Computer algebra independent integration tests

`1_Algebraic_functions/1.2_Trinomial_products/1.2.1Quadratic/1.2.1.5(a+bx+cx^2)^p(d+e`

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Contents

1 Introduction

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

1.1 Listing of CAS systems tested

The following systems were tested at this time.

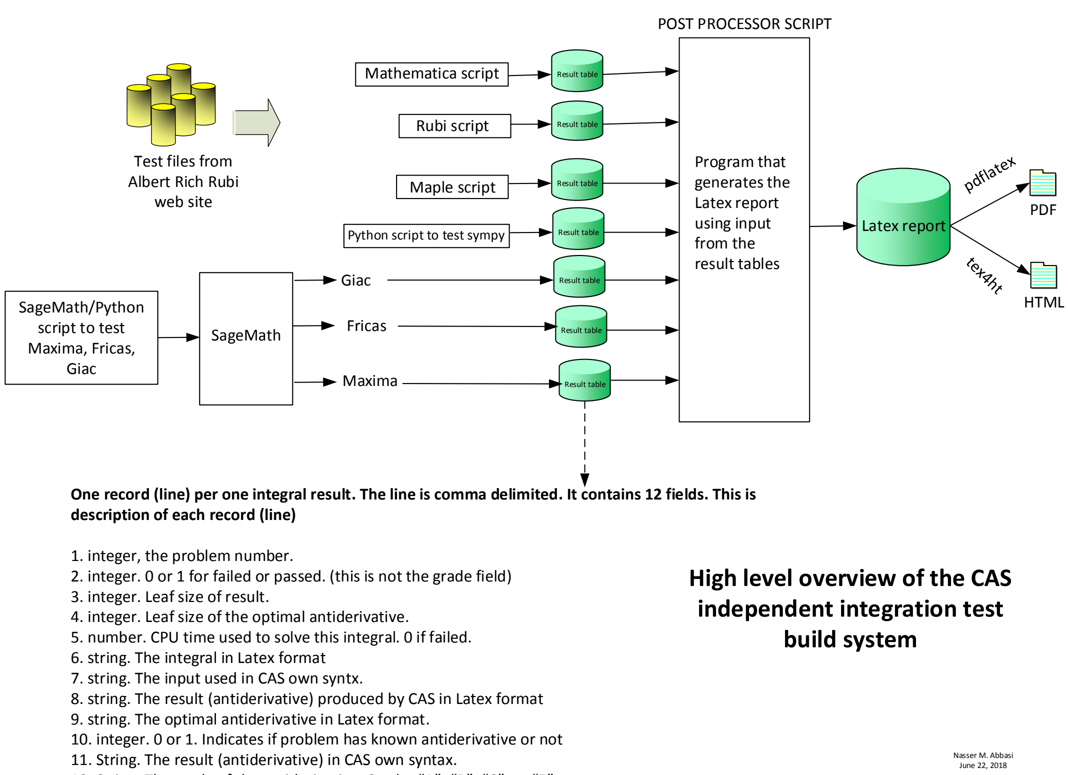
1. Mathematica 11.3 (64 bit).
2. Rubi 4.15.2 in Mathematica 11.3.
3. Rubi in Sympy (Version 1.3) under Python 3.7.0 using Anaconda distribution.
4. Maple 2018.1 (64 bit).
5. Maxima 5.41 Using Lisp ECL 16.1.2.
6. Fricas 1.3.4.
7. Sympy 1.3 under Python 3.7.0 using Anaconda distribution.
8. Giac/Xcas 1.4.9.

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

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

1.2 Design of the test system

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



1.3 Timing

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

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

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

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

1.4 Verification

A verification phase was applied on the result of integration for Rubi and Mathematica. Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative produced was correct.

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

1.5 Important notes about some of the results

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

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

The percentage of such failures were not counted for each test file, but for an example, for the Timofeev test file, there were about 30 such integrals out of total 705, or about 4 percent. This pecrentage can be higher or lower depending on the specific input test file.

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

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

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

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

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

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

Important note about FriCAS and Giac/XCAS results There are Few integrals which failed due to SageMath not able to translate the result back to SageMath syntax and not because these CAS system were not able to do the integrations.

These will fail With error `Exception raised: NotImplementedError`

The number of such cases seems to be very small. About 1 or 2 percent of all integrals.

