2*log(c) + 6250*b*d*r*x^5
*x^r*e*log(c) + 3750*b*d^2*n*r*x^5*log(x) + 2500*b*n*r*x^5*x^(2*r)*e^2*log(
x) + 6250*b*d*n*x^5*x^r*e*log(x) - 750*b*d^2*n*r*x^5 + 1625*a*d^2*r^2*x^5 -
 250*b*n*r*x^5*x^(2*r)*e^2 + 625*a*r^2*x^5*x^(2*r)*e^2 - 1250*b*d*n*x^5*x^r
*e + 6250*a*d*r*x^5*x^r*e + 3750*b*d^2*r*x^5*log(c) + 2500*b*r*x^5*x^(2*r)*
e^2*log(c) + 6250*b*d*x^5*x^r*e*log(c) + 3125*b*d^2*n*x^5*log(x) + 3125*b*n
*x^5*x^(2*r)*e^2*log(x) - 625*b*d^2*n*x^5 + 3750*a*d^2*r*x^5 - 625*b*n*x^5*
x^(2*r)*e^2 + 2500*a*r*x^5*x^(2*r)*e^2 + 6250*a*d*x^5*x^r*e + 3125*b*d^2*x^
5*log(c) + 3125*b*x^5*x^(2*r)*e^2*log(c) + 3125*a*d^2*x^5 + 3125*a*x^5*x^(2
*r)*e^2)/(4*r^4 + 60*r^3 + 325*r^2 + 750*r + 625)
```

3.386 $\int x^2 (d+ex^r)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=105

$$\frac{1}{3}\left(d^2x^3+\frac{6dex^{r+3}}{r+3}+\frac{3e^2x^{2r+3}}{2r+3}\right)(a+b\log(cx^n))-\frac{1}{9}bd^2nx^3-\frac{2bdenx^{r+3}}{(r+3)^2}-\frac{be^2nx^{2r+3}}{(2r+3)^2}$$

```
[Out] -(b*d^2*n*x^3)/9 - (2*b*d*e*n*x^(3 + r))/(3 + r)^2 - (b*e^2*n*x^(3 + 2*r))/
(3 + 2*r)^2 + ((d^2*x^3 + (6*d*e*x^(3 + r))/(3 + r) + (3*e^2*x^(3 + 2*r))/(
3 + 2*r))*(a + b*Log[c*x^n]))/3
```

Rubi [A] time = 0.15994, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{3}\left(d^2x^3+\frac{6dex^{r+3}}{r+3}+\frac{3e^2x^{2r+3}}{2r+3}\right)(a+b\log(cx^n))-\frac{1}{9}bd^2nx^3-\frac{2bdenx^{r+3}}{(r+3)^2}-\frac{be^2nx^{2r+3}}{(2r+3)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x^3)/9 - (2*b*d*e*n*x^(3 + r))/(3 + r)^2 - (b*e^2*n*x^(3 + 2*r))/
(3 + 2*r)^2 + ((d^2*x^3 + (6*d*e*x^(3 + r))/(3 + r) + (3*e^2*x^(3 + 2*r))/(
3 + 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^2 (d+ex^r)^2 (a+b\log(cx^n))\,dx &= \frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{3}x^2\left(d^2+\frac{6dex^r}{3+r}+\frac{3e^2x^2}{3+2}\right.\\ &= \frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int x^2\left(d^2+\frac{6dex^r}{3+r}+\frac{3e^2x^2}{3+2}\right.\\ &= \frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int\left(d^2x^2+\frac{3e^2x^{2(1+r)}}{3+2r}+\right.\\ &= -\frac{1}{9}bd^2nx^3-\frac{2bdenx^{3+r}}{(3+r)^2}-\frac{be^2nx^{3+2r}}{(3+2r)^2}+\frac{1}{3}\left(d^2x^3+\frac{6dex^{3+r}}{3+r}+\frac{3e^2x^{3+2r}}{3+2r}\right)(a+b\log(c\end{aligned}$$

Mathematica [A] time = 0.254736, size = 124, normalized size = 1.18

$$\frac{1}{9}x^3\left(3a\left(d^2+\frac{6dex^r}{r+3}+\frac{3e^2x^{2r}}{2r+3}\right)+3b\log(cx^n)\left(d^2+\frac{6dex^r}{r+3}+\frac{3e^2x^{2r}}{2r+3}\right)+bn\left(-d^2-\frac{18dex^r}{(r+3)^2}-\frac{9e^2x^{2r}}{(2r+3)^2}\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(b*n*(-d^2 - (18*d*e*x^r)/(3 + r)^2 - (9*e^2*x^(2*r))/(3 + 2*r)^2) + 3
*a*(d^2 + (6*d*e*x^r)/(3 + r) + (3*e^2*x^(2*r))/(3 + 2*r)) + 3*b*(d^2 + (6*
d*e*x^r)/(3 + r) + (3*e^2*x^(2*r))/(3 + 2*r))*Log[c*x^n]))/9
```

Maple [C] time = 0.293, size = 1930, normalized size = 18.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+e*x^r)^2*(a+b*ln(c*x^n)),x)

[Out] 1/3*b*x^3*(3*e^2*(x^r)^2*r+2*d^2*r^2+12*d*e*x^r*r+9*e^2*(x^r)^2+9*d^2*r+18*
d*e*x^r+9*d^2)/(3+2*r)/(3+r)*ln(x^n)-1/18*x^3*(8*b*d^2*n*r^4+72*b*d^2*n*r^3
-486*ln(c)*b*d^2+810*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2
34*b*d^2*n*r^2+324*b*d^2*n*r-36*a*e^2*r^3*(x^r)^2-270*a*e^2*r^2*(x^r)^2-486
*a*d^2-135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+432*I*Pi*b*d*e*
r^2*csgn(I*c*x^n)^3*x^r-972*a*d*e*x^r+72*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*x^r+135*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*(x^r)^2-108*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-486*I*Pi*b*d^2*r*cs
gn(I*x^n)*csgn(I*c*x^n)^2-486*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)+486*I*
Pi*b*d*e*csgn(I*c*x^n)^3*x^r+18*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-243*
I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+243*I*Pi*b*d^2*csgn(I*c*x^n)
^3-486*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-486*I*Pi*b*d*e*csgn(I*x^n)*
csgn(I*c*x^n)^2*x^r-18*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-3
24*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-135*I*Pi*b*e^2*r^2*csgn
(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+108*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)+486*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*b*
d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-648*a*e^2*r*(x^r)^2-702*a*d^2*r
^2-972*a*d^2*r-24*a*d^2*r^4-216*a*d^2*r^3-18*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2
*csgn(I*c)*(x^r)^2+243*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)
^2+162*b*d^2*n+324*b*d*e*n*x^r-36*ln(c)*b*e^2*r^3*(x^r)^2-972*ln(c)*b*d*e*x
^r-270*ln(c)*b*e^2*r^2*(x^r)^2-648*ln(c)*b*e^2*r*(x^r)^2-486*ln(c)*b*e^2*(x
^r)^2+162*b*e^2*n*(x^r)^2-702*ln(c)*b*d^2*r^2-972*ln(c)*b*d^2*r-486*a*e^2*(
x^r)^2-24*ln(c)*b*d^2*r^4-216*ln(c)*b*d^2*r^3+72*I*Pi*b*d*e*r^3*csgn(I*c*x^
n)^3*x^r+18*b*e^2*n*r^2*(x^r)^2-144*a*d*e*r^3*x^r-864*a*d*e*r^2*x^r-1620*a*
d*e*r*x^r+108*b*e^2*n*r*(x^r)^2+351*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)-324*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+810*I*Pi*b*d
*e*r*csgn(I*c*x^n)^3*x^r-432*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r
+486*I*Pi*b*d^2*r*csgn(I*c*x^n)^3-243*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+
12*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3-72*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*
c)*x^r+18*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+243*I*
Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-243*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2
+108*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+486*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*x^r+324*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^
2-351*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-432*I*Pi*b*d*e*r^2*csgn(I*
c*x^n)^2*csgn(I*c)*x^r-108*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+324*I*P
i*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-243*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*
(x^r)^2-72*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-864*ln(c)*b*d*e*r
^2*x^r-1620*ln(c)*b*d*e*r*x^r-144*ln(c)*b*d*e*r^3*x^r+351*I*Pi*b*d^2*r^2*cs
gn(I*c*x^n)^3+135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+432*I*Pi*b*d*e*r^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-810*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(
I*c*x^n)^2*x^r+432*b*d*e*n*r*x^r+144*b*d*e*n*r^2*x^r+243*I*Pi*b*d^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-12*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-
```

```
12*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-810*I*Pi*b*d*e*r*csgn(I*c*x^n)^
2*csgn(I*c)*x^r-351*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c))/(3+2*r)^2/(3+
r)^2
```

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(x^2*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.37507, size = 1172, normalized size = 11.16

$$\frac{3\left(4\,bd^2r^4+36\,bd^2r^3+117\,bd^2r^2+162\,bd^2r+81\,bd^2\right)x^3\log\left(c\right)+3\left(4\,bd^2nr^4+36\,bd^2nr^3+117\,bd^2nr^2+162\,bd^2nr+81\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/9*(3*(4*b*d^2*r^4 + 36*b*d^2*r^3 + 117*b*d^2*r^2 + 162*b*d^2*r + 81*b*d^2
)*x^3*log(c) + 3*(4*b*d^2*n*r^4 + 36*b*d^2*n*r^3 + 117*b*d^2*n*r^2 + 162*b*
d^2*n*r + 81*b*d^2*n)*x^3*log(x) - (4*(b*d^2*n - 3*a*d^2)*r^4 + 81*b*d^2*n
+ 36*(b*d^2*n - 3*a*d^2)*r^3 - 243*a*d^2 + 117*(b*d^2*n - 3*a*d^2)*r^2 + 16
2*(b*d^2*n - 3*a*d^2)*r)*x^3 + 9*((2*b*e^2*r^3 + 15*b*e^2*r^2 + 36*b*e^2*r
+ 27*b*e^2)*x^3*log(c) + (2*b*e^2*n*r^3 + 15*b*e^2*n*r^2 + 36*b*e^2*n*r + 2
7*b*e^2*n)*x^3*log(x) + (2*a*e^2*r^3 - 9*b*e^2*n + 27*a*e^2 - (b*e^2*n - 15
*a*e^2)*r^2 - 6*(b*e^2*n - 6*a*e^2)*r)*x^3)*x^(2*r) + 18*((4*b*d*e*r^3 + 24
*b*d*e*r^2 + 45*b*d*e*r + 27*b*d*e)*x^3*log(c) + (4*b*d*e*n*r^3 + 24*b*d*e*
n*r^2 + 45*b*d*e*n*r + 27*b*d*e*n)*x^3*log(x) + (4*a*d*e*r^3 - 9*b*d*e*n +
27*a*d*e - 4*(b*d*e*n - 6*a*d*e)*r^2 - 3*(4*b*d*e*n - 15*a*d*e)*r)*x^3)*x^r
)/(4*r^4 + 36*r^3 + 117*r^2 + 162*r + 81)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.2503, size = 1007, normalized size = 9.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*(12*b*d^2*n*r^4*x^3*log(x) + 72*b*d*n*r^3*x^3*x^r*e*log(x) - 4*b*d^2*n*
r^4*x^3 + 12*b*d^2*r^4*x^3*log(c) + 72*b*d*r^3*x^3*x^r*e*log(c) + 108*b*d^2
*n*r^3*x^3*log(x) + 18*b*n*r^3*x^3*x^(2*r)*e^2*log(x) + 432*b*d*n*r^2*x^3*x
^r*e*log(x) - 36*b*d^2*n*r^3*x^3 + 12*a*d^2*r^4*x^3 - 72*b*d*n*r^2*x^3*x^r*
e + 72*a*d*r^3*x^3*x^r*e + 108*b*d^2*r^3*x^3*log(c) + 18*b*r^3*x^3*x^(2*r)*
e^2*log(c) + 432*b*d*r^2*x^3*x^r*e*log(c) + 351*b*d^2*n*r^2*x^3*log(x) + 13
5*b*n*r^2*x^3*x^(2*r)*e^2*log(x) + 810*b*d*n*r*x^3*x^r*e*log(x) - 117*b*d^2
*n*r^2*x^3 + 108*a*d^2*r^3*x^3 - 9*b*n*r^2*x^3*x^(2*r)*e^2 + 18*a*r^3*x^3*x
^(2*r)*e^2 - 216*b*d*n*r*x^3*x^r*e + 432*a*d*r^2*x^3*x^r*e + 351*b*d^2*r^2*
x^3*log(c) + 135*b*r^2*x^3*x^(2*r)*e^2*log(c) + 810*b*d*r*x^3*x^r*e*log(c)
+ 486*b*d^2*n*r*x^3*log(x) + 324*b*n*r*x^3*x^(2*r)*e^2*log(x) + 486*b*d*n*x
^3*x^r*e*log(x) - 162*b*d^2*n*r*x^3 + 351*a*d^2*r^2*x^3 - 54*b*n*r*x^3*x^(2
*r)*e^2 + 135*a*r^2*x^3*x^(2*r)*e^2 - 162*b*d*n*x^3*x^r*e + 810*a*d*r*x^3*x
^r*e + 486*b*d^2*r*x^3*log(c) + 324*b*r*x^3*x^(2*r)*e^2*log(c) + 486*b*d*x^
3*x^r*e*log(c) + 243*b*d^2*n*x^3*log(x) + 243*b*n*x^3*x^(2*r)*e^2*log(x) -
81*b*d^2*n*x^3 + 486*a*d^2*r*x^3 - 81*b*n*x^3*x^(2*r)*e^2 + 324*a*r*x^3*x^(
2*r)*e^2 + 486*a*d*x^3*x^r*e + 243*b*d^2*x^3*log(c) + 243*b*x^3*x^(2*r)*e^2
*log(c) + 243*a*d^2*x^3 + 243*a*x^3*x^(2*r)*e^2)/(4*r^4 + 36*r^3 + 117*r^2
+ 162*r + 81)
```

3.387 $\int (d+ex^r)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=113

$$d^2x(a+b\log(cx^n))+\frac{2dex^{r+1}(a+b\log(cx^n))}{r+1}+\frac{e^2x^{2r+1}(a+b\log(cx^n))}{2r+1}-bd^2nx-\frac{2bdenx^{r+1}}{(r+1)^2}-\frac{be^2nx^{2r+1}}{(2r+1)^2}$$

```
[Out] -(b*d^2*n*x) - (2*b*d*e*n*x^(1 + r))/(1 + r)^2 - (b*e^2*n*x^(1 + 2*r))/(1 +
 2*r)^2 + d^2*x*(a + b*Log[c*x^n]) + (2*d*e*x^(1 + r)*(a + b*Log[c*x^n]))/(
1 + r) + (e^2*x^(1 + 2*r)*(a + b*Log[c*x^n]))/(1 + 2*r)
```

Rubi [A] time = 0.0762582, antiderivative size = 95, normalized size of antiderivative = 0.84, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {244, 2313}

$$\left(d^2x+\frac{2dex^{r+1}}{r+1}+\frac{e^2x^{2r+1}}{2r+1}\right)(a+b\log(cx^n))-bd^2nx-\frac{2bdenx^{r+1}}{(r+1)^2}-\frac{be^2nx^{2r+1}}{(2r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^2*n*x) - (2*b*d*e*n*x^(1 + r))/(1 + r)^2 - (b*e^2*n*x^(1 + 2*r))/(1 +
 2*r)^2 + (d^2*x + (2*d*e*x^(1 + r))/(1 + r) + (e^2*x^(1 + 2*r))/(1 + 2*r))
*(a + b*Log[c*x^n])
```

Rule 244

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\int (d+ex^r)^2 (a+b\log(cx^n))\,dx = \left(d^2x+\frac{2dex^{1+r}}{1+r}+\frac{e^2x^{1+2r}}{1+2r}\right)(a+b\log(cx^n)) - (bn)\int \left(d^2+\frac{2dex^r}{1+r}+\frac{e^2x^{2r}}{1+2r}\right)dx$$
$$= -bd^2nx-\frac{2bdenx^{1+r}}{(1+r)^2}-\frac{be^2nx^{1+2r}}{(1+2r)^2}+\left(d^2x+\frac{2dex^{1+r}}{1+r}+\frac{e^2x^{1+2r}}{1+2r}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.15896, size = 107, normalized size = 0.95

$$x\left(\frac{2dex^r(a+b\log(cx^n))}{r+1}+\frac{e^2x^{2r}(a+b\log(cx^n))}{2r+1}+ad^2+bd^2\log(cx^n)-bd^2n-\frac{2bdenx^r}{(r+1)^2}-\frac{be^2nx^{2r}}{(2r+1)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(a*d^2 - b*d^2*n - (2*b*d*e*n*x^r)/(1 + r)^2 - (b*e^2*n*x^(2*r))/(1 + 2*r
)^2 + b*d^2*Log[c*x^n] + (2*d*e*x^r*(a + b*Log[c*x^n]))/(1 + r) + (e^2*x^(2
*r)*(a + b*Log[c*x^n]))/(1 + 2*r))
```

Maple [C] time = 0.288, size = 1921, normalized size = 17.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n)),x)
```

```
[Out] b*x*(e^2*(x^r)^2*r+2*d^2*r^2+4*d*e*x^r*r+e^2*(x^r)^2+3*d^2*r+2*d*e*x^r+d^2)
/(1+2*r)/(1+r)*ln(x^n)-1/2*x*(8*b*d^2*n*r^4+24*b*d^2*n*r^3-2*ln(c)*b*d^2+10
*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+26*b*d^2*n*r^2+12*b*d
^2*n*r+8*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+13*I*Pi*b*d
^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*a*e^2*r^3*(x^r)^2-10*a*e^2*r^2
*(x^r)^2-2*a*d^2+4*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*a*d
*e*x^r+16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+I*Pi*b*e^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-4*I*Pi*b*e^2*r*csgn(I*x^n)*csg
n(I*c*x^n)^2*(x^r)^2-I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+12*I*Pi*b*d^2*r
^3*csgn(I*c*x^n)^3-4*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+10*I*Pi
*b*d*e*r*csgn(I*c*x^n)^3*x^r+16*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r+12*I*Pi*
b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6*I*Pi*b*d^2*r*csgn(I*x^n)*cs
```

```
gn(I*c*x^n)*csgn(I*c)-8*a*e^2*r*(x^r)^2-26*a*d^2*r^2-12*a*d^2*r-8*a*d^2*r^4
-24*a*d^2*r^3+2*b*d^2*n+I*Pi*b*d^2*csgn(I*c*x^n)^3+4*b*d*e*n*x^r-4*ln(c)*b*
e^2*r^3*(x^r)^2-4*ln(c)*b*d*e*x^r-10*ln(c)*b*e^2*r^2*(x^r)^2-8*ln(c)*b*e^2*
r*(x^r)^2-2*ln(c)*b*e^2*(x^r)^2+2*b*e^2*n*(x^r)^2-26*ln(c)*b*d^2*r^2-12*ln(
c)*b*d^2*r-2*a*e^2*(x^r)^2-8*ln(c)*b*d^2*r^4-24*ln(c)*b*d^2*r^3+2*b*e^2*n*r
^2*(x^r)^2-16*a*d*e*r^3*x^r-32*a*d*e*r^2*x^r-20*a*d*e*r*x^r+4*b*e^2*n*r*(x^
r)^2-5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-5*I*Pi*b*e^2*r^2*
csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^
r-2*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+8*I*Pi*b*d*e*r^3*csgn(
I*c*x^n)^3*x^r-2*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2*I*Pi*b*e^2*r^
3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+6*
I*Pi*b*d^2*r*csgn(I*c*x^n)^3-I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*
d^2*r^4*csgn(I*c*x^n)^3-16*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1
6*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+5*I*Pi*b*e^2*r^2*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-8*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)
^2*x^r-10*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-10*I*Pi*b*d*e*r*csgn
(I*c*x^n)^2*csgn(I*c)*x^r-8*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*
I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2*I*Pi*b*d*e*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+4*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*(x^r)^2-4*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-4*I*Pi*b*
d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^
n)^2-32*ln(c)*b*d*e*r^2*x^r-20*ln(c)*b*d*e*r*x^r-16*ln(c)*b*d*e*r^3*x^r-I*P
i*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6*I*Pi*b*d^2*r*csgn(I*x^n)*csgn
(I*c*x^n)^2-6*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)-13*I*Pi*b*d^2*r^2*csgn
(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi
*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2
+16*b*d*e*n*r*x^r+16*b*d*e*n*r^2*x^r+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)+5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-I*Pi*b*e^2*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^2+2*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+2*I*Pi*b*e^2*r^3*csgn(
I*c*x^n)^3*(x^r)^2+13*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3)/(1+2*r)^2/(1+r)^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.34927, size = 1041, normalized size = 9.21

$$\frac{\left(4\, bd^{2} r^{4} + 12\, bd^{2} r^{3} + 13\, bd^{2} r^{2} + 6\, bd^{2} r + bd^{2}\right) x \log\left(c\right) + \left(4\, bd^{2} n r^{4} + 12\, bd^{2} n r^{3} + 13\, bd^{2} n r^{2} + 6\, bd^{2} n r + bd^{2} n\right) x \log\left(x\right) \cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((4*b*d^2*r^4 + 12*b*d^2*r^3 + 13*b*d^2*r^2 + 6*b*d^2*r + b*d^2)*x*log(c) +
 (4*b*d^2*n*r^4 + 12*b*d^2*n*r^3 + 13*b*d^2*n*r^2 + 6*b*d^2*n*r + b*d^2*n)*
x*log(x) - (4*(b*d^2*n - a*d^2)*r^4 + b*d^2*n + 12*(b*d^2*n - a*d^2)*r^3 -
a*d^2 + 13*(b*d^2*n - a*d^2)*r^2 + 6*(b*d^2*n - a*d^2)*r)*x + ((2*b*e^2*r^3
 + 5*b*e^2*r^2 + 4*b*e^2*r + b*e^2)*x*log(c) + (2*b*e^2*n*r^3 + 5*b*e^2*n*r
^2 + 4*b*e^2*n*r + b*e^2*n)*x*log(x) + (2*a*e^2*r^3 - b*e^2*n + a*e^2 - (b*
e^2*n - 5*a*e^2)*r^2 - 2*(b*e^2*n - 2*a*e^2)*r)*x)*x^(2*r) + 2*((4*b*d*e*r^
3 + 8*b*d*e*r^2 + 5*b*d*e*r + b*d*e)*x*log(c) + (4*b*d*e*n*r^3 + 8*b*d*e*n*
r^2 + 5*b*d*e*n*r + b*d*e*n)*x*log(x) + (4*a*d*e*r^3 - b*d*e*n + a*d*e - 4*
(b*d*e*n - 2*a*d*e)*r^2 - (4*b*d*e*n - 5*a*d*e)*r)*x)*x^r)/(4*r^4 + 12*r^3
+ 13*r^2 + 6*r + 1)
```

Sympy [A] time = 13.4626, size = 211, normalized size = 1.87

$$ad^{2}x + 2ade\left(\begin{cases}\frac{x^{r+1}}{r+1} & \text{for}\ r \neq -1\\ \log\left(x\right) & \text{otherwise}\end{cases}\right) + ae^{2}\left(\begin{cases}\frac{x^{2r+1}}{2r+1} & \text{for}\ 2r \neq -1\\ \log\left(x\right) & \text{otherwise}\end{cases}\right) - bd^{2}nx + bd^{2}x\log\left(cx^{n}\right) - 2bden\left(\begin{cases}\frac{\begin{cases}\frac{xx^{r}}{r+1} & \text{for} \cdots\\ \log\left(x\right) & \text{oth}\cdots\end{cases}}{r+1} & \cdots\\ \frac{\log\left(x\right)^{2}}{2} & \cdots\end{cases}\right)\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**2*x + 2*a*d*e*Piecewise((x**(r + 1)/(r + 1), Ne(r, -1)), (log(x), True
)) + a*e**2*Piecewise((x**(2*r + 1)/(2*r + 1), Ne(2*r, -1)), (log(x), True)
) - b*d**2*n*x + b*d**2*x*log(c*x**n) - 2*b*d*e*n*Piecewise((Piecewise((x*x
**r/(r + 1), Ne(r, -1)), (log(x), True))/(r + 1), (r > -oo) & (r < oo) & Ne
(r, -1)), (log(x)**2/2, True)) + 2*b*d*e*Piecewise((x**(r + 1)/(r + 1), Ne(
r, -1)), (log(x), True))*log(c*x**n) - b*e**2*n*Piecewise((Piecewise((x*x**
(2*r)/(2*r + 1), Ne(r, -1/2)), (log(x), True))/(2*r + 1), (r > -oo) & (r <
oo) & Ne(r, -1/2)), (log(x)**2/2, True)) + b*e**2*Piecewise((x**(2*r + 1)/(
```

```
2*r + 1), Ne(2*r, -1)), (log(x), True))*log(c*x**n)
```

Giac [B] time = 1.32161, size = 329, normalized size = 2.91

$$\frac{2\,bdnrxx^{r}e\log(x)}{r^2+2\,r+1}+bd^2nx\log(x)+\frac{2\,bnrxx^{2\,r}e^2\log(x)}{4\,r^2+4\,r+1}+\frac{2\,bdnxx^{r}e\log(x)}{r^2+2\,r+1}-bd^2nx-\frac{2\,bdnxx^{r}e}{r^2+2\,r+1}+bd^2x\log(c)+\frac{2\,bd}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 2*b*d*n*r*x*x^r*e*log(x)/(r^2 + 2*r + 1) + b*d^2*n*x*log(x) + 2*b*n*r*x*x^(
2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + 2*b*d*n*x*x^r*e*log(x)/(r^2 + 2*r + 1)
- b*d^2*n*x - 2*b*d*n*x*x^r*e/(r^2 + 2*r + 1) + b*d^2*x*log(c) + 2*b*d*x*x^
r*e*log(c)/(r + 1) + b*n*x*x^(2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + a*d^2*x -
 b*n*x*x^(2*r)*e^2/(4*r^2 + 4*r + 1) + 2*a*d*x*x^r*e/(r + 1) + b*x*x^(2*r)*
e^2*log(c)/(2*r + 1) + a*x*x^(2*r)*e^2/(2*r + 1)
```

3.388 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=123

$$-\frac{d^2 (a + b \log (cx^n))}{x} - \frac{2dex^{r-1} (a + b \log (cx^n))}{1-r} - \frac{e^2x^{2r-1} (a + b \log (cx^n))}{1-2r} - \frac{bd^2n}{x} - \frac{2bdenx^{r-1}}{(1-r)^2} - \frac{be^2nx^{2r-1}}{(1-2r)^2}$$

```
[Out] -((b*d^2*n)/x) - (2*b*d*e*n*x^(-1 + r))/(1 - r)^2 - (b*e^2*n*x^(-1 + 2*r))/
(1 - 2*r)^2 - (d^2*(a + b*Log[c*x^n]))/x - (2*d*e*x^(-1 + r)*(a + b*Log[c*x
^n]))/(1 - r) - (e^2*x^(-1 + 2*r)*(a + b*Log[c*x^n]))/(1 - 2*r)
```

Rubi [A] time = 0.166915, antiderivative size = 104, normalized size of antiderivative = 0.85, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {270, 2334, 14}

$$-\left(\frac{d^2}{x} + \frac{2dex^{r-1}}{1-r} + \frac{e^2x^{2r-1}}{1-2r}\right)(a + b \log (cx^n)) - \frac{bd^2n}{x} - \frac{2bdenx^{r-1}}{(1-r)^2} - \frac{be^2nx^{2r-1}}{(1-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^2*n)/x) - (2*b*d*e*n*x^(-1 + r))/(1 - r)^2 - (b*e^2*n*x^(-1 + 2*r))/
(1 - 2*r)^2 - (d^2/x + (2*d*e*x^(-1 + r))/(1 - r) + (e^2*x^(-1 + 2*r))/(1 -
 2*r))*(a + b*Log[c*x^n])
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^2 (a+b\log(cx^n))}{x^2}\,dx = -\left(\frac{d^2}{x}+\frac{2dex^{-1+r}}{1-r}+\frac{e^2x^{-1+2r}}{1-2r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^2+\frac{2dex^r}{-1+r}+\frac{e^2x^{2r}}{-1+2r}}{x^2}\,dx$$
$$= -\left(\frac{d^2}{x}+\frac{2dex^{-1+r}}{1-r}+\frac{e^2x^{-1+2r}}{1-2r}\right)(a+b\log(cx^n))-(bn)\int\left(-\frac{d^2}{x^2}+\frac{2dex^{-2+r}}{-1+r}+\frac{e^2x^{2(-1+}}{-1+2}\right.$$
$$= -\frac{bd^2n}{x}-\frac{2bdenx^{-1+r}}{(1-r)^2}-\frac{be^2nx^{-1+2r}}{(1-2r)^2}-\left(\frac{d^2}{x}+\frac{2dex^{-1+r}}{1-r}+\frac{e^2x^{-1+2r}}{1-2r}\right)(a+b\log(cx^n))$$

Mathematica [A] time = 0.288323, size = 121, normalized size = 0.98

$$\frac{a\left(-d^2+\frac{2dex^r}{r-1}+\frac{e^2x^{2r}}{2r-1}\right)+b\log(cx^n)\left(-d^2+\frac{2dex^r}{r-1}+\frac{e^2x^{2r}}{2r-1}\right)+bn\left(-d^2-\frac{2dex^r}{(r-1)^2}-\frac{e^2x^{2r}}{(1-2r)^2}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (b*n*(-d^2 - (2*d*e*x^r)/(-1 + r)^2 - (e^2*x^(2*r))/(1 - 2*r)^2) + a*(-d^2
+ (2*d*e*x^r)/(-1 + r) + (e^2*x^(2*r))/(-1 + 2*r)) + b*(-d^2 + (2*d*e*x^r)/
(-1 + r) + (e^2*x^(2*r))/(-1 + 2*r))*Log[c*x^n])/x
```

Maple [C] time = 0.23, size = 1927, normalized size = 15.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x^2,x)
```

```
[Out] -b*(-e^2*(x^r)^2*r+2*d^2*r^2-4*d*e*x^r*r+e^2*(x^r)^2-3*d^2*r+2*d*e*x^r+d^2)
/x/(-1+2*r)/(-1+r)*ln(x^n)-1/2*(8*b*d^2*n*r^4-24*b*d^2*n*r^3+2*ln(c)*b*d^2+
10*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+26*b*d^2*n*r^2-12*b
```

```
*d^2*n*r+8*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-4*a*e^2*r
^3*(x^r)^2+10*a*e^2*r^2*(x^r)^2+2*a*d^2+4*a*d*e*x^r-4*I*Pi*b*e^2*r*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^2+I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+
4*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+12*I*Pi*b*d^2*r^3*csgn(I*c*x^n
)^3-4*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+10*I*Pi*b*d*e*r*csgn(I
*c*x^n)^3*x^r+12*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6*I*Pi*
b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-8*a*e^2*r*(x^r)^2+26*a*d^2*r^2-
12*a*d^2*r+8*a*d^2*r^4-24*a*d^2*r^3+2*b*d^2*n-I*Pi*b*d^2*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d^2*csgn(I*
c*x^n)^2*csgn(I*c)+4*b*d*e*n*x^r-4*ln(c)*b*e^2*r^3*(x^r)^2+4*ln(c)*b*d*e*x^
r+10*ln(c)*b*e^2*r^2*(x^r)^2-8*ln(c)*b*e^2*r*(x^r)^2+2*ln(c)*b*e^2*(x^r)^2+
2*b*e^2*n*(x^r)^2+26*ln(c)*b*d^2*r^2-12*ln(c)*b*d^2*r+2*a*e^2*(x^r)^2+8*ln(
c)*b*d^2*r^4-24*ln(c)*b*d^2*r^3-5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^2+2*b*e^2*n*r^2*(x^r)^2-16*a*d*e*r^3*x^r+32*a*d*e*r^2*x^r-2
0*a*d*e*r*x^r-4*b*e^2*n*r*(x^r)^2-2*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c
)*(x^r)^2+8*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r-2*I*Pi*b*e^2*r^3*csgn(I*x^n)
*csgn(I*c*x^n)^2*(x^r)^2-I*Pi*b*d^2*csgn(I*c*x^n)^3-4*I*Pi*b*d^2*r^4*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*
I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*(x^r)^2+5*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2
+5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-16*I*Pi*b*d*e*r^2*csgn(
I*c*x^n)^3*x^r-13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6*I*Pi
*b*d^2*r*csgn(I*c*x^n)^3-13*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+16*I*Pi*b*d*e*r^
2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+16*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*
c)*x^r-8*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-10*I*Pi*b*d*e*r*csg
n(I*x^n)*csgn(I*c*x^n)^2*x^r-10*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-
8*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2*I*Pi*b*d*e*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^r+4*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*
b*d*e*csgn(I*c*x^n)^3*x^r+13*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2*I
*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+4*I*Pi*b*e^2*r*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-4*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3-
I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^
r)^2+32*ln(c)*b*d*e*r^2*x^r-20*ln(c)*b*d*e*r*x^r-16*ln(c)*b*d*e*r^3*x^r-6*I
*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2-6*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn
(I*c)-12*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-12*I*Pi*b*d^2*r^3*csgn(
I*c*x^n)^2*csgn(I*c)+4*I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-16*b*d*e*n*r*x^
r+16*b*d*e*n*r^2*x^r+2*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+13*I*Pi*b*d^2
*r^2*csgn(I*c*x^n)^2*csgn(I*c)-5*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-16*
I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r)/(-1+2*r)^2/x/(-1+r)
^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.36923, size = 1015, normalized size = 8.25

$$-\frac{4\left(bd^2n+ad^2\right)r^4+bd^2n-12\left(bd^2n+ad^2\right)r^3+ad^2+13\left(bd^2n+ad^2\right)r^2-6\left(bd^2n+ad^2\right)r-\left(2\,ae^2r^3-be^2n-ae^2-\left(be^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(4*(b*d^2*n + a*d^2)*r^4 + b*d^2*n - 12*(b*d^2*n + a*d^2)*r^3 + a*d^2 + 13
*(b*d^2*n + a*d^2)*r^2 - 6*(b*d^2*n + a*d^2)*r - (2*a*e^2*r^3 - b*e^2*n - a
*e^2 - (b*e^2*n + 5*a*e^2)*r^2 + 2*(b*e^2*n + 2*a*e^2)*r + (2*b*e^2*r^3 - 5
*b*e^2*r^2 + 4*b*e^2*r - b*e^2)*log(c) + (2*b*e^2*n*r^3 - 5*b*e^2*n*r^2 + 4
*b*e^2*n*r - b*e^2*n)*log(x))*x^(2*r) - 2*(4*a*d*e*r^3 - b*d*e*n - a*d*e -
4*(b*d*e*n + 2*a*d*e)*r^2 + (4*b*d*e*n + 5*a*d*e)*r + (4*b*d*e*r^3 - 8*b*d*
e*r^2 + 5*b*d*e*r - b*d*e)*log(c) + (4*b*d*e*n*r^3 - 8*b*d*e*n*r^2 + 5*b*d*
e*n*r - b*d*e*n)*log(x))*x^r + (4*b*d^2*r^4 - 12*b*d^2*r^3 + 13*b*d^2*r^2 -
 6*b*d^2*r + b*d^2)*log(c) + (4*b*d^2*n*r^4 - 12*b*d^2*n*r^3 + 13*b*d^2*n*r
^2 - 6*b*d^2*n*r + b*d^2*n)*log(x))/((4*r^4 - 12*r^3 + 13*r^2 - 6*r + 1)*x)
```

Sympy [A] time = 32.1023, size = 204, normalized size = 1.66

$$-\frac{ad^2}{x}+2ade\left(\begin{cases}\frac{x^r}{rx-x} & \text{for } r\neq 1\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^2\left(\begin{cases}\frac{x^{2r}}{2rx-x} & \text{for } r\neq \frac{1}{2}\\ \log(x) & \text{otherwise}\end{cases}\right)-\frac{bd^2n}{x}-\frac{bd^2\log(cx^n)}{x}-2bden\left(\ldots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**2/x + 2*a*d*e*Piecewise((x**r/(r*x - x), Ne(r, 1)), (log(x), True)) +
 a*e**2*Piecewise((x**(2*r)/(2*r*x - x), Ne(r, 1/2)), (log(x), True)) - b*d
**2*n/x - b*d**2*log(c*x**n)/x - 2*b*d*e*n*Piecewise((Piecewise((x**r/(r*x
- x), Ne(r, 1)), (log(x), True))/(r - 1), (r > -oo) & (r < oo) & Ne(r, 1)),
 (log(x)**2/2, True)) + 2*b*d*e*Piecewise((x**(r - 1)/(r - 1), Ne(r - 2, -1
)), (log(x), True))*log(c*x**n) - b*e**2*n*Piecewise((Piecewise((x**(2*r)/(
2*r*x - x), Ne(r, 1/2)), (log(x), True))/(2*r - 1), (r > -oo) & (r < oo) &
Ne(r, 1/2)), (log(x)**2/2, True)) + b*e**2*Piecewise((x**(2*r - 1)/(2*r - 1
), Ne(2*r - 2, -1)), (log(x), True))*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^2 (b \log(cx^n) + a)}{x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^2, x)
```

3.389 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=127

$$-\frac{d^2(a+b\log(cx^n))}{3x^3}-\frac{2dex^{r-3}(a+b\log(cx^n))}{3-r}-\frac{e^2x^{2r-3}(a+b\log(cx^n))}{3-2r}-\frac{bd^2n}{9x^3}-\frac{2bdenx^{r-3}}{(3-r)^2}-\frac{be^2nx^{2r-3}}{(3-2r)^2}$$

```
[Out] -(b*d^2*n)/(9*x^3) - (2*b*d*e*n*x^(-3 + r))/(3 - r)^2 - (b*e^2*n*x^(-3 + 2*
r))/(3 - 2*r)^2 - (d^2*(a + b*Log[c*x^n]))/(3*x^3) - (2*d*e*x^(-3 + r)*(a +
 b*Log[c*x^n]))/(3 - r) - (e^2*x^(-3 + 2*r)*(a + b*Log[c*x^n]))/(3 - 2*r)
```

Rubi [A] time = 0.172924, antiderivative size = 109, normalized size of antiderivative = 0.86, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{r-3}}{3-r}+\frac{3e^2x^{2r-3}}{3-2r}\right)(a+b\log(cx^n))-\frac{bd^2n}{9x^3}-\frac{2bdenx^{r-3}}{(3-r)^2}-\frac{be^2nx^{2r-3}}{(3-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^2*n)/(9*x^3) - (2*b*d*e*n*x^(-3 + r))/(3 - r)^2 - (b*e^2*n*x^(-3 + 2*
r))/(3 - 2*r)^2 - ((d^2/x^3 + (6*d*e*x^(-3 + r))/(3 - r) + (3*e^2*x^(-3 + 2
*r))/(3 - 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^2 (a+b\log(cx^n))}{x^4}\,dx = -\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^2+\frac{6dex^r}{-3+r}+\frac{3e^2x^{2r}}{-3+2r}}{3x^4}\,dx$$

$$= -\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int \frac{-d^2+\frac{6dex^r}{-3+r}+\frac{3e^2x^{2r}}{-3+2r}}{x^4}\,dx$$

$$= -\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int \left(-\frac{d^2}{x^4}+\frac{6dex^{-4+r}}{-3+r}+\frac{3\cdots}{\cdots}\right)$$

$$= -\frac{bd^2n}{9x^3}-\frac{2bdenx^{-3+r}}{(3-r)^2}-\frac{be^2nx^{-3+2r}}{(3-2r)^2}-\frac{1}{3}\left(\frac{d^2}{x^3}+\frac{6dex^{-3+r}}{3-r}+\frac{3e^2x^{-3+2r}}{3-2r}\right)(a+b\log(cx^{\cdots}$$

Mathematica [A] time = 0.300047, size = 127, normalized size = 1.

$$\frac{a\left(-3d^2+\frac{18dex^r}{r-3}+\frac{9e^2x^{2r}}{2r-3}\right)+3b\log(cx^n)\left(-d^2+\frac{6dex^r}{r-3}+\frac{3e^2x^{2r}}{2r-3}\right)+bn\left(-d^2-\frac{18dex^r}{(r-3)^2}-\frac{9e^2x^{2r}}{(3-2r)^2}\right)}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] (b*n*(-d^2 - (18*d*e*x^r)/(-3 + r)^2 - (9*e^2*x^(2*r))/(3 - 2*r)^2) + a*(-3
*d^2 + (18*d*e*x^r)/(-3 + r) + (9*e^2*x^(2*r))/(-3 + 2*r)) + 3*b*(-d^2 + (6
*d*e*x^r)/(-3 + r) + (3*e^2*x^(2*r))/(-3 + 2*r))*Log[c*x^n])/(9*x^3)
```

Maple [C] time = 0.244, size = 1930, normalized size = 15.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x^4,x)
```

```
[Out] -1/3*b*(-3*e^2*(x^r)^2*r+2*d^2*r^2-12*d*e*x^r*r+9*e^2*(x^r)^2-9*d^2*r+18*d*
e*x^r+9*d^2)/x^3/(-3+2*r)/(-3+r)*ln(x^n)-1/18*(8*b*d^2*n*r^4-72*b*d^2*n*r^3
+486*ln(c)*b*d^2+810*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2
34*b*d^2*n*r^2-324*b*d^2*n*r-36*a*e^2*r^3*(x^r)^2+270*a*e^2*r^2*(x^r)^2+486
*a*d^2+972*a*d*e*x^r+72*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
x^r-108*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-486*I*Pi*b*d^2*r*csgn(I*
x^n)*csgn(I*c*x^n)^2-486*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b*e
^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-18*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^
2*(x^r)^2-324*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+108*I*Pi*b*d
^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+486*I*Pi*b*d^2*r*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)-648*a*e^2*r*(x^r)^2+702*a*d^2*r^2-972*a*d^2*r+24*a*d^2
*r^4-216*a*d^2*r^3-18*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+162*
b*d^2*n+324*b*d*e*n*x^r-36*ln(c)*b*e^2*r^3*(x^r)^2+972*ln(c)*b*d*e*x^r+270*
ln(c)*b*e^2*r^2*(x^r)^2-648*ln(c)*b*e^2*r*(x^r)^2+486*ln(c)*b*e^2*(x^r)^2+1
62*b*e^2*n*(x^r)^2+702*ln(c)*b*d^2*r^2-972*ln(c)*b*d^2*r+486*a*e^2*(x^r)^2+
24*ln(c)*b*d^2*r^4-216*ln(c)*b*d^2*r^3+72*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^
r+18*b*e^2*n*r^2*(x^r)^2-144*a*d*e*r^3*x^r+864*a*d*e*r^2*x^r-1620*a*d*e*r*x
^r-108*b*e^2*n*r*(x^r)^2-135*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^r)^2+432*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+432*I*Pi*b*
d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-324*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^2+810*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r+12*I*Pi*b*d^2*r^4*csgn(I
*c*x^n)^2*csgn(I*c)+243*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-486*I*
Pi*b*d*e*csgn(I*c*x^n)^3*x^r-243*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^r)^2+135*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-351*I*Pi*
b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+486*I*Pi*b*d*e*csgn(I*x^n)*cs
gn(I*c*x^n)^2*x^r+135*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-12
*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+486*I*Pi*b*d*e*csgn(I*c
*x^n)^2*csgn(I*c)*x^r-432*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^3*x^r-243*I*Pi*b*d^2
*csgn(I*c*x^n)^3+243*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+243*I*Pi*b*d^2*
csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^3-135*I*Pi*b*e^2*
r^2*csgn(I*c*x^n)^3*(x^r)^2+243*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^2+351*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+486*I*Pi*b*d^2*r*csgn(I*
c*x^n)^3+12*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-72*I*Pi*b*d*e*r^3*cs
gn(I*c*x^n)^2*csgn(I*c)*x^r+18*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*(x^r)^2+108*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^3+324*I*Pi*b*e^2*r*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-486*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*x^r-108*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+324*I*Pi*b*e^2
*r*csgn(I*c*x^n)^3*(x^r)^2-243*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-351*I*Pi*
b*d^2*r^2*csgn(I*c*x^n)^3-243*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)-72*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+864*ln(c)*b*d*e*r^2*x^r
```

```
-1620*ln(c)*b*d*e*r*x^r-144*ln(c)*b*d*e*r^3*x^r+351*I*Pi*b*d^2*r^2*csgn(I*c
*x^n)^2*csgn(I*c)-810*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-432*b*d*
e*n*r*x^r+144*b*d*e*n*r^2*x^r-810*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^
r-432*I*Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r)/(-3+2*r)^2/x^
3/(-3+r)^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.39846, size = 1125, normalized size = 8.86

$$-\frac{4\left(bd^2n+3\,ad^2\right)r^4+81\,bd^2n-36\left(bd^2n+3\,ad^2\right)r^3+243\,ad^2+117\left(bd^2n+3\,ad^2\right)r^2-162\left(bd^2n+3\,ad^2\right)r-9\left(2\,ae^2r\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(4*(b*d^2*n + 3*a*d^2)*r^4 + 81*b*d^2*n - 36*(b*d^2*n + 3*a*d^2)*r^3 +
 243*a*d^2 + 117*(b*d^2*n + 3*a*d^2)*r^2 - 162*(b*d^2*n + 3*a*d^2)*r - 9*(2
*a*e^2*r^3 - 9*b*e^2*n - 27*a*e^2 - (b*e^2*n + 15*a*e^2)*r^2 + 6*(b*e^2*n +
 6*a*e^2)*r + (2*b*e^2*r^3 - 15*b*e^2*r^2 + 36*b*e^2*r - 27*b*e^2)*log(c) +
 (2*b*e^2*n*r^3 - 15*b*e^2*n*r^2 + 36*b*e^2*n*r - 27*b*e^2*n)*log(x))*x^(2*
r) - 18*(4*a*d*e*r^3 - 9*b*d*e*n - 27*a*d*e - 4*(b*d*e*n + 6*a*d*e)*r^2 + 3
*(4*b*d*e*n + 15*a*d*e)*r + (4*b*d*e*r^3 - 24*b*d*e*r^2 + 45*b*d*e*r - 27*b
*d*e)*log(c) + (4*b*d*e*n*r^3 - 24*b*d*e*n*r^2 + 45*b*d*e*n*r - 27*b*d*e*n)
*log(x))*x^r + 3*(4*b*d^2*r^4 - 36*b*d^2*r^3 + 117*b*d^2*r^2 - 162*b*d^2*r
+ 81*b*d^2)*log(c) + 3*(4*b*d^2*n*r^4 - 36*b*d^2*n*r^3 + 117*b*d^2*n*r^2 -
162*b*d^2*n*r + 81*b*d^2*n)*log(x))/((4*r^4 - 36*r^3 + 117*r^2 - 162*r + 81
)*x^3)
```

Sympy [A] time = 173.603, size = 235, normalized size = 1.85

$$-\frac{ad^2}{3x^3}+2ade\left(\begin{cases}\frac{x^r}{rx^3-3x^3} & \text{for } r\neq 3\\ \log(x) & \text{otherwise}\end{cases}\right)+ae^2\left(\begin{cases}\frac{x^{2r}}{2rx^3-3x^3} & \text{for } r\neq \frac{3}{2}\\ \log(x) & \text{otherwise}\end{cases}\right)-\frac{bd^2n}{9x^3}-\frac{bd^2\log(cx^n)}{3x^3}-2bden\left(\begin{cases}\frac{\begin{cases}\frac{x^r}{rx^3-3x^3} & \text{for } r \neq \\ \log(x) & \text{other}\end{cases}}{r-3} \\ \frac{\log(x)^2}{2}\end{cases}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] -a*d**2/(3*x**3) + 2*a*d*e*Piecewise((x**r/(r*x**3 - 3*x**3), Ne(r, 3)), (l
og(x), True)) + a*e**2*Piecewise((x**(2*r)/(2*r*x**3 - 3*x**3), Ne(r, 3/2))
, (log(x), True)) - b*d**2*n/(9*x**3) - b*d**2*log(c*x**n)/(3*x**3) - 2*b*d
*e*n*Piecewise((Piecewise((x**r/(r*x**3 - 3*x**3), Ne(r, 3)), (log(x), True
))/(r - 3), (r > -oo) & (r < oo) & Ne(r, 3)), (log(x)**2/2, True)) + 2*b*d*
e*Piecewise((x**(r - 3)/(r - 3), Ne(r - 4, -1)), (log(x), True))*log(c*x**n
) - b*e**2*n*Piecewise((Piecewise((x**(2*r)/(2*r*x**3 - 3*x**3), Ne(r, 3/2)
), (log(x), True))/(2*r - 3), (r > -oo) & (r < oo) & Ne(r, 3/2)), (log(x)**
2/2, True)) + b*e**2*Piecewise((x**(2*r - 3)/(2*r - 3), Ne(2*r - 4, -1)), (
log(x), True))*log(c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r+d)^2(b\log(cx^n)+a)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^4, x)
```

3.390 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^6}\,dx$

Optimal. Leaf size=127

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{5x^5}-\frac{2dex^{r-5}\left(a+b\log\left(cx^n\right)\right)}{5-r}-\frac{e^2x^{2r-5}\left(a+b\log\left(cx^n\right)\right)}{5-2r}-\frac{bd^2n}{25x^5}-\frac{2bdenx^{r-5}}{(5-r)^2}-\frac{be^2nx^{2r-5}}{(5-2r)^2}$$

```
[Out] -(b*d^2*n)/(25*x^5) - (2*b*d*e*n*x^(-5 + r))/(5 - r)^2 - (b*e^2*n*x^(-5 + 2
*r))/(5 - 2*r)^2 - (d^2*(a + b*Log[c*x^n]))/(5*x^5) - (2*d*e*x^(-5 + r)*(a
+ b*Log[c*x^n]))/(5 - r) - (e^2*x^(-5 + 2*r)*(a + b*Log[c*x^n]))/(5 - 2*r)
```

Rubi [A] time = 0.173024, antiderivative size = 109, normalized size of antiderivative = 0.86, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{r-5}}{5-r}+\frac{5e^2x^{2r-5}}{5-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{25x^5}-\frac{2bdenx^{r-5}}{(5-r)^2}-\frac{be^2nx^{2r-5}}{(5-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^2*n)/(25*x^5) - (2*b*d*e*n*x^(-5 + r))/(5 - r)^2 - (b*e^2*n*x^(-5 + 2
*r))/(5 - 2*r)^2 - ((d^2/x^5 + (10*d*e*x^(-5 + r))/(5 - r) + (5*e^2*x^(-5 +
 2*r))/(5 - 2*r))*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)^2 (a+b\log(cx^n))}{x^6}\,dx &= -\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^2+\frac{10dex^r}{-5+r}+\frac{5e^2x^{2r}}{-5+2r}}{5x^6}\,dx\\ &= -\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int \frac{-d^2+\frac{10dex^r}{-5+r}+\frac{5e^2x^{2r}}{-5+2r}}{x^6}\,d\\ &= -\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int\left(-\frac{d^2}{x^6}+\frac{10dex^{-6+r}}{-5+r}+\ldots\right.\\ &= -\frac{bd^2n}{25x^5}-\frac{2bdenx^{-5+r}}{(5-r)^2}-\frac{be^2nx^{-5+2r}}{(5-2r)^2}-\frac{1}{5}\left(\frac{d^2}{x^5}+\frac{10dex^{-5+r}}{5-r}+\frac{5e^2x^{-5+2r}}{5-2r}\right)(a+b\log(cx^n\end{aligned}$$

Mathematica [A] time = 0.29933, size = 127, normalized size = 1.

$$\frac{a\left(-5d^2+\frac{50dex^r}{r-5}+\frac{25e^2x^{2r}}{2r-5}\right)+5b\log(cx^n)\left(-d^2+\frac{10dex^r}{r-5}+\frac{5e^2x^{2r}}{2r-5}\right)+bn\left(-d^2-\frac{50dex^r}{(r-5)^2}-\frac{25e^2x^{2r}}{(5-2r)^2}\right)}{25x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] (b*n*(-d^2 - (50*d*e*x^r)/(-5 + r)^2 - (25*e^2*x^(2*r))/(5 - 2*r)^2) + a*(-
5*d^2 + (50*d*e*x^r)/(-5 + r) + (25*e^2*x^(2*r))/(-5 + 2*r)) + 5*b*(-d^2 +
(10*d*e*x^r)/(-5 + r) + (5*e^2*x^(2*r))/(-5 + 2*r))*Log[c*x^n])/(25*x^5)
```

Maple [C] time = 0.237, size = 1930, normalized size = 15.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/5*b*(-5*e^2*(x^r)^2*r+2*d^2*r^2-20*d*e*x^r*r+25*e^2*(x^r)^2-15*d^2*r+50*
d*e*x^r+25*d^2)/x^5/(-5+2*r)/(-5+r)*ln(x^n)-1/50*(8*b*d^2*n*r^4-120*b*d^2*n
*r^3+6250*ln(c)*b*d^2+200*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*x^r+650*b*d^2*n*r^2-1500*b*d^2*n*r-100*a*e^2*r^3*(x^r)^2+1250*a*e^2*r^2*(
x^r)^2+6250*a*d^2+12500*a*d*e*x^r+6250*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*x^r-3750*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)-2500*I*Pi*b*e^
2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2500*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*c
sgn(I*c)*(x^r)^2+6250*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r+300*I*Pi*b*d^2*r^3*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5000*a*e^2*r*(x^r)^2+3250*a*d^2*r^2-7500
*a*d^2*r+40*a*d^2*r^4-600*a*d^2*r^3+3750*I*Pi*b*d^2*r*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)-50*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1250*b*d
^2*n+2500*b*d*e*n*x^r-100*ln(c)*b*e^2*r^3*(x^r)^2+12500*ln(c)*b*d*e*x^r+125
0*ln(c)*b*e^2*r^2*(x^r)^2-5000*ln(c)*b*e^2*r*(x^r)^2-50*I*Pi*b*e^2*r^3*csgn
(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+6250*ln(c)*b*e^2*(x^r)^2+1250*b*e^2*n*(x^r)
^2+3250*ln(c)*b*d^2*r^2-7500*ln(c)*b*d^2*r+6250*a*e^2*(x^r)^2+40*ln(c)*b*d^
2*r^4-600*ln(c)*b*d^2*r^3-1625*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+6250*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2500*I*Pi*b*e^2*r*cs
gn(I*c*x^n)^3*(x^r)^2+200*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r+300*I*Pi*b*d^2
*r^3*csgn(I*c*x^n)^3+50*b*e^2*n*r^2*(x^r)^2-400*a*d*e*r^3*x^r+4000*a*d*e*r^
2*x^r-12500*a*d*e*r*x^r-500*b*e^2*n*r*(x^r)^2+2000*I*Pi*b*d*e*r^2*csgn(I*x^
n)*csgn(I*c*x^n)^2*x^r-300*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-300*I
*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)-3125*I*Pi*b*d^2*csgn(I*c*x^n)^3-312
5*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3125*I*Pi*b*e^2*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-20*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+6250*I*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2000*I*Pi*b*d*e*
r^2*csgn(I*c*x^n)^3*x^r-1625*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^3+3125*I*Pi*b*d^2
*csgn(I*x^n)*csgn(I*c*x^n)^2+625*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^2+625*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1625*I*Pi*b*d
^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+20*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x
^n)^2+20*I*Pi*b*d^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)-3750*I*Pi*b*d^2*r*csgn(I*
x^n)*csgn(I*c*x^n)^2+3125*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-20*I*Pi*b*d^
2*r^4*csgn(I*c*x^n)^3-3125*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-6250*I*Pi*b*d
*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-6250*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn
(I*c)*x^r-200*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+50*I*Pi*b*e^2*r^
3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2000*I*Pi*b*d*e*r^2*csgn(I*c*
x^n)^2*csgn(I*c)*x^r-6250*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^
r-625*I*Pi*b*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+3750*I*Pi*
b*d^2*r*csgn(I*c*x^n)^3+1625*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)+4000*
ln(c)*b*d*e*r^2*x^r-12500*ln(c)*b*d*e*r*x^r-400*ln(c)*b*d*e*r^3*x^r+3125*I*
Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-6250*I*Pi*b*d*e*csgn(I*c*x^n)^3*
```

```
x^r-625*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+3125*I*Pi*b*e^2*csgn(I*x^n)*
csgn(I*c*x^n)^2*(x^r)^2+2500*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*(x^r)^2-2000*b*d*e*n*r*x^r+400*b*d*e*n*r^2*x^r+50*I*Pi*b*e^2*r^3*csgn(I*
c*x^n)^3*(x^r)^2-200*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2000*I*
Pi*b*d*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r)/(-5+2*r)^2/x^5/(-5+r)
^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.43625, size = 1154, normalized size = 9.09

$$-\frac{4\left(bd^2n+5\,ad^2\right)r^4+625\,bd^2n-60\left(bd^2n+5\,ad^2\right)r^3+3125\,ad^2+325\left(bd^2n+5\,ad^2\right)r^2-750\left(bd^2n+5\,ad^2\right)r-25\left(2\,a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/25*(4*(b*d^2*n + 5*a*d^2)*r^4 + 625*b*d^2*n - 60*(b*d^2*n + 5*a*d^2)*r^3
 + 3125*a*d^2 + 325*(b*d^2*n + 5*a*d^2)*r^2 - 750*(b*d^2*n + 5*a*d^2)*r - 2
5*(2*a*e^2*r^3 - 25*b*e^2*n - 125*a*e^2 - (b*e^2*n + 25*a*e^2)*r^2 + 10*(b*
e^2*n + 10*a*e^2)*r + (2*b*e^2*r^3 - 25*b*e^2*r^2 + 100*b*e^2*r - 125*b*e^2
)*log(c) + (2*b*e^2*n*r^3 - 25*b*e^2*n*r^2 + 100*b*e^2*n*r - 125*b*e^2*n)*l
og(x))*x^(2*r) - 50*(4*a*d*e*r^3 - 25*b*d*e*n - 125*a*d*e - 4*(b*d*e*n + 10
*a*d*e)*r^2 + 5*(4*b*d*e*n + 25*a*d*e)*r + (4*b*d*e*r^3 - 40*b*d*e*r^2 + 12
5*b*d*e*r - 125*b*d*e)*log(c) + (4*b*d*e*n*r^3 - 40*b*d*e*n*r^2 + 125*b*d*e
*n*r - 125*b*d*e*n)*log(x))*x^r + 5*(4*b*d^2*r^4 - 60*b*d^2*r^3 + 325*b*d^2
*r^2 - 750*b*d^2*r + 625*b*d^2)*log(c) + 5*(4*b*d^2*n*r^4 - 60*b*d^2*n*r^3
+ 325*b*d^2*n*r^2 - 750*b*d^2*n*r + 625*b*d^2*n)*log(x))/((4*r^4 - 60*r^3 +
 325*r^2 - 750*r + 625)*x^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^2 (b \log (cx^n) + a)}{x^6} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^6, x)
```

3.391 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=127

$$-\frac{d^2\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{2dex^{r-7}\left(a+b\log\left(cx^n\right)\right)}{7-r}-\frac{e^2x^{2r-7}\left(a+b\log\left(cx^n\right)\right)}{7-2r}-\frac{bd^2n}{49x^7}-\frac{2bdenx^{r-7}}{(7-r)^2}-\frac{be^2nx^{2r-7}}{(7-2r)^2}$$

```
[Out] -(b*d^2*n)/(49*x^7) - (2*b*d*e*n*x^(-7 + r))/(7 - r)^2 - (b*e^2*n*x^(-7 + 2
*r))/(7 - 2*r)^2 - (d^2*(a + b*Log[c*x^n]))/(7*x^7) - (2*d*e*x^(-7 + r)*(a
+ b*Log[c*x^n]))/(7 - r) - (e^2*x^(-7 + 2*r)*(a + b*Log[c*x^n]))/(7 - 2*r)
```

Rubi [A] time = 0.177296, antiderivative size = 109, normalized size of antiderivative = 0.86, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{r-7}}{7-r}+\frac{7e^2x^{2r-7}}{7-2r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{bd^2n}{49x^7}-\frac{2bdenx^{r-7}}{(7-r)^2}-\frac{be^2nx^{2r-7}}{(7-2r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^2*n)/(49*x^7) - (2*b*d*e*n*x^(-7 + r))/(7 - r)^2 - (b*e^2*n*x^(-7 + 2
*r))/(7 - 2*r)^2 - ((d^2/x^7 + (14*d*e*x^(-7 + r))/(7 - r) + (7*e^2*x^(-7 +
 2*r))/(7 - 2*r))*(a + b*Log[c*x^n]))/7
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^2\,(a+b\log(cx^n))}{x^8}\,dx = -\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^2+\frac{14dex^r}{-7+r}+\frac{7e^2x^{2r}}{-7+2r}}{7x^8}\,d$$

$$= -\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)(a+b\log(cx^n))-\frac{1}{7}(bn)\int \frac{-d^2+\frac{14dex^r}{-7+r}+\frac{7e^2x^{2r}}{-7+2r}}{x^8}$$

$$= -\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)(a+b\log(cx^n))-\frac{1}{7}(bn)\int\left(-\frac{d^2}{x^8}+\frac{14dex^{-8+r}}{-7+r}+\right.$$

$$= -\frac{bd^2n}{49x^7}-\frac{2bdenx^{-7+r}}{(7-r)^2}-\frac{be^2nx^{-7+2r}}{(7-2r)^2}-\frac{1}{7}\left(\frac{d^2}{x^7}+\frac{14dex^{-7+r}}{7-r}+\frac{7e^2x^{-7+2r}}{7-2r}\right)(a+b\log(c$$

Mathematica [A] time = 0.291135, size = 127, normalized size = 1.

$$\frac{a\left(-7d^2+\frac{98dex^r}{r-7}+\frac{49e^2x^{2r}}{2r-7}\right)+7b\log(cx^n)\left(-d^2+\frac{14dex^r}{r-7}+\frac{7e^2x^{2r}}{2r-7}\right)+bn\left(-d^2-\frac{98dex^r}{(r-7)^2}-\frac{49e^2x^{2r}}{(7-2r)^2}\right)}{49x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (b*n*(-d^2 - (98*d*e*x^r)/(-7 + r)^2 - (49*e^2*x^(2*r))/(7 - 2*r)^2) + a*(-
7*d^2 + (98*d*e*x^r)/(-7 + r) + (49*e^2*x^(2*r))/(-7 + 2*r)) + 7*b*(-d^2 +
(14*d*e*x^r)/(-7 + r) + (7*e^2*x^(2*r))/(-7 + 2*r))*Log[c*x^n])/(49*x^7)
```

Maple [C] time = 0.242, size = 1930, normalized size = 15.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x^8,x)
```

```
[Out] -1/7*b*(-7*e^2*(x^r)^2*r+2*d^2*r^2-28*d*e*x^r*r+49*e^2*(x^r)^2-21*d^2*r+98*
d*e*x^r+49*d^2)/x^7/(-7+2*r)/(-7+r)*ln(x^n)-1/98*(8*b*d^2*n*r^4-168*b*d^2*n
*r^3+33614*ln(c)*b*d^2+1274*b*d^2*n*r^2-4116*b*d^2*n*r-196*a*e^2*r^3*(x^r)^
2+3430*a*e^2*r^2*(x^r)^2+33614*a*d^2-98*I*Pi*b*e^2*r^3*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^2+392*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^3*x^r+33614*I*Pi*b*d*e*csgn(
I*c*x^n)^2*csgn(I*c)*x^r+67228*a*d*e*x^r-16807*I*Pi*b*d^2*csgn(I*c*x^n)^3-1
9208*a*e^2*r*(x^r)^2+8918*a*d^2*r^2-28812*a*d^2*r+56*a*d^2*r^4-1176*a*d^2*r
^3+392*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+4802*b*d^2*n+
9604*b*d*e*n*x^r-196*ln(c)*b*e^2*r^3*(x^r)^2+67228*ln(c)*b*d*e*x^r+3430*ln(
c)*b*e^2*r^2*(x^r)^2-19208*ln(c)*b*e^2*r*(x^r)^2+33614*ln(c)*b*e^2*(x^r)^2+
4802*b*e^2*n*(x^r)^2+8918*ln(c)*b*d^2*r^2-28812*ln(c)*b*d^2*r+33614*a*e^2*(
x^r)^2+56*ln(c)*b*d^2*r^4-1176*ln(c)*b*d^2*r^3-9604*I*Pi*b*e^2*r*csgn(I*x^n
)*csgn(I*c*x^n)^2*(x^r)^2-9604*I*Pi*b*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)
^2+24010*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r-5488*I*Pi*b*d*e*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*x^r+98*b*e^2*n*r^2*(x^r)^2-784*a*d*e*r^3*x^r+10976*a
*d*e*r^2*x^r-48020*a*d*e*r*x^r-1372*b*e^2*n*r*(x^r)^2+5488*I*Pi*b*d*e*r^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2*x^r+5488*I*Pi*b*d*e*r^2*csgn(I*c*x^n)^2*csgn(I*c
)*x^r-33614*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-98*I*Pi*b*e^
2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1715*I*Pi*b*e^2*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2*(x^r)^2+1715*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
2-16807*I*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+588*I*Pi*b*d
^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+14406*I*Pi*b*d^2*r*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)-28*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+16807*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+588*I*Pi*b*d^2*r^3*csgn(I*c*
x^n)^3-1715*I*Pi*b*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2+16807*I*Pi*b*e^2*csgn(I*
x^n)*csgn(I*c*x^n)^2*(x^r)^2-16807*I*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+28*I*Pi*b*d^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-5488*I*Pi*b*d*e*r^2*cs
gn(I*c*x^n)^3*x^r-4459*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3
3614*I*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-14406*I*Pi*b*d^2*r*csgn(I*x
^n)*csgn(I*c*x^n)^2-14406*I*Pi*b*d^2*r*csgn(I*c*x^n)^2*csgn(I*c)-24010*I*Pi
*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-392*I*Pi*b*d*e*r^3*csgn(I*c*x^n)^2*c
sgn(I*c)*x^r+98*I*Pi*b*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+
24010*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+14406*I*Pi*b*d^2
*r*csgn(I*c*x^n)^3+16807*I*Pi*b*d^2*csgn(I*c*x^n)^2*csgn(I*c)-28*I*Pi*b*d^2
*r^4*csgn(I*c*x^n)^3-16807*I*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-4459*I*Pi*b*d
^2*r^2*csgn(I*c*x^n)^3-588*I*Pi*b*d^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)+9604*I*
Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+16807*I*Pi*b*e^2*csgn(I*c*x^n)^2*csgn(I*
c)*(x^r)^2+10976*ln(c)*b*d*e*r^2*x^r-48020*ln(c)*b*d*e*r*x^r-784*ln(c)*b*d*
e*r^3*x^r+9604*I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-392
*I*Pi*b*d*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+28*I*Pi*b*d^2*r^4*csgn(I*c*
```

```
x^n)^2*csgn(I*c)-588*I*Pi*b*d^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-5488*b*d*e*
n*r*x^r+784*b*d*e*n*r^2*x^r-33614*I*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+98*I*Pi*b*
e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2+4459*I*Pi*b*d^2*r^2*csgn(I*x^n)*csgn(I*c*x^
n)^2+4459*I*Pi*b*d^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)-1715*I*Pi*b*e^2*r^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-24010*I*Pi*b*d*e*r*csgn(I*x^n)*csgn
(I*c*x^n)^2*x^r)/(-7+2*r)^2/x^7/(-7+r)^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [B] time = 1.44413, size = 1166, normalized size = 9.18

$$-\frac{4\left(bd^2n+7\,ad^2\right)r^4+2401\,bd^2n-84\left(bd^2n+7\,ad^2\right)r^3+16807\,ad^2+637\left(bd^2n+7\,ad^2\right)r^2-2058\left(bd^2n+7\,ad^2\right)r-49}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")

[Out] -1/49*(4*(b*d^2*n + 7*a*d^2)*r^4 + 2401*b*d^2*n - 84*(b*d^2*n + 7*a*d^2)*r^
3 + 16807*a*d^2 + 637*(b*d^2*n + 7*a*d^2)*r^2 - 2058*(b*d^2*n + 7*a*d^2)*r
- 49*(2*a*e^2*r^3 - 49*b*e^2*n - 343*a*e^2 - (b*e^2*n + 35*a*e^2)*r^2 + 14*
(b*e^2*n + 14*a*e^2)*r + (2*b*e^2*r^3 - 35*b*e^2*r^2 + 196*b*e^2*r - 343*b*
e^2)*log(c) + (2*b*e^2*n*r^3 - 35*b*e^2*n*r^2 + 196*b*e^2*n*r - 343*b*e^2*n
)*log(x))*x^(2*r) - 98*(4*a*d*e*r^3 - 49*b*d*e*n - 343*a*d*e - 4*(b*d*e*n +
 14*a*d*e)*r^2 + 7*(4*b*d*e*n + 35*a*d*e)*r + (4*b*d*e*r^3 - 56*b*d*e*r^2 +
 245*b*d*e*r - 343*b*d*e)*log(c) + (4*b*d*e*n*r^3 - 56*b*d*e*n*r^2 + 245*b*
d*e*n*r - 343*b*d*e*n)*log(x))*x^r + 7*(4*b*d^2*r^4 - 84*b*d^2*r^3 + 637*b*
d^2*r^2 - 2058*b*d^2*r + 2401*b*d^2)*log(c) + 7*(4*b*d^2*n*r^4 - 84*b*d^2*n
*r^3 + 637*b*d^2*n*r^2 - 2058*b*d^2*n*r + 2401*b*d^2*n)*log(x))/((4*r^4 - 8
4*r^3 + 637*r^2 - 2058*r + 2401)*x^7)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**2*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^2(b\log(cx^n) + a)}{x^8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x^8,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(b*log(c*x^n) + a)/x^8, x)
```

3.392 $\int x^5 (d+ex^r)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=147

$$\frac{1}{6}\left(\frac{18d^2ex^{r+6}}{r+6}+d^3x^6+\frac{9de^2x^{2(r+3)}}{r+3}+\frac{2e^3x^{3(r+2)}}{r+2}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+6}}{(r+6)^2}-\frac{1}{36}bd^3nx^6-\frac{3bde^2nx^{2(r+3)}}{4(r+3)^2}-\frac{be^3nx^{3(}}{9(r+2}$$

```
[Out] -(b*d^3*n*x^6)/36 - (b*e^3*n*x^(3*(2 + r)))/(9*(2 + r)^2) - (3*b*d*e^2*n*x^
(2*(3 + r)))/(4*(3 + r)^2) - (3*b*d^2*e*n*x^(6 + r))/(6 + r)^2 + ((d^3*x^6
+ (2*e^3*x^(3*(2 + r)))/(2 + r) + (9*d*e^2*x^(2*(3 + r)))/(3 + r) + (18*d^2
*e*x^(6 + r))/(6 + r))*(a + b*Log[c*x^n]))/6
```

Rubi [A] time = 0.38107, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{6}\left(\frac{18d^2ex^{r+6}}{r+6}+d^3x^6+\frac{9de^2x^{2(r+3)}}{r+3}+\frac{2e^3x^{3(r+2)}}{r+2}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+6}}{(r+6)^2}-\frac{1}{36}bd^3nx^6-\frac{3bde^2nx^{2(r+3)}}{4(r+3)^2}-\frac{be^3nx^{3(}}{9(r+2}$$

Antiderivative was successfully verified.

```
[In] Int[x^5*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^6)/36 - (b*e^3*n*x^(3*(2 + r)))/(9*(2 + r)^2) - (3*b*d*e^2*n*x^
(2*(3 + r)))/(4*(3 + r)^2) - (3*b*d^2*e*n*x^(6 + r))/(6 + r)^2 + ((d^3*x^6
+ (2*e^3*x^(3*(2 + r)))/(2 + r) + (9*d*e^2*x^(2*(3 + r)))/(3 + r) + (18*d^2
*e*x^(6 + r))/(6 + r))*(a + b*Log[c*x^n]))/6
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^5 (d+ex^r)^3 (a+b\log(cx^n))\,dx = \frac{1}{6}\left(d^3x^6+\frac{2e^3x^{3(2+r)}}{2+r}+\frac{9de^2x^{2(3+r)}}{3+r}+\frac{18d^2ex^{6+r}}{6+r}\right)(a+b\log(cx^n))-(bn)\int\frac{1}{6}x^5\Big(d^3$$

$$=\frac{1}{6}\left(d^3x^6+\frac{2e^3x^{3(2+r)}}{2+r}+\frac{9de^2x^{2(3+r)}}{3+r}+\frac{18d^2ex^{6+r}}{6+r}\right)(a+b\log(cx^n))-\frac{1}{6}(bn)\int x^5\Big(d^3$$

$$=\frac{1}{6}\left(d^3x^6+\frac{2e^3x^{3(2+r)}}{2+r}+\frac{9de^2x^{2(3+r)}}{3+r}+\frac{18d^2ex^{6+r}}{6+r}\right)(a+b\log(cx^n))-\frac{1}{6}(bn)\int\Big(d^3x^5$$

$$=-\frac{1}{36}bd^3nx^6-\frac{be^3nx^{3(2+r)}}{9(2+r)^2}-\frac{3bde^2nx^{2(3+r)}}{4(3+r)^2}-\frac{3bd^2enx^{6+r}}{(6+r)^2}+\frac{1}{6}\Big(d^3x^6+\frac{2e^3x^{3(2+r)}}{2+r}+$$

Mathematica [A] time = 0.377303, size = 172, normalized size = 1.17

$$\frac{1}{36}x^6\left(6a\left(\frac{18d^2ex^r}{r+6}+d^3+\frac{9de^2x^{2r}}{r+3}+\frac{2e^3x^{3r}}{r+2}\right)+6b\log(cx^n)\left(\frac{18d^2ex^r}{r+6}+d^3+\frac{9de^2x^{2r}}{r+3}+\frac{2e^3x^{3r}}{r+2}\right)+bn\Big(-\frac{108d^2ex^r}{(r+6)^2}-d^3-$$

Antiderivative was successfully verified.

```
[In] Integrate[x^5*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^6*(b*n*(-d^3 - (108*d^2*e*x^r)/(6 + r)^2 - (27*d*e^2*x^(2*r))/(3 + r)^2
- (4*e^3*x^(3*r))/(2 + r)^2) + 6*a*(d^3 + (18*d^2*e*x^r)/(6 + r) + (9*d*e^2
*x^(2*r))/(3 + r) + (2*e^3*x^(3*r))/(2 + r)) + 6*b*(d^3 + (18*d^2*e*x^r)/(6
 + r) + (9*d*e^2*x^(2*r))/(3 + r) + (2*e^3*x^(3*r))/(2 + r))*Log[c*x^n]))/3
6
```

Maple [C] time = 0.398, size = 4021, normalized size = 27.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(d+e*x^r)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/6*x^6*b*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+18*e^3*r*(x^r)^3+d^3*r^3+1
8*d^2*e*r^2*x^r+72*d*e^2*r*(x^r)^2+36*e^3*(x^r)^3+11*d^3*r^2+90*d^2*e*r*x^r
+108*d*e^2*(x^r)^2+36*d^3*r+108*d^2*e*x^r+36*d^3)/(2+r)/(3+r)/(6+r)*ln(x^n)
-1/36*x^6*(-7776*a*d^3+3672*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^2-15228*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3888*I*P
i*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-7776*a*e^3*(x^r)^3+2592*I*Pi*b*d^3*r^3*csgn
(I*c*x^n)^3+6264*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+7776*I*Pi*b*d^3*r*csgn(I*c*
x^n)^3-3888*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-7776*ln(c)*b*d^3-5238*I*
Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-12312*I*Pi*b*d*e^2*r^2*csgn(I*
x^n)*csgn(I*c*x^n)^2*(x^r)^2+21384*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-11664
*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-11664*I*Pi*b*d*e^2*csgn(I
*c*x^n)^2*csgn(I*c)*(x^r)^2+b*d^3*n*r^6+22*b*d^3*n*r^5+193*b*d^3*n*r^4-6*a*
d^3*r^6-132*a*d^3*r^5-1158*a*d^3*r^4-3888*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^3+6*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+120*I*Pi*b*e^3*r^4*c
sgn(I*c*x^n)^3*(x^r)^3+5832*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-3888*I*Pi*
b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+11664*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*
(x^r)^2+21384*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+513*I*
Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-12*a*e^3*r^5*(x^
r)^3-240*a*e^3*r^4*(x^r)^3-23328*a*d*e^2*(x^r)^2-23328*a*d^2*e*x^r+1296*b*e
^3*n*(x^r)^3-1836*a*e^3*r^3*(x^r)^3-6696*a*e^3*r^2*(x^r)^3-11664*a*e^3*r*(x
^r)^3-7776*ln(c)*b*e^3*(x^r)^3+864*b*d^3*n*r^3+2088*b*d^3*n*r^2+2592*b*d^3*
n*r-6*ln(c)*b*d^3*r^6-132*ln(c)*b*d^3*r^5-1158*ln(c)*b*d^3*r^4-5184*ln(c)*b
*d^3*r^3-12528*ln(c)*b*d^3*r^2-15552*ln(c)*b*d^3*r-5184*a*d^3*r^3-12528*a*d
^3*r^2-15552*a*d^3*r-38880*a*d*e^2*r*(x^r)^2-10476*a*d^2*e*r^3*x^r-30456*a*
d^2*e*r^2*x^r-42768*a*d^2*e*r*x^r-3672*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csg
n(I*c)*(x^r)^2-513*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+6*I*P
i*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+1296*b*d^3*n-54*I*P
i*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3672*I*Pi*b*d*e^2*r^3*csgn(I*
x^n)*csgn(I*c*x^n)^2*(x^r)^2-918*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^3-6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-6*I*Pi*b*e^3*r^
5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^
r)^2-120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-120*I*Pi*b*e^3*
r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-240*ln(c)*b*e^3*r^4*(x^r)^3-1836*ln(c
)*b*e^3*r^3*(x^r)^3-6696*ln(c)*b*e^3*r^2*(x^r)^3-11664*ln(c)*b*e^3*r*(x^r)^
3-23328*ln(c)*b*d^2*e*x^r-23328*ln(c)*b*d*e^2*(x^r)^2+468*b*e^3*n*r^2*(x^r)
^3+1296*b*e^3*n*r*(x^r)^3+3888*b*d*e^2*n*(x^r)^2+3888*b*d^2*e*n*x^r-7344*a*
d*e^2*r^3*(x^r)^2-24624*a*d*e^2*r^2*(x^r)^2+4*b*e^3*n*r^4*(x^r)^3+72*b*e^3*
n*r^3*(x^r)^3-54*a*d*e^2*r^5*(x^r)^2-1026*a*d*e^2*r^4*(x^r)^2-108*a*d^2*e*r
^5*x^r-1728*a*d^2*e*r^4*x^r-12*ln(c)*b*e^3*r^5*(x^r)^3+3888*I*Pi*b*d^3*csgn
(I*c*x^n)^3+2376*b*d*e^2*n*r^2*(x^r)^2+3996*b*d^2*e*n*r^2*x^r+864*I*Pi*b*d^
```

2*e*r^4*csgn(I*c*x^n)^3*x^r+3672*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-3348*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-3348*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+513*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+12312*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+15228*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+19440*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+5238*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-864*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-864*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r+918*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+11664*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+11664*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2592*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6264*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+7776*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+5184*b*d*e^2*n*r*(x^r)^2+6480*b*d^2*e*n*r*x^r+27*b*d*e^2*n*r^4*(x^r)^2+432*b*d*e^2*n*r^3*(x^r)^2+108*b*d^2*e*n*r^4*x^r+1080*b*d^2*e*n*r^3*x^r-54*ln(c)*b*d*e^2*r^5*(x^r)^2-1026*ln(c)*b*d*e^2*r^4*(x^r)^2-108*ln(c)*b*d^2*e*r^5*x^r-1728*ln(c)*b*d^2*e*r^4*x^r+918*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+3348*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3-12312*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+5832*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+54*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r+5238*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+12312*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-5832*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-5832*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-10476*ln(c)*b*d^2*e*r^3*x^r-30456*ln(c)*b*d^2*e*r^2*x^r-42768*ln(c)*b*d^2*e*r*x^r-7344*ln(c)*b*d*e^2*r^3*(x^r)^2-24624*ln(c)*b*d*e^2*r^2*(x^r)^2-38880*ln(c)*b*d*e^2*r*(x^r)^2-3888*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-7776*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+3888*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3348*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-5238*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-66*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-11664*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-11664*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-918*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-6264*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-6264*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-7776*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-15228*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+864*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3+579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+11664*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+15228*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+19440*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+3888*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+3*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^

```
n)*csgn(I*c)+66*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+579*I*Pi
*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-19440*I*Pi*b*d*e^2*r*csgn(I*
c*x^n)^2*csgn(I*c)*(x^r)^2-21384*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2
*x^r-21384*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-54*I*Pi*b*d^2*e*r^5
*csgn(I*c*x^n)^2*csgn(I*c)*x^r-513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^2-19440*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2592*
I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-2592*I*Pi*b*d^3*r^3*csgn(I*c*x^n
)^2*csgn(I*c))/(2+r)^2/(3+r)^2/(6+r)^2
```

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(x^5*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.39827, size = 2402, normalized size = 16.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/36*(6*(b*d^3*r^6 + 22*b*d^3*r^5 + 193*b*d^3*r^4 + 864*b*d^3*r^3 + 2088*b*
d^3*r^2 + 2592*b*d^3*r + 1296*b*d^3)*x^6*log(c) + 6*(b*d^3*n*r^6 + 22*b*d^3
*n*r^5 + 193*b*d^3*n*r^4 + 864*b*d^3*n*r^3 + 2088*b*d^3*n*r^2 + 2592*b*d^3*
n*r + 1296*b*d^3*n)*x^6*log(x) - ((b*d^3*n - 6*a*d^3)*r^6 + 22*(b*d^3*n - 6
*a*d^3)*r^5 + 1296*b*d^3*n + 193*(b*d^3*n - 6*a*d^3)*r^4 - 7776*a*d^3 + 864
*(b*d^3*n - 6*a*d^3)*r^3 + 2088*(b*d^3*n - 6*a*d^3)*r^2 + 2592*(b*d^3*n - 6
*a*d^3)*r)*x^6 + 4*(3*(b*e^3*r^5 + 20*b*e^3*r^4 + 153*b*e^3*r^3 + 558*b*e^3
*r^2 + 972*b*e^3*r + 648*b*e^3)*x^6*log(c) + 3*(b*e^3*n*r^5 + 20*b*e^3*n*r^
4 + 153*b*e^3*n*r^3 + 558*b*e^3*n*r^2 + 972*b*e^3*n*r + 648*b*e^3*n)*x^6*lo
g(x) + (3*a*e^3*r^5 - 324*b*e^3*n - (b*e^3*n - 60*a*e^3)*r^4 + 1944*a*e^3 -
 9*(2*b*e^3*n - 51*a*e^3)*r^3 - 9*(13*b*e^3*n - 186*a*e^3)*r^2 - 324*(b*e^3
*n - 9*a*e^3)*r)*x^6)*x^(3*r) + 27*(2*(b*d*e^2*r^5 + 19*b*d*e^2*r^4 + 136*b
*d*e^2*r^3 + 456*b*d*e^2*r^2 + 720*b*d*e^2*r + 432*b*d*e^2)*x^6*log(c) + 2*
```

```
(b*d*e^2*n*r^5 + 19*b*d*e^2*n*r^4 + 136*b*d*e^2*n*r^3 + 456*b*d*e^2*n*r^2 +
 720*b*d*e^2*n*r + 432*b*d*e^2*n)*x^6*log(x) + (2*a*d*e^2*r^5 - 144*b*d*e^2
*n - (b*d*e^2*n - 38*a*d*e^2)*r^4 + 864*a*d*e^2 - 16*(b*d*e^2*n - 17*a*d*e^
2)*r^3 - 8*(11*b*d*e^2*n - 114*a*d*e^2)*r^2 - 96*(2*b*d*e^2*n - 15*a*d*e^2)
*r)*x^6)*x^(2*r) + 108*((b*d^2*e*r^5 + 16*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 28
2*b*d^2*e*r^2 + 396*b*d^2*e*r + 216*b*d^2*e)*x^6*log(c) + (b*d^2*e*n*r^5 +
16*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 + 282*b*d^2*e*n*r^2 + 396*b*d^2*e*n*r +
 216*b*d^2*e*n)*x^6*log(x) + (a*d^2*e*r^5 - 36*b*d^2*e*n - (b*d^2*e*n - 16*
a*d^2*e)*r^4 + 216*a*d^2*e - (10*b*d^2*e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*
n - 282*a*d^2*e)*r^2 - 12*(5*b*d^2*e*n - 33*a*d^2*e)*r)*x^6)*x^r)/(r^6 + 22
*r^5 + 193*r^4 + 864*r^3 + 2088*r^2 + 2592*r + 1296)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.62734, size = 2141, normalized size = 14.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/36*(6*b*d^3*n*r^6*x^6*log(x) + 108*b*d^2*n*r^5*x^6*x^r*e*log(x) - b*d^3*n
*r^6*x^6 + 6*b*d^3*r^6*x^6*log(c) + 108*b*d^2*r^5*x^6*x^r*e*log(c) + 132*b*
d^3*n*r^5*x^6*log(x) + 54*b*d*n*r^5*x^6*x^(2*r)*e^2*log(x) + 1728*b*d^2*n*r
^4*x^6*x^r*e*log(x) - 22*b*d^3*n*r^5*x^6 + 6*a*d^3*r^6*x^6 - 108*b*d^2*n*r^
4*x^6*x^r*e + 108*a*d^2*r^5*x^6*x^r*e + 132*b*d^3*r^5*x^6*log(c) + 54*b*d*r
^5*x^6*x^(2*r)*e^2*log(c) + 1728*b*d^2*r^4*x^6*x^r*e*log(c) + 1158*b*d^3*n*
r^4*x^6*log(x) + 12*b*n*r^5*x^6*x^(3*r)*e^3*log(x) + 1026*b*d*n*r^4*x^6*x^(
2*r)*e^2*log(x) + 10476*b*d^2*n*r^3*x^6*x^r*e*log(x) - 193*b*d^3*n*r^4*x^6
+ 132*a*d^3*r^5*x^6 - 27*b*d*n*r^4*x^6*x^(2*r)*e^2 + 54*a*d*r^5*x^6*x^(2*r)
```

```
*e^2 - 1080*b*d^2*n*r^3*x^6*x^r*e + 1728*a*d^2*r^4*x^6*x^r*e + 1158*b*d^3*r
^4*x^6*log(c) + 12*b*r^5*x^6*x^(3*r)*e^3*log(c) + 1026*b*d*r^4*x^6*x^(2*r)*
e^2*log(c) + 10476*b*d^2*r^3*x^6*x^r*e*log(c) + 5184*b*d^3*n*r^3*x^6*log(x)
 + 240*b*n*r^4*x^6*x^(3*r)*e^3*log(x) + 7344*b*d*n*r^3*x^6*x^(2*r)*e^2*log(
x) + 30456*b*d^2*n*r^2*x^6*x^r*e*log(x) - 864*b*d^3*n*r^3*x^6 + 1158*a*d^3*
r^4*x^6 - 4*b*n*r^4*x^6*x^(3*r)*e^3 + 12*a*r^5*x^6*x^(3*r)*e^3 - 432*b*d*n*
r^3*x^6*x^(2*r)*e^2 + 1026*a*d*r^4*x^6*x^(2*r)*e^2 - 3996*b*d^2*n*r^2*x^6*x
^r*e + 10476*a*d^2*r^3*x^6*x^r*e + 5184*b*d^3*r^3*x^6*log(c) + 240*b*r^4*x^
6*x^(3*r)*e^3*log(c) + 7344*b*d*r^3*x^6*x^(2*r)*e^2*log(c) + 30456*b*d^2*r^
2*x^6*x^r*e*log(c) + 12528*b*d^3*n*r^2*x^6*log(x) + 1836*b*n*r^3*x^6*x^(3*r
)*e^3*log(x) + 24624*b*d*n*r^2*x^6*x^(2*r)*e^2*log(x) + 42768*b*d^2*n*r*x^6
*x^r*e*log(x) - 2088*b*d^3*n*r^2*x^6 + 5184*a*d^3*r^3*x^6 - 72*b*n*r^3*x^6*
x^(3*r)*e^3 + 240*a*r^4*x^6*x^(3*r)*e^3 - 2376*b*d*n*r^2*x^6*x^(2*r)*e^2 +
7344*a*d*r^3*x^6*x^(2*r)*e^2 - 6480*b*d^2*n*r*x^6*x^r*e + 30456*a*d^2*r^2*x
^6*x^r*e + 12528*b*d^3*r^2*x^6*log(c) + 1836*b*r^3*x^6*x^(3*r)*e^3*log(c) +
 24624*b*d*r^2*x^6*x^(2*r)*e^2*log(c) + 42768*b*d^2*r*x^6*x^r*e*log(c) + 15
552*b*d^3*n*r*x^6*log(x) + 6696*b*n*r^2*x^6*x^(3*r)*e^3*log(x) + 38880*b*d*
n*r*x^6*x^(2*r)*e^2*log(x) + 23328*b*d^2*n*x^6*x^r*e*log(x) - 2592*b*d^3*n*
r*x^6 + 12528*a*d^3*r^2*x^6 - 468*b*n*r^2*x^6*x^(3*r)*e^3 + 1836*a*r^3*x^6*
x^(3*r)*e^3 - 5184*b*d*n*r*x^6*x^(2*r)*e^2 + 24624*a*d*r^2*x^6*x^(2*r)*e^2
- 3888*b*d^2*n*x^6*x^r*e + 42768*a*d^2*r*x^6*x^r*e + 15552*b*d^3*r*x^6*log(
c) + 6696*b*r^2*x^6*x^(3*r)*e^3*log(c) + 38880*b*d*r*x^6*x^(2*r)*e^2*log(c)
 + 23328*b*d^2*x^6*x^r*e*log(c) + 7776*b*d^3*n*x^6*log(x) + 11664*b*n*r*x^6
*x^(3*r)*e^3*log(x) + 23328*b*d*n*x^6*x^(2*r)*e^2*log(x) - 1296*b*d^3*n*x^6
 + 15552*a*d^3*r*x^6 - 1296*b*n*r*x^6*x^(3*r)*e^3 + 6696*a*r^2*x^6*x^(3*r)*
e^3 - 3888*b*d*n*x^6*x^(2*r)*e^2 + 38880*a*d*r*x^6*x^(2*r)*e^2 + 23328*a*d^
2*x^6*x^r*e + 7776*b*d^3*x^6*log(c) + 11664*b*r*x^6*x^(3*r)*e^3*log(c) + 23
328*b*d*x^6*x^(2*r)*e^2*log(c) + 7776*b*n*x^6*x^(3*r)*e^3*log(x) + 7776*a*d
^3*x^6 - 1296*b*n*x^6*x^(3*r)*e^3 + 11664*a*r*x^6*x^(3*r)*e^3 + 23328*a*d*x
^6*x^(2*r)*e^2 + 7776*b*x^6*x^(3*r)*e^3*log(c) + 7776*a*x^6*x^(3*r)*e^3)/(r
^6 + 22*r^5 + 193*r^4 + 864*r^3 + 2088*r^2 + 2592*r + 1296)
```

3.393 $\int x^3 (d + ex^r)^3 (a + b\log(cx^n))\, dx$

Optimal. Leaf size=149

$$\frac{1}{4}\left(\frac{12d^2ex^{r+4}}{r+4} + d^3x^4 + \frac{6de^2x^{2(r+2)}}{r+2} + \frac{4e^3x^{3r+4}}{3r+4}\right)(a + b\log(cx^n)) - \frac{3bd^2enx^{r+4}}{(r+4)^2} - \frac{1}{16}bd^3nx^4 - \frac{3bde^2nx^{2(r+2)}}{4(r+2)^2} - \frac{be^3nx^{3r+4}}{(3r+4)^2}$$

```
[Out] -(b*d^3*n*x^4)/16 - (3*b*d*e^2*n*x^(2*(2 + r)))/(4*(2 + r)^2) - (3*b*d^2*e*
n*x^(4 + r))/(4 + r)^2 - (b*e^3*n*x^(4 + 3*r))/(4 + 3*r)^2 + ((d^3*x^4 + (6
*d*e^2*x^(2*(2 + r)))/(2 + r) + (12*d^2*e*x^(4 + r))/(4 + r) + (4*e^3*x^(4
+ 3*r))/(4 + 3*r))*(a + b*Log[c*x^n]))/4
```

Rubi [A] time = 0.385235, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{4}\left(\frac{12d^2ex^{r+4}}{r+4} + d^3x^4 + \frac{6de^2x^{2(r+2)}}{r+2} + \frac{4e^3x^{3r+4}}{3r+4}\right)(a + b\log(cx^n)) - \frac{3bd^2enx^{r+4}}{(r+4)^2} - \frac{1}{16}bd^3nx^4 - \frac{3bde^2nx^{2(r+2)}}{4(r+2)^2} - \frac{be^3nx^{3r+4}}{(3r+4)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^4)/16 - (3*b*d*e^2*n*x^(2*(2 + r)))/(4*(2 + r)^2) - (3*b*d^2*e*
n*x^(4 + r))/(4 + r)^2 - (b*e^3*n*x^(4 + 3*r))/(4 + 3*r)^2 + ((d^3*x^4 + (6
*d*e^2*x^(2*(2 + r)))/(2 + r) + (12*d^2*e*x^(4 + r))/(4 + r) + (4*e^3*x^(4
+ 3*r))/(4 + 3*r))*(a + b*Log[c*x^n]))/4
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int x^3 (d+ex^r)^3 (a+b\log(cx^n))\,dx &= \frac{1}{4}\left(d^3x^4+\frac{6de^2x^{2(2+r)}}{2+r}+\frac{12d^2ex^{4+r}}{4+r}+\frac{4e^3x^{4+3r}}{4+3r}\right)(a+b\log(cx^n))-(bn)\int\frac{1}{4}x^3\Big(d \\ &= \frac{1}{4}\left(d^3x^4+\frac{6de^2x^{2(2+r)}}{2+r}+\frac{12d^2ex^{4+r}}{4+r}+\frac{4e^3x^{4+3r}}{4+3r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int x^3\Big(d \\ &= \frac{1}{4}\left(d^3x^4+\frac{6de^2x^{2(2+r)}}{2+r}+\frac{12d^2ex^{4+r}}{4+r}+\frac{4e^3x^{4+3r}}{4+3r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\Big(d^3x^3 \\ &= -\frac{1}{16}bd^3nx^4-\frac{3bde^2nx^{2(2+r)}}{4(2+r)^2}-\frac{3bd^2enx^{4+r}}{(4+r)^2}-\frac{be^3nx^{4+3r}}{(4+3r)^2}+\frac{1}{4}\Big(d^3x^4+\frac{6de^2x^{2(2+r)}}{2+r}+\end{aligned}$$

Mathematica [A] time = 0.34265, size = 178, normalized size = 1.19

$$\frac{1}{16}x^4\left(4a\left(\frac{12d^2ex^r}{r+4}+d^3+\frac{6de^2x^{2r}}{r+2}+\frac{4e^3x^{3r}}{3r+4}\right)+4b\log(cx^n)\left(\frac{12d^2ex^r}{r+4}+d^3+\frac{6de^2x^{2r}}{r+2}+\frac{4e^3x^{3r}}{3r+4}\right)+bn\left(-\frac{48d^2ex^r}{(r+4)^2}-d^3-\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^4*(b*n*(-d^3 - (48*d^2*e*x^r)/(4 + r)^2 - (12*d*e^2*x^(2*r))/(2 + r)^2 -
 (16*e^3*x^(3*r))/(4 + 3*r)^2) + 4*a*(d^3 + (12*d^2*e*x^r)/(4 + r) + (6*d*e
^2*x^(2*r))/(2 + r) + (4*e^3*x^(3*r))/(4 + 3*r)) + 4*b*(d^3 + (12*d^2*e*x^r
)/(4 + r) + (6*d*e^2*x^(2*r))/(2 + r) + (4*e^3*x^(3*r))/(4 + 3*r))*Log[c*x^
n]))/16
```

Maple [C] time = 0.389, size = 4027, normalized size = 27.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+e*x^r)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/4*b*x^4*(4*e^3*r^2*(x^r)^3+18*d*e^2*r^2*(x^r)^2+24*e^3*r*(x^r)^3+3*d^3*r^
3+36*d^2*e*r^2*x^r+96*d*e^2*r*(x^r)^2+32*e^3*(x^r)^3+22*d^3*r^2+120*d^2*e*r
*x^r+96*d*e^2*(x^r)^2+48*d^3*r+96*d^2*e*x^r+32*d^3)/(4+3*r)/(2+r)/(4+r)*ln(
x^n)-1/16*x^4*(-4096*a*d^3+24*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^3-108*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3968
*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6144*I*Pi*b*d^3
*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+264*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-40
96*a*e^3*(x^r)^3+2048*I*Pi*b*d^3*csgn(I*c*x^n)^3-4096*ln(c)*b*d^3+9*b*d^3*n
*r^6+132*b*d^3*n*r^5+772*b*d^3*n*r^4+6528*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*
(x^r)^2-36*a*d^3*r^6-528*a*d^3*r^5-3088*a*d^3*r^4-48*a*e^3*r^5*(x^r)^3-640*
a*e^3*r^4*(x^r)^3-12288*a*d*e^2*(x^r)^2-12288*a*d^2*e*x^r+1024*b*e^3*n*(x^r
)^3-3264*a*e^3*r^3*(x^r)^3-7936*a*e^3*r^2*(x^r)^3-9216*a*e^3*r*(x^r)^3-4096
*ln(c)*b*e^3*(x^r)^3+2304*b*d^3*n*r^3+3712*b*d^3*n*r^2+3072*b*d^3*n*r-36*ln
(c)*b*d^3*r^6-528*ln(c)*b*d^3*r^5-3088*ln(c)*b*d^3*r^4-9216*ln(c)*b*d^3*r^3
-14848*ln(c)*b*d^3*r^2-12288*ln(c)*b*d^3*r-9216*a*d^3*r^3-14848*a*d^3*r^2-1
2288*a*d^3*r-30720*a*d*e^2*r*(x^r)^2-18624*a*d^2*e*r^3*x^r-36096*a*d^2*e*r^
2*x^r-33792*a*d^2*e*r*x^r+1024*b*d^3*n-15360*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2
*csgn(I*c)*(x^r)^2-16896*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+614
4*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2304*I*Pi*b*d^2*e*r^
4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-640*ln(c)*b*e^3*r^4*(x^r)^3-3264*ln(c)*b*
e^3*r^3*(x^r)^3-7936*ln(c)*b*e^3*r^2*(x^r)^3-9216*ln(c)*b*e^3*r*(x^r)^3-122
88*ln(c)*b*d^2*e*x^r-12288*ln(c)*b*d*e^2*(x^r)^2+832*b*e^3*n*r^2*(x^r)^3+15
36*b*e^3*n*r*(x^r)^3+3072*b*d*e^2*n*(x^r)^2+3072*b*d^2*e*n*x^r-13056*a*d*e^
2*r^3*(x^r)^2-29184*a*d*e^2*r^2*(x^r)^2+16*b*e^3*n*r^4*(x^r)^3+192*b*e^3*n*
r^3*(x^r)^3-216*a*d*e^2*r^5*(x^r)^2-2736*a*d*e^2*r^4*(x^r)^2-432*a*d^2*e*r^
5*x^r-4608*a*d^2*e*r^4*x^r-48*ln(c)*b*e^3*r^5*(x^r)^3+4224*b*d*e^2*n*r^2*(x
^r)^2+7104*b*d^2*e*n*r^2*x^r+4608*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^3-216*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-1368*I*P
i*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1632*I*Pi*b*e^3*r^3*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6144*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x
^r)^2-2048*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+24*I*Pi*b*e^3*r^5
*csgn(I*c*x^n)^3*(x^r)^3+320*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3-6528*I*
Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-18048*I*Pi*b*d^2*e*r^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2*x^r-18048*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(
I*c)*x^r-1632*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-24*I*Pi*b*e^
3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-24*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2
*csgn(I*c)*(x^r)^3-6144*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-6144*I
*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-1632*I*Pi*b*e^3*r^3*csgn(I*x^n)*c
sgn(I*c*x^n)^2*(x^r)^3-15360*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^
```

r)^2+108*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2-320*I*Pi*b*e^3*r^4*csgn(I
*x^n)*csgn(I*c*x^n)^2*(x^r)^3-320*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*
(x^r)^3+18048*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+1536
0*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+16896*I*Pi*b*d
^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+6144*b*d*e^2*n*r*(x^r)^2+768
0*b*d^2*e*n*r*x^r+108*b*d*e^2*n*r^4*(x^r)^2+1152*b*d*e^2*n*r^3*(x^r)^2+432*
b*d^2*e*n*r^4*x^r+2880*b*d^2*e*n*r^3*x^r-216*ln(c)*b*d*e^2*r^5*(x^r)^2-2736
*ln(c)*b*d*e^2*r^4*(x^r)^2-432*ln(c)*b*d^2*e*r^5*x^r-4608*ln(c)*b*d^2*e*r^4
*x^r+6144*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r-2304*I*Pi*b*d^2*e*r^4*csgn(I*c*x
^n)^2*csgn(I*c)*x^r-108*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+
320*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+3968*I*Pi*b*
e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+4608*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-2
048*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-16896*I*Pi*b*d^2*e*r*csgn(
I*c*x^n)^2*csgn(I*c)*x^r+6144*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
c)(x^r)^2+1632*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+2304*I*Pi*b*d^2*e*r
^4*csgn(I*c*x^n)^3*x^r+2048*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
(x^r)^3+16896*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-18624*ln(c)*b*d^2*e*r^3*x^
r-36096*ln(c)*b*d^2*e*r^2*x^r-33792*ln(c)*b*d^2*e*r*x^r-13056*ln(c)*b*d*e^2
r^3(x^r)^2-29184*ln(c)*b*d*e^2*r^2*(x^r)^2-30720*ln(c)*b*d*e^2*r*(x^r)^2+
2048*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-7424*I*Pi*b*d^3*r^2*csg
n(I*x^n)*csgn(I*c*x^n)^2-4608*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
3+18048*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+15360*I*Pi*b*d*e^2*r*csgn(I*c*
x^n)^3*(x^r)^2-18*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-264*I*Pi*b*d^3*r
^5*csgn(I*x^n)*csgn(I*c*x^n)^2-7424*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c
)-6144*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-216*I*Pi*b*d^2*e*r^5*csgn(I
*x^n)*csgn(I*c*x^n)^2*x^r-6528*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^2-1368*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+6528*I*Pi*b*
d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+9312*I*Pi*b*d^2*e*r^3
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+14592*I*Pi*b*d*e^2*r^2*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-6144*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c
)-264*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-1544*I*Pi*b*d^3*r^4*csgn(I*x
^n)*csgn(I*c*x^n)^2-1544*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+2048*I*Pi
*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-9312*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x
^n)^2*x^r+4608*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+7424*I*Pi*b*d^3*r^2*csgn(I*c*
x^n)^3+6144*I*Pi*b*d^3*r*csgn(I*c*x^n)^3+2304*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*x^r+108*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^2+216*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
x^r-6144*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6144*I*Pi*b*d*e^2
*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+216*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r
+1368*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-3968*I*Pi*b*e^3*r^2*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^3-3968*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^3+4608*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+7424*I*Pi*b*
d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-9312*I*Pi*b*d^2*e*r^3*csgn(I*c*
x^n)^2*csgn(I*c)*x^r-14592*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^
r)^2-14592*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1544*I*Pi*b*d

```
^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+9312*I*Pi*b*d^2*e*r^3*csgn(I*c*x
^n)^3*x^r+14592*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-4608*I*Pi*b*e^3*r*
csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-2048*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^
n)^2-2048*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi*b*d^3*r^6*csgn(I*c*x
^n)^3+264*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3+1544*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^
3-4608*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-4608*I*Pi*b*d^3*r^3*csgn(
I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+1368*I*P
i*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2)/(4+3*r)^2/(2+r)^
2/(4+r)^2
```

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(x^3*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.43212, size = 2461, normalized size = 16.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/16*(4*(9*b*d^3*r^6 + 132*b*d^3*r^5 + 772*b*d^3*r^4 + 2304*b*d^3*r^3 + 371
2*b*d^3*r^2 + 3072*b*d^3*r + 1024*b*d^3)*x^4*log(c) + 4*(9*b*d^3*n*r^6 + 13
2*b*d^3*n*r^5 + 772*b*d^3*n*r^4 + 2304*b*d^3*n*r^3 + 3712*b*d^3*n*r^2 + 307
2*b*d^3*n*r + 1024*b*d^3*n)*x^4*log(x) - (9*(b*d^3*n - 4*a*d^3)*r^6 + 132*(
b*d^3*n - 4*a*d^3)*r^5 + 1024*b*d^3*n + 772*(b*d^3*n - 4*a*d^3)*r^4 - 4096*
a*d^3 + 2304*(b*d^3*n - 4*a*d^3)*r^3 + 3712*(b*d^3*n - 4*a*d^3)*r^2 + 3072*
(b*d^3*n - 4*a*d^3)*r)*x^4 + 16*((3*b*e^3*r^5 + 40*b*e^3*r^4 + 204*b*e^3*r^
3 + 496*b*e^3*r^2 + 576*b*e^3*r + 256*b*e^3)*x^4*log(c) + (3*b*e^3*n*r^5 +
40*b*e^3*n*r^4 + 204*b*e^3*n*r^3 + 496*b*e^3*n*r^2 + 576*b*e^3*n*r + 256*b*
e^3*n)*x^4*log(x) + (3*a*e^3*r^5 - 64*b*e^3*n - (b*e^3*n - 40*a*e^3)*r^4 +
256*a*e^3 - 12*(b*e^3*n - 17*a*e^3)*r^3 - 4*(13*b*e^3*n - 124*a*e^3)*r^2 -
96*(b*e^3*n - 6*a*e^3)*r)*x^4)*x^(3*r) + 12*(2*(9*b*d*e^2*r^5 + 114*b*d*e^2
```

```
*r^4 + 544*b*d*e^2*r^3 + 1216*b*d*e^2*r^2 + 1280*b*d*e^2*r + 512*b*d*e^2)*x
^4*log(c) + 2*(9*b*d*e^2*n*r^5 + 114*b*d*e^2*n*r^4 + 544*b*d*e^2*n*r^3 + 12
16*b*d*e^2*n*r^2 + 1280*b*d*e^2*n*r + 512*b*d*e^2*n)*x^4*log(x) + (18*a*d*e
^2*r^5 - 256*b*d*e^2*n - 3*(3*b*d*e^2*n - 76*a*d*e^2)*r^4 + 1024*a*d*e^2 -
32*(3*b*d*e^2*n - 34*a*d*e^2)*r^3 - 32*(11*b*d*e^2*n - 76*a*d*e^2)*r^2 - 51
2*(b*d*e^2*n - 5*a*d*e^2)*r)*x^4)*x^(2*r) + 48*((9*b*d^2*e*r^5 + 96*b*d^2*e
*r^4 + 388*b*d^2*e*r^3 + 752*b*d^2*e*r^2 + 704*b*d^2*e*r + 256*b*d^2*e)*x^4
*log(c) + (9*b*d^2*e*n*r^5 + 96*b*d^2*e*n*r^4 + 388*b*d^2*e*n*r^3 + 752*b*d
^2*e*n*r^2 + 704*b*d^2*e*n*r + 256*b*d^2*e*n)*x^4*log(x) + (9*a*d^2*e*r^5 -
 64*b*d^2*e*n - 3*(3*b*d^2*e*n - 32*a*d^2*e)*r^4 + 256*a*d^2*e - 4*(15*b*d^
2*e*n - 97*a*d^2*e)*r^3 - 4*(37*b*d^2*e*n - 188*a*d^2*e)*r^2 - 32*(5*b*d^2*
e*n - 22*a*d^2*e)*r)*x^4)*x^r)/(9*r^6 + 132*r^5 + 772*r^4 + 2304*r^3 + 3712
*r^2 + 3072*r + 1024)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.39621, size = 2144, normalized size = 14.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/16*(36*b*d^3*n*r^6*x^4*log(x) + 432*b*d^2*n*r^5*x^4*x^r*e*log(x) - 9*b*d^
3*n*r^6*x^4 + 36*b*d^3*r^6*x^4*log(c) + 432*b*d^2*r^5*x^4*x^r*e*log(c) + 52
8*b*d^3*n*r^5*x^4*log(x) + 216*b*d*n*r^5*x^4*x^(2*r)*e^2*log(x) + 4608*b*d^
2*n*r^4*x^4*x^r*e*log(x) - 132*b*d^3*n*r^5*x^4 + 36*a*d^3*r^6*x^4 - 432*b*d
^2*n*r^4*x^4*x^r*e + 432*a*d^2*r^5*x^4*x^r*e + 528*b*d^3*r^5*x^4*log(c) + 2
16*b*d*r^5*x^4*x^(2*r)*e^2*log(c) + 4608*b*d^2*r^4*x^4*x^r*e*log(c) + 3088*
b*d^3*n*r^4*x^4*log(x) + 48*b*n*r^5*x^4*x^(3*r)*e^3*log(x) + 2736*b*d*n*r^4
```

*x^4*x^(2*r)*e^2*log(x) + 18624*b*d^2*n*r^3*x^4*x^r*e*log(x) - 772*b*d^3*n*r^4*x^4 + 528*a*d^3*r^5*x^4 - 108*b*d*n*r^4*x^4*x^(2*r)*e^2 + 216*a*d*r^5*x^4*x^(2*r)*e^2 - 2880*b*d^2*n*r^3*x^4*x^r*e + 4608*a*d^2*r^4*x^4*x^r*e + 3088*b*d^3*r^4*x^4*log(c) + 48*b*r^5*x^4*x^(3*r)*e^3*log(c) + 2736*b*d*r^4*x^4*x^(2*r)*e^2*log(c) + 18624*b*d^2*r^3*x^4*x^r*e*log(c) + 9216*b*d^3*n*r^3*x^4*log(x) + 640*b*n*r^4*x^4*x^(3*r)*e^3*log(x) + 13056*b*d*n*r^3*x^4*x^(2*r)*e^2*log(x) + 36096*b*d^2*n*r^2*x^4*x^r*e*log(x) - 2304*b*d^3*n*r^3*x^4 + 3088*a*d^3*r^4*x^4 - 16*b*n*r^4*x^4*x^(3*r)*e^3 + 48*a*r^5*x^4*x^(3*r)*e^3 - 1152*b*d*n*r^3*x^4*x^(2*r)*e^2 + 2736*a*d*r^4*x^4*x^(2*r)*e^2 - 7104*b*d^2*n*r^2*x^4*x^r*e + 18624*a*d^2*r^3*x^4*x^r*e + 9216*b*d^3*r^3*x^4*log(c) + 640*b*r^4*x^4*x^(3*r)*e^3*log(c) + 13056*b*d*r^3*x^4*x^(2*r)*e^2*log(c) + 36096*b*d^2*r^2*x^4*x^r*e*log(c) + 14848*b*d^3*n*r^2*x^4*log(x) + 3264*b*n*r^3*x^4*x^(3*r)*e^3*log(x) + 29184*b*d*n*r^2*x^4*x^(2*r)*e^2*log(x) + 33792*b*d^2*n*r*x^4*x^r*e*log(x) - 3712*b*d^3*n*r^2*x^4 + 9216*a*d^3*r^3*x^4 - 192*b*n*r^3*x^4*x^(3*r)*e^3 + 640*a*r^4*x^4*x^(3*r)*e^3 - 4224*b*d*n*r^2*x^4*x^(2*r)*e^2 + 13056*a*d*r^3*x^4*x^(2*r)*e^2 - 7680*b*d^2*n*r*x^4*x^r*e + 36096*a*d^2*r^2*x^4*x^r*e + 14848*b*d^3*r^2*x^4*log(c) + 3264*b*r^3*x^4*x^(3*r)*e^3*log(c) + 29184*b*d*r^2*x^4*x^(2*r)*e^2*log(c) + 33792*b*d^2*r*x^4*x^r*e*log(c) + 12288*b*d^3*n*r*x^4*log(x) + 7936*b*n*r^2*x^4*x^(3*r)*e^3*log(x) + 30720*b*d*n*r*x^4*x^(2*r)*e^2*log(x) + 12288*b*d^2*n*x^4*x^r*e*log(x) - 3072*b*d^3*n*r*x^4 + 14848*a*d^3*r^2*x^4 - 832*b*n*r^2*x^4*x^(3*r)*e^3 + 3264*a*r^3*x^4*x^(3*r)*e^3 - 6144*b*d*n*r*x^4*x^(2*r)*e^2 + 29184*a*d*r^2*x^4*x^(2*r)*e^2 - 3072*b*d^2*n*x^4*x^r*e + 33792*a*d^2*r*x^4*x^r*e + 12288*b*d^3*r*x^4*log(c) + 7936*b*r^2*x^4*x^(3*r)*e^3*log(c) + 30720*b*d*r*x^4*x^(2*r)*e^2*log(c) + 12288*b*d^2*x^4*x^r*e*log(c) + 4096*b*d^3*n*x^4*log(x) + 9216*b*n*r*x^4*x^(3*r)*e^3*log(x) + 12288*b*d*n*x^4*x^(2*r)*e^2*log(x) - 1024*b*d^3*n*x^4 + 12288*a*d^3*r*x^4 - 1536*b*n*r*x^4*x^(3*r)*e^3 + 7936*a*r^2*x^4*x^(3*r)*e^3 - 3072*b*d*n*x^4*x^(2*r)*e^2 + 30720*a*d*r*x^4*x^(2*r)*e^2 + 12288*a*d^2*x^4*x^r*e + 4096*b*d^3*x^4*log(c) + 9216*b*r*x^4*x^(3*r)*e^3*log(c) + 12288*b*d*x^4*x^(2*r)*e^2*log(c) + 4096*b*n*x^4*x^(3*r)*e^3*log(x) + 4096*a*d^3*x^4 - 1024*b*n*x^4*x^(3*r)*e^3 + 9216*a*r*x^4*x^(3*r)*e^3 + 12288*a*d*x^4*x^(2*r)*e^2 + 4096*b*x^4*x^(3*r)*e^3*log(c) + 4096*a*x^4*x^(3*r)*e^3)/(9*r^6 + 132*r^5 + 772*r^4 + 2304*r^3 + 3712*r^2 + 3072*r + 1024)

3.394 $\int x(d+ex^r)^3(a+b\log(cx^n))\,dx$

Optimal. Leaf size=149

$$\frac{1}{2}\left(\frac{6d^2ex^{r+2}}{r+2}+d^3x^2+\frac{3de^2x^{2(r+1)}}{r+1}+\frac{2e^3x^{3r+2}}{3r+2}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+2}}{(r+2)^2}-\frac{1}{4}bd^3nx^2-\frac{3bde^2nx^{2(r+1)}}{4(r+1)^2}-\frac{be^3nx^{3r+2}}{(3r+2)^2}$$

```
[Out] -(b*d^3*n*x^2)/4 - (3*b*d*e^2*n*x^(2*(1 + r)))/(4*(1 + r)^2) - (3*b*d^2*e*n
*x^(2 + r))/(2 + r)^2 - (b*e^3*n*x^(2 + 3*r))/(2 + 3*r)^2 + ((d^3*x^2 + (3*
d*e^2*x^(2*(1 + r)))/(1 + r) + (6*d^2*e*x^(2 + r))/(2 + r) + (2*e^3*x^(2 +
3*r))/(2 + 3*r))*(a + b*Log[c*x^n]))/2
```

Rubi [A] time = 0.348306, antiderivative size = 149, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {270, 2334, 12, 14}

$$\frac{1}{2}\left(\frac{6d^2ex^{r+2}}{r+2}+d^3x^2+\frac{3de^2x^{2(r+1)}}{r+1}+\frac{2e^3x^{3r+2}}{3r+2}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+2}}{(r+2)^2}-\frac{1}{4}bd^3nx^2-\frac{3bde^2nx^{2(r+1)}}{4(r+1)^2}-\frac{be^3nx^{3r+2}}{(3r+2)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^2)/4 - (3*b*d*e^2*n*x^(2*(1 + r)))/(4*(1 + r)^2) - (3*b*d^2*e*n
*x^(2 + r))/(2 + r)^2 - (b*e^3*n*x^(2 + 3*r))/(2 + 3*r)^2 + ((d^3*x^2 + (3*
d*e^2*x^(2*(1 + r)))/(1 + r) + (6*d^2*e*x^(2 + r))/(2 + r) + (2*e^3*x^(2 +
3*r))/(2 + 3*r))*(a + b*Log[c*x^n]))/2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x\left(d+ex^r\right)^3\left(a+b\log\left(cx^n\right)\right)\,dx=\frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1+r)}}{1+r}+\frac{6d^2ex^{2+r}}{2+r}+\frac{2e^3x^{2+3r}}{2+3r}\right)\left(a+b\log\left(cx^n\right)\right)-(bn)\int\frac{1}{2}x\left(d^3+\right.$$

$$=\frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1+r)}}{1+r}+\frac{6d^2ex^{2+r}}{2+r}+\frac{2e^3x^{2+3r}}{2+3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int x\left(d^3+\right.$$

$$=\frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1+r)}}{1+r}+\frac{6d^2ex^{2+r}}{2+r}+\frac{2e^3x^{2+3r}}{2+3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}(bn)\int\left(d^3x+\right.$$

$$=-\frac{1}{4}bd^3nx^2-\frac{3bde^2nx^{2(1+r)}}{4(1+r)^2}-\frac{3bd^2enx^{2+r}}{(2+r)^2}-\frac{be^3nx^{2+3r}}{(2+3r)^2}+\frac{1}{2}\left(d^3x^2+\frac{3de^2x^{2(1+r)}}{1+r}+\right.$$

Mathematica [A] time = 0.354285, size = 178, normalized size = 1.19

$$\frac{1}{4}x^2\left(2a\left(\frac{6d^2ex^r}{r+2}+d^3+\frac{3de^2x^{2r}}{r+1}+\frac{2e^3x^{3r}}{3r+2}\right)+2b\log\left(cx^n\right)\left(\frac{6d^2ex^r}{r+2}+d^3+\frac{3de^2x^{2r}}{r+1}+\frac{2e^3x^{3r}}{3r+2}\right)+bn\left(-\frac{12d^2ex^r}{(r+2)^2}-d^3-\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^2*(b*n*(-d^3 - (12*d^2*e*x^r)/(2 + r)^2 - (3*d*e^2*x^(2*r))/(1 + r)^2 -
(4*e^3*x^(3*r))/(2 + 3*r)^2) + 2*a*(d^3 + (6*d^2*e*x^r)/(2 + r) + (3*d*e^2*
x^(2*r))/(1 + r) + (2*e^3*x^(3*r))/(2 + 3*r)) + 2*b*(d^3 + (6*d^2*e*x^r)/(2
 + r) + (3*d*e^2*x^(2*r))/(1 + r) + (2*e^3*x^(3*r))/(2 + 3*r))*Log[c*x^n]))
/4
```

Maple [C] time = 0.381, size = 4027, normalized size = 27.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+e*x^r)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/2*b*x^2*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+6*e^3*r*(x^r)^3+3*d^3*r^3+
18*d^2*e*r^2*x^r+24*d*e^2*r*(x^r)^2+4*e^3*(x^r)^3+11*d^3*r^2+30*d^2*e*r*x^r
+12*d*e^2*(x^r)^2+12*d^3*r+12*d^2*e*x^r+4*d^3)/(2+3*r)/(1+r)/(2+r)*ln(x^n)-
1/4*x^2*(582*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+456*I
*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-32*a*d^3+408*I*
Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-288*I*Pi*b*d^3*r
^3*csgn(I*x^n)*csgn(I*c*x^n)^2-288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)
-9*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-32*a*e^3*(x^r)^3+16*I*Pi*b*d^
3*csgn(I*c*x^n)^3-32*ln(c)*b*d^3+456*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)
^2-72*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-72*I*Pi*b*e^3*r*csgn
(I*c*x^n)^2*csgn(I*c)*(x^r)^3+564*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+9*b*
d^3*n*r^6+66*b*d^3*n*r^5+193*b*d^3*n*r^4-18*a*d^3*r^6-132*a*d^3*r^5-386*a*d
^3*r^4-232*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+6*I*Pi*b*e^3*r^5*csgn
(I*c*x^n)^3*(x^r)^3-232*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-96*I*Pi*b*
d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-96*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)
+16*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-12*a*e^3*r^5*(x^r)^3-80*
a*e^3*r^4*(x^r)^3-96*a*d*e^2*(x^r)^2-96*a*d^2*e*x^r+16*b*e^3*n*(x^r)^3-204*
a*e^3*r^3*(x^r)^3-248*a*e^3*r^2*(x^r)^3-144*a*e^3*r*(x^r)^3-32*ln(c)*b*e^3*
(x^r)^3+288*b*d^3*n*r^3+232*b*d^3*n*r^2+96*b*d^3*n*r-18*ln(c)*b*d^3*r^6-132
*ln(c)*b*d^3*r^5-386*ln(c)*b*d^3*r^4-576*ln(c)*b*d^3*r^3-464*ln(c)*b*d^3*r^
2-192*ln(c)*b*d^3*r-576*a*d^3*r^3-464*a*d^3*r^2-192*a*d^3*r-480*a*d*e^2*r*(
x^r)^2-1164*a*d^2*e*r^3*x^r-1128*a*d^2*e*r^2*x^r-528*a*d^2*e*r*x^r+6*I*Pi*b
*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+16*b*d^3*n-54*I*Pi*b*d
^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)
^2*csgn(I*c)*x^r+40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r
)^3-171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-408*I*Pi*b*d*e
^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)
^2*csgn(I*c)*(x^r)^2+124*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*(x^r)^3+264*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-6*I*Pi*b*e^3*r^5*csgn(I*x^n
)*csgn(I*c*x^n)^2*(x^r)^3-48*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)
^2-6*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-48*I*Pi*b*d*e^2*csgn(
I*c*x^n)^2*csgn(I*c)*(x^r)^2+27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2-58
2*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-456*I*Pi*b*d*e^2*r^2*csgn(
I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-80*ln(c)*b*e^3*r^4*(x^r)^3-204*ln(c)*b*e^3*r
^3*(x^r)^3-248*ln(c)*b*e^3*r^2*(x^r)^3-144*ln(c)*b*e^3*r*(x^r)^3-96*ln(c)*b
*d^2*e*x^r-96*ln(c)*b*d*e^2*(x^r)^2+52*b*e^3*n*r^2*(x^r)^3+48*b*e^3*n*r*(x^
r)^3+48*b*d*e^2*n*(x^r)^2+48*b*d^2*e*n*x^r-816*a*d*e^2*r^3*(x^r)^2-912*a*d*
e^2*r^2*(x^r)^2+4*b*e^3*n*r^4*(x^r)^3+24*b*e^3*n*r^3*(x^r)^3-54*a*d*e^2*r^5
*(x^r)^2-342*a*d*e^2*r^4*(x^r)^2-108*a*d^2*e*r^5*x^r-576*a*d^2*e*r^4*x^r-12
*ln(c)*b*e^3*r^5*(x^r)^3+264*b*d*e^2*n*r^2*(x^r)^2+444*b*d^2*e*n*r^2*x^r-56
```

4*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-564*I*Pi*b*d^2*e*r^2*csg
n(I*c*x^n)^2*csgn(I*c)*x^r-240*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(
x^r)^2-240*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-40*I*Pi*b*e^3*r
^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(
x^r)^2+288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r-102*I*Pi*b*e^3*r^3*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^3-102*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x
^r)^3-40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-48*I*Pi*b*d^2*e
*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-48*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*
x^r+48*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-27*I*Pi*b*d*e^2
*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csg
n(I*c*x^n)^2*x^r-264*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-264*I*P
i*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+48*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(
I*c*x^n)*csgn(I*c)*(x^r)^2+408*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-124
*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+192*b*d*e^2*n*r*(x^r)^2
+240*b*d^2*e*n*r*x^r+27*b*d*e^2*n*r^4*(x^r)^2+144*b*d*e^2*n*r^3*(x^r)^2+108
*b*d^2*e*n*r^4*x^r+360*b*d^2*e*n*r^3*x^r-54*ln(c)*b*d*e^2*r^5*(x^r)^2-342*l
n(c)*b*d*e^2*r^4*(x^r)^2-108*ln(c)*b*d^2*e*r^5*x^r-576*ln(c)*b*d^2*e*r^4*x^
r-456*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+72*I*Pi*b*e^3*r*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+102*I*Pi*b*e^3*r^3*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*(x^r)^3-582*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n
)^2*x^r+48*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+102*I*Pi*b*e^3*r^3*csgn(I*c*x^n
)^3*(x^r)^3+124*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+72*I*Pi*b*e^3*r*csgn
(I*c*x^n)^3*(x^r)^3+54*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r-16*I*Pi*b*e^3*c
sgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+48*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-16
*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+232*I*Pi*b*d^3*r^2*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+96*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+9*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1164*ln(c)*b*d^2*
e*r^3*x^r-1128*ln(c)*b*d^2*e*r^2*x^r-528*ln(c)*b*d^2*e*r*x^r-816*ln(c)*b*d*
e^2*r^3*(x^r)^2-912*ln(c)*b*d*e^2*r^2*(x^r)^2-480*ln(c)*b*d*e^2*r*(x^r)^2+5
4*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-27*I*Pi*b*d*e^2*
r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-66*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(
I*c*x^n)^2-66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)+240*I*Pi*b*d*e^2*r*c
sgn(I*c*x^n)^3*(x^r)^2+16*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x
^r)^3-408*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+40*I*Pi*b*e^
3*r^4*csgn(I*c*x^n)^3*(x^r)^3+27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^2+66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-16*I*Pi*b*d^3*csgn(I*c
*x^n)^2*csgn(I*c)+9*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+193*I*Pi*b*d^3*r^4*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)+582*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+96*
I*Pi*b*d^3*r*csgn(I*c*x^n)^3-16*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-124*
I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+66*I*Pi*b*d^3*r^5*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+288*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+28
8*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-54*I*Pi*b*d^2*e*
r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+16*I*P
i*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+232*I*Pi

```
*b*d^3*r^2*csgn(I*c*x^n)^3-9*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-193*I
*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-193*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^
2*csgn(I*c)+564*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+24
0*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+264*I*Pi*b*d^2
*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r)/(2+3*r)^2/(1+r)^2/(2+r)^2
```

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(x*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.45181, size = 2353, normalized size = 15.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*(9*b*d^3*r^6 + 66*b*d^3*r^5 + 193*b*d^3*r^4 + 288*b*d^3*r^3 + 232*b*
d^3*r^2 + 96*b*d^3*r + 16*b*d^3)*x^2*log(c) + 2*(9*b*d^3*n*r^6 + 66*b*d^3*n
*r^5 + 193*b*d^3*n*r^4 + 288*b*d^3*n*r^3 + 232*b*d^3*n*r^2 + 96*b*d^3*n*r +
 16*b*d^3*n)*x^2*log(x) - (9*(b*d^3*n - 2*a*d^3)*r^6 + 66*(b*d^3*n - 2*a*d^
3)*r^5 + 16*b*d^3*n + 193*(b*d^3*n - 2*a*d^3)*r^4 - 32*a*d^3 + 288*(b*d^3*n
 - 2*a*d^3)*r^3 + 232*(b*d^3*n - 2*a*d^3)*r^2 + 96*(b*d^3*n - 2*a*d^3)*r)*x
^2 + 4*((3*b*e^3*r^5 + 20*b*e^3*r^4 + 51*b*e^3*r^3 + 62*b*e^3*r^2 + 36*b*e^
3*r + 8*b*e^3)*x^2*log(c) + (3*b*e^3*n*r^5 + 20*b*e^3*n*r^4 + 51*b*e^3*n*r^
3 + 62*b*e^3*n*r^2 + 36*b*e^3*n*r + 8*b*e^3*n)*x^2*log(x) + (3*a*e^3*r^5 -
4*b*e^3*n - (b*e^3*n - 20*a*e^3)*r^4 + 8*a*e^3 - 3*(2*b*e^3*n - 17*a*e^3)*r
^3 - (13*b*e^3*n - 62*a*e^3)*r^2 - 12*(b*e^3*n - 3*a*e^3)*r)*x^2)*x^(3*r) +
 3*(2*(9*b*d*e^2*r^5 + 57*b*d*e^2*r^4 + 136*b*d*e^2*r^3 + 152*b*d*e^2*r^2 +
 80*b*d*e^2*r + 16*b*d*e^2)*x^2*log(c) + 2*(9*b*d*e^2*n*r^5 + 57*b*d*e^2*n*
r^4 + 136*b*d*e^2*n*r^3 + 152*b*d*e^2*n*r^2 + 80*b*d*e^2*n*r + 16*b*d*e^2*n
)*x^2*log(x) + (18*a*d*e^2*r^5 - 16*b*d*e^2*n - 3*(3*b*d*e^2*n - 38*a*d*e^2
)*r^4 + 32*a*d*e^2 - 16*(3*b*d*e^2*n - 17*a*d*e^2)*r^3 - 8*(11*b*d*e^2*n -
```

```
38*a*d*e^2)*r^2 - 32*(2*b*d*e^2*n - 5*a*d*e^2)*r)*x^2)*x^(2*r) + 12*((9*b*d
^2*e*r^5 + 48*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 94*b*d^2*e*r^2 + 44*b*d^2*e*r
+ 8*b*d^2*e)*x^2*log(c) + (9*b*d^2*e*n*r^5 + 48*b*d^2*e*n*r^4 + 97*b*d^2*e*
n*r^3 + 94*b*d^2*e*n*r^2 + 44*b*d^2*e*n*r + 8*b*d^2*e*n)*x^2*log(x) + (9*a*
d^2*e*r^5 - 4*b*d^2*e*n - 3*(3*b*d^2*e*n - 16*a*d^2*e)*r^4 + 8*a*d^2*e - (3
0*b*d^2*e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*n - 94*a*d^2*e)*r^2 - 4*(5*b*d^
2*e*n - 11*a*d^2*e)*r)*x^2)*x^r)/(9*r^6 + 66*r^5 + 193*r^4 + 288*r^3 + 232*
r^2 + 96*r + 16)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)

[Out] Timed out
```

Giac [B] time = 1.36158, size = 2144, normalized size = 14.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")

[Out] 1/4*(18*b*d^3*n*r^6*x^2*log(x) + 108*b*d^2*n*r^5*x^2*x^r*e*log(x) - 9*b*d^3
*n*r^6*x^2 + 18*b*d^3*r^6*x^2*log(c) + 108*b*d^2*r^5*x^2*x^r*e*log(c) + 132
*b*d^3*n*r^5*x^2*log(x) + 54*b*d*n*r^5*x^2*x^(2*r)*e^2*log(x) + 576*b*d^2*n
*r^4*x^2*x^r*e*log(x) - 66*b*d^3*n*r^5*x^2 + 18*a*d^3*r^6*x^2 - 108*b*d^2*n
*r^4*x^2*x^r*e + 108*a*d^2*r^5*x^2*x^r*e + 132*b*d^3*r^5*x^2*log(c) + 54*b*
d*r^5*x^2*x^(2*r)*e^2*log(c) + 576*b*d^2*r^4*x^2*x^r*e*log(c) + 386*b*d^3*n
*r^4*x^2*log(x) + 12*b*n*r^5*x^2*x^(3*r)*e^3*log(x) + 342*b*d*n*r^4*x^2*x^(
2*r)*e^2*log(x) + 1164*b*d^2*n*r^3*x^2*x^r*e*log(x) - 193*b*d^3*n*r^4*x^2 +
 132*a*d^3*r^5*x^2 - 27*b*d*n*r^4*x^2*x^(2*r)*e^2 + 54*a*d*r^5*x^2*x^(2*r)*
e^2 - 360*b*d^2*n*r^3*x^2*x^r*e + 576*a*d^2*r^4*x^2*x^r*e + 386*b*d^3*r^4*x
^2*log(c) + 12*b*r^5*x^2*x^(3*r)*e^3*log(c) + 342*b*d*r^4*x^2*x^(2*r)*e^2*l
og(c) + 1164*b*d^2*r^3*x^2*x^r*e*log(c) + 576*b*d^3*n*r^3*x^2*log(x) + 80*b
```

```
*n*r^4*x^2*x^(3*r)*e^3*log(x) + 816*b*d*n*r^3*x^2*x^(2*r)*e^2*log(x) + 1128
*b*d^2*n*r^2*x^2*x^r*e*log(x) - 288*b*d^3*n*r^3*x^2 + 386*a*d^3*r^4*x^2 - 4
*b*n*r^4*x^2*x^(3*r)*e^3 + 12*a*r^5*x^2*x^(3*r)*e^3 - 144*b*d*n*r^3*x^2*x^(
2*r)*e^2 + 342*a*d*r^4*x^2*x^(2*r)*e^2 - 444*b*d^2*n*r^2*x^2*x^r*e + 1164*a
*d^2*r^3*x^2*x^r*e + 576*b*d^3*r^3*x^2*log(c) + 80*b*r^4*x^2*x^(3*r)*e^3*lo
g(c) + 816*b*d*r^3*x^2*x^(2*r)*e^2*log(c) + 1128*b*d^2*r^2*x^2*x^r*e*log(c)
 + 464*b*d^3*n*r^2*x^2*log(x) + 204*b*n*r^3*x^2*x^(3*r)*e^3*log(x) + 912*b*
d*n*r^2*x^2*x^(2*r)*e^2*log(x) + 528*b*d^2*n*r*x^2*x^r*e*log(x) - 232*b*d^3
*n*r^2*x^2 + 576*a*d^3*r^3*x^2 - 24*b*n*r^3*x^2*x^(3*r)*e^3 + 80*a*r^4*x^2*
x^(3*r)*e^3 - 264*b*d*n*r^2*x^2*x^(2*r)*e^2 + 816*a*d*r^3*x^2*x^(2*r)*e^2 -
 240*b*d^2*n*r*x^2*x^r*e + 1128*a*d^2*r^2*x^2*x^r*e + 464*b*d^3*r^2*x^2*log
(c) + 204*b*r^3*x^2*x^(3*r)*e^3*log(c) + 912*b*d*r^2*x^2*x^(2*r)*e^2*log(c)
 + 528*b*d^2*r*x^2*x^r*e*log(c) + 192*b*d^3*n*r*x^2*log(x) + 248*b*n*r^2*x^
2*x^(3*r)*e^3*log(x) + 480*b*d*n*r*x^2*x^(2*r)*e^2*log(x) + 96*b*d^2*n*x^2*
x^r*e*log(x) - 96*b*d^3*n*r*x^2 + 464*a*d^3*r^2*x^2 - 52*b*n*r^2*x^2*x^(3*r
)*e^3 + 204*a*r^3*x^2*x^(3*r)*e^3 - 192*b*d*n*r*x^2*x^(2*r)*e^2 + 912*a*d*r
^2*x^2*x^(2*r)*e^2 - 48*b*d^2*n*x^2*x^r*e + 528*a*d^2*r*x^2*x^r*e + 192*b*d
^3*r*x^2*log(c) + 248*b*r^2*x^2*x^(3*r)*e^3*log(c) + 480*b*d*r*x^2*x^(2*r)*
e^2*log(c) + 96*b*d^2*x^2*x^r*e*log(c) + 32*b*d^3*n*x^2*log(x) + 144*b*n*r*
x^2*x^(3*r)*e^3*log(x) + 96*b*d*n*x^2*x^(2*r)*e^2*log(x) - 16*b*d^3*n*x^2 +
 192*a*d^3*r*x^2 - 48*b*n*r*x^2*x^(3*r)*e^3 + 248*a*r^2*x^2*x^(3*r)*e^3 - 4
8*b*d*n*x^2*x^(2*r)*e^2 + 480*a*d*r*x^2*x^(2*r)*e^2 + 96*a*d^2*x^2*x^r*e +
32*b*d^3*x^2*log(c) + 144*b*r*x^2*x^(3*r)*e^3*log(c) + 96*b*d*x^2*x^(2*r)*e
^2*log(c) + 32*b*n*x^2*x^(3*r)*e^3*log(x) + 32*a*d^3*x^2 - 16*b*n*x^2*x^(3*
r)*e^3 + 144*a*r*x^2*x^(3*r)*e^3 + 96*a*d*x^2*x^(2*r)*e^2 + 32*b*x^2*x^(3*r
)*e^3*log(c) + 32*a*x^2*x^(3*r)*e^3)/(9*r^6 + 66*r^5 + 193*r^4 + 288*r^3 +
232*r^2 + 96*r + 16)
```

3.395 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=152

$$\frac{3d^2ex^r\left(a+b\log\left(cx^n\right)\right)}{r}+d^3\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{3de^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r}+\frac{e^3x^{3r}\left(a+b\log\left(cx^n\right)\right)}{3r}-\frac{3bd^2enx^r}{r^2}-\frac{1}{2}b$$

```
[Out] (-3*b*d^2*e*n*x^r)/r^2 - (3*b*d*e^2*n*x^(2*r))/(4*r^2) - (b*e^3*n*x^(3*r))/
(9*r^2) - (b*d^3*n*Log[x]^2)/2 + (3*d^2*e*x^r*(a + b*Log[c*x^n]))/r + (3*d*
e^2*x^(2*r)*(a + b*Log[c*x^n]))/(2*r) + (e^3*x^(3*r)*(a + b*Log[c*x^n]))/(3
*r) + d^3*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.170992, antiderivative size = 124, normalized size of antiderivative = 0.82, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{6}\left(\frac{18d^2ex^r}{r}+6d^3\log(x)+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^r}{r^2}-\frac{1}{2}bd^3n\log^2(x)-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-3*b*d^2*e*n*x^r)/r^2 - (3*b*d*e^2*n*x^(2*r))/(4*r^2) - (b*e^3*n*x^(3*r))/
(9*r^2) - (b*d^3*n*Log[x]^2)/2 + (((18*d^2*e*x^r)/r + (9*d*e^2*x^(2*r))/r +
 (2*e^3*x^(3*r))/r + 6*d^3*Log[x])*(a + b*Log[c*x^n]))/6
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex^r)^3\,(a+b\log(cx^n))}{x}\,dx = \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)(a+b\log(cx^n))-(bn)\int \frac{ex^r\left(18d^2+\right.}{}$$

$$=\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)(a+b\log(cx^n))-\frac{(bn)\int \frac{ex^r\left(18d^2+9dex^r\right.}{}}{6}$$

$$=\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)(a+b\log(cx^n))-\frac{(bn)\int\left(18d^2ex^{-1+r}\right.}{}$$

$$=-\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)$$

$$=-\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}\right.$$

Mathematica [A] time = 0.353775, size = 132, normalized size = 0.87

$$\frac{1}{36}\left(\frac{ex^r\left(6ar\left(18d^2+9dex^r+2e^2x^{2r}\right)-bn\left(108d^2+27dex^r+4e^2x^{2r}\right)\right)}{r^2}+\frac{6bex^r\log(cx^n)\left(18d^2+9dex^r+2e^2x^{2r}\right)}{r}+\frac{18bd}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] a*d^3*Log[x] + ((e*x^r*(6*a*r*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)) - b*n*(1
08*d^2 + 27*d*e*x^r + 4*e^2*x^(2*r))))/r^2 + (6*b*e*x^r*(18*d^2 + 9*d*e*x^r
 + 2*e^2*x^(2*r))*Log[c*x^n])/r + (18*b*d^3*Log[c*x^n]^2)/n)/36
```

Maple [C] time = 0.16, size = 693, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x,x)
```

```
[Out] -3*b*d^2*e*n*x^r/r^2+ln(x)*ln(c)*b*d^3+3/2/r*ln(c)*b*d*e^2*(x^r)^2+3/r*a*d^
2*e*x^r+1/3/r*ln(c)*b*e^3*(x^r)^3-1/9/r^2*b*e^3*n*(x^r)^3+3/2/r*a*d*e^2*(x^
r)^2-1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3/r*a*e^3*(
x^r)^3-1/2*I*ln(x)*Pi*b*d^3*csgn(I*c*x^n)^3+1/6*I/r*Pi*b*e^3*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^3+1/6*I/r*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-3/
4*I/r*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-3/2*I/r*Pi*b*d^2*e*csgn(I*c*x^n)^3
*x^r+1/6*b*(2*e^3*(x^r)^3+6*d^3*ln(x)*r+9*d*e^2*(x^r)^2+18*d^2*e*x^r)/r*ln(
x^n)+ln(x)*a*d^3+1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-3/4/r^2*b
*d*e^2*n*(x^r)^2+3/r*ln(c)*b*d^2*e*x^r+1/2*I*ln(x)*Pi*b*d^3*csgn(I*c*x^n)^2
*csgn(I*c)-1/6*I/r*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-3/4*I/r*Pi*b*d*e^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-3/2*I/r*Pi*b*d^2*e*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*x^r-1/2*b*d^3*n*ln(x)^2-1/6*I/r*Pi*b*e^3*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*(x^r)^3+3/4*I/r*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*
(x^r)^2+3/4*I/r*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3/2*I/r*Pi*b
*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3/2*I/r*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*
c*x^n)^2*x^r
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.39656, size = 419, normalized size = 2.76

$$\frac{18\,bd^3nr^2\log(x)^2 + 4\left(3\,be^3nr\log(x) + 3\,be^3r\log(c) - be^3n + 3\,ae^3r\right)x^{3\,r} + 27\left(2\,bde^2nr\log(x) + 2\,bde^2r\log(c) - bde^2r\right.}{36\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/36*(18*b*d^3*n*r^2*log(x)^2 + 4*(3*b*e^3*n*r*log(x) + 3*b*e^3*r*log(c) -
b*e^3*n + 3*a*e^3*r)*x^(3*r) + 27*(2*b*d*e^2*n*r*log(x) + 2*b*d*e^2*r*log(c
) - b*d*e^2*n + 2*a*d*e^2*r)*x^(2*r) + 108*(b*d^2*e*n*r*log(x) + b*d^2*e*r*
log(c) - b*d^2*e*n + a*d^2*e*r)*x^r + 36*(b*d^3*r^2*log(c) + a*d^3*r^2)*log
(x))/r^2
```

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((d+e*x**r)**3*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.35322, size = 284, normalized size = 1.87

$$\frac{1}{2}\,bd^3n\log(x)^2 + \frac{3\,bd^2nx^re\log(x)}{r} + bd^3\log(c)\log(x) + \frac{3\,bd^2x^re\log(c)}{r} + ad^3\log(x) + \frac{3\,bdnx^{2\,r}e^2\log(x)}{2\,r} - \frac{3\,bd^2nx^r}{r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^3*n*log(x)^2 + 3*b*d^2*n*x^r*e*log(x)/r + b*d^3*log(c)*log(x) + 3*b
*d^2*x^r*e*log(c)/r + a*d^3*log(x) + 3/2*b*d*n*x^(2*r)*e^2*log(x)/r - 3*b*d
^2*n*x^r*e/r^2 + 3*a*d^2*x^r*e/r + 3/2*b*d*x^(2*r)*e^2*log(c)/r + 1/3*b*n*x
^(3*r)*e^3*log(x)/r - 3/4*b*d*n*x^(2*r)*e^2/r^2 + 3/2*a*d*x^(2*r)*e^2/r + 1
/3*b*x^(3*r)*e^3*log(c)/r - 1/9*b*n*x^(3*r)*e^3/r^2 + 1/3*a*x^(3*r)*e^3/r
```

3.396 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^3}\,dx$

Optimal. Leaf size=191

$$-\frac{3d^2ex^{r-2}\left(a+b\log\left(cx^n\right)\right)}{2-r}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{2x^2}-\frac{3de^2x^{-2(1-r)}\left(a+b\log\left(cx^n\right)\right)}{2(1-r)}-\frac{e^3x^{3r-2}\left(a+b\log\left(cx^n\right)\right)}{2-3r}-\frac{3bd^2enx^{r-}}{(2-r)^2}$$

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d*e^2*n)/(4*(1 - r)^2*x^(2*(1 - r))) - (3*b*d^2*e
*n*x^(-2 + r))/(2 - r)^2 - (b*e^3*n*x^(-2 + 3*r))/(2 - 3*r)^2 - (d^3*(a + b
*Log[c*x^n]))/(2*x^2) - (3*d*e^2*(a + b*Log[c*x^n]))/(2*(1 - r)*x^(2*(1 - r
))) - (3*d^2*e*x^(-2 + r)*(a + b*Log[c*x^n]))/(2 - r) - (e^3*x^(-2 + 3*r)*(
a + b*Log[c*x^n]))/(2 - 3*r)
```

Rubi [A] time = 0.407696, antiderivative size = 161, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{2}\left(\frac{6d^2ex^{r-2}}{2-r}+\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{2e^3x^{3r-2}}{2-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-2}}{(2-r)^2}-\frac{bd^3n}{4x^2}-\frac{3bde^2nx^{-2(1-r)}}{4(1-r)^2}-\frac{be^3nx^{3r-2}}{(2-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] -(b*d^3*n)/(4*x^2) - (3*b*d*e^2*n)/(4*(1 - r)^2*x^(2*(1 - r))) - (3*b*d^2*e
*n*x^(-2 + r))/(2 - r)^2 - (b*e^3*n*x^(-2 + 3*r))/(2 - 3*r)^2 - ((d^3/x^2 +
 (3*d*e^2)/((1 - r)*x^(2*(1 - r))) + (6*d^2*e*x^(-2 + r))/(2 - r) + (2*e^3*
x^(-2 + 3*r))/(2 - 3*r))*(a + b*Log[c*x^n]))/2
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^3 (a+b\log(cx^n))}{x^3}\,dx = -\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{6d^2ex^{-2+r}}{2-r}+\frac{2e^3x^{-2+3r}}{2-3r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^3+\frac{6d^2 \cdots}{-2 \cdots}}{\cdots}$$

$$= -\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{6d^2ex^{-2+r}}{2-r}+\frac{2e^3x^{-2+3r}}{2-3r}\right)(a+b\log(cx^n))-\frac{1}{2}(bn)\int \frac{-d^3+\cdots}{\cdots}$$

$$= -\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{6d^2ex^{-2+r}}{2-r}+\frac{2e^3x^{-2+3r}}{2-3r}\right)(a+b\log(cx^n))-\frac{1}{2}(bn)\int \left(-\frac{d^3}{x^3}+\cdots\right.$$

$$= -\frac{bd^3n}{4x^2}-\frac{3bde^2nx^{-2(1-r)}}{4(1-r)^2}-\frac{3bd^2enx^{-2+r}}{(2-r)^2}-\frac{be^3nx^{-2+3r}}{(2-3r)^2}-\frac{1}{2}\left(\frac{d^3}{x^2}+\frac{3de^2x^{-2(1-r)}}{1-r}+\frac{6d^2e\cdots}{2-\cdots}\right.$$

Mathematica [A] time = 0.392199, size = 181, normalized size = 0.95

$$\frac{a\left(\frac{12d^2ex^r}{r-2}-2d^3+\frac{6de^2x^{2r}}{r-1}+\frac{4e^3x^{3r}}{3r-2}\right)+2b\log(cx^n)\left(\frac{6d^2ex^r}{r-2}-d^3+\frac{3de^2x^{2r}}{r-1}+\frac{2e^3x^{3r}}{3r-2}\right)+bn\left(-\frac{12d^2ex^r}{(r-2)^2}-d^3-\frac{3de^2x^{2r}}{(r-1)^2}-\frac{4e^3x^{3r}}{(2-3r)^2}\right)}{4x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^3,x]
```

```
[Out] (b*n*(-d^3 - (12*d^2*e*x^r)/(-2 + r)^2 - (3*d*e^2*x^(2*r))/(-1 + r)^2 - (4*
e^3*x^(3*r))/(2 - 3*r)^2) + a*(-2*d^3 + (12*d^2*e*x^r)/(-2 + r) + (6*d*e^2*
x^(2*r))/(-1 + r) + (4*e^3*x^(3*r))/(-2 + 3*r)) + 2*b*(-d^3 + (6*d^2*e*x^r)
/(-2 + r) + (3*d*e^2*x^(2*r))/(-1 + r) + (2*e^3*x^(3*r))/(-2 + 3*r))*Log[c*
x^n])/(4*x^2)
```

Maple [C] time = 0.339, size = 4027, normalized size = 21.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x^3,x)

[Out] -1/2*b*(-2*e^3*r^2*(x^r)^3-9*d*e^2*r^2*(x^r)^2+6*e^3*r*(x^r)^3+3*d^3*r^3-18
*d^2*e*r^2*x^r+24*d*e^2*r*(x^r)^2-4*e^3*(x^r)^3-11*d^3*r^2+30*d^2*e*r*x^r-1
2*d*e^2*(x^r)^2+12*d^3*r-12*d^2*e*x^r-4*d^3)/x^2/(-2+3*r)/(-1+r)/(-2+r)*ln(
x^n)-1/4*(582*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+32*a
*d^3+408*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-288*I
*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^
2*csgn(I*c)+32*a*e^3*(x^r)^3+32*ln(c)*b*d^3-72*I*Pi*b*e^3*r*csgn(I*x^n)*csg
n(I*c*x^n)^2*(x^r)^3-72*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+9*b*
d^3*n*r^6-66*b*d^3*n*r^5+193*b*d^3*n*r^4+18*a*d^3*r^6-132*a*d^3*r^5+386*a*d
^3*r^4+6*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-96*I*Pi*b*d^3*r*csgn(I*x^n)
*csgn(I*c*x^n)^2-96*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-12*a*e^3*r^5*(x^
r)^3+80*a*e^3*r^4*(x^r)^3+96*a*d*e^2*(x^r)^2+96*a*d^2*e*x^r+16*b*e^3*n*(x^r
)^3-204*a*e^3*r^3*(x^r)^3+248*a*e^3*r^2*(x^r)^3-144*a*e^3*r*(x^r)^3+32*ln(c
)*b*e^3*(x^r)^3-288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^
r-288*b*d^3*n*r^3+232*b*d^3*n*r^2-96*b*d^3*n*r+18*ln(c)*b*d^3*r^6-132*ln(c)
*b*d^3*r^5+386*ln(c)*b*d^3*r^4-576*ln(c)*b*d^3*r^3+464*ln(c)*b*d^3*r^2-192*
ln(c)*b*d^3*r-576*a*d^3*r^3+464*a*d^3*r^2-192*a*d^3*r-480*a*d*e^2*r*(x^r)^2
-1164*a*d^2*e*r^3*x^r+1128*a*d^2*e*r^2*x^r-528*a*d^2*e*r*x^r+6*I*Pi*b*e^3*r
^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+16*b*d^3*n-54*I*Pi*b*d^2*e*r
^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+9*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^
n)^2-124*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+16*I*Pi*b*e^3*csgn(I*x^n)*c
sgn(I*c*x^n)^2*(x^r)^3+16*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-408*
I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+264*I*Pi*b*d^2*e*r*csgn(
I*c*x^n)^3*x^r-6*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-6*I*Pi*
b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^
n)^3*(x^r)^2-582*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-16*I*Pi*b*d
^3*csgn(I*c*x^n)^3+80*ln(c)*b*e^3*r^4*(x^r)^3-204*ln(c)*b*e^3*r^3*(x^r)^3+2
48*ln(c)*b*e^3*r^2*(x^r)^3-144*ln(c)*b*e^3*r*(x^r)^3+96*ln(c)*b*d^2*e*x^r+9
6*ln(c)*b*d*e^2*(x^r)^2+52*b*e^3*n*r^2*(x^r)^3-48*b*e^3*n*r*(x^r)^3+48*b*d*
e^2*n*(x^r)^2+48*b*d^2*e*n*x^r-816*a*d*e^2*r^3*(x^r)^2+912*a*d*e^2*r^2*(x^r
)^2+4*b*e^3*n*r^4*(x^r)^3-24*b*e^3*n*r^3*(x^r)^3-54*a*d*e^2*r^5*(x^r)^2+342
*a*d*e^2*r^4*(x^r)^2-108*a*d^2*e*r^5*x^r+576*a*d^2*e*r^4*x^r-12*ln(c)*b*e^3
*r^5*(x^r)^3+264*b*d*e^2*n*r^2*(x^r)^2+444*b*d^2*e*n*r^2*x^r-193*I*Pi*b*d^3
*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-456*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)
^3*(x^r)^2-564*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r-16*I*Pi*b*e^3*csgn(I*x^
```

n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+48*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n
)^2*(x^r)^2+48*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+48*I*Pi*b*d^2
*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-240*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*
x^n)^2*(x^r)^2-240*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-102*I*P
i*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-102*I*Pi*b*e^3*r^3*csgn(I*c
*x^n)^2*csgn(I*c)*(x^r)^3-171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^2-27*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-456*I
*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-564*I*Pi*b*d^2*
e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-264*I*Pi*b*d^2*e*r*csgn(I*x^n
)*csgn(I*c*x^n)^2*x^r-264*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+124*
I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-232*I*Pi*b*d^3*r^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+408*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-1
92*b*d*e^2*n*r*(x^r)^2-240*b*d^2*e*n*r*x^r+27*b*d*e^2*n*r^4*(x^r)^2-144*b*d
*e^2*n*r^3*(x^r)^2+108*b*d^2*e*n*r^4*x^r-360*b*d^2*e*n*r^3*x^r-54*ln(c)*b*d
*e^2*r^5*(x^r)^2+342*ln(c)*b*d*e^2*r^4*(x^r)^2-108*ln(c)*b*d^2*e*r^5*x^r+57
6*ln(c)*b*d^2*e*r^4*x^r+72*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*(x^r)^3+102*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-582
*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+102*I*Pi*b*e^3*r^3*csgn(I
*c*x^n)^3*(x^r)^3+72*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3+54*I*Pi*b*d^2*e*r
^5*csgn(I*c*x^n)^3*x^r-16*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+16*I*Pi*b*d^3*
csgn(I*c*x^n)^2*csgn(I*c)-9*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3-193*I*Pi*b*d^3*r
^4*csgn(I*c*x^n)^3+96*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1164
*ln(c)*b*d^2*e*r^3*x^r+1128*ln(c)*b*d^2*e*r^2*x^r-528*ln(c)*b*d^2*e*r*x^r-8
16*ln(c)*b*d*e^2*r^3*(x^r)^2+912*ln(c)*b*d*e^2*r^2*(x^r)^2-480*ln(c)*b*d*e^
2*r*(x^r)^2+54*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-27*
I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-66*I*Pi*b*d^3*r^5*csgn
(I*x^n)*csgn(I*c*x^n)^2-66*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-48*I*Pi
*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+288*I*Pi*b*d^2*e*r^4*csgn(
I*x^n)*csgn(I*c*x^n)^2*x^r+288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x
^r+240*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-408*I*Pi*b*d*e^2*r^3*csgn(I*x
^n)*csgn(I*c*x^n)^2*(x^r)^2-40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)*(x^r)^3+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+171
*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+232*I*Pi*b*d^3*r^2*csgn
(I*x^n)*csgn(I*c*x^n)^2+232*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)+9*I*Pi
*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)+48*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I
*c)*x^r+40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+40*I*Pi*b*e^3
*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+27*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*(x^r)^2-124*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^3+456*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+66
*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^
2-288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+124*I*Pi*b*e^3*r^2*csgn(I*x^n)*c
sgn(I*c*x^n)^2*(x^r)^3-16*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+58
2*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+96*I*Pi*b*d^3*r*csgn(I*c*x^n)^3+66*I
*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+288*I*Pi*b*d^3*r^3*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+456*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c

```
)*(x^r)^2+564*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+564*I*Pi*b*d
^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-48*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*(x^r)^2+193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+193*
I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)-48*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^
r+16*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-232*I*Pi*b*d^3*r^2*csgn(I*c*x^n
)^3-9*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-54*I*Pi*b*d^2*e*r^
5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+288*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3-48*I*Pi*
b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3+2
40*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+264*I*Pi*b*d^
2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r)/(-2+3*r)^2/x^2/(-1+r)^2/(-2+
r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.49595, size = 2287, normalized size = 11.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^3,x, algorithm="fricas")
```

```
[Out] -1/4*(9*(b*d^3*n + 2*a*d^3)*r^6 - 66*(b*d^3*n + 2*a*d^3)*r^5 + 16*b*d^3*n +
 193*(b*d^3*n + 2*a*d^3)*r^4 + 32*a*d^3 - 288*(b*d^3*n + 2*a*d^3)*r^3 + 232
*(b*d^3*n + 2*a*d^3)*r^2 - 96*(b*d^3*n + 2*a*d^3)*r - 4*(3*a*e^3*r^5 - 4*b*
e^3*n - (b*e^3*n + 20*a*e^3)*r^4 - 8*a*e^3 + 3*(2*b*e^3*n + 17*a*e^3)*r^3 -
 (13*b*e^3*n + 62*a*e^3)*r^2 + 12*(b*e^3*n + 3*a*e^3)*r + (3*b*e^3*r^5 - 20
*b*e^3*r^4 + 51*b*e^3*r^3 - 62*b*e^3*r^2 + 36*b*e^3*r - 8*b*e^3)*log(c) + (
3*b*e^3*n*r^5 - 20*b*e^3*n*r^4 + 51*b*e^3*n*r^3 - 62*b*e^3*n*r^2 + 36*b*e^3
*n*r - 8*b*e^3*n)*log(x))*x^(3*r) - 3*(18*a*d*e^2*r^5 - 16*b*d*e^2*n - 3*(3
*b*d*e^2*n + 38*a*d*e^2)*r^4 - 32*a*d*e^2 + 16*(3*b*d*e^2*n + 17*a*d*e^2)*r
^3 - 8*(11*b*d*e^2*n + 38*a*d*e^2)*r^2 + 32*(2*b*d*e^2*n + 5*a*d*e^2)*r + 2
```

```
*(9*b*d*e^2*r^5 - 57*b*d*e^2*r^4 + 136*b*d*e^2*r^3 - 152*b*d*e^2*r^2 + 80*b
*d*e^2*r - 16*b*d*e^2)*log(c) + 2*(9*b*d*e^2*n*r^5 - 57*b*d*e^2*n*r^4 + 136
*b*d*e^2*n*r^3 - 152*b*d*e^2*n*r^2 + 80*b*d*e^2*n*r - 16*b*d*e^2*n)*log(x))
*x^(2*r) - 12*(9*a*d^2*e*r^5 - 4*b*d^2*e*n - 3*(3*b*d^2*e*n + 16*a*d^2*e)*r
^4 - 8*a*d^2*e + (30*b*d^2*e*n + 97*a*d^2*e)*r^3 - (37*b*d^2*e*n + 94*a*d^2
*e)*r^2 + 4*(5*b*d^2*e*n + 11*a*d^2*e)*r + (9*b*d^2*e*r^5 - 48*b*d^2*e*r^4
+ 97*b*d^2*e*r^3 - 94*b*d^2*e*r^2 + 44*b*d^2*e*r - 8*b*d^2*e)*log(c) + (9*b
*d^2*e*n*r^5 - 48*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 - 94*b*d^2*e*n*r^2 + 44*
b*d^2*e*n*r - 8*b*d^2*e*n)*log(x))*x^r + 2*(9*b*d^3*r^6 - 66*b*d^3*r^5 + 19
3*b*d^3*r^4 - 288*b*d^3*r^3 + 232*b*d^3*r^2 - 96*b*d^3*r + 16*b*d^3)*log(c)
 + 2*(9*b*d^3*n*r^6 - 66*b*d^3*n*r^5 + 193*b*d^3*n*r^4 - 288*b*d^3*n*r^3 +
232*b*d^3*n*r^2 - 96*b*d^3*n*r + 16*b*d^3*n)*log(x))/((9*r^6 - 66*r^5 + 193
*r^4 - 288*r^3 + 232*r^2 - 96*r + 16)*x^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^3 (b \log(cx^n) + a)}{x^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^3,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^3, x)
```

3.397 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^5}\,dx$

Optimal. Leaf size=191

$$-\frac{3d^2ex^{r-4}\left(a+b\log\left(cx^n\right)\right)}{4-r}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{4x^4}-\frac{3de^2x^{-2(2-r)}\left(a+b\log\left(cx^n\right)\right)}{2(2-r)}-\frac{e^3x^{3r-4}\left(a+b\log\left(cx^n\right)\right)}{4-3r}-\frac{3bd^2enx^{r-}}{(4-r)^2}$$

```
[Out] -(b*d^3*n)/(16*x^4) - (3*b*d*e^2*n)/(4*(2 - r)^2*x^(2*(2 - r))) - (3*b*d^2*
e*n*x^(-4 + r))/(4 - r)^2 - (b*e^3*n*x^(-4 + 3*r))/(4 - 3*r)^2 - (d^3*(a +
b*Log[c*x^n]))/(4*x^4) - (3*d*e^2*(a + b*Log[c*x^n]))/(2*(2 - r)*x^(2*(2 -
r))) - (3*d^2*e*x^(-4 + r)*(a + b*Log[c*x^n]))/(4 - r) - (e^3*x^(-4 + 3*r)*
(a + b*Log[c*x^n]))/(4 - 3*r)
```