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

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

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

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

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

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

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

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

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

  except Exception as ee:
         leafCount =1
```

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

1.6 Grading of results

The table below summarizes the grading of each CAS system.

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

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

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

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

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

System	solved	Failed
Rubi	% 100. (123)	% 0. (0)
Rubi in Sympy	% 64.23 (79)	% 35.77 (44)
Mathematica	% 100. (123)	% 0. (0)
Maple	% 98.37 (121)	% 1.63 (2)
Maxima	% 55.28 (68)	% 44.72 (55)
Fricas	% 90.24 (111)	% 9.76 (12)
Sympy	% 34.96 (43)	% 65.04 (80)
Giac	% 72.36 (89)	% 27.64 (34)

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

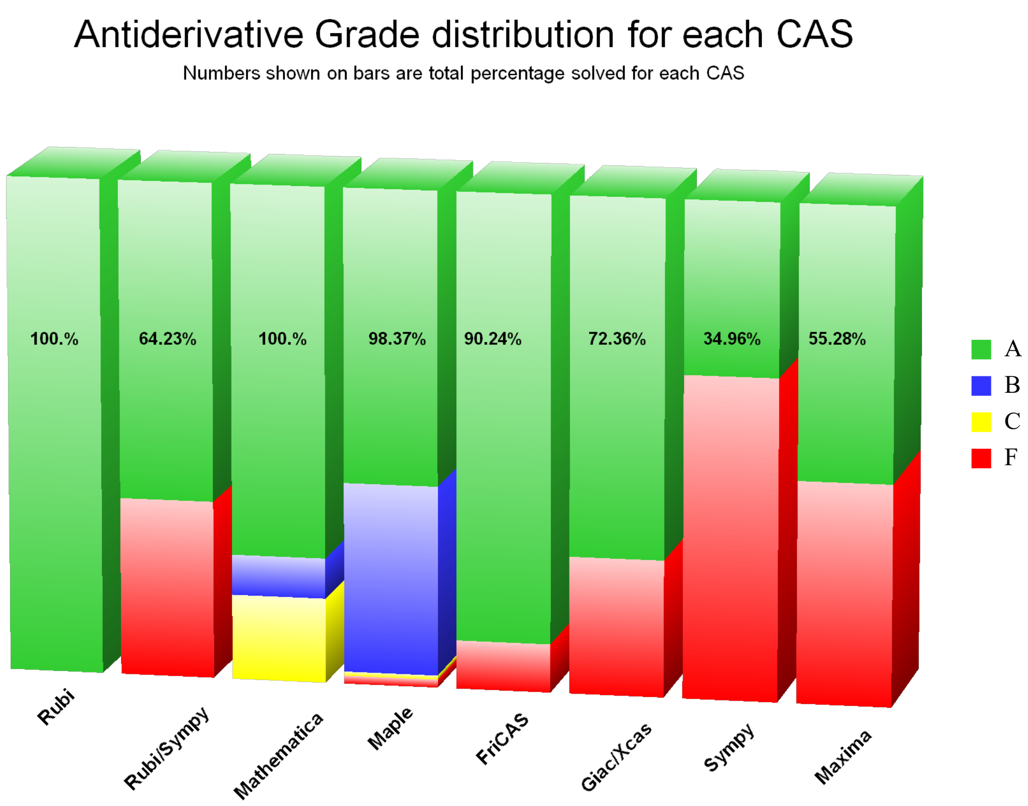
grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality.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

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

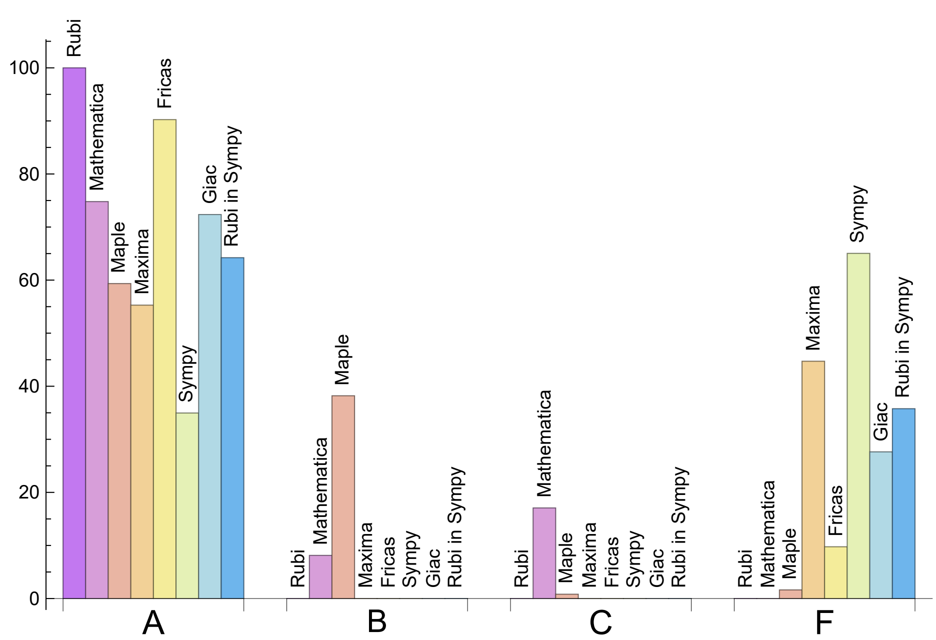
Based on the above, the following table summarizes the grading for this test suite.

System	% A grade	% B grade	% C grade	% F grade
Rubi	100.	0.	0.	0.
Rubi in Sympy	64.23	0.	0.	35.77
Mathematica	74.8	8.13	17.07	0.
Maple	59.35	38.21	0.81	1.63
Maxima	55.28	0.	0.	44.72
Fricas	90.24	0.	0.	9.76
Sympy	34.96	0.	0.	65.04
Giac	72.36	0.	0.	27.64

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



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



1.7 Performance

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

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	1.39	205.62	1.	128.	1.
Rubi in Sympy	66.47	158.19	1.	143.	0.96
Mathematica	1.73	385.28	1.81	95.	1.
Maple	0.05	6241.9	19.27	136.	0.82
Maxima	0.76	120.1	1.21	97.	1.11
Fricas	0.54	478.77	2.47	117.	1.31
Sympy	0.23	76.74	0.99	73.	0.97
Giac	0.29	136.07	1.1	85.	1.04

1.8 list of integrals that has no closed form antiderivative

{}

1.9 list of integrals not solved by each system

Not solved by Rubi {}

Not solved by Rubi in Sympy {5, 6, 13, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 44, 45, 46, 51, 52, 100, 103, 104, 106, 107, 108, 109, 110, 113, 114, 115, 117, 118, 122}

Not solved by Mathematica {}

Not solved by Maple {9, 10}

Not solved by Maxima {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 62, 63, 64, 69, 70, 71, 76, 77, 78, 83, 84, 85, 90, 91, 92, 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}

Not solved by Fricas {9, 10, 13, 102, 103, 106, 107, 108, 113, 117, 122, 123}

Not solved by Sympy {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 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}

Not solved by Giac {2, 3, 4, 5, 6, 7, 9, 10, 13, 62, 63, 64, 69, 70, 71, 76, 77, 78, 83, 84, 85, 90, 91, 92, 97, 98, 99, 102, 106, 107, 112, 117, 122, 123}

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

Rubi {}

Rubi in Sympy {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

1.11 list of integrals solved by CAS but failed verification

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

Rubi {13, 103, 106, 107, 108, 113, 122, 123}

Mathematica {106, 107, 108, 122, 123}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Rubi in Sympy Verification phase not implemented yet.

2 detailed summary tables of results

2.1 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	85	136	0	1	0	113	82
normalized size	1	1.	0.83	1.33	0.	0.01	0.	1.11	0.8
time (sec)	N/A	0.222	0.243	0.013	0.	0.37	0.	0.285	21.507

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	304	491	0	1	0	0	76
normalized size	1	1.	3.71	5.99	0.	0.01	0.	0.	0.93
time (sec)	N/A	0.244	0.678	0.062	0.	0.456	0.	0.	25.074

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	249	307	0	1	0	0	61
normalized size	1	1.	3.77	4.65	0.	0.02	0.	0.	0.92
time (sec)	N/A	0.168	0.473	0.038	0.	0.358	0.	0.	20.152

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	339	829	0	1	0	0	114
normalized size	1	1.	2.63	6.43	0.	0.01	0.	0.	0.88
time (sec)	N/A	0.398	0.553	0.039	0.	0.591	0.	0.	73.181

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	486	1884	0	1	0	0	0
normalized size	1	1.	2.17	8.41	0.	0.	0.	0.	0.
time (sec)	N/A	0.971	1.119	0.037	0.	1.792	0.	0.	0.

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	328	328	901	3695	0	1	0	0	0
normalized size	1	1.	2.75	11.27	0.	0.	0.	0.	0.
time (sec)	N/A	2.111	6.348	0.047	0.	11.338	0.	0.	0.

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	A	F(-1)	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	463	1377	0	1	0	0	150
normalized size	1	1.	2.86	8.5	0.	0.01	0.	0.	0.93
time (sec)	N/A	0.685	1.143	0.049	0.	1.005	0.	0.	134.701

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	27	0	51	0	70	31
normalized size	1	1.	1.	0.96	0.	1.82	0.	2.5	1.11
time (sec)	N/A	0.045	0.063	0.019	0.	0.274	0.	0.266	15.435

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	142	0	0	0	0	0	126
normalized size	1	1.	1.04	0.	0.	0.	0.	0.	0.93
time (sec)	N/A	0.222	0.243	0.353	0.	0.	0.	0.	28.281

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	F	F	F	F(-1)	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	172	0	0	0	0	0	194
normalized size	1	1.	0.86	0.	0.	0.	0.	0.	0.97
time (sec)	N/A	0.297	0.453	0.409	0.	0.	0.	0.	43.474

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	C	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	27	16	14	73	0	66	41
normalized size	1	1.	0.56	0.33	0.29	1.52	0.	1.38	0.85
time (sec)	N/A	0.052	0.027	0.103	0.783	0.26	0.	0.267	11.459

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	72	84	0	348	0	193	60
normalized size	1	1.	1.03	1.2	0.	4.97	0.	2.76	0.86
time (sec)	N/A	0.125	0.072	0.026	0.	0.273	0.	0.271	22.108

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	A	F	F	F	F	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	1077	1077	600	666	0	0	0	0	0
normalized size	1	1.	0.56	0.62	0.	0.	0.	0.	0.
time (sec)	N/A	6.638	3.421	0.268	0.	0.	0.	0.	0.

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	1087	341	0	213	0	231	116
normalized size	1	1.	11.09	3.48	0.	2.17	0.	2.36	1.18
time (sec)	N/A	0.489	6.275	0.04	0.	0.29	0.	0.273	72.318

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	55	73	1	65	73	0
normalized size	1	1.	1.	0.81	1.07	0.01	0.96	1.07	0.
time (sec)	N/A	0.08	0.005	0.002	0.698	0.231	0.068	0.263	0.

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	45	59	1	53	59	0
normalized size	1	1.	1.	0.8	1.05	0.02	0.95	1.05	0.
time (sec)	N/A	0.065	0.003	0.002	0.691	0.231	0.063	0.263	0.

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	35	46	1	41	46	0
normalized size	1	1.	1.	0.8	1.05	0.02	0.93	1.05	0.
time (sec)	N/A	0.048	0.002	0.001	0.689	0.231	0.056	0.262	0.

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	30	30	30	25	32	1	26	32	0
normalized size	1	1.	1.	0.83	1.07	0.03	0.87	1.07	0.
time (sec)	N/A	0.031	0.002	0.001	0.688	0.238	0.041	0.262	0.

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	34	45	55	49	45	0
normalized size	1	1.	1.	0.81	1.07	1.31	1.17	1.07	0.
time (sec)	N/A	0.08	0.028	0.006	0.782	0.262	0.135	0.266	0.

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	34	49	69	42	49	37
normalized size	1	1.	1.	0.79	1.14	1.6	0.98	1.14	0.86
time (sec)	N/A	0.051	0.031	0.009	0.788	0.258	0.174	0.265	9.294

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	53	47	76	108	63	62	56
normalized size	1	1.	0.83	0.73	1.19	1.69	0.98	0.97	0.88
time (sec)	N/A	0.066	0.052	0.009	0.787	0.268	0.225	0.265	9.851

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	80	65	86	1	76	86	0
normalized size	1	1.	1.	0.81	1.08	0.01	0.95	1.08	0.
time (sec)	N/A	0.098	0.005	0.002	0.697	0.251	0.08	0.263	0.

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	55	73	1	63	73	0
normalized size	1	1.	1.	0.83	1.11	0.02	0.95	1.11	0.
time (sec)	N/A	0.081	0.005	0.002	0.694	0.231	0.073	0.262	0.

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	45	59	1	51	59	0
normalized size	1	1.	1.	0.83	1.09	0.02	0.94	1.09	0.
time (sec)	N/A	0.072	0.004	0.001	0.694	0.235	0.063	0.264	0.

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	35	46	1	41	46	0
normalized size	1	1.	1.	0.76	1.	0.02	0.89	1.	0.
time (sec)	N/A	0.047	0.003	0.001	0.699	0.234	0.054	0.263	0.

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	53	44	58	73	63	58	0
normalized size	1	1.	0.95	0.79	1.04	1.3	1.12	1.04	0.
time (sec)	N/A	0.094	0.043	0.005	0.771	0.258	0.149	0.265	0.

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	59	51	70	117	65	70	0
normalized size	1	1.	0.94	0.81	1.11	1.86	1.03	1.11	0.
time (sec)	N/A	0.111	0.055	0.009	0.776	0.26	0.21	0.265	0.

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	53	47	76	109	63	62	0
normalized size	1	1.	0.83	0.73	1.19	1.7	0.98	0.97	0.
time (sec)	N/A	0.094	0.051	0.008	0.772	0.258	0.243	0.266	0.

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	63	57	103	149	83	76	100
normalized size	1	1.	0.74	0.67	1.21	1.75	0.98	0.89	1.18
time (sec)	N/A	0.112	0.086	0.011	0.768	0.266	0.291	0.263	49.803

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	96	75	100	1	92	100	0
normalized size	1	1.	1.	0.78	1.04	0.01	0.96	1.04	0.
time (sec)	N/A	0.128	0.005	0.002	0.69	0.235	0.089	0.264	0.

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	82	65	86	1	78	86	0
normalized size	1	1.	1.	0.79	1.05	0.01	0.95	1.05	0.
time (sec)	N/A	0.107	0.003	0.002	0.7	0.234	0.075	0.262	0.

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	68	55	73	1	65	73	0
normalized size	1	1.	1.	0.81	1.07	0.01	0.96	1.07	0.
time (sec)	N/A	0.088	0.004	0.002	0.688	0.234	0.068	0.261	0.

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	56	45	59	1	53	59	0
normalized size	1	1.	1.	0.8	1.05	0.02	0.95	1.05	0.
time (sec)	N/A	0.06	0.002	0.002	0.687	0.233	0.062	0.264	0.

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	63	54	72	86	76	72	0
normalized size	1	1.	0.9	0.77	1.03	1.23	1.09	1.03	0.
time (sec)	N/A	0.103	0.04	0.005	0.769	0.263	0.158	0.266	0.

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	61	84	131	78	84	0
normalized size	1	1.	1.	0.79	1.09	1.7	1.01	1.09	0.