Rubi [A] time = 0.39653, antiderivative size = 161, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{4}\left(\frac{12d^2ex^{r-4}}{4-r}+\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{4e^3x^{3r-4}}{4-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-4}}{(4-r)^2}-\frac{bd^3n}{16x^4}-\frac{3bde^2nx^{-2(2-r)}}{4(2-r)^2}-\frac{be^3nx^{3r-4}}{(4-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] -(b*d^3*n)/(16*x^4) - (3*b*d*e^2*n)/(4*(2 - r)^2*x^(2*(2 - r))) - (3*b*d^2*
e*n*x^(-4 + r))/(4 - r)^2 - (b*e^3*n*x^(-4 + 3*r))/(4 - 3*r)^2 - ((d^3/x^4
+ (6*d*e^2)/((2 - r)*x^(2*(2 - r))) + (12*d^2*e*x^(-4 + r))/(4 - r) + (4*e^
3*x^(-4 + 3*r))/(4 - 3*r))*(a + b*Log[c*x^n]))/4
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^3 (a+b\log(cx^n))}{x^5}\,dx = -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{12d^2ex^{-4+r}}{4-r}+\frac{4e^3x^{-4+3r}}{4-3r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^3+1\cdots}{\cdots}$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{12d^2ex^{-4+r}}{4-r}+\frac{4e^3x^{-4+3r}}{4-3r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int \frac{-d^3+\cdots}{\cdots}$$

$$= -\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{12d^2ex^{-4+r}}{4-r}+\frac{4e^3x^{-4+3r}}{4-3r}\right)(a+b\log(cx^n))-\frac{1}{4}(bn)\int\left(-\frac{d^3}{x^5}\cdots\right.$$

$$= -\frac{bd^3n}{16x^4}-\frac{3bde^2nx^{-2(2-r)}}{4(2-r)^2}-\frac{3bd^2enx^{-4+r}}{(4-r)^2}-\frac{be^3nx^{-4+3r}}{(4-3r)^2}-\frac{1}{4}\left(\frac{d^3}{x^4}+\frac{6de^2x^{-2(2-r)}}{2-r}+\frac{12d^2e\cdots}{4\cdots}\right.$$

Mathematica [A] time = 0.389925, size = 181, normalized size = 0.95

$$\frac{a\left(\frac{48d^2ex^r}{r-4}-4d^3+\frac{24de^2x^{2r}}{r-2}+\frac{16e^3x^{3r}}{3r-4}\right)+4b\log(cx^n)\left(\frac{12d^2ex^r}{r-4}-d^3+\frac{6de^2x^{2r}}{r-2}+\frac{4e^3x^{3r}}{3r-4}\right)+bn\left(-\frac{48d^2ex^r}{(r-4)^2}-d^3-\frac{12de^2x^{2r}}{(r-2)^2}-\frac{16e^3x^{3r}}{(4-3r)^2}\right)}{16x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^5,x]
```

```
[Out] (b*n*(-d^3 - (48*d^2*e*x^r)/(-4 + r)^2 - (12*d*e^2*x^(2*r))/(-2 + r)^2 - (1
6*e^3*x^(3*r))/(4 - 3*r)^2) + a*(-4*d^3 + (48*d^2*e*x^r)/(-4 + r) + (24*d*e
^2*x^(2*r))/(-2 + r) + (16*e^3*x^(3*r))/(-4 + 3*r)) + 4*b*(-d^3 + (12*d^2*e
*x^r)/(-4 + r) + (6*d*e^2*x^(2*r))/(-2 + r) + (4*e^3*x^(3*r))/(-4 + 3*r))*L
og[c*x^n])/(16*x^4)
```

Maple [C] time = 0.347, size = 4027, normalized size = 21.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x^5,x)
```

```
[Out] -1/4*b*(-4*e^3*r^2*(x^r)^3-18*d*e^2*r^2*(x^r)^2+24*e^3*r*(x^r)^3+3*d^3*r^3-
36*d^2*e*r^2*x^r+96*d*e^2*r*(x^r)^2-32*e^3*(x^r)^3-22*d^3*r^2+120*d^2*e*r*x
^r-96*d*e^2*(x^r)^2+48*d^3*r-96*d^2*e*x^r-32*d^3)/x^4/(-4+3*r)/(-2+r)/(-4+r
)*ln(x^n)-1/16*(4096*a*d^3+24*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^3-108*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+6144
*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+264*I*Pi*b*d^3*r^5*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)+4096*a*e^3*(x^r)^3+7424*I*Pi*b*d^3*r^2*csgn(I
*x^n)*csgn(I*c*x^n)^2+7424*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)+18*I*Pi
*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)+4096*ln(c)*b*d^3-1544*I*Pi*b*d^3*r^4*c
sgn(I*c*x^n)^3+2048*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+9*b*d^3*n*r^6-13
2*b*d^3*n*r^5+772*b*d^3*n*r^4+6528*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2
+36*a*d^3*r^6-528*a*d^3*r^5+3088*a*d^3*r^4-48*a*e^3*r^5*(x^r)^3+640*a*e^3*r
^4*(x^r)^3+12288*a*d*e^2*(x^r)^2+12288*a*d^2*e*x^r+1024*b*e^3*n*(x^r)^3-326
4*a*e^3*r^3*(x^r)^3+7936*a*e^3*r^2*(x^r)^3-9216*a*e^3*r*(x^r)^3+4096*ln(c)*
b*e^3*(x^r)^3-2304*b*d^3*n*r^3+3712*b*d^3*n*r^2-3072*b*d^3*n*r+36*ln(c)*b*d
^3*r^6-528*ln(c)*b*d^3*r^5+3088*ln(c)*b*d^3*r^4-9216*ln(c)*b*d^3*r^3+14848*
ln(c)*b*d^3*r^2-12288*ln(c)*b*d^3*r-9216*a*d^3*r^3+14848*a*d^3*r^2-12288*a*
d^3*r-30720*a*d*e^2*r*(x^r)^2-18624*a*d^2*e*r^3*x^r+36096*a*d^2*e*r^2*x^r-3
3792*a*d^2*e*r*x^r+1024*b*d^3*n-15360*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I
*c)*(x^r)^2-16896*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+1544*I*Pi*
b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+1544*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*c
sgn(I*c)-6144*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+640*ln(c)*b*e^3*r^4*(x^r)^3-
3264*ln(c)*b*e^3*r^3*(x^r)^3+7936*ln(c)*b*e^3*r^2*(x^r)^3-9216*ln(c)*b*e^3*
r*(x^r)^3+12288*ln(c)*b*d^2*e*x^r+12288*ln(c)*b*d*e^2*(x^r)^2+832*b*e^3*n*r
^2*(x^r)^3-1536*b*e^3*n*r*(x^r)^3+3072*b*d*e^2*n*(x^r)^2+3072*b*d^2*e*n*x^r
-13056*a*d*e^2*r^3*(x^r)^2+29184*a*d*e^2*r^2*(x^r)^2+16*b*e^3*n*r^4*(x^r)^3
-192*b*e^3*n*r^3*(x^r)^3-216*a*d*e^2*r^5*(x^r)^2+2736*a*d*e^2*r^4*(x^r)^2-4
32*a*d^2*e*r^5*x^r+4608*a*d^2*e*r^4*x^r-48*ln(c)*b*e^3*r^5*(x^r)^3+4224*b*d
*e^2*n*r^2*(x^r)^2+7104*b*d^2*e*n*r^2*x^r+4608*I*Pi*b*e^3*r*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*(x^r)^3-216*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)
*x^r+1632*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+24*I*P
i*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-2048*I*Pi*b*d^3*csgn(I*c*x^n)^3-6528*I*
Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3968*I*Pi*b*e^3*r^2*csgn
(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+3968*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*
c)*(x^r)^3-1632*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-24*I*Pi*b*
```

e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-24*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-1632*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+14592*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+14592*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+18048*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+18048*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1368*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1368*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-3968*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-15360*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+6144*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+6144*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+6144*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+320*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+108*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+15360*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+16896*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-6144*b*d*e^2*n*r*(x^r)^2-7680*b*d^2*e*n*r*x^r+108*b*d*e^2*n*r^4*(x^r)^2-1152*b*d*e^2*n*r^3*(x^r)^2+432*b*d^2*e*n*r^4*x^r-2880*b*d^2*e*n*r^3*x^r-216*ln(c)*b*d*e^2*r^5*(x^r)^2+2736*ln(c)*b*d*e^2*r^4*(x^r)^2-432*ln(c)*b*d^2*e*r^5*x^r+4608*ln(c)*b*d^2*e*r^4*x^r-108*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+4608*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-16896*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1632*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3-2048*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+2048*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-18*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+16896*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-18624*ln(c)*b*d^2*e*r^3*x^r+36096*ln(c)*b*d^2*e*r^2*x^r-33792*ln(c)*b*d^2*e*r*x^r-13056*ln(c)*b*d*e^2*r^3*(x^r)^2+29184*ln(c)*b*d*e^2*r^2*(x^r)^2-30720*ln(c)*b*d*e^2*r*(x^r)^2-7424*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3-4608*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+15360*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-264*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-6144*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-216*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-6528*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-6144*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-6144*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+6528*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+9312*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1544*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-14592*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-2048*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-6144*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+2304*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2304*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-320*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-264*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-18048*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r-2048*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+6144*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-6144*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-320*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3-9312*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+4608*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+6144*I*Pi*b*d^3*r*csgn(I*c*x^n)^3+108*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+216*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+18*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-3968*I*Pi*b*e^3*r

```
^2*csgn(I*c*x^n)^3*(x^r)^3+2048*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^3+2048*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-14592*I*Pi*b*d*e^2*r^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+216*I*Pi*b*d^2*e*r^5*csgn(I*c
*x^n)^3*x^r+320*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-1368*I*Pi*
b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-2304*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x
^r-18048*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-1368*I*Pi
*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-2304*I*Pi*b*d^2*e*
r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+4608*I*Pi*b*d^3*r^3*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)-7424*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)-9312*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+9312*I*Pi*b*d^2*e
*r^3*csgn(I*c*x^n)^3*x^r-4608*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^3+264*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-4608*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn
(I*c*x^n)^2-4608*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c))/(-4+3*r)^2/x^4/(
-2+r)^2/(-4+r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x^5,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.52473, size = 2395, normalized size = 12.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^5,x, algorithm="fricas")
```

```
[Out] -1/16*(9*(b*d^3*n + 4*a*d^3)*r^6 - 132*(b*d^3*n + 4*a*d^3)*r^5 + 1024*b*d^3
*n + 772*(b*d^3*n + 4*a*d^3)*r^4 + 4096*a*d^3 - 2304*(b*d^3*n + 4*a*d^3)*r^
3 + 3712*(b*d^3*n + 4*a*d^3)*r^2 - 3072*(b*d^3*n + 4*a*d^3)*r - 16*(3*a*e^3
*r^5 - 64*b*e^3*n - (b*e^3*n + 40*a*e^3)*r^4 - 256*a*e^3 + 12*(b*e^3*n + 17
*a*e^3)*r^3 - 4*(13*b*e^3*n + 124*a*e^3)*r^2 + 96*(b*e^3*n + 6*a*e^3)*r + (
3*b*e^3*r^5 - 40*b*e^3*r^4 + 204*b*e^3*r^3 - 496*b*e^3*r^2 + 576*b*e^3*r -
256*b*e^3)*log(c) + (3*b*e^3*n*r^5 - 40*b*e^3*n*r^4 + 204*b*e^3*n*r^3 - 496
```

```
*b*e^3*n*r^2 + 576*b*e^3*n*r - 256*b*e^3*n)*log(x))*x^(3*r) - 12*(18*a*d*e^
2*r^5 - 256*b*d*e^2*n - 3*(3*b*d*e^2*n + 76*a*d*e^2)*r^4 - 1024*a*d*e^2 + 3
2*(3*b*d*e^2*n + 34*a*d*e^2)*r^3 - 32*(11*b*d*e^2*n + 76*a*d*e^2)*r^2 + 512
*(b*d*e^2*n + 5*a*d*e^2)*r + 2*(9*b*d*e^2*r^5 - 114*b*d*e^2*r^4 + 544*b*d*e
^2*r^3 - 1216*b*d*e^2*r^2 + 1280*b*d*e^2*r - 512*b*d*e^2)*log(c) + 2*(9*b*d
*e^2*n*r^5 - 114*b*d*e^2*n*r^4 + 544*b*d*e^2*n*r^3 - 1216*b*d*e^2*n*r^2 + 1
280*b*d*e^2*n*r - 512*b*d*e^2*n)*log(x))*x^(2*r) - 48*(9*a*d^2*e*r^5 - 64*b
*d^2*e*n - 3*(3*b*d^2*e*n + 32*a*d^2*e)*r^4 - 256*a*d^2*e + 4*(15*b*d^2*e*n
 + 97*a*d^2*e)*r^3 - 4*(37*b*d^2*e*n + 188*a*d^2*e)*r^2 + 32*(5*b*d^2*e*n +
 22*a*d^2*e)*r + (9*b*d^2*e*r^5 - 96*b*d^2*e*r^4 + 388*b*d^2*e*r^3 - 752*b*
d^2*e*r^2 + 704*b*d^2*e*r - 256*b*d^2*e)*log(c) + (9*b*d^2*e*n*r^5 - 96*b*d
^2*e*n*r^4 + 388*b*d^2*e*n*r^3 - 752*b*d^2*e*n*r^2 + 704*b*d^2*e*n*r - 256*
b*d^2*e*n)*log(x))*x^r + 4*(9*b*d^3*r^6 - 132*b*d^3*r^5 + 772*b*d^3*r^4 - 2
304*b*d^3*r^3 + 3712*b*d^3*r^2 - 3072*b*d^3*r + 1024*b*d^3)*log(c) + 4*(9*b
*d^3*n*r^6 - 132*b*d^3*n*r^5 + 772*b*d^3*n*r^4 - 2304*b*d^3*n*r^3 + 3712*b*
d^3*n*r^2 - 3072*b*d^3*n*r + 1024*b*d^3*n)*log(x))/((9*r^6 - 132*r^5 + 772*
r^4 - 2304*r^3 + 3712*r^2 - 3072*r + 1024)*x^4)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**5,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^3 (b \log(cx^n) + a)}{x^5} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^5,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^5, x)
```

3.398 $\int x^4 (d+ex^r)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=151

$$\frac{1}{5}\left(\frac{15d^2ex^{r+5}}{r+5}+d^3x^5+\frac{15de^2x^{2r+5}}{2r+5}+\frac{5e^3x^{3r+5}}{3r+5}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+5}}{(r+5)^2}-\frac{1}{25}bd^3nx^5-\frac{3bde^2nx^{2r+5}}{(2r+5)^2}-\frac{be^3nx^{3r+5}}{(3r+5)^2}$$

```
[Out] -(b*d^3*n*x^5)/25 - (3*b*d^2*e*n*x^(5 + r))/(5 + r)^2 - (3*b*d*e^2*n*x^(5 +
 2*r))/(5 + 2*r)^2 - (b*e^3*n*x^(5 + 3*r))/(5 + 3*r)^2 + ((d^3*x^5 + (15*d^
2*e*x^(5 + r))/(5 + r) + (15*d*e^2*x^(5 + 2*r))/(5 + 2*r) + (5*e^3*x^(5 + 3
*r))/(5 + 3*r))*(a + b*Log[c*x^n]))/5
```

Rubi [A] time = 0.380962, antiderivative size = 151, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{5}\left(\frac{15d^2ex^{r+5}}{r+5}+d^3x^5+\frac{15de^2x^{2r+5}}{2r+5}+\frac{5e^3x^{3r+5}}{3r+5}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+5}}{(r+5)^2}-\frac{1}{25}bd^3nx^5-\frac{3bde^2nx^{2r+5}}{(2r+5)^2}-\frac{be^3nx^{3r+5}}{(3r+5)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^5)/25 - (3*b*d^2*e*n*x^(5 + r))/(5 + r)^2 - (3*b*d*e^2*n*x^(5 +
 2*r))/(5 + 2*r)^2 - (b*e^3*n*x^(5 + 3*r))/(5 + 3*r)^2 + ((d^3*x^5 + (15*d^
2*e*x^(5 + r))/(5 + r) + (15*d*e^2*x^(5 + 2*r))/(5 + 2*r) + (5*e^3*x^(5 + 3
*r))/(5 + 3*r))*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^4 (d+ex^r)^3 (a+b\log(cx^n))\,dx = \frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{5+r}}{5+r}+\frac{15de^2x^{5+2r}}{5+2r}+\frac{5e^3x^{5+3r}}{5+3r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{5}x^4\left(d^3\right.$$
$$=\frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{5+r}}{5+r}+\frac{15de^2x^{5+2r}}{5+2r}+\frac{5e^3x^{5+3r}}{5+3r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int x^4\left(d^3\right.$$
$$=\frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{5+r}}{5+r}+\frac{15de^2x^{5+2r}}{5+2r}+\frac{5e^3x^{5+3r}}{5+3r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int\left(d^3x^4\right.$$
$$=-\frac{1}{25}bd^3nx^5-\frac{3bd^2enx^{5+r}}{(5+r)^2}-\frac{3bde^2nx^{5+2r}}{(5+2r)^2}-\frac{be^3nx^{5+3r}}{(5+3r)^2}+\frac{1}{5}\left(d^3x^5+\frac{15d^2ex^{5+r}}{5+r}+\right.$$

Mathematica [A] time = 0.352846, size = 184, normalized size = 1.22

$$\frac{1}{25}x^5\left(5a\left(\frac{15d^2ex^r}{r+5}+d^3+\frac{15de^2x^{2r}}{2r+5}+\frac{5e^3x^{3r}}{3r+5}\right)+5b\log(cx^n)\left(\frac{15d^2ex^r}{r+5}+d^3+\frac{15de^2x^{2r}}{2r+5}+\frac{5e^3x^{3r}}{3r+5}\right)+bn\left(-\frac{75d^2ex^r}{(r+5)^2}-d^3\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^5*(b*n*(-d^3 - (75*d^2*e*x^r)/(5 + r)^2 - (75*d*e^2*x^(2*r))/(5 + 2*r)^2
 - (25*e^3*x^(3*r))/(5 + 3*r)^2) + 5*a*(d^3 + (15*d^2*e*x^r)/(5 + r) + (15*
d*e^2*x^(2*r))/(5 + 2*r) + (5*e^3*x^(3*r))/(5 + 3*r)) + 5*b*(d^3 + (15*d^2*
e*x^r)/(5 + r) + (15*d*e^2*x^(2*r))/(5 + 2*r) + (5*e^3*x^(3*r))/(5 + 3*r))*
Log[c*x^n]))/25
```

Maple [C] time = 0.403, size = 4031, normalized size = 26.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^4*(d+e*x^r)^3*(a+b*ln(c*x^n)),x)

[Out] 1/5*x^5*b*(10*e^3*r^2*(x^r)^3+45*d*e^2*r^2*(x^r)^2+75*e^3*r*(x^r)^3+6*d^3*r^3+90*d^2*e*r^2*x^r+300*d*e^2*r*(x^r)^2+125*e^3*(x^r)^3+55*d^3*r^2+375*d^2*e*r*x^r+375*d*e^2*(x^r)^2+150*d^3*r+375*d^2*e*x^r+125*d^3)/(5+3*r)/(5+2*r)/(5+r)*ln(x^n)-1/50*x^5*(356250*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-140625*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-156250*a*d^3-31875*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-31875*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-300*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-5000*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-156250*a*e^3*(x^r)^3-181250*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)-187500*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-90000*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-156250*ln(c)*b*d^3+3300*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3+24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-78125*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+90000*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+72*b*d^3*n*r^6+1320*b*d^3*n*r^5+9650*b*d^3*n*r^4-360*a*d^3*r^6-6600*a*d^3*r^5-48250*a*d^3*r^4+300*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+5000*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3+78125*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-600*a*e^3*r^5*(x^r)^3-10000*a*e^3*r^4*(x^r)^3-468750*a*d*e^2*(x^r)^2-468750*a*d^2*e*x^r+31250*b*e^3*n*(x^r)^3-63750*a*e^3*r^3*(x^r)^3-193750*a*e^3*r^2*(x^r)^3-281250*a*e^3*r*(x^r)^3-156250*ln(c)*b*e^3*(x^r)^3-3300*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-24125*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+36000*b*d^3*n*r^3+72500*b*d^3*n*r^2+75000*b*d^3*n*r-360*ln(c)*b*d^3*r^6-6600*ln(c)*b*d^3*r^5-48250*ln(c)*b*d^3*r^4-180000*ln(c)*b*d^3*r^3-362500*ln(c)*b*d^3*r^2-375000*ln(c)*b*d^3*r-180000*a*d^3*r^3-362500*a*d^3*r^2-375000*a*d^3*r-937500*a*d*e^2*r*(x^r)^2-363750*a*d^2*e*r^3*x^r-881250*a*d^2*e*r^2*x^r-1031250*a*d^2*e*r*x^r+31250*b*d^3*n-180*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+96875*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3-78125*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+78125*I*Pi*b*d^3*csgn(I*c*x^n)^3-90000*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)-180*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-3300*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-10000*ln(c)*b*e^3*r^4*(x^r)^3-63750*ln(c)*b*e^3*r^3*(x^r)^3-193750*ln(c)*b*e^3*r^2*(x^r)^3-281250*ln(c)*b*e^3*r*(x^r)^3-468750*ln(c)*b*d^2*e*x^r-468750*ln(c)*b*d*e^2*(x^r)^2+16250*b*e^3*n*r^2*(x^r)^3+37500*b*e^3*n*r*(x^r)^3+93750*b*d*e^2*n*(x^r)^2+93750*b*d^2*e*n*x^r-255000*a*d*e^2*r^3*(x^r)^2-712500*a*d*e^2*r^2*(x^r)^2+200*b*e^3*n*r^4*(x^r)^3+3000*b*e^3*n*r^3*(x^r)^3-2700*a*d*e^2*r^5*(x^r)^2-42750*a*d*e^2*r^4*(x^r)^2-5400*a*d^2*e*r^5*x^r-72000*a*d^2*e*r^4*x^r-600*ln(c)*b*e^3*r^5*(x^r)^3+82500*b*d*e^2*n*r^2*(x^r)^2+138750*b*d^2*e*n*r^2*x^r-78125*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+180*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+468750*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+515625*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+21375*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+181875*I*Pi

*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+356250*I*Pi*b*d*e^2*r^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+440625*I*Pi*b*d^2*e*r^2*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2700*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*cs
gn(I*c)*x^r-2700*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+5000*I*Pi
*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+181250*I*Pi*b*d^3*r^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+127500*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)
^3*(x^r)^2-300*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+1350*I*Pi*b
*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+150000*b*d*e^2*n*r*(x^r)^2+187500*b*d^2*
e*n*r*x^r+1350*b*d*e^2*n*r^4*(x^r)^2+18000*b*d*e^2*n*r^3*(x^r)^2+5400*b*d^2
*e*n*r^4*x^r+45000*b*d^2*e*n*r^3*x^r-2700*ln(c)*b*d*e^2*r^5*(x^r)^2-42750*l
n(c)*b*d*e^2*r^4*(x^r)^2-5400*ln(c)*b*d^2*e*r^5*x^r-72000*ln(c)*b*d^2*e*r^4
*x^r+78125*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+515625*I*
Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+234375*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+31
875*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+140625*I*Pi*b*e^3*r*csgn(I*c*x^n
)^3*(x^r)^3+234375*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+36000*I*Pi*b*d^2*e*
r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+1350*I*Pi*b*d*e^2*r^5*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2700*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*x^r-140625*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3
+440625*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+468750*I*Pi*b*d*e^2*r*csgn(I*c
x^n)^3(x^r)^2-363750*ln(c)*b*d^2*e*r^3*x^r-881250*ln(c)*b*d^2*e*r^2*x^r-1
031250*ln(c)*b*d^2*e*r*x^r-255000*ln(c)*b*d*e^2*r^3*(x^r)^2-712500*ln(c)*b*
d*e^2*r^2*(x^r)^2-937500*ln(c)*b*d*e^2*r*(x^r)^2+181250*I*Pi*b*d^3*r^2*csgn
(I*c*x^n)^3+187500*I*Pi*b*d^3*r*csgn(I*c*x^n)^3+78125*I*Pi*b*e^3*csgn(I*c*x
^n)^3*(x^r)^3-21375*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3600
0*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r-96875*I*Pi*b*e^3*r^2*csgn(I*x^n)*csg
n(I*c*x^n)^2*(x^r)^3-96875*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3
-234375*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-234375*I*Pi*b*d*e^
2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+127500*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*(x^r)^2-78125*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^
r)^3-187500*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-21375*I*Pi*b*d*e^2*r^4*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-127500*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*
csgn(I*c)*(x^r)^2-5000*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+270
0*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r+21375*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)
^3*(x^r)^2+180*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3300*I*Pi
*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+24125*I*Pi*b*d^3*r^4*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+181875*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-13
50*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-1350*I*Pi*b*d*e^2*r
^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+187500*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)+90000*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
181250*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+234375*I*Pi*b*d^2*e*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-36000*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(
I*c*x^n)^2*x^r-36000*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-468750*
I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-515625*I*Pi*b*d^2*e*r*csgn
(I*x^n)*csgn(I*c*x^n)^2*x^r-515625*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)
*x^r+234375*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-234375

```
*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-234375*I*Pi*b*d^2*e*csgn(I*c*
x^n)^2*csgn(I*c)*x^r-440625*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^
r-440625*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-468750*I*Pi*b*d*e^2
*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+140625*I*Pi*b*e^3*r*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*(x^r)^3+31875*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^3-127500*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)
^2-181875*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-356250*I*Pi*b*d*e^
2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-356250*I*Pi*b*d*e^2*r^2*csgn(I*c*
x^n)^2*csgn(I*c)*(x^r)^2+300*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^r)^3+96875*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)
^3-181875*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r)/(5+3*r)^2/(5+2*
r)^2/(5+r)^2
```

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(x^4*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.48592, size = 2560, normalized size = 16.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] 1/25*(5*(36*b*d^3*r^6 + 660*b*d^3*r^5 + 4825*b*d^3*r^4 + 18000*b*d^3*r^3 +
36250*b*d^3*r^2 + 37500*b*d^3*r + 15625*b*d^3)*x^5*log(c) + 5*(36*b*d^3*n*r
^6 + 660*b*d^3*n*r^5 + 4825*b*d^3*n*r^4 + 18000*b*d^3*n*r^3 + 36250*b*d^3*n
*r^2 + 37500*b*d^3*n*r + 15625*b*d^3*n)*x^5*log(x) - (36*(b*d^3*n - 5*a*d^3
)*r^6 + 660*(b*d^3*n - 5*a*d^3)*r^5 + 15625*b*d^3*n + 4825*(b*d^3*n - 5*a*d
^3)*r^4 - 78125*a*d^3 + 18000*(b*d^3*n - 5*a*d^3)*r^3 + 36250*(b*d^3*n - 5*
a*d^3)*r^2 + 37500*(b*d^3*n - 5*a*d^3)*r)*x^5 + 25*((12*b*e^3*r^5 + 200*b*e
^3*r^4 + 1275*b*e^3*r^3 + 3875*b*e^3*r^2 + 5625*b*e^3*r + 3125*b*e^3)*x^5*l
og(c) + (12*b*e^3*n*r^5 + 200*b*e^3*n*r^4 + 1275*b*e^3*n*r^3 + 3875*b*e^3*n
```

```
*r^2 + 5625*b*e^3*n*r + 3125*b*e^3*n)*x^5*log(x) + (12*a*e^3*r^5 - 625*b*e^
3*n - 4*(b*e^3*n - 50*a*e^3)*r^4 + 3125*a*e^3 - 15*(4*b*e^3*n - 85*a*e^3)*r
^3 - 25*(13*b*e^3*n - 155*a*e^3)*r^2 - 375*(2*b*e^3*n - 15*a*e^3)*r)*x^5)*x
^(3*r) + 75*((18*b*d*e^2*r^5 + 285*b*d*e^2*r^4 + 1700*b*d*e^2*r^3 + 4750*b*
d*e^2*r^2 + 6250*b*d*e^2*r + 3125*b*d*e^2)*x^5*log(c) + (18*b*d*e^2*n*r^5 +
 285*b*d*e^2*n*r^4 + 1700*b*d*e^2*n*r^3 + 4750*b*d*e^2*n*r^2 + 6250*b*d*e^2
*n*r + 3125*b*d*e^2*n)*x^5*log(x) + (18*a*d*e^2*r^5 - 625*b*d*e^2*n - 3*(3*
b*d*e^2*n - 95*a*d*e^2)*r^4 + 3125*a*d*e^2 - 20*(6*b*d*e^2*n - 85*a*d*e^2)*
r^3 - 50*(11*b*d*e^2*n - 95*a*d*e^2)*r^2 - 250*(4*b*d*e^2*n - 25*a*d*e^2)*r
)*x^5)*x^(2*r) + 75*((36*b*d^2*e*r^5 + 480*b*d^2*e*r^4 + 2425*b*d^2*e*r^3 +
 5875*b*d^2*e*r^2 + 6875*b*d^2*e*r + 3125*b*d^2*e)*x^5*log(c) + (36*b*d^2*e
*n*r^5 + 480*b*d^2*e*n*r^4 + 2425*b*d^2*e*n*r^3 + 5875*b*d^2*e*n*r^2 + 6875
*b*d^2*e*n*r + 3125*b*d^2*e*n)*x^5*log(x) + (36*a*d^2*e*r^5 - 625*b*d^2*e*n
 - 12*(3*b*d^2*e*n - 40*a*d^2*e)*r^4 + 3125*a*d^2*e - 25*(12*b*d^2*e*n - 97
*a*d^2*e)*r^3 - 25*(37*b*d^2*e*n - 235*a*d^2*e)*r^2 - 625*(2*b*d^2*e*n - 11
*a*d^2*e)*r)*x^5)*x^r)/(36*r^6 + 660*r^5 + 4825*r^4 + 18000*r^3 + 36250*r^2
 + 37500*r + 15625)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.34276, size = 2144, normalized size = 14.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/25*(180*b*d^3*n*r^6*x^5*log(x) + 2700*b*d^2*n*r^5*x^5*x^r*e*log(x) - 36*b
*d^3*n*r^6*x^5 + 180*b*d^3*r^6*x^5*log(c) + 2700*b*d^2*r^5*x^5*x^r*e*log(c)
 + 3300*b*d^3*n*r^5*x^5*log(x) + 1350*b*d*n*r^5*x^5*x^(2*r)*e^2*log(x) + 36
```

```
000*b*d^2*n*r^4*x^5*x^r*e*log(x) - 660*b*d^3*n*r^5*x^5 + 180*a*d^3*r^6*x^5
- 2700*b*d^2*n*r^4*x^5*x^r*e + 2700*a*d^2*r^5*x^5*x^r*e + 3300*b*d^3*r^5*x^
5*log(c) + 1350*b*d*r^5*x^5*x^(2*r)*e^2*log(c) + 36000*b*d^2*r^4*x^5*x^r*e*
log(c) + 24125*b*d^3*n*r^4*x^5*log(x) + 300*b*n*r^5*x^5*x^(3*r)*e^3*log(x)
+ 21375*b*d*n*r^4*x^5*x^(2*r)*e^2*log(x) + 181875*b*d^2*n*r^3*x^5*x^r*e*log
(x) - 4825*b*d^3*n*r^4*x^5 + 3300*a*d^3*r^5*x^5 - 675*b*d*n*r^4*x^5*x^(2*r)
*e^2 + 1350*a*d*r^5*x^5*x^(2*r)*e^2 - 22500*b*d^2*n*r^3*x^5*x^r*e + 36000*a
*d^2*r^4*x^5*x^r*e + 24125*b*d^3*r^4*x^5*log(c) + 300*b*r^5*x^5*x^(3*r)*e^3
*log(c) + 21375*b*d*r^4*x^5*x^(2*r)*e^2*log(c) + 181875*b*d^2*r^3*x^5*x^r*e
*log(c) + 90000*b*d^3*n*r^3*x^5*log(x) + 5000*b*n*r^4*x^5*x^(3*r)*e^3*log(x
) + 127500*b*d*n*r^3*x^5*x^(2*r)*e^2*log(x) + 440625*b*d^2*n*r^2*x^5*x^r*e*
log(x) - 18000*b*d^3*n*r^3*x^5 + 24125*a*d^3*r^4*x^5 - 100*b*n*r^4*x^5*x^(3
*r)*e^3 + 300*a*r^5*x^5*x^(3*r)*e^3 - 9000*b*d*n*r^3*x^5*x^(2*r)*e^2 + 2137
5*a*d*r^4*x^5*x^(2*r)*e^2 - 69375*b*d^2*n*r^2*x^5*x^r*e + 181875*a*d^2*r^3*
x^5*x^r*e + 90000*b*d^3*r^3*x^5*log(c) + 5000*b*r^4*x^5*x^(3*r)*e^3*log(c)
+ 127500*b*d*r^3*x^5*x^(2*r)*e^2*log(c) + 440625*b*d^2*r^2*x^5*x^r*e*log(c)
 + 181250*b*d^3*n*r^2*x^5*log(x) + 31875*b*n*r^3*x^5*x^(3*r)*e^3*log(x) + 3
56250*b*d*n*r^2*x^5*x^(2*r)*e^2*log(x) + 515625*b*d^2*n*r*x^5*x^r*e*log(x)
- 36250*b*d^3*n*r^2*x^5 + 90000*a*d^3*r^3*x^5 - 1500*b*n*r^3*x^5*x^(3*r)*e^
3 + 5000*a*r^4*x^5*x^(3*r)*e^3 - 41250*b*d*n*r^2*x^5*x^(2*r)*e^2 + 127500*a
*d*r^3*x^5*x^(2*r)*e^2 - 93750*b*d^2*n*r*x^5*x^r*e + 440625*a*d^2*r^2*x^5*x
^r*e + 181250*b*d^3*r^2*x^5*log(c) + 31875*b*r^3*x^5*x^(3*r)*e^3*log(c) + 3
56250*b*d*r^2*x^5*x^(2*r)*e^2*log(c) + 515625*b*d^2*r*x^5*x^r*e*log(c) + 18
7500*b*d^3*n*r*x^5*log(x) + 96875*b*n*r^2*x^5*x^(3*r)*e^3*log(x) + 468750*b
*d*n*r*x^5*x^(2*r)*e^2*log(x) + 234375*b*d^2*n*x^5*x^r*e*log(x) - 37500*b*d
^3*n*r*x^5 + 181250*a*d^3*r^2*x^5 - 8125*b*n*r^2*x^5*x^(3*r)*e^3 + 31875*a*
r^3*x^5*x^(3*r)*e^3 - 75000*b*d*n*r*x^5*x^(2*r)*e^2 + 356250*a*d*r^2*x^5*x^
(2*r)*e^2 - 46875*b*d^2*n*x^5*x^r*e + 515625*a*d^2*r*x^5*x^r*e + 187500*b*d
^3*r*x^5*log(c) + 96875*b*r^2*x^5*x^(3*r)*e^3*log(c) + 468750*b*d*r*x^5*x^(
2*r)*e^2*log(c) + 234375*b*d^2*x^5*x^r*e*log(c) + 78125*b*d^3*n*x^5*log(x)
+ 140625*b*n*r*x^5*x^(3*r)*e^3*log(x) + 234375*b*d*n*x^5*x^(2*r)*e^2*log(x)
 - 15625*b*d^3*n*x^5 + 187500*a*d^3*r*x^5 - 18750*b*n*r*x^5*x^(3*r)*e^3 + 9
6875*a*r^2*x^5*x^(3*r)*e^3 - 46875*b*d*n*x^5*x^(2*r)*e^2 + 468750*a*d*r*x^5
*x^(2*r)*e^2 + 234375*a*d^2*x^5*x^r*e + 78125*b*d^3*x^5*log(c) + 140625*b*r
*x^5*x^(3*r)*e^3*log(c) + 234375*b*d*x^5*x^(2*r)*e^2*log(c) + 78125*b*n*x^5
*x^(3*r)*e^3*log(x) + 78125*a*d^3*x^5 - 15625*b*n*x^5*x^(3*r)*e^3 + 140625*
a*r*x^5*x^(3*r)*e^3 + 234375*a*d*x^5*x^(2*r)*e^2 + 78125*b*x^5*x^(3*r)*e^3*
log(c) + 78125*a*x^5*x^(3*r)*e^3)/(36*r^6 + 660*r^5 + 4825*r^4 + 18000*r^3
+ 36250*r^2 + 37500*r + 15625)
```

3.399 $\int x^2 (d+ex^r)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=148

$$\frac{1}{3}\left(\frac{9d^2ex^{r+3}}{r+3}+d^3x^3+\frac{9de^2x^{2r+3}}{2r+3}+\frac{e^3x^{3(r+1)}}{r+1}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+3}}{(r+3)^2}-\frac{1}{9}bd^3nx^3-\frac{3bde^2nx^{2r+3}}{(2r+3)^2}-\frac{be^3nx^{3(r+1)}}{9(r+1)^2}$$

```
[Out] -(b*d^3*n*x^3)/9 - (b*e^3*n*x^(3*(1 + r)))/(9*(1 + r)^2) - (3*b*d^2*e*n*x^(
3 + r))/(3 + r)^2 - (3*b*d*e^2*n*x^(3 + 2*r))/(3 + 2*r)^2 + ((d^3*x^3 + (e^
3*x^(3*(1 + r)))/(1 + r) + (9*d^2*e*x^(3 + r))/(3 + r) + (9*d*e^2*x^(3 + 2*
r))/(3 + 2*r))*(a + b*Log[c*x^n]))/3
```

Rubi [A] time = 0.380695, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$\frac{1}{3}\left(\frac{9d^2ex^{r+3}}{r+3}+d^3x^3+\frac{9de^2x^{2r+3}}{2r+3}+\frac{e^3x^{3(r+1)}}{r+1}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+3}}{(r+3)^2}-\frac{1}{9}bd^3nx^3-\frac{3bde^2nx^{2r+3}}{(2r+3)^2}-\frac{be^3nx^{3(r+1)}}{9(r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x^3)/9 - (b*e^3*n*x^(3*(1 + r)))/(9*(1 + r)^2) - (3*b*d^2*e*n*x^(
3 + r))/(3 + r)^2 - (3*b*d*e^2*n*x^(3 + 2*r))/(3 + 2*r)^2 + ((d^3*x^3 + (e^
3*x^(3*(1 + r)))/(1 + r) + (9*d^2*e*x^(3 + r))/(3 + r) + (9*d*e^2*x^(3 + 2*
r))/(3 + 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int x^2 (d+ex^r)^3 (a+b\log(cx^n))\,dx = \frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+r)}}{1+r}+\frac{9d^2ex^{3+r}}{3+r}+\frac{9de^2x^{3+2r}}{3+2r}\right)(a+b\log(cx^n))-(bn)\int \frac{1}{3}x^2\left(d^3+\right.$$

$$=\frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+r)}}{1+r}+\frac{9d^2ex^{3+r}}{3+r}+\frac{9de^2x^{3+2r}}{3+2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int x^2\left(d^3+\right.$$

$$=\frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+r)}}{1+r}+\frac{9d^2ex^{3+r}}{3+r}+\frac{9de^2x^{3+2r}}{3+2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int\left(d^3x^2+\right.$$

$$=-\frac{1}{9}bd^3nx^3-\frac{be^3nx^{3(1+r)}}{9(1+r)^2}-\frac{3bd^2enx^{3+r}}{(3+r)^2}-\frac{3bde^2nx^{3+2r}}{(3+2r)^2}+\frac{1}{3}\left(d^3x^3+\frac{e^3x^{3(1+r)}}{1+r}+\right.$$

Mathematica [A] time = 0.343478, size = 176, normalized size = 1.19

$$\frac{1}{9}x^3\left(3a\left(\frac{9d^2ex^r}{r+3}+d^3+\frac{9de^2x^{2r}}{2r+3}+\frac{e^3x^{3r}}{r+1}\right)+3b\log(cx^n)\left(\frac{9d^2ex^r}{r+3}+d^3+\frac{9de^2x^{2r}}{2r+3}+\frac{e^3x^{3r}}{r+1}\right)+bn\left(-\frac{27d^2ex^r}{(r+3)^2}-d^3-\frac{27de^2}{(2r+}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] (x^3*(b*n*(-d^3 - (27*d^2*e*x^r)/(3 + r)^2 - (27*d*e^2*x^(2*r))/(3 + 2*r)^2
 - (e^3*x^(3*r))/(1 + r)^2) + 3*a*(d^3 + (9*d^2*e*x^r)/(3 + r) + (9*d*e^2*x
^(2*r))/(3 + 2*r) + (e^3*x^(3*r))/(1 + r)) + 3*b*(d^3 + (9*d^2*e*x^r)/(3 +
r) + (9*d*e^2*x^(2*r))/(3 + 2*r) + (e^3*x^(3*r))/(1 + r))*Log[c*x^n]))/9
```

Maple [C] time = 0.395, size = 4027, normalized size = 27.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+e*x^r)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] 1/3*b*x^3*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+9*e^3*r*(x^r)^3+2*d^3*r^3+
18*d^2*e*r^2*x^r+36*d*e^2*r*(x^r)^2+9*e^3*(x^r)^3+11*d^3*r^2+45*d^2*e*r*x^r
+27*d*e^2*(x^r)^2+18*d^3*r+27*d^2*e*x^r+9*d^3)/(1+r)/(3+2*r)/(3+r)*ln(x^n)-
1/18*x^3*(-486*a*d^3-486*a*e^3*(x^r)^3-486*ln(c)*b*d^3+1566*I*Pi*b*d^3*r^2*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+972*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+1296*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+8*b*d
^3*n*r^6+88*b*d^3*n*r^5+386*b*d^3*n*r^4-24*a*d^3*r^6-264*a*d^3*r^5-1158*a*d
^3*r^4+120*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3+513*I*Pi*b*d*e^2*r^4*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+729*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^
r+459*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+729*I*Pi*b*e^3*r*csgn(I*c*x^n)
^3*(x^r)^3-24*a*e^3*r^5*(x^r)^3-240*a*e^3*r^4*(x^r)^3-1458*a*d*e^2*(x^r)^2-
1458*a*d^2*e*x^r+162*b*e^3*n*(x^r)^3-918*a*e^3*r^3*(x^r)^3-1674*a*e^3*r^2*(
x^r)^3-1458*a*e^3*r*(x^r)^3-486*ln(c)*b*e^3*(x^r)^3-12*I*Pi*b*e^3*r^5*csgn(
I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r-837
*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-837*I*Pi*b*e^3*r^2*csgn
(I*c*x^n)^2*csgn(I*c)*(x^r)^3+729*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+12*I
*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+864*b*d^3*n*r^3+1044*b*d^3*n*r^2+648*
b*d^3*n*r-24*ln(c)*b*d^3*r^6-264*ln(c)*b*d^3*r^5-1158*ln(c)*b*d^3*r^4-2592*
ln(c)*b*d^3*r^3-3132*ln(c)*b*d^3*r^2-1944*ln(c)*b*d^3*r-2592*a*d^3*r^3-3132
*a*d^3*r^2-1944*a*d^3*r-4860*a*d*e^2*r*(x^r)^2-5238*a*d^2*e*r^3*x^r-7614*a*
d^2*e*r^2*x^r-5346*a*d^2*e*r*x^r-513*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(
I*c)*(x^r)^2+162*b*d^3*n+972*I*Pi*b*d^3*r*csgn(I*c*x^n)^3+243*I*Pi*b*d^3*cs
gn(I*c*x^n)^3-120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-120*I*
Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-240*ln(c)*b*e^3*r^4*(x^r)^3-
918*ln(c)*b*e^3*r^3*(x^r)^3-1674*ln(c)*b*e^3*r^2*(x^r)^3-1458*ln(c)*b*e^3*r
*(x^r)^3-1458*ln(c)*b*d^2*e*x^r-1458*ln(c)*b*d*e^2*(x^r)^2+234*b*e^3*n*r^2*
(x^r)^3+324*b*e^3*n*r*(x^r)^3+486*b*d*e^2*n*(x^r)^2+486*b*d^2*e*n*x^r-3672*
a*d*e^2*r^3*(x^r)^2-6156*a*d*e^2*r^2*(x^r)^2+8*b*e^3*n*r^4*(x^r)^3+72*b*e^3
*n*r^3*(x^r)^3-108*a*d*e^2*r^5*(x^r)^2-1026*a*d*e^2*r^4*(x^r)^2-216*a*d^2*e
*r^5*x^r-1728*a*d^2*e*r^4*x^r-24*ln(c)*b*e^3*r^5*(x^r)^3+2673*I*Pi*b*d^2*e*
r*csgn(I*c*x^n)^3*x^r-729*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-
729*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-729*I*Pi*b*d^2*e*csgn(I*
x^n)*csgn(I*c*x^n)^2*x^r+1188*b*d*e^2*n*r^2*(x^r)^2+1998*b*d^2*e*n*r^2*x^r+
864*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+513*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)
^3*(x^r)^2+120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-8
64*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-864*I*Pi*b*d^2*e*r^4*cs
gn(I*c*x^n)^2*csgn(I*c)*x^r+729*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^3+459*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^
3-1836*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2619*I*Pi*b*d^2
*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-3078*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn
```

(I*c*x^n)^2*(x^r)^2-3078*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2
+243*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+3078*I*Pi*b*d*e
^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+3807*I*Pi*b*d^2*e*r^2*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-729*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^3+3807*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+1296*b*d*e^2*n*r*(x
^r)^2+1620*b*d^2*e*n*r*x^r+54*b*d*e^2*n*r^4*(x^r)^2+432*b*d*e^2*n*r^3*(x^r)
^2+216*b*d^2*e*n*r^4*x^r+1080*b*d^2*e*n*r^3*x^r-108*ln(c)*b*d*e^2*r^5*(x^r)
^2-1026*ln(c)*b*d*e^2*r^4*(x^r)^2-216*ln(c)*b*d^2*e*r^5*x^r-1728*ln(c)*b*d^
2*e*r^4*x^r-12*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+837*I*Pi*b*e^3*r^
2*csgn(I*c*x^n)^3*(x^r)^3-243*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^
3-729*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-459*I*Pi*b*e^3*r^3*csgn(I*
x^n)*csgn(I*c*x^n)^2*(x^r)^3-459*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^3+243*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-5238*ln(c)*b*d^2*
e*r^3*x^r-7614*ln(c)*b*d^2*e*r^2*x^r-5346*ln(c)*b*d^2*e*r*x^r-3672*ln(c)*b*
d*e^2*r^3*(x^r)^2-6156*ln(c)*b*d*e^2*r^2*(x^r)^2-4860*ln(c)*b*d*e^2*r*(x^r)
^2+3078*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-729*I*Pi*b*e^3*r*csgn(I*x^
n)*csgn(I*c*x^n)^2*(x^r)^3-108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x
^r-108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1566*I*Pi*b*d^3*r^2
*csgn(I*c*x^n)^2*csgn(I*c)-972*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-129
6*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1296*I*Pi*b*d^3*r^3*csgn(I*c*x
^n)^2*csgn(I*c)-12*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-132*I*Pi*b*d^3*
r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c
)+1836*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-12*I*Pi*b*e^3*r^5*csgn(I*c*
x^n)^2*csgn(I*c)*(x^r)^3+54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+1296*I
*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+2619*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)*x^r+1566*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+864*I*Pi*b*d^2*e*r^4*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2619*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*cs
gn(I*c*x^n)^2*x^r+579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-579*I*Pi*b*d^3*r^4*csg
n(I*x^n)*csgn(I*c*x^n)^2-579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)+12*I*
Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+837*I*Pi*b*e^3*r^2
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-54*I*Pi*b*d*e^2*r^5*csgn(I*c*x
^n)^2*csgn(I*c)*(x^r)^2+12*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)+54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+579*I*Pi
*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-243*I*Pi*b*e^3*csgn(I*c*x^n)
^2*csgn(I*c)*(x^r)^3-972*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-1566*I*Pi*b
*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+2430*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x
^r)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+1836*I*P
i*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+243*I*Pi*b*e^3*cs
gn(I*c*x^n)^3*(x^r)^3-243*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b*d^
3*r^6*csgn(I*c*x^n)^3+132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-243*I*Pi*b*d^3*csg
n(I*x^n)*csgn(I*c*x^n)^2-2430*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x
^r)^2-2430*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-1836*I*Pi*b*d*e
^2*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*c
sgn(I*c*x^n)^2*(x^r)^2+132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)+2619*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-3807*I*Pi*b*d^2*e*r^2*csgn(I*x

```
^n)*csgn(I*c*x^n)^2*x^r-3807*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r
+729*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+729*I*Pi*b*d^
2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)
*csgn(I*c*x^n)^2*(x^r)^2-2673*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^
r-2673*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2430*I*Pi*b*d*e^2*r*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2673*I*Pi*b*d^2*e*r*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x^r)/(1+r)^2/(3+2*r)^2/(3+r)^2
```

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(x^2*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [B] time = 1.4805, size = 2376, normalized size = 16.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")

[Out] 1/9*(3*(4*b*d^3*r^6 + 44*b*d^3*r^5 + 193*b*d^3*r^4 + 432*b*d^3*r^3 + 522*b*
d^3*r^2 + 324*b*d^3*r + 81*b*d^3)*x^3*log(c) + 3*(4*b*d^3*n*r^6 + 44*b*d^3*
n*r^5 + 193*b*d^3*n*r^4 + 432*b*d^3*n*r^3 + 522*b*d^3*n*r^2 + 324*b*d^3*n*r
 + 81*b*d^3*n)*x^3*log(x) - (4*(b*d^3*n - 3*a*d^3)*r^6 + 44*(b*d^3*n - 3*a*
d^3)*r^5 + 81*b*d^3*n + 193*(b*d^3*n - 3*a*d^3)*r^4 - 243*a*d^3 + 432*(b*d^
3*n - 3*a*d^3)*r^3 + 522*(b*d^3*n - 3*a*d^3)*r^2 + 324*(b*d^3*n - 3*a*d^3)*
r)*x^3 + (3*(4*b*e^3*r^5 + 40*b*e^3*r^4 + 153*b*e^3*r^3 + 279*b*e^3*r^2 + 2
43*b*e^3*r + 81*b*e^3)*x^3*log(c) + 3*(4*b*e^3*n*r^5 + 40*b*e^3*n*r^4 + 153
*b*e^3*n*r^3 + 279*b*e^3*n*r^2 + 243*b*e^3*n*r + 81*b*e^3*n)*x^3*log(x) + (
12*a*e^3*r^5 - 81*b*e^3*n - 4*(b*e^3*n - 30*a*e^3)*r^4 + 243*a*e^3 - 9*(4*b
*e^3*n - 51*a*e^3)*r^3 - 9*(13*b*e^3*n - 93*a*e^3)*r^2 - 81*(2*b*e^3*n - 9*
a*e^3)*r)*x^3)*x^(3*r) + 27*((2*b*d*e^2*r^5 + 19*b*d*e^2*r^4 + 68*b*d*e^2*r
^3 + 114*b*d*e^2*r^2 + 90*b*d*e^2*r + 27*b*d*e^2)*x^3*log(c) + (2*b*d*e^2*n
*r^5 + 19*b*d*e^2*n*r^4 + 68*b*d*e^2*n*r^3 + 114*b*d*e^2*n*r^2 + 90*b*d*e^2
```

```
*n*r + 27*b*d*e^2*n)*x^3*log(x) + (2*a*d*e^2*r^5 - 9*b*d*e^2*n - (b*d*e^2*n
 - 19*a*d*e^2)*r^4 + 27*a*d*e^2 - 4*(2*b*d*e^2*n - 17*a*d*e^2)*r^3 - 2*(11*
b*d*e^2*n - 57*a*d*e^2)*r^2 - 6*(4*b*d*e^2*n - 15*a*d*e^2)*r)*x^3)*x^(2*r)
+ 27*((4*b*d^2*e*r^5 + 32*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 141*b*d^2*e*r^2 +
99*b*d^2*e*r + 27*b*d^2*e)*x^3*log(c) + (4*b*d^2*e*n*r^5 + 32*b*d^2*e*n*r^4
 + 97*b*d^2*e*n*r^3 + 141*b*d^2*e*n*r^2 + 99*b*d^2*e*n*r + 27*b*d^2*e*n)*x^
3*log(x) + (4*a*d^2*e*r^5 - 9*b*d^2*e*n - 4*(b*d^2*e*n - 8*a*d^2*e)*r^4 + 2
7*a*d^2*e - (20*b*d^2*e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*n - 141*a*d^2*e)*
r^2 - 3*(10*b*d^2*e*n - 33*a*d^2*e)*r)*x^3)*x^r)/(4*r^6 + 44*r^5 + 193*r^4
+ 432*r^3 + 522*r^2 + 324*r + 81)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.31604, size = 2144, normalized size = 14.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 1/9*(12*b*d^3*n*r^6*x^3*log(x) + 108*b*d^2*n*r^5*x^3*x^r*e*log(x) - 4*b*d^3
*n*r^6*x^3 + 12*b*d^3*r^6*x^3*log(c) + 108*b*d^2*r^5*x^3*x^r*e*log(c) + 132
*b*d^3*n*r^5*x^3*log(x) + 54*b*d*n*r^5*x^3*x^(2*r)*e^2*log(x) + 864*b*d^2*n
*r^4*x^3*x^r*e*log(x) - 44*b*d^3*n*r^5*x^3 + 12*a*d^3*r^6*x^3 - 108*b*d^2*n
*r^4*x^3*x^r*e + 108*a*d^2*r^5*x^3*x^r*e + 132*b*d^3*r^5*x^3*log(c) + 54*b*
d*r^5*x^3*x^(2*r)*e^2*log(c) + 864*b*d^2*r^4*x^3*x^r*e*log(c) + 579*b*d^3*n
*r^4*x^3*log(x) + 12*b*n*r^5*x^3*x^(3*r)*e^3*log(x) + 513*b*d*n*r^4*x^3*x^(
2*r)*e^2*log(x) + 2619*b*d^2*n*r^3*x^3*x^r*e*log(x) - 193*b*d^3*n*r^4*x^3 +
 132*a*d^3*r^5*x^3 - 27*b*d*n*r^4*x^3*x^(2*r)*e^2 + 54*a*d*r^5*x^3*x^(2*r)*
e^2 - 540*b*d^2*n*r^3*x^3*x^r*e + 864*a*d^2*r^4*x^3*x^r*e + 579*b*d^3*r^4*x
```

^3*log(c) + 12*b*r^5*x^3*x^(3*r)*e^3*log(c) + 513*b*d*r^4*x^3*x^(2*r)*e^2*l
og(c) + 2619*b*d^2*r^3*x^3*x^r*e*log(c) + 1296*b*d^3*n*r^3*x^3*log(x) + 120
*b*n*r^4*x^3*x^(3*r)*e^3*log(x) + 1836*b*d*n*r^3*x^3*x^(2*r)*e^2*log(x) + 3
807*b*d^2*n*r^2*x^3*x^r*e*log(x) - 432*b*d^3*n*r^3*x^3 + 579*a*d^3*r^4*x^3
- 4*b*n*r^4*x^3*x^(3*r)*e^3 + 12*a*r^5*x^3*x^(3*r)*e^3 - 216*b*d*n*r^3*x^3*
x^(2*r)*e^2 + 513*a*d*r^4*x^3*x^(2*r)*e^2 - 999*b*d^2*n*r^2*x^3*x^r*e + 261
9*a*d^2*r^3*x^3*x^r*e + 1296*b*d^3*r^3*x^3*log(c) + 120*b*r^4*x^3*x^(3*r)*e
^3*log(c) + 1836*b*d*r^3*x^3*x^(2*r)*e^2*log(c) + 3807*b*d^2*r^2*x^3*x^r*e*
log(c) + 1566*b*d^3*n*r^2*x^3*log(x) + 459*b*n*r^3*x^3*x^(3*r)*e^3*log(x) +
3078*b*d*n*r^2*x^3*x^(2*r)*e^2*log(x) + 2673*b*d^2*n*r*x^3*x^r*e*log(x) -
522*b*d^3*n*r^2*x^3 + 1296*a*d^3*r^3*x^3 - 36*b*n*r^3*x^3*x^(3*r)*e^3 + 120
*a*r^4*x^3*x^(3*r)*e^3 - 594*b*d*n*r^2*x^3*x^(2*r)*e^2 + 1836*a*d*r^3*x^3*x
^(2*r)*e^2 - 810*b*d^2*n*r*x^3*x^r*e + 3807*a*d^2*r^2*x^3*x^r*e + 1566*b*d^
3*r^2*x^3*log(c) + 459*b*r^3*x^3*x^(3*r)*e^3*log(c) + 3078*b*d*r^2*x^3*x^(2
*r)*e^2*log(c) + 2673*b*d^2*r*x^3*x^r*e*log(c) + 972*b*d^3*n*r*x^3*log(x) +
837*b*n*r^2*x^3*x^(3*r)*e^3*log(x) + 2430*b*d*n*r*x^3*x^(2*r)*e^2*log(x) +
729*b*d^2*n*x^3*x^r*e*log(x) - 324*b*d^3*n*r*x^3 + 1566*a*d^3*r^2*x^3 - 11
7*b*n*r^2*x^3*x^(3*r)*e^3 + 459*a*r^3*x^3*x^(3*r)*e^3 - 648*b*d*n*r*x^3*x^(
2*r)*e^2 + 3078*a*d*r^2*x^3*x^(2*r)*e^2 - 243*b*d^2*n*x^3*x^r*e + 2673*a*d^
2*r*x^3*x^r*e + 972*b*d^3*r*x^3*log(c) + 837*b*r^2*x^3*x^(3*r)*e^3*log(c) +
2430*b*d*r*x^3*x^(2*r)*e^2*log(c) + 729*b*d^2*x^3*x^r*e*log(c) + 243*b*d^3
*n*x^3*log(x) + 729*b*n*r*x^3*x^(3*r)*e^3*log(x) + 729*b*d*n*x^3*x^(2*r)*e^
2*log(x) - 81*b*d^3*n*x^3 + 972*a*d^3*r*x^3 - 162*b*n*r*x^3*x^(3*r)*e^3 + 8
37*a*r^2*x^3*x^(3*r)*e^3 - 243*b*d*n*x^3*x^(2*r)*e^2 + 2430*a*d*r*x^3*x^(2*
r)*e^2 + 729*a*d^2*x^3*x^r*e + 243*b*d^3*x^3*log(c) + 729*b*r*x^3*x^(3*r)*e
^3*log(c) + 729*b*d*x^3*x^(2*r)*e^2*log(c) + 243*b*n*x^3*x^(3*r)*e^3*log(x)
+ 243*a*d^3*x^3 - 81*b*n*x^3*x^(3*r)*e^3 + 729*a*r*x^3*x^(3*r)*e^3 + 729*a
*d*x^3*x^(2*r)*e^2 + 243*b*x^3*x^(3*r)*e^3*log(c) + 243*a*x^3*x^(3*r)*e^3)/
(4*r^6 + 44*r^5 + 193*r^4 + 432*r^3 + 522*r^2 + 324*r + 81)

3.400 $\int (d+ex^r)^3 (a+b\log(cx^n))\, dx$

Optimal. Leaf size=169

$$\frac{3d^2ex^{r+1}(a+b\log(cx^n))}{r+1}+d^3x(a+b\log(cx^n))+\frac{3de^2x^{2r+1}(a+b\log(cx^n))}{2r+1}+\frac{e^3x^{3r+1}(a+b\log(cx^n))}{3r+1}-\frac{3bd^2enx^{r+1}}{(r+1)^2}$$

```
[Out] -(b*d^3*n*x) - (3*b*d^2*e*n*x^(1 + r))/(1 + r)^2 - (3*b*d*e^2*n*x^(1 + 2*r)
)/(1 + 2*r)^2 - (b*e^3*n*x^(1 + 3*r))/(1 + 3*r)^2 + d^3*x*(a + b*Log[c*x^n]
) + (3*d^2*e*x^(1 + r)*(a + b*Log[c*x^n]))/(1 + r) + (3*d*e^2*x^(1 + 2*r)*(
a + b*Log[c*x^n]))/(1 + 2*r) + (e^3*x^(1 + 3*r)*(a + b*Log[c*x^n]))/(1 + 3*
r)
```

Rubi [A] time = 0.10286, antiderivative size = 141, normalized size of antiderivative = 0.83, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.1, Rules used = {244, 2313}

$$\left(\frac{3d^2ex^{r+1}}{r+1}+d^3x+\frac{3de^2x^{2r+1}}{2r+1}+\frac{e^3x^{3r+1}}{3r+1}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r+1}}{(r+1)^2}-bd^3nx-\frac{3bde^2nx^{2r+1}}{(2r+1)^2}-\frac{be^3nx^{3r+1}}{(3r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] -(b*d^3*n*x) - (3*b*d^2*e*n*x^(1 + r))/(1 + r)^2 - (3*b*d*e^2*n*x^(1 + 2*r)
)/(1 + 2*r)^2 - (b*e^3*n*x^(1 + 3*r))/(1 + 3*r)^2 + (d^3*x + (3*d^2*e*x^(1
+ r))/(1 + r) + (3*d*e^2*x^(1 + 2*r))/(1 + 2*r) + (e^3*x^(1 + 3*r))/(1 + 3*
r))*(a + b*Log[c*x^n])
```

Rule 244

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b, n}, x] && IGtQ[p, 0]
```

Rule 2313

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.),
x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q, x]}, Simp[u*(a + b*Log[c*x^n]
), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /; FreeQ[{a, b, c,
 d, e, n, r}, x] && IGtQ[q, 0]
```

Rubi steps

$$\int (d+ex^r)^3 (a+b\log(cx^n))\,dx = \left(d^3x+\frac{3d^2ex^{1+r}}{1+r}+\frac{3de^2x^{1+2r}}{1+2r}+\frac{e^3x^{1+3r}}{1+3r}\right)(a+b\log(cx^n))-(bn)\int\left(d^3+\frac{3d^2ex^r}{1+r}+\frac{3}{1}\right.$$
$$= -bd^3nx-\frac{3bd^2enx^{1+r}}{(1+r)^2}-\frac{3bde^2nx^{1+2r}}{(1+2r)^2}-\frac{be^3nx^{1+3r}}{(1+3r)^2}+\left(d^3x+\frac{3d^2ex^{1+r}}{1+r}+\frac{3de^2x^{1+2r}}{1+2r}+\right.$$

Mathematica [A] time = 0.221951, size = 159, normalized size = 0.94

$$x\left(\frac{3d^2ex^r(a+b\log(cx^n))}{r+1}+\frac{3de^2x^{2r}(a+b\log(cx^n))}{2r+1}+\frac{e^3x^{3r}(a+b\log(cx^n))}{3r+1}+ad^3+bd^3\log(cx^n)-\frac{3bd^2enx^r}{(r+1)^2}-bd^3n-\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(a*d^3 - b*d^3*n - (3*b*d^2*e*n*x^r)/(1 + r)^2 - (3*b*d*e^2*n*x^(2*r))/(1
 + 2*r)^2 - (b*e^3*n*x^(3*r))/(1 + 3*r)^2 + b*d^3*Log[c*x^n] + (3*d^2*e*x^r
*(a + b*Log[c*x^n]))/(1 + r) + (3*d*e^2*x^(2*r)*(a + b*Log[c*x^n]))/(1 + 2*
r) + (e^3*x^(3*r)*(a + b*Log[c*x^n]))/(1 + 3*r))
```

Maple [C] time = 0.386, size = 4023, normalized size = 23.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n)),x)
```

```
[Out] b*x*(2*e^3*r^2*(x^r)^3+9*d*e^2*r^2*(x^r)^2+3*e^3*r*(x^r)^3+6*d^3*r^3+18*d^2
*e*r^2*x^r+12*d*e^2*r*(x^r)^2+e^3*(x^r)^3+11*d^3*r^2+15*d^2*e*r*x^r+3*d*e^2
*(x^r)^2+6*d^3*r+3*d^2*e*x^r+d^3)/(1+3*r)/(1+2*r)/(1+r)*ln(x^n)-1/2*x*(-2*a
*d^3+291*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+3*I*Pi*b*
d*e^2*csgn(I*c*x^n)^3*(x^r)^2-2*a*e^3*(x^r)^3+I*Pi*b*d^3*csgn(I*c*x^n)^3-2*
ln(c)*b*d^3-141*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-30*I*Pi*b*d*
e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-30*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2
*csgn(I*c)*(x^r)^2+72*b*d^3*n*r^6+264*b*d^3*n*r^5+386*b*d^3*n*r^4-72*a*d^3*
r^6-264*a*d^3*r^5-386*a*d^3*r^4+9*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-36*I
*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+
```

51*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+114*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-24*a*e^3*r^5*(x^r)^3-80*a*e^3*r^4*(x^r)^3-6
*a*d*e^2*(x^r)^2-6*a*d^2*e*x^r+2*b*e^3*n*(x^r)^3-102*a*e^3*r^3*(x^r)^3-62*a
*e^3*r^2*(x^r)^3-18*a*e^3*r*(x^r)^3-2*ln(c)*b*e^3*(x^r)^3-12*I*Pi*b*e^3*r^5
*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x
^r+12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+288*b*d^3*n*r^3+116*b*d^3*n*r^
2+24*b*d^3*n*r-72*ln(c)*b*d^3*r^6-264*ln(c)*b*d^3*r^5-386*ln(c)*b*d^3*r^4-2
88*ln(c)*b*d^3*r^3-116*ln(c)*b*d^3*r^2-24*ln(c)*b*d^3*r-288*a*d^3*r^3-116*a
*d^3*r^2-24*a*d^3*r-60*a*d*e^2*r*(x^r)^2-582*a*d^2*e*r^3*x^r-282*a*d^2*e*r^
2*x^r-66*a*d^2*e*r*x^r+51*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*(x^r)^3+2*b*d^3*n-288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r+40*I
*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-171*I*Pi*b*d*e^2*
r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^2-80*ln(c)*b*e^3*r^4*(x^r)^3-102*ln(c)*b*e^3*r^3*(x^r)^3-
62*ln(c)*b*e^3*r^2*(x^r)^3-18*ln(c)*b*e^3*r*(x^r)^3-6*ln(c)*b*d^2*e*x^r-6*l
n(c)*b*d*e^2*(x^r)^2+26*b*e^3*n*r^2*(x^r)^3+12*b*e^3*n*r*(x^r)^3+6*b*d*e^2*
n*(x^r)^2+6*b*d^2*e*n*x^r-408*a*d*e^2*r^3*(x^r)^2-228*a*d*e^2*r^2*(x^r)^2+8
*b*e^3*n*r^4*(x^r)^3+24*b*e^3*n*r^3*(x^r)^3-108*a*d*e^2*r^5*(x^r)^2-342*a*d
*e^2*r^4*(x^r)^2-216*a*d^2*e*r^5*x^r-576*a*d^2*e*r^4*x^r-24*ln(c)*b*e^3*r^5
*(x^r)^3+132*b*d*e^2*n*r^2*(x^r)^2+222*b*d^2*e*n*r^2*x^r-58*I*Pi*b*d^3*r^2*
csgn(I*c*x^n)^2*csgn(I*c)-40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)
^3+171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2+288*I*Pi*b*d^2*e*r^4*csgn(I
*c*x^n)^3*x^r-40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+141*I*P
i*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r-9*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*
(x^r)^3+291*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+114*I*Pi*b*d*e^2*r^2*csgn(
I*c*x^n)^3*(x^r)^2-9*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-288*I
*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+144*I*Pi*b*d^3*r^3*csgn(I*c
*x^n)^3+58*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+48*b*d*e^2*n*r*(x^r)^2+60*b*d^2*e
*n*r*x^r+54*b*d*e^2*n*r^4*(x^r)^2+144*b*d*e^2*n*r^3*(x^r)^2+216*b*d^2*e*n*r
^4*x^r+360*b*d^2*e*n*r^3*x^r-108*ln(c)*b*d*e^2*r^5*(x^r)^2-342*ln(c)*b*d*e^
2*r^4*(x^r)^2-216*ln(c)*b*d^2*e*r^5*x^r-576*ln(c)*b*d^2*e*r^4*x^r-33*I*Pi*b
*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)-582*ln(c)*b*d^2*e*r^3*x^r-282*ln(c)*b*d^2*e*r^2*x^r-66*ln(c)*b
*d^2*e*r*x^r-408*ln(c)*b*d*e^2*r^3*(x^r)^2-228*ln(c)*b*d*e^2*r^2*(x^r)^2-60
*ln(c)*b*d*e^2*r*(x^r)^2+33*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*x^r+204*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-58
*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2-204*I*Pi*b*d*e^2*r^3*csgn(I*x^n
)*csgn(I*c*x^n)^2*(x^r)^2-141*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*
x^r-108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-108*I*Pi*b*d^2*e*r^5
*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-291*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*
x^n)^2*x^r-291*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-114*I*Pi*b*d*
e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-132*I*Pi*b*d^3*r^5*csgn(I*x^n)*
csgn(I*c*x^n)^2-132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*e^3*
r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(
x^r)^2+58*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e^3*csg

```
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-204*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)
^2*csgn(I*c)*(x^r)^2+31*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
(x^r)^3-I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-I*Pi*b*e^3*csgn(I*c*
x^n)^2*csgn(I*c)*(x^r)^3-12*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+40*I*Pi*
b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3-36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^
n)^2+31*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+141*I*Pi*b*d^2*e*r^2*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+30*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*(x^r)^2+30*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+33*I*Pi*b*d^2
*e*r*csgn(I*c*x^n)^3*x^r-3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2
-31*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+204*I*Pi*b*d*e^2*r^3*c
sgn(I*c*x^n)^3*(x^r)^2+144*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)+36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*b*e^3*r^5*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^
n)^2*csgn(I*c)*(x^r)^2+12*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+
193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+54*I*Pi*b*d*e^2*r^5*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*x^r+12*I*Pi*b*d^3*r*csgn(I*c*x^n)^3-I*Pi*b*d^3*csgn(I*c*x^n
)^2*csgn(I*c)+I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-12*I*Pi*b*d^3*r*csgn(I*x^n
)*csgn(I*c*x^n)^2-144*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-144*I*Pi*b
*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)+36*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3-I*Pi*b
*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*x^r+132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-3*I*Pi*b*d*e^2*csgn(I
*c*x^n)^2*csgn(I*c)*(x^r)^2-3*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-
3*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3*I*Pi*b*d^2*e*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^r-51*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^3-51*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-31*I*Pi*b*e^3*r^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-33*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I
*c)*x^r+3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+132*I*Pi
*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+193*I*Pi*b*d^3*r^4*csgn(I*c*
x^n)^3-193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2-193*I*Pi*b*d^3*r^4*cs
gn(I*c*x^n)^2*csgn(I*c)-54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^
r)^2-114*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+9*I*Pi*b*e^3*r*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3)/(1+3*r)^2/(1+2*r)^2/(1+r)^2
```

<u>Maxima</u> [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.4291, size = 2237, normalized size = 13.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((36*b*d^3*r^6 + 132*b*d^3*r^5 + 193*b*d^3*r^4 + 144*b*d^3*r^3 + 58*b*d^3*r
^2 + 12*b*d^3*r + b*d^3)*x*log(c) + (36*b*d^3*n*r^6 + 132*b*d^3*n*r^5 + 193
*b*d^3*n*r^4 + 144*b*d^3*n*r^3 + 58*b*d^3*n*r^2 + 12*b*d^3*n*r + b*d^3*n)*x
*log(x) - (36*(b*d^3*n - a*d^3)*r^6 + 132*(b*d^3*n - a*d^3)*r^5 + b*d^3*n +
 193*(b*d^3*n - a*d^3)*r^4 - a*d^3 + 144*(b*d^3*n - a*d^3)*r^3 + 58*(b*d^3*
n - a*d^3)*r^2 + 12*(b*d^3*n - a*d^3)*r)*x + ((12*b*e^3*r^5 + 40*b*e^3*r^4
+ 51*b*e^3*r^3 + 31*b*e^3*r^2 + 9*b*e^3*r + b*e^3)*x*log(c) + (12*b*e^3*n*r
^5 + 40*b*e^3*n*r^4 + 51*b*e^3*n*r^3 + 31*b*e^3*n*r^2 + 9*b*e^3*n*r + b*e^3
*n)*x*log(x) + (12*a*e^3*r^5 - b*e^3*n - 4*(b*e^3*n - 10*a*e^3)*r^4 + a*e^3
 - 3*(4*b*e^3*n - 17*a*e^3)*r^3 - (13*b*e^3*n - 31*a*e^3)*r^2 - 3*(2*b*e^3*
n - 3*a*e^3)*r)*x)*x^(3*r) + 3*((18*b*d*e^2*r^5 + 57*b*d*e^2*r^4 + 68*b*d*e
^2*r^3 + 38*b*d*e^2*r^2 + 10*b*d*e^2*r + b*d*e^2)*x*log(c) + (18*b*d*e^2*n*
r^5 + 57*b*d*e^2*n*r^4 + 68*b*d*e^2*n*r^3 + 38*b*d*e^2*n*r^2 + 10*b*d*e^2*n
*r + b*d*e^2*n)*x*log(x) + (18*a*d*e^2*r^5 - b*d*e^2*n - 3*(3*b*d*e^2*n - 1
9*a*d*e^2)*r^4 + a*d*e^2 - 4*(6*b*d*e^2*n - 17*a*d*e^2)*r^3 - 2*(11*b*d*e^2
*n - 19*a*d*e^2)*r^2 - 2*(4*b*d*e^2*n - 5*a*d*e^2)*r)*x)*x^(2*r) + 3*((36*b
*d^2*e*r^5 + 96*b*d^2*e*r^4 + 97*b*d^2*e*r^3 + 47*b*d^2*e*r^2 + 11*b*d^2*e*
r + b*d^2*e)*x*log(c) + (36*b*d^2*e*n*r^5 + 96*b*d^2*e*n*r^4 + 97*b*d^2*e*n
*r^3 + 47*b*d^2*e*n*r^2 + 11*b*d^2*e*n*r + b*d^2*e*n)*x*log(x) + (36*a*d^2*
e*r^5 - b*d^2*e*n - 12*(3*b*d^2*e*n - 8*a*d^2*e)*r^4 + a*d^2*e - (60*b*d^2*
e*n - 97*a*d^2*e)*r^3 - (37*b*d^2*e*n - 47*a*d^2*e)*r^2 - (10*b*d^2*e*n - 1
1*a*d^2*e)*r)*x)*x^r)/(36*r^6 + 132*r^5 + 193*r^4 + 144*r^3 + 58*r^2 + 12*r
 + 1)
```

Sympy [A] time = 26.8578, size = 325, normalized size = 1.92

$$ad^3x + 3ad^2e\left(\begin{cases} \frac{x^{r+1}}{r+1} & \text{for } r \neq -1 \\ \log(x) & \text{otherwise} \end{cases}\right) + 3ade^2\left(\begin{cases} \frac{x^{2r+1}}{2r+1} & \text{for } 2r \neq -1 \\ \log(x) & \text{otherwise} \end{cases}\right) + ae^3\left(\begin{cases} \frac{x^{3r+1}}{3r+1} & \text{for } 3r \neq -1 \\ \log(x) & \text{otherwise} \end{cases}\right) - bd^3nx + bd^3x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] a*d**3*x + 3*a*d**2*e*Piecewise((x**(r + 1)/(r + 1), Ne(r, -1)), (log(x), T
rue)) + 3*a*d*e**2*Piecewise((x**(2*r + 1)/(2*r + 1), Ne(2*r, -1)), (log(x)
, True)) + a*e**3*Piecewise((x**(3*r + 1)/(3*r + 1), Ne(3*r, -1)), (log(x),
 True)) - b*d**3*n*x + b*d**3*x*log(c*x**n) - 3*b*d**2*e*n*Piecewise((Piece
wise((x*x**r/(r + 1), Ne(r, -1)), (log(x), True))/(r + 1), (r > -oo) & (r <
 oo) & Ne(r, -1)), (log(x)**2/2, True)) + 3*b*d**2*e*Piecewise((x**(r + 1)/
(r + 1), Ne(r, -1)), (log(x), True))*log(c*x**n) - 3*b*d*e**2*n*Piecewise((
Piecewise((x*x**(2*r)/(2*r + 1), Ne(r, -1/2)), (log(x), True))/(2*r + 1), (
r > -oo) & (r < oo) & Ne(r, -1/2)), (log(x)**2/2, True)) + 3*b*d*e**2*Piece
wise((x**(2*r + 1)/(2*r + 1), Ne(2*r, -1)), (log(x), True))*log(c*x**n) - b
*e**3*n*Piecewise((Piecewise((x*x**(3*r)/(3*r + 1), Ne(r, -1/3)), (log(x),
True))/(3*r + 1), (r > -oo) & (r < oo) & Ne(r, -1/3)), (log(x)**2/2, True))
 + b*e**3*Piecewise((x**(3*r + 1)/(3*r + 1), Ne(3*r, -1)), (log(x), True))*
log(c*x**n)
```

Giac [B] time = 1.33496, size = 505, normalized size = 2.99

$$\frac{3\,bd^2nrxx^re\log(x)}{r^2+2\,r+1}+bd^3nx\log(x)+\frac{6\,bdnrxx^{2\,r}e^2\log(x)}{4\,r^2+4\,r+1}+\frac{3\,bd^2nxx^re\log(x)}{r^2+2\,r+1}-bd^3nx-\frac{3\,bd^2nxx^re}{r^2+2\,r+1}+bd^3x\log(c)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 3*b*d^2*n*r*x*x^r*e*log(x)/(r^2 + 2*r + 1) + b*d^3*n*x*log(x) + 6*b*d*n*r*x
*x^(2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + 3*b*d^2*n*x*x^r*e*log(x)/(r^2 + 2*r
 + 1) - b*d^3*n*x - 3*b*d^2*n*x*x^r*e/(r^2 + 2*r + 1) + b*d^3*x*log(c) + 3*
b*d^2*x*x^r*e*log(c)/(r + 1) + 3*b*n*r*x*x^(3*r)*e^3*log(x)/(9*r^2 + 6*r +
1) + 3*b*d*n*x*x^(2*r)*e^2*log(x)/(4*r^2 + 4*r + 1) + a*d^3*x - 3*b*d*n*x*x
^(2*r)*e^2/(4*r^2 + 4*r + 1) + 3*a*d^2*x*x^r*e/(r + 1) + 3*b*d*x*x^(2*r)*e^
2*log(c)/(2*r + 1) + b*n*x*x^(3*r)*e^3*log(x)/(9*r^2 + 6*r + 1) - b*n*x*x^(
3*r)*e^3/(9*r^2 + 6*r + 1) + 3*a*d*x*x^(2*r)*e^2/(2*r + 1) + b*x*x^(3*r)*e^
3*log(c)/(3*r + 1) + a*x*x^(3*r)*e^3/(3*r + 1)
```

3.401 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^2}\,dx$

Optimal. Leaf size=179

$$-\frac{3d^2ex^{r-1}\left(a+b\log\left(cx^n\right)\right)}{1-r}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{x}-\frac{3de^2x^{2r-1}\left(a+b\log\left(cx^n\right)\right)}{1-2r}-\frac{e^3x^{3r-1}\left(a+b\log\left(cx^n\right)\right)}{1-3r}-\frac{3bd^2enx^{r-1}}{(1-r)^2}$$

```
[Out] -((b*d^3*n)/x) - (3*b*d^2*e*n*x^(-1 + r))/(1 - r)^2 - (3*b*d*e^2*n*x^(-1 +
2*r))/(1 - 2*r)^2 - (b*e^3*n*x^(-1 + 3*r))/(1 - 3*r)^2 - (d^3*(a + b*Log[c*
x^n]))/x - (3*d^2*e*x^(-1 + r)*(a + b*Log[c*x^n]))/(1 - r) - (3*d*e^2*x^(-1
 + 2*r)*(a + b*Log[c*x^n]))/(1 - 2*r) - (e^3*x^(-1 + 3*r)*(a + b*Log[c*x^n]
))/(1 - 3*r)
```

Rubi [A] time = 0.397323, antiderivative size = 150, normalized size of antiderivative = 0.84, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.13, Rules used = {270, 2334, 14}

$$-\left(\frac{3d^2ex^{r-1}}{1-r}+\frac{d^3}{x}+\frac{3de^2x^{2r-1}}{1-2r}+\frac{e^3x^{3r-1}}{1-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-1}}{(1-r)^2}-\frac{bd^3n}{x}-\frac{3bde^2nx^{2r-1}}{(1-2r)^2}-\frac{be^3nx^{3r-1}}{(1-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] -((b*d^3*n)/x) - (3*b*d^2*e*n*x^(-1 + r))/(1 - r)^2 - (3*b*d*e^2*n*x^(-1 +
2*r))/(1 - 2*r)^2 - (b*e^3*n*x^(-1 + 3*r))/(1 - 3*r)^2 - (d^3/x + (3*d^2*e*
x^(-1 + r))/(1 - r) + (3*d*e^2*x^(-1 + 2*r))/(1 - 2*r) + (e^3*x^(-1 + 3*r))
/(1 - 3*r))*(a + b*Log[c*x^n])
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^3 (a+b\log(cx^n))}{x^2}\,dx = -\left(\frac{d^3}{x}+\frac{3d^2ex^{-1+r}}{1-r}+\frac{3de^2x^{-1+2r}}{1-2r}+\frac{e^3x^{-1+3r}}{1-3r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^3+\frac{3d^2ex^r}{-1+r}}{}$$

$$= -\left(\frac{d^3}{x}+\frac{3d^2ex^{-1+r}}{1-r}+\frac{3de^2x^{-1+2r}}{1-2r}+\frac{e^3x^{-1+3r}}{1-3r}\right)(a+b\log(cx^n))-(bn)\int\left(-\frac{d^3}{x^2}+\frac{3d^2e}{-1}\right.$$

$$= -\frac{bd^3n}{x}-\frac{3bd^2enx^{-1+r}}{(1-r)^2}-\frac{3bde^2nx^{-1+2r}}{(1-2r)^2}-\frac{be^3nx^{-1+3r}}{(1-3r)^2}-\left(\frac{d^3}{x}+\frac{3d^2ex^{-1+r}}{1-r}+\frac{3de^2x^{-1+2r}}{1-2r}\right.$$

Mathematica [A] time = 0.392607, size = 181, normalized size = 1.01

$$\frac{a\left(\frac{3d^2ex^r}{r-1}-d^3+\frac{3de^2x^{2r}}{2r-1}+\frac{e^3x^{3r}}{3r-1}\right)+b\log(cx^n)\left(\frac{3d^2ex^r}{r-1}-d^3+\frac{3de^2x^{2r}}{2r-1}+\frac{e^3x^{3r}}{3r-1}\right)+bn\left(-\frac{3d^2ex^r}{(r-1)^2}-d^3-\frac{3de^2x^{2r}}{(1-2r)^2}-\frac{e^3x^{3r}}{(1-3r)^2}\right)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^2,x]
```

```
[Out] (b*n*(-d^3 - (3*d^2*e*x^r)/(-1 + r)^2 - (3*d*e^2*x^(2*r))/(1 - 2*r)^2 - (e^
3*x^(3*r))/(1 - 3*r)^2) + a*(-d^3 + (3*d^2*e*x^r)/(-1 + r) + (3*d*e^2*x^(2*
r))/(-1 + 2*r) + (e^3*x^(3*r))/(-1 + 3*r)) + b*(-d^3 + (3*d^2*e*x^r)/(-1 +
r) + (3*d*e^2*x^(2*r))/(-1 + 2*r) + (e^3*x^(3*r))/(-1 + 3*r))*Log[c*x^n])/x
```

Maple [C] time = 0.35, size = 4031, normalized size = 22.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x^2,x)

[Out] -b*(-2*e^3*r^2*(x^r)^3-9*d*e^2*r^2*(x^r)^2+3*e^3*r*(x^r)^3+6*d^3*r^3-18*d^2
*e*r^2*x^r+12*d*e^2*r*(x^r)^2-e^3*(x^r)^3-11*d^3*r^2+15*d^2*e*r*x^r-3*d*e^2
*(x^r)^2+6*d^3*r-3*d^2*e*x^r-d^3)/x/(-1+3*r)/(-1+2*r)/(-1+r)*ln(x^n)-1/2*(2
*a*d^3+291*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2*a*e^3
*(x^r)^3+2*ln(c)*b*d^3-30*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^
2-30*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+72*b*d^3*n*r^6-264*b*
d^3*n*r^5+386*b*d^3*n*r^4+72*a*d^3*r^6-264*a*d^3*r^5+386*a*d^3*r^4+9*I*Pi*b
*e^3*r*csgn(I*c*x^n)^3*(x^r)^3+51*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3-24
*a*e^3*r^5*(x^r)^3+80*a*e^3*r^4*(x^r)^3+6*a*d*e^2*(x^r)^2+6*a*d^2*e*x^r+2*b
*e^3*n*(x^r)^3-102*a*e^3*r^3*(x^r)^3+62*a*e^3*r^2*(x^r)^3-18*a*e^3*r*(x^r)^
3+2*ln(c)*b*e^3*(x^r)^3-288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*x^r-12*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+108*I*Pi*b*
d^2*e*r^5*csgn(I*c*x^n)^3*x^r+12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3+I*P
i*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-28
8*b*d^3*n*r^3+116*b*d^3*n*r^2-24*b*d^3*n*r+72*ln(c)*b*d^3*r^6-264*ln(c)*b*d
^3*r^5+386*ln(c)*b*d^3*r^4-288*ln(c)*b*d^3*r^3+116*ln(c)*b*d^3*r^2-24*ln(c)
*b*d^3*r-288*a*d^3*r^3+116*a*d^3*r^2-24*a*d^3*r-60*a*d*e^2*r*(x^r)^2-582*a*
d^2*e*r^3*x^r+282*a*d^2*e*r^2*x^r-66*a*d^2*e*r*x^r+51*I*Pi*b*e^3*r^3*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+2*b*d^3*n-I*Pi*b*d^3*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)+80*ln(c)*b*e^3*r^4*(x^r)^3-102*ln(c)*b*e^3*r^3*(x^r)^3+
62*ln(c)*b*e^3*r^2*(x^r)^3-18*ln(c)*b*e^3*r*(x^r)^3+6*ln(c)*b*d^2*e*x^r+6*l
n(c)*b*d*e^2*(x^r)^2+26*b*e^3*n*r^2*(x^r)^3-12*b*e^3*n*r*(x^r)^3+6*b*d*e^2*
n*(x^r)^2+6*b*d^2*e*n*x^r-408*a*d*e^2*r^3*(x^r)^2+228*a*d*e^2*r^2*(x^r)^2+8
*b*e^3*n*r^4*(x^r)^3-24*b*e^3*n*r^3*(x^r)^3-108*a*d*e^2*r^5*(x^r)^2+342*a*d
*e^2*r^4*(x^r)^2-216*a*d^2*e*r^5*x^r+576*a*d^2*e*r^4*x^r-24*ln(c)*b*e^3*r^5
*(x^r)^3+132*b*d*e^2*n*r^2*(x^r)^2+222*b*d^2*e*n*r^2*x^r-193*I*Pi*b*d^3*r^4
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d^3*csgn(I*c*x^n)^3-9*I*Pi*b*e^
3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+291*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*
x^r-9*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-171*I*Pi*b*d*e^2*r^4
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-114*I*Pi*b*d*e^2*r^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-141*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*x^r-3*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r
-31*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-36*I*Pi*b*d^
3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-114*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n
)^3*(x^r)^2-141*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r+144*I*Pi*b*d^3*r^3*csg
n(I*c*x^n)^3-48*b*d*e^2*n*r*(x^r)^2-60*b*d^2*e*n*r*x^r+54*b*d*e^2*n*r^4*(x^
r)^2-144*b*d*e^2*n*r^3*(x^r)^2+216*b*d^2*e*n*r^4*x^r-360*b*d^2*e*n*r^3*x^r-
108*ln(c)*b*d*e^2*r^5*(x^r)^2+342*ln(c)*b*d*e^2*r^4*(x^r)^2-216*ln(c)*b*d^2
*e*r^5*x^r+576*ln(c)*b*d^2*e*r^4*x^r-I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*(x^r)^3+3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3*I*Pi*
b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I
*c*x^n)^2*x^r-33*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-58*I*Pi*b*d
```

^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*
x^n)^2*(x^r)^3+I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+36*I*Pi*b*d^3*r
^6*csgn(I*x^n)*csgn(I*c*x^n)^2-31*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3-19
3*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-582*ln(c)*b*d^2*e*r^3*x^r+282*ln(c)*b*d^2*
e*r^2*x^r-66*ln(c)*b*d^2*e*r*x^r-408*ln(c)*b*d*e^2*r^3*(x^r)^2+228*ln(c)*b*
d*e^2*r^2*(x^r)^2-60*ln(c)*b*d*e^2*r*(x^r)^2+3*I*Pi*b*d^2*e*csgn(I*c*x^n)^2
*csgn(I*c)*x^r+31*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+31*I*P
i*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+33*I*Pi*b*d^2*e*r*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*x^r+204*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^2-204*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2
-108*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r-108*I*Pi*b*d^2*e*r^5*cs
gn(I*x^n)*csgn(I*c*x^n)^2*x^r+288*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n
)^2*x^r+288*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-291*I*Pi*b*d^2*e
*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-291*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*c
sgn(I*c)*x^r-132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-132*I*Pi*b*d^3*
r^5*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(
x^r)^3+54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2-40*I*Pi*b*e^3*r^4*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+171*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn
(I*c*x^n)^2*(x^r)^2+171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+
40*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+40*I*Pi*b*e^3*r^4*csg
n(I*c*x^n)^2*csgn(I*c)*(x^r)^3-204*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn(I*
c)*(x^r)^2-12*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)-3*I*Pi*b*d^2*e*csgn(I*
c*x^n)^3*x^r-3*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+30*I*Pi*b*d*e^2*r*csgn(
I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+58*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I
*c*x^n)^2+58*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)+36*I*Pi*b*d^3*r^6*csg
n(I*c*x^n)^2*csgn(I*c)-171*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-288*I*P
i*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+30*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2
+33*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+204*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3
*(x^r)^2+144*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12*I*Pi*b*e
^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-54*I*Pi*b*d*e^2*r^5*csgn
(I*c*x^n)^2*csgn(I*c)*(x^r)^2+12*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+12*I
*Pi*b*d^3*r*csgn(I*c*x^n)^3-12*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2-144
*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-144*I*Pi*b*d^3*r^3*csgn(I*c*x^n
)^2*csgn(I*c)+193*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+193*I*Pi*b*d^3
*r^4*csgn(I*c*x^n)^2*csgn(I*c)-58*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3-I*Pi*b*e^3
*csgn(I*c*x^n)^3*(x^r)^3-36*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+108*I*Pi*b*d^2*e
*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+132*I*Pi*b*d^3*r^5*csgn(I*c*x^
n)^3+141*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+141*I*Pi*b*d^2*e*
r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-3*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)*(x^r)^2-51*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-51*
I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-33*I*Pi*b*d^2*e*r*csgn(I*c
*x^n)^2*csgn(I*c)*x^r+132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+114*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+114*I*Pi*b*d*e^2
*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-40*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x

```
^r)^3-54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+9*I*Pi*b*e^3*
r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3)/(-1+3*r)^2/x/(-1+2*r)^2/(-1+
r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.40963, size = 2201, normalized size = 12.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^2,x, algorithm="fricas")
```

```
[Out] -(36*(b*d^3*n + a*d^3)*r^6 - 132*(b*d^3*n + a*d^3)*r^5 + b*d^3*n + 193*(b*d
^3*n + a*d^3)*r^4 + a*d^3 - 144*(b*d^3*n + a*d^3)*r^3 + 58*(b*d^3*n + a*d^3
)*r^2 - 12*(b*d^3*n + a*d^3)*r - (12*a*e^3*r^5 - b*e^3*n - 4*(b*e^3*n + 10*
a*e^3)*r^4 - a*e^3 + 3*(4*b*e^3*n + 17*a*e^3)*r^3 - (13*b*e^3*n + 31*a*e^3)
*r^2 + 3*(2*b*e^3*n + 3*a*e^3)*r + (12*b*e^3*r^5 - 40*b*e^3*r^4 + 51*b*e^3*
r^3 - 31*b*e^3*r^2 + 9*b*e^3*r - b*e^3)*log(c) + (12*b*e^3*n*r^5 - 40*b*e^3
*n*r^4 + 51*b*e^3*n*r^3 - 31*b*e^3*n*r^2 + 9*b*e^3*n*r - b*e^3*n)*log(x))*x
^(3*r) - 3*(18*a*d*e^2*r^5 - b*d*e^2*n - 3*(3*b*d*e^2*n + 19*a*d*e^2)*r^4 -
 a*d*e^2 + 4*(6*b*d*e^2*n + 17*a*d*e^2)*r^3 - 2*(11*b*d*e^2*n + 19*a*d*e^2)
*r^2 + 2*(4*b*d*e^2*n + 5*a*d*e^2)*r + (18*b*d*e^2*r^5 - 57*b*d*e^2*r^4 + 6
8*b*d*e^2*r^3 - 38*b*d*e^2*r^2 + 10*b*d*e^2*r - b*d*e^2)*log(c) + (18*b*d*e
^2*n*r^5 - 57*b*d*e^2*n*r^4 + 68*b*d*e^2*n*r^3 - 38*b*d*e^2*n*r^2 + 10*b*d*
e^2*n*r - b*d*e^2*n)*log(x))*x^(2*r) - 3*(36*a*d^2*e*r^5 - b*d^2*e*n - 12*(
3*b*d^2*e*n + 8*a*d^2*e)*r^4 - a*d^2*e + (60*b*d^2*e*n + 97*a*d^2*e)*r^3 -
(37*b*d^2*e*n + 47*a*d^2*e)*r^2 + (10*b*d^2*e*n + 11*a*d^2*e)*r + (36*b*d^2
*e*r^5 - 96*b*d^2*e*r^4 + 97*b*d^2*e*r^3 - 47*b*d^2*e*r^2 + 11*b*d^2*e*r -
b*d^2*e)*log(c) + (36*b*d^2*e*n*r^5 - 96*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 -
 47*b*d^2*e*n*r^2 + 11*b*d^2*e*n*r - b*d^2*e*n)*log(x))*x^r + (36*b*d^3*r^6
```

```
 - 132*b*d^3*r^5 + 193*b*d^3*r^4 - 144*b*d^3*r^3 + 58*b*d^3*r^2 - 12*b*d^3*
r + b*d^3)*log(c) + (36*b*d^3*n*r^6 - 132*b*d^3*n*r^5 + 193*b*d^3*n*r^4 - 1
44*b*d^3*n*r^3 + 58*b*d^3*n*r^2 - 12*b*d^3*n*r + b*d^3*n)*log(x))/((36*r^6
- 132*r^5 + 193*r^4 - 144*r^3 + 58*r^2 - 12*r + 1)*x)
```

Sympy [A] time = 94.6739, size = 314, normalized size = 1.75

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**2,x)
```

```
[Out] -a*d**3/x + 3*a*d**2*e*Piecewise((x**r/(r*x - x), Ne(r, 1)), (log(x), True)
) + 3*a*d*e**2*Piecewise((x**(2*r)/(2*r*x - x), Ne(r, 1/2)), (log(x), True)
) + a*e**3*Piecewise((x**(3*r)/(3*r*x - x), Ne(r, 1/3)), (log(x), True)) -
b*d**3*n/x - b*d**3*log(c*x**n)/x - 3*b*d**2*e*n*Piecewise((Piecewise((x**r
/(r*x - x), Ne(r, 1)), (log(x), True))/(r - 1), (r > -oo) & (r < oo) & Ne(r
, 1)), (log(x)**2/2, True)) + 3*b*d**2*e*Piecewise((x**(r - 1)/(r - 1), Ne(
r - 2, -1)), (log(x), True))*log(c*x**n) - 3*b*d*e**2*n*Piecewise((Piecewis
e((x**(2*r)/(2*r*x - x), Ne(r, 1/2)), (log(x), True))/(2*r - 1), (r > -oo)
& (r < oo) & Ne(r, 1/2)), (log(x)**2/2, True)) + 3*b*d*e**2*Piecewise((x**(
2*r - 1)/(2*r - 1), Ne(2*r - 2, -1)), (log(x), True))*log(c*x**n) - b*e**3*
n*Piecewise((Piecewise((x**(3*r)/(3*r*x - x), Ne(r, 1/3)), (log(x), True))/
(3*r - 1), (r > -oo) & (r < oo) & Ne(r, 1/3)), (log(x)**2/2, True)) + b*e**
3*Piecewise((x**(3*r - 1)/(3*r - 1), Ne(3*r - 2, -1)), (log(x), True))*log(
c*x**n)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^3 (b \log(cx^n) + a)}{x^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^2,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^2, x)
```

3.402 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^4}\,dx$

Optimal. Leaf size=191

$$-\frac{3d^2ex^{r-3}(a+b\log(cx^n))}{3-r}-\frac{d^3(a+b\log(cx^n))}{3x^3}-\frac{3de^2x^{2r-3}(a+b\log(cx^n))}{3-2r}-\frac{e^3x^{-3(1-r)}(a+b\log(cx^n))}{3(1-r)}-\frac{3bd^2enx^{r-}}{(3-r)^2}$$

```
[Out] -(b*d^3*n)/(9*x^3) - (b*e^3*n)/(9*(1 - r)^2*x^(3*(1 - r))) - (3*b*d^2*e*n*x
^(-3 + r))/(3 - r)^2 - (3*b*d*e^2*n*x^(-3 + 2*r))/(3 - 2*r)^2 - (d^3*(a + b
*Log[c*x^n]))/(3*x^3) - (e^3*(a + b*Log[c*x^n]))/(3*(1 - r)*x^(3*(1 - r)))
- (3*d^2*e*x^(-3 + r)*(a + b*Log[c*x^n]))/(3 - r) - (3*d*e^2*x^(-3 + 2*r)*(
a + b*Log[c*x^n]))/(3 - 2*r)
```

Rubi [A] time = 0.39323, antiderivative size = 160, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{3}\left(\frac{9d^2ex^{r-3}}{3-r}+\frac{d^3}{x^3}+\frac{9de^2x^{2r-3}}{3-2r}+\frac{e^3x^{-3(1-r)}}{1-r}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r-3}}{(3-r)^2}-\frac{bd^3n}{9x^3}-\frac{3bde^2nx^{2r-3}}{(3-2r)^2}-\frac{be^3nx^{-3(1-r)}}{9(1-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] -(b*d^3*n)/(9*x^3) - (b*e^3*n)/(9*(1 - r)^2*x^(3*(1 - r))) - (3*b*d^2*e*n*x
^(-3 + r))/(3 - r)^2 - (3*b*d*e^2*n*x^(-3 + 2*r))/(3 - 2*r)^2 - ((d^3/x^3 +
 e^3/((1 - r)*x^(3*(1 - r))) + (9*d^2*e*x^(-3 + r))/(3 - r) + (9*d*e^2*x^(-
3 + 2*r))/(3 - 2*r))*(a + b*Log[c*x^n]))/3
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^3 (a+b\log(cx^n))}{x^4}\,dx = -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r)}}{1-r}+\frac{9d^2ex^{-3+r}}{3-r}+\frac{9de^2x^{-3+2r}}{3-2r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^3+\frac{9d^2e}{-3+}}{}$$

$$= -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r)}}{1-r}+\frac{9d^2ex^{-3+r}}{3-r}+\frac{9de^2x^{-3+2r}}{3-2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int \frac{-d^3+\frac{9d}{-}}{}$$

$$= -\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r)}}{1-r}+\frac{9d^2ex^{-3+r}}{3-r}+\frac{9de^2x^{-3+2r}}{3-2r}\right)(a+b\log(cx^n))-\frac{1}{3}(bn)\int\left(-\frac{d^3}{x^4}+\right.$$

$$= -\frac{bd^3n}{9x^3}-\frac{be^3nx^{-3(1-r)}}{9(1-r)^2}-\frac{3bd^2enx^{-3+r}}{(3-r)^2}-\frac{3bde^2nx^{-3+2r}}{(3-2r)^2}-\frac{1}{3}\left(\frac{d^3}{x^3}+\frac{e^3x^{-3(1-r)}}{1-r}+\frac{9d^2ex^{-3}}{3-r}\right.$$

Mathematica [A] time = 0.375765, size = 180, normalized size = 0.94

$$\frac{3a\left(\frac{9d^2ex^r}{r-3}-d^3+\frac{9de^2x^{2r}}{2r-3}+\frac{e^3x^{3r}}{r-1}\right)+3b\log(cx^n)\left(\frac{9d^2ex^r}{r-3}-d^3+\frac{9de^2x^{2r}}{2r-3}+\frac{e^3x^{3r}}{r-1}\right)+bn\left(-\frac{27d^2ex^r}{(r-3)^2}-d^3-\frac{27de^2x^{2r}}{(3-2r)^2}-\frac{e^3x^{3r}}{(r-1)^2}\right)}{9x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^4,x]
```

```
[Out] (b*n*(-d^3 - (27*d^2*e*x^r)/(-3 + r)^2 - (27*d*e^2*x^(2*r))/(3 - 2*r)^2 - (
e^3*x^(3*r))/(-1 + r)^2) + 3*a*(-d^3 + (9*d^2*e*x^r)/(-3 + r) + (9*d*e^2*x^
(2*r))/(-3 + 2*r) + (e^3*x^(3*r))/(-1 + r)) + 3*b*(-d^3 + (9*d^2*e*x^r)/(-3
 + r) + (9*d*e^2*x^(2*r))/(-3 + 2*r) + (e^3*x^(3*r))/(-1 + r))*Log[c*x^n])/
(9*x^3)
```

Maple [C] time = 0.352, size = 4027, normalized size = 21.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x^4,x)

[Out] -1/3*b*(-2*e^3*r^2*(x^r)^3-9*d*e^2*r^2*(x^r)^2+9*e^3*r*(x^r)^3+2*d^3*r^3-18
*d^2*e*r^2*x^r+36*d*e^2*r*(x^r)^2-9*e^3*(x^r)^3-11*d^3*r^2+45*d^2*e*r*x^r-2
7*d*e^2*(x^r)^2+18*d^3*r-27*d^2*e*x^r-9*d^3)/x^3/(-1+r)/(-3+2*r)/(-3+r)*ln(
x^n)-1/18*(486*a*d^3+486*a*e^3*(x^r)^3+486*ln(c)*b*d^3+972*I*Pi*b*d^3*r*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1296*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)+8*b*d^3*n*r^6-88*b*d^3*n*r^5+386*b*d^3*n*r^4+24*a*d^3*r^6-264
*a*d^3*r^5+1158*a*d^3*r^4+459*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+729*I*
Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-24*a*e^3*r^5*(x^r)^3+240*a*e^3*r^4*(x^r)
^3+1458*a*d*e^2*(x^r)^2+1458*a*d^2*e*x^r+162*b*e^3*n*(x^r)^3-918*a*e^3*r^3*
(x^r)^3+1674*a*e^3*r^2*(x^r)^3-1458*a*e^3*r*(x^r)^3+486*ln(c)*b*e^3*(x^r)^3
-12*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+108*I*Pi*b*d^2*e*r^5
*csgn(I*c*x^n)^3*x^r+12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-864*b*d^3*n*
r^3+1044*b*d^3*n*r^2-648*b*d^3*n*r+24*ln(c)*b*d^3*r^6-264*ln(c)*b*d^3*r^5+1
158*ln(c)*b*d^3*r^4-2592*ln(c)*b*d^3*r^3+3132*ln(c)*b*d^3*r^2-1944*ln(c)*b*
d^3*r-2592*a*d^3*r^3+3132*a*d^3*r^2-1944*a*d^3*r-4860*a*d*e^2*r*(x^r)^2-523
8*a*d^2*e*r^3*x^r+7614*a*d^2*e*r^2*x^r-5346*a*d^2*e*r*x^r+162*b*d^3*n+972*I
*Pi*b*d^3*r*csgn(I*c*x^n)^3+240*ln(c)*b*e^3*r^4*(x^r)^3-918*ln(c)*b*e^3*r^3
*(x^r)^3+1674*ln(c)*b*e^3*r^2*(x^r)^3-1458*ln(c)*b*e^3*r*(x^r)^3+1458*ln(c)
*b*d^2*e*x^r+1458*ln(c)*b*d*e^2*(x^r)^2+234*b*e^3*n*r^2*(x^r)^3-324*b*e^3*n
*r*(x^r)^3+486*b*d*e^2*n*(x^r)^2+486*b*d^2*e*n*x^r-3672*a*d*e^2*r^3*(x^r)^2
+6156*a*d*e^2*r^2*(x^r)^2+8*b*e^3*n*r^4*(x^r)^3-72*b*e^3*n*r^3*(x^r)^3-108*
a*d*e^2*r^5*(x^r)^2+1026*a*d*e^2*r^4*(x^r)^2-216*a*d^2*e*r^5*x^r+1728*a*d^2
*e*r^4*x^r-24*ln(c)*b*e^3*r^5*(x^r)^3+2673*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x
^r+1188*b*d*e^2*n*r^2*(x^r)^2+1998*b*d^2*e*n*r^2*x^r-837*I*Pi*b*e^3*r^2*csg
n(I*c*x^n)^3*(x^r)^3+243*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+243
*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-243*I*Pi*b*d^3*csgn(I*c*x^n)^
3-579*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+243*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^
n)^2+729*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+459*I*Pi*
b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-1836*I*Pi*b*d*e^2*r^3
*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2619*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*
csgn(I*c)*x^r-864*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+837*I*Pi*b*e^3*r^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+837*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(
I*c)*(x^r)^3-729*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-120*I*Pi*b*e^3*r^4*cs
gn(I*c*x^n)^3*(x^r)^3-243*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+12
*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2+729*I*Pi*b*d*e^2*csgn(I*x^n)*cs
```

gn(I*c*x^n)^2*(x^r)^2+729*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+72
9*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-729*I*Pi*b*e^3*r*csgn(I*c*x^
n)^2*csgn(I*c)*(x^r)^3-1296*b*d*e^2*n*r*(x^r)^2-1620*b*d^2*e*n*r*x^r+54*b*d
*e^2*n*r^4*(x^r)^2-432*b*d*e^2*n*r^3*(x^r)^2+216*b*d^2*e*n*r^4*x^r-1080*b*d
^2*e*n*r^3*x^r-108*ln(c)*b*d*e^2*r^5*(x^r)^2+1026*ln(c)*b*d*e^2*r^4*(x^r)^2
-216*ln(c)*b*d^2*e*r^5*x^r+1728*ln(c)*b*d^2*e*r^4*x^r-1566*I*Pi*b*d^3*r^2*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-243*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^3-459*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-4
59*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-5238*ln(c)*b*d^2*e*r^3*
x^r+7614*ln(c)*b*d^2*e*r^2*x^r-5346*ln(c)*b*d^2*e*r*x^r-3672*ln(c)*b*d*e^2*
r^3*(x^r)^2+6156*ln(c)*b*d*e^2*r^2*(x^r)^2-4860*ln(c)*b*d*e^2*r*(x^r)^2-729
*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-108*I*Pi*b*d^2*e*r^5*csgn
(I*c*x^n)^2*csgn(I*c)*x^r-120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*(x^r)^3-108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+513*I*Pi
*b*d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-837*I*Pi*b*e^3*r^2*csgn(I*x^
n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-972*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^
n)^2-1296*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-1296*I*Pi*b*d^3*r^3*cs
gn(I*c*x^n)^2*csgn(I*c)-132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2-132*
I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)+1836*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n
)^3*(x^r)^2-12*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+54*I*Pi*b*d
*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+1296*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^3+729*I*
Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+120*I*Pi*b*e^3*r^4*csgn(I*x^n)*csg
n(I*c*x^n)^2*(x^r)^3+120*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-5
13*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-12*I*Pi*b*d^3*r^6*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)+2619*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*x^r+579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+579*I*Pi*b*d^3*r^4
*csgn(I*c*x^n)^2*csgn(I*c)-2619*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^
2*x^r+1566*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+1566*I*Pi*b*d^3*r^2*c
sgn(I*c*x^n)^2*csgn(I*c)+12*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-1566*I
*Pi*b*d^3*r^2*csgn(I*c*x^n)^3-243*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+243*I*
Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-12*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3-729*I*
Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+12*I*Pi*b*e^3*r^5*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+864*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn
(I*c*x^n)^2*x^r-54*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+864*I
*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-729*I*Pi*b*d^2*e*csgn(I*c*x^n
)^3*x^r+54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-307
8*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-3807*I*Pi*b*
d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-972*I*Pi*b*d^3*r*csgn(I*c
*x^n)^2*csgn(I*c)-579*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-30
78*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-3807*I*Pi*b*d^2*e*r^2*csgn(I*c*
x^n)^3*x^r+2430*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-864*I*Pi*b*d^2*e*r^4
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+108*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*x^r-513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*(x^r)^2+1836*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
(x^r)^2+132*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-2430*I*Pi*b*d*e^2*r*csgn(I*x^n)*

```
csgn(I*c*x^n)^2*(x^r)^2+3807*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r
-2430*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-729*I*Pi*b*d*e^2*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-1836*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n
)^2*csgn(I*c)*(x^r)^2+132*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)+2619*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+3807*I*Pi*b*d^2*e*r^2*csgn(I*x^
n)*csgn(I*c*x^n)^2*x^r-54*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^2+513*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2673*I*Pi*b*d^
2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3078*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csg
n(I*c*x^n)^2*(x^r)^2-2673*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3078
*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+2430*I*Pi*b*d*e^2*r*csg
n(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+2673*I*Pi*b*d^2*e*r*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x^r)/(-1+r)^2/x^3/(-3+2*r)^2/(-3+r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.47249, size = 2310, normalized size = 12.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^4,x, algorithm="fricas")
```

```
[Out] -1/9*(4*(b*d^3*n + 3*a*d^3)*r^6 - 44*(b*d^3*n + 3*a*d^3)*r^5 + 81*b*d^3*n +
 193*(b*d^3*n + 3*a*d^3)*r^4 + 243*a*d^3 - 432*(b*d^3*n + 3*a*d^3)*r^3 + 52
2*(b*d^3*n + 3*a*d^3)*r^2 - 324*(b*d^3*n + 3*a*d^3)*r - (12*a*e^3*r^5 - 81*
b*e^3*n - 4*(b*e^3*n + 30*a*e^3)*r^4 - 243*a*e^3 + 9*(4*b*e^3*n + 51*a*e^3)
*r^3 - 9*(13*b*e^3*n + 93*a*e^3)*r^2 + 81*(2*b*e^3*n + 9*a*e^3)*r + 3*(4*b*
e^3*r^5 - 40*b*e^3*r^4 + 153*b*e^3*r^3 - 279*b*e^3*r^2 + 243*b*e^3*r - 81*b
*e^3)*log(c) + 3*(4*b*e^3*n*r^5 - 40*b*e^3*n*r^4 + 153*b*e^3*n*r^3 - 279*b*
e^3*n*r^2 + 243*b*e^3*n*r - 81*b*e^3*n)*log(x))*x^(3*r) - 27*(2*a*d*e^2*r^5
 - 9*b*d*e^2*n - (b*d*e^2*n + 19*a*d*e^2)*r^4 - 27*a*d*e^2 + 4*(2*b*d*e^2*n
```

```
 + 17*a*d*e^2)*r^3 - 2*(11*b*d*e^2*n + 57*a*d*e^2)*r^2 + 6*(4*b*d*e^2*n + 1
5*a*d*e^2)*r + (2*b*d*e^2*r^5 - 19*b*d*e^2*r^4 + 68*b*d*e^2*r^3 - 114*b*d*e
^2*r^2 + 90*b*d*e^2*r - 27*b*d*e^2)*log(c) + (2*b*d*e^2*n*r^5 - 19*b*d*e^2*
n*r^4 + 68*b*d*e^2*n*r^3 - 114*b*d*e^2*n*r^2 + 90*b*d*e^2*n*r - 27*b*d*e^2*
n)*log(x))*x^(2*r) - 27*(4*a*d^2*e*r^5 - 9*b*d^2*e*n - 4*(b*d^2*e*n + 8*a*d
^2*e)*r^4 - 27*a*d^2*e + (20*b*d^2*e*n + 97*a*d^2*e)*r^3 - (37*b*d^2*e*n +
141*a*d^2*e)*r^2 + 3*(10*b*d^2*e*n + 33*a*d^2*e)*r + (4*b*d^2*e*r^5 - 32*b*
d^2*e*r^4 + 97*b*d^2*e*r^3 - 141*b*d^2*e*r^2 + 99*b*d^2*e*r - 27*b*d^2*e)*l
og(c) + (4*b*d^2*e*n*r^5 - 32*b*d^2*e*n*r^4 + 97*b*d^2*e*n*r^3 - 141*b*d^2*
e*n*r^2 + 99*b*d^2*e*n*r - 27*b*d^2*e*n)*log(x))*x^r + 3*(4*b*d^3*r^6 - 44*
b*d^3*r^5 + 193*b*d^3*r^4 - 432*b*d^3*r^3 + 522*b*d^3*r^2 - 324*b*d^3*r + 8
1*b*d^3)*log(c) + 3*(4*b*d^3*n*r^6 - 44*b*d^3*n*r^5 + 193*b*d^3*n*r^4 - 432
*b*d^3*n*r^3 + 522*b*d^3*n*r^2 - 324*b*d^3*n*r + 81*b*d^3*n)*log(x))/((4*r^
6 - 44*r^5 + 193*r^4 - 432*r^3 + 522*r^2 - 324*r + 81)*x^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**4,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^3 (b \log (cx^n) + a)}{x^4} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^4,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^4, x)
```

3.403 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^6} dx$

Optimal. Leaf size=183

$$-\frac{3d^2ex^{r-5}(a+b\log(cx^n))}{5-r}-\frac{d^3(a+b\log(cx^n))}{5x^5}-\frac{3de^2x^{2r-5}(a+b\log(cx^n))}{5-2r}-\frac{e^3x^{3r-5}(a+b\log(cx^n))}{5-3r}-\frac{3bd^2enx^{r-5}}{(5-r)^2}$$

```
[Out] -(b*d^3*n)/(25*x^5) - (3*b*d^2*e*n*x^(-5 + r))/(5 - r)^2 - (3*b*d*e^2*n*x^(
-5 + 2*r))/(5 - 2*r)^2 - (b*e^3*n*x^(-5 + 3*r))/(5 - 3*r)^2 - (d^3*(a + b*L
og[c*x^n]))/(5*x^5) - (3*d^2*e*x^(-5 + r)*(a + b*Log[c*x^n]))/(5 - r) - (3*
d*e^2*x^(-5 + 2*r)*(a + b*Log[c*x^n]))/(5 - 2*r) - (e^3*x^(-5 + 3*r)*(a + b
*Log[c*x^n]))/(5 - 3*r)
```

Rubi [A] time = 0.411522, antiderivative size = 155, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{5}\left(\frac{15d^2ex^{r-5}}{5-r}+\frac{d^3}{x^5}+\frac{15de^2x^{2r-5}}{5-2r}+\frac{5e^3x^{3r-5}}{5-3r}\right)(a+b\log(cx^n))-\frac{3bd^2enx^{r-5}}{(5-r)^2}-\frac{bd^3n}{25x^5}-\frac{3bde^2nx^{2r-5}}{(5-2r)^2}-\frac{be^3nx^{3r-5}}{(5-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] -(b*d^3*n)/(25*x^5) - (3*b*d^2*e*n*x^(-5 + r))/(5 - r)^2 - (3*b*d*e^2*n*x^(
-5 + 2*r))/(5 - 2*r)^2 - (b*e^3*n*x^(-5 + 3*r))/(5 - 3*r)^2 - ((d^3/x^5 + (
15*d^2*e*x^(-5 + r))/(5 - r) + (15*d*e^2*x^(-5 + 2*r))/(5 - 2*r) + (5*e^3*x
^(-5 + 3*r))/(5 - 3*r))*(a + b*Log[c*x^n]))/5
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^6}\,dx = -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\frac{15de^2x^{-5+2r}}{5-2r}+\frac{5e^3x^{-5+3r}}{5-3r}\right)(a+b\log(cx^n))-(bn)\int \frac{-d^3+1\ldots}{}$$

$$= -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\frac{15de^2x^{-5+2r}}{5-2r}+\frac{5e^3x^{-5+3r}}{5-3r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int \frac{-d^3+\ldots}{}$$

$$= -\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\frac{15de^2x^{-5+2r}}{5-2r}+\frac{5e^3x^{-5+3r}}{5-3r}\right)(a+b\log(cx^n))-\frac{1}{5}(bn)\int\left(-\frac{d^3}{x^6}\ldots\right.$$

$$= -\frac{bd^3n}{25x^5}-\frac{3bd^2enx^{-5+r}}{(5-r)^2}-\frac{3bde^2nx^{-5+2r}}{(5-2r)^2}-\frac{be^3nx^{-5+3r}}{(5-3r)^2}-\frac{1}{5}\left(\frac{d^3}{x^5}+\frac{15d^2ex^{-5+r}}{5-r}+\frac{15de^2x\ldots}{5-\ldots}\right.$$

Mathematica [A] time = 0.40007, size = 187, normalized size = 1.02

$$\frac{a\left(\frac{75d^2ex^r}{r-5}-5d^3+\frac{75de^2x^{2r}}{2r-5}+\frac{25e^3x^{3r}}{3r-5}\right)+5b\log(cx^n)\left(\frac{15d^2ex^r}{r-5}-d^3+\frac{15de^2x^{2r}}{2r-5}+\frac{5e^3x^{3r}}{3r-5}\right)+bn\left(-\frac{75d^2ex^r}{(r-5)^2}-d^3-\frac{75de^2x^{2r}}{(5-2r)^2}-\frac{25e^3x^{3r}}{(5-3r)^2}\right)}{25x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^6,x]
```

```
[Out] (b*n*(-d^3 - (75*d^2*e*x^r)/(-5 + r)^2 - (75*d*e^2*x^(2*r))/(5 - 2*r)^2 - (
25*e^3*x^(3*r))/(5 - 3*r)^2) + a*(-5*d^3 + (75*d^2*e*x^r)/(-5 + r) + (75*d*
e^2*x^(2*r))/(-5 + 2*r) + (25*e^3*x^(3*r))/(-5 + 3*r)) + 5*b*(-d^3 + (15*d^
2*e*x^r)/(-5 + r) + (15*d*e^2*x^(2*r))/(-5 + 2*r) + (5*e^3*x^(3*r))/(-5 + 3
*r))*Log[c*x^n])/(25*x^5)
```

Maple [C] time = 0.363, size = 4031, normalized size = 22.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x^6,x)
```

```
[Out] -1/5*b*(-10*e^3*r^2*(x^r)^3-45*d*e^2*r^2*(x^r)^2+75*e^3*r*(x^r)^3+6*d^3*r^3
-90*d^2*e*r^2*x^r+300*d*e^2*r*(x^r)^2-125*e^3*(x^r)^3-55*d^3*r^2+375*d^2*e*
r*x^r-375*d*e^2*(x^r)^2+150*d^3*r-375*d^2*e*x^r-125*d^3)/x^5/(-5+3*r)/(-5+2
*r)/(-5+r)*ln(x^n)-1/50*(-140625*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(
x^r)^3+156250*a*d^3-356250*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^r)^2-31875*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-31875
*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-300*I*Pi*b*e^3*r^5*csgn(I
*x^n)*csgn(I*c*x^n)^2*(x^r)^3+156250*a*e^3*(x^r)^3-187500*I*Pi*b*d^3*r*csgn
(I*x^n)*csgn(I*c*x^n)^2-90000*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2+15
6250*ln(c)*b*d^3+3300*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3+90000*I*Pi*b*d^3*r^3*c
sgn(I*c*x^n)^3+72*b*d^3*n*r^6-1320*b*d^3*n*r^5+9650*b*d^3*n*r^4+360*a*d^3*r
^6-6600*a*d^3*r^5+48250*a*d^3*r^4-181250*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)+5000*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+50
00*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-21375*I*Pi*b*d*e^2*r^4*
csgn(I*c*x^n)^3*(x^r)^2+300*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-600*a*e^
3*r^5*(x^r)^3+10000*a*e^3*r^4*(x^r)^3+468750*a*d*e^2*(x^r)^2+468750*a*d^2*e
*x^r+31250*b*e^3*n*(x^r)^3-63750*a*e^3*r^3*(x^r)^3+193750*a*e^3*r^2*(x^r)^3
-281250*a*e^3*r*(x^r)^3+156250*ln(c)*b*e^3*(x^r)^3-3300*I*Pi*b*d^3*r^5*csgn
(I*c*x^n)^2*csgn(I*c)-36000*b*d^3*n*r^3+72500*b*d^3*n*r^2-75000*b*d^3*n*r+3
60*ln(c)*b*d^3*r^6-6600*ln(c)*b*d^3*r^5+48250*ln(c)*b*d^3*r^4-180000*ln(c)*
b*d^3*r^3+362500*ln(c)*b*d^3*r^2-375000*ln(c)*b*d^3*r-180000*a*d^3*r^3+3625
00*a*d^3*r^2-375000*a*d^3*r-937500*a*d*e^2*r*(x^r)^2-363750*a*d^2*e*r^3*x^r
+881250*a*d^2*e*r^2*x^r-1031250*a*d^2*e*r*x^r+31250*b*d^3*n+24125*I*Pi*b*d^
3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn
(I*c)-234375*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+181250*I*Pi*b*d^3*r^2*csgn(I*
x^n)*csgn(I*c*x^n)^2+181250*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)+180*I*
Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-90000*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2
*csgn(I*c)-3300*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2+10000*ln(c)*b*e^
3*r^4*(x^r)^3-63750*ln(c)*b*e^3*r^3*(x^r)^3+193750*ln(c)*b*e^3*r^2*(x^r)^3-
281250*ln(c)*b*e^3*r*(x^r)^3+468750*ln(c)*b*d^2*e*x^r+468750*ln(c)*b*d*e^2*
(x^r)^2+16250*b*e^3*n*r^2*(x^r)^3-37500*b*e^3*n*r*(x^r)^3+93750*b*d*e^2*n*(
x^r)^2+93750*b*d^2*e*n*x^r-255000*a*d*e^2*r^3*(x^r)^2+712500*a*d*e^2*r^2*(x
^r)^2+200*b*e^3*n*r^4*(x^r)^3-3000*b*e^3*n*r^3*(x^r)^3-2700*a*d*e^2*r^5*(x^
r)^2+42750*a*d*e^2*r^4*(x^r)^2-5400*a*d^2*e*r^5*x^r+72000*a*d^2*e*r^4*x^r-6
00*ln(c)*b*e^3*r^5*(x^r)^3+82500*b*d*e^2*n*r^2*(x^r)^2+138750*b*d^2*e*n*r^2
```

*x^r-78125*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+234375*I*
Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+234375*I*Pi*b*d*e^2*csgn(I*c
*x^n)^2*csgn(I*c)*(x^r)^2+234375*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x
^r+21375*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+21375*I*Pi*b*
d*e^2*r^4*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-96875*I*Pi*b*e^3*r^2*csgn(I*x^n
)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-78125*I*Pi*b*d^3*csgn(I*c*x^n)^3+468750*I
*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+515625*I*Pi*b*d^2
*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+181875*I*Pi*b*d^2*e*r^3*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2700*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csg
n(I*c)*x^r-2700*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-440625*I*P
i*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-21375*I*Pi*b*d*e^2*r^
4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+127500*I*Pi*b*d*e^2*r^3*csgn(
I*c*x^n)^3*(x^r)^2-300*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+135
0*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2+78125*I*Pi*b*d^3*csgn(I*x^n)*csg
n(I*c*x^n)^2-150000*b*d*e^2*n*r*(x^r)^2-187500*b*d^2*e*n*r*x^r+1350*b*d*e^2
*n*r^4*(x^r)^2-18000*b*d*e^2*n*r^3*(x^r)^2+5400*b*d^2*e*n*r^4*x^r-45000*b*d
^2*e*n*r^3*x^r-2700*ln(c)*b*d*e^2*r^5*(x^r)^2+42750*ln(c)*b*d*e^2*r^4*(x^r)
^2-5400*ln(c)*b*d^2*e*r^5*x^r+72000*ln(c)*b*d^2*e*r^4*x^r+96875*I*Pi*b*e^3*
r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+515625*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3
*x^r+31875*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+140625*I*Pi*b*e^3*r*csgn(
I*c*x^n)^3*(x^r)^3+1350*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*(x^r)^2+2700*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-140
625*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+468750*I*Pi*b*d*e^2*r*cs
gn(I*c*x^n)^3*(x^r)^2-363750*ln(c)*b*d^2*e*r^3*x^r+881250*ln(c)*b*d^2*e*r^2
*x^r-1031250*ln(c)*b*d^2*e*r*x^r-255000*ln(c)*b*d*e^2*r^3*(x^r)^2+712500*ln
(c)*b*d*e^2*r^2*(x^r)^2-937500*ln(c)*b*d*e^2*r*(x^r)^2-36000*I*Pi*b*d^2*e*r
^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+187500*I*Pi*b*d^3*r*csgn(I*c*x^n
)^3+234375*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-234375*I*Pi*b*d*e^2*c
sgn(I*c*x^n)^3*(x^r)^2-5000*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3+127500*I
*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-187500*I*Pi*b*d
^3*r*csgn(I*c*x^n)^2*csgn(I*c)-127500*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^2*csgn
(I*c)*(x^r)^2-24125*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-3562
50*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-440625*I*Pi*b*d^2*e*r^2*csgn(I*
c*x^n)^3*x^r-181250*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3-78125*I*Pi*b*d^3*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+180*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2
+2700*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r+3300*I*Pi*b*d^3*r^5*csgn(I*x^n)*
csgn(I*c*x^n)*csgn(I*c)+181875*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r+356250*
I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+356250*I*Pi*b*d*e^2*r^
2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-96875*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x
^r)^3+78125*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+78125*I*Pi*b*e^3
*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-1350*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I
*c*x^n)^2*(x^r)^2-1350*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1
87500*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+90000*I*Pi*b*d^3*r^3
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-36000*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3
*x^r+96875*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-180*I*Pi*b*d^

```
3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-78125*I*Pi*b*e^3*csgn(I*c*x^n)^3*
(x^r)^3+78125*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-180*I*Pi*b*d^3*r^6*csgn(
I*c*x^n)^3-24125*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3-468750*I*Pi*b*d*e^2*r*csgn(
I*c*x^n)^2*csgn(I*c)*(x^r)^2-515625*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n
)^2*x^r-515625*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+36000*I*Pi*b*d^
2*e*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+36000*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n
)^2*csgn(I*c)*x^r-468750*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2
-5000*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+140625*I*P
i*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+440625*I*Pi*b*d^2*e*r
^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+31875*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)*(x^r)^3-234375*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)*(x^r)^2-127500*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-234
375*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-181875*I*Pi*b*d^2*
e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+440625*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csg
n(I*c*x^n)^2*x^r+300*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^
r)^3-181875*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r)/(-5+3*r)^2/x^
5/(-5+2*r)^2/(-5+r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.49279, size = 2493, normalized size = 13.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^6,x, algorithm="fricas")
```

```
[Out] -1/25*(36*(b*d^3*n + 5*a*d^3)*r^6 - 660*(b*d^3*n + 5*a*d^3)*r^5 + 15625*b*d
^3*n + 4825*(b*d^3*n + 5*a*d^3)*r^4 + 78125*a*d^3 - 18000*(b*d^3*n + 5*a*d^
3)*r^3 + 36250*(b*d^3*n + 5*a*d^3)*r^2 - 37500*(b*d^3*n + 5*a*d^3)*r - 25*(
12*a*e^3*r^5 - 625*b*e^3*n - 4*(b*e^3*n + 50*a*e^3)*r^4 - 3125*a*e^3 + 15*(
```

```
4*b*e^3*n + 85*a*e^3)*r^3 - 25*(13*b*e^3*n + 155*a*e^3)*r^2 + 375*(2*b*e^3*
n + 15*a*e^3)*r + (12*b*e^3*r^5 - 200*b*e^3*r^4 + 1275*b*e^3*r^3 - 3875*b*e
^3*r^2 + 5625*b*e^3*r - 3125*b*e^3)*log(c) + (12*b*e^3*n*r^5 - 200*b*e^3*n*
r^4 + 1275*b*e^3*n*r^3 - 3875*b*e^3*n*r^2 + 5625*b*e^3*n*r - 3125*b*e^3*n)*
log(x))*x^(3*r) - 75*(18*a*d*e^2*r^5 - 625*b*d*e^2*n - 3*(3*b*d*e^2*n + 95*
a*d*e^2)*r^4 - 3125*a*d*e^2 + 20*(6*b*d*e^2*n + 85*a*d*e^2)*r^3 - 50*(11*b*
d*e^2*n + 95*a*d*e^2)*r^2 + 250*(4*b*d*e^2*n + 25*a*d*e^2)*r + (18*b*d*e^2*
r^5 - 285*b*d*e^2*r^4 + 1700*b*d*e^2*r^3 - 4750*b*d*e^2*r^2 + 6250*b*d*e^2*
r - 3125*b*d*e^2)*log(c) + (18*b*d*e^2*n*r^5 - 285*b*d*e^2*n*r^4 + 1700*b*d
*e^2*n*r^3 - 4750*b*d*e^2*n*r^2 + 6250*b*d*e^2*n*r - 3125*b*d*e^2*n)*log(x)
)*x^(2*r) - 75*(36*a*d^2*e*r^5 - 625*b*d^2*e*n - 12*(3*b*d^2*e*n + 40*a*d^2
*e)*r^4 - 3125*a*d^2*e + 25*(12*b*d^2*e*n + 97*a*d^2*e)*r^3 - 25*(37*b*d^2*
e*n + 235*a*d^2*e)*r^2 + 625*(2*b*d^2*e*n + 11*a*d^2*e)*r + (36*b*d^2*e*r^5
 - 480*b*d^2*e*r^4 + 2425*b*d^2*e*r^3 - 5875*b*d^2*e*r^2 + 6875*b*d^2*e*r -
 3125*b*d^2*e)*log(c) + (36*b*d^2*e*n*r^5 - 480*b*d^2*e*n*r^4 + 2425*b*d^2*
e*n*r^3 - 5875*b*d^2*e*n*r^2 + 6875*b*d^2*e*n*r - 3125*b*d^2*e*n)*log(x))*x
^r + 5*(36*b*d^3*r^6 - 660*b*d^3*r^5 + 4825*b*d^3*r^4 - 18000*b*d^3*r^3 + 3
6250*b*d^3*r^2 - 37500*b*d^3*r + 15625*b*d^3)*log(c) + 5*(36*b*d^3*n*r^6 -
660*b*d^3*n*r^5 + 4825*b*d^3*n*r^4 - 18000*b*d^3*n*r^3 + 36250*b*d^3*n*r^2
- 37500*b*d^3*n*r + 15625*b*d^3*n)*log(x))/((36*r^6 - 660*r^5 + 4825*r^4 -
18000*r^3 + 36250*r^2 - 37500*r + 15625)*x^5)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**6,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r+d)^3(b\log(cx^n)+a)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^6,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^6, x)
```

3.404 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^8}\,dx$

Optimal. Leaf size=183

$$-\frac{3d^2ex^{r-7}\left(a+b\log\left(cx^n\right)\right)}{7-r}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{7x^7}-\frac{3de^2x^{2r-7}\left(a+b\log\left(cx^n\right)\right)}{7-2r}-\frac{e^3x^{3r-7}\left(a+b\log\left(cx^n\right)\right)}{7-3r}-\frac{3bd^2enx^{r-7}}{(7-r)^2}-$$

```
[Out] -(b*d^3*n)/(49*x^7) - (3*b*d^2*e*n*x^(-7 + r))/(7 - r)^2 - (3*b*d*e^2*n*x^(
-7 + 2*r))/(7 - 2*r)^2 - (b*e^3*n*x^(-7 + 3*r))/(7 - 3*r)^2 - (d^3*(a + b*L
og[c*x^n]))/(7*x^7) - (3*d^2*e*x^(-7 + r)*(a + b*Log[c*x^n]))/(7 - r) - (3*
d*e^2*x^(-7 + 2*r)*(a + b*Log[c*x^n]))/(7 - 2*r) - (e^3*x^(-7 + 3*r)*(a + b
*Log[c*x^n]))/(7 - 3*r)
```

Rubi [A] time = 0.412631, antiderivative size = 155, normalized size of antiderivative = 0.85, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{7}\left(\frac{21d^2ex^{r-7}}{7-r}+\frac{d^3}{x^7}+\frac{21de^2x^{2r-7}}{7-2r}+\frac{7e^3x^{3r-7}}{7-3r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-7}}{(7-r)^2}-\frac{bd^3n}{49x^7}-\frac{3bde^2nx^{2r-7}}{(7-2r)^2}-\frac{be^3nx^{3r-7}}{(7-3r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] -(b*d^3*n)/(49*x^7) - (3*b*d^2*e*n*x^(-7 + r))/(7 - r)^2 - (3*b*d*e^2*n*x^(
-7 + 2*r))/(7 - 2*r)^2 - (b*e^3*n*x^(-7 + 3*r))/(7 - 3*r)^2 - ((d^3/x^7 + (
21*d^2*e*x^(-7 + r))/(7 - r) + (21*d*e^2*x^(-7 + 2*r))/(7 - 2*r) + (7*e^3*x
^(-7 + 3*r))/(7 - 3*r))*(a + b*Log[c*x^n]))/7
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^8}\,dx = -\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+r}}{7-r}+\frac{21de^2x^{-7+2r}}{7-2r}+\frac{7e^3x^{-7+3r}}{7-3r}\right)(a+b\log(cx^n))-(bn)\int\frac{-d^3+\cdots}{\cdots}$$

$$=-\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+r}}{7-r}+\frac{21de^2x^{-7+2r}}{7-2r}+\frac{7e^3x^{-7+3r}}{7-3r}\right)(a+b\log(cx^n))-\frac{1}{7}(bn)\int\frac{-d^3\cdots}{\cdots}$$

$$=-\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+r}}{7-r}+\frac{21de^2x^{-7+2r}}{7-2r}+\frac{7e^3x^{-7+3r}}{7-3r}\right)(a+b\log(cx^n))-\frac{1}{7}(bn)\int\left(-\frac{d^3}{x^8}\cdots\right.$$

$$=-\frac{bd^3n}{49x^7}-\frac{3bd^2enx^{-7+r}}{(7-r)^2}-\frac{3bde^2nx^{-7+2r}}{(7-2r)^2}-\frac{be^3nx^{-7+3r}}{(7-3r)^2}-\frac{1}{7}\left(\frac{d^3}{x^7}+\frac{21d^2ex^{-7+r}}{7-r}+\frac{21de^2\cdots}{7-\cdots}\right.$$

Mathematica [A] time = 0.390751, size = 188, normalized size = 1.03

$$\frac{7a\left(\frac{21d^2ex^r}{r-7}-d^3+\frac{21de^2x^{2r}}{2r-7}+\frac{7e^3x^{3r}}{3r-7}\right)+7b\log(cx^n)\left(\frac{21d^2ex^r}{r-7}-d^3+\frac{21de^2x^{2r}}{2r-7}+\frac{7e^3x^{3r}}{3r-7}\right)+bn\left(-\frac{147d^2ex^r}{(r-7)^2}-d^3-\frac{147de^2x^{2r}}{(7-2r)^2}-\frac{49e^3x^{3r}}{(7-3r)^2}\cdots\right)}{49x^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^8,x]
```

```
[Out] (b*n*(-d^3 - (147*d^2*e*x^r)/(-7 + r)^2 - (147*d*e^2*x^(2*r))/(7 - 2*r)^2 -
 (49*e^3*x^(3*r))/(7 - 3*r)^2) + 7*a*(-d^3 + (21*d^2*e*x^r)/(-7 + r) + (21*
d*e^2*x^(2*r))/(-7 + 2*r) + (7*e^3*x^(3*r))/(-7 + 3*r)) + 7*b*(-d^3 + (21*d
^2*e*x^r)/(-7 + r) + (21*d*e^2*x^(2*r))/(-7 + 2*r) + (7*e^3*x^(3*r))/(-7 +
3*r))*Log[c*x^n])/(49*x^7)
```

Maple [C] time = 0.358, size = 4031, normalized size = 22.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x^8,x)
```

```
[Out] -1/7*b*(-14*e^3*r^2*(x^r)^3-63*d*e^2*r^2*(x^r)^2+147*e^3*r*(x^r)^3+6*d^3*r^
3-126*d^2*e*r^2*x^r+588*d*e^2*r*(x^r)^2-343*e^3*(x^r)^3-77*d^3*r^2+735*d^2*
e*r*x^r-1029*d*e^2*(x^r)^2+294*d^3*r-1029*d^2*e*x^r-343*d^3)/x^7/(-7+3*r)/(
-7+2*r)/(-7+r)*ln(x^n)-1/98*(1647086*a*d^3+1647086*a*e^3*(x^r)^3+1647086*ln
(c)*b*d^3+72*b*d^3*n*r^6-1848*b*d^3*n*r^5+18914*b*d^3*n*r^4+504*a*d^3*r^6-1
2936*a*d^3*r^5+132398*a*d^3*r^4-98784*I*Pi*b*d^2*e*r^4*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*x^r+2646*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*(x^r)^2-1176*a*e^3*r^5*(x^r)^3+27440*a*e^3*r^4*(x^r)^3+4941258*a*d*e^2*(
x^r)^2+4941258*a*d^2*e*x^r+235298*b*e^3*n*(x^r)^3-244902*a*e^3*r^3*(x^r)^3+
1042034*a*e^3*r^2*(x^r)^3-2117682*a*e^3*r*(x^r)^3+1647086*ln(c)*b*e^3*(x^r)
^3-588*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+13720*I*Pi*b*e^3*
r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+13720*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^3+5292*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r+698691*I*Pi*b
*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-98784*b*d^3*n*r^3+278516
*b*d^3*n*r^2-403368*b*d^3*n*r+504*ln(c)*b*d^3*r^6-12936*ln(c)*b*d^3*r^5+132
398*ln(c)*b*d^3*r^4-691488*ln(c)*b*d^3*r^3+1949612*ln(c)*b*d^3*r^2-2823576*
ln(c)*b*d^3*r-691488*a*d^3*r^3+1949612*a*d^3*r^2-2823576*a*d^3*r-7058940*a*
d*e^2*r*(x^r)^2-1397382*a*d^2*e*r^3*x^r+4739574*a*d^2*e*r^2*x^r-7764834*a*d
^2*e*r*x^r+235298*b*d^3*n+66199*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+
252*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^2*csgn(I*c)-6468*I*Pi*b*d^3*r^5*csgn(I*x^n
)*csgn(I*c*x^n)^2-6468*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)+27440*ln(c)
*b*e^3*r^4*(x^r)^3-244902*ln(c)*b*e^3*r^3*(x^r)^3+1042034*ln(c)*b*e^3*r^2*(
x^r)^3-2117682*ln(c)*b*e^3*r*(x^r)^3+4941258*ln(c)*b*d^2*e*x^r+4941258*ln(c
)*b*d*e^2*(x^r)^2+62426*b*e^3*n*r^2*(x^r)^3-201684*b*e^3*n*r*(x^r)^3+705894
*b*d*e^2*n*(x^r)^2+705894*b*d^2*e*n*x^r-979608*a*d*e^2*r^3*(x^r)^2+3831996*
a*d*e^2*r^2*(x^r)^2+392*b*e^3*n*r^4*(x^r)^3-8232*b*e^3*n*r^3*(x^r)^3-5292*a
*d*e^2*r^5*(x^r)^2+117306*a*d*e^2*r^4*(x^r)^2-10584*a*d^2*e*r^5*x^r+197568*
a*d^2*e*r^4*x^r-1176*ln(c)*b*e^3*r^5*(x^r)^3+6468*I*Pi*b*d^3*r^5*csgn(I*c*x
^n)^3+823543*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+345744*I*Pi*b*d^3*r^3*c
sgn(I*c*x^n)^3-974806*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+316932*b*d*e^2*n*r^2*(
x^r)^2+533022*b*d^2*e*n*r^2*x^r+2369787*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I
*c*x^n)^2*x^r+2369787*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-352947
0*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-823543*I*Pi*b*d^3*csgn
(I*c*x^n)^3-252*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+6468*I*P
i*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-698691*I*Pi*b*d^2*e*r^3*csg
```

n(I*x^n)*csgn(I*c*x^n)^2*x^r-698691*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1915998*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3882417*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-58653*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+3529470*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+521017*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+489804*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-588*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-1915998*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-2369787*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2646*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^3*(x^r)^2-974806*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3882417*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+2470629*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-2369787*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^3*x^r-806736*b*d*e^2*n*r*(x^r)^2-1008420*b*d^2*e*n*r*x^r+2646*b*d*e^2*n*r^4*(x^r)^2-49392*b*d*e^2*n*r^3*(x^r)^2+10584*b*d^2*e*n*r^4*x^r-123480*b*d^2*e*n*r^3*x^r-5292*ln(c)*b*d*e^2*r^5*(x^r)^2+117306*ln(c)*b*d*e^2*r^4*(x^r)^2-10584*ln(c)*b*d^2*e*r^5*x^r+197568*ln(c)*b*d^2*e*r^4*x^r+2470629*I*Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-521017*I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+823543*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+823543*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-122451*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-1397382*ln(c)*b*d^2*e*r^3*x^r+4739574*ln(c)*b*d^2*e*r^2*x^r-7764834*ln(c)*b*d^2*e*r*x^r-979608*ln(c)*b*d*e^2*r^3*(x^r)^2+3831996*ln(c)*b*d*e^2*r^2*(x^r)^2-7058940*ln(c)*b*d*e^2*r*(x^r)^2+2470629*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2470629*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-122451*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+588*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-13720*I*Pi*b*e^3*r^4*csgn(I*c*x^n)^3*(x^r)^3+1411788*I*Pi*b*d^3*r*csgn(I*c*x^n)^3-823543*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3+823543*I*Pi*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-252*I*Pi*b*d^3*r^6*csgn(I*c*x^n)^3+66199*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I*c)-2470629*I*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+122451*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+3529470*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-823543*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-3529470*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+698691*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-1915998*I*Pi*b*d*e^2*r^2*csgn(I*c*x^n)^3*(x^r)^2-1058841*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1058841*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+1058841*I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-2470629*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2-3882417*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3882417*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2470629*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-58653*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^3*(x^r)^2-98784*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^3*x^r+521017*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1411788*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+974806*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+974806*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^2*csgn(I*c)+5292*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+489804*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-823543*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+252*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-5292*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+58653*I*Pi*b*d

```
*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-489804*I*Pi*b*d*e^2*r^3*csgn(I
*c*x^n)^2*csgn(I*c)*(x^r)^2-1411788*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^
2-345744*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2-345744*I*Pi*b*d^3*r^3*c
sgn(I*c*x^n)^2*csgn(I*c)+1411788*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)+345744*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-2470629*I*
Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+98784*I*Pi*b*d^2*e*r^4*c
sgn(I*x^n)*csgn(I*c*x^n)^2*x^r+98784*I*Pi*b*d^2*e*r^4*csgn(I*c*x^n)^2*csgn(
I*c)*x^r-2646*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-66199*I*
Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+58653*I*Pi*b*d*e^2*r^4*csg
n(I*c*x^n)^2*csgn(I*c)*(x^r)^2+588*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)*(x^r)^3-521017*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*(x^r)^3-66199*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^3+1058841*I*Pi*b*e^3*r*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+122451*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn
(I*c*x^n)*csgn(I*c)*(x^r)^3-489804*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^2-5292*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+1915998*I*
Pi*b*d*e^2*r^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2646*I*Pi*b*d*e^2*r^5*csgn
(I*c*x^n)^2*csgn(I*c)*(x^r)^2-13720*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n
)*csgn(I*c)*(x^r)^3)/(-7+3*r)^2/x^7/(-7+2*r)^2/(-7+r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x^8,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.47732, size = 2554, normalized size = 13.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^8,x, algorithm="fricas")
```

```
[Out] -1/49*(36*(b*d^3*n + 7*a*d^3)*r^6 - 924*(b*d^3*n + 7*a*d^3)*r^5 + 117649*b*
d^3*n + 9457*(b*d^3*n + 7*a*d^3)*r^4 + 823543*a*d^3 - 49392*(b*d^3*n + 7*a*
d^3)*r^3 + 139258*(b*d^3*n + 7*a*d^3)*r^2 - 201684*(b*d^3*n + 7*a*d^3)*r -
```

```
49*(12*a*e^3*r^5 - 2401*b*e^3*n - 4*(b*e^3*n + 70*a*e^3)*r^4 - 16807*a*e^3
+ 21*(4*b*e^3*n + 119*a*e^3)*r^3 - 49*(13*b*e^3*n + 217*a*e^3)*r^2 + 1029*(
2*b*e^3*n + 21*a*e^3)*r + (12*b*e^3*r^5 - 280*b*e^3*r^4 + 2499*b*e^3*r^3 -
10633*b*e^3*r^2 + 21609*b*e^3*r - 16807*b*e^3)*log(c) + (12*b*e^3*n*r^5 - 2
80*b*e^3*n*r^4 + 2499*b*e^3*n*r^3 - 10633*b*e^3*n*r^2 + 21609*b*e^3*n*r - 1
6807*b*e^3*n)*log(x))*x^(3*r) - 147*(18*a*d*e^2*r^5 - 2401*b*d*e^2*n - 3*(3
*b*d*e^2*n + 133*a*d*e^2)*r^4 - 16807*a*d*e^2 + 28*(6*b*d*e^2*n + 119*a*d*e
^2)*r^3 - 98*(11*b*d*e^2*n + 133*a*d*e^2)*r^2 + 686*(4*b*d*e^2*n + 35*a*d*e
^2)*r + (18*b*d*e^2*r^5 - 399*b*d*e^2*r^4 + 3332*b*d*e^2*r^3 - 13034*b*d*e^
2*r^2 + 24010*b*d*e^2*r - 16807*b*d*e^2)*log(c) + (18*b*d*e^2*n*r^5 - 399*b
*d*e^2*n*r^4 + 3332*b*d*e^2*n*r^3 - 13034*b*d*e^2*n*r^2 + 24010*b*d*e^2*n*r
 - 16807*b*d*e^2*n)*log(x))*x^(2*r) - 147*(36*a*d^2*e*r^5 - 2401*b*d^2*e*n
- 12*(3*b*d^2*e*n + 56*a*d^2*e)*r^4 - 16807*a*d^2*e + 7*(60*b*d^2*e*n + 679
*a*d^2*e)*r^3 - 49*(37*b*d^2*e*n + 329*a*d^2*e)*r^2 + 343*(10*b*d^2*e*n + 7
7*a*d^2*e)*r + (36*b*d^2*e*r^5 - 672*b*d^2*e*r^4 + 4753*b*d^2*e*r^3 - 16121
*b*d^2*e*r^2 + 26411*b*d^2*e*r - 16807*b*d^2*e)*log(c) + (36*b*d^2*e*n*r^5
- 672*b*d^2*e*n*r^4 + 4753*b*d^2*e*n*r^3 - 16121*b*d^2*e*n*r^2 + 26411*b*d^
2*e*n*r - 16807*b*d^2*e*n)*log(x))*x^r + 7*(36*b*d^3*r^6 - 924*b*d^3*r^5 +
9457*b*d^3*r^4 - 49392*b*d^3*r^3 + 139258*b*d^3*r^2 - 201684*b*d^3*r + 1176
49*b*d^3)*log(c) + 7*(36*b*d^3*n*r^6 - 924*b*d^3*n*r^5 + 9457*b*d^3*n*r^4 -
 49392*b*d^3*n*r^3 + 139258*b*d^3*n*r^2 - 201684*b*d^3*n*r + 117649*b*d^3*n
)*log(x))/((36*r^6 - 924*r^5 + 9457*r^4 - 49392*r^3 + 139258*r^2 - 201684*r
 + 117649)*x^7)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**8,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^3 (b \log (cx^n) + a)}{x^8} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^8,x, algorithm="giac")

[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^8, x)
```

3.405 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x^{10}}\,dx$

Optimal. Leaf size=191

$$-\frac{3d^2ex^{r-9}\left(a+b\log\left(cx^n\right)\right)}{9-r}-\frac{d^3\left(a+b\log\left(cx^n\right)\right)}{9x^9}-\frac{3de^2x^{2r-9}\left(a+b\log\left(cx^n\right)\right)}{9-2r}-\frac{e^3x^{-3(3-r)}\left(a+b\log\left(cx^n\right)\right)}{3(3-r)}-\frac{3bd^2enx^{r-}}{(9-r)^2}$$

```
[Out] -(b*d^3*n)/(81*x^9) - (b*e^3*n)/(9*(3 - r)^2*x^(3*(3 - r))) - (3*b*d^2*e*n*
x^(-9 + r))/(9 - r)^2 - (3*b*d*e^2*n*x^(-9 + 2*r))/(9 - 2*r)^2 - (d^3*(a +
b*Log[c*x^n]))/(9*x^9) - (e^3*(a + b*Log[c*x^n]))/(3*(3 - r)*x^(3*(3 - r)))
 - (3*d^2*e*x^(-9 + r)*(a + b*Log[c*x^n]))/(9 - r) - (3*d*e^2*x^(-9 + 2*r)*
(a + b*Log[c*x^n]))/(9 - 2*r)
```

Rubi [A] time = 0.418994, antiderivative size = 161, normalized size of antiderivative = 0.84, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {270, 2334, 12, 14}

$$-\frac{1}{9}\left(\frac{27d^2ex^{r-9}}{9-r}+\frac{d^3}{x^9}+\frac{27de^2x^{2r-9}}{9-2r}+\frac{3e^3x^{-3(3-r)}}{3-r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{3bd^2enx^{r-9}}{(9-r)^2}-\frac{bd^3n}{81x^9}-\frac{3bde^2nx^{2r-9}}{(9-2r)^2}-\frac{be^3nx^{-3(3-r)}}{9(3-r)^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] -(b*d^3*n)/(81*x^9) - (b*e^3*n)/(9*(3 - r)^2*x^(3*(3 - r))) - (3*b*d^2*e*n*
x^(-9 + r))/(9 - r)^2 - (3*b*d*e^2*n*x^(-9 + 2*r))/(9 - 2*r)^2 - ((d^3/x^9
+ (3*e^3)/((3 - r)*x^(3*(3 - r))) + (27*d^2*e*x^(-9 + r))/(9 - r) + (27*d*e
^2*x^(-9 + 2*r))/(9 - 2*r))*(a + b*Log[c*x^n]))/9
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
```

```
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int \frac{(d+ex^r)^3\,(a+b\log(cx^n))}{x^{10}}\,dx = -\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}+\frac{27d^2ex^{-9+r}}{9-r}+\frac{27de^2x^{-9+2r}}{9-2r}\right)(a+b\log(cx^n))-(bn)\int\frac{-d^3+}{}$$

$$= -\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}+\frac{27d^2ex^{-9+r}}{9-r}+\frac{27de^2x^{-9+2r}}{9-2r}\right)(a+b\log(cx^n))-\frac{1}{9}(bn)\int\frac{-d^3}{}$$

$$= -\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}+\frac{27d^2ex^{-9+r}}{9-r}+\frac{27de^2x^{-9+2r}}{9-2r}\right)(a+b\log(cx^n))-\frac{1}{9}(bn)\int\left(-\frac{d^3}{x^1}\right.$$

$$= -\frac{bd^3n}{81x^9}-\frac{be^3nx^{-3(3-r)}}{9(3-r)^2}-\frac{3bd^2enx^{-9+r}}{(9-r)^2}-\frac{3bde^2nx^{-9+2r}}{(9-2r)^2}-\frac{1}{9}\left(\frac{d^3}{x^9}+\frac{3e^3x^{-3(3-r)}}{3-r}+\frac{27d^2e}{9-}\right.$$

Mathematica [A] time = 0.389352, size = 182, normalized size = 0.95

$$\frac{9a\left(\frac{27d^2ex^r}{r-9}-d^3+\frac{27de^2x^{2r}}{2r-9}+\frac{3e^3x^{3r}}{r-3}\right)+9b\log(cx^n)\left(\frac{27d^2ex^r}{r-9}-d^3+\frac{27de^2x^{2r}}{2r-9}+\frac{3e^3x^{3r}}{r-3}\right)+bn\left(-\frac{243d^2ex^r}{(r-9)^2}-d^3-\frac{243de^2x^{2r}}{(9-2r)^2}-\frac{9e^3x^{3r}}{(r-3)^2}\right)}{81x^9}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x^10,x]
```

```
[Out] (b*n*(-d^3 - (243*d^2*e*x^r)/(-9 + r)^2 - (243*d*e^2*x^(2*r))/(9 - 2*r)^2 -
 (9*e^3*x^(3*r))/(-3 + r)^2) + 9*a*(-d^3 + (27*d^2*e*x^r)/(-9 + r) + (27*d*
e^2*x^(2*r))/(-9 + 2*r) + (3*e^3*x^(3*r))/(-3 + r)) + 9*b*(-d^3 + (27*d^2*e
*x^r)/(-9 + r) + (27*d*e^2*x^(2*r))/(-9 + 2*r) + (3*e^3*x^(3*r))/(-3 + r))*
Log[c*x^n])/(81*x^9)
```

Maple [C] time = 0.372, size = 4027, normalized size = 21.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x^10,x)
```

```
[Out] -1/9*b*(-6*e^3*r^2*(x^r)^3-27*d*e^2*r^2*(x^r)^2+81*e^3*r*(x^r)^3+2*d^3*r^3-
54*d^2*e*r^2*x^r+324*d*e^2*r*(x^r)^2-243*e^3*(x^r)^3-33*d^3*r^2+405*d^2*e*r
*x^r-729*d*e^2*(x^r)^2+162*d^3*r-729*d^2*e*x^r-243*d^3)/x^9/(-3+r)/(-9+2*r)
/(-9+r)*ln(x^n)-1/162*(1062882*a*d^3+212139*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*x^r+1062882*a*e^3*(x^r)^3+1062882*ln(c)*b*d^3+531441*
I*Pi*b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3-1594323*I*Pi*b*d*e^2*csgn(I*c*x^n)^3*(
x^r)^2+108*I*Pi*b*e^3*r^5*csgn(I*c*x^n)^3*(x^r)^3-3240*I*Pi*b*e^3*r^4*csgn(
I*c*x^n)^3*(x^r)^3+8*b*d^3*n*r^6-264*b*d^3*n*r^5+3474*b*d^3*n*r^4+72*a*d^3*
r^6-2376*a*d^3*r^5+31266*a*d^3*r^4-216*a*e^3*r^5*(x^r)^3+6480*a*e^3*r^4*(x^
r)^3+3188646*a*d*e^2*(x^r)^2+3188646*a*d^2*e*x^r+118098*b*e^3*n*(x^r)^3-743
58*a*e^3*r^3*(x^r)^3+406782*a*e^3*r^2*(x^r)^3-1062882*a*e^3*r*(x^r)^3+10628
82*ln(c)*b*e^3*(x^r)^3-531441*I*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c
)*(x^r)^3+1948617*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r+1594323*I*Pi*b*d*e^2*c
sgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2-531441*I*Pi*b*d^3*csgn(I*c*x^n)^3-23328*
b*d^3*n*r^3+84564*b*d^3*n*r^2-157464*b*d^3*n*r+72*ln(c)*b*d^3*r^6-2376*ln(c
)*b*d^3*r^5+31266*ln(c)*b*d^3*r^4-209952*ln(c)*b*d^3*r^3+761076*ln(c)*b*d^3
*r^2-1417176*ln(c)*b*d^3*r-209952*a*d^3*r^3+761076*a*d^3*r^2-1417176*a*d^3*
r-3542940*a*d*e^2*r*(x^r)^2-424278*a*d^2*e*r^3*x^r+1850202*a*d^2*e*r^2*x^r-
3897234*a*d^2*e*r*x^r+118098*b*d^3*n+6480*ln(c)*b*e^3*r^4*(x^r)^3-74358*ln(
c)*b*e^3*r^3*(x^r)^3+406782*ln(c)*b*e^3*r^2*(x^r)^3-1062882*ln(c)*b*e^3*r*(
x^r)^3+3188646*ln(c)*b*d^2*e*x^r+3188646*ln(c)*b*d*e^2*(x^r)^2+18954*b*e^3*
n*r^2*(x^r)^3-78732*b*e^3*n*r*(x^r)^3+354294*b*d*e^2*n*(x^r)^2+354294*b*d^2
*e*n*x^r-297432*a*d*e^2*r^3*(x^r)^2+1495908*a*d*e^2*r^2*(x^r)^2+72*b*e^3*n*
r^4*(x^r)^3-1944*b*e^3*n*r^3*(x^r)^3-972*a*d*e^2*r^5*(x^r)^2+27702*a*d*e^2*
r^4*(x^r)^2-1944*a*d^2*e*r^5*x^r+46656*a*d^2*e*r^4*x^r-216*ln(c)*b*e^3*r^5*
(x^r)^3+212139*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^3*x^r-747954*I*Pi*b*d*e^2*r^2
*csgn(I*c*x^n)^3*(x^r)^2-531441*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x
^r)^3+1188*I*Pi*b*d^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+96228*b*d*e^2
*n*r^2*(x^r)^2+161838*b*d^2*e*n*r^2*x^r+203391*I*Pi*b*e^3*r^2*csgn(I*c*x^n)
^2*csgn(I*c)*(x^r)^3+148716*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^3*(x^r)^2-108*I*
Pi*b*e^3*r^5*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+104976*I*Pi*b*d^3*r^3*csgn(I
*c*x^n)^3-380538*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^3+708588*I*Pi*b*d^3*r*csgn(I*
c*x^n)^3-531441*I*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-148716*I*Pi*b*d*e^2*r^3*
csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+925101*I*Pi*b*d^2*e*r^2*csgn(I*x^n)*csg
n(I*c*x^n)^2*x^r+925101*I*Pi*b*d^2*e*r^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r-7479
```