time (sec)	N/A	0.125	0.054	0.009	0.771	0.266	0.22	0.265	0.

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	78	63	97	171	85	84	0
normalized size	1	1.	0.93	0.75	1.15	2.04	1.01	1.	0.
time (sec)	N/A	0.149	0.073	0.01	0.778	0.266	0.283	0.267	0.

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	72	64	85	100	87	85	0
normalized size	1	1.	0.86	0.76	1.01	1.19	1.04	1.01	0.
time (sec)	N/A	0.112	0.052	0.007	0.774	0.262	0.169	0.266	0.

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	63	54	72	86	73	72	0
normalized size	1	1.	0.9	0.77	1.03	1.23	1.04	1.03	0.
time (sec)	N/A	0.097	0.044	0.005	0.773	0.261	0.157	0.265	0.

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	52	44	58	73	60	58	58
normalized size	1	1.	0.93	0.79	1.04	1.3	1.07	1.04	1.04
time (sec)	N/A	0.088	0.032	0.005	0.766	0.271	0.154	0.265	27.191

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	42	34	45	55	46	45	0
normalized size	1	1.	1.	0.81	1.07	1.31	1.1	1.07	0.
time (sec)	N/A	0.067	0.02	0.004	0.77	0.268	0.136	0.265	0.

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	73	60	80	105	83	80	71
normalized size	1	1.	1.	0.82	1.1	1.44	1.14	1.1	0.97
time (sec)	N/A	0.115	0.066	0.005	0.772	0.27	0.32	0.265	27.302

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	94	77	105	194	102	105	90
normalized size	1	1.	1.	0.82	1.12	2.06	1.09	1.12	0.96
time (sec)	N/A	0.186	0.16	0.008	0.77	0.273	0.427	0.266	50.34

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	104	89	132	275	119	119	105
normalized size	1	1.	0.9	0.77	1.15	2.39	1.03	1.03	0.91
time (sec)	N/A	0.271	0.286	0.01	0.77	0.275	0.507	0.267	74.262

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	91	71	97	144	88	97	0
normalized size	1	1.	1.	0.78	1.07	1.58	0.97	1.07	0.
time (sec)	N/A	0.142	0.108	0.011	0.779	0.266	0.228	0.265	0.

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	77	61	84	131	75	84	0
normalized size	1	1.	1.	0.79	1.09	1.7	0.97	1.09	0.
time (sec)	N/A	0.125	0.052	0.009	0.771	0.265	0.22	0.266	0.

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	63	51	70	116	61	70	0
normalized size	1	1.	1.	0.81	1.11	1.84	0.97	1.11	0.
time (sec)	N/A	0.11	0.059	0.009	0.77	0.261	0.209	0.265	0.

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	43	34	49	69	41	49	37
normalized size	1	1.	1.	0.79	1.14	1.6	0.95	1.14	0.86
time (sec)	N/A	0.049	0.03	0.007	0.765	0.258	0.17	0.265	9.561

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	94	77	105	194	102	105	90
normalized size	1	1.	1.	0.82	1.12	2.06	1.09	1.12	0.96
time (sec)	N/A	0.193	0.11	0.008	0.773	0.278	0.413	0.264	50.449

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	106	94	130	262	122	130	116
normalized size	1	1.	0.83	0.74	1.02	2.06	0.96	1.02	0.91
time (sec)	N/A	0.279	0.101	0.013	0.771	0.272	0.493	0.266	75.791

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	136	106	159	356	143	149	143
normalized size	1	1.	0.92	0.72	1.07	2.41	0.97	1.01	0.97
time (sec)	N/A	0.365	0.128	0.013	0.767	0.275	0.579	0.266	106.206

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	98	73	111	185	95	97	0
normalized size	1	1.	1.	0.74	1.13	1.89	0.97	0.99	0.
time (sec)	N/A	0.173	0.071	0.012	0.774	0.264	0.285	0.266	0.

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	84	63	97	170	82	84	0
normalized size	1	1.	1.	0.75	1.15	2.02	0.98	1.	0.
time (sec)	N/A	0.15	0.07	0.01	0.769	0.266	0.282	0.266	0.

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	51	47	76	109	61	62	71
normalized size	1	1.	0.8	0.73	1.19	1.7	0.95	0.97	1.11
time (sec)	N/A	0.096	0.061	0.008	0.769	0.266	0.244	0.264	45.731

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	51	47	76	108	61	62	54
normalized size	1	1.	0.8	0.73	1.19	1.69	0.95	0.97	0.84
time (sec)	N/A	0.065	0.053	0.008	0.763	0.263	0.233	0.262	10.737

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	99	89	132	275	122	119	107
normalized size	1	1.	0.86	0.77	1.15	2.39	1.06	1.03	0.93
time (sec)	N/A	0.281	0.338	0.01	0.767	0.272	0.486	0.265	77.854

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	136	106	157	343	143	149	134
normalized size	1	1.	0.85	0.66	0.98	2.14	0.89	0.93	0.84
time (sec)	N/A	0.366	0.204	0.013	0.765	0.272	0.596	0.267	101.504

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	A	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	151	118	186	437	163	157	172
normalized size	1	1.	0.83	0.65	1.03	2.41	0.9	0.87	0.95
time (sec)	N/A	0.454	0.164	0.014	0.768	0.28	0.699	0.268	126.545

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	85	166	239	143	0	126	192
normalized size	1	1.	0.41	0.8	1.15	0.69	0.	0.61	0.92
time (sec)	N/A	0.484	0.113	0.039	0.795	0.284	0.	0.27	102.482

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	75	132	193	130	0	112	153
normalized size	1	1.	0.45	0.8	1.16	0.78	0.	0.67	0.92
time (sec)	N/A	0.311	0.09	0.01	0.778	0.282	0.	0.27	68.403

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	65	98	147	116	0	99	105
normalized size	1	1.	0.52	0.79	1.19	0.94	0.	0.8	0.85
time (sec)	N/A	0.175	0.079	0.009	0.77	0.278	0.	0.271	23.165

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	55	64	101	103	0	85	73
normalized size	1	1.	0.67	0.78	1.23	1.26	0.	1.04	0.89
time (sec)	N/A	0.085	0.051	0.008	0.772	0.278	0.	0.27	10.173

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	1133	2065	0	1397	0	0	204
normalized size	1	1.	6.51	11.87	0.	8.03	0.	0.	1.17
time (sec)	N/A	0.862	6.412	0.187	0.	0.337	0.	0.	75.479

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	1148	16357	0	1465	0	0	219
normalized size	1	1.	6.11	87.01	0.	7.79	0.	0.	1.16
time (sec)	N/A	0.808	6.547	0.248	0.	0.354	0.	0.	80.306

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	1170	43932	0	1646	0	0	252
normalized size	1	1.	5.25	197.	0.	7.38	0.	0.	1.13
time (sec)	N/A	0.971	6.474	0.401	0.	0.374	0.	0.	104.314

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	95	185	278	157	0	139	226
normalized size	1	1.	0.41	0.8	1.2	0.68	0.	0.6	0.98
time (sec)	N/A	0.539	0.132	0.046	0.779	0.286	0.	0.271	127.504

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	85	151	232	143	0	126	201
normalized size	1	1.	0.45	0.8	1.23	0.76	0.	0.67	1.06
time (sec)	N/A	0.314	0.11	0.01	0.77	0.287	0.	0.269	96.967

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	75	117	186	130	0	112	126
normalized size	1	1.	0.51	0.8	1.27	0.88	0.	0.76	0.86
time (sec)	N/A	0.198	0.092	0.009	0.775	0.282	0.	0.27	24.137

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	65	83	140	116	0	99	94
normalized size	1	1.	0.62	0.79	1.33	1.1	0.	0.94	0.9
time (sec)	N/A	0.104	0.072	0.007	0.768	0.279	0.	0.269	11.09

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	197	197	1175	3460	0	1486	0	0	226
normalized size	1	1.	5.96	17.56	0.	7.54	0.	0.	1.15
time (sec)	N/A	1.008	6.454	0.058	0.	0.347	0.	0.	101.444

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	1180	28185	0	1548	0	0	255
normalized size	1	1.	5.09	121.49	0.	6.67	0.	0.	1.1
time (sec)	N/A	1.164	6.469	0.182	0.	0.372	0.	0.	127.233

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	1171	81415	0	1601	0	0	284
normalized size	1	1.	5.25	365.09	0.	7.18	0.	0.	1.27
time (sec)	N/A	0.911	6.575	0.373	0.	0.367	0.	0.	92.946

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	254	254	105	204	317	170	0	153	246
normalized size	1	1.	0.41	0.8	1.25	0.67	0.	0.6	0.97
time (sec)	N/A	0.604	0.153	0.054	0.8	0.293	0.	0.274	128.005

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	95	170	271	157	0	139	221
normalized size	1	1.	0.45	0.8	1.28	0.74	0.	0.66	1.04
time (sec)	N/A	0.369	0.126	0.01	0.79	0.286	0.	0.273	96.831

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	85	136	225	143	0	126	146
normalized size	1	1.	0.5	0.8	1.32	0.84	0.	0.74	0.86
time (sec)	N/A	0.233	0.111	0.01	0.783	0.278	0.	0.27	25.215

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	75	102	180	130	0	112	114
normalized size	1	1.	0.59	0.8	1.41	1.02	0.	0.88	0.89
time (sec)	N/A	0.124	0.087	0.008	0.794	0.283	0.	0.273	11.886

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	1189	4860	0	1519	0	0	250
normalized size	1	1.	5.36	21.89	0.	6.84	0.	0.	1.13
time (sec)	N/A	1.113	6.459	0.064	0.	0.417	0.	0.	129.99

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	1196	40028	0	1621	0	0	270
normalized size	1	1.	4.69	156.97	0.	6.36	0.	0.	1.06
time (sec)	N/A	1.385	6.481	0.185	0.	0.384	0.	0.	152.489

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	1203	119321	0	1773	0	0	284
normalized size	1	1.	4.28	424.63	0.	6.31	0.	0.	1.01
time (sec)	N/A	1.385	6.509	0.42	0.	0.48	0.	0.	155.682

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	75	147	200	130	0	112	153
normalized size	1	1.	0.41	0.79	1.08	0.7	0.	0.61	0.83
time (sec)	N/A	0.513	0.113	0.025	0.784	0.285	0.	0.277	71.679

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	65	113	154	116	0	99	124
normalized size	1	1.	0.45	0.79	1.08	0.81	0.	0.69	0.87
time (sec)	N/A	0.287	0.086	0.009	0.791	0.281	0.	0.275	45.547

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	55	79	108	103	0	85	85
normalized size	1	1.	0.54	0.78	1.07	1.02	0.	0.84	0.84
time (sec)	N/A	0.16	0.063	0.01	0.778	0.275	0.	0.274	22.385

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	46	45	62	89	0	72	53
normalized size	1	1.	0.78	0.76	1.05	1.51	0.	1.22	0.9
time (sec)	N/A	0.073	0.05	0.007	0.784	0.282	0.	0.272	9.67

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	959	684	0	1299	0	0	172
normalized size	1	1.	6.48	4.62	0.	8.78	0.	0.	1.16
time (sec)	N/A	0.627	6.413	0.006	0.	0.33	0.	0.	55.024

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	1147	5225	0	1505	0	0	216
normalized size	1	1.	6.1	27.79	0.	8.01	0.	0.	1.15
time (sec)	N/A	0.885	6.449	0.009	0.	0.362	0.	0.	77.524

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	1170	13040	0	1601	0	0	258
normalized size	1	1.	5.25	58.48	0.	7.18	0.	0.	1.16
time (sec)	N/A	0.969	6.467	0.037	0.	0.372	0.	0.	104.21

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	95	166	200	159	0	111	175
normalized size	1	1.	0.57	1.	1.2	0.96	0.	0.67	1.05
time (sec)	N/A	0.335	0.095	0.036	0.782	0.29	0.	0.273	97.021

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	65	132	154	146	0	97	144
normalized size	1	1.	0.52	1.06	1.24	1.18	0.	0.78	1.16
time (sec)	N/A	0.218	0.097	0.01	0.78	0.285	0.	0.273	72.126

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	55	98	108	132	0	84	112
normalized size	1	1.	0.67	1.2	1.32	1.61	0.	1.02	1.37
time (sec)	N/A	0.127	0.079	0.009	0.782	0.28	0.	0.272	46.323

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	45	64	62	119	0	72	51
normalized size	1	1.	1.	1.42	1.38	2.64	0.	1.6	1.13