54*I*Pi*b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-925101*I*Pi
*b*d^2*e*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+486*I*Pi*b*d*e^2*r^5*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+972*I*Pi*b*d^2*e*r^5*csgn(I*x^n)
*csgn(I*c*x^n)*csgn(I*c)*x^r+148716*I*Pi*b*d*e^2*r^3*csgn(I*x^n)*csgn(I*c*x
^n)*csgn(I*c)*(x^r)^2-37179*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
3-108*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+3240*I*Pi*b*e^3*r^
4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+13851*I*Pi*b*d*e^2*r^4*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^2+108*I*Pi*b*e^3*r^5*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
(x^r)^3-203391*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-2
12139*I*Pi*b*d^2*e*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3240*I*Pi*b*e^3*r^4*
csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+531441*I*Pi*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-314928*b*d
*e^2*n*r*(x^r)^2-393660*b*d^2*e*n*r*x^r+486*b*d*e^2*n*r^4*(x^r)^2-11664*b*d
*e^2*n*r^3*(x^r)^2+1944*b*d^2*e*n*r^4*x^r-29160*b*d^2*e*n*r^3*x^r-972*ln(c)
*b*d*e^2*r^5*(x^r)^2+27702*ln(c)*b*d*e^2*r^4*(x^r)^2-1944*ln(c)*b*d^2*e*r^5
*x^r+46656*ln(c)*b*d^2*e*r^4*x^r-15633*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)+708588*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1049
76*I*Pi*b*d^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-104976*I*Pi*b*d^3*r^3
*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*b*d^3*r^6*csgn(I*x^n)*csgn(I*c*x^n)^2-
104976*I*Pi*b*d^3*r^3*csgn(I*c*x^n)^2*csgn(I*c)-1188*I*Pi*b*d^3*r^5*csgn(I*
x^n)*csgn(I*c*x^n)^2+1771470*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)*(x^r)^2+1948617*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r
-13851*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-424278*
ln(c)*b*d^2*e*r^3*x^r+1850202*ln(c)*b*d^2*e*r^2*x^r-3897234*ln(c)*b*d^2*e*r
*x^r-297432*ln(c)*b*d*e^2*r^3*(x^r)^2+1495908*ln(c)*b*d*e^2*r^2*(x^r)^2-354
2940*ln(c)*b*d*e^2*r*(x^r)^2-486*I*Pi*b*d*e^2*r^5*csgn(I*c*x^n)^2*csgn(I*c)
*(x^r)^2-3240*I*Pi*b*e^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-97
2*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^2*csgn(I*c)*x^r+531441*I*Pi*b*d^3*csgn(I*c
*x^n)^2*csgn(I*c)+1188*I*Pi*b*d^3*r^5*csgn(I*c*x^n)^3-15633*I*Pi*b*d^3*r^4*
csgn(I*c*x^n)^3+531441*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2-531441*I*Pi*b
*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-925101*I*Pi*b*d^2*e*r^2*csgn(I*c*x
^n)^3*x^r+1771470*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^3*(x^r)^2-23328*I*Pi*b*d^2*e
*r^4*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-23328*I*Pi*b*d^2*e*r^4*csgn(I*
c*x^n)^3*x^r+203391*I*Pi*b*e^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1594
323*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+23328*I*Pi*b*d^2*e
*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-148716*I*Pi*b*d*e^2*r^3*csgn(I*c*x^n)^
2*csgn(I*c)*(x^r)^2-1771470*I*Pi*b*d*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r
)^2-1771470*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-1948617*I*Pi*b
*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1594323*I*Pi*b*d^2*e*csgn(I*c*x^n)
^3*x^r+37179*I*Pi*b*e^3*r^3*csgn(I*c*x^n)^3*(x^r)^3+1594323*I*Pi*b*d*e^2*cs
gn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1594323*I*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x
^n)^2*x^r+1594323*I*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-37179*I*Pi*b*e
^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3-1188*I*Pi*b*d^3*r^5*csgn(I*c*x^n
)^2*csgn(I*c)+15633*I*Pi*b*d^3*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2+36*I*Pi*b*d^
3*r^6*csgn(I*c*x^n)^2*csgn(I*c)+15633*I*Pi*b*d^3*r^4*csgn(I*c*x^n)^2*csgn(I

```
*c)+13851*I*Pi*b*d*e^2*r^4*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+747954*I*Pi*
b*d*e^2*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+486*I*Pi*b*d*e^2*r^5*csgn(I
*c*x^n)^3*(x^r)^2-380538*I*Pi*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
+972*I*Pi*b*d^2*e*r^5*csgn(I*c*x^n)^3*x^r-13851*I*Pi*b*d*e^2*r^4*csgn(I*c*x
^n)^3*(x^r)^2-531441*I*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-203391*
I*Pi*b*e^3*r^2*csgn(I*c*x^n)^3*(x^r)^3+531441*I*Pi*b*e^3*csgn(I*x^n)*csgn(I
*c*x^n)^2*(x^r)^3-708588*I*Pi*b*d^3*r*csgn(I*c*x^n)^2*csgn(I*c)+380538*I*Pi
*b*d^3*r^2*csgn(I*x^n)*csgn(I*c*x^n)^2+380538*I*Pi*b*d^3*r^2*csgn(I*c*x^n)^
2*csgn(I*c)-708588*I*Pi*b*d^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2+23328*I*Pi*b*d^
2*e*r^4*csgn(I*c*x^n)^2*csgn(I*c)*x^r-486*I*Pi*b*d*e^2*r^5*csgn(I*x^n)*csgn
(I*c*x^n)^2*(x^r)^2-1948617*I*Pi*b*d^2*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-15
94323*I*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2-36*I*Pi*b*d^
3*r^6*csgn(I*c*x^n)^3-972*I*Pi*b*d^2*e*r^5*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-
212139*I*Pi*b*d^2*e*r^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r+747954*I*Pi*b*d*e^2*r
^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+531441*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I
*c*x^n)*csgn(I*c)*(x^r)^3+37179*I*Pi*b*e^3*r^3*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*(x^r)^3)/(-3+r)^2/x^9/(-9+2*r)^2/(-9+r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x^10,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.4512, size = 2476, normalized size = 12.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^10,x, algorithm="fricas")
```

```
[Out] -1/81*(4*(b*d^3*n + 9*a*d^3)*r^6 - 132*(b*d^3*n + 9*a*d^3)*r^5 + 59049*b*d^
3*n + 1737*(b*d^3*n + 9*a*d^3)*r^4 + 531441*a*d^3 - 11664*(b*d^3*n + 9*a*d^
3)*r^3 + 42282*(b*d^3*n + 9*a*d^3)*r^2 - 78732*(b*d^3*n + 9*a*d^3)*r - 9*(1
2*a*e^3*r^5 - 6561*b*e^3*n - 4*(b*e^3*n + 90*a*e^3)*r^4 - 59049*a*e^3 + 27*
```

```
(4*b*e^3*n + 153*a*e^3)*r^3 - 81*(13*b*e^3*n + 279*a*e^3)*r^2 + 2187*(2*b*e
^3*n + 27*a*e^3)*r + 3*(4*b*e^3*r^5 - 120*b*e^3*r^4 + 1377*b*e^3*r^3 - 7533
*b*e^3*r^2 + 19683*b*e^3*r - 19683*b*e^3)*log(c) + 3*(4*b*e^3*n*r^5 - 120*b
*e^3*n*r^4 + 1377*b*e^3*n*r^3 - 7533*b*e^3*n*r^2 + 19683*b*e^3*n*r - 19683*
b*e^3*n)*log(x))*x^(3*r) - 243*(2*a*d*e^2*r^5 - 729*b*d*e^2*n - (b*d*e^2*n
+ 57*a*d*e^2)*r^4 - 6561*a*d*e^2 + 12*(2*b*d*e^2*n + 51*a*d*e^2)*r^3 - 18*(
11*b*d*e^2*n + 171*a*d*e^2)*r^2 + 162*(4*b*d*e^2*n + 45*a*d*e^2)*r + (2*b*d
*e^2*r^5 - 57*b*d*e^2*r^4 + 612*b*d*e^2*r^3 - 3078*b*d*e^2*r^2 + 7290*b*d*e
^2*r - 6561*b*d*e^2)*log(c) + (2*b*d*e^2*n*r^5 - 57*b*d*e^2*n*r^4 + 612*b*d
*e^2*n*r^3 - 3078*b*d*e^2*n*r^2 + 7290*b*d*e^2*n*r - 6561*b*d*e^2*n)*log(x)
)*x^(2*r) - 243*(4*a*d^2*e*r^5 - 729*b*d^2*e*n - 4*(b*d^2*e*n + 24*a*d^2*e)
*r^4 - 6561*a*d^2*e + 3*(20*b*d^2*e*n + 291*a*d^2*e)*r^3 - 9*(37*b*d^2*e*n
+ 423*a*d^2*e)*r^2 + 81*(10*b*d^2*e*n + 99*a*d^2*e)*r + (4*b*d^2*e*r^5 - 96
*b*d^2*e*r^4 + 873*b*d^2*e*r^3 - 3807*b*d^2*e*r^2 + 8019*b*d^2*e*r - 6561*b
*d^2*e)*log(c) + (4*b*d^2*e*n*r^5 - 96*b*d^2*e*n*r^4 + 873*b*d^2*e*n*r^3 -
3807*b*d^2*e*n*r^2 + 8019*b*d^2*e*n*r - 6561*b*d^2*e*n)*log(x))*x^r + 9*(4*
b*d^3*r^6 - 132*b*d^3*r^5 + 1737*b*d^3*r^4 - 11664*b*d^3*r^3 + 42282*b*d^3*
r^2 - 78732*b*d^3*r + 59049*b*d^3)*log(c) + 9*(4*b*d^3*n*r^6 - 132*b*d^3*n*
r^5 + 1737*b*d^3*n*r^4 - 11664*b*d^3*n*r^3 + 42282*b*d^3*n*r^2 - 78732*b*d^
3*n*r + 59049*b*d^3*n)*log(x))/((4*r^6 - 132*r^5 + 1737*r^4 - 11664*r^3 + 4
2282*r^2 - 78732*r + 59049)*x^9)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**3*(a+b*ln(c*x**n))/x**10,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^3 (b \log (cx^n) + a)}{x^{10}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x^10,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(b*log(c*x^n) + a)/x^10, x)
```

3.406 $\int \frac{x^3(a+b\log(cx^n))}{d+ex^r}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{x^3\,(a+b\log{(cx^n)})}{d+ex^r},x\right)$$

```
[Out] Unintegrable[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi [A] time = 0.0642847, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^3\,(a+b\log{(cx^n)})}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] Defer[Int][(x^3*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{x^3\,(a+b\log{(cx^n)})}{d+ex^r}\,dx=\int \frac{x^3\,(a+b\log{(cx^n)})}{d+ex^r}\,dx$$

Mathematica [A] time = 0.116605, size = 87, normalized size = 3.48

$$\frac{x^4\left(4\,{}_2F_1\left(1,\frac{4}{r};\frac{r+4}{r};-\frac{ex^r}{d}\right)(a+b\log{(cx^n)})-bn\,{}_3F_2\left(1,\frac{4}{r},\frac{4}{r};1+\frac{4}{r},1+\frac{4}{r};-\frac{ex^r}{d}\right)\right)}{16d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] (x^4*(-(b*n*HypergeometricPFQ[{1, 4/r, 4/r}, {1 + 4/r, 1 + 4/r}, -((e*x^r)/
d)]) + 4*Hypergeometric2F1[1, 4/r, (4 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^
```

```
n])))/(16*d)
```

Maple [A] time = 0.75, size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \ln (c x^n))}{d + e x^r} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log (c x^n) + a) x^3}{e x^r + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b x^3 \log (c x^n) + a x^3}{e x^r + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e*x^r + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \log{(cx^n)})}{d + ex^r} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*ln(c*x**n))/(d+e*x**r),x)
```

```
[Out] Integral(x**3*(a + b*log(c*x**n))/(d + e*x**r), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log{(cx^n)} + a)x^3}{ex^r + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d), x)
```

3.407 $\int \frac{x(a+b\log(cx^n))}{d+ex^r}\,dx$

Optimal. Leaf size=23

$$\text{Unintegrable}\left(\frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r},x\right)$$

```
[Out] Unintegrable[(x*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi [A] time = 0.0411681, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] Defer[Int][(x*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx=\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.0997893, size = 87, normalized size = 3.78

$$\frac{x^2\left(2\,{}_2F_1\left(1,\frac{2}{r};\frac{r+2}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,\frac{2}{r},\frac{2}{r};1+\frac{2}{r},1+\frac{2}{r};-\frac{ex^r}{d}\right)\right)}{4d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] (x^2*(-(b*n*HypergeometricPFQ[{1, 2/r, 2/r}, {1 + 2/r, 1 + 2/r}, -((e*x^r)/
d)]) + 2*Hypergeometric2F1[1, 2/r, (2 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^
```

```
n])))/(4*d)
```

Maple [A] time = 0.659, size = 0, normalized size = 0.

$$\int \frac{x\,(a+b\ln(cx^n))}{d+ex^r}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

```
[Out] int(x*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n)+a)x}{ex^r+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx\log(cx^n)+ax}{ex^r+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] integral((b*x*log(c*x^n) + a*x)/(e*x^r + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)}{d+ex^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(d+e*x**r),x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))/(d + e*x**r), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)x}{ex^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d), x)
```

3.408 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx$

Optimal. Leaf size=54

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))}{dr}$$

```
[Out] -(((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d*r)) + (b*n*PolyLog[2, -(d/(e*x
^r))])/(d*r^2)
```

Rubi [A] time = 0.0777626, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))}{dr}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] -(((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d*r)) + (b*n*PolyLog[2, -(d/(e*x
^r))])/(d*r^2)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx = -\frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{dr} + \frac{(bn)\int \frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{dr}$$
$$= -\frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{dr} + \frac{bn\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}$$

Mathematica [A] time = 0.113823, size = 108, normalized size = 2.

$$\frac{2bn\mathrm{PolyLog}\left(2,\frac{ex^r}{d}+1\right)-2r\log(d-dx^r)(a+b\log(cx^n))+2bnr\log(x)(\log(d-dx^r)-\log(d+ex^r))+2bn\log\left(-\frac{ex^r}{d}\right.}{2dr^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] (b*n*r^2*Log[x]^2 - 2*r*(a + b*Log[c*x^n])*Log[d - d*x^r] + 2*b*n*r*Log[x]*
(Log[d - d*x^r] - Log[d + e*x^r]) + 2*b*n*Log[-((e*x^r)/d)]*Log[d + e*x^r]
+ 2*b*n*PolyLog[2, 1 + (e*x^r)/d])/(2*d*r^2)
```

Maple [C] time = 0.194, size = 451, normalized size = 8.4

$$\frac{b\ln(d+ex^r)n\ln(x)}{dr}-\frac{b\ln(d+ex^r)\ln(x^n)}{dr}-\frac{b\ln(x^r)n\ln(x)}{dr}+\frac{b\ln(x^r)\ln(x^n)}{dr}+\frac{bn(\ln(x))^2}{2d}-\frac{\ln(x)bn}{dr}\ln\left(1+\frac{ex^r}{d}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r),x)
```

```
[Out] b/r/d*ln(d+e*x^r)*n*ln(x)-b/r/d*ln(d+e*x^r)*ln(x^n)-b/r/d*ln(x^r)*n*ln(x)+b
/r/d*ln(x^r)*ln(x^n)+1/2*b*n/d*ln(x)^2-b/r*n/d*ln(x)*ln(1+e*x^r/d)-b/r^2*n/
d*polylog(2,-e*x^r/d)+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln
(d+e*x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(x^r)+1/2*I/
r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2/d*ln(d+e*x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d*ln(x^r)+1/2*I/r*b*P
i*csgn(I*c*x^n)^3/d*ln(d+e*x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*ln
(x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*ln(d+e*x^r)-1/r*b*ln(c)/d*ln
(d+e*x^r)+1/r*b*ln(c)/d*ln(x^r)-1/r*a/d*ln(d+e*x^r)+1/r*a/d*ln(x^r)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a\left(\frac{\log(x)}{d} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{dr}\right) + b\int \frac{\log(c) + \log(x^n)}{exx^r + dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] a*(log(x)/d - log((e*x^r + d)/e)/(d*r)) + b*integrate((log(c) + log(x^n))/(
e*x*x^r + d*x), x)
```

Fricas [A] time = 1.32528, size = 235, normalized size = 4.35

$$\frac{bnr^2\log(x)^2 - 2\,bnr\log(x)\log\left(\frac{ex^r+d}{d}\right) - 2\,bn\mathrm{Li}_2\left(-\frac{ex^r+d}{d}+1\right) - 2\,(br\log(c)+ar)\log(ex^r+d) + 2\left(br^2\log(c)+ar^2\right)\log}{2\,dr^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] 1/2*(b*n*r^2*log(x)^2 - 2*b*n*r*log(x)*log((e*x^r + d)/d) - 2*b*n*dilog(-(e
*x^r + d)/d + 1) - 2*(b*r*log(c) + a*r)*log(e*x^r + d) + 2*(b*r^2*log(c) +
a*r^2)*log(x))/(d*r^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log (cx^n) + a}{(ex^r + d)x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x), x)
```

3.409 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^r)}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)},x\right)$$

```
[Out] Unintegrable[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)), x]
```

Rubi [A] time = 0.0640177, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)),x]
```

```
[Out] Defer[Int][(a + b*Log[c*x^n])/(x^3*(d + e*x^r)), x]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)}\,dx=\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)}\,dx$$

Mathematica [A] time = 0.104514, size = 86, normalized size = 3.44

$$-\frac{bn\,{}_3F_2\left(1,-\frac{2}{r},-\frac{2}{r};1-\frac{2}{r},1-\frac{2}{r};-\frac{ex^r}{d}\right)+2\,{}_2F_1\left(1,-\frac{2}{r};\frac{r-2}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{4dx^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)),x]
```

```
[Out] -(b*n*HypergeometricPFQ[{1, -2/r, -2/r}, {1 - 2/r, 1 - 2/r}, -((e*x^r)/d)]
+ 2*Hypergeometric2F1[1, -2/r, (-2 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^n])
```

```
)/(4*d*x^2)
```

Maple [A] time = 0.706, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^3(d+ex^r)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(d+e*x^r),x)

[Out] int((a+b*ln(c*x^n))/x^3/(d+e*x^r),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n)+a}{(ex^r+d)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r),x, algorithm="maxima")

[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx^n)+a}{ex^3x^r+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r),x, algorithm="fricas")

[Out] integral((b*log(c*x^n) + a)/(e*x^3*x^r + d*x^3), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log\left(cx^{n}\right)}{x^{3}\left(d + ex^{r}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**3/(d+e*x**r),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**3*(d + e*x**r)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right) + a}{(ex^{r} + d)x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^3), x)
```

3.410 $\int \frac{x^2(a+b\log(cx^n))}{d+ex^r}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r},x\right)$$

```
[Out] Unintegrable[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi [A] time = 0.0648725, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] Defer[Int][(x^2*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx=\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.106612, size = 87, normalized size = 3.48

$$\frac{x^3\left(3\,{}_2F_1\left(1,\frac{3}{r};\frac{r+3}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,\frac{3}{r},\frac{3}{r};1+\frac{3}{r},1+\frac{3}{r};-\frac{ex^r}{d}\right)\right)}{9d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] (x^3*(-(b*n*HypergeometricPFQ[{1, 3/r, 3/r}, {1 + 3/r, 1 + 3/r}, -((e*x^r)/
d)]) + 3*Hypergeometric2F1[1, 3/r, (3 + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^
```

```
n])))/(9*d)
```

Maple [A] time = 0.681, size = 0, normalized size = 0.

$$\int \frac{x^2 (a + b\ln(cx^n))}{d + ex^r}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^2}{ex^r + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{bx^2\log(cx^n) + ax^2}{ex^r + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e*x^r + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x^2 (a + b \log (cx^n))}{d + ex^r} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*ln(c*x**n))/(d+e*x**r),x)
```

```
[Out] Integral(x**2*(a + b*log(c*x**n))/(d + e*x**r), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log (cx^n) + a)x^2}{ex^r + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d), x)
```

3.411 $\int \frac{a+b\log(cx^n)}{d+ex^r}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{a+b\log\left(cx^n\right)}{d+ex^r},x\right)$$

```
[Out] Unintegrable[(a + b*Log[c*x^n])/(d + e*x^r), x]
```

Rubi [A] time = 0.0180241, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{a+b\log\left(cx^n\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(d + e*x^r),x]
```

```
[Out] Defer[Int][(a + b*Log[c*x^n])/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{d+ex^r}\,dx=\int \frac{a+b\log\left(cx^n\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.0787297, size = 69, normalized size = 3.14

$$\frac{x\left({}_2F_1\left(1,\frac{1}{r};1+\frac{1}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)-bn\,{}_3F_2\left(1,\frac{1}{r},\frac{1}{r};1+\frac{1}{r},1+\frac{1}{r};-\frac{ex^r}{d}\right)\right)}{d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^r),x]
```

```
[Out] (x*(-(b*n*HypergeometricPFQ[{1, r^(-1), r^(-1)}, {1 + r^(-1), 1 + r^(-1)},
-((e*x^r)/d)]) + Hypergeometric2F1[1, r^(-1), 1 + r^(-1), -((e*x^r)/d)]*(a
```

```
+ b*Log[c*x^n])))/d
```

Maple [A] time = 0.642, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{d+ex^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(d+e*x^r),x)
```

```
[Out] int((a+b*ln(c*x^n))/(d+e*x^r),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{ex^{r}+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{ex^{r}+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e*x^r + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{d + ex^r}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/(d+e*x**r),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(d + e*x**r), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{ex^r + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d), x)
```

3.412 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^r)}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)},x\right)$$

```
[Out] Unintegrable[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)), x]
```

Rubi [A] time = 0.0655535, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} = 0.$, Rules used = {}

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)),x]
```

```
[Out] Defer[Int][(a + b*Log[c*x^n])/(x^2*(d + e*x^r)), x]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)}\,dx = \int \frac{a+b\log\left(cx^n\right)}{x^2\left(d+ex^r\right)}\,dx$$

Mathematica [A] time = 0.0973344, size = 83, normalized size = 3.32

$$-\frac{bn\,{}_3F_2\left(1,-\frac{1}{r},-\frac{1}{r};1-\frac{1}{r},1-\frac{1}{r};-\frac{ex^r}{d}\right)+{}_2F_1\left(1,-\frac{1}{r};\frac{r-1}{r};-\frac{ex^r}{d}\right)\left(a+b\log\left(cx^n\right)\right)}{dx}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)),x]
```

```
[Out] -((b*n*HypergeometricPFQ[{1, -r^(-1), -r^(-1)}, {1 - r^(-1), 1 - r^(-1)}, -
((e*x^r)/d)] + Hypergeometric2F1[1, -r^(-1), (-1 + r)/r, -((e*x^r)/d)]*(a +
```

```
b*Log[c*x^n]))/(d*x))
```

Maple [A] time = 0.687, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{x^{2}\left(d+ex^{r}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(d+e*x^r),x)

[Out] int((a+b*ln(c*x^n))/x^2/(d+e*x^r),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{r}+d\right)x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r),x, algorithm="maxima")

[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{ex^{2}x^{r}+dx^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r),x, algorithm="fricas")

[Out] integral((b*log(c*x^n) + a)/(e*x^2*x^r + d*x^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{x^2 (d + ex^r)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x**2/(d+e*x**r),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x**2*(d + e*x**r)), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{(ex^r + d)x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x^2), x)
```

3.413 $\int \frac{x^3(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi [A] time = 0.0639346, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] Defer[Int][(x^3*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx=\int \frac{x^3\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.243539, size = 140, normalized size = 5.6

$$\frac{x^4\left(-bn(r-4)\left(d+ex^r\right)\,{}_3F_2\left(1,\frac{4}{r},\frac{4}{r};1+\frac{4}{r},1+\frac{4}{r};-\frac{ex^r}{d}\right)+4\left(d+ex^r\right)\,{}_2F_1\left(1,\frac{4}{r};\frac{r+4}{r};-\frac{ex^r}{d}\right)\left(a(r-4)+b(r-4)\log\left(cx^n\right)-bn\right.\right.}{16d^2r\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] (x^4*(-(b*n*(-4 + r)*(d + e*x^r)*HypergeometricPFQ[{1, 4/r, 4/r}, {1 + 4/r,
 1 + 4/r}, -((e*x^r)/d)]) + 16*d*(a + b*Log[c*x^n]) + 4*(d + e*x^r)*Hyperge
ometric2F1[1, 4/r, (4 + r)/r, -((e*x^r)/d)]*(-(b*n) + a*(-4 + r) + b*(-4 +
r)*Log[c*x^n])))/(16*d^2*r*(d + e*x^r))
```

Maple [A] time = 0.641, size = 0, normalized size = 0.

$$\int \frac{x^3 (a + b \ln(cx^n))}{(d + ex^r)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

```
[Out] int(x^3*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log(cx^n) + a)x^3}{(ex^r + d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^3 \log(cx^n) + ax^3}{e^2x^{2r} + 2\,dex^r + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(c*x^n) + a*x^3)/(e^2*x^(2*r) + 2*d*e*x^r + d^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(x**3*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^3}{(ex^r + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^3/(e*x^r + d)^2, x)
```

3.414 $\int \frac{x(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=23

$$\text{Unintegrable}\left(\frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable[(x*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi [A] time = 0.0397893, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] Defer[Int][(x*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx = \int \frac{x\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.233625, size = 140, normalized size = 6.09

$$\frac{x^2\left(-bn(r-2)\left(d+ex^r\right)\,{}_3F_2\left(1,\frac{2}{r},\frac{2}{r};1+\frac{2}{r},1+\frac{2}{r};-\frac{ex^r}{d}\right)+2\left(d+ex^r\right)\,{}_2F_1\left(1,\frac{2}{r};\frac{r+2}{r};-\frac{ex^r}{d}\right)\left(a(r-2)+b(r-2)\log\left(cx^n\right)-\right.\right.}{4d^2r\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] (x^2*(-(b*n*(-2 + r)*(d + e*x^r)*HypergeometricPFQ[{1, 2/r, 2/r}, {1 + 2/r,
 1 + 2/r}, -((e*x^r)/d)]) + 4*d*(a + b*Log[c*x^n]) + 2*(d + e*x^r)*Hypergeo
```

```
metric2F1[1, 2/r, (2 + r)/r, -((e*x^r)/d)]*(-(b*n) + a*(-2 + r) + b*(-2 + r
)*Log[c*x^n])))/(4*d^2*r*(d + e*x^r))
```

Maple [A] time = 0.709, size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\ln\left(cx^{n}\right)\right)}{\left(d+ex^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)

[Out] int(x*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)x}{\left(ex^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")

[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx\log\left(cx^{n}\right)+ax}{e^{2}x^{2\,r}+2\,dex^{r}+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")

[Out] integral((b*x*log(c*x^n) + a*x)/(e^2*x^(2*r) + 2*d*e*x^r + d^2), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{x\left(a+b\log\left(cx^{n}\right)\right)}{\left(d+ex^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
```

```
[Out] Integral(x*(a + b*log(c*x**n))/(d + e*x**r)**2, x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(b\log\left(cx^{n}\right)+a\right)x}{\left(ex^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x/(e*x^r + d)^2, x)
```

3.415 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx$

Optimal. Leaf size=102

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

```
[Out] -((e*x^r*(a + b*Log[c*x^n]))/(d^2*r*(d + e*x^r))) - ((a + b*Log[c*x^n])*Log
[1 + d/(e*x^r)])/(d^2*r) + (b*n*Log[d + e*x^r])/(d^2*r^2) + (b*n*PolyLog[2,
 -(d/(e*x^r))])/(d^2*r^2)
```

Rubi [A] time = 0.232898, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2349, 2345, 2391, 2335, 260}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] -((e*x^r*(a + b*Log[c*x^n]))/(d^2*r*(d + e*x^r))) - ((a + b*Log[c*x^n])*Log
[1 + d/(e*x^r)])/(d^2*r) + (b*n*Log[d + e*x^r])/(d^2*r^2) + (b*n*PolyLog[2,
 -(d/(e*x^r))])/(d^2*r^2)
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx}{d} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))}{(d+ex^r)^2}\,dx}{d}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{(bn)\int \frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{d^2r} + \frac{(ben)\int \frac{x^{-1+r}}{d+ex^r}\,d}{d^2r}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{bn\log(d+ex^r)}{d^2r^2} + \frac{bn\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{d^2r^2}$$

Mathematica [A] time = 0.336817, size = 132, normalized size = 1.29

$$\frac{bn\left(\mathrm{PolyLog}\left(2,\frac{ex^r}{d}+1\right)+\left(\log\left(-\frac{ex^r}{d}\right)-r\log(x)\right)\log(d+ex^r)+\frac{1}{2}r^2\log^2(x)\right)+\frac{dr(a+b\log(cx^n))}{d+ex^r}-ar\log(d-dx^r)+br(n}{d^2r^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] ((d*r*(a + b*Log[c*x^n]))/(d + e*x^r) + b*n*Log[d - d*x^r] - a*r*Log[d - d*
x^r] + b*r*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + b*n*((r^2*Log[x]^2)/2 +
```

```
 (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/
d]))/(d^2*r^2)
```

Maple [C] time = 0.234, size = 715, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r)^2,x)
```

```
[Out] -1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(x^r)+1/2*b*n/d^2*l
n(x)^2+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(d+e*x^r)+1/2
*I/r*b*Pi*csgn(I*c*x^n)^3/d^2*ln(d+e*x^r)-b/r/d^2*ln(x^r)*n*ln(x)-b/r*n/d^2
*ln(x)*ln((d+e*x^r)/d)-b/r/d/(d+e*x^r)*n*ln(x)+b/r/d^2*ln(d+e*x^r)*n*ln(x)-
1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d^2*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)/d/(d+e*x^r)-b/r*n*e/d^2*ln(x)*x^r/(d+e*x^r)+1/2*I/r*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(x^r)-b/r/d^2*ln(d+e*x^r)*ln(x^n)+b/r/d/(d+e
*x^r)*ln(x^n)+b/r/d^2*ln(x^r)*ln(x^n)-b/r^2*n/d^2*dilog((d+e*x^r)/d)-1/r*b*
ln(c)/d^2*ln(d+e*x^r)+1/r*b*ln(c)/d/(d+e*x^r)+1/r*b*ln(c)/d^2*ln(x^r)-1/2*I
/r*b*Pi*csgn(I*c*x^n)^3/d/(d+e*x^r)-1/r*a/d^2*ln(d+e*x^r)+1/r*a/d/(d+e*x^r)
+1/r*a/d^2*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(d+e*x^r)
+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/(d+e*x^r)+1/2*I/r*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/d/(d+e*x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln
(x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(d+e*x^r)+b*n*ln(d+e*x^r
)/d^2/r^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a\left(\frac{1}{derx^r + d^2r} + \frac{\log(x)}{d^2} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{d^2r}\right) + b\int \frac{\log(c) + \log(x^n)}{e^2xx^{2r} + 2\,dexx^r + d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] a*(1/(d*e*r*x^r + d^2*r) + log(x)/d^2 - log((e*x^r + d)/e)/(d^2*r)) + b*int
egrate((log(c) + log(x^n))/(e^2*x*x^(2*r) + 2*d*e*x*x^r + d^2*x), x)
```

Fricas [B] time = 1.32012, size = 527, normalized size = 5.17

$$\frac{bdnr^2\log(x)^2 + 2\,bdr\log(c) + 2\,adr + \left(benr^2\log(x)^2 + 2\left(ber^2\log(c) - benr + aer^2\right)\log(x)\right)x^r - 2\,(benx^r + bdn)\mathrm{Li}_2\left(-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*b*d*r*log(c) + 2*a*d*r + (b*e*n*r^2*log(x)^2 +
2*(b*e*r^2*log(c) - b*e*n*r + a*e*r^2)*log(x))*x^r - 2*(b*e*n*x^r + b*d*n)*
dilog(-(e*x^r + d)/d + 1) - 2*(b*d*r*log(c) - b*d*n + a*d*r + (b*e*r*log(c)
 - b*e*n + a*e*r)*x^r)*log(e*x^r + d) + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x)
 - 2*(b*e*n*r*x^r*log(x) + b*d*n*r*log(x))*log((e*x^r + d)/d))/(d^2*e*r^2*x
^r + d^3*r^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{(ex^r + d)^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x), x)
```

3.416 $\int \frac{a+b\log(cx^n)}{x^3(d+ex^r)^2}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)^2), x]
```

Rubi [A] time = 0.0629914, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)^2),x]
```

```
[Out] Defer[Int][(a + b*Log[c*x^n])/(x^3*(d + e*x^r)^2), x]
```

Rubi steps

$$\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2}\,dx=\int \frac{a+b\log\left(cx^n\right)}{x^3\left(d+ex^r\right)^2}\,dx$$

Mathematica [A] time = 0.23461, size = 139, normalized size = 5.56

$$-\frac{bn(r+2)\left(d+ex^r\right)\,{}_3F_2\left(1,-\frac{2}{r},-\frac{2}{r};1-\frac{2}{r},1-\frac{2}{r};-\frac{ex^r}{d}\right)+2\left(d+ex^r\right)\,{}_2F_1\left(1,-\frac{2}{r};\frac{r-2}{r};-\frac{ex^r}{d}\right)\left(a(r+2)+b(r+2)\log\left(cx^n\right)-b\right.}{4d^2rx^2\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^3*(d + e*x^r)^2),x]
```

```
[Out] -(b*n*(2 + r)*(d + e*x^r)*HypergeometricPFQ[{1, -2/r, -2/r}, {1 - 2/r, 1 -
2/r}, -((e*x^r)/d)] - 4*d*(a + b*Log[c*x^n]) + 2*(d + e*x^r)*Hypergeometric
```

```
2F1[1, -2/r, (-2 + r)/r, -((e*x^r)/d)]*(-(b*n) + a*(2 + r) + b*(2 + r)*Log[
c*x^n]))/(4*d^2*r*x^2*(d + e*x^r))
```

Maple [A] time = 0.642, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x^3 (d + ex^r)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^3/(d+e*x^r)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))/x^3/(d+e*x^r)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{(ex^r + d)^2 x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^3), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx^n) + a}{e^2x^3x^{2r} + 2\,dex^3x^r + d^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^3*x^(2*r) + 2*d*e*x^3*x^r + d^2*x^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((a+b*ln(c*x**n))/x**3/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right) + a}{\left(ex^r + d\right)^2 x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^3/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^3), x)
```

3.417 $\int \frac{x^2(a+b\log(cx^n))}{(d+ex^r)^2} \, dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2},x\right)$$

```
[Out] Unintegrable[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi [A] time = 0.0628515, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] Defer[Int][(x^2*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2} \, dx=\int \frac{x^2\left(a+b\log\left(cx^n\right)\right)}{\left(d+ex^r\right)^2} \, dx$$

Mathematica [A] time = 0.238609, size = 140, normalized size = 5.6

$$\frac{x^3\left(-bn(r-3)\left(d+ex^r\right) {}_3F_2\left(1,\frac{3}{r},\frac{3}{r};1+\frac{3}{r},1+\frac{3}{r};-\frac{ex^r}{d}\right)+3\left(d+ex^r\right) {}_2F_1\left(1,\frac{3}{r};\frac{r+3}{r};-\frac{ex^r}{d}\right)\left(a(r-3)+b(r-3)\log\left(cx^n\right)-\right.\right.}{9d^2r\left(d+ex^r\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] (x^3*(-(b*n*(-3 + r)*(d + e*x^r)*HypergeometricPFQ[{1, 3/r, 3/r}, {1 + 3/r,
 1 + 3/r}, -((e*x^r)/d)]) + 9*d*(a + b*Log[c*x^n]) + 3*(d + e*x^r)*Hypergeo
metric2F1[1, 3/r, (3 + r)/r, -((e*x^r)/d)]*(-(b*n) + a*(-3 + r) + b*(-3 + r
)*Log[c*x^n])))/(9*d^2*r*(d + e*x^r))
```

Maple [A] time = 0.744, size = 0, normalized size = 0.

$$\int \frac{x^2 (a + b\ln (cx^n))}{(d + ex^r)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

```
[Out] int(x^2*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log (cx^n) + a)x^2}{(ex^r + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{bx^2\log (cx^n) + ax^2}{e^2x^{2r} + 2\,dex^r + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(c*x^n) + a*x^2)/(e^2*x^(2*r) + 2*d*e*x^r + d^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(x**2*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)x^2}{(ex^r + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*x^2/(e*x^r + d)^2, x)
```

3.418 $\int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=22

$$\text{Unintegrable}\left(\frac{a+b\log(cx^n)}{(d+ex^r)^2},x\right)$$

[Out] Unintegrable[(a + b*Log[c*x^n])/(d + e*x^r)^2, x]

Rubi [A] time = 0.0168403, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(a + b*Log[c*x^n])/(d + e*x^r)^2,x]

[Out] Defer[Int][(a + b*Log[c*x^n])/(d + e*x^r)^2, x]

Rubi steps

$$\int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx = \int \frac{a+b\log(cx^n)}{(d+ex^r)^2}\,dx$$

Mathematica [A] time = 2.46866, size = 161, normalized size = 7.32

$$\frac{x\left(-bn(r-1)(d+ex^r)\,{}_3F_2\left(1,\frac{1}{r},\frac{1}{r};1+\frac{1}{r},1+\frac{1}{r};-\frac{ex^r}{d}\right)+aerx^r\,{}_2F_1\left(2,\frac{1}{r};1+\frac{1}{r};-\frac{ex^r}{d}\right)+adr\,{}_2F_1\left(2,\frac{1}{r};1+\frac{1}{r};-\frac{ex^r}{d}\right)-b(d+e\right.}{d^2r(d+ex^r)}$$

Warning: Unable to verify antiderivative.

[In] Integrate[(a + b*Log[c*x^n])/(d + e*x^r)^2,x]

[Out] (x*(a*d*r*Hypergeometric2F1[2, r^(-1), 1 + r^(-1), -((e*x^r)/d)] + a*e*r*x^
r*Hypergeometric2F1[2, r^(-1), 1 + r^(-1), -((e*x^r)/d)] - b*n*(-1 + r)*(d

```
+ e*x^r)*HypergeometricPFQ[{1, r^(-1), r^(-1)}, {1 + r^(-1), 1 + r^(-1)}, -
((e*x^r)/d)] + b*d*Log[c*x^n] - b*(d + e*x^r)*Hypergeometric2F1[1, r^(-1),
1 + r^(-1), -((e*x^r)/d)]*(n - (-1 + r)*Log[c*x^n])))/(d^2*r*(d + e*x^r))
```

Maple [A] time = 0.662, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{\left(d+ex^{r}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right)+a}{\left(ex^{r}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left(\frac{b\log\left(cx^{n}\right)+a}{e^{2}x^{2\,r}+2\,dex^{r}+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^(2*r) + 2*d*e*x^r + d^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*ln(c*x**n))/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{(ex^r + d)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(e*x^r + d)^2, x)
```

3.419 $\int \frac{a+b\log(cx^n)}{x^2(d+ex^r)^2}\,dx$

Optimal. Leaf size=25

$$\text{Unintegrable}\left(\frac{a+b\log(cx^n)}{x^2(d+ex^r)^2},x\right)$$

```
[Out] Unintegrable[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)^2), x]
```

Rubi [A] time = 0.0622788, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^r)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)^2),x]
```

```
[Out] Defer[Int][(a + b*Log[c*x^n])/(x^2*(d + e*x^r)^2), x]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x^2(d+ex^r)^2}\,dx=\int \frac{a+b\log(cx^n)}{x^2(d+ex^r)^2}\,dx$$

Mathematica [A] time = 0.201404, size = 135, normalized size = 5.4

$$\frac{-bn(r+1)(d+ex^r)\,{}_3F_2\left(1,-\frac{1}{r},-\frac{1}{r};1-\frac{1}{r},1-\frac{1}{r};-\frac{ex^r}{d}\right)-(d+ex^r)\,{}_2F_1\left(1,-\frac{1}{r};\frac{r-1}{r};-\frac{ex^r}{d}\right)(ar+a+b(r+1)\log(cx^n)-bn)}{d^2rx(d+ex^r)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x^2*(d + e*x^r)^2),x]
```

```
[Out] (-(b*n*(1 + r)*(d + e*x^r)*HypergeometricPFQ[{1, -r^(-1), -r^(-1)}, {1 - r^
(-1), 1 - r^(-1)}, -((e*x^r)/d)]) + d*(a + b*Log[c*x^n]) - (d + e*x^r)*Hype
```

```
rgeometric2F1[1, -r^(-1), (-1 + r)/r, -((e*x^r)/d)]*(a - b*n + a*r + b*(1 +
 r)*Log[c*x^n]))/(d^2*r*x*(d + e*x^r))
```

Maple [A] time = 0.75, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x^2(d+ex^r)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x^2/(d+e*x^r)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))/x^2/(d+e*x^r)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n)+a}{(ex^r+d)^2x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^2), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{b\log(cx^n)+a}{e^2x^2x^{2r}+2\,dex^2x^r+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)/(e^2*x^2*x^(2*r) + 2*d*e*x^2*x^r + d^2*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*ln(c*x**n))/x**2/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{(ex^r + d)^2 x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x^2/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x^2), x)
```

3.420 $\int \frac{a+b\log(cx^n)}{x(c-x^{-n})}\,dx$

Optimal. Leaf size=37

$$\frac{a\log(1-cx^n)}{cn}-\frac{b\text{PolyLog}(2,1-cx^n)}{cn}$$

```
[Out] (a*Log[1 - c*x^n])/(c*n) - (b*PolyLog[2, 1 - c*x^n])/(c*n)
```

Rubi [A] time = 0.144024, antiderivative size = 37, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {2343, 2333, 2316, 2315}

$$\frac{a\log(1-cx^n)}{cn}-\frac{b\text{PolyLog}(2,1-cx^n)}{cn}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(c - x^(-n))),x]
```

```
[Out] (a*Log[1 - c*x^n])/(c*n) - (b*PolyLog[2, 1 - c*x^n])/(c*n)
```

Rule 2343

```
Int[((a_.) + Log[(c_.)*(x_)^(n_)]*(b_.))/((x_)*((d_) + (e_.)*(x_)^(r_.))),
x_Symbol] :> Dist[1/n, Subst[Int[(a + b*Log[c*x])/(x*(d + e*x^(r/n))), x],
x, x^n], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IntegerQ[r/n]
```

Rule 2333

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)/(x_))^(q_.)*(
x_)^(m_.), x_Symbol] :> Int[(e + d*x)^q*(a + b*Log[c*x^n])^p, x] /; FreeQ[{
a, b, c, d, e, m, n, p}, x] && EqQ[m, q] && IntegerQ[q]
```

Rule 2316

```
Int[((a_.) + Log[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[
((a + b*Log[-((c*d)/e)])*Log[d + e*x])/e, x] + Dist[b, Int[Log[-((e*x)/d)]/
(d + e*x), x], x] /; FreeQ[{a, b, c, d, e}, x] && GtQ[-((c*d)/e), 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(c-x^{-n})}\,dx = \frac{\text{Subst}\left(\int \frac{a+b\log(cx)}{\left(c-\frac{1}{x}\right)x}\,dx, x, x^n\right)}{n}$$
$$= \frac{\text{Subst}\left(\int \frac{a+b\log(cx)}{-1+cx}\,dx, x, x^n\right)}{n}$$
$$= \frac{a\log(1-cx^n)}{cn} + \frac{b\,\text{Subst}\left(\int \frac{\log(cx)}{-1+cx}\,dx, x, x^n\right)}{n}$$
$$= \frac{a\log(1-cx^n)}{cn} - \frac{b\text{Li}_2(1-cx^n)}{cn}$$

Mathematica [A] time = 0.0176798, size = 37, normalized size = 1.

$$\frac{b\text{PolyLog}(2,cx^n)+\log(1-cx^n)(a+b\log(cx^n))}{cn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(c - x^(-n))),x]
```

```
[Out] ((a + b*Log[c*x^n])*Log[1 - c*x^n] + b*PolyLog[2, c*x^n])/(c*n)
```

Maple [A] time = 0.043, size = 33, normalized size = 0.9

$$\frac{a\ln(cx^n-1)}{nc} - \frac{b\text{dilog}(cx^n)}{nc}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(c-1/(x^n)),x)
```

```
[Out] 1/n*a/c*ln(c*x^n-1)-1/n/c*b*dilog(c*x^n)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$b\int \frac{x^n \log (c) + x^n \log (x^n)}{cxx^n - x}\,dx + \frac{a\log \left(\frac{cx^n - 1}{c}\right)}{cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(c-1/(x^n)),x, algorithm="maxima")
```

```
[Out] b*integrate((x^n*log(c) + x^n*log(x^n))/(c*x*x^n - x), x) + a*log((c*x^n -
1)/c)/(c*n)
```

Fricas [A] time = 1.30936, size = 115, normalized size = 3.11

$$\frac{bn\log (-cx^n + 1)\log (x) + b\mathrm{Li}_2\left(cx^n\right) + (b\log (c) + a)\log (cx^n - 1)}{cn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(c-1/(x^n)),x, algorithm="fricas")
```

```
[Out] (b*n*log(-c*x^n + 1)*log(x) + b*dilog(c*x^n) + (b*log(c) + a)*log(c*x^n - 1
))/(c*n)
```

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((a+b*ln(c*x**n))/x/(c-1/(x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right) + a}{\left(c - \frac{1}{x^n}\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(c-1/(x^n)),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((c - 1/x^n)*x), x)
```

3.421 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=152

$$\frac{3d^2ex^r\,(a+b\log(cx^n))}{r}+d^3\log(x)\,(a+b\log(cx^n))+\frac{3de^2x^{2r}\,(a+b\log(cx^n))}{2r}+\frac{e^3x^{3r}\,(a+b\log(cx^n))}{3r}-\frac{3bd^2enx^r}{r^2}-\frac{1}{2}b$$

```
[Out] (-3*b*d^2*e*n*x^r)/r^2 - (3*b*d*e^2*n*x^(2*r))/(4*r^2) - (b*e^3*n*x^(3*r))/
(9*r^2) - (b*d^3*n*Log[x]^2)/2 + (3*d^2*e*x^r*(a + b*Log[c*x^n]))/r + (3*d*
e^2*x^(2*r)*(a + b*Log[c*x^n]))/(2*r) + (e^3*x^(3*r)*(a + b*Log[c*x^n]))/(3
*r) + d^3*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.153988, antiderivative size = 124, normalized size of antiderivative = 0.82, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{6}\left(\frac{18d^2ex^r}{r}+6d^3\log(x)+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}\right)(a+b\log(cx^n))-\frac{3bd^2enx^r}{r^2}-\frac{1}{2}bd^3n\log^2(x)-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-3*b*d^2*e*n*x^r)/r^2 - (3*b*d*e^2*n*x^(2*r))/(4*r^2) - (b*e^3*n*x^(3*r))/
(9*r^2) - (b*d^3*n*Log[x]^2)/2 + (((18*d^2*e*x^r)/r + (9*d*e^2*x^(2*r))/r +
 (2*e^3*x^(3*r))/r + 6*d^3*Log[x])*(a + b*Log[c*x^n]))/6
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$\int \frac{(d+ex^r)^3\,(a+b\log(cx^n))}{x}\,dx = \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)(a+b\log(cx^n))-(bn)\int \frac{ex^r\left(18d^2+\right.}{}$$

$$= \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)(a+b\log(cx^n))-\frac{(bn)\int \frac{ex^r\left(18d^2+9dex^r\right.}{}}{6}$$

$$= \frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)(a+b\log(cx^n))-\frac{(bn)\int\left(18d^2ex^{-1+r}\right.}{}$$

$$= -\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}+6d^3\log(x)\right)$$

$$= -\frac{3bd^2enx^r}{r^2}-\frac{3bde^2nx^{2r}}{4r^2}-\frac{be^3nx^{3r}}{9r^2}-\frac{1}{2}bd^3n\log^2(x)+\frac{1}{6}\left(\frac{18d^2ex^r}{r}+\frac{9de^2x^{2r}}{r}+\frac{2e^3x^{3r}}{r}\right.$$

Mathematica [A] time = 0.355995, size = 132, normalized size = 0.87

$$\frac{1}{36}\left(\frac{ex^r\left(6ar\left(18d^2+9dex^r+2e^2x^{2r}\right)-bn\left(108d^2+27dex^r+4e^2x^{2r}\right)\right)}{r^2}+\frac{6bex^r\log(cx^n)\left(18d^2+9dex^r+2e^2x^{2r}\right)}{r}+\frac{18bd}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] a*d^3*Log[x] + ((e*x^r*(6*a*r*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)) - b*n*(1
08*d^2 + 27*d*e*x^r + 4*e^2*x^(2*r))))/r^2 + (6*b*e*x^r*(18*d^2 + 9*d*e*x^r
 + 2*e^2*x^(2*r))*Log[c*x^n])/r + (18*b*d^3*Log[c*x^n]^2)/n)/36
```

Maple [C] time = 0.077, size = 693, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))/x,x)
```

```
[Out] 3/2/r*ln(c)*b*d*e^2*(x^r)^2+3/r*ln(c)*b*d^2*e*x^r-3/4/r^2*b*d*e^2*n*(x^r)^2
-1/6*I/r*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+3/4*I/r*Pi*b*
d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1/3/r*ln(c)*b*e^3*(x^r)^3-1/9/r^2
*b*e^3*n*(x^r)^3+3/2/r*a*d*e^2*(x^r)^2+3/r*a*d^2*e*x^r+1/3/r*a*e^3*(x^r)^3+
1/6*b*(2*e^3*(x^r)^3+6*d^3*ln(x)*r+9*d*e^2*(x^r)^2+18*d^2*e*x^r)/r*ln(x^n)-
3*b*d^2*e*n*x^r/r^2-3/4*I/r*Pi*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*
(x^r)^2+ln(x)*ln(c)*b*d^3-3/2*I/r*Pi*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn
(I*c)*x^r-1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3/4*I/r*
Pi*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3/2*I/r*Pi*b*d^2*e*csgn(I*x^n)
*csgn(I*c*x^n)^2*x^r+3/2*I/r*Pi*b*d^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-1/2*I
*ln(x)*Pi*b*d^3*csgn(I*c*x^n)^3-3/2*I/r*Pi*b*d^2*e*csgn(I*c*x^n)^3*x^r+1/6*
I/r*Pi*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+1/6*I/r*Pi*b*e^3*csgn(I*c*
x^n)^2*csgn(I*c)*(x^r)^3-3/4*I/r*Pi*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+ln(x)*a
*d^3+1/2*I*ln(x)*Pi*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*ln(x)*Pi*b*d^3*
csgn(I*c*x^n)^2*csgn(I*c)-1/6*I/r*Pi*b*e^3*csgn(I*c*x^n)^3*(x^r)^3-1/2*b*d^
3*n*ln(x)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.39162, size = 419, normalized size = 2.76

$$\frac{18\,bd^3nr^2\log(x)^2 + 4\left(3\,be^3nr\log(x) + 3\,be^3r\log(c) - be^3n + 3\,ae^3r\right)x^{3\,r} + 27\left(2\,bde^2nr\log(x) + 2\,bde^2r\log(c) - bde^2r\right.}{36\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/36*(18*b*d^3*n*r^2*log(x)^2 + 4*(3*b*e^3*n*r*log(x) + 3*b*e^3*r*log(c) -
b*e^3*n + 3*a*e^3*r)*x^(3*r) + 27*(2*b*d*e^2*n*r*log(x) + 2*b*d*e^2*r*log(c
) - b*d*e^2*n + 2*a*d*e^2*r)*x^(2*r) + 108*(b*d^2*e*n*r*log(x) + b*d^2*e*r*
log(c) - b*d^2*e*n + a*d^2*e*r)*x^r + 36*(b*d^3*r^2*log(c) + a*d^3*r^2)*log
(x))/r^2
```

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((d+e*x**r)**3*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.33299, size = 284, normalized size = 1.87

$$\frac{1}{2}\,bd^3n\log(x)^2 + \frac{3\,bd^2nx^re\log(x)}{r} + bd^3\log(c)\log(x) + \frac{3\,bd^2x^re\log(c)}{r} + ad^3\log(x) + \frac{3\,bdnx^{2\,r}e^2\log(x)}{2\,r} - \frac{3\,bd^2nx^r}{r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^3*n*log(x)^2 + 3*b*d^2*n*x^r*e*log(x)/r + b*d^3*log(c)*log(x) + 3*b
*d^2*x^r*e*log(c)/r + a*d^3*log(x) + 3/2*b*d*n*x^(2*r)*e^2*log(x)/r - 3*b*d
^2*n*x^r*e/r^2 + 3*a*d^2*x^r*e/r + 3/2*b*d*x^(2*r)*e^2*log(c)/r + 1/3*b*n*x
^(3*r)*e^3*log(x)/r - 3/4*b*d*n*x^(2*r)*e^2/r^2 + 3/2*a*d*x^(2*r)*e^2/r + 1
/3*b*x^(3*r)*e^3*log(c)/r - 1/9*b*n*x^(3*r)*e^3/r^2 + 1/3*a*x^(3*r)*e^3/r
```

3.422 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=104

$$d^2\log(x)\left(a+b\log\left(cx^n\right)\right)+\frac{2dex^r\left(a+b\log\left(cx^n\right)\right)}{r}+\frac{e^2x^{2r}\left(a+b\log\left(cx^n\right)\right)}{2r}-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

```
[Out] (-2*b*d*e*n*x^r)/r^2 - (b*e^2*n*x^(2*r))/(4*r^2) - (b*d^2*n*Log[x]^2)/2 + (
2*d*e*x^r*(a + b*Log[c*x^n]))/r + (e^2*x^(2*r)*(a + b*Log[c*x^n]))/(2*r) +
d^2*Log[x]*(a + b*Log[c*x^n])
```

Rubi [A] time = 0.127237, antiderivative size = 87, normalized size of antiderivative = 0.84, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {266, 43, 2334, 12, 14, 2301}

$$\frac{1}{2}\left(2d^2\log(x)+\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}\right)\left(a+b\log\left(cx^n\right)\right)-\frac{1}{2}bd^2n\log^2(x)-\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-2*b*d*e*n*x^r)/r^2 - (b*e^2*n*x^(2*r))/(4*r^2) - (b*d^2*n*Log[x]^2)/2 + (
((4*d*e*x^r)/r + (e^2*x^(2*r))/r + 2*d^2*Log[x])*(a + b*Log[c*x^n]))/2
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 2334

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*(x_)^(m_.)*((d_) + (e_.)*(x_)^(r_
.))^(q_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*x^r)^q, x]}, Simp[u*(a
```

```
 + b*Log[c*x^n]), x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x], x], x]] /;
FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[q, 0] && IntegerQ[m] &&  !(EqQ[q, 1
] && EqQ[m, -1])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{(d+ex^r)^2\,(a+b\log(cx^n))}{x}\,dx &= \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)(a+b\log(cx^n))-(bn)\int \frac{ex^r\,(4d+ex^r)+2d^2r\log(x)}{2rx} \\
&= \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)(a+b\log(cx^n))-\frac{(bn)\int \frac{ex^r(4d+ex^r)+2d^2r\log(x)}{x}\,dx}{2r} \\
&= \frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)(a+b\log(cx^n))-\frac{(bn)\int \left(4dex^{-1+r}+e^2x^{-1+2r}+\frac{2d^2r}{}\right.}{2r} \\
&= -\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)(a+b\log(cx^n))-\left(bd^2n\right)\int \\
&= -\frac{2bdenx^r}{r^2}-\frac{be^2nx^{2r}}{4r^2}-\frac{1}{2}bd^2n\log^2(x)+\frac{1}{2}\left(\frac{4dex^r}{r}+\frac{e^2x^{2r}}{r}+2d^2\log(x)\right)(a+b\log(cx
\end{aligned}
$$

Mathematica [A] time = 0.207908, size = 90, normalized size = 0.87

$$
\frac{1}{4}\left(\frac{ex^r\,(2ar\,(4d+ex^r)-bn\,(8d+ex^r))}{r^2}+4ad^2\log(x)+\frac{2bd^2\log^2(cx^n)}{n}+\frac{2bex^r\log(cx^n)\,(4d+ex^r)}{r}\right)
$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] ((e*x^r*(2*a*r*(4*d + e*x^r) - b*n*(8*d + e*x^r)))/r^2 + 4*a*d^2*Log[x] + (
2*b*e*x^r*(4*d + e*x^r)*Log[c*x^n])/r + (2*b*d^2*Log[c*x^n]^2)/n)/4
```

Maple [C] time = 0.069, size = 487, normalized size = 4.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))/x,x)
```

```
[Out] 1/2*b*(2*d^2*ln(x)*r+e^2*(x^r)^2+4*d*e*x^r)/r*ln(x^n)-1/4*I/r*Pi*b*e^2*csgn
(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+1/4*I/r*Pi*b*e^2*csgn(I*c*x^n)^2*cs
gn(I*c)*(x^r)^2-I/r*Pi*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+I/r*Pi
*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+1/2*I*ln(x)*Pi*b*d^2*csgn(I*x^n)*csg
n(I*c*x^n)^2-1/2*I*ln(x)*Pi*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/4*I
/r*Pi*b*e^2*csgn(I*c*x^n)^3*(x^r)^2+I/r*Pi*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*
x^r-1/2*I*ln(x)*Pi*b*d^2*csgn(I*c*x^n)^3-I/r*Pi*b*d*e*csgn(I*c*x^n)^3*x^r+1
/4*I/r*Pi*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1/2*I*ln(x)*Pi*b*d^2*cs
gn(I*c*x^n)^2*csgn(I*c)-1/2*b*d^2*n*ln(x)^2+1/2/r*ln(c)*b*e^2*(x^r)^2+ln(x)
*ln(c)*b*d^2+1/2/r*a*e^2*(x^r)^2-1/4/r^2*b*e^2*n*(x^r)^2+2/r*ln(c)*b*d*e*x^
r+ln(x)*a*d^2+2/r*a*d*e*x^r-2*b*d*e*n*x^r/r^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.32654, size = 286, normalized size = 2.75

$$\frac{2\,bd^2nr^2\log(x)^2 + \left(2\,be^2nr\log(x) + 2\,be^2r\log(c) - be^2n + 2\,ae^2r\right)x^{2\,r} + 8\,(bdenr\log(x) + bder\log(c) - bden + ader)x^r}{4\,r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/4*(2*b*d^2*n*r^2*log(x)^2 + (2*b*e^2*n*r*log(x) + 2*b*e^2*r*log(c) - b*e^
2*n + 2*a*e^2*r)*x^(2*r) + 8*(b*d*e*n*r*log(x) + b*d*e*r*log(c) - b*d*e*n +
 a*d*e*r)*x^r + 4*(b*d^2*r^2*log(c) + a*d^2*r^2)*log(x))/r^2
```

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((d+e*x**r)**2*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.34391, size = 189, normalized size = 1.82

$$\frac{1}{2}\,bd^2n\log\left(x\right)^2 + \frac{2\,bdnx^re\log\left(x\right)}{r} + bd^2\log\left(c\right)\log\left(x\right) + \frac{2\,bdx^re\log\left(c\right)}{r} + ad^2\log\left(x\right) + \frac{bnx^{2\,r}e^2\log\left(x\right)}{2\,r} - \frac{2\,bdnx^re}{r^2} + \frac{2\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d^2*n*log(x)^2 + 2*b*d*n*x^r*e*log(x)/r + b*d^2*log(c)*log(x) + 2*b*d
*x^r*e*log(c)/r + a*d^2*log(x) + 1/2*b*n*x^(2*r)*e^2*log(x)/r - 2*b*d*n*x^r
*e/r^2 + 2*a*d*x^r*e/r + 1/2*b*x^(2*r)*e^2*log(c)/r - 1/4*b*n*x^(2*r)*e^2/r
^2 + 1/2*a*x^(2*r)*e^2/r
```

3.423 $\int \frac{(d+ex^r)(a+b\log(cx^n))}{x} dx$

Optimal. Leaf size=53

$$\frac{d (a + b \log (cx^n))^2}{2bn} + \frac{ex^r (a + b \log (cx^n))}{r} - \frac{benx^r}{r^2}$$

```
[Out] -((b*e*n*x^r)/r^2) + (e*x^r*(a + b*Log[c*x^n]))/r + (d*(a + b*Log[c*x^n])^2
)/(2*b*n)
```

Rubi [A] time = 0.0847481, antiderivative size = 53, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.19, Rules used = {14, 2351, 2301, 2304}

$$\frac{d (a + b \log (cx^n))^2}{2bn} + \frac{ex^r (a + b \log (cx^n))}{r} - \frac{benx^r}{r^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] -((b*e*n*x^r)/r^2) + (e*x^r*(a + b*Log[c*x^n]))/r + (d*(a + b*Log[c*x^n])^2
)/(2*b*n)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 2351

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[a + b*Log[c*x^n],
 (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d, e,
 f, m, n, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[m] && Integer
Q[r]))
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)(a+b\log(cx^n))}{x}\,dx &= \int \left(\frac{d(a+b\log(cx^n))}{x}+ex^{-1+r}(a+b\log(cx^n))\right)dx\\ &= d\int \frac{a+b\log(cx^n)}{x}\,dx+e\int x^{-1+r}(a+b\log(cx^n))\,dx\\ &= -\frac{benx^r}{r^2}+\frac{ex^r(a+b\log(cx^n))}{r}+\frac{d(a+b\log(cx^n))^2}{2bn}\end{aligned}$$

Mathematica [A] time = 0.0844595, size = 54, normalized size = 1.02

$$\frac{ex^r(ar-bn)}{r^2}+ad\log(x)+\frac{bd\log^2(cx^n)}{2n}+\frac{bex^r\log(cx^n)}{r}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (e*(-(b*n) + a*r)*x^r)/r^2 + a*d*Log[x] + (b*e*x^r*Log[c*x^n])/r + (b*d*Log
[c*x^n]^2)/(2*n)
```

Maple [C] time = 0.066, size = 278, normalized size = 5.3

$$\frac{b(dr\ln(x)+ex^r)\ln(x^n)}{r}-\frac{i}{2}\pi\ln(x)bd\,\mathrm{csgn}(ix^n)\,\mathrm{csgn}(icx^n)\,\mathrm{csgn}(ic)+\frac{i}{2}\pi\ln(x)bd(\mathrm{csgn}(icx^n))^2\,\mathrm{csgn}(ic)+\frac{i}{2}\pi\ln(x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] b*(d*r*ln(x)+e*x^r)/r*ln(x^n)-1/2*I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)+1/2*I*Pi*ln(x)*b*d*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I*Pi*ln(x)*b*d*c
sgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*Pi*ln(x)*b*d*csgn(I*c*x^n)^3-1/2*I/r*Pi*b*
```

```
e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+1/2*I/r*Pi*b*e*csgn(I*c*x^n)^2*cs
gn(I*c)*x^r+1/2*I/r*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-1/2*I/r*Pi*b*e*c
sgn(I*c*x^n)^3*x^r-1/2*b*d*n*ln(x)^2+ln(x)*ln(c)*b*d+1/r*ln(c)*b*e*x^r+ln(x
)*a*d+1/r*x^r*a*e-b*e*n*x^r/r^2
```

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((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.35332, size = 167, normalized size = 3.15

$$\frac{bdnr^2 \log(x)^2 + 2(benr \log(x) + ber \log(c) - ben + aer)x^r + 2\left(bdr^2 \log(c) + adr^2\right) \log(x)}{2r^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*(b*e*n*r*log(x) + b*e*r*log(c) - b*e*n + a*e*r)
*x^r + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x))/r^2
```

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((d+e*x**r)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [A] time = 1.14149, size = 93, normalized size = 1.75

$$\frac{1}{2}\,bdn\log\left(x\right)^{2}+\frac{bnx^{r}e\log\left(x\right)}{r}+bd\log\left(c\right)\log\left(x\right)+\frac{bx^{r}e\log\left(c\right)}{r}+ad\log\left(x\right)-\frac{bnx^{r}e}{r^{2}}+\frac{ax^{r}e}{r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] 1/2*b*d*n*log(x)^2 + b*n*x^r*e*log(x)/r + b*d*log(c)*log(x) + b*x^r*e*log(c
)/r + a*d*log(x) - b*n*x^r*e/r^2 + a*x^r*e/r
```

3.424 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx$

Optimal. Leaf size=54

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))}{dr}$$

```
[Out] -(((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d*r)) + (b*n*PolyLog[2, -(d/(e*x
^r))])/(d*r^2)
```

Rubi [A] time = 0.0753664, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {2345, 2391}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))}{dr}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] -(((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d*r)) + (b*n*PolyLog[2, -(d/(e*x
^r))])/(d*r^2)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx = -\frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{dr} + \frac{(bn)\int \frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{dr}$$
$$= -\frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{dr} + \frac{bn\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}$$

Mathematica [A] time = 0.102542, size = 108, normalized size = 2.

$$\frac{2bn\mathrm{PolyLog}\left(2,\frac{ex^r}{d}+1\right)-2r\log(d-dx^r)(a+b\log(cx^n))+2bnr\log(x)(\log(d-dx^r)-\log(d+ex^r))+2bn\log\left(-\frac{ex^r}{d}\right)}{2dr^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)),x]
```

```
[Out] (b*n*r^2*Log[x]^2 - 2*r*(a + b*Log[c*x^n])*Log[d - d*x^r] + 2*b*n*r*Log[x]*
(Log[d - d*x^r] - Log[d + e*x^r]) + 2*b*n*Log[-((e*x^r)/d)]*Log[d + e*x^r]
+ 2*b*n*PolyLog[2, 1 + (e*x^r)/d])/(2*d*r^2)
```

Maple [C] time = 0.059, size = 451, normalized size = 8.4

$$\frac{b\ln(d+ex^r)n\ln(x)}{dr}-\frac{b\ln(d+ex^r)\ln(x^n)}{dr}-\frac{b\ln(x^r)n\ln(x)}{dr}+\frac{b\ln(x^r)\ln(x^n)}{dr}+\frac{bn(\ln(x))^2}{2d}-\frac{\ln(x)bn}{dr}\ln\left(1+\frac{ex^r}{d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r),x)
```

```
[Out] b/r/d*ln(d+e*x^r)*n*ln(x)-b/r/d*ln(d+e*x^r)*ln(x^n)-b/r/d*ln(x^r)*n*ln(x)+b
/r/d*ln(x^r)*ln(x^n)+1/2*b*n/d*ln(x)^2-b/r*n/d*ln(x)*ln(1+e*x^r/d)-b/r^2*n/
d*polylog(2,-e*x^r/d)+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln
(d+e*x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d*ln(x^r)+1/2*I/
r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(
I*c*x^n)^2/d*ln(d+e*x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d*ln(x^r)+1/2*I/r*b*P
i*csgn(I*c*x^n)^3/d*ln(d+e*x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*ln
(x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d*ln(d+e*x^r)-1/r*b*ln(c)/d*ln
(d+e*x^r)+1/r*b*ln(c)/d*ln(x^r)-1/r*a/d*ln(d+e*x^r)+1/r*a/d*ln(x^r)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a\left(\frac{\log(x)}{d} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{dr}\right) + b\int \frac{\log(c) + \log(x^n)}{exx^r + dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] a*(log(x)/d - log((e*x^r + d)/e)/(d*r)) + b*integrate((log(c) + log(x^n))/(
e*x*x^r + d*x), x)
```

Fricas [A] time = 1.26406, size = 235, normalized size = 4.35

$$\frac{bnr^2\log(x)^2 - 2\,bnr\log(x)\log\left(\frac{ex^r+d}{d}\right) - 2\,bn\mathrm{Li}_2\left(-\frac{ex^r+d}{d}+1\right) - 2\,(br\log(c)+ar)\log(ex^r+d) + 2\left(br^2\log(c)+ar^2\right)\mathrm{lo}}{2\,dr^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] 1/2*(b*n*r^2*log(x)^2 - 2*b*n*r*log(x)*log((e*x^r + d)/d) - 2*b*n*dilog(-(e
*x^r + d)/d + 1) - 2*(b*r*log(c) + a*r)*log(e*x^r + d) + 2*(b*r^2*log(c) +
a*r^2)*log(x))/(d*r^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right) + a}{(ex^r + d)x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)*x), x)
```

3.425 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx$

Optimal. Leaf size=102

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

```
[Out] -((e*x^r*(a + b*Log[c*x^n]))/(d^2*r*(d + e*x^r))) - ((a + b*Log[c*x^n])*Log
[1 + d/(e*x^r)])/(d^2*r) + (b*n*Log[d + e*x^r])/(d^2*r^2) + (b*n*PolyLog[2,
 -(d/(e*x^r))])/(d^2*r^2)
```

Rubi [A] time = 0.229273, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2349, 2345, 2391, 2335, 260}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^2r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^2r}+\frac{bn\log\left(d+ex^r\right)}{d^2r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] -((e*x^r*(a + b*Log[c*x^n]))/(d^2*r*(d + e*x^r))) - ((a + b*Log[c*x^n])*Log
[1 + d/(e*x^r)])/(d^2*r) + (b*n*Log[d + e*x^r])/(d^2*r^2) + (b*n*PolyLog[2,
 -(d/(e*x^r))])/(d^2*r^2)
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx}{d} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))}{(d+ex^r)^2}\,dx}{d}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{(bn)\int \frac{\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{d^2r} + \frac{(ben)\int \frac{x^{-1+r}}{d+ex^r}\,dx}{d^2r}$$

$$= -\frac{ex^r(a+b\log(cx^n))}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{bn\log(d+ex^r)}{d^2r^2} + \frac{bn\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{d^2r^2}$$

Mathematica [A] time = 0.313321, size = 132, normalized size = 1.29

$$\frac{bn\left(\mathrm{PolyLog}\left(2,\frac{ex^r}{d}+1\right)+\left(\log\left(-\frac{ex^r}{d}\right)-r\log(x)\right)\log(d+ex^r)+\frac{1}{2}r^2\log^2(x)\right)+\frac{dr(a+b\log(cx^n))}{d+ex^r}-ar\log(d-dx^r)+br(n\log$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^2),x]
```

```
[Out] ((d*r*(a + b*Log[c*x^n]))/(d + e*x^r) + b*n*Log[d - d*x^r] - a*r*Log[d - d*
x^r] + b*r*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + b*n*((r^2*Log[x]^2)/2 +
```

```
(-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/
d]))/(d^2*r^2)
```

Maple [C] time = 0.066, size = 715, normalized size = 7.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r)^2,x)
```

```
[Out] -1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(x^r)+1/2*b*n/d^2*l
n(x)^2+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2*ln(d+e*x^r)+1/2
*I/r*b*Pi*csgn(I*c*x^n)^3/d^2*ln(d+e*x^r)-b/r/d^2*ln(x^r)*n*ln(x)-b/r*n/d^2
*ln(x)*ln((d+e*x^r)/d)-b/r/d/(d+e*x^r)*n*ln(x)+b/r/d^2*ln(d+e*x^r)*n*ln(x)-
1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d^2*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*
x^n)*csgn(I*c)/d/(d+e*x^r)-b/r*n*e/d^2*ln(x)*x^r/(d+e*x^r)+1/2*I/r*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(x^r)-b/r/d^2*ln(d+e*x^r)*ln(x^n)+b/r/d/(d+e
*x^r)*ln(x^n)+b/r/d^2*ln(x^r)*ln(x^n)-b/r^2*n/d^2*dilog((d+e*x^r)/d)-1/r*b*
ln(c)/d^2*ln(d+e*x^r)+1/r*b*ln(c)/d/(d+e*x^r)+1/r*b*ln(c)/d^2*ln(x^r)-1/2*I
/r*b*Pi*csgn(I*c*x^n)^3/d/(d+e*x^r)-1/r*a/d^2*ln(d+e*x^r)+1/r*a/d/(d+e*x^r)
+1/r*a/d^2*ln(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^2*ln(d+e*x^r)
+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d/(d+e*x^r)+1/2*I/r*b*Pi*csgn(I*c
*x^n)^2*csgn(I*c)/d/(d+e*x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln
(x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^2*ln(d+e*x^r)+b*n*ln(d+e*x^r
)/d^2/r^2
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a\left(\frac{1}{derx^r + d^2r} + \frac{\log(x)}{d^2} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{d^2r}\right) + b\int \frac{\log(c) + \log(x^n)}{e^2xx^{2r} + 2\,dexx^r + d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] a*(1/(d*e*r*x^r + d^2*r) + log(x)/d^2 - log((e*x^r + d)/e)/(d^2*r)) + b*int
egrate((log(c) + log(x^n))/(e^2*x*x^(2*r) + 2*d*e*x*x^r + d^2*x), x)
```

Fricas [B] time = 1.38566, size = 527, normalized size = 5.17

$$\frac{bdnr^2\log(x)^2 + 2\,bdr\log(c) + 2\,adr + \left(benr^2\log(x)^2 + 2\left(ber^2\log(c) - benr + aer^2\right)\log(x)\right)x^r - 2\,(benx^r + bdn)\mathrm{Li}_2\left(-\frac{e}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d*n*r^2*log(x)^2 + 2*b*d*r*log(c) + 2*a*d*r + (b*e*n*r^2*log(x)^2 +
2*(b*e*r^2*log(c) - b*e*n*r + a*e*r^2)*log(x))*x^r - 2*(b*e*n*x^r + b*d*n)*
dilog(-(e*x^r + d)/d + 1) - 2*(b*d*r*log(c) - b*d*n + a*d*r + (b*e*r*log(c)
 - b*e*n + a*e*r)*x^r)*log(e*x^r + d) + 2*(b*d*r^2*log(c) + a*d*r^2)*log(x)
 - 2*(b*e*n*r*x^r*log(x) + b*d*n*r*log(x))*log((e*x^r + d)/d))/(d^2*e*r^2*x
^r + d^3*r^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log(cx^n) + a}{(ex^r + d)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^2*x), x)
```

3.426 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^3}\,dx$

Optimal. Leaf size=169

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^3r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^3r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3r}+\frac{a+b\log\left(cx^n\right)}{2dr\left(d+ex^r\right)^2}-\frac{bn}{2d^2r^2\left(d+ex^r\right)}+\frac{3b}{}$$

```
[Out] -(b*n)/(2*d^2*r^2*(d + e*x^r)) - (b*n*Log[x])/(2*d^3*r) + (a + b*Log[c*x^n]
)/(2*d*r*(d + e*x^r)^2) - (e*x^r*(a + b*Log[c*x^n]))/(d^3*r*(d + e*x^r)) -
((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d^3*r) + (3*b*n*Log[d + e*x^r])/(2
*d^3*r^2) + (b*n*PolyLog[2, -(d/(e*x^r))])/(d^3*r^2)
```

Rubi [A] time = 0.409281, antiderivative size = 169, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {2349, 2345, 2391, 2335, 260, 2338, 266, 44}

$$\frac{bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^3r^2}-\frac{ex^r\left(a+b\log\left(cx^n\right)\right)}{d^3r\left(d+ex^r\right)}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)\left(a+b\log\left(cx^n\right)\right)}{d^3r}+\frac{a+b\log\left(cx^n\right)}{2dr\left(d+ex^r\right)^2}-\frac{bn}{2d^2r^2\left(d+ex^r\right)}+\frac{3b}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^3),x]
```


```
[Out] -(b*n)/(2*d^2*r^2*(d + e*x^r)) - (b*n*Log[x])/(2*d^3*r) + (a + b*Log[c*x^n]
)/(2*d*r*(d + e*x^r)^2) - (e*x^r*(a + b*Log[c*x^n]))/(d^3*r*(d + e*x^r)) -
((a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d^3*r) + (3*b*n*Log[d + e*x^r])/(2
*d^3*r^2) + (b*n*PolyLog[2, -(d/(e*x^r))])/(d^3*r^2)
```


Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
```

```
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^3}\,dx = \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx}{d} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))}{(d+ex^r)^3}\,dx}{d}$$

$$= \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} + \frac{\int \frac{a+b\log(cx^n)}{x(d+ex^r)}\,dx}{d^2} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))}{(d+ex^r)^2}\,dx}{d^2} - \frac{(bn)\int \frac{1}{x(d+ex^r)^2}\,dx}{2dr}$$

$$= \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} - \frac{ex^r(a+b\log(cx^n))}{d^3r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^3r} - \frac{(bn)\,\text{Subst}\left(\int \frac{1}{x(d+ex)^2}\right.}{2dr^2}$$

$$= \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} - \frac{ex^r(a+b\log(cx^n))}{d^3r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^3r} + \frac{bn\log(d+ex^r)}{d^3r^2} + \frac{bn}{}$$

$$= -\frac{bn}{2d^2r^2(d+ex^r)} - \frac{bn\log(x)}{2d^3r} + \frac{a+b\log(cx^n)}{2dr(d+ex^r)^2} - \frac{ex^r(a+b\log(cx^n))}{d^3r(d+ex^r)} - \frac{(a+b\log(cx^n))\log\left(1\right.}{d^3r}$$

Mathematica [A] time = 0.234533, size = 170, normalized size = 1.01

$$\frac{2bn\left(\text{PolyLog}\left(2,\frac{ex^r}{d}+1\right)+\left(\log\left(-\frac{ex^r}{d}\right)-r\log(x)\right)\log(d+ex^r)+\frac{1}{2}r^2\log^2(x)\right)+\frac{d^2r(a+b\log(cx^n))}{(d+ex^r)^2}+\frac{d(2ar+2br\log(cx^n)-bn)}{d+ex^r}-}{2d^3r^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^3),x]
```

```
[Out] ((d^2*r*(a + b*Log[c*x^n]))/(d + e*x^r)^2 + (d*(-(b*n) + 2*a*r + 2*b*r*Log[
c*x^n]))/(d + e*x^r) + 3*b*n*Log[d - d*x^r] - 2*a*r*Log[d - d*x^r] + 2*b*r*
(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + 2*b*n*((r^2*Log[x]^2)/2 + (-(r*Log
[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]))/(2*d
^3*r^2)
```

Maple [C] time = 0.25, size = 1012, normalized size = 6.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r)^3,x)
```

```
[Out] 1/2*b*n/d^3*ln(x)^2-b/r/d^2/(d+e*x^r)*n*ln(x)-1/2*b/r/d/(d+e*x^r)^2*n*ln(x)
+b/r/d^3*ln(d+e*x^r)*n*ln(x)-1/r*a/d^3*ln(d+e*x^r)+1/r*a/d^2/(d+e*x^r)+1/2/
r*a/d/(d+e*x^r)^2+1/r*a/d^3*ln(x^r)-1/4*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*
csgn(I*c)/d/(d+e*x^r)^2+1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^
3*ln(d+e*x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d^3*ln(d+e*x^r)+1/2*I/r*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(x^r)+1/4*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2/d/(d+e*x^r)^2-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2/d^3*ln(d+e*x^r)-1
/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^3*ln(x^r)-1/r*b*ln(c)/d^3
*ln(d+e*x^r)+1/r*b*ln(c)/d^2/(d+e*x^r)+1/2/r*b*ln(c)/d/(d+e*x^r)^2+1/r*b*ln
(c)/d^3*ln(x^r)+1/2*b/r/d/(d+e*x^r)^2*ln(x^n)+b/r/d^3*ln(x^r)*ln(x^n)-b/r^2
*n/d^3*dilog((d+e*x^r)/d)-b/r/d^3*ln(d+e*x^r)*ln(x^n)+b/r/d^2/(d+e*x^r)*ln(
x^n)-1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d^2/(d+e*x^r)-1/4*I/r*b*Pi*csgn(I*c*x^n)^
3/d/(d+e*x^r)^2-b/r/d^3*ln(x^r)*n*ln(x)-1/2*I/r*b*Pi*csgn(I*c*x^n)^3/d^3*ln
(x^r)-1/2*I/r*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)/d^2/(d+e*x^r)+1/2*I/
r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(x^r)+1/2*I/r*b*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)/d^2/(d+e*x^r)-1/2*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d^3*ln(d+e*x^
r)-b/r*n*e/d^2*ln(x)*x^r/(d+e*x^r)^2-1/2*b/r*n*e^2/d^3*ln(x)*(x^r)^2/(d+e*x
^r)^2+1/4*I/r*b*Pi*csgn(I*c*x^n)^2*csgn(I*c)/d/(d+e*x^r)^2+1/2*I/r*b*Pi*csg
n(I*x^n)*csgn(I*c*x^n)^2/d^2/(d+e*x^r)-b/r*n*e/d^3*ln(x)*x^r/(d+e*x^r)-1/2*
b*n/d^2/r^2/(d+e*x^r)+3/2*b*n*ln(d+e*x^r)/d^3/r^2-b/r*n/d^3*ln(x)*ln((d+e*x
^r)/d)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}\,a\left(\frac{2\,ex^{r}+3\,d}{d^{2}e^{2}rx^{2\,r}+2\,d^{3}erx^{r}+d^{4}r}+\frac{2\,\log\left(x\right)}{d^{3}}-\frac{2\,\log\left(\frac{ex^{r}+d}{e}\right)}{d^{3}r}\right)+b\int\frac{\log\left(c\right)+\log\left(x^{n}\right)}{e^{3}xx^{3\,r}+3\,de^{2}xx^{2\,r}+3\,d^{2}exx^{r}+d^{3}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*((2*e*x^r + 3*d)/(d^2*e^2*r*x^(2*r) + 2*d^3*e*r*x^r + d^4*r) + 2*log(
x)/d^3 - 2*log((e*x^r + d)/e)/(d^3*r)) + b*integrate((log(c) + log(x^n))/(e
^3*x*x^(3*r) + 3*d*e^2*x*x^(2*r) + 3*d^2*e*x*x^r + d^3*x), x)
```

Fricas [B] time = 1.60719, size = 959, normalized size = 5.67

$$bd^{2}nr^{2}\log\left(x\right)^{2}+3\,bd^{2}r\log\left(c\right)-bd^{2}n+3\,ad^{2}r+\left(be^{2}nr^{2}\log\left(x\right)^{2}+\left(2\,be^{2}r^{2}\log\left(c\right)-3\,be^{2}nr+2\,ae^{2}r^{2}\right)\log\left(x\right)\right)x^{2\,r}+\left(2\,b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^3,x, algorithm="fricas")
```

```
[Out] 1/2*(b*d^2*n*r^2*log(x)^2 + 3*b*d^2*r*log(c) - b*d^2*n + 3*a*d^2*r + (b*e^2
*n*r^2*log(x)^2 + (2*b*e^2*r^2*log(c) - 3*b*e^2*n*r + 2*a*e^2*r^2)*log(x))*
x^(2*r) + (2*b*d*e*n*r^2*log(x)^2 + 2*b*d*e*r*log(c) - b*d*e*n + 2*a*d*e*r
+ 4*(b*d*e*r^2*log(c) - b*d*e*n*r + a*d*e*r^2)*log(x))*x^r - 2*(b*e^2*n*x^(
2*r) + 2*b*d*e*n*x^r + b*d^2*n)*dilog(-(e*x^r + d)/d + 1) - (2*b*d^2*r*log(
c) - 3*b*d^2*n + 2*a*d^2*r + (2*b*e^2*r*log(c) - 3*b*e^2*n + 2*a*e^2*r)*x^(
2*r) + 2*(2*b*d*e*r*log(c) - 3*b*d*e*n + 2*a*d*e*r)*x^r)*log(e*x^r + d) + 2
*(b*d^2*r^2*log(c) + a*d^2*r^2)*log(x) - 2*(b*e^2*n*r*x^(2*r)*log(x) + 2*b*
d*e*n*r*x^r*log(x) + b*d^2*n*r*log(x))*log((e*x^r + d)/d))/(d^3*e^2*r^2*x^(
2*r) + 2*d^4*e*r^2*x^r + d^5*r^2)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log (cx^n) + a}{(ex^r + d)^3 x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^3*x), x)
```

3.427 $\int \frac{(d+ex^r)^3(a+b\log(cx^n))^2}{x}\,dx$

Optimal. Leaf size=245

$$-\frac{6bd^2enx^r(a+b\log(cx^n))}{r^2}+\frac{3d^2ex^r(a+b\log(cx^n))^2}{r}+\frac{d^3(a+b\log(cx^n))^3}{3bn}-\frac{3bde^2nx^{2r}(a+b\log(cx^n))}{2r^2}+\frac{3de^2x^{2r}(a}{}$$

```
[Out] (6*b^2*d^2*e*n^2*x^r)/r^3 + (3*b^2*d*e^2*n^2*x^(2*r))/(4*r^3) + (2*b^2*e^3*
n^2*x^(3*r))/(27*r^3) - (6*b*d^2*e*n*x^r*(a + b*Log[c*x^n]))/r^2 - (3*b*d*e
^2*n*x^(2*r)*(a + b*Log[c*x^n]))/(2*r^2) - (2*b*e^3*n*x^(3*r)*(a + b*Log[c*
x^n]))/(9*r^2) + (3*d^2*e*x^r*(a + b*Log[c*x^n])^2)/r + (3*d*e^2*x^(2*r)*(a
 + b*Log[c*x^n])^2)/(2*r) + (e^3*x^(3*r)*(a + b*Log[c*x^n])^2)/(3*r) + (d^3
*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.303403, antiderivative size = 245, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {2353, 2302, 30, 2305, 2304}

$$-\frac{6bd^2enx^r(a+b\log(cx^n))}{r^2}+\frac{3d^2ex^r(a+b\log(cx^n))^2}{r}+\frac{d^3(a+b\log(cx^n))^3}{3bn}-\frac{3bde^2nx^{2r}(a+b\log(cx^n))}{2r^2}+\frac{3de^2x^{2r}(a}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^3*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (6*b^2*d^2*e*n^2*x^r)/r^3 + (3*b^2*d*e^2*n^2*x^(2*r))/(4*r^3) + (2*b^2*e^3*
n^2*x^(3*r))/(27*r^3) - (6*b*d^2*e*n*x^r*(a + b*Log[c*x^n]))/r^2 - (3*b*d*e
^2*n*x^(2*r)*(a + b*Log[c*x^n]))/(2*r^2) - (2*b*e^3*n*x^(3*r)*(a + b*Log[c*
x^n]))/(9*r^2) + (3*d^2*e*x^r*(a + b*Log[c*x^n])^2)/r + (3*d*e^2*x^(2*r)*(a
 + b*Log[c*x^n])^2)/(2*r) + (e^3*x^(3*r)*(a + b*Log[c*x^n])^2)/(3*r) + (d^3
*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d+ex^r)^3 (a+b\log(cx^n))^2}{x}\,dx = \int \left(\frac{d^3 (a+b\log(cx^n))^2}{x} + 3d^2ex^{-1+r}(a+b\log(cx^n))^2 + 3de^2x^{-1+2r}(a+b\log(cx^n)$$

$$= d^3 \int \frac{(a+b\log(cx^n))^2}{x}\,dx + \left(3d^2e\right)\int x^{-1+r}(a+b\log(cx^n))^2\,dx + \left(3de^2\right)\int x^{-1+2}$$

$$= \frac{3d^2ex^r(a+b\log(cx^n))^2}{r} + \frac{3de^2x^{2r}(a+b\log(cx^n))^2}{2r} + \frac{e^3x^{3r}(a+b\log(cx^n))^2}{3r} + \frac{d}{}$$

$$= \frac{6b^2d^2en^2x^r}{r^3} + \frac{3b^2de^2n^2x^{2r}}{4r^3} + \frac{2b^2e^3n^2x^{3r}}{27r^3} - \frac{6bd^2enx^r(a+b\log(cx^n))}{r^2} - \frac{3bde^2nx^{2r}}{}$$

Mathematica [A] time = 0.433927, size = 262, normalized size = 1.07

$$\frac{enx^r\left(18a^2r^2\left(18d^2+9dex^r+2e^2x^{2r}\right)-6abnr\left(108d^2+27dex^r+4e^2x^{2r}\right)+b^2n^2\left(648d^2+81dex^r+8e^2x^{2r}\right)\right)+108a^2d^3n}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^3*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (e*n*x^r*(18*a^2*r^2*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)) - 6*a*b*n*r*(108*
d^2 + 27*d*e*x^r + 4*e^2*x^(2*r)) + b^2*n^2*(648*d^2 + 81*d*e*x^r + 8*e^2*x
^(2*r))) + 108*a^2*d^3*n*r^3*Log[x] - 6*b*e*n*r*x^r*(-6*a*r*(18*d^2 + 9*d*e
*x^r + 2*e^2*x^(2*r)) + b*n*(108*d^2 + 27*d*e*x^r + 4*e^2*x^(2*r)))*Log[c*x
^n] + 18*b*r^2*(6*a*d^3*r + b*e*n*x^r*(18*d^2 + 9*d*e*x^r + 2*e^2*x^(2*r)))
*Log[c*x^n]^2 + 36*b^2*d^3*r^3*Log[c*x^n]^3)/(108*n*r^3)
```

Maple [C] time = 0.378, size = 3984, normalized size = 16.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^3*(a+b*ln(c*x^n))^2/x,x)
```

```
[Out] 1/3/r*a^2*e^3*(x^r)^3+1/3*b^2*d^3*n^2*ln(x)^3+ln(c)^2*ln(x)*b^2*d^3+1/6/r*P
i^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*(x^r)^3-1/12/r*Pi^2*b^2
*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*(x^r)^3-1/3/r*Pi^2*b^2*e^3*c
sgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^r)^3+1/6/r*Pi^2*b^2*e^3*csgn(I*x^n)
*csgn(I*c*x^n)^3*csgn(I*c)^2*(x^r)^3-3/8/r*Pi^2*b^2*d*e^2*csgn(I*x^n)^2*csg
n(I*c*x^n)^4*(x^r)^2-1/12/r*Pi^2*b^2*e^3*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^r
)^3+1/6/r*Pi^2*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^r)^3+1/6/r*Pi^2*b^2*e
^3*csgn(I*c*x^n)^5*csgn(I*c)*(x^r)^3-1/12/r*Pi^2*b^2*e^3*csgn(I*c*x^n)^4*cs
gn(I*c)^2*(x^r)^3+6*b^2*d^2*e*n^2*x^r/r^3-1/18*b*(27*I*Pi*b*d*e^2*r*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2+54*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*x^r-36*ln(x)*a*d^3*r^2+4*b*e^3*n*(x^r)^3-12*a*e^3*r*(x^r)^3
-36*ln(c)*ln(x)*b*d^3*r^2+18*b*d^3*n*ln(x)^2*r^2-54*a*d*e^2*r*(x^r)^2-108*a
*d^2*e*r*x^r-12*ln(c)*b*e^3*r*(x^r)^3+27*b*d*e^2*n*(x^r)^2+108*b*d^2*e*n*x^
r-54*I*Pi*b*d^2*e*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-54*I*Pi*b*d^2*e*r*csgn(
I*c*x^n)^2*csgn(I*c)*x^r-6*I*Pi*b*e^3*r*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3
-6*I*Pi*b*e^3*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3+27*I*Pi*b*d*e^2*r*csgn(I*
c*x^n)^3*(x^r)^2-108*ln(c)*b*d^2*e*r*x^r-54*ln(c)*b*d*e^2*r*(x^r)^2+6*I*Pi*
b*e^3*r*csgn(I*c*x^n)^3*(x^r)^3+18*I*Pi*ln(x)*b*d^3*csgn(I*c*x^n)^3*r^2+54*
I*Pi*b*d^2*e*r*csgn(I*c*x^n)^3*x^r-18*I*Pi*ln(x)*b*d^3*csgn(I*x^n)*csgn(I*c
*x^n)^2*r^2-18*I*Pi*ln(x)*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)*r^2+6*I*Pi*b*e^3*
r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-27*I*Pi*b*d*e^2*r*csgn(I*x^n)
*csgn(I*c*x^n)^2*(x^r)^2-27*I*Pi*b*d*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^
2+18*I*Pi*ln(x)*b*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r^2)/r^2*ln(x^n)+
1/6*b^2*(2*e^3*(x^r)^3+6*d^3*ln(x)*r+9*d*e^2*(x^r)^2+18*d^2*e*x^r)/r*ln(x^n
)^2+1/9*I/r^2*Pi*b^2*e^3*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3+3/2*
I/r*ln(c)*Pi*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+3/2*I/r*ln(c)*Pi
*b^2*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3/2*I/r*Pi*a*b*d*e^2*csgn(I*x^
```

n)*csgn(I*c*x^n)^2*(x^r)^2-3/4*I/r^2*Pi*b^2*d*e^2*n*csgn(I*x^n)*csgn(I*c*x^
n)^2*(x^r)^2+3/2*I/r*Pi*a*b*d*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-3/4*I/r
^2*Pi*b^2*d*e^2*n*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+3*I/r*ln(c)*Pi*b^2*d^2*
e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3*I/r*ln(c)*Pi*b^2*d^2*e*csgn(I*c*x^n)^2*
csgn(I*c)*x^r+3*I/r*Pi*a*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-3*I/r^2*Pi
*b^2*d^2*e*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+3*I/r*Pi*a*b*d^2*e*csgn(I*c*x^
n)^2*csgn(I*c)*x^r-3*I/r^2*Pi*b^2*d^2*e*n*csgn(I*c*x^n)^2*csgn(I*c)*x^r-1/3
*I/r*ln(c)*Pi*b^2*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-1/3*I/r*P
i*a*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^3-1/4*Pi^2*ln(x)*b^2*d^
3*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2*Pi^2*ln(x)*b^2*d^3*csgn(I*x^n)*csgn(I*c
*x^n)^5+1/3/r*ln(c)^2*b^2*e^3*(x^r)^3+2/27/r^3*b^2*e^3*n^2*(x^r)^3+3/2/r*a^
2*d*e^2*(x^r)^2+3/r*a^2*d^2*e*x^r+2*ln(c)*ln(x)*a*b*d^3-ln(x)^2*ln(c)*b^2*d
^3*n-ln(x)^2*a*b*d^3*n+ln(x)*a^2*d^3-1/4*Pi^2*ln(x)*b^2*d^3*csgn(I*c*x^n)^6
-3/8/r*Pi^2*b^2*d*e^2*csgn(I*c*x^n)^6*(x^r)^2-3/4/r*Pi^2*b^2*d^2*e*csgn(I*c
*x^n)^6*x^r+3/r*ln(c)*a*b*d*e^2*(x^r)^2-3/2/r^2*ln(c)*b^2*d*e^2*n*(x^r)^2-3
/2/r^2*a*b*d*e^2*n*(x^r)^2+6/r*ln(c)*a*b*d^2*e*x^r-6/r^2*ln(c)*b^2*d^2*e*n*
x^r-6/r^2*a*b*d^2*e*n*x^r+1/2*I*ln(x)^2*Pi*b^2*d^3*n*csgn(I*c*x^n)^3-I*ln(c
)*Pi*ln(x)*b^2*d^3*csgn(I*c*x^n)^3-I*Pi*ln(x)*a*b*d^3*csgn(I*c*x^n)^3+3/4*I
/r^2*Pi*b^2*d*e^2*n*csgn(I*c*x^n)^3*(x^r)^2-3*I/r*ln(c)*Pi*b^2*d^2*e*csgn(I
*c*x^n)^3*x^r-3*I/r*Pi*a*b*d^2*e*csgn(I*c*x^n)^3*x^r+3*I/r^2*Pi*b^2*d^2*e*n
*csgn(I*c*x^n)^3*x^r+3/4/r*Pi^2*b^2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csg
n(I*c)*(x^r)^2-3/8/r*Pi^2*b^2*d*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)
^2*(x^r)^2-3/2/r*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^r)
^2+3/4/r*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*(x^r)^2+3/2
/r*Pi^2*b^2*d^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^r-3/4/r*Pi^2*b^
2*d^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^r-3/r*Pi^2*b^2*d^2*e*cs
gn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*x^r+3/2/r*Pi^2*b^2*d^2*e*csgn(I*x^n)*cs
gn(I*c*x^n)^3*csgn(I*c)^2*x^r+1/3*I/r*ln(c)*Pi*b^2*e^3*csgn(I*x^n)*csgn(I*c
x^n)^2(x^r)^3+1/3*I/r*ln(c)*Pi*b^2*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-
I*ln(c)*Pi*ln(x)*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*ln(x)*a*b
*d^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x)^2*Pi*b^2*d^3*n*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)+1/3*I/r*Pi*a*b*e^3*csgn(I*x^n)*csgn(I*c*x^n)^2
*(x^r)^3-1/9*I/r^2*Pi*b^2*e^3*n*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^3+1/3*I/r
*Pi*a*b*e^3*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^3-1/9*I/r^2*Pi*b^2*e^3*n*csgn(I
*c*x^n)^2*csgn(I*c)*(x^r)^3-3/2*I/r*ln(c)*Pi*b^2*d*e^2*csgn(I*c*x^n)^3*(x^r
)^2-3/2*I/r*Pi*a*b*d*e^2*csgn(I*c*x^n)^3*(x^r)^2+1/2*Pi^2*ln(x)*b^2*d^3*csg
n(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/4*Pi^2*ln(x)*b^2*d^3*csgn(I*x^n)^2*c
sgn(I*c*x^n)^2*csgn(I*c)^2-Pi^2*ln(x)*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n)^4*c
sgn(I*c)+1/2*Pi^2*ln(x)*b^2*d^3*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/2
*Pi^2*ln(x)*b^2*d^3*csgn(I*c*x^n)^5*csgn(I*c)-1/4*Pi^2*ln(x)*b^2*d^3*csgn(I
*c*x^n)^4*csgn(I*c)^2+3/4/r*Pi^2*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^r
)^2+3/4/r*Pi^2*b^2*d*e^2*csgn(I*c*x^n)^5*csgn(I*c)*(x^r)^2-3/8/r*Pi^2*b^2*d
*e^2*csgn(I*c*x^n)^4*csgn(I*c)^2*(x^r)^2-3/4/r*Pi^2*b^2*d^2*e*csgn(I*x^n)^2
*csgn(I*c*x^n)^4*x^r+3/2/r*Pi^2*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x^r+3
/2/r*Pi^2*b^2*d^2*e*csgn(I*c*x^n)^5*csgn(I*c)*x^r-3/4/r*Pi^2*b^2*d^2*e*csgn

```
(I*c*x^n)^4*csgn(I*c)^2*x^r+I*ln(c)*Pi*ln(x)*b^2*d^3*csgn(I*x^n)*csgn(I*c*x
^n)^2+I*ln(c)*Pi*ln(x)*b^2*d^3*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*ln(x)*a*b*d^3
*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*ln(x)*a*b*d^3*csgn(I*c*x^n)^2*csgn(I*c)-1
/3*I/r*ln(c)*Pi*b^2*e^3*csgn(I*c*x^n)^3*(x^r)^3-1/3*I/r*Pi*a*b*e^3*csgn(I*c
*x^n)^3*(x^r)^3+1/9*I/r^2*Pi*b^2*e^3*n*csgn(I*c*x^n)^3*(x^r)^3-1/2*I*ln(x)^
2*Pi*b^2*d^3*n*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x)^2*Pi*b^2*d^3*n*csgn(
I*c*x^n)^2*csgn(I*c)-3/2*I/r*ln(c)*Pi*b^2*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*(x^r)^2-3/2*I/r*Pi*a*b*d*e^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(
x^r)^2+3/4*I/r^2*Pi*b^2*d*e^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*(x^r)^2
-3*I/r*ln(c)*Pi*b^2*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-3*I/r*Pi*
a*b*d^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+3*I/r^2*Pi*b^2*d^2*e*n*cs
gn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-1/12/r*Pi^2*b^2*e^3*csgn(I*c*x^n)^6*(
x^r)^3+2/3/r*ln(c)*a*b*e^3*(x^r)^3-2/9/r^2*ln(c)*b^2*e^3*n*(x^r)^3+3/2/r*ln
(c)^2*b^2*d*e^2*(x^r)^2-2/9/r^2*a*b*e^3*n*(x^r)^3+3/r*ln(c)^2*b^2*d^2*e*x^r
+3/4/r^3*b^2*d*e^2*n^2*(x^r)^2
```

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((d+e*x^r)^3*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.64984, size = 1172, normalized size = 4.78

$$\frac{36\, b^2 d^3 n^2 r^3 \log(x)^3 + 108\left(b^2 d^3 n r^3 \log(c) + a b d^3 n r^3\right)\log(x)^2 + 4\left(9\, b^2 e^3 n^2 r^2 \log(x)^2 + 9\, b^2 e^3 r^2 \log(c)^2 + 2\, b^2 e^3 n^2 - 6\, a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/108*(36*b^2*d^3*n^2*r^3*log(x)^3 + 108*(b^2*d^3*n*r^3*log(c) + a*b*d^3*n*
r^3)*log(x)^2 + 4*(9*b^2*e^3*n^2*r^2*log(x)^2 + 9*b^2*e^3*r^2*log(c)^2 + 2*
b^2*e^3*n^2 - 6*a*b*e^3*n*r + 9*a^2*e^3*r^2 - 6*(b^2*e^3*n*r - 3*a*b*e^3*r^
2)*log(c) + 6*(3*b^2*e^3*n*r^2*log(c) - b^2*e^3*n^2*r + 3*a*b*e^3*n*r^2)*lo
g(x))*x^(3*r) + 81*(2*b^2*d*e^2*n^2*r^2*log(x)^2 + 2*b^2*d*e^2*r^2*log(c)^2
```

```
 + b^2*d*e^2*n^2 - 2*a*b*d*e^2*n*r + 2*a^2*d*e^2*r^2 - 2*(b^2*d*e^2*n*r - 2
*a*b*d*e^2*r^2)*log(c) + 2*(2*b^2*d*e^2*n*r^2*log(c) - b^2*d*e^2*n^2*r + 2*
a*b*d*e^2*n*r^2)*log(x))*x^(2*r) + 324*(b^2*d^2*e*n^2*r^2*log(x)^2 + b^2*d^
2*e*r^2*log(c)^2 + 2*b^2*d^2*e*n^2 - 2*a*b*d^2*e*n*r + a^2*d^2*e*r^2 - 2*(b
^2*d^2*e*n*r - a*b*d^2*e*r^2)*log(c) + 2*(b^2*d^2*e*n*r^2*log(c) - b^2*d^2*
e*n^2*r + a*b*d^2*e*n*r^2)*log(x))*x^r + 108*(b^2*d^3*r^3*log(c)^2 + 2*a*b*
d^3*r^3*log(c) + a^2*d^3*r^3)*log(x))/r^3
```

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((d+e*x**r)**3*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.33084, size = 856, normalized size = 3.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^3*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] 1/3*b^2*d^3*n^2*log(x)^3 + 3*b^2*d^2*n^2*x^r*e*log(x)^2/r + b^2*d^3*n*log(c
)*log(x)^2 + 6*b^2*d^2*n*x^r*e*log(c)*log(x)/r + b^2*d^3*log(c)^2*log(x) +
a*b*d^3*n*log(x)^2 + 3/2*b^2*d*n^2*x^(2*r)*e^2*log(x)^2/r + 3*b^2*d^2*x^r*e
*log(c)^2/r - 6*b^2*d^2*n^2*x^r*e*log(x)/r^2 + 6*a*b*d^2*n*x^r*e*log(x)/r +
 2*a*b*d^3*log(c)*log(x) + 3*b^2*d*n*x^(2*r)*e^2*log(c)*log(x)/r + 1/3*b^2*
n^2*x^(3*r)*e^3*log(x)^2/r - 6*b^2*d^2*n*x^r*e*log(c)/r^2 + 6*a*b*d^2*x^r*e
*log(c)/r + 3/2*b^2*d*x^(2*r)*e^2*log(c)^2/r + a^2*d^3*log(x) - 3/2*b^2*d*n
^2*x^(2*r)*e^2*log(x)/r^2 + 3*a*b*d*n*x^(2*r)*e^2*log(x)/r + 2/3*b^2*n*x^(3
*r)*e^3*log(c)*log(x)/r + 6*b^2*d^2*n^2*x^r*e/r^3 - 6*a*b*d^2*n*x^r*e/r^2 +
 3*a^2*d^2*x^r*e/r - 3/2*b^2*d*n*x^(2*r)*e^2*log(c)/r^2 + 3*a*b*d*x^(2*r)*e
^2*log(c)/r + 1/3*b^2*x^(3*r)*e^3*log(c)^2/r - 2/9*b^2*n^2*x^(3*r)*e^3*log(
x)/r^2 + 2/3*a*b*n*x^(3*r)*e^3*log(x)/r + 3/4*b^2*d*n^2*x^(2*r)*e^2/r^3 - 3
/2*a*b*d*n*x^(2*r)*e^2/r^2 + 3/2*a^2*d*x^(2*r)*e^2/r - 2/9*b^2*n*x^(3*r)*e^
```

```
3*log(c)/r^2 + 2/3*a*b*x^(3*r)*e^3*log(c)/r + 2/27*b^2*n^2*x^(3*r)*e^3/r^3
- 2/9*a*b*n*x^(3*r)*e^3/r^2 + 1/3*a^2*x^(3*r)*e^3/r
```

3.428 $\int \frac{(d+ex^r)^2(a+b\log(cx^n))^2}{x}\,dx$

Optimal. Leaf size=161

$$\frac{d^2(a+b\log(cx^n))^3}{3bn}-\frac{4bdenx^r(a+b\log(cx^n))}{r^2}+\frac{2dex^r(a+b\log(cx^n))^2}{r}-\frac{be^2nx^{2r}(a+b\log(cx^n))}{2r^2}+\frac{e^2x^{2r}(a+b\log}{2r}$$

```
[Out] (4*b^2*d*e*n^2*x^r)/r^3 + (b^2*e^2*n^2*x^(2*r))/(4*r^3) - (4*b*d*e*n*x^r*(a
 + b*Log[c*x^n]))/r^2 - (b*e^2*n*x^(2*r)*(a + b*Log[c*x^n]))/(2*r^2) + (2*d
*e*x^r*(a + b*Log[c*x^n])^2)/r + (e^2*x^(2*r)*(a + b*Log[c*x^n])^2)/(2*r) +
 (d^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.236719, antiderivative size = 161, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {2353, 2302, 30, 2305, 2304}

$$\frac{d^2(a+b\log(cx^n))^3}{3bn}-\frac{4bdenx^r(a+b\log(cx^n))}{r^2}+\frac{2dex^r(a+b\log(cx^n))^2}{r}-\frac{be^2nx^{2r}(a+b\log(cx^n))}{2r^2}+\frac{e^2x^{2r}(a+b\log}{2r}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^2*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (4*b^2*d*e*n^2*x^r)/r^3 + (b^2*e^2*n^2*x^(2*r))/(4*r^3) - (4*b*d*e*n*x^r*(a
 + b*Log[c*x^n]))/r^2 - (b*e^2*n*x^(2*r)*(a + b*Log[c*x^n]))/(2*r^2) + (2*d
*e*x^r*(a + b*Log[c*x^n])^2)/r + (e^2*x^(2*r)*(a + b*Log[c*x^n])^2)/(2*r) +
 (d^2*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{(d+ex^r)^2 (a+b\log(cx^n))^2}{x}\,dx = \int \left(\frac{d^2 (a+b\log(cx^n))^2}{x} + 2dex^{-1+r}(a+b\log(cx^n))^2 + e^2x^{-1+2r}(a+b\log(cx^n))^2\right) d$$

$$= d^2 \int \frac{(a+b\log(cx^n))^2}{x}\,dx + (2de)\int x^{-1+r}(a+b\log(cx^n))^2\,dx + e^2 \int x^{-1+2r}(a+b$$

$$= \frac{2dex^r(a+b\log(cx^n))^2}{r} + \frac{e^2x^{2r}(a+b\log(cx^n))^2}{2r} + \frac{d^2\,\mathrm{Subst}\left(\int x^2\,dx, x, a+b\log(c\right.}{bn}$$

$$= \frac{4b^2den^2x^r}{r^3} + \frac{b^2e^2n^2x^{2r}}{4r^3} - \frac{4bdenx^r(a+b\log(cx^n))}{r^2} - \frac{be^2nx^{2r}(a+b\log(cx^n))}{2r^2} + \frac{2de}{}$$

Mathematica [A] time = 0.267785, size = 179, normalized size = 1.11

$$\frac{3enx^r\left(2a^2r^2(4d+ex^r) - 2abnr(8d+ex^r) + b^2n^2(16d+ex^r)\right) + 12a^2d^2nr^3\log(x) + 6br^2\log^2(cx^n)\left(2ad^2r + benx^r(4d+\right.}{12nr^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)^2*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (3*e*n*x^r*(2*a^2*r^2*(4*d + e*x^r) - 2*a*b*n*r*(8*d + e*x^r) + b^2*n^2*(16
*d + e*x^r)) + 12*a^2*d^2*n*r^3*Log[x] - 6*b*e*n*r*x^r*(-2*a*r*(4*d + e*x^r
) + b*n*(8*d + e*x^r))*Log[c*x^n] + 6*b*r^2*(2*a*d^2*r + b*e*n*x^r*(4*d + e
```

```
*x^r))*Log[c*x^n]^2 + 4*b^2*d^2*r^3*Log[c*x^n]^3)/(12*n*r^3)
```

Maple [C] time = 0.326, size = 2844, normalized size = 17.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^2*(a+b*ln(c*x^n))^2/x,x)
```

```
[Out] -2*I/r*Pi*a*b*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+2*I/r^2*Pi*b^2*d*
e*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-4/r^2*ln(c)*b^2*d*e*n*x^r-4/r^2
*a*b*d*e*n*x^r-1/8/r*Pi^2*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4*(x^r)^2+1/4
/r*Pi^2*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^5*(x^r)^2+1/4/r*Pi^2*b^2*e^2*csgn
(I*c*x^n)^5*csgn(I*c)*(x^r)^2-1/8/r*Pi^2*b^2*e^2*csgn(I*c*x^n)^4*csgn(I*c)^
2*(x^r)^2-1/2/r*Pi^2*b^2*d*e*csgn(I*c*x^n)^6*x^r+4/r*ln(c)*a*b*d*e*x^r-1/4*
ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2*ln(x)*Pi^2*b^2*d^2*csg
n(I*x^n)*csgn(I*c*x^n)^5+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*c*x^n)^5*csgn(I*c)-1
/4*ln(x)*Pi^2*b^2*d^2*csgn(I*c*x^n)^4*csgn(I*c)^2+1/2*I/r*ln(c)*Pi*b^2*e^2*
csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2+1/2*I/r*Pi*a*b*e^2*csgn(I*x^n)*csgn(I*c*x
^n)^2*(x^r)^2-1/4*I/r^2*Pi*b^2*e^2*n*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1/
2*I/r*Pi*a*b*e^2*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-1/4*I/r^2*Pi*b^2*e^2*n*c
sgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2*I/r*ln(c)*Pi*b^2*d*e*csgn(I*c*x^n)^3*x^r
-2*I/r*Pi*a*b*d*e*csgn(I*c*x^n)^3*x^r+2*I/r^2*Pi*b^2*d*e*n*csgn(I*c*x^n)^3*
x^r+1/2*I/r*ln(c)*Pi*b^2*e^2*csgn(I*x^n)*csgn(I*c*x^n)^2*(x^r)^2+1/4/r*Pi^2
*b^2*e^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*(x^r)^2-1/8/r*Pi^2*b^2*e^2
*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*(x^r)^2-1/2/r*Pi^2*b^2*e^2*csgn(
I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)*(x^r)^2+1/4/r*Pi^2*b^2*e^2*csgn(I*x^n)*csg
n(I*c*x^n)^3*csgn(I*c)^2*(x^r)^2-1/2/r*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*
x^n)^4*x^r+1/r*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x^r+1/r*Pi^2*b^2*d*
e*csgn(I*c*x^n)^5*csgn(I*c)*x^r-1/2/r*Pi^2*b^2*d*e*csgn(I*c*x^n)^4*csgn(I*c
)^2*x^r+1/4*I/r^2*Pi*b^2*e^2*n*csgn(I*c*x^n)^3*(x^r)^2-1/2*I/r*ln(c)*Pi*b^2
*e^2*csgn(I*c*x^n)^3*(x^r)^2-1/2*I/r*Pi*a*b*e^2*csgn(I*x^n)*csgn(I*c*x^n)*c
sgn(I*c)*(x^r)^2+1/4*I/r^2*Pi*b^2*e^2*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
*(x^r)^2+2*I/r*ln(c)*Pi*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2*I/r*ln(c)
*Pi*b^2*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*I/r*Pi*a*b*d*e*csgn(I*x^n)*csgn
(I*c*x^n)^2*x^r-2*I/r^2*Pi*b^2*d*e*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+2*I/r*
Pi*a*b*d*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2*I/r^2*Pi*b^2*d*e*n*csgn(I*c*x^n)
^2*csgn(I*c)*x^r+1/2*b^2*(2*d^2*ln(x)*r+e^2*(x^r)^2+4*d*e*x^r)/r*ln(x^n)^2-
1/2*b*(2*I*Pi*ln(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*r^2-2*I*Pi*ln
(x)*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2*r^2+I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c
*x^n)*csgn(I*c)*(x^r)^2-4*I*Pi*b*d*e*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r-I*Pi*b
```

```
*e^2*r*csgn(I*c*x^n)^2*csgn(I*c)*(x^r)^2-2*I*Pi*ln(x)*b*d^2*csgn(I*c*x^n)^2
*csgn(I*c)*r^2+2*I*Pi*ln(x)*b*d^2*csgn(I*c*x^n)^3*r^2+4*I*Pi*b*d*e*r*csgn(I
*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I*Pi*b*e^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*
(x^r)^2+4*I*Pi*b*d*e*r*csgn(I*c*x^n)^3*x^r-4*I*Pi*b*d*e*r*csgn(I*x^n)*csgn(
I*c*x^n)^2*x^r+I*Pi*b*e^2*r*csgn(I*c*x^n)^3*(x^r)^2+2*b*d^2*n*ln(x)^2*r^2-4
*ln(c)*ln(x)*b*d^2*r^2-2*ln(c)*b*e^2*r*(x^r)^2-8*ln(c)*b*d*e*r*x^r-4*ln(x)*
a*d^2*r^2-2*a*e^2*r*(x^r)^2+b*e^2*n*(x^r)^2-8*a*d*e*r*x^r+8*b*d*e*n*x^r)/r^
2*ln(x^n)+ln(x)*a^2*d^2+1/2/r*a^2*e^2*(x^r)^2+1/r*Pi^2*b^2*d*e*csgn(I*x^n)^
2*csgn(I*c*x^n)^3*csgn(I*c)*x^r-1/2/r*Pi^2*b^2*d*e*csgn(I*x^n)^2*csgn(I*c*x
^n)^2*csgn(I*c)^2*x^r-2/r*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c
)*x^r+1/r*Pi^2*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x^r+2/r*a^2*
d*e*x^r+1/2/r*ln(c)^2*b^2*e^2*(x^r)^2+1/4/r^3*b^2*e^2*n^2*(x^r)^2+1/2*ln(x)
*Pi^2*b^2*d^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/4*ln(x)*Pi^2*b^2*d^
2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)*
csgn(I*c*x^n)^4*csgn(I*c)-I*ln(x)*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^3-ln(x)^2*
a*b*n*d^2-ln(x)^2*ln(c)*b^2*d^2*n+I*ln(x)*ln(c)*Pi*b^2*d^2*csgn(I*x^n)*csgn
(I*c*x^n)^2+I*ln(x)*ln(c)*Pi*b^2*d^2*csgn(I*c*x^n)^2*csgn(I*c)+I*ln(x)*Pi*a
*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I*ln(x)*Pi*a*b*d^2*csgn(I*c*x^n)^2*csgn(
I*c)+1/2*ln(x)*Pi^2*b^2*d^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2-I*ln(x)
*Pi*a*b*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1/2*I*ln(x)^2*Pi*b^2*d^2*n*
csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/r*ln(c)*Pi*b^2*e^2*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)*(x^r)^2-1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*x^n)*csgn(I
*c*x^n)^2-1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*c*x^n)^2*csgn(I*c)-1/8/r*Pi^2*b
^2*e^2*csgn(I*c*x^n)^6*(x^r)^2+1/r*ln(c)*a*b*e^2*(x^r)^2-1/2/r^2*ln(c)*b^2*
e^2*n*(x^r)^2+2/r*ln(c)^2*b^2*d*e*x^r-1/2/r^2*a*b*e^2*n*(x^r)^2-2*I/r*ln(c)
*Pi*b^2*d*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-1/4*ln(x)*Pi^2*b^2*d^2*
csgn(I*c*x^n)^6+ln(x)*ln(c)^2*b^2*d^2+1/3*b^2*d^2*n^2*ln(x)^3+4*b^2*d*e*n^2
*x^r/r^3-1/2*I/r*Pi*a*b*e^2*csgn(I*c*x^n)^3*(x^r)^2-I*ln(x)*Pi*a*b*d^2*csgn
(I*c*x^n)^3+1/2*I*ln(x)^2*Pi*b^2*d^2*n*csgn(I*c*x^n)^3-I*ln(x)*ln(c)*Pi*b^2
*d^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*ln(x)*ln(c)*a*b*d^2
```

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((d+e*x^r)^2*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.64594, size = 806, normalized size = 5.01

$$\frac{4\,b^2d^2n^2r^3\log\left(x\right)^3+12\left(b^2d^2nr^3\log\left(c\right)+abd^2nr^3\right)\log\left(x\right)^2+3\left(2\,b^2e^2n^2r^2\log\left(x\right)^2+2\,b^2e^2r^2\log\left(c\right)^2+b^2e^2n^2-2\,abe^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/12*(4*b^2*d^2*n^2*r^3*log(x)^3 + 12*(b^2*d^2*n*r^3*log(c) + a*b*d^2*n*r^3
)*log(x)^2 + 3*(2*b^2*e^2*n^2*r^2*log(x)^2 + 2*b^2*e^2*r^2*log(c)^2 + b^2*e
^2*n^2 - 2*a*b*e^2*n*r + 2*a^2*e^2*r^2 - 2*(b^2*e^2*n*r - 2*a*b*e^2*r^2)*lo
g(c) + 2*(2*b^2*e^2*n*r^2*log(c) - b^2*e^2*n^2*r + 2*a*b*e^2*n*r^2)*log(x))
*x^(2*r) + 24*(b^2*d*e*n^2*r^2*log(x)^2 + b^2*d*e*r^2*log(c)^2 + 2*b^2*d*e*
n^2 - 2*a*b*d*e*n*r + a^2*d*e*r^2 - 2*(b^2*d*e*n*r - a*b*d*e*r^2)*log(c) +
2*(b^2*d*e*n*r^2*log(c) - b^2*d*e*n^2*r + a*b*d*e*n*r^2)*log(x))*x^r + 12*(
b^2*d^2*r^3*log(c)^2 + 2*a*b*d^2*r^3*log(c) + a^2*d^2*r^3)*log(x))/r^3
```

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((d+e*x**r)**2*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.29143, size = 568, normalized size = 3.53

$$\frac{1}{3}\,b^2d^2n^2\log\left(x\right)^3+\frac{2\,b^2dn^2x^re\log\left(x\right)^2}{r}+b^2d^2n\log\left(c\right)\log\left(x\right)^2+\frac{4\,b^2dnx^re\log\left(c\right)\log\left(x\right)}{r}+b^2d^2\log\left(c\right)^2\log\left(x\right)+abd^2n$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^2*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] 1/3*b^2*d^2*n^2*log(x)^3 + 2*b^2*d*n^2*x^r*e*log(x)^2/r + b^2*d^2*n*log(c)*
log(x)^2 + 4*b^2*d*n*x^r*e*log(c)*log(x)/r + b^2*d^2*log(c)^2*log(x) + a*b*
```

```
d^2*n*log(x)^2 + 1/2*b^2*n^2*x^(2*r)*e^2*log(x)^2/r + 2*b^2*d*x^r*e*log(c)^
2/r - 4*b^2*d*n^2*x^r*e*log(x)/r^2 + 4*a*b*d*n*x^r*e*log(x)/r + 2*a*b*d^2*l
og(c)*log(x) + b^2*n*x^(2*r)*e^2*log(c)*log(x)/r - 4*b^2*d*n*x^r*e*log(c)/r
^2 + 4*a*b*d*x^r*e*log(c)/r + 1/2*b^2*x^(2*r)*e^2*log(c)^2/r + a^2*d^2*log(
x) - 1/2*b^2*n^2*x^(2*r)*e^2*log(x)/r^2 + a*b*n*x^(2*r)*e^2*log(x)/r + 4*b^
2*d*n^2*x^r*e/r^3 - 4*a*b*d*n*x^r*e/r^2 + 2*a^2*d*x^r*e/r - 1/2*b^2*n*x^(2*
r)*e^2*log(c)/r^2 + a*b*x^(2*r)*e^2*log(c)/r + 1/4*b^2*n^2*x^(2*r)*e^2/r^3
- 1/2*a*b*n*x^(2*r)*e^2/r^2 + 1/2*a^2*x^(2*r)*e^2/r
```

3.429 $\int \frac{(d+ex^r)(a+b\log(cx^n))^2}{x}\,dx$

Optimal. Leaf size=80

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{2benx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{ex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}+\frac{2b^2en^2x^r}{r^3}$$

```
[Out] (2*b^2*e*n^2*x^r)/r^3 - (2*b*e*n*x^r*(a + b*Log[c*x^n]))/r^2 + (e*x^r*(a +
b*Log[c*x^n])^2)/r + (d*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rubi [A] time = 0.139085, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2353, 2302, 30, 2305, 2304}

$$\frac{d\left(a+b\log\left(cx^n\right)\right)^3}{3bn}-\frac{2benx^r\left(a+b\log\left(cx^n\right)\right)}{r^2}+\frac{ex^r\left(a+b\log\left(cx^n\right)\right)^2}{r}+\frac{2b^2en^2x^r}{r^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (2*b^2*e*n^2*x^r)/r^3 - (2*b*e*n*x^r*(a + b*Log[c*x^n]))/r^2 + (e*x^r*(a +
b*Log[c*x^n])^2)/r + (d*(a + b*Log[c*x^n])^3)/(3*b*n)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2305

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbo
l] :> Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n])^p)/(d*(m + 1)), x] - Dist[(b*n
*p)/(m + 1), Int[(d*x)^m*(a + b*Log[c*x^n])^(p - 1), x], x] /; FreeQ[{a, b,
 c, d, m, n}, x] && NeQ[m, -1] && GtQ[p, 0]
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{(d+ex^r)(a+b\log(cx^n))^2}{x}\,dx &= \int \left(\frac{d(a+b\log(cx^n))^2}{x}+ex^{-1+r}(a+b\log(cx^n))^2\right)dx\\ &= d\int \frac{(a+b\log(cx^n))^2}{x}\,dx+e\int x^{-1+r}(a+b\log(cx^n))^2\,dx\\ &= \frac{ex^r(a+b\log(cx^n))^2}{r}+\frac{d\,\mathrm{Subst}\left(\int x^2\,dx,x,a+b\log(cx^n)\right)}{bn}-\frac{(2ben)\int x^{-1+r}(a+b\log}{r}\\ &= \frac{2b^2en^2x^r}{r^3}-\frac{2benx^r(a+b\log(cx^n))}{r^2}+\frac{ex^r(a+b\log(cx^n))^2}{r}+\frac{d(a+b\log(cx^n))^3}{3bn}\end{aligned}$$

Mathematica [A] time = 0.143085, size = 109, normalized size = 1.36

$$\frac{ex^r\left(a^2r^2-2abnr+2b^2n^2\right)}{r^3}+a^2d\log(x)+\frac{b\log^2(cx^n)(adr+benx^r)}{nr}-\frac{2bex^r(bn-ar)\log(cx^n)}{r^2}+\frac{b^2d\log^3(cx^n)}{3n}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^r)*(a + b*Log[c*x^n])^2)/x,x]
```

```
[Out] (e*(2*b^2*n^2 - 2*a*b*n*r + a^2*r^2)*x^r)/r^3 + a^2*d*Log[x] - (2*b*e*(b*n
- a*r)*x^r*Log[c*x^n])/r^2 + (b*(a*d*r + b*e*n*x^r)*Log[c*x^n]^2)/(n*r) + (
b^2*d*Log[c*x^n]^3)/(3*n)
```

Maple [C] time = 0.279, size = 1712, normalized size = 21.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)*(a+b*ln(c*x^n))^2/x,x)
```

```
[Out] I/r*Pi*ln(c)*b^2*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+I/r*Pi*ln(c)*b^2*e*csgn(I*
x^n)*csgn(I*c*x^n)^2*x^r+I/r*Pi*a*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r+I/r*Pi*
a*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-I/r^2*Pi*b^2*e*n*csgn(I*c*x^n)^2*csgn
(I*c)*x^r-I/r^2*Pi*b^2*e*n*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r+1/2*I*Pi*b^2*d*n
*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*ln(x)^2-I*Pi*ln(c)*ln(x)*b^2*d*csgn(I*
x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*ln(x)*a*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csg
n(I*c)-1/4/r*Pi^2*b^2*e*csgn(I*c*x^n)^6*x^r+2/r*ln(c)*a*b*e*x^r-2/r^2*ln(c)
*b^2*e*n*x^r-2/r^2*a*b*e*n*x^r+b^2*(d*r*ln(x)+e*x^r)/r*ln(x^n)^2-b*(-I*Pi*l
n(x)*b*d*csgn(I*x^n)*csgn(I*c*x^n)^2*r^2+I*Pi*ln(x)*b*d*csgn(I*x^n)*csgn(I*
c*x^n)*csgn(I*c)*r^2+I*Pi*ln(x)*b*d*csgn(I*c*x^n)^3*r^2-I*Pi*ln(x)*b*d*csgn
(I*c*x^n)^2*csgn(I*c)*r^2-I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r*r+I*Pi*b
*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r+I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r
-I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r*r+b*d*n*ln(x)^2*r^2-2*ln(c)*ln(x)*b
*d*r^2-2*ln(c)*b*e*x^r*r-2*ln(x)*a*d*r^2-2*x^r*a*e*r+2*x^r*b*e*n)/r^2*ln(x^
n)+1/r*a^2*e*x^r-1/4/r*Pi^2*b^2*e*csgn(I*c*x^n)^4*csgn(I*c)^2*x^r+1/2/r*Pi^
2*b^2*e*csgn(I*c*x^n)^5*csgn(I*c)*x^r-1/4/r*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I
*c*x^n)^4*x^r+1/2/r*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^5*x^r+1/2*I*Pi*b^2
*d*n*csgn(I*c*x^n)^3*ln(x)^2-I*Pi*ln(c)*ln(x)*b^2*d*csgn(I*c*x^n)^3-I*Pi*ln
(x)*a*b*d*csgn(I*c*x^n)^3+2*b^2*e*n^2*x^r/r^3+ln(x)*a^2*d-1/4*Pi^2*ln(x)*b^
2*d*csgn(I*c*x^n)^6+1/r*ln(c)^2*b^2*e*x^r+ln(x)*ln(c)^2*b^2*d+1/3*b^2*d*n^2
*ln(x)^3-ln(x)^2*a*b*n*d-ln(x)^2*ln(c)*b^2*d*n+1/2*Pi^2*ln(x)*b^2*d*csgn(I*
c*x^n)^5*csgn(I*c)-1/4*Pi^2*ln(x)*b^2*d*csgn(I*c*x^n)^4*csgn(I*c)^2-1/4*Pi^
2*ln(x)*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^4+1/2*Pi^2*ln(x)*b^2*d*csgn(I*x^n
)*csgn(I*c*x^n)^5+I*Pi*ln(c)*ln(x)*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*l
n(x)*a*b*d*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*ln(x)*a*b*d*csgn(I*x^n)*csgn(I*c*
x^n)^2-1/4/r*Pi^2*b^2*e*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2*x^r+1/2/r
*Pi^2*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2*x^r+1/2/r*Pi^2*b^2*e*cs
gn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)*x^r-1/r*Pi^2*b^2*e*csgn(I*x^n)*csgn(I
*c*x^n)^4*csgn(I*c)*x^r+I/r^2*Pi*b^2*e*n*csgn(I*c*x^n)^3*x^r+2*ln(x)*ln(c)*
a*b*d+I/r^2*Pi*b^2*e*n*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I/r*Pi*ln(c)
*b^2*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I/r*Pi*a*b*e*csgn(I*x^n)*csg
n(I*c*x^n)*csgn(I*c)*x^r-Pi^2*ln(x)*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(
I*c)+1/2*Pi^2*ln(x)*b^2*d*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+1/2*Pi^2*
ln(x)*b^2*d*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-1/4*Pi^2*ln(x)*b^2*d*cs
gn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+I*Pi*ln(c)*ln(x)*b^2*d*csgn(I*c*x^n
```

```
)^2*csgn(I*c)-I/r*Pi*ln(c)*b^2*e*csgn(I*c*x^n)^3*x^r-I/r*Pi*a*b*e*csgn(I*c*
x^n)^3*x^r-1/2*I*Pi*b^2*d*n*csgn(I*c*x^n)^2*csgn(I*c)*ln(x)^2-1/2*I*Pi*b^2*
d*n*csgn(I*x^n)*csgn(I*c*x^n)^2*ln(x)^2
```

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((d+e*x^r)*(a+b*log(c*x^n))^2/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.60679, size = 454, normalized size = 5.68

$$\frac{b^2dn^2r^3\log(x)^3 + 3\left(b^2dnr^3\log(c) + abdnr^3\right)\log(x)^2 + 3\left(b^2en^2r^2\log(x)^2 + b^2er^2\log(c)^2 + 2\,b^2en^2 - 2\,abenr + a^2er^2 - \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))^2/x,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*d*n^2*r^3*log(x)^3 + 3*(b^2*d*n*r^3*log(c) + a*b*d*n*r^3)*log(x)^2
 + 3*(b^2*e*n^2*r^2*log(x)^2 + b^2*e*r^2*log(c)^2 + 2*b^2*e*n^2 - 2*a*b*e*n
*r + a^2*e*r^2 - 2*(b^2*e*n*r - a*b*e*r^2)*log(c) + 2*(b^2*e*n*r^2*log(c) -
 b^2*e*n^2*r + a*b*e*n*r^2)*log(x))*x^r + 3*(b^2*d*r^3*log(c)^2 + 2*a*b*d*r
^3*log(c) + a^2*d*r^3)*log(x))/r^3
```

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((d+e*x**r)*(a+b*ln(c*x**n))**2/x,x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.32681, size = 296, normalized size = 3.7

$$\frac{1}{3}\,b^2dn^2\log\left(x\right)^3+\frac{b^2n^2x^re\log\left(x\right)^2}{r}+b^2dn\log\left(c\right)\log\left(x\right)^2+\frac{2\,b^2nx^re\log\left(c\right)\log\left(x\right)}{r}+b^2d\log\left(c\right)^2\log\left(x\right)+abdn\log\left(x\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)*(a+b*log(c*x^n))^2/x,x, algorithm="giac")
```

```
[Out] 1/3*b^2*d*n^2*log(x)^3 + b^2*n^2*x^r*e*log(x)^2/r + b^2*d*n*log(c)*log(x)^2
 + 2*b^2*n*x^r*e*log(c)*log(x)/r + b^2*d*log(c)^2*log(x) + a*b*d*n*log(x)^2
 + b^2*x^r*e*log(c)^2/r - 2*b^2*n^2*x^r*e*log(x)/r^2 + 2*a*b*n*x^r*e*log(x)
/r + 2*a*b*d*log(c)*log(x) - 2*b^2*n*x^r*e*log(c)/r^2 + 2*a*b*x^r*e*log(c)/
r + a^2*d*log(x) + 2*b^2*n^2*x^r*e/r^3 - 2*a*b*n*x^r*e/r^2 + a^2*x^r*e/r
```

3.430 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)}\,dx$

Optimal. Leaf size=94

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{dr^2}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{dr^3}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))^2}{dr}$$

```
[Out] -(((a + b*Log[c*x^n])^2*Log[1 + d/(e*x^r)])/(d*r)) + (2*b*n*(a + b*Log[c*x^
n])*PolyLog[2, -(d/(e*x^r))])/(d*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))]
)/(d*r^3)
```

Rubi [A] time = 0.135188, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.12, Rules used = {2345, 2374, 6589}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{dr^2}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{dr^3}-\frac{\log\left(\frac{dx^{-r}}{e}+1\right)(a+b\log(cx^n))^2}{dr}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)),x]
```

```
[Out] -(((a + b*Log[c*x^n])^2*Log[1 + d/(e*x^r)])/(d*r)) + (2*b*n*(a + b*Log[c*x^
n])*PolyLog[2, -(d/(e*x^r))])/(d*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))]
)/(d*r^3)
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
```

```
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)}dx = -\frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{(2bn)\int\frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{x}dx}{dr}$$
$$= -\frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{2bn(a+b\log(cx^n))\,\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}-\frac{\left(2b^2n^2\right)\int\frac{\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{x}d}{dr^2}$$
$$= -\frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{dr}+\frac{2bn(a+b\log(cx^n))\,\mathrm{Li}_2\left(-\frac{dx^{-r}}{e}\right)}{dr^2}+\frac{2b^2n^2\mathrm{Li}_3\left(-\frac{dx^{-r}}{e}\right)}{dr^3}$$

Mathematica [B] time = 0.293643, size = 270, normalized size = 2.87

$$-\frac{-2abnr\left(\mathrm{PolyLog}\left(2,\frac{ex^r}{d}+1\right)+\left(\log\left(-\frac{ex^r}{d}\right)-r\log(x)\right)\log(d+ex^r)+\frac{1}{2}r^2\log^2(x)\right)+2b^2nr(n\log(x)-\log(cx^n))\left(\mathrm{Po}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)),x]
```

```
[Out] -((a^2*r^2*Log[d - d*x^r] - 2*a*b*r^2*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r
] + b^2*r^2*(-(n*Log[x]) + Log[c*x^n])^2*Log[d - d*x^r] - 2*a*b*n*r*((r^2*L
og[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2,
1 + (e*x^r)/d]) + 2*b^2*n*r*(n*Log[x] - Log[c*x^n])*((r^2*Log[x]^2)/2 + (-(
r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d])
+ b^2*n^2*(r^2*Log[x]^2*Log[1 + d/(e*x^r)] - 2*r*Log[x]*PolyLog[2, -(d/(e*x
^r))] - 2*PolyLog[3, -(d/(e*x^r))]))/(d*r^3))
```

Maple [C] time = 0.236, size = 3012, normalized size = 32.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*ln(c*x^n))^2/x/(d+e*x^r),x)

[Out] 1/4/r/d*ln(d+e*x^r)*Pi^2*b^2*csgn(I*c*x^n)^6-1/4/r/d*ln(x^r)*Pi^2*b^2*csgn(I*c*x^n)^6+b^2/r/d*ln(x^r)*ln(x^n)^2+I/r/d*ln(d+e*x^r)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/r/d*ln(d+e*x^r)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/r^2*n/d*polylog(2,-e*x^r/d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/r/d*ln(d+e*x^r)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I/r/d*ln(d+e*x^r)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+I/r/d*ln(d+e*x^r)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/r/d*ln(x^r)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/r/d*ln(x^r)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/r/d*ln(x^r)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I/r/d*ln(d+e*x^r)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I/r/d*ln(x^r)*Pi*a*b*csgn(I*c*x^n)^2*csgn(I*c)+I/r/d*ln(x^r)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^3+I/r/d*ln(x^r)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/r*n/d*ln(x)*ln(1+e*x^r/d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/r*n/d*ln(x)*ln(1+e*x^r/d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/r/d*ln(x^r)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/r/d*ln(d+e*x^r)*ln(x^n)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/r/d*ln(d+e*x^r)*Pi*a*b*csgn(I*c*x^n)^2*csgn(I*c)-I/r/d*ln(d+e*x^r)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2+2/r/d*ln(d+e*x^r)*n*ln(x)*b^2*ln(c)-I/r/d*ln(x^r)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+b^2/d*ln(x)^2*ln(x^n)*n-b^2/r/d*ln(d+e*x^r)*ln(x)^2*n^2+b^2/r/d*ln(x^r)*ln(x)^2*n^2+b^2/r*n^2/d*ln(x)^2*ln(1+e*x^r/d)-2*b^2/r^2*n/d*polylog(2,-e*x^r/d)*ln(x^n)+2/r/d*ln(x^r)*ln(c)*a*b-2*b/r/d*ln(d+e*x^r)*ln(x^n)*a+2*b^2/r^3*n^2/d*polylog(3,-e*x^r/d)-1/r/d*ln(d+e*x^r)*ln(c)^2*b^2+1/r/d*ln(x^r)*ln(c)^2*b^2+1/4/r/d*ln(d+e*x^r)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2+1/2/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+I/r^2*n/d*polylog(2,-e*x^r/d)*b^2*Pi*csgn(I*c*x^n)^3-1/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^4*csgn(I*c)-I/r/d*ln(x^r)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3+I/r/d*ln(d+e*x^r)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^3+I/r/d*ln(d+e*x^r)*Pi*a*b*csgn(I*c*x^n)^3-2*b^2/r*n/d*ln(x)*ln(1+e*x^r/d)*ln(x^n)-1/4/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^2*csgn(I*c)^2-1/2/r/d*ln(d+e*x^r)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^3*csgn(I*c)^2+I/r/d*ln(d+e*x^r)*ln(c)*Pi*b^2*csgn(I*c*x^n)^3+1/2/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-I/r/d*ln(x^r)*Pi*a*b*csgn(I*c*x^n)^3-1/2/r/d*ln(d+e*x^r)*Pi^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^3*csgn(I*c)-2/r*n/d*ln(x)*ln(1+e*x^r/d)*b^2*ln(c)-2/r/d*ln(x^r)*n*ln(x)*b^2*ln(c)-I/r^2*n/d*polylog(2,-e*x^r/d)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/r/d*ln(d+e*x^r)*n*ln(x)*b^2*Pi*csgn(I*c*x^n)^3-I/r/d*ln(d+e*x^r)*ln(x^n)*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*c*x^n)^3-1/r/d*ln(d+e*x^r)*a^2+1/r/d*ln(x^r)*a^2-2/r^2*n/d*polylog(2,-e*x^r/d)*b^2*ln(c)-2/r/d*ln(d+e*x^r)*ln(c)*a*b-2/r/d*ln(d+e*x^r)*ln(x^n)*b^2*ln(c)+2/r/d*ln(x^r)*ln(x^n)*b^2*ln(c)-I/r/d*ln(d+e*x^r)*ln(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)+I/r/d*ln(x^r)*Pi*a*b*csgn(I*x^n)*csgn(I*c*x^n)^2-b^2/r/d*ln(d+e*x^r)

```
*ln(x^n)^2+1/4/r/d*ln(d+e*x^r)*Pi^2*b^2*csgn(I*c*x^n)^4*csgn(I*c)^2+2*b/r/d
*ln(d+e*x^r)*n*ln(x)*a-2*b/r/d*ln(x^r)*n*ln(x)*a-2*b/r*n/d*ln(x)*ln(1+e*x^r
/d)*a+1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I*n/d*ln(x)^
2*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+2*b/r/d*ln(x^r)*ln(x^n)*a-2*b/r^2*n/d*po
lylog(2,-e*x^r/d)*a+1/r/d*ln(d+e*x^r)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^4*
csgn(I*c)-I/r/d*ln(x^r)*ln(c)*Pi*b^2*csgn(I*c*x^n)^3+1/4/r/d*ln(d+e*x^r)*Pi
^2*b^2*csgn(I*x^n)^2*csgn(I*c*x^n)^4-1/4/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)^2
*csgn(I*c*x^n)^4+1/2/r/d*ln(x^r)*Pi^2*b^2*csgn(I*c*x^n)^5*csgn(I*c)-1/2/r/d
*ln(d+e*x^r)*Pi^2*b^2*csgn(I*c*x^n)^5*csgn(I*c)-1/4/r/d*ln(x^r)*Pi^2*b^2*cs
gn(I*c*x^n)^4*csgn(I*c)^2+1/2/r/d*ln(x^r)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n
)^5-1/2/r/d*ln(d+e*x^r)*Pi^2*b^2*csgn(I*x^n)*csgn(I*c*x^n)^5+2*b^2/r/d*ln(d
+e*x^r)*ln(x)*ln(x^n)*n-2*b^2/r/d*ln(x^r)*ln(x)*ln(x^n)*n-I/r^2*n/d*polylog
(2,-e*x^r/d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+I/r/d*ln(x^r)*ln(x^n)*b^2*P
i*csgn(I*c*x^n)^2*csgn(I*c)+I/r*n/d*ln(x)*ln(1+e*x^r/d)*b^2*Pi*csgn(I*c*x^n
)^3+I/r/d*ln(x^r)*ln(c)*Pi*b^2*csgn(I*x^n)*csgn(I*c*x^n)^2+I/r/d*ln(x^r)*ln
(c)*Pi*b^2*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I*n/d*ln(x)^2*b^2*Pi*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)-2/3*b^2*n^2/d*ln(x)^3+n/d*ln(x)^2*b^2*ln(c)+b*n/d*ln
(x)^2*a+I/r*n/d*ln(x)*ln(1+e*x^r/d)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I
*c)-I/r/d*ln(d+e*x^r)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+I/
r/d*ln(x^r)*n*ln(x)*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a^2\left(\frac{\log(x)}{d}-\frac{\log\left(\frac{ex^r+d}{e}\right)}{dr}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\log(c)+ab\right)\log(x^n)}{exx^r+dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] a^2*(log(x)/d - log((e*x^r + d)/e)/(d*r)) + integrate((b^2*log(c)^2 + b^2*l
og(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e*x*x^r + d*x),
x)
```

Fricas [C] time = 1.57036, size = 544, normalized size = 5.79

$$b^2n^2r^3\log(x)^3+6\,b^2n^2\text{polylog}\left(3,-\frac{ex^r}{d}\right)+3\left(b^2nr^3\log(c)+abnr^3\right)\log(x)^2-6\left(b^2n^2r\log(x)+b^2nr\log(c)+abnr\right)\text{Li}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*n^2*r^3*log(x)^3 + 6*b^2*n^2*polylog(3, -e*x^r/d) + 3*(b^2*n*r^3*l
og(c) + a*b*n*r^3)*log(x)^2 - 6*(b^2*n^2*r*log(x) + b^2*n*r*log(c) + a*b*n*
r)*dilog(-(e*x^r + d)/d + 1) - 3*(b^2*r^2*log(c)^2 + 2*a*b*r^2*log(c) + a^2
*r^2)*log(e*x^r + d) + 3*(b^2*r^3*log(c)^2 + 2*a*b*r^3*log(c) + a^2*r^3)*lo
g(x) - 3*(b^2*n^2*r^2*log(x)^2 + 2*(b^2*n*r^2*log(c) + a*b*n*r^2)*log(x))*l
og((e*x^r + d)/d))/(d*r^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(d+e*x**r),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex^r + d)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x^r + d)*x), x)
```

3.431 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)^2}\,dx$

Optimal. Leaf size=182

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{d^2r^2}-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{d^2r^3}+\frac{2bn\log\left(\frac{dx^{-r}}{e}+1\right)(}{d^2r^2}$$

```
[Out] (a + b*Log[c*x^n])^2/(d*r*(d + e*x^r)) + (2*b*n*(a + b*Log[c*x^n])*Log[1 +
d/(e*x^r)])/(d^2*r^2) - ((a + b*Log[c*x^n])^2*Log[1 + d/(e*x^r)])/(d^2*r) -
 (2*b^2*n^2*PolyLog[2, -(d/(e*x^r))])/(d^2*r^3) + (2*b*n*(a + b*Log[c*x^n])
*PolyLog[2, -(d/(e*x^r))])/(d^2*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))])
/(d^2*r^3)
```

Rubi [A] time = 0.426535, antiderivative size = 182, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24, Rules used = {2349, 2345, 2374, 6589, 2338, 2391}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{d^2r^2}-\frac{2b^2n^2\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^2r^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{d^2r^3}+\frac{2bn\log\left(\frac{dx^{-r}}{e}+1\right)(}{d^2r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^2),x]
```


```
[Out] (a + b*Log[c*x^n])^2/(d*r*(d + e*x^r)) + (2*b*n*(a + b*Log[c*x^n])*Log[1 +
d/(e*x^r)])/(d^2*r^2) - ((a + b*Log[c*x^n])^2*Log[1 + d/(e*x^r)])/(d^2*r) -
 (2*b^2*n^2*PolyLog[2, -(d/(e*x^r))])/(d^2*r^3) + (2*b*n*(a + b*Log[c*x^n])
*PolyLog[2, -(d/(e*x^r))])/(d^2*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))])
/(d^2*r^3)
```


Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)^2}\,dx = \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)}\,dx}{d} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))^2}{(d+ex^r)^2}\,dx}{d}$$

$$= \frac{(a+b\log(cx^n))^2}{dr(d+ex^r)} - \frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{(2bn)\int \frac{(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{x}\,dx}{d^2r} - \frac{(2l}{}$$

$$= \frac{(a+b\log(cx^n))^2}{dr(d+ex^r)} + \frac{2bn(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r^2} - \frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} + \frac{2}{}$$

$$= \frac{(a+b\log(cx^n))^2}{dr(d+ex^r)} + \frac{2bn(a+b\log(cx^n))\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r^2} - \frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{d^2r} - \frac{2}{}$$

Mathematica [B] time = 0.461516, size = 397, normalized size = 2.18

$$\frac{2abnr\left(\text{PolyLog}\left(2,\frac{ex^r}{d}+1\right)+\left(\log\left(-\frac{ex^r}{d}\right)-r\log(x)\right)\log(d+ex^r)+\frac{1}{2}r^2\log^2(x)\right)+2b^2nr(\log(cx^n)-n\log(x))\left(\text{PolyL}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^2),x]
```

```
[Out] ((d*r^2*(a + b*Log[c*x^n])^2)/(d + e*x^r) + 2*a*b*n*r*Log[d - d*x^r] - a^2*
r^2*Log[d - d*x^r] + 2*a*b*r^2*(n*Log[x] - Log[c*x^n])*Log[d - d*x^r] + 2*b
^2*n*r*(-(n*Log[x]) + Log[c*x^n])*Log[d - d*x^r] - b^2*r^2*(-(n*Log[x]) + L
og[c*x^n])^2*Log[d - d*x^r] - 2*b^2*n^2*((r^2*Log[x]^2)/2 + (-(r*Log[x]) +
Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]) + 2*a*b*n*r*
((r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + Poly
Log[2, 1 + (e*x^r)/d]) + 2*b^2*n*r*(-(n*Log[x]) + Log[c*x^n])*((r^2*Log[x]^
2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e
*x^r)/d]) - b^2*n^2*(r^2*Log[x]^2*Log[1 + d/(e*x^r)] - 2*r*Log[x]*PolyLog[2
, -(d/(e*x^r))] - 2*PolyLog[3, -(d/(e*x^r))]))/(d^2*r^3)
```

Maple [F] time = 0.851, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x(d+ex^r)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x/(d+e*x^r)^2,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x/(d+e*x^r)^2,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$a^2\left(\frac{1}{derx^r + d^2r} + \frac{\log(x)}{d^2} - \frac{\log\left(\frac{ex^r+d}{e}\right)}{d^2r}\right) + \int \frac{b^2\log(c)^2 + b^2\log(x^n)^2 + 2\,ab\log(c) + 2\left(b^2\log(c) + ab\right)\log(x^n)}{e^2xx^{2\,r} + 2\,dexx^r + d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] a^2*(1/(d*e*r*x^r + d^2*r) + log(x)/d^2 - log((e*x^r + d)/e)/(d^2*r)) + int
egrate((b^2*log(c)^2 + b^2*log(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)
*log(x^n))/(e^2*x*x^(2*r) + 2*d*e*x*x^r + d^2*x), x)
```

Fricas [C] time = 1.45819, size = 1382, normalized size = 7.59

$$\frac{b^2dn^2r^3\log(x)^3 + 3\,b^2dr^2\log(c)^2 + 6\,abdr^2\log(c) + 3\,a^2dr^2 + 3\left(b^2dnr^3\log(c) + abdnr^3\right)\log(x)^2 + \left(b^2en^2r^3\log(x)^3 + 3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] 1/3*(b^2*d*n^2*r^3*log(x)^3 + 3*b^2*d*r^2*log(c)^2 + 6*a*b*d*r^2*log(c) + 3
*a^2*d*r^2 + 3*(b^2*d*n*r^3*log(c) + a*b*d*n*r^3)*log(x)^2 + (b^2*e*n^2*r^3
*log(x)^3 + 3*(b^2*e*n*r^3*log(c) - b^2*e*n^2*r^2 + a*b*e*n*r^3)*log(x)^2 +
 3*(b^2*e*r^3*log(c)^2 - 2*a*b*e*n*r^2 + a^2*e*r^3 - 2*(b^2*e*n*r^2 - a*b*e
*r^3)*log(c))*log(x))*x^r - 6*(b^2*d*n^2*r*log(x) + b^2*d*n*r*log(c) - b^2*
d*n^2 + a*b*d*n*r + (b^2*e*n^2*r*log(x) + b^2*e*n*r*log(c) - b^2*e*n^2 + a*
b*e*n*r)*x^r)*dilog(-(e*x^r + d)/d + 1) - 3*(b^2*d*r^2*log(c)^2 - 2*a*b*d*n
*r + a^2*d*r^2 + (b^2*e*r^2*log(c)^2 - 2*a*b*e*n*r + a^2*e*r^2 - 2*(b^2*e*n
*r - a*b*e*r^2)*log(c))*x^r - 2*(b^2*d*n*r - a*b*d*r^2)*log(c))*log(e*x^r +
 d) + 3*(b^2*d*r^3*log(c)^2 + 2*a*b*d*r^3*log(c) + a^2*d*r^3)*log(x) - 3*(b
^2*d*n^2*r^2*log(x)^2 + (b^2*e*n^2*r^2*log(x)^2 + 2*(b^2*e*n*r^2*log(c) - b
```

```
^2*e*n^2*r + a*b*e*n*r^2)*log(x))*x^r + 2*(b^2*d*n*r^2*log(c) - b^2*d*n^2*r
 + a*b*d*n*r^2)*log(x))*log((e*x^r + d)/d) + 6*(b^2*e*n^2*x^r + b^2*d*n^2)*
polylog(3, -e*x^r/d))/(d^2*e*r^3*x^r + d^3*r^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex^r + d)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x^r + d)^2*x), x)
```

3.432 $\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)^3}\,dx$

Optimal. Leaf size=267

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{d^3r^2}-\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^3r^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{d^3r^3}+\frac{benx^r(a+b\log(cx^n}{d^3r^2(d+ex^r)}$$

```
[Out] (b*e*n*x^r*(a + b*Log[c*x^n]))/(d^3*r^2*(d + e*x^r)) + (a + b*Log[c*x^n])^2
/(2*d*r*(d + e*x^r)^2) + (a + b*Log[c*x^n])^2/(d^2*r*(d + e*x^r)) + (3*b*n*
(a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d^3*r^2) - ((a + b*Log[c*x^n])^2*Lo
g[1 + d/(e*x^r)])/(d^3*r) - (b^2*n^2*Log[d + e*x^r])/(d^3*r^3) - (3*b^2*n^2
*PolyLog[2, -(d/(e*x^r))])/(d^3*r^3) + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2,
 -(d/(e*x^r))])/(d^3*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))])/(d^3*r^3)
```

Rubi [A] time = 0.891979, antiderivative size = 267, normalized size of antiderivative = 1., number of steps used = 14, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.32, Rules used = {2349, 2345, 2374, 6589, 2338, 2391, 2335, 260}

$$\frac{2bn\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)(a+b\log(cx^n))}{d^3r^2}-\frac{3b^2n^2\text{PolyLog}\left(2,-\frac{dx^{-r}}{e}\right)}{d^3r^3}+\frac{2b^2n^2\text{PolyLog}\left(3,-\frac{dx^{-r}}{e}\right)}{d^3r^3}+\frac{benx^r(a+b\log(cx^n}{d^3r^2(d+ex^r)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^3),x]
```

```
[Out] (b*e*n*x^r*(a + b*Log[c*x^n]))/(d^3*r^2*(d + e*x^r)) + (a + b*Log[c*x^n])^2
/(2*d*r*(d + e*x^r)^2) + (a + b*Log[c*x^n])^2/(d^2*r*(d + e*x^r)) + (3*b*n*
(a + b*Log[c*x^n])*Log[1 + d/(e*x^r)])/(d^3*r^2) - ((a + b*Log[c*x^n])^2*Lo
g[1 + d/(e*x^r)])/(d^3*r) - (b^2*n^2*Log[d + e*x^r])/(d^3*r^3) - (3*b^2*n^2
*PolyLog[2, -(d/(e*x^r))])/(d^3*r^3) + (2*b*n*(a + b*Log[c*x^n])*PolyLog[2,
 -(d/(e*x^r))])/(d^3*r^2) + (2*b^2*n^2*PolyLog[3, -(d/(e*x^r))])/(d^3*r^3)
```

Rule 2349

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^(r_.))^
(q_))/(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x^r)^(q + 1)*(a + b*Log[c*x^
n])^p)/x, x], x] - Dist[e/d, Int[x^(r - 1)*(d + e*x^r)^q*(a + b*Log[c*x^n])
^p, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0] && ILtQ[q, -1]
```

Rule 2345

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^(r
_.))), x_Symbol] :> -Simp[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^p)/(d*r),
x] + Dist[(b*n*p)/(d*r), Int[(Log[1 + d/(e*x^r)]*(a + b*Log[c*x^n])^(p - 1)
)/x, x], x] /; FreeQ[{a, b, c, d, e, n, r}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2338

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_))^(q_.), x_Symbol] :> Simp[(f^m*(d + e*x^r)^(q + 1)*(a + b*L
og[c*x^n])^p)/(e*r*(q + 1)), x] - Dist[(b*f^m*n*p)/(e*r*(q + 1)), Int[((d +
 e*x^r)^(q + 1)*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, m, n, q, r}, x] && EqQ[m, r - 1] && IGtQ[p, 0] && (IntegerQ[m] || Gt
Q[f, 0]) && NeQ[r, n] && NeQ[q, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 1) + 1, 0] && NeQ[m, -1]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rubi steps

$$\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)^3}\,dx = \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)^2}\,dx}{d} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))^2}{(d+ex^r)^3}\,dx}{d}$$

$$= \frac{(a+b\log(cx^n))^2}{2dr(d+ex^r)^2} + \frac{\int \frac{(a+b\log(cx^n))^2}{x(d+ex^r)}\,dx}{d^2} - \frac{e\int \frac{x^{-1+r}(a+b\log(cx^n))^2}{(d+ex^r)^2}\,dx}{d^2} - \frac{(bn)\int \frac{a+b\log(cx^n)}{x(d+ex^r)^2}\,dx}{dr}$$

$$= \frac{(a+b\log(cx^n))^2}{2dr(d+ex^r)^2} + \frac{(a+b\log(cx^n))^2}{d^2r(d+ex^r)} - \frac{(a+b\log(cx^n))^2\log\left(1+\frac{dx^{-r}}{e}\right)}{d^3r} + \frac{(2bn)\int \frac{(a+b\log(cx^n))}{x}}{d^3r}$$

$$= \frac{benx^r(a+b\log(cx^n))}{d^3r^2(d+ex^r)} + \frac{(a+b\log(cx^n))^2}{2dr(d+ex^r)^2} + \frac{(a+b\log(cx^n))^2}{d^2r(d+ex^r)} + \frac{3bn(a+b\log(cx^n))\log\left(1+\right.}{d^3r^2}$$

$$= \frac{benx^r(a+b\log(cx^n))}{d^3r^2(d+ex^r)} + \frac{(a+b\log(cx^n))^2}{2dr(d+ex^r)^2} + \frac{(a+b\log(cx^n))^2}{d^2r(d+ex^r)} + \frac{3bn(a+b\log(cx^n))\log\left(1+\right.}{d^3r^2}$$

Mathematica [A] time = 0.592054, size = 459, normalized size = 1.72

$$4abnr\left(\text{PolyLog}\left(2,\frac{ex^r}{d}+1\right)+\left(\log\left(-\frac{ex^r}{d}\right)-r\log(x)\right)\log(d+ex^r)+\frac{1}{2}r^2\log^2(x)\right)+4b^2nr(\log(cx^n)-n\log(x))\left(\text{PolyLo}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Log[c*x^n])^2/(x*(d + e*x^r)^3),x]
```

```
[Out] ((d^2*r^2*(a + b*Log[c*x^n])^2)/(d + e*x^r)^2 + (2*d*r*(a + b*Log[c*x^n])*(
-(b*n) + a*r + b*r*Log[c*x^n]))/(d + e*x^r) - 2*b^2*n^2*Log[d - d*x^r] + 6*
a*b*n*r*Log[d - d*x^r] - 2*a^2*r^2*Log[d - d*x^r] + 4*a*b*r^2*(n*Log[x] - L
og[c*x^n])*Log[d - d*x^r] + 6*b^2*n*r*(-(n*Log[x]) + Log[c*x^n])*Log[d - d*
x^r] - 2*b^2*r^2*(-(n*Log[x]) + Log[c*x^n])^2*Log[d - d*x^r] - 6*b^2*n^2*((
r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*Log[d + e*x^r] + PolyLo
g[2, 1 + (e*x^r)/d]) + 4*a*b*n*r*((r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((
e*x^r)/d)])*Log[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]) + 4*b^2*n*r*(-(n*Lo
g[x]) + Log[c*x^n])*((r^2*Log[x]^2)/2 + (-(r*Log[x]) + Log[-((e*x^r)/d)])*L
og[d + e*x^r] + PolyLog[2, 1 + (e*x^r)/d]) - 2*b^2*n^2*(r^2*Log[x]^2*Log[1
```

```
+ d/(e*x^r)] - 2*r*Log[x]*PolyLog[2, -(d/(e*x^r))] - 2*PolyLog[3, -(d/(e*x^
r))]]))/(2*d^3*r^3)
```

Maple [F] time = 0.714, size = 0, normalized size = 0.

$$\int \frac{(a+b\ln(cx^n))^2}{x(d+ex^r)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))^2/x/(d+e*x^r)^3,x)
```

```
[Out] int((a+b*ln(c*x^n))^2/x/(d+e*x^r)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{1}{2}a^2\left(\frac{2\,ex^r+3\,d}{d^2e^2rx^{2\,r}+2\,d^3erx^r+d^4r}+\frac{2\,\log(x)}{d^3}-\frac{2\,\log\left(\frac{ex^r+d}{e}\right)}{d^3r}\right)+\int\frac{b^2\log(c)^2+b^2\log(x^n)^2+2\,ab\log(c)+2\left(b^2\log(c)\right.}{e^3xx^{3\,r}+3\,de^2xx^{2\,r}+3\,d^2exx^r+d^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*((2*e*x^r + 3*d)/(d^2*e^2*r*x^(2*r) + 2*d^3*e*r*x^r + d^4*r) + 2*lo
g(x)/d^3 - 2*log((e*x^r + d)/e)/(d^3*r)) + integrate((b^2*log(c)^2 + b^2*lo
g(x^n)^2 + 2*a*b*log(c) + 2*(b^2*log(c) + a*b)*log(x^n))/(e^3*x*x^(3*r) + 3
*d*e^2*x*x^(2*r) + 3*d^2*e*x*x^r + d^3*x), x)
```

Fricas [C] time = 1.44088, size = 2619, normalized size = 9.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^3,x, algorithm="fricas")
```

```
[Out] 1/6*(2*b^2*d^2*n^2*r^3*log(x)^3 + 9*b^2*d^2*r^2*log(c)^2 - 6*a*b*d^2*n*r +
9*a^2*d^2*r^2 + 6*(b^2*d^2*n*r^3*log(c) + a*b*d^2*n*r^3)*log(x)^2 + (2*b^2*
e^2*n^2*r^3*log(x)^3 + 3*(2*b^2*e^2*n*r^3*log(c) - 3*b^2*e^2*n^2*r^2 + 2*a*
b*e^2*n*r^3)*log(x)^2 + 6*(b^2*e^2*r^3*log(c)^2 + b^2*e^2*n^2*r - 3*a*b*e^2
*n*r^2 + a^2*e^2*r^3 - (3*b^2*e^2*n*r^2 - 2*a*b*e^2*r^3)*log(c))*log(x))*x^
(2*r) + 2*(2*b^2*d*e*n^2*r^3*log(x)^3 + 3*b^2*d*e*r^2*log(c)^2 - 3*a*b*d*e*
n*r + 3*a^2*d*e*r^2 + 6*(b^2*d*e*n*r^3*log(c) - b^2*d*e*n^2*r^2 + a*b*d*e*n
*r^3)*log(x)^2 - 3*(b^2*d*e*n*r - 2*a*b*d*e*r^2)*log(c) + 3*(2*b^2*d*e*r^3*
log(c)^2 + b^2*d*e*n^2*r - 4*a*b*d*e*n*r^2 + 2*a^2*d*e*r^3 - 4*(b^2*d*e*n*r
^2 - a*b*d*e*r^3)*log(c))*log(x))*x^r - 6*(2*b^2*d^2*n^2*r*log(x) + 2*b^2*d
^2*n*r*log(c) - 3*b^2*d^2*n^2 + 2*a*b*d^2*n*r + (2*b^2*e^2*n^2*r*log(x) + 2
*b^2*e^2*n*r*log(c) - 3*b^2*e^2*n^2 + 2*a*b*e^2*n*r)*x^(2*r) + 2*(2*b^2*d*e
*n^2*r*log(x) + 2*b^2*d*e*n*r*log(c) - 3*b^2*d*e*n^2 + 2*a*b*d*e*n*r)*x^r)*
dilog(-(e*x^r + d)/d + 1) - 6*(b^2*d^2*r^2*log(c)^2 + b^2*d^2*n^2 - 3*a*b*d
^2*n*r + a^2*d^2*r^2 + (b^2*e^2*r^2*log(c)^2 + b^2*e^2*n^2 - 3*a*b*e^2*n*r
+ a^2*e^2*r^2 - (3*b^2*e^2*n*r - 2*a*b*e^2*r^2)*log(c))*x^(2*r) + 2*(b^2*d*
e*r^2*log(c)^2 + b^2*d*e*n^2 - 3*a*b*d*e*n*r + a^2*d*e*r^2 - (3*b^2*d*e*n*r
 - 2*a*b*d*e*r^2)*log(c))*x^r - (3*b^2*d^2*n*r - 2*a*b*d^2*r^2)*log(c))*log
(e*x^r + d) - 6*(b^2*d^2*n*r - 3*a*b*d^2*r^2)*log(c) + 6*(b^2*d^2*r^3*log(c
)^2 + 2*a*b*d^2*r^3*log(c) + a^2*d^2*r^3)*log(x) - 6*(b^2*d^2*n^2*r^2*log(x
)^2 + (b^2*e^2*n^2*r^2*log(x)^2 + (2*b^2*e^2*n*r^2*log(c) - 3*b^2*e^2*n^2*r
 + 2*a*b*e^2*n*r^2)*log(x))*x^(2*r) + 2*(b^2*d*e*n^2*r^2*log(x)^2 + (2*b^2*
d*e*n*r^2*log(c) - 3*b^2*d*e*n^2*r + 2*a*b*d*e*n*r^2)*log(x))*x^r + (2*b^2*
d^2*n*r^2*log(c) - 3*b^2*d^2*n^2*r + 2*a*b*d^2*n*r^2)*log(x))*log((e*x^r +
d)/d) + 12*(b^2*e^2*n^2*x^(2*r) + 2*b^2*d*e*n^2*x^r + b^2*d^2*n^2)*polylog(
3, -e*x^r/d))/(d^3*e^2*r^3*x^(2*r) + 2*d^4*e*r^3*x^r + d^5*r^3)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))**2/x/(d+e*x**r)**3,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)^2}{(ex^r + d)^3 x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))^2/x/(d+e*x^r)^3,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)^2/((e*x^r + d)^3*x), x)
```

3.433 $\int \frac{(d+ex^r)^{5/2}(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=327

$$-\frac{2bd^{5/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+\frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r}-\frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{5d\,(d+ex^r)^{3/2}}{r}+\frac{3\,(d+ex^r)^{5/2}}{r}\right)(a$$

```
[Out] (-92*b*d^2*n*Sqrt[d + e*x^r])/(15*r^2) - (32*b*d*n*(d + e*x^r)^(3/2))/(45*r
^2) - (4*b*n*(d + e*x^r)^(5/2))/(25*r^2) + (92*b*d^(5/2)*n*ArcTanh[Sqrt[d +
 e*x^r]/Sqrt[d]])/(15*r^2) + (2*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]
]^2)/r^2 + (2*((15*d^2*Sqrt[d + e*x^r])/r + (5*d*(d + e*x^r)^(3/2))/r + (3*
(d + e*x^r)^(5/2))/r - (15*d^(5/2)*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a
+ b*Log[c*x^n]))/15 - (4*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(
2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*d^(5/2)*n*PolyLog[2, 1
- (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```

Rubi [A] time = 0.480287, antiderivative size = 327, normalized size of antiderivative = 1., number of steps used = 23, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bd^{5/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+\frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r}-\frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{5d\,(d+ex^r)^{3/2}}{r}+\frac{3\,(d+ex^r)^{5/2}}{r}\right)(a$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^(5/2)*(a + b*Log[c*x^n]))/x,x]
```


```
[Out] (-92*b*d^2*n*Sqrt[d + e*x^r])/(15*r^2) - (32*b*d*n*(d + e*x^r)^(3/2))/(45*r
^2) - (4*b*n*(d + e*x^r)^(5/2))/(25*r^2) + (92*b*d^(5/2)*n*ArcTanh[Sqrt[d +
 e*x^r]/Sqrt[d]])/(15*r^2) + (2*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]
]^2)/r^2 + (2*((15*d^2*Sqrt[d + e*x^r])/r + (5*d*(d + e*x^r)^(3/2))/r + (3*
(d + e*x^r)^(5/2))/r - (15*d^(5/2)*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a
+ b*Log[c*x^n]))/15 - (4*b*d^(5/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(
2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*d^(5/2)*n*PolyLog[2, 1
- (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
```

```
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{(d+ex^r)^{5/2}(a+b\log(cx^n))}{x}\,dx = \frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r}+\frac{5d(d+ex^r)^{3/2}}{r}+\frac{3(d+ex^r)^{5/2}}{r}-\frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a\cdots$$

$$= \frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r}+\frac{5d(d+ex^r)^{3/2}}{r}+\frac{3(d+ex^r)^{5/2}}{r}-\frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a\cdots$$

$$= \frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r}+\frac{5d(d+ex^r)^{3/2}}{r}+\frac{3(d+ex^r)^{5/2}}{r}-\frac{15d^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a\cdots$$

$$= -\frac{4bd^2n\sqrt{d+ex^r}}{r^2}-\frac{4bdn(d+ex^r)^{3/2}}{9r^2}-\frac{4bn(d+ex^r)^{5/2}}{25r^2}+\frac{2}{15}\left(\frac{15d^2\sqrt{d+ex^r}}{r}+5d\cdots\right.$$

$$= -\frac{16bd^2n\sqrt{d+ex^r}}{3r^2}-\frac{32bdn(d+ex^r)^{3/2}}{45r^2}-\frac{4bn(d+ex^r)^{5/2}}{25r^2}+\frac{2bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+e\cdots}}{\sqrt{d}}\right.}{r^2}\cdots$$

$$= -\frac{92bd^2n\sqrt{d+ex^r}}{15r^2}-\frac{32bdn(d+ex^r)^{3/2}}{45r^2}-\frac{4bn(d+ex^r)^{5/2}}{25r^2}+\frac{4bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+e\cdots}}{\sqrt{d}}\right.}{r^2}\cdots$$

$$= -\frac{92bd^2n\sqrt{d+ex^r}}{15r^2}-\frac{32bdn(d+ex^r)^{3/2}}{45r^2}-\frac{4bn(d+ex^r)^{5/2}}{25r^2}+\frac{16bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+\cdots}}{\sqrt{\cdots}}\right.}{3r^2}\cdots$$

$$= -\frac{92bd^2n\sqrt{d+ex^r}}{15r^2}-\frac{32bdn(d+ex^r)^{3/2}}{45r^2}-\frac{4bn(d+ex^r)^{5/2}}{25r^2}+\frac{92bd^{5/2}n\tanh^{-1}\left(\frac{\sqrt{d+\cdots}}{\sqrt{\cdots}}\right.}{15r^2}\cdots$$

Mathematica [F] time = 0.53774, size = 0, normalized size = 0.

$$\int \frac{(d+ex^r)^{5/2}(a+b\log(cx^n))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^r)^(5/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] Integrate[((d + e*x^r)^(5/2)*(a + b*Log[c*x^n]))/x, x]
```