time (sec)	N/A	0.054	0.052	0.007	0.781	0.278	0.	0.272	9.599

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	1129	718	0	1463	0	0	207
normalized size	1	1.	6.41	4.08	0.	8.31	0.	0.	1.18
time (sec)	N/A	0.833	6.394	0.037	0.	0.333	0.	0.	79.311

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	1170	5942	0	1588	0	0	248
normalized size	1	1.	5.55	28.16	0.	7.53	0.	0.	1.18
time (sec)	N/A	0.975	6.453	0.096	0.	0.373	0.	0.	99.989

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	246	246	1191	18844	0	1777	0	0	286
normalized size	1	1.	4.84	76.6	0.	7.22	0.	0.	1.16
time (sec)	N/A	1.083	6.501	0.195	0.	0.384	0.	0.	130.217

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	75	214	342	186	0	109	180
normalized size	1	1.	0.51	1.46	2.33	1.27	0.	0.74	1.22
time (sec)	N/A	0.278	0.155	0.043	0.792	0.291	0.	0.274	98.319

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	65	180	296	173	0	97	144
normalized size	1	1.	0.62	1.71	2.82	1.65	0.	0.92	1.37
time (sec)	N/A	0.176	0.12	0.01	0.78	0.288	0.	0.274	72.99

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	55	146	250	159	0	82	114
normalized size	1	1.	0.81	2.15	3.68	2.34	0.	1.21	1.68
time (sec)	N/A	0.101	0.104	0.009	0.779	0.281	0.	0.274	44.887

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	A	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	33	30	80	69	0	39	37
normalized size	1	1.	0.7	0.64	1.7	1.47	0.	0.83	0.79
time (sec)	N/A	0.041	0.029	0.005	0.7	0.275	0.	0.27	9.367

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	199	1176	751	0	1601	0	0	238
normalized size	1	1.	5.91	3.77	0.	8.05	0.	0.	1.2
time (sec)	N/A	0.942	6.43	0.04	0.	0.359	0.	0.	105.101

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	234	234	1191	5975	0	1763	0	0	274
normalized size	1	1.	5.09	25.53	0.	7.53	0.	0.	1.17
time (sec)	N/A	1.097	6.454	0.097	0.	0.365	0.	0.	130.288

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	1218	18877	0	1871	0	0	308
normalized size	1	1.	4.53	70.17	0.	6.96	0.	0.	1.14
time (sec)	N/A	1.232	6.484	0.203	0.	0.396	0.	0.	152.126

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	436	436	456	1429	0	1	0	861	0
normalized size	1	1.	1.05	3.28	0.	0.	0.	1.97	0.
time (sec)	N/A	1.497	1.194	0.027	0.	0.564	0.	0.28	0.

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	171	453	0	1	0	286	160
normalized size	1	1.	0.98	2.59	0.	0.01	0.	1.63	0.91
time (sec)	N/A	0.338	0.296	0.009	0.	0.307	0.	0.278	20.416

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	431	431	699	6019	0	0	0	0	420
normalized size	1	1.	1.62	13.97	0.	0.	0.	0.	0.97
time (sec)	N/A	2.379	5.283	0.091	0.	0.	0.	0.	157.729

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F	F(-1)	F(-1)	A	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	488	488	798	22287	0	0	0	4	0
normalized size	1	1.	1.64	45.67	0.	0.	0.	0.01	0.
time (sec)	N/A	7.222	3.044	0.059	0.	0.	0.	0.799	0.

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	564	564	766	2458	0	1	0	1	0
normalized size	1	1.	1.36	4.36	0.	0.	0.	0.	0.
time (sec)	N/A	2.015	3.713	0.031	0.	1.156	0.	0.284	0.

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	290	862	0	1	0	563	223
normalized size	1	1.	1.23	3.65	0.	0.	0.	2.39	0.94
time (sec)	N/A	0.497	0.658	0.011	0.	0.374	0.	0.28	30.602

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F(-2)	F(-1)	F(-1)	F(-2)	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	679	678	1934	22523	0	0	0	0	0
normalized size	1	1.	2.85	33.17	0.	0.	0.	0.	0.
time (sec)	N/A	18.25	6.264	0.045	0.	0.	0.	0.	0.

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	F(-2)	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	704	704	1844	72576	0	0	0	0	0
normalized size	1	1.	2.62	103.09	0.	0.	0.	0.	0.
time (sec)	N/A	22.408	6.465	0.069	0.	0.	0.	0.	0.

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	A	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	671	669	1621	178044	0	0	0	4	0
normalized size	1	1.	2.42	265.34	0.	0.	0.	0.01	0.
time (sec)	N/A	17.629	6.666	0.121	0.	0.	0.	0.743	0.

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	717	717	615	1930	0	1	0	1112	0
normalized size	1	1.	0.86	2.69	0.	0.	0.	1.55	0.
time (sec)	N/A	6.354	1.261	0.033	0.	1.453	0.	0.293	0.

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	316	316	251	706	0	1	0	410	0
normalized size	1	1.	0.79	2.23	0.	0.	0.	1.3	0.
time (sec)	N/A	1.19	0.443	0.019	0.	0.845	0.	0.285	0.

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	95	185	0	1	0	132	97
normalized size	1	1.	0.82	1.59	0.	0.01	0.	1.14	0.84
time (sec)	N/A	0.215	0.147	0.009	0.	0.571	0.	0.282	15.755

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	F(-2)	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	374	374	633	761	0	15237	0	0	357
normalized size	1	1.	1.69	2.03	0.	40.74	0.	0.	0.95
time (sec)	N/A	1.369	5.146	0.037	0.	6.721	0.	0.	103.052

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	B	B	F	F(-1)	F(-1)	A	F(-1)
verified	N/A	NO	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	789	787	1836	3858	0	0	0	4	0
normalized size	1	1.	2.33	4.89	0.	0.	0.	0.01	0.
time (sec)	N/A	16.704	6.671	0.044	0.	0.	0.	0.738	0.

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	649	649	745	2827	0	1	0	1	0
normalized size	1	1.	1.15	4.36	0.	0.	0.	0.	0.
time (sec)	N/A	4.14	4.233	0.037	0.	1.437	0.	0.287	0.

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	309	309	288	1011	0	1	0	549	0
normalized size	1	1.	0.93	3.27	0.	0.	0.	1.78	0.
time (sec)	N/A	0.87	0.645	0.019	0.	0.954	0.	0.288	0.

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	113	249	0	1	0	165	105
normalized size	1	1.	1.02	2.24	0.	0.01	0.	1.49	0.95
time (sec)	N/A	0.165	0.324	0.008	0.	0.576	0.	0.285	15.482

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	F(-1)	F(-1)	F(-2)	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	666	666	906	3889	0	0	0	0	0
normalized size	1	1.	1.36	5.84	0.	0.	0.	0.	0.
time (sec)	N/A	4.631	4.557	0.039	0.	0.	0.	0.	0.

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	F(-1)
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	891	891	872	4635	0	1	0	1	0
normalized size	1	1.	0.98	5.2	0.	0.	0.	0.	0.
time (sec)	N/A	5.044	4.886	0.045	0.	1.432	0.	0.288	0.

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	B	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	444	444	387	1786	0	1	0	792	282
normalized size	1	1.	0.87	4.02	0.	0.	0.	1.78	0.64
time (sec)	N/A	0.988	1.912	0.02	0.	0.835	0.	0.29	151.808

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	147	185	0	386	0	356	131
normalized size	1	1.	1.12	1.41	0.	2.95	0.	2.72	1.
time (sec)	N/A	0.184	0.254	0.009	0.	0.663	0.	0.277	20.914

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	C	B	F	A	F	A	A
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	193	144	0	207	0	277	48
normalized size	1	1.	3.78	2.82	0.	4.06	0.	5.43	0.94
time (sec)	N/A	0.165	0.051	0.028	0.	0.283	0.	0.281	50.391

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	F(-1)
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1432	1432	670	928	0	0	0	0	0
normalized size	1	1.	0.47	0.65	0.	0.	0.	0.	0.
time (sec)	N/A	13.044	5.027	0.331	0.	0.	0.	0.	0.

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Rubi in Sympy
grade	A	A	A	A	F	F	F	F	A
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	710	652	390	420	0	0	0	0	462
normalized size	1	0.92	0.55	0.59	0.	0.	0.	0.	0.65
time (sec)	N/A	1.626	1.129	0.776	0.	0.	0.	0.	85.439

2.2 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [14] had the largest ratio of [0.4444]

Table 1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	4	4	1.	29	0.138
2	A	2	2	1.	31	0.065
3	A	2	2	1.	27	0.074
4	A	4	4	1.	27	0.148
5	A	5	5	1.	27	0.185
6	A	6	5	1.	27	0.185
7	A	4	4	1.	31	0.129
8	A	2	2	1.	23	0.087
9	A	2	2	1.	31	0.065
10	A	2	2	1.	34	0.059
11	A	3	3	1.	22	0.136
12	A	6	5	1.	18	0.278
13	A	3	3	1.	26	0.115
14	A	16	12	1.	27	0.444
15	A	2	1	1.	23	0.043
16	A	2	1	1.	23	0.043
17	A	2	1	1.	23	0.043
18	A	2	1	1.	21	0.048
19	A	6	5	1.	23	0.217
20	A	4	4	1.	23	0.174
21	A	5	5	1.	23	0.217
22	A	2	1	1.	25	0.04
23	A	2	1	1.	25	0.04
24	A	2	1	1.	25	0.04
25	A	2	1	1.	23	0.043
26	A	6	5	1.	25	0.2
27	A	7	6	1.	25	0.24
28	A	5	4	1.	25	0.16
29	A	6	5	1.	25	0.2
30	A	2	1	1.	25	0.04
31	A	2	1	1.	25	0.04
32	A	2	1	1.	25	0.04
33	A	2	1	1.	23	0.043
34	A	6	5	1.	25	0.2
35	A	7	6	1.	25	0.24
36	A	8	6	1.	25	0.24
37	A	6	5	1.	25	0.2
38	A	6	5	1.	25	0.2
39	A	6	5	1.	25	0.2
40	A	6	5	1.	23	0.217
41	A	9	5	1.	25	0.2
42	A	10	6	1.	25	0.24
43	A	11	7	1.	25	0.28
44	A	7	6	1.	25	0.24
45	A	7	6	1.	25	0.24
46	A	7	6	1.	25	0.24

Continued on next page

Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
47	A	4	4	1.	23	0.174
48	A	10	6	1.	25	0.24
49	A	11	7	1.	25	0.28
50	A	12	7	1.	25	0.28
51	A	8	6	1.	25	0.24
52	A	8	6	1.	25	0.24
53	A	5	4	1.	25	0.16
54	A	5	5	1.	23	0.217
55	A	11	7	1.	25	0.28
56	A	12	7	1.	25	0.28
57	A	13	7	1.	25	0.28
58	A	11	5	1.	27	0.185
59	A	9	5	1.	27	0.185
60	A	7	5	1.	27	0.185
61	A	5	5	1.	25	0.2
62	A	8	7	1.	27	0.259
63	A	6	5	1.	27	0.185
64	A	7	6	1.	27	0.222
65	A	12	5	1.	27	0.185
66	A	10	5	1.	27	0.185
67	A	8	5	1.	27	0.185
68	A	6	5	1.	25	0.2
69	A	9	8	1.	27	0.296
70	A	10	9	1.	27	0.333
71	A	7	6	1.	27	0.222
72	A	13	5	1.	27	0.185
73	A	11	5	1.	27	0.185
74	A	9	5	1.	27	0.185
75	A	7	5	1.	25	0.2
76	A	10	9	1.	27	0.333
77	A	11	9	1.	27	0.333
78	A	11	10	1.	27	0.37
79	A	10	4	1.	27	0.148
80	A	8	4	1.	27	0.148
81	A	6	4	1.	27	0.148
82	A	4	4	1.	25	0.16
83	A	5	4	1.	27	0.148
84	A	6	5	1.	27	0.185
85	A	7	6	1.	27	0.222
86	A	9	5	1.	27	0.185
87	A	7	5	1.	27	0.185
88	A	5	5	1.	27	0.185
89	A	4	4	1.	25	0.16
90	A	6	5	1.	27	0.185
91	A	7	6	1.	27	0.222
92	A	8	6	1.	27	0.222
93	A	8	5	1.	27	0.185

Continued on next page

Table 1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
94	A	6	5	1.	27	0.185
95	A	5	4	1.	27	0.148
96	A	3	3	1.	25	0.12
97	A	7	6	1.	27	0.222
98	A	8	6	1.	27	0.222
99	A	9	6	1.	27	0.222
100	A	7	5	1.	27	0.185
101	A	5	5	1.	25	0.2
102	A	8	5	1.	27	0.185
103	A	6	4	1.	27	0.148
104	A	8	5	1.	27	0.185
105	A	6	5	1.	25	0.2
106	A	9	6	1.	27	0.222
107	A	10	7	1.	27	0.259
108	A	7	5	1.	27	0.185
109	A	8	4	1.	27	0.148
110	A	6	4	1.	27	0.148
111	A	4	4	1.	25	0.16
112	A	5	3	1.	27	0.111
113	A	6	4	1.	27	0.148
114	A	7	5	1.	27	0.185
115	A	5	5	1.	27	0.185
116	A	4	4	1.	25	0.16
117	A	6	4	1.	27	0.148
118	A	6	5	1.	27	0.185
119	A	5	4	1.	27	0.148
120	A	3	3	1.	25	0.12
121	A	5	4	1.	27	0.148
122	A	3	3	1.	29	0.103
123	A	3	3	0.92	29	0.103

3 Listing of integrals

3.1 $\int \frac{a+bx+\frac{bfx^2}{e}}{\sqrt{d+ex+fx^2}}\,dx$

Optimal. Leaf size=102

$$\frac{\left(8af-b\left(\frac{4df}{e}+e\right)\right)\tanh^{-1}\left(\frac{e+2fx}{2\sqrt{f}\sqrt{d+ex+fx^2}}\right)}{8f^{3/2}}+\frac{bx\sqrt{d+ex+fx^2}}{2e}+\frac{b\sqrt{d+ex+fx^2}}{4f}$$

```
[Out] (b*Sqrt[d + e*x + f*x^2])/(4*f) + (b*x*Sqrt[d + e*x + f*x^2])/(2*
e) + ((8*a*f - b*(e + (4*d*f)/e))*ArcTanh[(e + 2*f*x)/(2*Sqrt[f]*
Sqrt[d + e*x + f*x^2])])/(8*f^(3/2))
```

Rubi [A] time = 0.222452, antiderivative size = 102, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.138

$$\frac{\left(8af-b\left(\frac{4df}{e}+e\right)\right)\tanh^{-1}\left(\frac{e+2fx}{2\sqrt{f}\sqrt{d+ex+fx^2}}\right)}{8f^{3/2}}+\frac{bx\sqrt{d+ex+fx^2}}{2e}+\frac{b\sqrt{d+ex+fx^2}}{4f}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + b*x + (b*f*x^2)/e)/Sqrt[d + e*x + f*x^2],x]
```

```
[Out] (b*Sqrt[d + e*x + f*x^2])/(4*f) + (b*x*Sqrt[d + e*x + f*x^2])/(2*
e) + ((8*a*f - b*(e + (4*d*f)/e))*ArcTanh[(e + 2*f*x)/(2*Sqrt[f]*
Sqrt[d + e*x + f*x^2])])/(8*f^(3/2))
```