Maple [F] time = 0.769, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{x}\left(d+ex^{r}\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^(5/2)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] int((d+e*x^r)^(5/2)*(a+b*ln(c*x^n))/x,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((d+e*x^r)^(5/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(5/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**(5/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^{\frac{5}{2}}(b \log (cx^n) + a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(5/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^(5/2)*(b*log(c*x^n) + a)/x, x)
```

3.434 $\int \frac{(d+ex^r)^{3/2}(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=284

$$-\frac{2bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+\frac{2}{3}\left(-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}\right)(a+b\log(cx^n))+\frac{2bd^3}{}$$

```
[Out] (-16*b*d*n*Sqrt[d + e*x^r])/(3*r^2) - (4*b*n*(d + e*x^r)^(3/2))/(9*r^2) + (
16*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(3*r^2) + (2*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/r^2 + (2*((3*d*Sqrt[d + e*x^r])/r + (d +
 e*x^r)^(3/2)/r - (3*d^(3/2)*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a + b*Lo
g[c*x^n]))/3 - (4*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[
d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*d^(3/2)*n*PolyLog[2, 1 - (2*Sq
rt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```

Rubi [A] time = 0.391427, antiderivative size = 284, normalized size of antiderivative = 1., number of steps used = 17, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bd^{3/2}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+\frac{2}{3}\left(-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}+\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}\right)(a+b\log(cx^n))+\frac{2bd^3}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^r)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```


```
[Out] (-16*b*d*n*Sqrt[d + e*x^r])/(3*r^2) - (4*b*n*(d + e*x^r)^(3/2))/(9*r^2) + (
16*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(3*r^2) + (2*b*d^(3/2)*n*A
rcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/r^2 + (2*((3*d*Sqrt[d + e*x^r])/r + (d +
 e*x^r)^(3/2)/r - (3*d^(3/2)*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a + b*Lo
g[c*x^n]))/3 - (4*b*d^(3/2)*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[
d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*d^(3/2)*n*PolyLog[2, 1 - (2*Sq
rt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
```

```
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{(d+ex^r)^{3/2}(a+b\log(cx^n))}{x}\,dx = \frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-(bn)\int$$

$$=\frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-\frac{(2bn)\int}{}$$

$$=\frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-\frac{(2bn)\,\mathrm{S}}{}$$

$$=-\frac{4bdn\sqrt{d+ex^r}}{r^2}-\frac{4bn(d+ex^r)^{3/2}}{9r^2}+\frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}+\frac{(d+ex^r)^{3/2}}{r}-\frac{3d^{3/2}\tanh^{-1}}{r}\right.$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn(d+ex^r)^{3/2}}{9r^2}+\frac{2bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2}+\frac{2}{3}\left(\frac{3d\sqrt{d+ex^r}}{r}\right.$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn(d+ex^r)^{3/2}}{9r^2}+\frac{4bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2}+\frac{2bd^{3/2}n\tanh^{-1}\left(\right.}{r^2}$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn(d+ex^r)^{3/2}}{9r^2}+\frac{16bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3r^2}+\frac{2bd^{3/2}n\tanh^{-1}}{r^2}$$

$$=-\frac{16bdn\sqrt{d+ex^r}}{3r^2}-\frac{4bn(d+ex^r)^{3/2}}{9r^2}+\frac{16bd^{3/2}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3r^2}+\frac{2bd^{3/2}n\tanh^{-1}}{r^2}$$

Mathematica [F] time = 0.432997, size = 0, normalized size = 0.

$$\int \frac{(d+ex^r)^{3/2}(a+b\log(cx^n))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^r)^(3/2)*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] Integrate[((d + e*x^r)^(3/2)*(a + b*Log[c*x^n]))/x, x]
```

Maple [F] time = 0.636, size = 0, normalized size = 0.

$$\int \frac{a + b\ln \left(c x^{n}\right)}{x} \left(d + e x^{r}\right)^{\frac{3}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^(3/2)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] int((d+e*x^r)^(3/2)*(a+b*ln(c*x^n))/x,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((d+e*x^r)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**(3/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(ex^r + d)^{\frac{3}{2}}(b\log(cx^n) + a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(3/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^(3/2)*(b*log(c*x^n) + a)/x, x)
```

3.435 $\int \frac{\sqrt{d+ex^r}(a+b\log(cx^n))}{x}\,dx$

Optimal. Leaf size=240

$$-\frac{2b\sqrt{d}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{2b\sqrt{d}n\tan}{}$$

```
[Out] (-4*b*n*Sqrt[d + e*x^r])/r^2 + (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[
d]])/r^2 + (2*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/r^2 + 2*(Sqrt
[d + e*x^r]/r - (Sqrt[d]*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a + b*Log[c*
x^n]) - (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sq
rt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/
(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```

Rubi [A] time = 0.317036, antiderivative size = 240, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 50, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2b\sqrt{d}n\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{2b\sqrt{d}n\tan}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^r]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] (-4*b*n*Sqrt[d + e*x^r])/r^2 + (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[
d]])/r^2 + (2*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/r^2 + 2*(Sqrt
[d + e*x^r]/r - (Sqrt[d]*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/r)*(a + b*Log[c*
x^n]) - (4*b*Sqrt[d]*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sq
rt[d] - Sqrt[d + e*x^r])])/r^2 - (2*b*Sqrt[d]*n*PolyLog[2, 1 - (2*Sqrt[d])/
(Sqrt[d] - Sqrt[d + e*x^r])])/r^2
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{\sqrt{d+ex^r}\,(a+b\log(cx^n))}{x}\,dx = 2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-(bn)\int\left(\frac{2\sqrt{d+ex^r}}{rx}-\frac{2\sqrt{d}\,\mathrm{ta}\right.$$

$$= 2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-\frac{(2bn)\int\frac{\sqrt{d+ex^r}}{x}\,dx}{r}+\frac{\left(2b\sqrt{d}n\right)}{}$$

$$= 2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))-\frac{(2bn)\,\mathrm{Subst}\left(\int\frac{\sqrt{d+ex}}{x}\,dx,x,x\right.}{r^2}$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a+b\log(cx^n))+\frac{\left(4b\sqrt{d}n\right)\mathrm{Su}}{}$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}-\frac{\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r}\right)(a$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2}+\frac{2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}\right.$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2}+\frac{2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}\right.$$

$$= -\frac{4bn\sqrt{d+ex^r}}{r^2}+\frac{4b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{r^2}+\frac{2b\sqrt{d}n\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{r^2}+2\left(\frac{\sqrt{d+ex^r}}{r}\right.$$

Mathematica [F] time = 0.339452, size = 0, normalized size = 0.

$$\int \frac{\sqrt{d+ex^r}\,(a+b\log(cx^n))}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d + e*x^r]*(a + b*Log[c*x^n]))/x,x]
```

```
[Out] Integrate[(Sqrt[d + e*x^r]*(a + b*Log[c*x^n]))/x, x]
```

Maple [F] time = 0.662, size = 0, normalized size = 0.

$$\int \frac{a + b\ln\left(cx^{n}\right)}{x}\sqrt{d + ex^{r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e*x^r)^(1/2)*(a+b*ln(c*x^n))/x,x)
```

```
[Out] int((d+e*x^r)^(1/2)*(a+b*ln(c*x^n))/x,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((d+e*x^r)^(1/2)*(a+b*log(c*x^n))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(1/2)*(a+b*log(c*x^n))/x,x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a+b\log(cx^n))\sqrt{d+ex^r}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x**r)**(1/2)*(a+b*ln(c*x**n))/x,x)
```

```
[Out] Integral((a + b*log(c*x**n))*sqrt(d + e*x**r)/x, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\sqrt{ex^r+d}(b\log(cx^n)+a)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e*x^r)^(1/2)*(a+b*log(c*x^n))/x,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*x^r + d)*(b*log(c*x^n) + a)/x, x)
```

3.436 $\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^r}}\,dx$

Optimal. Leaf size=174

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{\sqrt{d}r^2}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}r^2}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)\text{ta}}{\sqrt{d}r^2}$$

```
[Out] (2*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(Sqrt[d]*r^2) - (2*ArcTanh[Sqrt[
d + e*x^r]/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*r) - (4*b*n*ArcTanh[Sqrt[d
 + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(Sqrt[d]*r
^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(Sqrt
[d]*r^2)
```

Rubi [A] time = 0.269333, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 63, 208, 2348, 12, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{\sqrt{d}r^2}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}r^2}-\frac{4bn\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)\text{ta}}{\sqrt{d}r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^r]),x]
```

```
[Out] (2*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(Sqrt[d]*r^2) - (2*ArcTanh[Sqrt[
d + e*x^r]/Sqrt[d]]*(a + b*Log[c*x^n]))/(Sqrt[d]*r) - (4*b*n*ArcTanh[Sqrt[d
 + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(Sqrt[d]*r
^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(Sqrt
[d]*r^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
```

```
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x\sqrt{d+ex^r}}\,dx = -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} - (bn)\int -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{\sqrt{d}rx}\,dx$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} + \frac{(2bn)\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{x}\,dx}{\sqrt{d}r}$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} + \frac{(2bn)\,\mathrm{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}\,dx, x, x^r\right)}{\sqrt{d}r^2}$$

$$= -\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} + \frac{(4bn)\,\mathrm{Subst}\left(\int \frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}\,dx, x, \sqrt{d+ex^r}\right)}{\sqrt{d}r^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} - \frac{(4bn)\,\mathrm{Subst}\left(\int \frac{\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{1-\frac{x}{\sqrt{d}}}\,dx, x, \sqrt{d\right.}}{dr^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right.}{\sqrt{d}r^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right.}{\sqrt{d}r^2}$$

$$= \frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{\sqrt{d}r^2} - \frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)(a+b\log(cx^n))}{\sqrt{d}r} - \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)\log\left(\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right.}{\sqrt{d}r^2}$$

Mathematica [F] time = 0.115798, size = 0, normalized size = 0.

$$\int \frac{a + b\log(cx^n)}{x\sqrt{d + ex^r}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^r]),x]
```

```
[Out] Integrate[(a + b*Log[c*x^n])/(x*Sqrt[d + e*x^r]), x]
```

Maple [F] time = 0.487, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x}\frac{1}{\sqrt{d + ex^r}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(1/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(1/2),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((a+b*log(c*x^n))/x/(d+e*x^r)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{a + b\log\left(cx^{n}\right)}{x\sqrt{d + ex^{r}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*ln(c*x**n))/x/(d+e*x**r)**(1/2),x)
```

```
[Out] Integral((a + b*log(c*x**n))/(x*sqrt(d + e*x**r)), x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^{n}\right) + a}{\sqrt{ex^{r} + d}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/(sqrt(e*x^r + d)*x), x)
```

3.437 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{3/2}}\,dx$

Optimal. Leaf size=225

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{3/2}r^2}+2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx^n))+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+\frac{4bn}{}$$

```
[Out] (4*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(3/2)*r^2) + (2*b*n*ArcTanh[Sqr
t[d + e*x^r]/Sqrt[d]]^2)/(d^(3/2)*r^2) + 2*(1/(d*r*Sqrt[d + e*x^r]) - ArcTa
nh[Sqrt[d + e*x^r]/Sqrt[d]]/(d^(3/2)*r))*(a + b*Log[c*x^n]) - (4*b*n*ArcTan
h[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(d
^(3/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])
])/(d^(3/2)*r^2)
```

Rubi [A] time = 0.342926, antiderivative size = 225, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{3/2}r^2}+2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx^n))+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+\frac{4bn}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(3/2)),x]
```


```
[Out] (4*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(3/2)*r^2) + (2*b*n*ArcTanh[Sqr
t[d + e*x^r]/Sqrt[d]]^2)/(d^(3/2)*r^2) + 2*(1/(d*r*Sqrt[d + e*x^r]) - ArcTa
nh[Sqrt[d + e*x^r]/Sqrt[d]]/(d^(3/2)*r))*(a + b*Log[c*x^n]) - (4*b*n*ArcTan
h[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])])/(d
^(3/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])
])/(d^(3/2)*r^2)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{3/2}}\,dx = 2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx^n))-(bn)\int\left(\frac{2}{drx\sqrt{d+ex^r}}-\frac{2\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}rx}\right.$$

$$= 2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx^n))+\frac{(2bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{x}dx}{d^{3/2}r}-\frac{(2bn)\int\frac{1}{x\sqrt{d+ex^r}}}{dr}$$

$$= 2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx^n))+\frac{(2bn)\,\text{Subst}\left(\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right)}{x}dx,x,x^r\right)}{d^{3/2}r^2}-\frac{(2}{}$$

$$= 2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx^n))+\frac{(4bn)\,\text{Subst}\left(\int\frac{x\tanh^{-1}\left(\frac{x}{\sqrt{d}}\right)}{-d+x^2}dx,x,\sqrt{d+ex^r}\right.}{d^{3/2}r^2}$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx$$

$$= \frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{3/2}r^2}+2\left(\frac{1}{dr\sqrt{d+ex^r}}-\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{3/2}r}\right)(a+b\log(cx$$

Mathematica [F] time = 0.293638, size = 0, normalized size = 0.

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(3/2)),x]
```

```
[Out] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(3/2)), x]
```

Maple [F] time = 0.477, size = 0, normalized size = 0.

$$\int \frac{a+b\ln(cx^n)}{x}(d+ex^r)^{-\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(3/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(3/2),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((a+b*log(c*x^n))/x/(d+e*x^r)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

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*ln(c*x**n))/x/(d+e*x**r)**(3/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b\log\left(cx^n\right)+a}{\left(ex^r+d\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^(3/2)*x), x)
```

3.438 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{5/2}}\,dx$

Optimal. Leaf size=271

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}+\frac{1}{dr(d+ex^r)^{3/2}}\right)(a+b\log(cx^n))-\frac{4bn}{3d^2r^2\sqrt{d}}$$

```
[Out] (-4*b*n)/(3*d^2*r^2*Sqrt[d + e*x^r]) + (16*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt
[d]])/(3*d^(5/2)*r^2) + (2*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(d^(5/2)
*r^2) + (2*(1/(d*r*(d + e*x^r)^(3/2)) + 3/(d^2*r*Sqrt[d + e*x^r]) - (3*ArcT
anh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(5/2)*r))*(a + b*Log[c*x^n]))/3 - (4*b*n*A
rcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])
])/(d^(5/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*
x^r])])/(d^(5/2)*r^2)
```

Rubi [A] time = 0.415863, antiderivative size = 271, normalized size of antiderivative = 1., number of steps used = 15, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}+\frac{1}{dr(d+ex^r)^{3/2}}\right)(a+b\log(cx^n))-\frac{4bn}{3d^2r^2\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(5/2)),x]
```

```
[Out] (-4*b*n)/(3*d^2*r^2*Sqrt[d + e*x^r]) + (16*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt
[d]])/(3*d^(5/2)*r^2) + (2*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(d^(5/2)
*r^2) + (2*(1/(d*r*(d + e*x^r)^(3/2)) + 3/(d^2*r*Sqrt[d + e*x^r]) - (3*ArcT
anh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(5/2)*r))*(a + b*Log[c*x^n]))/3 - (4*b*n*A
rcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r])
])/(d^(5/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*
x^r])])/(d^(5/2)*r^2)
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
```

```
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{5/2}}\,dx = \frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx^n))-(bn)\int\left(\frac{2}{3drx(d+ex^r)^{3}}\right.$$

$$=\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx^n))+\frac{(2bn)\int\frac{\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{x}d}{d^{5/2}r}$$

$$=\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx^n))+\frac{(2bn)\,\mathrm{Subst}\left(\int\frac{\tanh^{-1}(}{x}\right.}{d^{5/2}r^2}$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+ex^r}}-\frac{3\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r}\right)(a+b\log(cx^n))+\frac{(4b}{}$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d+}}\right.$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d-}}\right.$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d-}}\right.$$

$$=-\frac{4bn}{3d^2r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{5/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{5/2}r^2}+\frac{2}{3}\left(\frac{1}{dr(d+ex^r)^{3/2}}+\frac{3}{d^2r\sqrt{d-}}\right.$$

Mathematica [F] time = 0.351192, size = 0, normalized size = 0.

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(5/2)),x]
```

```
[Out] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(5/2)), x]
```

Maple [F] time = 0.48, size = 0, normalized size = 0.

$$\int \frac{a+b\ln\left(cx^{n}\right)}{x}\left(d+ex^{r}\right)^{-\frac{5}{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(5/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(5/2),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((a+b*log(c*x^n))/x/(d+e*x^r)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

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*ln(c*x**n))/x/(d+e*x**r)**(5/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log (cx^n) + a}{(ex^r + d)^{\frac{5}{2}} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^(5/2)*x), x)
```

3.439 $\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{7/2}}\,dx$

Optimal. Leaf size=314

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{7/2}r^2}+\frac{2}{15}\left(\frac{15}{d^3r\sqrt{d+ex^r}}+\frac{5}{d^2r\,(d+ex^r)^{3/2}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}+\frac{3}{dr\,(d+ex^r)^{5/2}}\right)(a+b\,l$$

```
[Out] (-4*b*n)/(15*d^2*r^2*(d + e*x^r)^(3/2)) - (32*b*n)/(15*d^3*r^2*Sqrt[d + e*x
^r]) + (92*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(15*d^(7/2)*r^2) + (2*b*n*
ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(d^(7/2)*r^2) + (2*(3/(d*r*(d + e*x^r)^
(5/2)) + 5/(d^2*r*(d + e*x^r)^(3/2)) + 15/(d^3*r*Sqrt[d + e*x^r]) - (15*Arc
Tanh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(7/2)*r))*(a + b*Log[c*x^n]))/15 - (4*b*n
*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r
])])/(d^(7/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d +
e*x^r])])/(d^(7/2)*r^2)
```

Rubi [A] time = 0.470836, antiderivative size = 314, normalized size of antiderivative = 1., number of steps used = 20, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.36, Rules used = {266, 51, 63, 208, 2348, 5984, 5918, 2402, 2315}

$$-\frac{2bn\text{PolyLog}\left(2,1-\frac{2\sqrt{d}}{\sqrt{d}-\sqrt{d+ex^r}}\right)}{d^{7/2}r^2}+\frac{2}{15}\left(\frac{15}{d^3r\sqrt{d+ex^r}}+\frac{5}{d^2r\,(d+ex^r)^{3/2}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}+\frac{3}{dr\,(d+ex^r)^{5/2}}\right)(a+b\,l$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(7/2)),x]
```


```
[Out] (-4*b*n)/(15*d^2*r^2*(d + e*x^r)^(3/2)) - (32*b*n)/(15*d^3*r^2*Sqrt[d + e*x
^r]) + (92*b*n*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]])/(15*d^(7/2)*r^2) + (2*b*n*
ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]^2)/(d^(7/2)*r^2) + (2*(3/(d*r*(d + e*x^r)^
(5/2)) + 5/(d^2*r*(d + e*x^r)^(3/2)) + 15/(d^3*r*Sqrt[d + e*x^r]) - (15*Arc
Tanh[Sqrt[d + e*x^r]/Sqrt[d]])/(d^(7/2)*r))*(a + b*Log[c*x^n]))/15 - (4*b*n
*ArcTanh[Sqrt[d + e*x^r]/Sqrt[d]]*Log[(2*Sqrt[d])/(Sqrt[d] - Sqrt[d + e*x^r
])])/(d^(7/2)*r^2) - (2*b*n*PolyLog[2, 1 - (2*Sqrt[d])/(Sqrt[d] - Sqrt[d +
e*x^r])])/(d^(7/2)*r^2)
```


Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 2348

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_.))
/(x_), x_Symbol] :> With[{u = IntHide[(d + e*x^r)^q/x, x]}, Simp[u*(a + b*L
og[c*x^n]), x] - Dist[b*n, Int[Dist[1/x, u, x], x], x]] /; FreeQ[{a, b, c,
d, e, n, r}, x] && IntegerQ[q - 1/2]
```

Rule 5984

```
Int[(((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
 x_Symbol] :> Simp[(a + b*ArcTanh[c*x])^(p + 1)/(b*e*(p + 1)), x] + Dist[1/
(c*d), Int[(a + b*ArcTanh[c*x])^p/(1 - c*x), x], x] /; FreeQ[{a, b, c, d, e
}, x] && EqQ[c^2*d + e, 0] && IGtQ[p, 0]
```

Rule 5918

```
Int[((a_.) + ArcTanh[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol
] :> -Simp[((a + b*ArcTanh[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*
p)/e, Int[((a + b*ArcTanh[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 - c^2*x^2)
```

```
, x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 - e^2, 0
]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rubi steps

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{7/2}}\,dx = \frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+ex^r}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}\right)(a+b\log(cx^n))-(bn$$

$$=\frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+ex^r}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}\right)(a+b\log(cx^n))+\frac{(2\ldots}{}$$

$$=\frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+ex^r}}-\frac{15\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r}\right)(a+b\log(cx^n))+\frac{(2\ldots}{}$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{4bn}{3d^3r^2\sqrt{d+ex^r}}+\frac{2}{15}\left(\frac{3}{dr(d+ex^r)^{5/2}}+\frac{5}{d^2r(d+ex^r)^{3/2}}+\frac{15}{d^3r\sqrt{d+ex^r}}-\frac{15\ldots}{}\right.$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{4bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}+\frac{2}{15}\left(\frac{}{dr\ldots}\right.$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{16bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{3d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}+\frac{2}{15}\left(\frac{}{d\ldots}\right.$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{92bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{15d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}+\frac{2}{15}\left(\frac{}{d\ldots}\right.$$

$$=-\frac{4bn}{15d^2r^2(d+ex^r)^{3/2}}-\frac{32bn}{15d^3r^2\sqrt{d+ex^r}}+\frac{92bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)}{15d^{7/2}r^2}+\frac{2bn\tanh^{-1}\left(\frac{\sqrt{d+ex^r}}{\sqrt{d}}\right)^2}{d^{7/2}r^2}+\frac{2}{15}\left(\frac{}{d\ldots}\right.$$

Mathematica [F] time = 0.421023, size = 0, normalized size = 0.

$$\int \frac{a+b\log(cx^n)}{x(d+ex^r)^{7/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(7/2)),x]
```

```
[Out] Integrate[(a + b*Log[c*x^n])/(x*(d + e*x^r)^(7/2)), x]
```

Maple [F] time = 0.48, size = 0, normalized size = 0.

$$\int \frac{a + b\ln(cx^n)}{x} (d + ex^r)^{-\frac{7}{2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(7/2),x)
```

```
[Out] int((a+b*ln(c*x^n))/x/(d+e*x^r)^(7/2),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((a+b*log(c*x^n))/x/(d+e*x^r)^(7/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: UnboundLocalError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(7/2),x, algorithm="fricas")
```

```
[Out] Exception raised: UnboundLocalError
```

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*ln(c*x**n))/x/(d+e*x**r)**(7/2),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{b \log(cx^n) + a}{(ex^r + d)^{\frac{7}{2}} x} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*log(c*x^n))/x/(d+e*x^r)^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)/((e*x^r + d)^(7/2)*x), x)
```

3.440 $\int (fx)^m (d+ex^r)^3 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=233

$$\frac{3d^2ex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}+\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3de^2x^{2r+1}(fx)^m(a+b\log(cx^n))}{m+2r+1}+\frac{e^3x^{3r+1}(fx)^m(a+b}{m+3r+1}$$

```
[Out] (-3*b*d^2*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2 - (3*b*d*e^2*n*x^(1 + 2*r)*(
f*x)^m)/(1 + m + 2*r)^2 - (b*e^3*n*x^(1 + 3*r)*(f*x)^m)/(1 + m + 3*r)^2 - (
b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2) + (3*d^2*e*x^(1 + r)*(f*x)^m*(a + b*Lo
g[c*x^n]))/(1 + m + r) + (3*d*e^2*x^(1 + 2*r)*(f*x)^m*(a + b*Log[c*x^n]))/(
1 + m + 2*r) + (e^3*x^(1 + 3*r)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + 3*r) +
 (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m))
```

Rubi [A] time = 1.98725, antiderivative size = 233, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {270, 20, 30, 2350, 14}

$$\frac{3d^2ex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}+\frac{d^3(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{3de^2x^{2r+1}(fx)^m(a+b\log(cx^n))}{m+2r+1}+\frac{e^3x^{3r+1}(fx)^m(a+b}{m+3r+1}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```


```
[Out] (-3*b*d^2*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2 - (3*b*d*e^2*n*x^(1 + 2*r)*(
f*x)^m)/(1 + m + 2*r)^2 - (b*e^3*n*x^(1 + 3*r)*(f*x)^m)/(1 + m + 3*r)^2 - (
b*d^3*n*(f*x)^(1 + m))/(f*(1 + m)^2) + (3*d^2*e*x^(1 + r)*(f*x)^m*(a + b*Lo
g[c*x^n]))/(1 + m + r) + (3*d*e^2*x^(1 + 2*r)*(f*x)^m*(a + b*Log[c*x^n]))/(
1 + m + 2*r) + (e^3*x^(1 + 3*r)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + 3*r) +
 (d^3*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1 + m))
```


Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 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 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] && !LinearQ[u, x] && !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\begin{aligned}\int (fx)^m (d+ex^r)^3 (a+b\log(cx^n))\,dx &= \frac{3d^2ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m(a+b\log(cx^n))}{1+m+2r}+\frac{e^3x^{1+3r}(f\\
&= \frac{3d^2ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m(a+b\log(cx^n))}{1+m+2r}+\frac{e^3x^{1+3r}(f\\
&= -\frac{bd^3n(fx)^{1+m}}{f(1+m)^2}+\frac{3d^2ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m(a+b\log(c\\
&= -\frac{bd^3n(fx)^{1+m}}{f(1+m)^2}+\frac{3d^2ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{3de^2x^{1+2r}(fx)^m(a+b\log(c\\
&= -\frac{3bd^2enx^{1+r}(fx)^m}{(1+m+r)^2}-\frac{3bde^2nx^{1+2r}(fx)^m}{(1+m+2r)^2}-\frac{be^3nx^{1+3r}(fx)^m}{(1+m+3r)^2}-\frac{bd^3n(fx)^{1+m}}{f(1+m)^2}+\frac{3a\end{aligned}$$

Mathematica [A] time = 0.476407, size = 178, normalized size = 0.76

$$x(fx)^m\left(\frac{3d^2ex^r(a+b\log(cx^n))}{m+r+1}+\frac{d^3(a+b\log(cx^n))}{m+1}+\frac{3de^2x^{2r}(a+b\log(cx^n))}{m+2r+1}+\frac{e^3x^{3r}(a+b\log(cx^n))}{m+3r+1}-\frac{3bd^2enx^r}{(m+r+1)^2}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^3*n)/(1 + m)^2) - (3*b*d^2*e*n*x^r)/(1 + m + r)^2 - (3*b*
d*e^2*n*x^(2*r))/(1 + m + 2*r)^2 - (b*e^3*n*x^(3*r))/(1 + m + 3*r)^2 + (d^3
*(a + b*Log[c*x^n]))/(1 + m) + (3*d^2*e*x^r*(a + b*Log[c*x^n]))/(1 + m + r)
 + (3*d*e^2*x^(2*r)*(a + b*Log[c*x^n]))/(1 + m + 2*r) + (e^3*x^(3*r)*(a + b
*Log[c*x^n]))/(1 + m + 3*r))
```

Maple [C] time = 1.512, size = 22706, normalized size = 97.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d+e*x^r)^3*(a+b*ln(c*x^n)),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((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 2.00417, size = 10967, normalized size = 47.07

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (((b*e^3*m^7 + 7*b*e^3*m^6 + 21*b*e^3*m^5 + 35*b*e^3*m^4 + 35*b*e^3*m^3 + 2
1*b*e^3*m^2 + 12*(b*e^3*m^2 + 2*b*e^3*m + b*e^3)*r^5 + 7*b*e^3*m + 40*(b*e^
3*m^3 + 3*b*e^3*m^2 + 3*b*e^3*m + b*e^3)*r^4 + b*e^3 + 51*(b*e^3*m^4 + 4*b*
e^3*m^3 + 6*b*e^3*m^2 + 4*b*e^3*m + b*e^3)*r^3 + 31*(b*e^3*m^5 + 5*b*e^3*m^
4 + 10*b*e^3*m^3 + 10*b*e^3*m^2 + 5*b*e^3*m + b*e^3)*r^2 + 9*(b*e^3*m^6 + 6
*b*e^3*m^5 + 15*b*e^3*m^4 + 20*b*e^3*m^3 + 15*b*e^3*m^2 + 6*b*e^3*m + b*e^3
)*r)*x*log(c) + (12*(b*e^3*m^2 + 2*b*e^3*m + b*e^3)*n*r^5 + 40*(b*e^3*m^3 +
 3*b*e^3*m^2 + 3*b*e^3*m + b*e^3)*n*r^4 + 51*(b*e^3*m^4 + 4*b*e^3*m^3 + 6*b
*e^3*m^2 + 4*b*e^3*m + b*e^3)*n*r^3 + 31*(b*e^3*m^5 + 5*b*e^3*m^4 + 10*b*e^
3*m^3 + 10*b*e^3*m^2 + 5*b*e^3*m + b*e^3)*n*r^2 + 9*(b*e^3*m^6 + 6*b*e^3*m^
5 + 15*b*e^3*m^4 + 20*b*e^3*m^3 + 15*b*e^3*m^2 + 6*b*e^3*m + b*e^3)*n*r + (
b*e^3*m^7 + 7*b*e^3*m^6 + 21*b*e^3*m^5 + 35*b*e^3*m^4 + 35*b*e^3*m^3 + 21*b
*e^3*m^2 + 7*b*e^3*m + b*e^3)*n)*x*log(x) + (a*e^3*m^7 + 7*a*e^3*m^6 + 21*a
*e^3*m^5 + 35*a*e^3*m^4 + 35*a*e^3*m^3 + 21*a*e^3*m^2 + 12*(a*e^3*m^2 + 2*a
*e^3*m + a*e^3)*r^5 + 7*a*e^3*m + 4*(10*a*e^3*m^3 + 30*a*e^3*m^2 + 30*a*e^3
*m + 10*a*e^3 - (b*e^3*m^2 + 2*b*e^3*m + b*e^3)*n)*r^4 + a*e^3 + 3*(17*a*e^
3*m^4 + 68*a*e^3*m^3 + 102*a*e^3*m^2 + 68*a*e^3*m + 17*a*e^3 - 4*(b*e^3*m^3
 + 3*b*e^3*m^2 + 3*b*e^3*m + b*e^3)*n)*r^3 + (31*a*e^3*m^5 + 155*a*e^3*m^4
+ 310*a*e^3*m^3 + 310*a*e^3*m^2 + 155*a*e^3*m + 31*a*e^3 - 13*(b*e^3*m^4 +
4*b*e^3*m^3 + 6*b*e^3*m^2 + 4*b*e^3*m + b*e^3)*n)*r^2 - (b*e^3*m^6 + 6*b*e^
3*m^5 + 15*b*e^3*m^4 + 20*b*e^3*m^3 + 15*b*e^3*m^2 + 6*b*e^3*m + b*e^3)*n +
 3*(3*a*e^3*m^6 + 18*a*e^3*m^5 + 45*a*e^3*m^4 + 60*a*e^3*m^3 + 45*a*e^3*m^2
 + 18*a*e^3*m + 3*a*e^3 - 2*(b*e^3*m^5 + 5*b*e^3*m^4 + 10*b*e^3*m^3 + 10*b*
e^3*m^2 + 5*b*e^3*m + b*e^3)*n)*r)*x)*x^(3*r)*e^(m*log(f) + m*log(x)) + 3*(
(b*d*e^2*m^7 + 7*b*d*e^2*m^6 + 21*b*d*e^2*m^5 + 35*b*d*e^2*m^4 + 35*b*d*e^2
*m^3 + 21*b*d*e^2*m^2 + 18*(b*d*e^2*m^2 + 2*b*d*e^2*m + b*d*e^2)*r^5 + 7*b*
d*e^2*m + 57*(b*d*e^2*m^3 + 3*b*d*e^2*m^2 + 3*b*d*e^2*m + b*d*e^2)*r^4 + b*
d*e^2 + 68*(b*d*e^2*m^4 + 4*b*d*e^2*m^3 + 6*b*d*e^2*m^2 + 4*b*d*e^2*m + b*d
*e^2)*r^3 + 38*(b*d*e^2*m^5 + 5*b*d*e^2*m^4 + 10*b*d*e^2*m^3 + 10*b*d*e^2*m
^2 + 5*b*d*e^2*m + b*d*e^2)*r^2 + 10*(b*d*e^2*m^6 + 6*b*d*e^2*m^5 + 15*b*d*
e^2*m^4 + 20*b*d*e^2*m^3 + 15*b*d*e^2*m^2 + 6*b*d*e^2*m + b*d*e^2)*r)*x*log
(c) + (18*(b*d*e^2*m^2 + 2*b*d*e^2*m + b*d*e^2)*n*r^5 + 57*(b*d*e^2*m^3 + 3
*b*d*e^2*m^2 + 3*b*d*e^2*m + b*d*e^2)*n*r^4 + 68*(b*d*e^2*m^4 + 4*b*d*e^2*m
^3 + 6*b*d*e^2*m^2 + 4*b*d*e^2*m + b*d*e^2)*n*r^3 + 38*(b*d*e^2*m^5 + 5*b*d
*e^2*m^4 + 10*b*d*e^2*m^3 + 10*b*d*e^2*m^2 + 5*b*d*e^2*m + b*d*e^2)*n*r^2 +
 10*(b*d*e^2*m^6 + 6*b*d*e^2*m^5 + 15*b*d*e^2*m^4 + 20*b*d*e^2*m^3 + 15*b*d
*e^2*m^2 + 6*b*d*e^2*m + b*d*e^2)*n*r + (b*d*e^2*m^7 + 7*b*d*e^2*m^6 + 21*b
*d*e^2*m^5 + 35*b*d*e^2*m^4 + 35*b*d*e^2*m^3 + 21*b*d*e^2*m^2 + 7*b*d*e^2*m
 + b*d*e^2)*n)*x*log(x) + (a*d*e^2*m^7 + 7*a*d*e^2*m^6 + 21*a*d*e^2*m^5 + 3
5*a*d*e^2*m^4 + 35*a*d*e^2*m^3 + 21*a*d*e^2*m^2 + 18*(a*d*e^2*m^2 + 2*a*d*e
^2*m + a*d*e^2)*r^5 + 7*a*d*e^2*m + 3*(19*a*d*e^2*m^3 + 57*a*d*e^2*m^2 + 57
*a*d*e^2*m + 19*a*d*e^2 - 3*(b*d*e^2*m^2 + 2*b*d*e^2*m + b*d*e^2)*n)*r^4 +
a*d*e^2 + 4*(17*a*d*e^2*m^4 + 68*a*d*e^2*m^3 + 102*a*d*e^2*m^2 + 68*a*d*e^2
*m + 17*a*d*e^2 - 6*(b*d*e^2*m^3 + 3*b*d*e^2*m^2 + 3*b*d*e^2*m + b*d*e^2)*n
)*r^3 + 2*(19*a*d*e^2*m^5 + 95*a*d*e^2*m^4 + 190*a*d*e^2*m^3 + 190*a*d*e^2*
```

```
m^2 + 95*a*d*e^2*m + 19*a*d*e^2 - 11*(b*d*e^2*m^4 + 4*b*d*e^2*m^3 + 6*b*d*e
^2*m^2 + 4*b*d*e^2*m + b*d*e^2)*n)*r^2 - (b*d*e^2*m^6 + 6*b*d*e^2*m^5 + 15*
b*d*e^2*m^4 + 20*b*d*e^2*m^3 + 15*b*d*e^2*m^2 + 6*b*d*e^2*m + b*d*e^2)*n +
2*(5*a*d*e^2*m^6 + 30*a*d*e^2*m^5 + 75*a*d*e^2*m^4 + 100*a*d*e^2*m^3 + 75*a
*d*e^2*m^2 + 30*a*d*e^2*m + 5*a*d*e^2 - 4*(b*d*e^2*m^5 + 5*b*d*e^2*m^4 + 10
*b*d*e^2*m^3 + 10*b*d*e^2*m^2 + 5*b*d*e^2*m + b*d*e^2)*n)*r)*x)*x^(2*r)*e^(
m*log(f) + m*log(x)) + 3*((b*d^2*e*m^7 + 7*b*d^2*e*m^6 + 21*b*d^2*e*m^5 + 3
5*b*d^2*e*m^4 + 35*b*d^2*e*m^3 + 21*b*d^2*e*m^2 + 36*(b*d^2*e*m^2 + 2*b*d^2
*e*m + b*d^2*e)*r^5 + 7*b*d^2*e*m + 96*(b*d^2*e*m^3 + 3*b*d^2*e*m^2 + 3*b*d
^2*e*m + b*d^2*e)*r^4 + b*d^2*e + 97*(b*d^2*e*m^4 + 4*b*d^2*e*m^3 + 6*b*d^2
*e*m^2 + 4*b*d^2*e*m + b*d^2*e)*r^3 + 47*(b*d^2*e*m^5 + 5*b*d^2*e*m^4 + 10*
b*d^2*e*m^3 + 10*b*d^2*e*m^2 + 5*b*d^2*e*m + b*d^2*e)*r^2 + 11*(b*d^2*e*m^6
 + 6*b*d^2*e*m^5 + 15*b*d^2*e*m^4 + 20*b*d^2*e*m^3 + 15*b*d^2*e*m^2 + 6*b*d
^2*e*m + b*d^2*e)*r)*x*log(c) + (36*(b*d^2*e*m^2 + 2*b*d^2*e*m + b*d^2*e)*n
*r^5 + 96*(b*d^2*e*m^3 + 3*b*d^2*e*m^2 + 3*b*d^2*e*m + b*d^2*e)*n*r^4 + 97*
(b*d^2*e*m^4 + 4*b*d^2*e*m^3 + 6*b*d^2*e*m^2 + 4*b*d^2*e*m + b*d^2*e)*n*r^3
 + 47*(b*d^2*e*m^5 + 5*b*d^2*e*m^4 + 10*b*d^2*e*m^3 + 10*b*d^2*e*m^2 + 5*b*
d^2*e*m + b*d^2*e)*n*r^2 + 11*(b*d^2*e*m^6 + 6*b*d^2*e*m^5 + 15*b*d^2*e*m^4
 + 20*b*d^2*e*m^3 + 15*b*d^2*e*m^2 + 6*b*d^2*e*m + b*d^2*e)*n*r + (b*d^2*e*
m^7 + 7*b*d^2*e*m^6 + 21*b*d^2*e*m^5 + 35*b*d^2*e*m^4 + 35*b*d^2*e*m^3 + 21
*b*d^2*e*m^2 + 7*b*d^2*e*m + b*d^2*e)*n)*x*log(x) + (a*d^2*e*m^7 + 7*a*d^2*
e*m^6 + 21*a*d^2*e*m^5 + 35*a*d^2*e*m^4 + 35*a*d^2*e*m^3 + 21*a*d^2*e*m^2 +
 36*(a*d^2*e*m^2 + 2*a*d^2*e*m + a*d^2*e)*r^5 + 7*a*d^2*e*m + 12*(8*a*d^2*e
*m^3 + 24*a*d^2*e*m^2 + 24*a*d^2*e*m + 8*a*d^2*e - 3*(b*d^2*e*m^2 + 2*b*d^2
*e*m + b*d^2*e)*n)*r^4 + a*d^2*e + (97*a*d^2*e*m^4 + 388*a*d^2*e*m^3 + 582*
a*d^2*e*m^2 + 388*a*d^2*e*m + 97*a*d^2*e - 60*(b*d^2*e*m^3 + 3*b*d^2*e*m^2
+ 3*b*d^2*e*m + b*d^2*e)*n)*r^3 + (47*a*d^2*e*m^5 + 235*a*d^2*e*m^4 + 470*a
*d^2*e*m^3 + 470*a*d^2*e*m^2 + 235*a*d^2*e*m + 47*a*d^2*e - 37*(b*d^2*e*m^4
 + 4*b*d^2*e*m^3 + 6*b*d^2*e*m^2 + 4*b*d^2*e*m + b*d^2*e)*n)*r^2 - (b*d^2*e
*m^6 + 6*b*d^2*e*m^5 + 15*b*d^2*e*m^4 + 20*b*d^2*e*m^3 + 15*b*d^2*e*m^2 + 6
*b*d^2*e*m + b*d^2*e)*n + (11*a*d^2*e*m^6 + 66*a*d^2*e*m^5 + 165*a*d^2*e*m^
4 + 220*a*d^2*e*m^3 + 165*a*d^2*e*m^2 + 66*a*d^2*e*m + 11*a*d^2*e - 10*(b*d
^2*e*m^5 + 5*b*d^2*e*m^4 + 10*b*d^2*e*m^3 + 10*b*d^2*e*m^2 + 5*b*d^2*e*m +
b*d^2*e)*n)*r)*x)*x^r*e^(m*log(f) + m*log(x)) + ((b*d^3*m^7 + 7*b*d^3*m^6 +
 21*b*d^3*m^5 + 35*b*d^3*m^4 + 35*b*d^3*m^3 + 36*(b*d^3*m + b*d^3)*r^6 + 21
*b*d^3*m^2 + 132*(b*d^3*m^2 + 2*b*d^3*m + b*d^3)*r^5 + 7*b*d^3*m + 193*(b*d
^3*m^3 + 3*b*d^3*m^2 + 3*b*d^3*m + b*d^3)*r^4 + b*d^3 + 144*(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)*r^3 + 58*(b*d^3*m^5 + 5*b*d^3*
m^4 + 10*b*d^3*m^3 + 10*b*d^3*m^2 + 5*b*d^3*m + b*d^3)*r^2 + 12*(b*d^3*m^6
+ 6*b*d^3*m^5 + 15*b*d^3*m^4 + 20*b*d^3*m^3 + 15*b*d^3*m^2 + 6*b*d^3*m + b*
d^3)*r)*x*log(c) + (36*(b*d^3*m + b*d^3)*n*r^6 + 132*(b*d^3*m^2 + 2*b*d^3*m
 + b*d^3)*n*r^5 + 193*(b*d^3*m^3 + 3*b*d^3*m^2 + 3*b*d^3*m + b*d^3)*n*r^4 +
 144*(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)*n*r^3 + 58
*(b*d^3*m^5 + 5*b*d^3*m^4 + 10*b*d^3*m^3 + 10*b*d^3*m^2 + 5*b*d^3*m + b*d^3
)*n*r^2 + 12*(b*d^3*m^6 + 6*b*d^3*m^5 + 15*b*d^3*m^4 + 20*b*d^3*m^3 + 15*b*
```

```
d^3*m^2 + 6*b*d^3*m + b*d^3)*n*r + (b*d^3*m^7 + 7*b*d^3*m^6 + 21*b*d^3*m^5
+ 35*b*d^3*m^4 + 35*b*d^3*m^3 + 21*b*d^3*m^2 + 7*b*d^3*m + b*d^3)*n)*x*log(
x) + (a*d^3*m^7 + 7*a*d^3*m^6 + 21*a*d^3*m^5 + 35*a*d^3*m^4 + 35*a*d^3*m^3
+ 36*(a*d^3*m - b*d^3*n + a*d^3)*r^6 + 21*a*d^3*m^2 + 132*(a*d^3*m^2 + 2*a*
d^3*m + a*d^3 - (b*d^3*m + b*d^3)*n)*r^5 + 7*a*d^3*m + 193*(a*d^3*m^3 + 3*a
*d^3*m^2 + 3*a*d^3*m + a*d^3 - (b*d^3*m^2 + 2*b*d^3*m + b*d^3)*n)*r^4 + a*d
^3 + 144*(a*d^3*m^4 + 4*a*d^3*m^3 + 6*a*d^3*m^2 + 4*a*d^3*m + a*d^3 - (b*d^
3*m^3 + 3*b*d^3*m^2 + 3*b*d^3*m + b*d^3)*n)*r^3 + 58*(a*d^3*m^5 + 5*a*d^3*m
^4 + 10*a*d^3*m^3 + 10*a*d^3*m^2 + 5*a*d^3*m + a*d^3 - (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)*n)*r^2 - (b*d^3*m^6 + 6*b*d^3*m^5 +
 15*b*d^3*m^4 + 20*b*d^3*m^3 + 15*b*d^3*m^2 + 6*b*d^3*m + b*d^3)*n + 12*(a*
d^3*m^6 + 6*a*d^3*m^5 + 15*a*d^3*m^4 + 20*a*d^3*m^3 + 15*a*d^3*m^2 + 6*a*d^
3*m + a*d^3 - (b*d^3*m^5 + 5*b*d^3*m^4 + 10*b*d^3*m^3 + 10*b*d^3*m^2 + 5*b*
d^3*m + b*d^3)*n)*r)*x)*e^(m*log(f) + m*log(x)))/(m^8 + 8*m^7 + 36*(m^2 + 2
*m + 1)*r^6 + 28*m^6 + 132*(m^3 + 3*m^2 + 3*m + 1)*r^5 + 56*m^5 + 193*(m^4
+ 4*m^3 + 6*m^2 + 4*m + 1)*r^4 + 70*m^4 + 144*(m^5 + 5*m^4 + 10*m^3 + 10*m^
2 + 5*m + 1)*r^3 + 56*m^3 + 58*(m^6 + 6*m^5 + 15*m^4 + 20*m^3 + 15*m^2 + 6*
m + 1)*r^2 + 28*m^2 + 12*(m^7 + 7*m^6 + 21*m^5 + 35*m^4 + 35*m^3 + 21*m^2 +
 7*m + 1)*r + 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((f*x)**m*(d+e*x**r)**3*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.40581, size = 1034, normalized size = 4.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 3*b*d^2*f^m*m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + 3*
b*d^2*f^m*n*r*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*d^
```

```
3*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + 3*b*d*f^m*m*n*x*x^m*x^(2*r)*e^2*lo
g(x)/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 6*b*d*f^m*n*r*x*x^m*x^(2*r)*e^
2*log(x)/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 3*b*d^2*f^m*n*x*x^m*x^r*e*
log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) - 3*b*d^2*f^m*n*x*x^m*x^r*e/(m^2
 + 2*m*r + r^2 + 2*m + 2*r + 1) + 3*b*d^2*f^m*x*x^m*x^r*e*log(c)/(m + r + 1
) + b*d^3*f^m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*m*n*x*x^m*x^(3*r)*e^3*
log(x)/(m^2 + 6*m*r + 9*r^2 + 2*m + 6*r + 1) + 3*b*f^m*n*r*x*x^m*x^(3*r)*e^
3*log(x)/(m^2 + 6*m*r + 9*r^2 + 2*m + 6*r + 1) + 3*b*d*f^m*n*x*x^m*x^(2*r)*
e^2*log(x)/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) - b*d^3*f^m*n*x*x^m/(m^2 +
 2*m + 1) - 3*b*d*f^m*n*x*x^m*x^(2*r)*e^2/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r
+ 1) + 3*a*d^2*f^m*x*x^m*x^r*e/(m + r + 1) + 3*b*d*f^m*x*x^m*x^(2*r)*e^2*lo
g(c)/(m + 2*r + 1) + b*f^m*n*x*x^m*x^(3*r)*e^3*log(x)/(m^2 + 6*m*r + 9*r^2
+ 2*m + 6*r + 1) - b*f^m*n*x*x^m*x^(3*r)*e^3/(m^2 + 6*m*r + 9*r^2 + 2*m + 6
*r + 1) + 3*a*d*f^m*x*x^m*x^(2*r)*e^2/(m + 2*r + 1) + (f*x)^m*b*d^3*x*log(c
)/(m + 1) + b*f^m*x*x^m*x^(3*r)*e^3*log(c)/(m + 3*r + 1) + (f*x)^m*a*d^3*x/
(m + 1) + a*f^m*x*x^m*x^(3*r)*e^3/(m + 3*r + 1)
```

3.441 $\int (fx)^m (d+ex^r)^2 (a+b\log(cx^n))\,dx$

Optimal. Leaf size=165

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2dex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}+\frac{e^2x^{2r+1}(fx)^m(a+b\log(cx^n))}{m+2r+1}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bdenx^{r+}}{(m+r}$$

```
[Out] (-2*b*d*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2 - (b*e^2*n*x^(1 + 2*r)*(f*x)^m
)/(1 + m + 2*r)^2 - (b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2) + (2*d*e*x^(1 + r
)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + r) + (e^2*x^(1 + 2*r)*(f*x)^m*(a + b
*Log[c*x^n]))/(1 + m + 2*r) + (d^2*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1
+ m))
```

Rubi [A] time = 0.185399, antiderivative size = 165, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2, Rules used = {270, 20, 30, 2350, 14}

$$\frac{d^2(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{2dex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}+\frac{e^2x^{2r+1}(fx)^m(a+b\log(cx^n))}{m+2r+1}-\frac{bd^2n(fx)^{m+1}}{f(m+1)^2}-\frac{2bdenx^{r+}}{(m+r}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] (-2*b*d*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2 - (b*e^2*n*x^(1 + 2*r)*(f*x)^m
)/(1 + m + 2*r)^2 - (b*d^2*n*(f*x)^(1 + m))/(f*(1 + m)^2) + (2*d*e*x^(1 + r
)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + r) + (e^2*x^(1 + 2*r)*(f*x)^m*(a + b
*Log[c*x^n]))/(1 + m + 2*r) + (d^2*(f*x)^(1 + m)*(a + b*Log[c*x^n]))/(f*(1
+ m))
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 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 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rubi steps

$$\int (fx)^m (d+ex^r)^2 (a+b\log(cx^n))\,dx = \frac{2dex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m(a+b\log(cx^n))}{1+m+2r} + \frac{d^2(fx)^{1+m}(\ldots}{f(1\ldots}$$

$$= \frac{2dex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m(a+b\log(cx^n))}{1+m+2r} + \frac{d^2(fx)^{1+m}(\ldots}{f(1\ldots}$$

$$= -\frac{bd^2n(fx)^{1+m}}{f(1+m)^2} + \frac{2dex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m(a+b\log(cx^{\ldots}}{1+m+2r}$$

$$= -\frac{bd^2n(fx)^{1+m}}{f(1+m)^2} + \frac{2dex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r} + \frac{e^2x^{1+2r}(fx)^m(a+b\log(cx^{\ldots}}{1+m+2r}$$

$$= -\frac{2bdenx^{1+r}(fx)^m}{(1+m+r)^2} - \frac{be^2nx^{1+2r}(fx)^m}{(1+m+2r)^2} - \frac{bd^2n(fx)^{1+m}}{f(1+m)^2} + \frac{2dex^{1+r}(fx)^m(a+b\,\mathrm{lo}\ldots}{1+m+r}$$

Mathematica [A] time = 0.244075, size = 124, normalized size = 0.75

$$x(fx)^m\left(\frac{d^2(a+b\log(cx^n))}{m+1} + \frac{2dex^r(a+b\log(cx^n))}{m+r+1} + \frac{e^2x^{2r}(a+b\log(cx^n))}{m+2r+1} - \frac{bd^2n}{(m+1)^2} - \frac{2bdenx^r}{(m+r+1)^2} - \frac{be^2nx^{2r}}{(m+2r+1\ldots}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d^2*n)/(1 + m)^2) - (2*b*d*e*n*x^r)/(1 + m + r)^2 - (b*e^2*
n*x^(2*r))/(1 + m + 2*r)^2 + (d^2*(a + b*Log[c*x^n]))/(1 + m) + (2*d*e*x^r*
(a + b*Log[c*x^n]))/(1 + m + r) + (e^2*x^(2*r)*(a + b*Log[c*x^n]))/(1 + m +
 2*r))
```

Maple [C] time = 0.727, size = 8737, normalized size = 53.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d+e*x^r)^2*(a+b*ln(c*x^n)),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((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.58715, size = 4199, normalized size = 25.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (((b*e^2*m^5 + 5*b*e^2*m^4 + 10*b*e^2*m^3 + 10*b*e^2*m^2 + 5*b*e^2*m + 2*(b
*e^2*m^2 + 2*b*e^2*m + b*e^2)*r^3 + b*e^2 + 5*(b*e^2*m^3 + 3*b*e^2*m^2 + 3*
```

```
b*e^2*m + b*e^2)*r^2 + 4*(b*e^2*m^4 + 4*b*e^2*m^3 + 6*b*e^2*m^2 + 4*b*e^2*m
 + b*e^2)*r)*x*log(c) + (2*(b*e^2*m^2 + 2*b*e^2*m + b*e^2)*n*r^3 + 5*(b*e^2
*m^3 + 3*b*e^2*m^2 + 3*b*e^2*m + b*e^2)*n*r^2 + 4*(b*e^2*m^4 + 4*b*e^2*m^3
+ 6*b*e^2*m^2 + 4*b*e^2*m + b*e^2)*n*r + (b*e^2*m^5 + 5*b*e^2*m^4 + 10*b*e^
2*m^3 + 10*b*e^2*m^2 + 5*b*e^2*m + b*e^2)*n)*x*log(x) + (a*e^2*m^5 + 5*a*e^
2*m^4 + 10*a*e^2*m^3 + 10*a*e^2*m^2 + 5*a*e^2*m + 2*(a*e^2*m^2 + 2*a*e^2*m
+ a*e^2)*r^3 + a*e^2 + (5*a*e^2*m^3 + 15*a*e^2*m^2 + 15*a*e^2*m + 5*a*e^2 -
 (b*e^2*m^2 + 2*b*e^2*m + b*e^2)*n)*r^2 - (b*e^2*m^4 + 4*b*e^2*m^3 + 6*b*e^
2*m^2 + 4*b*e^2*m + b*e^2)*n + 2*(2*a*e^2*m^4 + 8*a*e^2*m^3 + 12*a*e^2*m^2
+ 8*a*e^2*m + 2*a*e^2 - (b*e^2*m^3 + 3*b*e^2*m^2 + 3*b*e^2*m + b*e^2)*n)*r)
*x)*x^(2*r)*e^(m*log(f) + m*log(x)) + 2*((b*d*e*m^5 + 5*b*d*e*m^4 + 10*b*d*
e*m^3 + 10*b*d*e*m^2 + 5*b*d*e*m + 4*(b*d*e*m^2 + 2*b*d*e*m + b*d*e)*r^3 +
b*d*e + 8*(b*d*e*m^3 + 3*b*d*e*m^2 + 3*b*d*e*m + b*d*e)*r^2 + 5*(b*d*e*m^4
+ 4*b*d*e*m^3 + 6*b*d*e*m^2 + 4*b*d*e*m + b*d*e)*r)*x*log(c) + (4*(b*d*e*m^
2 + 2*b*d*e*m + b*d*e)*n*r^3 + 8*(b*d*e*m^3 + 3*b*d*e*m^2 + 3*b*d*e*m + b*d
*e)*n*r^2 + 5*(b*d*e*m^4 + 4*b*d*e*m^3 + 6*b*d*e*m^2 + 4*b*d*e*m + b*d*e)*n
*r + (b*d*e*m^5 + 5*b*d*e*m^4 + 10*b*d*e*m^3 + 10*b*d*e*m^2 + 5*b*d*e*m + b
*d*e)*n)*x*log(x) + (a*d*e*m^5 + 5*a*d*e*m^4 + 10*a*d*e*m^3 + 10*a*d*e*m^2
+ 5*a*d*e*m + 4*(a*d*e*m^2 + 2*a*d*e*m + a*d*e)*r^3 + a*d*e + 4*(2*a*d*e*m^
3 + 6*a*d*e*m^2 + 6*a*d*e*m + 2*a*d*e - (b*d*e*m^2 + 2*b*d*e*m + b*d*e)*n)*
r^2 - (b*d*e*m^4 + 4*b*d*e*m^3 + 6*b*d*e*m^2 + 4*b*d*e*m + b*d*e)*n + (5*a*
d*e*m^4 + 20*a*d*e*m^3 + 30*a*d*e*m^2 + 20*a*d*e*m + 5*a*d*e - 4*(b*d*e*m^3
 + 3*b*d*e*m^2 + 3*b*d*e*m + b*d*e)*n)*r)*x)*x^r*e^(m*log(f) + m*log(x)) +
((b*d^2*m^5 + 5*b*d^2*m^4 + 10*b*d^2*m^3 + 10*b*d^2*m^2 + 4*(b*d^2*m + b*d^
2)*r^4 + 5*b*d^2*m + 12*(b*d^2*m^2 + 2*b*d^2*m + b*d^2)*r^3 + b*d^2 + 13*(b
*d^2*m^3 + 3*b*d^2*m^2 + 3*b*d^2*m + b*d^2)*r^2 + 6*(b*d^2*m^4 + 4*b*d^2*m^
3 + 6*b*d^2*m^2 + 4*b*d^2*m + b*d^2)*r)*x*log(c) + (4*(b*d^2*m + b*d^2)*n*r
^4 + 12*(b*d^2*m^2 + 2*b*d^2*m + b*d^2)*n*r^3 + 13*(b*d^2*m^3 + 3*b*d^2*m^2
 + 3*b*d^2*m + b*d^2)*n*r^2 + 6*(b*d^2*m^4 + 4*b*d^2*m^3 + 6*b*d^2*m^2 + 4*
b*d^2*m + b*d^2)*n*r + (b*d^2*m^5 + 5*b*d^2*m^4 + 10*b*d^2*m^3 + 10*b*d^2*m
^2 + 5*b*d^2*m + b*d^2)*n)*x*log(x) + (a*d^2*m^5 + 5*a*d^2*m^4 + 10*a*d^2*m
^3 + 10*a*d^2*m^2 + 4*(a*d^2*m - b*d^2*n + a*d^2)*r^4 + 5*a*d^2*m + 12*(a*d
^2*m^2 + 2*a*d^2*m + a*d^2 - (b*d^2*m + b*d^2)*n)*r^3 + a*d^2 + 13*(a*d^2*m
^3 + 3*a*d^2*m^2 + 3*a*d^2*m + a*d^2 - (b*d^2*m^2 + 2*b*d^2*m + b*d^2)*n)*r
^2 - (b*d^2*m^4 + 4*b*d^2*m^3 + 6*b*d^2*m^2 + 4*b*d^2*m + b*d^2)*n + 6*(a*d
^2*m^4 + 4*a*d^2*m^3 + 6*a*d^2*m^2 + 4*a*d^2*m + a*d^2 - (b*d^2*m^3 + 3*b*d
^2*m^2 + 3*b*d^2*m + b*d^2)*n)*r)*x)*e^(m*log(f) + m*log(x)))/(m^6 + 6*m^5
+ 4*(m^2 + 2*m + 1)*r^4 + 15*m^4 + 12*(m^3 + 3*m^2 + 3*m + 1)*r^3 + 20*m^3
+ 13*(m^4 + 4*m^3 + 6*m^2 + 4*m + 1)*r^2 + 15*m^2 + 6*(m^5 + 5*m^4 + 10*m^3
 + 10*m^2 + 5*m + 1)*r + 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((f*x)**m*(d+e*x**r)**2*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [B] time = 1.37214, size = 713, normalized size = 4.32

$$\frac{2\,bdf^m mnxx^m x^r e\log(x)}{m^2+2\,mr+r^2+2\,m+2\,r+1}+\frac{2\,bdf^m nrxx^m x^r e\log(x)}{m^2+2\,mr+r^2+2\,m+2\,r+1}+\frac{bd^2 f^m mnxx^m\log(x)}{m^2+2\,m+1}+\frac{bf^m mnxx^m x^{2\,r}e^2\log(x)}{m^2+4\,mr+4\,r^2+2\,m+4\,r}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] 2*b*d*f^m*m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + 2*b*
d*f^m*n*r*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*d^2*f^
m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*m*n*x*x^m*x^(2*r)*e^2*log(x)/(m^
2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 2*b*f^m*n*r*x*x^m*x^(2*r)*e^2*log(x)/(
m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 2*b*d*f^m*n*x*x^m*x^r*e*log(x)/(m^2
+ 2*m*r + r^2 + 2*m + 2*r + 1) - 2*b*d*f^m*n*x*x^m*x^r*e/(m^2 + 2*m*r + r^2
 + 2*m + 2*r + 1) + 2*b*d*f^m*x*x^m*x^r*e*log(c)/(m + r + 1) + b*d^2*f^m*n*
x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*x^(2*r)*e^2*log(x)/(m^2 + 4*m*
r + 4*r^2 + 2*m + 4*r + 1) - b*d^2*f^m*n*x*x^m/(m^2 + 2*m + 1) - b*f^m*n*x*
x^m*x^(2*r)*e^2/(m^2 + 4*m*r + 4*r^2 + 2*m + 4*r + 1) + 2*a*d*f^m*x*x^m*x^r
*e/(m + r + 1) + b*f^m*x*x^m*x^(2*r)*e^2*log(c)/(m + 2*r + 1) + a*f^m*x*x^m
*x^(2*r)*e^2/(m + 2*r + 1) + (f*x)^m*b*d^2*x*log(c)/(m + 1) + (f*x)^m*a*d^2
*x/(m + 1)
```

3.442 $\int (fx)^m (d+ex^r)(a+b\log(cx^n))\,dx$

Optimal. Leaf size=97

$$\frac{d(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{ex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{benx^{r+1}(fx)^m}{(m+r+1)^2}$$

```
[Out] -((b*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2) - (b*d*n*(f*x)^(1 + m))/(f*(1 +
m)^2) + (e*x^(1 + r)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + r) + (d*(f*x)^(1
+ m)*(a + b*Log[c*x^n]))/(f*(1 + m))
```

Rubi [A] time = 0.102707, antiderivative size = 97, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {14, 20, 30, 2350}

$$\frac{d(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}+\frac{ex^{r+1}(fx)^m(a+b\log(cx^n))}{m+r+1}-\frac{bdn(fx)^{m+1}}{f(m+1)^2}-\frac{benx^{r+1}(fx)^m}{(m+r+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*e*n*x^(1 + r)*(f*x)^m)/(1 + m + r)^2) - (b*d*n*(f*x)^(1 + m))/(f*(1 +
m)^2) + (e*x^(1 + r)*(f*x)^m*(a + b*Log[c*x^n]))/(1 + m + r) + (d*(f*x)^(1
+ m)*(a + b*Log[c*x^n]))/(f*(1 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

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 2350

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^r)^q, x]
}, Dist[a + b*Log[c*x^n], u, x] - Dist[b*n, Int[SimplifyIntegrand[u/x, x],
x], x] /; ((EqQ[r, 1] || EqQ[r, 2]) && IntegerQ[m] && IntegerQ[q - 1/2]) ||
 InverseFunctionFreeQ[u, x]] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] &&
 IntegerQ[2*q] && ((IntegerQ[m] && IntegerQ[r]) || IGtQ[q, 0])
```

Rubi steps

$$\begin{aligned}\int (fx)^m (d+ex^r)(a+b\log(cx^n))\,dx &= \frac{ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}-(bn)\int (fx)^m\left(\frac{d}{1+m}\right.\\ &= \frac{ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}-(bn)\int\left(\frac{d(fx)^m}{1+m}+\frac{ex}{1}\right.\\ &= -\frac{bdn(fx)^{1+m}}{f(1+m)^2}+\frac{ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}-\frac{(ben}{}\\ &= -\frac{bdn(fx)^{1+m}}{f(1+m)^2}+\frac{ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{d(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}-\frac{(ben}{}\\ &= -\frac{benx^{1+r}(fx)^m}{(1+m+r)^2}-\frac{bdn(fx)^{1+m}}{f(1+m)^2}+\frac{ex^{1+r}(fx)^m(a+b\log(cx^n))}{1+m+r}+\frac{d(fx)^{1+m}(a+b}{f(1+m}\end{aligned}$$

Mathematica [A] time = 0.110588, size = 70, normalized size = 0.72

$$x(fx)^m\left(\frac{d(a+b\log(cx^n))}{m+1}+\frac{ex^r(a+b\log(cx^n))}{m+r+1}-\frac{bdn}{(m+1)^2}-\frac{benx^r}{(m+r+1)^2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n]),x]
```

```
[Out] x*(f*x)^m*(-((b*d*n)/(1 + m)^2) - (b*e*n*x^r)/(1 + m + r)^2 + (d*(a + b*Log
[c*x^n]))/(1 + m) + (e*x^r*(a + b*Log[c*x^n]))/(1 + m + r))
```

Maple [C] time = 0.362, size = 2152, normalized size = 22.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d+e*x^r)*(a+b*ln(c*x^n)),x)

[Out] b*x*(m*e*x^r+m*d+d*r+e*x^r+d)/(1+m)/(1+m+r)*exp(1/2*m*(-I*Pi*csgn(I*f*x)^3+
I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*csgn(I*x)-I*Pi*csgn(I*f*x)*
csgn(I*f)*csgn(I*x)+2*ln(f)+2*ln(x)))*ln(x^n)-1/2*x*(-2*a*d-2*a*d*m^3+2*I*P
i*b*e*m*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-6*x^r*a*e*m-2*x^r*a*e*r+2
*x^r*b*e*n+4*b*d*n*r+2*b*d*n+3*I*Pi*b*e*m*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)*x^r-I*Pi*b*e*m^2*r*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-6*a*d*m-2*x^r*a*e-4*l
n(c)*b*d*r-2*ln(c)*b*d*r^2-2*ln(c)*b*e*x^r*r-8*ln(c)*b*d*m*r-4*ln(c)*b*d*m^
2*r-2*ln(c)*b*d*m*r^2-6*ln(c)*b*d*m^2-6*ln(c)*b*d*m-2*ln(c)*b*d*m^3+4*I*Pi*
b*d*m*r*csgn(I*c*x^n)^3-3*I*Pi*b*d*m*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I*Pi*b*d
*m*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*d*m^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*
c)-2*ln(c)*b*e*x^r+2*b*d*m^2*n-2*a*d*r^2-2*ln(c)*b*d-4*a*d*r+4*b*d*m*n-2*a*
e*m^3*x^r-6*a*e*m^2*x^r+2*b*d*n*r^2-I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^
r*r+I*Pi*b*e*csgn(I*c*x^n)^3*x^r+2*I*Pi*b*d*csgn(I*c*x^n)^3*r-I*Pi*b*d*csgn
(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*d*r^2*csgn(I*c*x^n)^3+I*Pi*b*d*m^3*csgn(I*c*
x^n)^3-4*a*d*m^2*r-2*a*d*m*r^2+I*Pi*b*e*csgn(I*c*x^n)^3*x^r*r-I*Pi*b*e*csgn
(I*c*x^n)^2*csgn(I*c)*x^r*r-3*I*Pi*b*e*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-
3*I*Pi*b*e*m^2*csgn(I*c*x^n)^2*csgn(I*c)*x^r+2*I*Pi*b*e*m*r*csgn(I*c*x^n)^3
*x^r+I*Pi*b*d*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+4*b*d*m*n*r-8*a*d*m*r
-I*Pi*b*e*m^2*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+4*I*Pi*b*d*m*r*csgn(I*x^n)*cs
gn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d*m^2*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-
I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-2*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*
x^n)^2-6*a*d*m^2-2*I*Pi*b*e*m*r*csgn(I*c*x^n)^2*csgn(I*c)*x^r+3*I*Pi*b*e*m^
2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-2*I*Pi*b*e*m*r*csgn(I*x^n)*csgn(I
*c*x^n)^2*x^r-6*ln(c)*b*e*m^2*x^r-6*ln(c)*b*e*m*x^r-2*ln(c)*b*e*m^3*x^r-2*a
*e*m^2*r*x^r+2*b*e*m^2*n*x^r-4*a*e*m*r*x^r+4*b*e*m*n*x^r+I*Pi*b*d*csgn(I*c*
x^n)^3+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r*r-4*I*Pi*b*d*m*r*cs
gn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e*m^2*r*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r-I*Pi*b*d*r^2*csgn(I*c*x^n)^2*csgn(I*
c)+2*I*Pi*b*d*m^2*r*csgn(I*c*x^n)^3+3*I*Pi*b*e*m^2*csgn(I*c*x^n)^3*x^r+3*I*
Pi*b*e*m*csgn(I*c*x^n)^3*x^r-3*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)^2-3*I
*Pi*b*d*m^2*csgn(I*c*x^n)^2*csgn(I*c)+I*Pi*b*e*csgn(I*x^n)*csgn(I*c*x^n)*cs
gn(I*c)*x^r+2*I*Pi*b*d*r*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3*I*Pi*b*d*m*c
sgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+3*I*Pi*b*d*m^2*csgn(I*x^n)*csgn(I*c*x^n)
*csgn(I*c)-4*I*Pi*b*d*m*r*csgn(I*x^n)*csgn(I*c*x^n)^2-4*ln(c)*b*e*m*r*x^r-2
*ln(c)*b*e*m^2*r*x^r+3*I*Pi*b*d*m^2*csgn(I*c*x^n)^3+I*Pi*b*d*m*r^2*csgn(I*c
*x^n)^3+I*Pi*b*e*m^3*csgn(I*c*x^n)^3*x^r-2*I*Pi*b*d*m^2*r*csgn(I*x^n)*csgn(
```

```
I*c*x^n)^2-2*I*Pi*b*d*m^2*r*csgn(I*c*x^n)^2*csgn(I*c)-I*Pi*b*d*m*r^2*csgn(I
*x^n)*csgn(I*c*x^n)^2-I*Pi*b*d*m*r^2*csgn(I*c*x^n)^2*csgn(I*c)+3*I*Pi*b*d*m
*csgn(I*c*x^n)^3+I*Pi*b*e*m^2*r*csgn(I*c*x^n)^3*x^r-3*I*Pi*b*e*m*csgn(I*c*x
^n)^2*csgn(I*c)*x^r-I*Pi*b*e*m^3*csgn(I*x^n)*csgn(I*c*x^n)^2*x^r-I*Pi*b*e*m
^3*csgn(I*c*x^n)^2*csgn(I*c)*x^r-3*I*Pi*b*e*m*csgn(I*x^n)*csgn(I*c*x^n)^2*x
^r-I*Pi*b*e*csgn(I*c*x^n)^2*csgn(I*c)*x^r-2*I*Pi*b*d*r*csgn(I*c*x^n)^2*csgn
(I*c)+I*Pi*b*d*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*r^2*csgn(I*x^n)
*csgn(I*c*x^n)^2+I*Pi*b*e*m^3*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)*x^r+I*Pi*
b*d*m*r^2*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*Pi*b*d*m^3*csgn(I*x^n)*csgn
(I*c*x^n)^2-I*Pi*b*d*m^3*csgn(I*c*x^n)^2*csgn(I*c))/(1+m)^2/(1+m+r)^2*exp(1
/2*m*(-I*Pi*csgn(I*f*x)^3+I*Pi*csgn(I*f*x)^2*csgn(I*f)+I*Pi*csgn(I*f*x)^2*c
sgn(I*x)-I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)+2*ln(f)+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((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [B] time = 1.39571, size = 1035, normalized size = 10.67

$$\frac{\left(\left(bem^3 + 3\,bem^2 + 3\,bem + be + \left(bem^2 + 2\,bem + be\right)r\right)x\log\left(c\right) + \left(\left(bem^2 + 2\,bem + be\right)nr + \left(bem^3 + 3\,bem^2 + 3\,bem + b\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] (((b*e*m^3 + 3*b*e*m^2 + 3*b*e*m + b*e + (b*e*m^2 + 2*b*e*m + b*e)*r)*x*log
(c) + ((b*e*m^2 + 2*b*e*m + b*e)*n*r + (b*e*m^3 + 3*b*e*m^2 + 3*b*e*m + b*e
)*n)*x*log(x) + (a*e*m^3 + 3*a*e*m^2 + 3*a*e*m + a*e - (b*e*m^2 + 2*b*e*m +
 b*e)*n + (a*e*m^2 + 2*a*e*m + a*e)*r)*x)*x^r*e^(m*log(f) + m*log(x)) + ((b
*d*m^3 + 3*b*d*m^2 + 3*b*d*m + (b*d*m + b*d)*r^2 + b*d + 2*(b*d*m^2 + 2*b*d
*m + b*d)*r)*x*log(c) + ((b*d*m + b*d)*n*r^2 + 2*(b*d*m^2 + 2*b*d*m + b*d)*
n*r + (b*d*m^3 + 3*b*d*m^2 + 3*b*d*m + b*d)*n)*x*log(x) + (a*d*m^3 + 3*a*d*
```

```
m^2 + 3*a*d*m + (a*d*m - b*d*n + a*d)*r^2 + a*d - (b*d*m^2 + 2*b*d*m + b*d)
*n + 2*(a*d*m^2 + 2*a*d*m + a*d - (b*d*m + b*d)*n)*r)*x)*e^(m*log(f) + m*lo
g(x)))/(m^4 + 4*m^3 + (m^2 + 2*m + 1)*r^2 + 6*m^2 + 2*(m^3 + 3*m^2 + 3*m +
1)*r + 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((f*x)**m*(d+e*x**r)*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.32141, size = 393, normalized size = 4.05

$$\frac{bf^m mnxx^m x^r e \log(x)}{m^2 + 2mr + r^2 + 2m + 2r + 1} + \frac{bf^m nrxx^m x^r e \log(x)}{m^2 + 2mr + r^2 + 2m + 2r + 1} + \frac{bdf^m mnxx^m \log(x)}{m^2 + 2m + 1} + \frac{bf^m nxx^m x^r e \log(x)}{m^2 + 2mr + r^2 + 2m + 2r +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*f^m*n*
r*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) + b*d*f^m*m*n*x*x^
m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*x^r*e*log(x)/(m^2 + 2*m*r + r^2 +
2*m + 2*r + 1) - b*f^m*n*x*x^m*x^r*e/(m^2 + 2*m*r + r^2 + 2*m + 2*r + 1) +
b*f^m*x*x^m*x^r*e*log(c)/(m + r + 1) + b*d*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*d*f^m*n*x*x^m/(m^2 + 2*m + 1) + a*f^m*x*x^m*x^r*e/(m + r + 1) + (f*x
)^m*b*d*x*log(c)/(m + 1) + (f*x)^m*a*d*x/(m + 1)
```

3.443 $\int (fx)^m (a+b\log(cx^n))\,dx$

Optimal. Leaf size=46

$$\frac{(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rubi [A] time = 0.0171639, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 1, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {2304}

$$\frac{(fx)^{m+1}(a+b\log(cx^n))}{f(m+1)}-\frac{bn(fx)^{m+1}}{f(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(f*x)^(1 + m))/(f*(1 + m)^2)) + ((f*x)^(1 + m)*(a + b*Log[c*x^n]))/(
f*(1 + m))
```

Rule 2304

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_.)*(x_))^(m_.), x_Symbol] :>
Simp[((d*x)^(m + 1)*(a + b*Log[c*x^n]))/(d*(m + 1)), x] - Simp[(b*n*(d*x)^(
m + 1))/(d*(m + 1)^2), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[m, -1]
```

Rubi steps

$$\int (fx)^m (a+b\log(cx^n))\,dx=-\frac{bn(fx)^{1+m}}{f(1+m)^2}+\frac{(fx)^{1+m}(a+b\log(cx^n))}{f(1+m)}$$

Mathematica [A] time = 0.0150854, size = 32, normalized size = 0.7

$$\frac{x(fx)^m(am+a+b(m+1)\log(cx^n)-bn)}{(m+1)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n]),x]
```

```
[Out] (x*(f*x)^m*(a + a*m - b*n + b*(1 + m)*Log[c*x^n]))/(1 + m)^2
```

Maple [C] time = 0.073, size = 371, normalized size = 8.1

$$\frac{bx\ln(x^n)}{1+m}\mathrm{e}^{-\frac{m\left(i\pi\left(\mathrm{csgn}(ifx)\right)^3-i\pi\left(\mathrm{csgn}(ifx)\right)^2\mathrm{csgn}(if)-i\pi\left(\mathrm{csgn}(ifx)\right)^2\mathrm{csgn}(ix)+i\pi\,\mathrm{csgn}(ifx)\mathrm{csgn}(if)\mathrm{csgn}(ix)-2\ln(f)-2\ln(x)\right)}{2}} - \frac{\left(-i\pi\,b\mathrm{csgn}\left(ix^n\right)\left(\mathrm{csgn}\left(i\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n)),x)
```

```
[Out] b/(1+m)*x*ln(x^n)*exp(-1/2*m*(I*Pi*csgn(I*f*x)^3-I*Pi*csgn(I*f*x)^2*csgn(I*
f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*csgn(I*f)*csgn(I*x)-2*ln(f
)-2*ln(x)))-1/2*(-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2*m+I*Pi*b*csgn(I*x^n)*c
sgn(I*c*x^n)*csgn(I*c)*m+I*Pi*b*csgn(I*c*x^n)^3*m-I*Pi*b*csgn(I*c*x^n)^2*cs
gn(I*c)*m-I*Pi*b*csgn(I*x^n)*csgn(I*c*x^n)^2+I*Pi*b*csgn(I*x^n)*csgn(I*c*x^
n)*csgn(I*c)+I*Pi*b*csgn(I*c*x^n)^3-I*Pi*b*csgn(I*c*x^n)^2*csgn(I*c)-2*b*ln
(c)*m-2*b*ln(c)-2*a*m+2*b*n-2*a)/(1+m)^2*x*exp(-1/2*m*(I*Pi*csgn(I*f*x)^3-I
*Pi*csgn(I*f*x)^2*csgn(I*f)-I*Pi*csgn(I*f*x)^2*csgn(I*x)+I*Pi*csgn(I*f*x)*c
sgn(I*f)*csgn(I*x)-2*ln(f)-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((f*x)^m*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError
```

Fricas [A] time = 1.28366, size = 142, normalized size = 3.09

$$\frac{((bm+b)nx\log(x)+(bm+b)x\log(c)+(am-bn+a)x)e^{\left(m\log(f)+m\log(x)\right)}}{m^2+2m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] ((b*m + b)*n*x*log(x) + (b*m + b)*x*log(c) + (a*m - b*n + a)*x)*e^(m*log(f)
 + m*log(x))/(m^2 + 2*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((f*x)**m*(a+b*ln(c*x**n)),x)
```

```
[Out] Exception raised: TypeError
```

Giac [B] time = 1.17622, size = 128, normalized size = 2.78

$$\frac{bf^m mnxx^m\log(x)}{m^2+2m+1}+\frac{bf^m nxx^m\log(x)}{m^2+2m+1}-\frac{bf^m nxx^m}{m^2+2m+1}+\frac{(fx)^m bx\log(c)}{m+1}+\frac{(fx)^m ax}{m+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] b*f^m*m*n*x*x^m*log(x)/(m^2 + 2*m + 1) + b*f^m*n*x*x^m*log(x)/(m^2 + 2*m +
1) - b*f^m*n*x*x^m/(m^2 + 2*m + 1) + (f*x)^m*b*x*log(c)/(m + 1) + (f*x)^m*a
*x/(m + 1)
```

3.444 $\int \frac{(fx)^m(a+b\log(cx^n))}{d+ex^r} dx$

Optimal. Leaf size=27

$$\text{Unintegrable}\left(\frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi [A] time = 0.0701191, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx=\int \frac{(fx)^m\left(a+b\log\left(cx^n\right)\right)}{d+ex^r}\,dx$$

Mathematica [A] time = 0.153989, size = 111, normalized size = 4.11

$$\frac{x(fx)^m\left((m+1)\left(a+b\log\left(cx^n\right)\right)\,{}_2F_1\left(1,\frac{m+1}{r};\frac{m+r+1}{r};-\frac{ex^r}{d}\right)-bn\,{}_3F_2\left(1,\frac{m}{r}+\frac{1}{r},\frac{m}{r}+\frac{1}{r};\frac{m}{r}+\frac{1}{r}+1,\frac{m}{r}+\frac{1}{r}+1;-\frac{ex^r}{d}\right)\right)}{d(m+1)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r),x]
```

```
[Out] (x*(f*x)^m*(-(b*n*HypergeometricPFQ[{1, r^(-1) + m/r, r^(-1) + m/r}, {1 + r
^(-1) + m/r, 1 + r^(-1) + m/r}, -((e*x^r)/d)]) + (1 + m)*Hypergeometric2F1[
```

```
1, (1 + m)/r, (1 + m + r)/r, -((e*x^r)/d)]*(a + b*Log[c*x^n])))/(d*(1 + m)^
2)
```

Maple [A] time = 0.987, size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b\ln(cx^n))}{d + ex^r} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))/(d+e*x^r),x)

[Out] int((f*x)^m*(a+b*ln(c*x^n))/(d+e*x^r),x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)(fx)^m}{ex^r + d} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="maxima")

[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d), x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx)^m b\log(cx^n) + (fx)^m a}{ex^r + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="fricas")

[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e*x^r + d), x)
```

Sympy [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b \log(cx^n))}{d + ex^r} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))/(d+e*x**r),x)
```

```
[Out] Integral((f*x)**m*(a + b*log(c*x**n))/(d + e*x**r), x)
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b \log(cx^n) + a)(fx)^m}{ex^r + d} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d), x)
```

3.445 $\int \frac{(fx)^m(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=27

$$\text{Unintegrable}\left(\frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^r)^2},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi [A] time = 0.0688923, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^r)^2}\,dx=\int \frac{(fx)^m\,(a+b\log(cx^n))}{(d+ex^r)^2}\,dx$$

Mathematica [A] time = 0.387871, size = 177, normalized size = 6.56

$$\frac{x(fx)^m\left(bn(m-r+1)\,(d+ex^r)\;{}_3F_2\left(1,\frac{m}{r}+\frac{1}{r},\frac{m}{r}+\frac{1}{r};\frac{m}{r}+\frac{1}{r}+1,\frac{m}{r}+\frac{1}{r}+1;-\frac{ex^r}{d}\right)-(m+1)\left((d+ex^r)\;{}_2F_1\left(1,\frac{m+1}{r};\frac{m+r+1}{r}\right.\right.\right.}{d^2(m+1)^2r\,(d+ex^r)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n]))/(d + e*x^r)^2,x]
```

```
[Out] (x*(f*x)^m*(b*n*(1 + m - r)*(d + e*x^r)*HypergeometricPFQ[{1, r^(-1) + m/r,
 r^(-1) + m/r}, {1 + r^(-1) + m/r, 1 + r^(-1) + m/r}, -((e*x^r)/d)] - (1 +
```

```
m)*(-(d*(1 + m)*(a + b*Log[c*x^n])) + (d + e*x^r)*Hypergeometric2F1[1, (1 +
 m)/r, (1 + m + r)/r, -((e*x^r)/d)]*(b*n + a*(1 + m - r) + b*(1 + m - r)*Lo
g[c*x^n]))))/(d^2*(1 + m)^2*r*(d + e*x^r))
```

Maple [A] time = 1.058, size = 0, normalized size = 0.

$$\int \frac{(fx)^{m}(a+b\ln(cx^{n}))}{(d+ex^{r})^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))/(d+e*x^r)^2,x)
```

Maxima [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^{n})+a)(fx)^{m}}{(ex^{r}+d)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d)^2, x)
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx)^{m}b\log(cx^{n})+(fx)^{m}a}{e^{2}x^{2r}+2\,dex^{r}+d^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral(((f*x)^m*b*log(c*x^n) + (f*x)^m*a)/(e^2*x^(2*r) + 2*d*e*x^r + d^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((f*x)**m*(a+b*ln(c*x**n))/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(b\log(cx^n) + a)\left(fx\right)^m}{(ex^r + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(f*x)^m/(e*x^r + d)^2, x)
```

3.446 $\int \left(d+ex^{-\frac{1}{1+q}}\right)^q (a+b\log(cx^n))\,dx$

Optimal. Leaf size=102

$$\frac{x\left(d+ex^{-\frac{1}{q+1}}\right)^{q+1}(a+b\log(cx^n))}{d}-bnx\left(d+ex^{-\frac{1}{q+1}}\right)^q\left(\frac{ex^{-\frac{1}{q+1}}}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^{-\frac{1}{q+1}}}{d}\right)$$

```
[Out] -((b*n*x*(d + e/x^(1 + q)^(-1))^q*Hypergeometric2F1[-1 - q, -1 - q, -q, -(e
/(d*x^(1 + q)^(-1)))])/(1 + e/(d*x^(1 + q)^(-1)))^q) + (x*(d + e/x^(1 + q)^
(-1))^(1 + q)*(a + b*Log[c*x^n]))/d
```

Rubi [A] time = 0.0440655, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {2314, 246, 245}

$$\frac{x\left(d+ex^{-\frac{1}{q+1}}\right)^{q+1}(a+b\log(cx^n))}{d}-bnx\left(d+ex^{-\frac{1}{q+1}}\right)^q\left(\frac{ex^{-\frac{1}{q+1}}}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^{-\frac{1}{q+1}}}{d}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(d + e/x^(1 + q)^(-1))^q*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*x*(d + e/x^(1 + q)^(-1))^q*Hypergeometric2F1[-1 - q, -1 - q, -q, -(e
/(d*x^(1 + q)^(-1)))])/(1 + e/(d*x^(1 + q)^(-1)))^q) + (x*(d + e/x^(1 + q)^
(-1))^(1 + q)*(a + b*Log[c*x^n]))/d
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 246

```
Int[((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[(1 + (b*x^n)/a)^p, x], x]
```

```
/; FreeQ[{a, b, n, p}, x] && !IGtQ[p, 0] && !IntegerQ[1/n] && !ILtQ[Sim
plify[1/n + p], 0] && !(IntegerQ[p] || GtQ[a, 0])
```

Rule 245

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p*x*Hypergeometric2F
1[-p, 1/n, 1/n + 1, -((b*x^n)/a)], x] /; FreeQ[{a, b, n, p}, x] && !IGtQ[p
, 0] && !IntegerQ[1/n] && !ILtQ[Simplify[1/n + p], 0] && (IntegerQ[p] ||
GtQ[a, 0])
```

Rubi steps

$$\int \left(d+ex^{-\frac{1}{1+q}}\right)^q (a+b\log(cx^n))\,dx = \frac{x\left(d+ex^{-\frac{1}{1+q}}\right)^{1+q}(a+b\log(cx^n))}{d} - \frac{(bn)\int \left(d+ex^{-\frac{1}{1+q}}\right)^{1+q}dx}{d}$$

$$= \frac{x\left(d+ex^{-\frac{1}{1+q}}\right)^{1+q}(a+b\log(cx^n))}{d} - \left(bn\left(d+ex^{-\frac{1}{1+q}}\right)^q\left(1+\frac{ex^{-\frac{1}{1+q}}}{d}\right)^{-q}\right)\int \left(1+\frac{ex}{\ldots}\right.$$

$$= -bnx\left(d+ex^{-\frac{1}{1+q}}\right)^q\left(1+\frac{ex^{-\frac{1}{1+q}}}{d}\right)^{-q} {}_2F_1\left(-1-q,-1-q;-q;-\frac{ex^{-\frac{1}{1+q}}}{d}\right) + \frac{x\left(d+ex^{-\ldots}\right.}{\ldots}$$

Mathematica [A] time = 0.571386, size = 143, normalized size = 1.4

$$\frac{x^{-\frac{1}{q+1}}\left(d+ex^{-\frac{1}{q+1}}\right)^q\left(\frac{dx^{\frac{1}{q+1}}}{e}+1\right)^{-q}\left(-bdn(q+1)^2x^{\frac{q+2}{q+1}}\,{}_3F_2\left(1,1,-q;2,2;-\frac{dx^{\frac{1}{q+1}}}{e}\right)+\left(dx^{\frac{q+2}{q+1}}+ex\right)\left(\frac{dx^{\frac{1}{q+1}}}{e}+1\right)^q(a+b\log(cx^n\ldots\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e/x^(1 + q)^(-1))^q*(a + b*Log[c*x^n]),x]
```

```
[Out] ((d + e/x^(1 + q)^(-1))^q*(-(b*d*n*(1 + q)^2*x^((2 + q)/(1 + q))*Hypergeome
tricPFQ[{1, 1, -q}, {2, 2}, -((d*x^(1 + q)^(-1))/e)]) - b*e*n*x*Log[x] + (1
 + (d*x^(1 + q)^(-1))/e)^q*(e*x + d*x^((2 + q)/(1 + q)))*(a + b*Log[c*x^n])
))/(d*x^(1 + q)^(-1)*(1 + (d*x^(1 + q)^(-1))/e)^q)
```

Maple [F] time = 0.829, size = 0, normalized size = 0.

$$\int \left(d+\frac{e}{x^{\left(1+q\right)^{-1}}}\right)^{q} \left(a+b\ln \left(c x^{n}\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+e/(x^(1/(1+q))))^q*(a+b*ln(c*x^n)),x)
```

```
[Out] int((d+e/(x^(1/(1+q))))^q*(a+b*ln(c*x^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (b\log\left(cx^{n}\right)+a)\left(d+\frac{e}{x^{\left(\frac{1}{q+1}\right)}}\right)^{q}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x^(1/(1+q))))^q*(a+b*log(c*x^n)),x, algorithm="maxima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(d + e/x^(1/(q + 1)))^q, x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\mathrm{integral}\left((b\log\left(cx^{n}\right)+a)\left(\frac{dx^{\left(\frac{1}{q+1}\right)}+e}{x^{\left(\frac{1}{q+1}\right)}}\right)^{q},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x^(1/(1+q))))^q*(a+b*log(c*x^n)),x, algorithm="fricas")
```

```
[Out] integral((b*log(c*x^n) + a)*((d*x^(1/(q + 1)) + e)/x^(1/(q + 1)))^q, x)
```

Sympy [F(-1)] time = 0., size = 0, normalized size = 0.