Rubi in Sympy [A] time = 21.5069, size = 82, normalized size = 0.8

$$\frac{b\left(\frac{e}{2}+fx\right)\sqrt{d+ex+fx^2}}{2ef}-\frac{\left(-8aef+4bdf+be^2\right)\operatorname{atanh}\left(\frac{e+2fx}{2\sqrt{f}\sqrt{d+ex+fx^2}}\right)}{8ef^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] b*(e/2 + f*x)*sqrt(d + e*x + f*x**2)/(2*e*f) - (-8*a*e*f + 4*b*d*
f + b*e**2)*atanh((e + 2*f*x)/(2*sqrt(f)*sqrt(d + e*x + f*x**2)))
/(8*e*f**(3/2))
```

Mathematica [A] time = 0.242723, size = 85, normalized size = 0.83

$$\frac{\left(8aef-b\left(4df+e^2\right)\right)\log\left(2\sqrt{f}\sqrt{d+x(e+fx)}+e+2fx\right)+2b\sqrt{f}(e+2fx)\sqrt{d+x(e+fx)}}{8ef^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + b*x + (b*f*x^2)/e)/Sqrt[d + e*x + f*x^2],x]
```

```
[Out] (2*b*Sqrt[f]*(e + 2*f*x)*Sqrt[d + x*(e + f*x)] + (8*a*e*f - b*(e^
2 + 4*d*f))*Log[e + 2*f*x + 2*Sqrt[f]*Sqrt[d + x*(e + f*x)]])/(8*
e*f^(3/2))
```

Maple [A] time = 0.013, size = 136, normalized size = 1.3

$$
\begin{aligned}
&a\ln\left(1\left(\frac{e}{2}+fx\right)\frac{1}{\sqrt{f}}+\sqrt{fx^2+ex+d}\right)\frac{1}{\sqrt{f}}+\frac{b}{4f}\sqrt{fx^2+ex+d}\\
&-\frac{be}{8}\ln\left(1\left(\frac{e}{2}+fx\right)\frac{1}{\sqrt{f}}+\sqrt{fx^2+ex+d}\right)f^{-\frac{3}{2}}+\frac{bx}{2e}\sqrt{fx^2+ex+d}\\
&-\frac{bd}{2e}\ln\left(1\left(\frac{e}{2}+fx\right)\frac{1}{\sqrt{f}}+\sqrt{fx^2+ex+d}\right)\frac{1}{\sqrt{f}}
\end{aligned}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+b*x+b*f*x^2/e)/(f*x^2+e*x+d)^(1/2),x)
```

```
[Out] a*ln((1/2*e+f*x)/f^(1/2)+(f*x^2+e*x+d)^(1/2))/f^(1/2)+1/4*b*(f*x^
2+e*x+d)^(1/2)/f-1/8*e*b/f^(3/2)*ln((1/2*e+f*x)/f^(1/2)+(f*x^2+e*
x+d)^(1/2))+1/2*b*x*(f*x^2+e*x+d)^(1/2)/e-1/2/e*b/f^(1/2)*d*ln((1
/2*e+f*x)/f^(1/2)+(f*x^2+e*x+d)^(1/2))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.369598, size = 1, normalized size = 0.01

$$
\left[\frac{4\,(2\,bfx+be)\sqrt{fx^2+ex+d}\sqrt{f}-\left(be^2+4\,(bd-2\,ae)f\right)\log\left(-4\left(2\,f^2x+ef\right)\sqrt{fx^2+ex+d}-\left(8\,f^2x^2+8\,efx+e^2+4\,d\right.\right.}{16\,ef^{\frac{3}{2}}}\right.
$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/16*(4*(2*b*f*x + b*e)*sqrt(f*x^2 + e*x + d)*sqrt(f) - (b*e^2 +
 4*(b*d - 2*a*e)*f)*log(-4*(2*f^2*x + e*f)*sqrt(f*x^2 + e*x + d)
- (8*f^2*x^2 + 8*e*f*x + e^2 + 4*d*f)*sqrt(f)))/(e*f^(3/2)), 1/8*
(2*(2*b*f*x + b*e)*sqrt(f*x^2 + e*x + d)*sqrt(-f) - (b*e^2 + 4*(b
*d - 2*a*e)*f)*arctan(1/2*(2*f*x + e)*sqrt(-f)/(sqrt(f*x^2 + e*x
+ d)*f)))/(e*sqrt(-f)*f)]
```

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

$$
\frac{\int \frac{ae}{\sqrt{d+ex+fx^2}}\,dx+\int \frac{bex}{\sqrt{d+ex+fx^2}}\,dx+\int \frac{bfx^2}{\sqrt{d+ex+fx^2}}\,dx}{e}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] (Integral(a*e/sqrt(d + e*x + f*x**2), x) + Integral(b*e*x/sqrt(d
+ e*x + f*x**2), x) + Integral(b*f*x**2/sqrt(d + e*x + f*x**2), x
))/e
```

GIAC/XCAS [A] time = 0.284918, size = 113, normalized size = 1.11

$$\frac{1}{4}\sqrt{fx^2+xe+d}\left(2\,bxe^{(-1)}+\frac{b}{f}\right)+\frac{\left(4\,bdf-8\,afe+be^2\right)e^{(-1)}\ln\left(\left|-2\left(\sqrt{f}x-\sqrt{fx^2+xe+d}\right)\sqrt{f}-e\right|\right)}{8\,f^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*sqrt(f*x^2 + x*e + d)*(2*b*x*e^(-1) + b/f) + 1/8*(4*b*d*f - 8
*a*f*e + b*e^2)*e^(-1)*ln(abs(-2*(sqrt(f)*x - sqrt(f*x^2 + x*e +
d))*sqrt(f) - e))/f^(3/2)
```

3.2 $\int \frac{1}{\sqrt{d+ex+fx^2}\left(a+bx+\frac{bfx^2}{e}\right)}\,dx$

Optimal. Leaf size=82

$$-\frac{2\sqrt{e}\tanh^{-1}\left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{\sqrt{bd-ae}\sqrt{be-4af}}$$

```
[Out] (-2*Sqrt[e]*ArcTanh[(Sqrt[b*d - a*e]*(e + 2*f*x))/(Sqrt[e]*Sqrt[b
*e - 4*a*f]*Sqrt[d + e*x + f*x^2])])/(Sqrt[b*d - a*e]*Sqrt[b*e -
4*a*f])
```

Rubi [A] time = 0.243848, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$

$$-\frac{2\sqrt{e}\tanh^{-1}\left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{\sqrt{bd-ae}\sqrt{be-4af}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[d + e*x + f*x^2]*(a + b*x + (b*f*x^2)/e)),x]
```

```
[Out] (-2*Sqrt[e]*ArcTanh[(Sqrt[b*d - a*e]*(e + 2*f*x))/(Sqrt[e]*Sqrt[b
*e - 4*a*f]*Sqrt[d + e*x + f*x^2])])/(Sqrt[b*d - a*e]*Sqrt[b*e -
4*a*f])
```

Rubi in Sympy [A] time = 25.0735, size = 76, normalized size = 0.93

$$\frac{2\sqrt{e}\,\mathrm{atanh}\left(\frac{(e+2fx)\sqrt{ae-bd}}{\sqrt{e}\sqrt{4af-be}\sqrt{d+ex+fx^2}}\right)}{\sqrt{ae-bd}\sqrt{4af-be}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] 2*sqrt(e)*atanh((e + 2*f*x)*sqrt(a*e - b*d)/(sqrt(e)*sqrt(4*a*f -
 b*e)*sqrt(d + e*x + f*x**2)))/(sqrt(a*e - b*d)*sqrt(4*a*f - b*e)
)
```

Mathematica [B] time = 0.678144, size = 304, normalized size = 3.71

$$\sqrt{e}\left(-\log\left(\sqrt{b}\sqrt{e}\left(e^2-4df\right)\sqrt{be-4af}-4\sqrt{e}f\sqrt{bd-ae}\sqrt{be-4af}\sqrt{d+x(e+fx)}+4aef(e+2fx)-be^2(e+2fx)\right)+\text{lo}\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[d + e*x + f*x^2]*(a + b*x + (b*f*x^2)/e)),x]
```

```
[Out] (Sqrt[e]*(-Log[b*e + Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f] + 2*b*f*x]
 + Log[-(Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f]) + b*(e + 2*f*x)] - Lo
```

```
g[Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f]*(e^2 - 4*d*f) - b*e^2*(e + 2*
f*x) + 4*a*e*f*(e + 2*f*x) - 4*Sqrt[e]*Sqrt[b*d - a*e]*f*Sqrt[b*e
 - 4*a*f]*Sqrt[d + x*(e + f*x)]] + Log[Sqrt[b]*Sqrt[e]*Sqrt[b*e -
 4*a*f]*(e^2 - 4*d*f) + b*e^2*(e + 2*f*x) - 4*(a*e*f*(e + 2*f*x)
+ Sqrt[e]*Sqrt[b*d - a*e]*f*Sqrt[b*e - 4*a*f]*Sqrt[d + x*(e + f*x
)])]))/(Sqrt[b*d - a*e]*Sqrt[b*e - 4*a*f])
```

Maple [B] time = 0.062, size = 491, normalized size = 6.

$$-e\ln\left(1\left(-2\,\frac{ae-bd}{b}+\frac{1}{b}\sqrt{-be\,(4\,fa-be)}\left(x-\frac{1}{2\,bf}\left(-be+\sqrt{-be\,(4\,fa-be)}\right)\right)+2\,\sqrt{-\frac{ae-bd}{b}}\sqrt{\left(x-1/2\,\frac{-be+\sqrt{-be}}{bf}\right.}\right.\right.$$
$$+e\ln\left(1\left(-2\,\frac{ae-bd}{b}-\frac{1}{b}\sqrt{-be\,(4\,fa-be)}\left(x+\frac{1}{2\,bf}\left(be+\sqrt{-be\,(4\,fa-be)}\right)\right)+2\,\sqrt{-\frac{ae-bd}{b}}\sqrt{\left(x+1/2\,\frac{be+\sqrt{-be\,(4\,f}}{bf}\right.}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(a+b*x+b*f*x^2/e)/(f*x^2+e*x+d)^(1/2),x)
```

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*f*x^2/e + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="maxima")
```

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

Fricas [A] time = 0.45648, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*f*x^2/e + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="fricas")
```

```
[Out] [1/2*sqrt(e/(b^2*d*e - a*b*e^2 - 4*(a*b*d - a^2*e)*f))*log((8*b^2
*d^2*e^4 - 8*a*b*d*e^5 + a^2*e^6 + 16*a^2*d^2*e^2*f^2 + (b^2*e^4*
f^2 + 16*(b^2*d^2 - 8*a*b*d*e + 8*a^2*e^2)*f^4 + 8*(3*b^2*d*e^2 -
 4*a*b*e^3)*f^3)*x^4 + 2*(b^2*e^5*f + 16*(b^2*d^2*e - 8*a*b*d*e^2
 + 8*a^2*e^3)*f^3 + 8*(3*b^2*d*e^3 - 4*a*b*e^4)*f^2)*x^3 + (b^2*e
^6 - 32*(3*a*b*d^2*e - 4*a^2*d*e^2)*f^3 + 16*(3*b^2*d^2*e^2 - 13*
```

```
a*b*d*e^3 + 10*a^2*e^4)*f^2 + 2*(16*b^2*d*e^4 - 19*a*b*e^5)*f)*x^
2 - 8*(4*a*b*d^2*e^3 - 3*a^2*d*e^4)*f + 2*(4*b^2*d*e^5 - 3*a*b*e^
6 - 16*(3*a*b*d^2*e^2 - 4*a^2*d*e^3)*f^2 + 8*(2*b^2*d^2*e^3 - 5*a
*b*d*e^4 + 2*a^2*e^5)*f)*x - 4*(2*b^3*d^2*e^4 - 3*a*b^2*d*e^5 + a
^2*b*e^6 - 2*(16*(a*b^2*d^2 - 3*a^2*b*d*e + 2*a^3*e^2)*f^4 - 4*(b
^3*d^2*e - 4*a*b^2*d*e^2 + 3*a^2*b*e^3)*f^3 - (b^3*d*e^3 - a*b^2*
e^4)*f^2)*x^3 + 16*(a^2*b*d^2*e^2 - a^3*d*e^3)*f^2 - 3*(16*(a*b^2
*d^2*e - 3*a^2*b*d*e^2 + 2*a^3*e^3)*f^3 - 4*(b^3*d^2*e^2 - 4*a*b^
2*d*e^3 + 3*a^2*b*e^4)*f^2 - (b^3*d*e^4 - a*b^2*e^5)*f)*x^2 - 4*(
3*a*b^2*d^2*e^3 - 4*a^2*b*d*e^4 + a^3*e^5)*f + (b^3*d*e^5 - a*b^2
*e^6 + 32*(a^2*b*d^2*e - a^3*d*e^2)*f^3 - 40*(a*b^2*d^2*e^2 - 2*a
^2*b*d*e^3 + a^3*e^4)*f^2 + 2*(4*b^3*d^2*e^3 - 11*a*b^2*d*e^4 + 7
*a^2*b*e^5)*f)*x)*sqrt(f*x^2 + e*x + d)*sqrt(e/(b^2*d*e - a*b*e^2
 - 4*(a*b*d - a^2*e)*f)))/(b^2*f^2*x^4 + 2*b^2*e*f*x^3 + 2*a*b*e^
2*x + a^2*e^2 + (b^2*e^2 + 2*a*b*e*f)*x^2)), sqrt(-e/(b^2*d*e - a
*b*e^2 - 4*(a*b*d - a^2*e)*f))*arctan(-1/2*(2*b*d*e^2 - a*e^3 - 4
*a*d*e*f + (b*e^2*f + 4*(b*d - 2*a*e)*f^2)*x^2 + (b*e^3 + 4*(b*d*
e - 2*a*e^2)*f)*x)/((b^2*d*e^2 - a*b*e^3 - 4*(a*b*d*e - a^2*e^2)*
f - 2*(4*(a*b*d - a^2*e)*f^2 - (b^2*d*e - a*b*e^2)*f)*x)*sqrt(f*x
^2 + e*x + d)*sqrt(-e/(b^2*d*e - a*b*e^2 - 4*(a*b*d - a^2*e)*f)))
)]
```

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

$$e\int\frac{1}{ae\sqrt{d+ex+fx^2}+bex\sqrt{d+ex+fx^2}+bfx^2\sqrt{d+ex+fx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(a+b*x+b*f*x**2/e)/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] e*Integral(1/(a*e*sqrt(d + e*x + f*x**2) + b*e*x*sqrt(d + e*x + f
*x**2) + b*f*x**2*sqrt(d + e*x + f*x**2)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*f*x^2/e + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.3 $\int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)}\,dx$

Optimal. Leaf size=66

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{\sqrt{a-d}\sqrt{b^2-4cd}}$$

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

Rubi [A] time = 0.16826, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.074

$$-\frac{2\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{\sqrt{a-d}\sqrt{b^2-4cd}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)),x]
```

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

Rubi in Sympy [A] time = 20.1515, size = 61, normalized size = 0.92

$$-\frac{2\,\mathrm{atanh}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{\sqrt{a-d}\sqrt{b^2-4cd}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+d)/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] -2*atanh(sqrt(a - d)*(b + 2*c*x)/(sqrt(b**2 - 4*c*d)*sqrt(a + b*x
 + c*x**2)))/(sqrt(a - d)*sqrt(b**2 - 4*c*d))
```

Mathematica [B] time = 0.472859, size = 249, normalized size = 3.77

$$-\log\left(4c\left(-\sqrt{a-d}\sqrt{b^2-4cd}\sqrt{a+x(b+cx)}+a\left(-\sqrt{b^2-4cd}\right)+2cdx\right)-b^3+b^2\left(\sqrt{b^2-4cd}-2cx\right)+4bcd\right)+\log\left(-4c\left(\right.\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)),x]
```

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

Maple [B] time = 0.038, size = 307, normalized size = 4.7

$$-1\ln\left(1\left(2a-2d+\sqrt{b^2-4cd}\left(x-\frac{1}{2c}\left(-b+\sqrt{b^2-4cd}\right)\right)+2\sqrt{a-d}\sqrt{\left(x-1/2\frac{-b+\sqrt{b^2-4cd}}{c}\right)^2c+\sqrt{b^2-4cd}\left(x-\right.}\right.\right.$$

$$+1\ln\left(1\left(2a-2d-\sqrt{b^2-4cd}\left(x+\frac{1}{2c}\left(b+\sqrt{b^2-4cd}\right)\right)+2\sqrt{a-d}\sqrt{\left(x+1/2\frac{b+\sqrt{b^2-4cd}}{c}\right)^2c-\sqrt{b^2-4cd}\left(x+1/2\right.}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^2+b*x+d)/(c*x^2+b*x+a)^(1/2),x)
```

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)),x, algorithm="maxima")
```

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

Fricas [A] time = 0.358473, size = 1, normalized size = 0.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)),x, algorithm="fricas")
```