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x**(1/(1+q))))**q*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (b\log(cx^n) + a)\left(d + \frac{e}{x^{\left(\frac{1}{q+1}\right)}}\right)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+e/(x^(1/(1+q))))^q*(a+b*log(c*x^n)),x, algorithm="giac")
```

```
[Out] integrate((b*log(c*x^n) + a)*(d + e/x^(1/(q + 1)))^q, x)
```

3.447 $\int (fx)^{-1-(1+q)r} (d+ex^r)^q (a+b\log(cx^n))\,dx$

Optimal. Leaf size=119

$$-\frac{(fx)^{-(q+1)r}(d+ex^r)^{q+1}(a+b\log(cx^n))}{df(q+1)r}-\frac{bn(fx)^{-(q+1)r}(d+ex^r)^q\left(\frac{ex^r}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^r}{d}\right)}{f(q+1)^2r^2}$$

```
[Out] -((b*n*(d + e*x^r)^q*Hypergeometric2F1[-1 - q, -1 - q, -q, -((e*x^r)/d)])/(
f*(1 + q)^2*r^2*(f*x)^((1 + q)*r)*(1 + (e*x^r)/d)^q)) - ((d + e*x^r)^(1 + q
)*(a + b*Log[c*x^n]))/(d*f*(1 + q)*r*(f*x)^((1 + q)*r))
```

Rubi [A] time = 0.13262, antiderivative size = 119, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.094, Rules used = {2335, 365, 364}

$$-\frac{(fx)^{-(q+1)r}(d+ex^r)^{q+1}(a+b\log(cx^n))}{df(q+1)r}-\frac{bn(fx)^{-(q+1)r}(d+ex^r)^q\left(\frac{ex^r}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^r}{d}\right)}{f(q+1)^2r^2}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^(-1 - (1 + q)*r)*(d + e*x^r)^q*(a + b*Log[c*x^n]),x]
```

```
[Out] -((b*n*(d + e*x^r)^q*Hypergeometric2F1[-1 - q, -1 - q, -q, -((e*x^r)/d)])/(
f*(1 + q)^2*r^2*(f*x)^((1 + q)*r)*(1 + (e*x^r)/d)^q)) - ((d + e*x^r)^(1 + q
)*(a + b*Log[c*x^n]))/(d*f*(1 + q)*r*(f*x)^((1 + q)*r))
```

Rule 2335

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((f_.)*(x_))^(m_.)*((d_) + (e_.)*
(x_)^(r_.))^(q_), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^r)^(q + 1)*(a +
 b*Log[c*x^n]))/(d*f*(m + 1)), x] - Dist[(b*n)/(d*(m + 1)), Int[(f*x)^m*(d
+ e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, q, r}, x] && EqQ
[m + r*(q + 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

$$\int (fx)^{-1-(1+q)r}\left(d+ex^r\right)^q\left(a+b\log\left(cx^n\right)\right)dx=-\frac{(fx)^{-(1+q)r}\left(d+ex^r\right)^{1+q}\left(a+b\log\left(cx^n\right)\right)}{df(1+q)r}+\frac{(bn)\int (fx)^{-1-(1+q)r}\left(d+ex^r\right)^{1}}{d(1+q)r}$$

$$=-\frac{(fx)^{-(1+q)r}\left(d+ex^r\right)^{1+q}\left(a+b\log\left(cx^n\right)\right)}{df(1+q)r}+\frac{\left(bn\left(d+ex^r\right)^q\left(1+\frac{ex^r}{d}\right)^{-q}\right)\int (}{(1+}$$

$$=-\frac{bn(fx)^{-(1+q)r}\left(d+ex^r\right)^q\left(1+\frac{ex^r}{d}\right)^{-q}{}_2F_1\left(-1-q,-1-q;-q;-\frac{ex^r}{d}\right)}{f(1+q)^2r^2}-\frac{(fx)}{}$$

Mathematica [A] time = 0.340544, size = 98, normalized size = 0.82

$$-\frac{(fx)^{-(q+1)r}\left(d+ex^r\right)^q\left(\frac{(q+1)r\left(d+ex^r\right)\left(a+b\log\left(cx^n\right)\right)}{d}+bn\left(\frac{ex^r}{d}+1\right)^{-q}{}_2F_1\left(-q-1,-q-1;-q;-\frac{ex^r}{d}\right)\right)}{f(q+1)^2r^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^(-1 - (1 + q)*r)*(d + e*x^r)^q*(a + b*Log[c*x^n]),x]
```

```
[Out] -(((d + e*x^r)^q*((b*n*Hypergeometric2F1[-1 - q, -1 - q, -q, -((e*x^r)/d)])
/(1 + (e*x^r)/d)^q + ((1 + q)*r*(d + e*x^r)*(a + b*Log[c*x^n]))/d))/(f*(1 +
 q)^2*r^2*(f*x)^((1 + q)*r)))
```

Maple [F] time = 0.779, size = 0, normalized size = 0.

$$\int \left(fx\right)^{-1-\left(1+q\right)r}\left(d+ex^r\right)^q\left(a+b\ln\left(cx^n\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*ln(c*x^n)),x)
```

```
[Out] int((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*ln(c*x^n)),x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\int (b\log(cx^n) + a)(ex^r + d)^q \left(fx\right)^{-(q+1)r-1}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*log(c*x^n)),x, algorithm="max
ima")
```

```
[Out] integrate((b*log(c*x^n) + a)*(e*x^r + d)^q*(f*x)^(-(q + 1)*r - 1), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(\left(fx\right)^{-(q+1)r-1} b\log(cx^n) + \left(fx\right)^{-(q+1)r-1} a\right)(ex^r + d)^q, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*log(c*x^n)),x, algorithm="fri
cas")
```

```
[Out] integral(((f*x)^(-(q + 1)*r - 1)*b*log(c*x^n) + (f*x)^(-(q + 1)*r - 1)*a)*(
e*x^r + d)^q, 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((f*x)**(-1-(1+q)*r)*(d+e*x**r)**q*(a+b*ln(c*x**n)),x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (b\log (cx^n) + a)(ex^r + d)^q \left(fx\right)^{-\left(q+1\right)r-1} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(-1-(1+q)*r)*(d+e*x^r)^q*(a+b*log(c*x^n)),x, algorithm="gia
c")
```

```
[Out] integrate((b*log(c*x^n) + a)*(e*x^r + d)^q*(f*x)^(-(q + 1)*r - 1), x)
```

3.448 $\int (fx)^m (d+ex^r)^3 (a+b\log(cx^n))^p \, dx$

Optimal. Leaf size=480

$$\frac{3d^2ex^{r+1}(fx)^m e^{-\frac{a(m+r+1)}{bn}} (cx^n)^{-\frac{m+r+1}{n}} (a+b\log(cx^n))^p \left(-\frac{(m+r+1)(a+b\log(cx^n))}{bn}\right)^{-p} \text{Gamma}\left(p+1,-\frac{(m+r+1)(a+b\log(cx^n))}{bn}\right)}{m+r+1} + \frac{d}{}$$

```
[Out] (d^3*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a +
 b*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-((
(1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (3*d^2*e*x^(1 + r)*(f*x)^m*Gamma[1
 + p, -(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^(
(a*(1 + m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*
(a + b*Log[c*x^n]))/(b*n)))^p) + (3*d*e^2*x^(1 + 2*r)*(f*x)^m*Gamma[1 + p,
-(((1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(
1 + m + 2*r))/(b*n))*(1 + m + 2*r)*(c*x^n)^((1 + m + 2*r)/n)*(-(((1 + m + 2
*r)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e^3*x^(1 + 3*r)*(f*x)^m*Gamma[1 + p,
-(((1 + m + 3*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(
1 + m + 3*r))/(b*n))*(1 + m + 3*r)*(c*x^n)^((1 + m + 3*r)/n)*(-(((1 + m + 3
*r)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

Rubi [A] time = 0.660258, antiderivative size = 480, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2353, 2310, 2181, 20}

$$\frac{3d^2ex^{r+1}(fx)^m e^{-\frac{a(m+r+1)}{bn}} (cx^n)^{-\frac{m+r+1}{n}} (a+b\log(cx^n))^p \left(-\frac{(m+r+1)(a+b\log(cx^n))}{bn}\right)^{-p} \text{Gamma}\left(p+1,-\frac{(m+r+1)(a+b\log(cx^n))}{bn}\right)}{m+r+1} + \frac{d}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n])^p,x]
```


```
[Out] (d^3*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a +
 b*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-((
(1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (3*d^2*e*x^(1 + r)*(f*x)^m*Gamma[1
 + p, -(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^(
(a*(1 + m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*
(a + b*Log[c*x^n]))/(b*n)))^p) + (3*d*e^2*x^(1 + 2*r)*(f*x)^m*Gamma[1 + p,
-(((1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(
1 + m + 2*r))/(b*n))*(1 + m + 2*r)*(c*x^n)^((1 + m + 2*r)/n)*(-(((1 + m + 2
*r)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e^3*x^(1 + 3*r)*(f*x)^m*Gamma[1 + p,
```

```
-(((1 + m + 3*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(
1 + m + 3*r))/(b*n))*(1 + m + 3*r)*(c*x^n)^((1 + m + 3*r)/n)*(-(((1 + m + 3
*r)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

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]
```

Rubi steps

$$\int (fx)^m (d+ex^r)^3 (a+b\log(cx^n))^p \, dx = \int \left(d^3(fx)^m (a+b\log(cx^n))^p + 3d^2ex^r(fx)^m (a+b\log(cx^n))^p + 3de^2x^{2r}(fx)^{\cdots}\right.$$
$$= d^3 \int (fx)^m (a+b\log(cx^n))^p \, dx + \left(3d^2e\right) \int x^r(fx)^m (a+b\log(cx^n))^p \, dx + \left(\cdots\right.$$
$$= \left(3d^2ex^{-m}(fx)^m\right) \int x^{m+r} (a+b\log(cx^n))^p \, dx + \left(3de^2x^{-m}(fx)^m\right) \int x^{m+2r} (a+\cdots$$
$$= \frac{d^3 e^{-\frac{a(1+m)}{bn}} (fx)^{1+m} (cx^n)^{-\frac{1+m}{n}} \Gamma\left(1+p, -\frac{(1+m)(a+b\log(cx^n))}{bn}\right) (a+b\log(cx^n))^p \left(-\cdots\right.}{f(1+m)}$$
$$= \frac{d^3 e^{-\frac{a(1+m)}{bn}} (fx)^{1+m} (cx^n)^{-\frac{1+m}{n}} \Gamma\left(1+p, -\frac{(1+m)(a+b\log(cx^n))}{bn}\right) (a+b\log(cx^n))^p \left(-\cdots\right.}{f(1+m)}$$

Mathematica [A] time = 1.87308, size = 408, normalized size = 0.85

$$x^{-m}(fx)^m (a+b\log(cx^n))^p \left(e\left(\frac{3d^2 \exp\left(-\frac{(m+r+1)(a+b\log(cx^n)-bn\log(x))}{bn}\right)\left(-\frac{(m+r+1)(a+b\log(cx^n))}{bn}\right)^{-p} \operatorname{Gamma}\left(p+1, -\frac{(m+r+1)(\cdots}{}\right.}{m+r+1}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^3*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n])^p*((d^3*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^
n]))/(b*n))])/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*
(-(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + e*((3*d^2*Gamma[1 + p, -(((1 +
 m + r)*(a + b*Log[c*x^n]))/(b*n))])/(E^(((1 + m + r)*(a - b*n*Log[x] + b*L
og[c*x^n]))/(b*n))*(1 + m + r)*(-(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n)))^
p) + e*((3*d*Gamma[1 + p, -(((1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n))])/(E^
(((1 + m + 2*r)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m + 2*r)*(-(((
1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e*Gamma[1 + p, -(((1 + m + 3
*r)*(a + b*Log[c*x^n]))/(b*n))])/(E^(((1 + m + 3*r)*(a - b*n*Log[x] + b*Log
[c*x^n]))/(b*n))*(1 + m + 3*r)*(-(((1 + m + 3*r)*(a + b*Log[c*x^n]))/(b*n))
)^p)))))/x^m
```

Maple [F] time = 0.853, size = 0, normalized size = 0.

$$\int \left(fx\right)^m (d+ex^r)^3 (a+b\ln(cx^n))^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d+e*x^r)^3*(a+b*ln(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(d+e*x^r)^3*(a+b*ln(c*x^n))^p,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(e^3x^{3r} + 3\,de^2x^{2r} + 3\,d^2ex^r + d^3\right)\left(fx\right)^m\left(b\log\left(cx^n\right) + a\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((e^3*x^(3*r) + 3*d*e^2*x^(2*r) + 3*d^2*e*x^r + d^3)*(f*x)^m*(b*log
(c*x^n) + a)^p, 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((f*x)**m*(d+e*x**r)**3*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex^r + d)^3 \left(fx\right)^m (b\log (cx^n) + a)^p \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^3*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^3*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

3.449 $\int (fx)^m (d+ex^r)^2 (a+b\log(cx^n))^p \, dx$

Optimal. Leaf size=350

$$\frac{d^2(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}(cx^n)^{-\frac{m+1}{n}}(a+b\log(cx^n))^p\left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)}{f(m+1)}+\frac{2dex^{r+1}(fx)^m e}{}$$

```
[Out] (d^2*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a +
 b*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-((
(1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (2*d*e*x^(1 + r)*(f*x)^m*Gamma[1 +
 p, -(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a
*(1 + m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*(a
 + b*Log[c*x^n]))/(b*n)))^p) + (e^2*x^(1 + 2*r)*(f*x)^m*Gamma[1 + p, -(((1
+ m + 2*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(1 + m
+ 2*r))/(b*n))*(1 + m + 2*r)*(c*x^n)^((1 + m + 2*r)/n)*(-(((1 + m + 2*r)*(a
 + b*Log[c*x^n]))/(b*n)))^p)
```

Rubi [A] time = 0.412714, antiderivative size = 350, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148, Rules used = {2353, 2310, 2181, 20}

$$\frac{d^2(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}(cx^n)^{-\frac{m+1}{n}}(a+b\log(cx^n))^p\left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)}{f(m+1)}+\frac{2dex^{r+1}(fx)^m e}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n])^p,x]
```


```
[Out] (d^2*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a +
 b*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-((
(1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (2*d*e*x^(1 + r)*(f*x)^m*Gamma[1 +
 p, -(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a
*(1 + m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*(a
 + b*Log[c*x^n]))/(b*n)))^p) + (e^2*x^(1 + 2*r)*(f*x)^m*Gamma[1 + p, -(((1
+ m + 2*r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(1 + m
+ 2*r))/(b*n))*(1 + m + 2*r)*(c*x^n)^((1 + m + 2*r)/n)*(-(((1 + m + 2*r)*(a
 + b*Log[c*x^n]))/(b*n)))^p)
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] && !I
ntegerQ[m]
```

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]
```

Rubi steps

$$\int (fx)^m (d+ex^r)^2 (a+b\log(cx^n))^p\,dx = \int \left(d^2(fx)^m (a+b\log(cx^n))^p + 2dex^r(fx)^m (a+b\log(cx^n))^p + e^2x^{2r}(fx)^m (a\right.$$

$$= d^2\int (fx)^m (a+b\log(cx^n))^p\,dx + (2de)\int x^r(fx)^m (a+b\log(cx^n))^p\,dx + e^2$$

$$= \left(2dex^{-m}(fx)^m\right)\int x^{m+r} (a+b\log(cx^n))^p\,dx + \left(e^2x^{-m}(fx)^m\right)\int x^{m+2r} (a+b\,\mathrm{l}$$

$$= \frac{d^2e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\,\Gamma\left(1+p,-\frac{(1+m)(a+b\log(cx^n))}{bn}\right)(a+b\log(cx^n))^p\left(-\right.}{f(1+m)}$$

$$= \frac{d^2e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\,\Gamma\left(1+p,-\frac{(1+m)(a+b\log(cx^n))}{bn}\right)(a+b\log(cx^n))^p\left(-\right.}{f(1+m)}$$

Mathematica [A] time = 0.969889, size = 304, normalized size = 0.87

$$x^{-m}(fx)^m\left(a+b\log\left(cx^n\right)\right)^p\left(\frac{d^2\exp\left(-\frac{(m+1)(a+b\log(cx^n)-bn\log(x))}{bn}\right)\left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(a+b\log(cx^n))}{bn}\right.}{m+1}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)^2*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n])^p*((d^2*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^
n]))/(b*n))])/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*
(-(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + e*((2*d*Gamma[1 + p, -(((1 + m
 + r)*(a + b*Log[c*x^n]))/(b*n))])/(E^(((1 + m + r)*(a - b*n*Log[x] + b*Log
[c*x^n]))/(b*n))*(1 + m + r)*(-(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n)))^p)
 + (e*Gamma[1 + p, -(((1 + m + 2*r)*(a + b*Log[c*x^n]))/(b*n))])/(E^(((1 +
m + 2*r)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m + 2*r)*(-(((1 + m +
 2*r)*(a + b*Log[c*x^n]))/(b*n)))^p))))/x^m
```

Maple [F] time = 1.22, size = 0, normalized size = 0.

$$\int \left(fx\right)^{m}\left(d+ex^{r}\right)^{2}\left(a+b\ln\left(cx^{n}\right)\right)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d+e*x^r)^2*(a+b*ln(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(d+e*x^r)^2*(a+b*ln(c*x^n))^p,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(e^2x^{2\,r} + 2\,dex^r + d^2\right)\left(fx\right)^m (b\log\left(cx^n\right) + a)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((e^2*x^(2*r) + 2*d*e*x^r + d^2)*(f*x)^m*(b*log(c*x^n) + a)^p, 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((f*x)**m*(d+e*x**r)**2*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex^r + d)^2 \left(fx\right)^m (b\log\left(cx^n\right) + a)^p \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)^2*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)^2*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

3.450 $\int (fx)^m (d+ex^r) (a+b\log(cx^n))^p \, dx$

Optimal. Leaf size=220

$$\frac{d(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}(cx^n)^{-\frac{m+1}{n}}(a+b\log(cx^n))^p\left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)}{f(m+1)}+\frac{ex^{r+1}(fx)^m e^{-\frac{a(n}{}}}{}$$

```
[Out] (d*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b
*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-(((1
 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e*x^(1 + r)*(f*x)^m*Gamma[1 + p, -(
((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(1 +
m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*(a + b*L
og[c*x^n]))/(b*n)))^p)
```

Rubi [A] time = 0.256212, antiderivative size = 220, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.16, Rules used = {2353, 2310, 2181, 20}

$$\frac{d(fx)^{m+1}e^{-\frac{a(m+1)}{bn}}(cx^n)^{-\frac{m+1}{n}}(a+b\log(cx^n))^p\left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)}{f(m+1)}+\frac{ex^{r+1}(fx)^m e^{-\frac{a(n}{}}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n])^p,x]
```


```
[Out] (d*(f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b
*Log[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-(((1
 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e*x^(1 + r)*(f*x)^m*Gamma[1 + p, -(
((1 + m + r)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x^n])^p)/(E^((a*(1 +
m + r))/(b*n))*(1 + m + r)*(c*x^n)^((1 + m + r)/n)*(-(((1 + m + r)*(a + b*L
og[c*x^n]))/(b*n)))^p)
```


Rule 2353

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) +
(e_.)*(x_)^(r_.))^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*Log[
c*x^n])^p, (f*x)^m*(d + e*x^r)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b
, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[q] && (GtQ[q, 0] || (IGtQ[p, 0
] && IntegerQ[m] && IntegerQ[r]))
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

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]
```

Rubi steps

$$\int (fx)^m\left(d+ex^r\right)\left(a+b\log\left(cx^n\right)\right)^p\,dx=\int\left(d(fx)^m\left(a+b\log\left(cx^n\right)\right)^p+ex^r(fx)^m\left(a+b\log\left(cx^n\right)\right)^p\right)dx$$

$$=d\int (fx)^m\left(a+b\log\left(cx^n\right)\right)^p\,dx+e\int x^r(fx)^m\left(a+b\log\left(cx^n\right)\right)^p\,dx$$

$$=\left(ex^{-m}(fx)^m\right)\int x^{m+r}\left(a+b\log\left(cx^n\right)\right)^p\,dx+\frac{\left(d(fx)^{1+m}\left(cx^n\right)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\cdots}\right.}{fn}$$

$$=\frac{de^{-\frac{a(1+m)}{bn}}(fx)^{1+m}\left(cx^n\right)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)(a+b\log(cx^n))}{bn}\right)\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(1+\cdots}{\cdots}\right.}{f(1+m)}$$

$$=\frac{de^{-\frac{a(1+m)}{bn}}(fx)^{1+m}\left(cx^n\right)^{-\frac{1+m}{n}}\Gamma\left(1+p,-\frac{(1+m)(a+b\log(cx^n))}{bn}\right)\left(a+b\log\left(cx^n\right)\right)^p\left(-\frac{(1+\cdots}{\cdots}\right.}{f(1+m)}$$

Mathematica [A] time = 0.428966, size = 200, normalized size = 0.91

$$x^{-m}(fx)^m\left(a+b\log\left(cx^n\right)\right)^p\left(\frac{d\exp\left(-\frac{(m+1)(a+b\log(cx^n)-bn\log(x))}{bn}\right)\left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(a+b\log(cx^n))}{bn}\cdots\right.}{m+1}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(d + e*x^r)*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*(a + b*Log[c*x^n])^p*((d*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]
))/(b*n))])/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*(-
(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p) + (e*Gamma[1 + p, -(((1 + m + r)*(
a + b*Log[c*x^n]))/(b*n))])/(E^(((1 + m + r)*(a - b*n*Log[x] + b*Log[c*x^n]
))/(b*n))*(1 + m + r)*(-(((1 + m + r)*(a + b*Log[c*x^n]))/(b*n)))^p)))/x^m
```

Maple [F] time = 1.322, size = 0, normalized size = 0.

$$\int \left(fx\right)^{m} \left(d + e x^{r}\right) \left(a + b \ln \left(c x^{n}\right)\right)^{p} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(d+e*x^r)*(a+b*ln(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(d+e*x^r)*(a+b*ln(c*x^n))^p,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(e x^{r} + d\right) \left(fx\right)^{m} \left(b \log \left(c x^{n}\right) + a\right)^{p}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((e*x^r + d)*(f*x)^m*(b*log(c*x^n) + a)^p, 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((f*x)**m*(d+e*x**r)*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Timed out
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int (ex^r + d)\left(fx\right)^m (b\log(cx^n) + a)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(d+e*x^r)*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((e*x^r + d)*(f*x)^m*(b*log(c*x^n) + a)^p, x)
```

3.451 $\int (fx)^m (a + b \log(cx^n))^p \, dx$

Optimal. Leaf size=106

$$\frac{(fx)^{m+1} e^{-\frac{a(m+1)}{bn}} (cx^n)^{-\frac{m+1}{n}} (a + b\log(cx^n))^p \left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p} \operatorname{Gamma}\left(p+1, -\frac{(m+1)(a+b\log(cx^n))}{bn}\right)}{f(m+1)}$$

```
[Out] ((f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*L
og[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-(((1 +
 m)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

Rubi [A] time = 0.0671816, antiderivative size = 106, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {2310, 2181}

$$\frac{(fx)^{m+1} e^{-\frac{a(m+1)}{bn}} (cx^n)^{-\frac{m+1}{n}} (a + b\log(cx^n))^p \left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p} \operatorname{Gamma}\left(p+1, -\frac{(m+1)(a+b\log(cx^n))}{bn}\right)}{f(m+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(f*x)^m*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^(1 + m)*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*L
og[c*x^n])^p)/(E^((a*(1 + m))/(b*n))*f*(1 + m)*(c*x^n)^((1 + m)/n)*(-(((1 +
 m)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

Rule 2310

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_)*((d_.)*(x_))^(m_.), x_Symbol
] :> Dist[(d*x)^(m + 1)/(d*n*(c*x^n)^((m + 1)/n)), Subst[Int[E^(((m + 1)*x)
/n)*(a + b*x)^p, x], x, Log[c*x^n]], x] /; FreeQ[{a, b, c, d, m, n, p}, x]
```

Rule 2181

```
Int[(F_)^((g_.)*((e_.) + (f_.)*(x_)))*((c_.) + (d_.)*(x_))^(m_), x_Symbol]
:> -Simp[(F^(g*(e - (c*f)/d))*(c + d*x)^FracPart[m]*Gamma[m + 1, (-((f*g*Lo
g[F])/d))*(c + d*x)])/(d*(-((f*g*Log[F])/d))^(IntPart[m] + 1)*(-((f*g*Log[F
]*(c + d*x))/d))^FracPart[m]), x] /; FreeQ[{F, c, d, e, f, g, m}, x] &&  !I
ntegerQ[m]
```

Rubi steps

$$\int (fx)^m (a+b\log(cx^n))^p\,dx = \frac{\left((fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\right)\text{Subst}\left(\int e^{\frac{(1+m)x}{n}}(a+bx)^p\,dx, x, \log(cx^n)\right)}{fn}$$
$$= \frac{e^{-\frac{a(1+m)}{bn}}(fx)^{1+m}(cx^n)^{-\frac{1+m}{n}}\,\Gamma\left(1+p, -\frac{(1+m)(a+b\log(cx^n))}{bn}\right)(a+b\log(cx^n))^p\left(-\frac{(1+m)(a+b\log(c\ldots}{bn}\right.}{f(1+m)}$$

Mathematica [A] time = 0.0668302, size = 107, normalized size = 1.01

$$\frac{x^{-m}(fx)^m(a+b\log(cx^n))^p\exp\left(-\frac{(m+1)(a+b\log(cx^n)-bn\log(x))}{bn}\right)\left(-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)^{-p}\text{Gamma}\left(p+1,-\frac{(m+1)(a+b\log(cx^n))}{bn}\right)}{m+1}$$

Antiderivative was successfully verified.

```
[In] Integrate[(f*x)^m*(a + b*Log[c*x^n])^p,x]
```

```
[Out] ((f*x)^m*Gamma[1 + p, -(((1 + m)*(a + b*Log[c*x^n]))/(b*n))]*(a + b*Log[c*x
^n])^p)/(E^(((1 + m)*(a - b*n*Log[x] + b*Log[c*x^n]))/(b*n))*(1 + m)*x^m*(-
(((1 + m)*(a + b*Log[c*x^n]))/(b*n)))^p)
```

Maple [F] time = 0.597, size = 0, normalized size = 0.

$$\int (fx)^m (a+b\ln(cx^n))^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))^p,x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))^p,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\left(fx\right)^{m}(b\log\left(cx^{n}\right)+a)^{p},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p,x, algorithm="fricas")
```

```
[Out] integral((f*x)^m*(b*log(c*x^n) + a)^p, x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx\right)^{m}(a+b\log\left(cx^{n}\right))^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(a+b*ln(c*x**n))**p,x)
```

```
[Out] Integral((f*x)**m*(a + b*log(c*x**n))**p, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \left(fx\right)^{m}(b\log\left(cx^{n}\right)+a)^{p}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p,x, algorithm="giac")
```

```
[Out] integrate((f*x)^m*(b*log(c*x^n) + a)^p, x)
```

3.452 $\int \frac{(fx)^m(a+b\log(cx^n))^p}{d+ex^r} dx$

Optimal. Leaf size=29

$$\text{Unintegrable}\left(\frac{(fx)^m (a+b\log(cx^n))^p}{d+ex^r},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r), x]
```

Rubi [A] time = 0.0995713, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m (a+b\log(cx^n))^p}{d+ex^r} dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r),x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r), x]
```

Rubi steps

$$\int \frac{(fx)^m (a+b\log(cx^n))^p}{d+ex^r} dx = \int \frac{(fx)^m (a+b\log(cx^n))^p}{d+ex^r} dx$$

Mathematica [A] time = 2.76521, size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a+b\log(cx^n))^p}{d+ex^r} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r),x]
```

```
[Out] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r), x]
```

Maple [A] time = 1.244, size = 0, normalized size = 0.

$$\int \frac{(fx)^{m} (a+b\ln (c x^{n}))^{p}}{d+e x^{r}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))^p/(d+e*x^r),x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))^p/(d+e*x^r),x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx)^{m} (b\log (c x^{n})+a)^{p}}{e x^{r}+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r),x, algorithm="fricas")
```

```
[Out] integral((f*x)^m*(b*log(c*x^n) + a)^p/(e*x^r + d), 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((f*x)**m*(a+b*ln(c*x**n))**p/(d+e*x**r),x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^m (b\log(cx^n) + a)^p}{ex^r + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r),x, algorithm="giac")
```

```
[Out] integrate((f*x)^m*(b*log(c*x^n) + a)^p/(e*x^r + d), x)
```

3.453 $\int \frac{(fx)^m(a+b\log(cx^n))^p}{(d+ex^r)^2}\,dx$

Optimal. Leaf size=29

$$\text{Unintegrable}\left(\frac{(fx)^m\,(a+b\log(cx^n))^p}{(d+ex^r)^2},x\right)$$

```
[Out] Unintegrable[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2, x]
```

Rubi [A] time = 0.101942, antiderivative size = 0, normalized size of antiderivative = 0., number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0., Rules used = {}

$$\int \frac{(fx)^m\,(a+b\log(cx^n))^p}{(d+ex^r)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2,x]
```

```
[Out] Defer[Int][((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2, x]
```

Rubi steps

$$\int \frac{(fx)^m\,(a+b\log(cx^n))^p}{(d+ex^r)^2}\,dx=\int \frac{(fx)^m\,(a+b\log(cx^n))^p}{(d+ex^r)^2}\,dx$$

Mathematica [A] time = 2.97245, size = 0, normalized size = 0.

$$\int \frac{(fx)^m\,(a+b\log(cx^n))^p}{(d+ex^r)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2,x]
```

```
[Out] Integrate[((f*x)^m*(a + b*Log[c*x^n])^p)/(d + e*x^r)^2, x]
```

Maple [A] time = 0.881, size = 0, normalized size = 0.

$$\int \frac{(fx)^m (a + b\ln(cx^n))^p}{(d + ex^r)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(a+b*ln(c*x^n))^p/(d+e*x^r)^2,x)
```

```
[Out] int((f*x)^m*(a+b*ln(c*x^n))^p/(d+e*x^r)^2,x)
```

Maxima [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError
```

Fricas [A] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{(fx)^m (b\log(cx^n) + a)^p}{e^2x^{2r} + 2dex^r + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r)^2,x, algorithm="fricas")
```

```
[Out] integral((f*x)^m*(b*log(c*x^n) + a)^p/(e^2*x^(2*r) + 2*d*e*x^r + d^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((f*x)**m*(a+b*ln(c*x**n))**p/(d+e*x**r)**2,x)
```

```
[Out] Timed out
```

Giac [A] time = 0., size = 0, normalized size = 0.

$$\int \frac{(fx)^m (b\log(cx^n) + a)^p}{(ex^r + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(a+b*log(c*x^n))^p/(d+e*x^r)^2,x, algorithm="giac")
```

```
[Out] integrate((f*x)^m*(b*log(c*x^n) + a)^p/(e*x^r + d)^2, x)
```

3.454 $\int \frac{(f+gx)(a+b\log(cx^n))}{(d+ex)^3}\,dx$

Optimal. Leaf size=115

$$-\frac{(f+gx)^2\left(a+b\log\left(cx^n\right)\right)}{2(d+ex)^2(ef-dg)}-\frac{bn(dg+ef)\log(d+ex)}{2d^2e^2}+\frac{bf^2n\log(x)}{2d^2(ef-dg)}+\frac{bn(ef-dg)}{2de^2(d+ex)}$$

```
[Out] (b*(e*f - d*g)*n)/(2*d*e^2*(d + e*x)) + (b*f^2*n*Log[x])/(2*d^2*(e*f - d*g)
) - ((f + g*x)^2*(a + b*Log[c*x^n]))/(2*(e*f - d*g)*(d + e*x)^2) - (b*(e*f
+ d*g)*n*Log[d + e*x])/(2*d^2*e^2)
```

Rubi [A] time = 0.145514, antiderivative size = 151, normalized size of antiderivative = 1.31, number of steps used = 7, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {2357, 2319, 44, 2314, 31}

$$-\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)}{de(d+ex)}+\frac{bn\log(x)(ef-dg)}{2d^2e^2}-\frac{bn(ef-dg)\log(d+ex)}{2d^2e^2}+\frac{bn(ef-dg)}{2de^2(d+ex)}-bg$$

Antiderivative was successfully verified.

```
[In] Int[((f + g*x)*(a + b*Log[c*x^n]))/(d + e*x)^3,x]
```

```
[Out] (b*(e*f - d*g)*n)/(2*d*e^2*(d + e*x)) + (b*(e*f - d*g)*n*Log[x])/(2*d^2*e^2
) - ((e*f - d*g)*(a + b*Log[c*x^n]))/(2*e^2*(d + e*x)^2) + (g*x*(a + b*Log[
c*x^n]))/(d*e*(d + e*x)) - (b*g*n*Log[d + e*x])/(d*e^2) - (b*(e*f - d*g)*n*
Log[d + e*x])/(2*d^2*e^2)
```

Rule 2357

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{
u = ExpandIntegrand[(a + b*Log[c*x^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /
; FreeQ[{a, b, c, n}, x] && RationalFunctionQ[RFx, x] && IGtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] && !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rubi steps

$$\int \frac{(f+gx)(a+b\log(cx^n))}{(d+ex)^3}\,dx = \int \left(\frac{(ef-dg)(a+b\log(cx^n))}{e(d+ex)^3}+\frac{g(a+b\log(cx^n))}{e(d+ex)^2}\right)dx$$

$$= \frac{g\int \frac{a+b\log(cx^n)}{(d+ex)^2}\,dx}{e}+\frac{(ef-dg)\int \frac{a+b\log(cx^n)}{(d+ex)^3}\,dx}{e}$$

$$= -\frac{(ef-dg)(a+b\log(cx^n))}{2e^2(d+ex)^2}+\frac{gx(a+b\log(cx^n))}{de(d+ex)}-\frac{(bgn)\int \frac{1}{d+ex}\,dx}{de}+\frac{(b(ef-dg)n)\int}{2e^2}$$

$$= -\frac{(ef-dg)(a+b\log(cx^n))}{2e^2(d+ex)^2}+\frac{gx(a+b\log(cx^n))}{de(d+ex)}-\frac{bgn\log(d+ex)}{de^2}+\frac{(b(ef-dg)n)\int}{}$$

$$= \frac{b(ef-dg)n}{2de^2(d+ex)}+\frac{b(ef-dg)n\log(x)}{2d^2e^2}-\frac{(ef-dg)(a+b\log(cx^n))}{2e^2(d+ex)^2}+\frac{gx(a+b\log(cx^n))}{de(d+ex)}-$$

Mathematica [A] time = 0.171129, size = 108, normalized size = 0.94

$$\frac{-\frac{(ef-dg)(a+b\log(cx^n))}{(d+ex)^2}-\frac{2g(a+b\log(cx^n))}{d+ex}+\frac{bn(ef-dg)\left(\frac{d}{d+ex}-\log(d+ex)+\log(x)\right)}{d^2}+\frac{2bgn(\log(x)-\log(d+ex))}{d}}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f + g*x)*(a + b*Log[c*x^n]))/(d + e*x)^3,x]
```

```
[Out] (-(((e*f - d*g)*(a + b*Log[c*x^n]))/(d + e*x)^2) - (2*g*(a + b*Log[c*x^n]))
/(d + e*x) + (2*b*g*n*(Log[x] - Log[d + e*x]))/d + (b*(e*f - d*g)*n*(d/(d +
 e*x) + Log[x] - Log[d + e*x]))/d^2)/(2*e^2)
```

Maple [C] time = 0.147, size = 624, normalized size = 5.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(a+b*ln(c*x^n))/(e*x+d)^3,x)
```

```
[Out] -1/2*b*(2*e*g*x+d*g+e*f)/(e*x+d)^2/e^2*ln(x^n)+1/4*(I*Pi*b*d^2*e*f*csgn(I*x
^n)*csgn(I*c*x^n)*csgn(I*c)+I*Pi*b*d^3*g*csgn(I*c*x^n)^3-2*a*d^3*g-2*I*Pi*b
*d^2*e*g*x*csgn(I*c*x^n)^2*csgn(I*c)-2*I*Pi*b*d^2*e*g*x*csgn(I*x^n)*csgn(I*
c*x^n)^2-2*b*d^3*g*n-2*a*d^2*e*f+2*ln(-x)*b*e^3*f*n*x^2+2*ln(-x)*b*d^2*e*f*
n-2*ln(e*x+d)*b*e^3*f*n*x^2-2*ln(e*x+d)*b*d^2*e*f*n-4*ln(c)*b*d^2*e*g*x+2*I
*Pi*b*d^2*e*g*x*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-4*a*d^2*e*g*x+2*b*d^2*e
*f*n+2*ln(-x)*b*d^3*g*n-2*ln(e*x+d)*b*d^3*g*n-2*ln(c)*b*d^2*e*f-2*b*d^2*e*g
*n*x+2*b*d*e^2*f*n*x-2*ln(c)*b*d^3*g-I*Pi*b*d^3*g*csgn(I*c*x^n)^2*csgn(I*c)
+I*Pi*b*d^2*e*f*csgn(I*c*x^n)^3-I*Pi*b*d^2*e*f*csgn(I*c*x^n)^2*csgn(I*c)+I*
Pi*b*d^3*g*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+2*I*Pi*b*d^2*e*g*x*csgn(I*c*
x^n)^3-I*Pi*b*d^2*e*f*csgn(I*x^n)*csgn(I*c*x^n)^2+2*ln(-x)*b*d*e^2*g*n*x^2+
4*ln(-x)*b*d^2*e*g*n*x+4*ln(-x)*b*d*e^2*f*n*x-2*ln(e*x+d)*b*d*e^2*g*n*x^2-4
*ln(e*x+d)*b*d^2*e*g*n*x-4*ln(e*x+d)*b*d*e^2*f*n*x-I*Pi*b*d^3*g*csgn(I*x^n)
*csgn(I*c*x^n)^2)/e^2/d^2/(e*x+d)^2
```

Maxima [B] time = 1.2056, size = 294, normalized size = 2.56

$$\frac{1}{2}\,bfn\left(\frac{1}{de^2x + d^2e} - \frac{\log(ex+d)}{d^2e} + \frac{\log(x)}{d^2e}\right) - \frac{1}{2}\,bgn\left(\frac{1}{e^3x + de^2} + \frac{\log(ex+d)}{de^2} - \frac{\log(x)}{de^2}\right) - \frac{(2\,ex+d)bg\log(cx^n)}{2\left(e^4x^2 + 2\,de^3x + d^2e^2\right)} -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 1/2*b*f*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e)) - 1
/2*b*g*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)) - 1/2*
(2*e*x + d)*b*g*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*(2*e*x + d
)*a*g/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*b*f*log(c*x^n)/(e^3*x^2 + 2*d*e
^2*x + d^2*e) - 1/2*a*f/(e^3*x^2 + 2*d*e^2*x + d^2*e)
```

Fricas [B] time = 1.32886, size = 466, normalized size = 4.05

$$-\frac{ad^2ef + ad^3g - \left(bd^2ef - bd^3g\right)n + \left(2\,ad^2eg - \left(bde^2f - bd^2eg\right)n\right)x + \left(\left(be^3f + bde^2g\right)nx^2 + 2\left(bde^2f + bd^2eg\right)nx + \left(bd^2e\right.\right.}{2\left(d^2e^4x^2 + 2\,d^3e^3x + \right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a*d^2*e*f + a*d^3*g - (b*d^2*e*f - b*d^3*g)*n + (2*a*d^2*e*g - (b*d*e
^2*f - b*d^2*e*g)*n)*x + ((b*e^3*f + b*d*e^2*g)*n*x^2 + 2*(b*d*e^2*f + b*d^
2*e*g)*n*x + (b*d^2*e*f + b*d^3*g)*n)*log(e*x + d) + (2*b*d^2*e*g*x + b*d^2
*e*f + b*d^3*g)*log(c) - (2*b*d*e^2*f*n*x + (b*e^3*f + b*d*e^2*g)*n*x^2)*lo
g(x))/(d^2*e^4*x^2 + 2*d^3*e^3*x + d^4*e^2)
```

Sympy [A] time = 5.41824, size = 1103, normalized size = 9.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*ln(c*x**n))/(e*x+d)**3,x)
```

```
[Out] Piecewise((zoo*(-a*f/(2*x**2) - a*g/x - b*f*n*log(x)/(2*x**2) - b*f*n/(4*x*
*2) - b*f*log(c)/(2*x**2) - b*g*n*log(x)/x - b*g*n/x - b*g*log(c)/x), Eq(d,
 0) & Eq(e, 0)), ((-a*f/(2*x**2) - a*g/x - b*f*n*log(x)/(2*x**2) - b*f*n/(4
*x**2) - b*f*log(c)/(2*x**2) - b*g*n*log(x)/x - b*g*n/x - b*g*log(c)/x)/e**
3, Eq(d, 0)), ((a*f*x + a*g*x**2/2 + b*f*n*x*log(x) - b*f*n*x + b*f*x*log(c
) + b*g*n*x**2*log(x)/2 - b*g*n*x**2/4 + b*g*x**2*log(c)/2)/d**3, Eq(e, 0))
, (2*a*d*e**2*f*x/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + a*d*e*
*2*g*x**2/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + a*e**3*f*x**2/
(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*d**3*g*n*log(d/e + x)/
(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*d**2*e*f*n*log(d/e + x
```

```
)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - 2*b*d**2*e*g*n*x*log(d
/e + x)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + b*d**2*e*g*n*x/(
2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + 2*b*d*e**2*f*n*x*log(x)/(
2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - 2*b*d*e**2*f*n*x*log(d/e
+ x)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*d*e**2*f*n*x/(2*d
**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + 2*b*d*e**2*f*x*log(c)/(2*d**
4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + b*d*e**2*g*n*x**2*log(x)/(2*d*
*4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*d*e**2*g*n*x**2*log(d/e + x
)/(2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + b*d*e**2*g*n*x**2/(2*d
**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + b*d*e**2*g*x**2*log(c)/(2*d*
*4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + b*e**3*f*n*x**2*log(x)/(2*d**
4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*e**3*f*n*x**2*log(d/e + x)/(
2*d**4*e**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) - b*e**3*f*n*x**2/(2*d**4*e
**2 + 4*d**3*e**3*x + 2*d**2*e**4*x**2) + b*e**3*f*x**2*log(c)/(2*d**4*e**2
 + 4*d**3*e**3*x + 2*d**2*e**4*x**2), True))
```

Giac [B] time = 1.32223, size = 340, normalized size = 2.96

$$-\frac{bdgnx^2e^2\log(xe+d)+2\,bd^2gnxe\log(xe+d)-bdgnx^2e^2\log(x)+bd^2gnxe+bd^3gn\log(xe+d)+bfnx^2e^3\log(xe+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] -1/2*(b*d*g*n*x^2*e^2*log(x*e + d) + 2*b*d^2*g*n*x*e*log(x*e + d) - b*d*g*n
*x^2*e^2*log(x) + b*d^2*g*n*x*e + b*d^3*g*n*log(x*e + d) + b*f*n*x^2*e^3*lo
g(x*e + d) + 2*b*d*f*n*x*e^2*log(x*e + d) + b*d^2*f*n*e*log(x*e + d) + 2*b*
d^2*g*x*e*log(c) - b*f*n*x^2*e^3*log(x) - 2*b*d*f*n*x*e^2*log(x) + b*d^3*g*
n - b*d*f*n*x*e^2 - b*d^2*f*n*e + 2*a*d^2*g*x*e + b*d^3*g*log(c) + b*d^2*f*
e*log(c) + a*d^3*g + a*d^2*f*e)/(d^2*x^2*e^4 + 2*d^3*x*e^3 + d^4*e^2)
```

3.455 $\int \frac{(f+gx)(a+b\log(cx^n))^2}{(d+ex)^3}\,dx$

Optimal. Leaf size=202

$$-\frac{b^2n^2(dg+ef)\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2e^2}-\frac{bn(dg+ef)\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^2e^2}+\frac{f^2(a+b\log(cx^n))^2}{2d^2(ef-dg)}-\frac{bnx(ef-dg)(a+}{d^2e(d+}$$

```
[Out] -((b*(e*f - d*g)*n*x*(a + b*Log[c*x^n]))/(d^2*e*(d + e*x))) + (f^2*(a + b*L
og[c*x^n])^2)/(2*d^2*(e*f - d*g)) - ((f + g*x)^2*(a + b*Log[c*x^n])^2)/(2*(
e*f - d*g)*(d + e*x)^2) + (b^2*(e*f - d*g)*n^2*Log[d + e*x])/(d^2*e^2) - (b
*(e*f + d*g)*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d^2*e^2) - (b^2*(e*f +
 d*g)*n^2*PolyLog[2, -((e*x)/d)])/(d^2*e^2)
```

Rubi [A] time = 0.405262, antiderivative size = 278, normalized size of antiderivative = 1.38, number of steps used = 13, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.4, Rules used = {2357, 2319, 2347, 2344, 2301, 2317, 2391, 2314, 31, 2318}

$$-\frac{b^2n^2(ef-dg)\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2e^2}-\frac{2b^2gn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{de^2}-\frac{bn(ef-dg)\log\left(\frac{ex}{d}+1\right)(a+b\log(cx^n))}{d^2e^2}+\frac{(ef-dg)(a+}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[((f + g*x)*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] -((b*(e*f - d*g)*n*x*(a + b*Log[c*x^n]))/(d^2*e*(d + e*x))) + ((e*f - d*g)*
(a + b*Log[c*x^n])^2)/(2*d^2*e^2) - ((e*f - d*g)*(a + b*Log[c*x^n])^2)/(2*e
^2*(d + e*x)^2) + (g*x*(a + b*Log[c*x^n])^2)/(d*e*(d + e*x)) + (b^2*(e*f -
d*g)*n^2*Log[d + e*x])/(d^2*e^2) - (2*b*g*n*(a + b*Log[c*x^n])*Log[1 + (e*x
)/d])/(d*e^2) - (b*(e*f - d*g)*n*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d^2*
e^2) - (2*b^2*g*n^2*PolyLog[2, -((e*x)/d)])/(d*e^2) - (b^2*(e*f - d*g)*n^2*
PolyLog[2, -((e*x)/d)])/(d^2*e^2)
```

Rule 2357

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{
u = ExpandIntegrand[(a + b*Log[c*x^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /
; FreeQ[{a, b, c, n}, x] && RationalFunctionQ[RFx, x] && IGtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{(f+gx)\left(a+b\log\left(cx^n\right)\right)^2}{(d+ex)^3}\,dx = \int \left(\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^3}+\frac{g\left(a+b\log\left(cx^n\right)\right)^2}{e(d+ex)^2}\right)dx$$

$$= \frac{g\int \frac{(a+b\log(cx^n))^2}{(d+ex)^2}\,dx}{e}+\frac{(ef-dg)\int \frac{(a+b\log(cx^n))^2}{(d+ex)^3}\,dx}{e}$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)}-\frac{(2bgn)\int \frac{a+b\log(cx^n)}{d+ex}\,dx}{de}+\frac{(b(ef$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)}-\frac{2bgn\left(a+b\log\left(cx^n\right)\right)\log\left(1+\right.}{de^2}$$

$$= -\frac{b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)}-\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2e^2(d+ex)^2}+\frac{gx\left(a+b\log\left(cx^n\right)\right)^2}{de(d+ex)}$$

$$= -\frac{b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)}+\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e^2}-\frac{(ef-dg)\left(a+b\log(c\right.}{2e^2(d+ex)^2}$$

$$= -\frac{b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)}{d^2e(d+ex)}+\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e^2}-\frac{(ef-dg)\left(a+b\log(c\right.}{2e^2(d+ex)^2}$$

Mathematica [A] time = 0.273739, size = 244, normalized size = 1.21

$$\frac{\frac{(ef-dg)\left(-2b^2n^2(d+ex)\text{PolyLog}\left(2,-\frac{ex}{d}\right)-2bn(d+ex)\log\left(\frac{ex}{d}+1\right)\left(a+b\log\left(cx^n\right)\right)+(d+ex)\left(a+b\log\left(cx^n\right)\right)^2+2bdn\left(a+b\log\left(cx^n\right)\right)-2b^2n^2(d+ex)(\log(x)-\log(d+ex))\right)}{d^2(d+ex)}+}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f + g*x)*(a + b*Log[c*x^n])^2)/(d + e*x)^3,x]
```

```
[Out] (-(((e*f - d*g)*(a + b*Log[c*x^n])^2)/(d + e*x)^2) - (2*g*(a + b*Log[c*x^n]
)^2)/(d + e*x) + (2*g*((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*b*n*Log[1 +
 (e*x)/d]) - 2*b^2*n^2*PolyLog[2, -((e*x)/d)]))/d + ((e*f - d*g)*(2*b*d*n*(
a + b*Log[c*x^n]) + (d + e*x)*(a + b*Log[c*x^n])^2 - 2*b^2*n^2*(d + e*x)*(L
og[x] - Log[d + e*x]) - 2*b*n*(d + e*x)*(a + b*Log[c*x^n])*Log[1 + (e*x)/d]
 - 2*b^2*n^2*(d + e*x)*PolyLog[2, -((e*x)/d)]))/(d^2*(d + e*x)))/(2*e^2)
```

Maple [C] time = 0.305, size = 2163, normalized size = 10.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(a+b*ln(c*x^n))^2/(e*x+d)^3,x)
```

```
[Out] -1/2*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x^n)/e^2
/(e*x+d)^2*d*g*b^2*Pi*csgn(I*c*x^n)^3-1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*Pi*cs
gn(I*x^n)*csgn(I*c*x^n)^2-1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*Pi*csgn(I*c*x^n)^
2*csgn(I*c)-1/2*I/e^2*n/d*ln(x)*g*b^2*Pi*csgn(I*c*x^n)^3-1/2*I/e*n/d^2*ln(x
)*f*b^2*Pi*csgn(I*c*x^n)^3-1/2*b^2/e^2*n^2/d*ln(x)^2*g-1/2*b^2/e*n^2/d^2*ln
(x)^2*f-b^2/e^2*n^2/d*ln(e*x+d)*g+b^2/e*n^2/d^2*ln(e*x+d)*f+b^2/e^2*n^2/d*l
n(x)*g-b^2/e*n^2/d^2*ln(x)*f+b^2/e^2*n^2/d*dilog(-e*x/d)*g+b^2/e*n^2/d^2*di
log(-e*x/d)*f-1/2*b^2*ln(x^n)^2/e/(e*x+d)^2*f-b^2*ln(x^n)^2*g/e^2/(e*x+d)-1
/e^2*n/(e*x+d)*g*b^2*ln(c)-1/2*I/e*n/d/(e*x+d)*f*b^2*Pi*csgn(I*c*x^n)^3-1/2
*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-I/e^2*ln(x^n)/(e*x+d)*g
*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-I/e^2*ln(x^n)/(e*x+d)*g*b^2*Pi*csgn(I*c
*x^n)^2*csgn(I*c)+1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*Pi*csgn(I*c*x^n)^3+1/2*I/
e^2*n/d*ln(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^3+1/2*I/e*n/d^2*ln(e*x+d)*f*b^2*Pi
*csgn(I*c*x^n)^3-b/e^2*n/(e*x+d)*g*a-b^2*n/e^2*ln(x^n)/(e*x+d)*g+I/e^2*ln(x
^n)/(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^3+1/2*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*c*
x^n)^3+1/2*I/e^2*n/d*ln(x)*g*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I/e^2*n/d
*ln(e*x+d)*g*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)-1/2*I/e*n/d^2*ln(e*x+d)*f*b^2
*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*b^2*ln(x^n)^2/e^2/(e*x+d)^2*d*g-2*b/e^2
*ln(x^n)/(e*x+d)*g*a-b*ln(x^n)/e/(e*x+d)^2*f*a-2/e^2*ln(x^n)/(e*x+d)*g*b^2*
ln(c)-ln(x^n)/e/(e*x+d)^2*f*b^2*ln(c)+1/4*(I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)
^2-I*b*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-I*b*Pi*csgn(I*c*x^n)^3+I*b*Pi
*csgn(I*c*x^n)^2*csgn(I*c)+2*b*ln(c)+2*a)^2*(-g/e^2/(e*x+d)-1/2*(-d*g+e*f)/
e^2/(e*x+d)^2)+1/2*I/e^2*n/(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+1/2*I/e*n/d/(e*x+d)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2+b^2*n/e*ln(x^
n)/d/(e*x+d)*f-b^2*n/e^2*ln(x^n)/d*ln(e*x+d)*g+1/2*I/e*n/d^2*ln(x)*f*b^2*Pi
*csgn(I*x^n)*csgn(I*c*x^n)^2+1/2*I/e*n/d^2*ln(x)*f*b^2*Pi*csgn(I*c*x^n)^2*c
sgn(I*c)-1/2*I/e*n/d^2*ln(x)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1
```

```
/2*I*ln(x^n)/e^2/(e*x+d)^2*d*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+1
/2*I/e^2*n/d*ln(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)+b^2/e^2
*n^2/d*ln(-e*x/d)*ln(e*x+d)*g+b^2/e*n^2/d^2*ln(-e*x/d)*ln(e*x+d)*f+1/2*I*ln
(x^n)/e^2/(e*x+d)^2*d*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/e*n/d^2*ln(e*x
+d)*f*b^2*ln(c)+1/e^2*n/d*ln(x)*g*b^2*ln(c)+1/e*n/d^2*ln(x)*f*b^2*ln(c)+b/e
*n/d^2*ln(x)*f*a-b/e^2*n/d*ln(e*x+d)*g*a-b/e*n/d^2*ln(e*x+d)*f*a+b/e^2*n/d*
ln(x)*g*a+b/e*n/d/(e*x+d)*f*a+1/e*n/d/(e*x+d)*f*b^2*ln(c)-1/e^2*n/d*ln(e*x+
d)*g*b^2*ln(c)+1/2*I*ln(x^n)/e^2/(e*x+d)^2*d*g*b^2*Pi*csgn(I*c*x^n)^2*csgn(
I*c)+b*ln(x^n)/e^2/(e*x+d)^2*d*g*a+ln(x^n)/e^2/(e*x+d)^2*d*g*b^2*ln(c)-b^2*
n/e*ln(x^n)/d^2*ln(e*x+d)*f+b^2*n/e^2*ln(x^n)/d*ln(x)*g+b^2*n/e*ln(x^n)/d^2
*ln(x)*f+1/2*I*ln(x^n)/e/(e*x+d)^2*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(
I*c)+I/e^2*ln(x^n)/(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2
*I/e^2*n/d*ln(e*x+d)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)^2-1/2*I/e*n/d^2*ln(
e*x+d)*f*b^2*Pi*csgn(I*c*x^n)^2*csgn(I*c)+1/2*I/e*n/d/(e*x+d)*f*b^2*Pi*csgn
(I*c*x^n)^2*csgn(I*c)+1/2*I/e^2*n/d*ln(x)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n
)^2+1/2*I/e*n/d^2*ln(e*x+d)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/
2*I/e*n/d/(e*x+d)*f*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)-1/2*I/e^2*n/
d*ln(x)*g*b^2*Pi*csgn(I*x^n)*csgn(I*c*x^n)*csgn(I*c)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$abfn\left(\frac{1}{de^2x+d^2e}-\frac{\log(ex+d)}{d^2e}+\frac{\log(x)}{d^2e}\right)-abgn\left(\frac{1}{e^3x+de^2}+\frac{\log(ex+d)}{de^2}-\frac{\log(x)}{de^2}\right)-\frac{(2\,ex+d)abg\log(cx^n)}{e^4x^2+2\,de^3x+d^2e^2}-\frac{\cdots}{2\left(e^4\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] a*b*f*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e)) - a*b
*g*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)) - (2*e*x +
 d)*a*b*g*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/2*(2*e*x + d)*a^2*
g/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - a*b*f*log(c*x^n)/(e^3*x^2 + 2*d*e^2*x +
 d^2*e) - 1/2*a^2*f/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 1/2*(2*b^2*e*g*x + (e*f
 + d*g)*b^2)*log(x^n)^2/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) + integrate((b^2*e^
2*g*x^2*log(c)^2 + b^2*e^2*f*x*log(c)^2 + (2*(e^2*g*n + e^2*g*log(c))*b^2*x
^2 + (e^2*f*n + 3*d*e*g*n + 2*e^2*f*log(c))*b^2*x + (d*e*f*n + d^2*g*n)*b^2
)*log(x^n))/(e^5*x^4 + 3*d*e^4*x^3 + 3*d^2*e^3*x^2 + d^3*e^2*x), x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{a^2gx + a^2f + \left(b^2gx + b^2f\right)\log\left(cx^n\right)^2 + 2\left(abgx + abf\right)\log\left(cx^n\right)}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*g*x + a^2*f + (b^2*g*x + b^2*f)*log(c*x^n)^2 + 2*(a*b*g*x + a
*b*f)*log(c*x^n))/(e^3*x^3 + 3*d*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log\left(cx^n\right))^2\left(f + gx\right)}{(d + ex)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*ln(c*x**n))**2/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**2*(f + g*x)/(d + e*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(gx + f\right)(b\log\left(cx^n\right) + a)^2}{(ex + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^2/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(b*log(c*x^n) + a)^2/(e*x + d)^3, x)
```

3.456 $\int \frac{(f+gx)(a+b\log(cx^n))^3}{(d+ex)^3}\,dx$

Optimal. Leaf size=295

$$-\frac{3b^2n^2(dg+ef)\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^2e^2}+\frac{3b^3n^3(ef-dg)\text{PolyLog}\left(2,-\frac{ex}{d}\right)}{d^2e^2}+\frac{3b^3n^3(dg+ef)\text{PolyLog}\left(3,-\frac{e}{d}\right.}{d^2e^2}$$

```
[Out] (-3*b*(e*f - d*g)*n*x*(a + b*Log[c*x^n])^2)/(2*d^2*e*(d + e*x)) + (f^2*(a +
 b*Log[c*x^n])^3)/(2*d^2*(e*f - d*g)) - ((f + g*x)^2*(a + b*Log[c*x^n])^3)/
(2*(e*f - d*g)*(d + e*x)^2) + (3*b^2*(e*f - d*g)*n^2*(a + b*Log[c*x^n])*Log
[1 + (e*x)/d])/(d^2*e^2) - (3*b*(e*f + d*g)*n*(a + b*Log[c*x^n])^2*Log[1 +
(e*x)/d])/(2*d^2*e^2) + (3*b^3*(e*f - d*g)*n^3*PolyLog[2, -((e*x)/d)])/(d^2
*e^2) - (3*b^2*(e*f + d*g)*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)])/(
d^2*e^2) + (3*b^3*(e*f + d*g)*n^3*PolyLog[3, -((e*x)/d)])/(d^2*e^2)
```

Rubi [A] time = 0.624214, antiderivative size = 408, normalized size of antiderivative = 1.38, number of steps used = 17, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.44, Rules used = {2357, 2319, 2347, 2344, 2302, 30, 2317, 2374, 6589, 2318, 2391}

$$-\frac{3b^2n^2(ef-dg)\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{d^2e^2}-\frac{6b^2gn^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))}{de^2}+\frac{3b^3n^3(ef-dg)\text{PolyLo}}{d^2e^2}$$

Antiderivative was successfully verified.

```
[In] Int[((f + g*x)*(a + b*Log[c*x^n])^3)/(d + e*x)^3,x]
```

```
[Out] (-3*b*(e*f - d*g)*n*x*(a + b*Log[c*x^n])^2)/(2*d^2*e*(d + e*x)) + ((e*f - d
*g)*(a + b*Log[c*x^n])^3)/(2*d^2*e^2) - ((e*f - d*g)*(a + b*Log[c*x^n])^3)/
(2*e^2*(d + e*x)^2) + (g*x*(a + b*Log[c*x^n])^3)/(d*e*(d + e*x)) + (3*b^2*(
e*f - d*g)*n^2*(a + b*Log[c*x^n])*Log[1 + (e*x)/d])/(d^2*e^2) - (3*b*g*n*(a
 + b*Log[c*x^n])^2*Log[1 + (e*x)/d])/(d*e^2) - (3*b*(e*f - d*g)*n*(a + b*Lo
g[c*x^n])^2*Log[1 + (e*x)/d])/(2*d^2*e^2) + (3*b^3*(e*f - d*g)*n^3*PolyLog[
2, -((e*x)/d)])/(d^2*e^2) - (6*b^2*g*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e
*x)/d)])/(d*e^2) - (3*b^2*(e*f - d*g)*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((
e*x)/d)])/(d^2*e^2) + (6*b^3*g*n^3*PolyLog[3, -((e*x)/d)])/(d*e^2) + (3*b^3
*(e*f - d*g)*n^3*PolyLog[3, -((e*x)/d)])/(d^2*e^2)
```

Rule 2357

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*(RFx_), x_Symbol] :> With[{
u = ExpandIntegrand[(a + b*Log[c*x^n])^p, RFx, x]}, Int[u, x] /; SumQ[u]] /
```

```
; FreeQ[{a, b, c, n}, x] && RationalFunctionQ[RFx, x] && IGtQ[p, 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2302

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/(x_), x_Symbol] :> Dist[1/(
b*n), Subst[Int[x^p, x], x, a + b*Log[c*x^n]], x] /; FreeQ[{a, b, c, n, p},
 x]
```

Rule 30

```
Int[(x_)^(m_.), x_Symbol] :> Simp[x^(m + 1)/(m + 1), x] /; FreeQ[m, x] && N
eQ[m, -1]
```

Rule 2317

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symb
ol] :> Simp[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^p)/e, x] - Dist[(b*n*p)/e,
 Int[(Log[1 + (e*x)/d]*(a + b*Log[c*x^n])^(p - 1))/x, x], x] /; FreeQ[{a, b
, c, d, e, n}, x] && IGtQ[p, 0]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 2318

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((d_) + (e_.)*(x_))^2, x_Sy
mbol] :> Simp[(x*(a + b*Log[c*x^n])^p)/(d*(d + e*x)), x] - Dist[(b*n*p)/d,
Int[(a + b*Log[c*x^n])^(p - 1)/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n
, p}, x] && GtQ[p, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rubi steps

$$\int \frac{(f+gx)\left(a+b\log\left(cx^n\right)\right)^3}{(d+ex)^3}\,dx = \int \left(\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{e(d+ex)^3} + \frac{g\left(a+b\log\left(cx^n\right)\right)^3}{e(d+ex)^2}\right)dx$$

$$= \frac{g\int \frac{(a+b\log(cx^n))^3}{(d+ex)^2}\,dx}{e} + \frac{(ef-dg)\int \frac{(a+b\log(cx^n))^3}{(d+ex)^3}\,dx}{e}$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+b\log\left(cx^n\right)\right)^3}{de(d+ex)} - \frac{(3bgn)\int \frac{(a+b\log(cx^n))^2}{d+ex}\,dx}{de} + \frac{(3}{}$$

$$= -\frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+b\log\left(cx^n\right)\right)^3}{de(d+ex)} - \frac{3bgn\left(a+b\log\left(cx^n\right)\right)^2\log\left(1\right.}{de^2}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} - \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+b\log\left(cx^n\right.\right.}{de(d+ex)}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} - \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2e^2(d+ex)^2} + \frac{gx\left(a+b\log\left(cx^n\right.\right.}{de(d+ex)}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} + \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2d^2e^2} - \frac{(ef-dg)\left(a+b\,\mathrm{lo}\right.}{2e^2(d+ex}$$

$$= -\frac{3b(ef-dg)nx\left(a+b\log\left(cx^n\right)\right)^2}{2d^2e(d+ex)} + \frac{(ef-dg)\left(a+b\log\left(cx^n\right)\right)^3}{2d^2e^2} - \frac{(ef-dg)\left(a+b\,\mathrm{lo}\right.}{2e^2(d+ex}$$

Mathematica [A] time = 0.380427, size = 339, normalized size = 1.15

$$\frac{(ef-dg)\left(-3bn(d+ex)\left((a+b\log(cx^n))\left(a+b\log(cx^n)-2bn\log\left(\frac{ex}{d}+1\right)\right)-2b^2n^2\text{PolyLog}\left(2,-\frac{ex}{d}\right)\right)-6b^2n^2(d+ex)\left(\text{PolyLog}\left(2,-\frac{ex}{d}\right)(a+b\log(cx^n))-bn\text{PolyLog}\left(3,-\frac{ex}{d}\right.\right.\right.}{d^2(d+ex)}$$

Antiderivative was successfully verified.

```
[In] Integrate[((f + g*x)*(a + b*Log[c*x^n])^3)/(d + e*x)^3,x]
```

```
[Out] (-(((e*f - d*g)*(a + b*Log[c*x^n])^3)/(d + e*x)^2) - (2*g*(a + b*Log[c*x^n]
)^3)/(d + e*x) + (2*g*((a + b*Log[c*x^n])^2*(a + b*Log[c*x^n] - 3*b*n*Log[1
 + (e*x)/d]) - 6*b^2*n^2*(a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] + 6*b^3*
n^3*PolyLog[3, -((e*x)/d)]))/d + ((e*f - d*g)*(3*b*d*n*(a + b*Log[c*x^n])^2
 + (d + e*x)*(a + b*Log[c*x^n])^3 - 3*b*n*(d + e*x)*(a + b*Log[c*x^n])^2*Lo
g[1 + (e*x)/d] - 3*b*n*(d + e*x)*((a + b*Log[c*x^n])*(a + b*Log[c*x^n] - 2*
b*n*Log[1 + (e*x)/d]) - 2*b^2*n^2*PolyLog[2, -((e*x)/d)]) - 6*b^2*n^2*(d +
e*x)*((a + b*Log[c*x^n])*PolyLog[2, -((e*x)/d)] - b*n*PolyLog[3, -((e*x)/d)
```

```
])))/(d^2*(d + e*x)))/(2*e^2)
```

Maple [F] time = 1.284, size = 0, normalized size = 0.

$$\int \frac{(gx + f)(a + b\ln(cx^n))^3}{(ex + d)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((g*x+f)*(a+b*ln(c*x^n))^3/(e*x+d)^3,x)
```

```
[Out] int((g*x+f)*(a+b*ln(c*x^n))^3/(e*x+d)^3,x)
```

Maxima [F] time = 0., size = 0, normalized size = 0.

$$\frac{3}{2}a^2bfn\left(\frac{1}{de^2x + d^2e} - \frac{\log(ex + d)}{d^2e} + \frac{\log(x)}{d^2e}\right) - \frac{3}{2}a^2bgn\left(\frac{1}{e^3x + de^2} + \frac{\log(ex + d)}{de^2} - \frac{\log(x)}{de^2}\right) - \frac{3(2ex + d)a^2bg\log(cx^n}{2(e^4x^2 + 2de^3x + d^2e^2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^3/(e*x+d)^3,x, algorithm="maxima")
```

```
[Out] 3/2*a^2*b*f*n*(1/(d*e^2*x + d^2*e) - log(e*x + d)/(d^2*e) + log(x)/(d^2*e))
 - 3/2*a^2*b*g*n*(1/(e^3*x + d*e^2) + log(e*x + d)/(d*e^2) - log(x)/(d*e^2)
) - 3/2*(2*e*x + d)*a^2*b*g*log(c*x^n)/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 1/
2*(2*e*x + d)*a^3*g/(e^4*x^2 + 2*d*e^3*x + d^2*e^2) - 3/2*a^2*b*f*log(c*x^n
)/(e^3*x^2 + 2*d*e^2*x + d^2*e) - 1/2*a^3*f/(e^3*x^2 + 2*d*e^2*x + d^2*e) -
 1/2*(2*b^3*e*g*x + (e*f + d*g)*b^3)*log(x^n)^3/(e^4*x^2 + 2*d*e^3*x + d^2*
e^2) + integrate(1/2*(2*(b^3*e^2*g*log(c)^3 + 3*a*b^2*e^2*g*log(c)^2)*x^2 +
 3*((d*e*f*n + d^2*g*n)*b^3 + 2*(a*b^2*e^2*g + (e^2*g*n + e^2*g*log(c))*b^3
)*x^2 + (2*a*b^2*e^2*f + (e^2*f*n + 3*d*e*g*n + 2*e^2*f*log(c))*b^3)*x)*log
(x^n)^2 + 2*(b^3*e^2*f*log(c)^3 + 3*a*b^2*e^2*f*log(c)^2)*x + 6*((b^3*e^2*g
*log(c)^2 + 2*a*b^2*e^2*g*log(c))*x^2 + (b^3*e^2*f*log(c)^2 + 2*a*b^2*e^2*f
*log(c))*x)*log(x^n))/(e^5*x^4 + 3*d*e^4*x^3 + 3*d^2*e^3*x^2 + d^3*e^2*x),
x)
```

Fricas [F] time = 0., size = 0, normalized size = 0.

$$\text{integral}\left(\frac{a^3gx + a^3f + \left(b^3gx + b^3f\right)\log\left(cx^n\right)^3 + 3\left(ab^2gx + ab^2f\right)\log\left(cx^n\right)^2 + 3\left(a^2bgx + a^2bf\right)\log\left(cx^n\right)}{e^3x^3 + 3\,de^2x^2 + 3\,d^2ex + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^3/(e*x+d)^3,x, algorithm="fricas")
```

```
[Out] integral((a^3*g*x + a^3*f + (b^3*g*x + b^3*f)*log(c*x^n)^3 + 3*(a*b^2*g*x +
 a*b^2*f)*log(c*x^n)^2 + 3*(a^2*b*g*x + a^2*b*f)*log(c*x^n))/(e^3*x^3 + 3*d
*e^2*x^2 + 3*d^2*e*x + d^3), x)
```

Sympy [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{(a + b\log(cx^n))^3 \left(f + gx\right)}{(d + ex)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*ln(c*x**n))**3/(e*x+d)**3,x)
```

```
[Out] Integral((a + b*log(c*x**n))**3*(f + g*x)/(d + e*x)**3, x)
```

Giac [F] time = 0., size = 0, normalized size = 0.

$$\int \frac{\left(gx + f\right)(b\log(cx^n) + a)^3}{(ex + d)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((g*x+f)*(a+b*log(c*x^n))^3/(e*x+d)^3,x, algorithm="giac")
```

```
[Out] integrate((g*x + f)*(b*log(c*x^n) + a)^3/(e*x + d)^3, 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"
```