```
[Out] [1/2*log(((8*a^2*b^4 + (b^4*c^2 + 24*a*b^2*c^3 + 16*a^2*c^4 + 128
*c^4*d^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 + 2*(b^5*c + 24*a*b^3*c^
2 + 16*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(b^3*c^2 + 4*a*b*c^3)*d)*x^
3 + (b^4 + 24*a*b^2*c + 16*a^2*c^2)*d^2 + (b^6 + 32*a*b^4*c + 48*
a^2*b^2*c^2 + 32*(5*b^2*c^2 + 4*a*c^3)*d^2 - 2*(19*b^4*c + 104*a*
b^2*c^2 + 48*a^2*c^3)*d)*x^2 - 8*(a*b^4 + 4*a^2*b^2*c)*d + 2*(4*a
*b^5 + 16*a^2*b^3*c + 16*(b^3*c + 4*a*b*c^2)*d^2 - (3*b^5 + 40*a*
b^3*c + 48*a^2*b*c^2)*d)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*
d) - 4*(2*a^2*b^5 - 4*(b^3*c + 4*a*b*c^2)*d^3 + 2*(a*b^4*c^2 + 4*
a^2*b^2*c^3 - 32*c^4*d^3 + 12*(b^2*c^3 + 4*a*c^4)*d^2 - (b^4*c^2
+ 16*a*b^2*c^3 + 16*a^2*c^4)*d)*x^3 + (b^5 + 16*a*b^3*c + 16*a^2*
b*c^2)*d^2 + 3*(a*b^5*c + 4*a^2*b^3*c^2 - 32*b*c^3*d^3 + 12*(b^3*
c^2 + 4*a*b*c^3)*d^2 - (b^5*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*d)*x
^2 - 3*(a*b^5 + 4*a^2*b^3*c)*d + (a*b^6 + 8*a^2*b^4*c - 8*(5*b^2*
c^2 + 4*a*c^3)*d^3 + 2*(7*b^4*c + 40*a*b^2*c^2 + 16*a^2*c^3)*d^2
- (b^6 + 22*a*b^4*c + 40*a^2*b^2*c^2)*d)*x)*sqrt(c*x^2 + b*x + a)
)/(c^2*x^4 + 2*b*c*x^3 + 2*b*d*x + (b^2 + 2*c*d)*x^2 + d^2))/sqrt
```

```
(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d), arctan(-1/2*(2*a*b^2 + (b^2*
c + 4*a*c^2 - 8*c^2*d)*x^2 - (b^2 + 4*a*c)*d + (b^3 + 4*a*b*c - 8
*b*c*d)*x)*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)/((a*b^3 + 4*b
*c*d^2 - (b^3 + 4*a*b*c)*d + 2*(a*b^2*c + 4*c^2*d^2 - (b^2*c + 4*
a*c^2)*d)*x)*sqrt(c*x^2 + b*x + a)))/sqrt(-a*b^2 - 4*c*d^2 + (b^2
 + 4*a*c)*d)]
```

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

$$\int \frac{1}{\sqrt{a+bx+cx^2}\,(bx+cx^2+d)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**2+b*x+d)/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*x + c*x**2)*(b*x + c*x**2 + d)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.4 $\int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)^2} dx$

Optimal. Leaf size=129

$$\frac{\left(4c(a-2d)+b^2\right)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{(a-d)^{3/2}\left(b^2-4cd\right)^{3/2}}-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{(a-d)\left(b^2-4cd\right)\left(bx+cx^2+d\right)}$$

```
[Out] -(((b + 2*c*x)*Sqrt[a + b*x + c*x^2])/((a - d)*(b^2 - 4*c*d)*(d +
 b*x + c*x^2))) + ((b^2 + 4*c*(a - 2*d))*ArcTanh[(Sqrt[a - d]*(b
+ 2*c*x))/(Sqrt[b^2 - 4*c*d]*Sqrt[a + b*x + c*x^2])])/((a - d)^(3
/2)*(b^2 - 4*c*d)^(3/2))
```

Rubi [A] time = 0.397961, antiderivative size = 129, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148

$$\frac{\left(4c(a-2d)+b^2\right)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{(a-d)^{3/2}\left(b^2-4cd\right)^{3/2}}-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{(a-d)\left(b^2-4cd\right)\left(bx+cx^2+d\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^2),x]
```

```
[Out] -(((b + 2*c*x)*Sqrt[a + b*x + c*x^2])/((a - d)*(b^2 - 4*c*d)*(d +
 b*x + c*x^2))) + ((b^2 + 4*c*(a - 2*d))*ArcTanh[(Sqrt[a - d]*(b
+ 2*c*x))/(Sqrt[b^2 - 4*c*d]*Sqrt[a + b*x + c*x^2])])/((a - d)^(3
/2)*(b^2 - 4*c*d)^(3/2))
```

Rubi in Sympy [A] time = 73.1812, size = 114, normalized size = 0.88

$$-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{(a-d)\left(b^2-4cd\right)\left(bx+cx^2+d\right)}+\frac{\left(4ac+b^2-8cd\right)\operatorname{atanh}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{(a-d)^{\frac{3}{2}}\left(b^2-4cd\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+d)**2/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] -(b + 2*c*x)*sqrt(a + b*x + c*x**2)/((a - d)*(b**2 - 4*c*d)*(b*x
+ c*x**2 + d)) + (4*a*c + b**2 - 8*c*d)*atanh(sqrt(a - d)*(b + 2*
c*x)/(sqrt(b**2 - 4*c*d)*sqrt(a + b*x + c*x**2)))/((a - d)**(3/2)
*(b**2 - 4*c*d)**(3/2))
```

Mathematica [B] time = 0.552985, size = 339, normalized size = 2.63

$$-2\sqrt{a-d}\sqrt{b^2-4cd}(b+2cx)\sqrt{a+x(b+cx)}-\left(4c(a-2d)+b^2\right)(x(b+cx)+d)\log\left(-\sqrt{b^2-4cd}+b+2cx\right)+\left(4c(a-2d)+\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^2),x]
```

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

```
*c*d] + 2*c*x] + (b^2 + 4*c*(a - 2*d))*(d + x*(b + c*x))*Log[b +
Sqrt[b^2 - 4*c*d] + 2*c*x] - (b^2 + 4*c*(a - 2*d))*(d + x*(b + c*
x))*Log[b^2 + b*Sqrt[b^2 - 4*c*d] + 2*c*(-2*a + Sqrt[b^2 - 4*c*d]
*x - 2*Sqrt[a - d]*Sqrt[a + x*(b + c*x)])] + (b^2 + 4*c*(a - 2*d)
)*(d + x*(b + c*x))*Log[-b^2 + b*Sqrt[b^2 - 4*c*d] + 2*c*(2*a + S
qrt[b^2 - 4*c*d]*x + 2*Sqrt[a - d]*Sqrt[a + x*(b + c*x)])])/(2*(a
 - d)^(3/2)*(b^2 - 4*c*d)^(3/2)*(d + x*(b + c*x)))
```

Maple [B] time = 0.039, size = 829, normalized size = 6.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(c*x^2+b*x+d)^2/(c*x^2+b*x+a)^(1/2),x)
```

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

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}(cx^2 + bx + d)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^2), x)
```

Fricas [A] time = 0.590916, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^2),x, algorithm="fricas")
```

```
[Out] [-1/4*(4*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d)*sqrt(c*x^2 + b*x
 + a)*(2*c*x + b) - (8*c*d^2 - (b^2*c + 4*a*c^2 - 8*c^2*d)*x^2 -
```

```
(b^2 + 4*a*c)*d - (b^3 + 4*a*b*c - 8*b*c*d)*x)*log(((8*a^2*b^4 +
(b^4*c^2 + 24*a*b^2*c^3 + 16*a^2*c^4 + 128*c^4*d^2 - 32*(b^2*c^3
+ 4*a*c^4)*d)*x^4 + 2*(b^5*c + 24*a*b^3*c^2 + 16*a^2*b*c^3 + 128*
b*c^3*d^2 - 32*(b^3*c^2 + 4*a*b*c^3)*d)*x^3 + (b^4 + 24*a*b^2*c +
 16*a^2*c^2)*d^2 + (b^6 + 32*a*b^4*c + 48*a^2*b^2*c^2 + 32*(5*b^2
*c^2 + 4*a*c^3)*d^2 - 2*(19*b^4*c + 104*a*b^2*c^2 + 48*a^2*c^3)*d
)*x^2 - 8*(a*b^4 + 4*a^2*b^2*c)*d + 2*(4*a*b^5 + 16*a^2*b^3*c + 1
6*(b^3*c + 4*a*b*c^2)*d^2 - (3*b^5 + 40*a*b^3*c + 48*a^2*b*c^2)*d
)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d) - 4*(2*a^2*b^5 - 4*(
b^3*c + 4*a*b*c^2)*d^3 + 2*(a*b^4*c^2 + 4*a^2*b^2*c^3 - 32*c^4*d^
3 + 12*(b^2*c^3 + 4*a*c^4)*d^2 - (b^4*c^2 + 16*a*b^2*c^3 + 16*a^2
*c^4)*d)*x^3 + (b^5 + 16*a*b^3*c + 16*a^2*b*c^2)*d^2 + 3*(a*b^5*c
 + 4*a^2*b^3*c^2 - 32*b*c^3*d^3 + 12*(b^3*c^2 + 4*a*b*c^3)*d^2 -
(b^5*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*d)*x^2 - 3*(a*b^5 + 4*a^2*b
^3*c)*d + (a*b^6 + 8*a^2*b^4*c - 8*(5*b^2*c^2 + 4*a*c^3)*d^3 + 2*
(7*b^4*c + 40*a*b^2*c^2 + 16*a^2*c^3)*d^2 - (b^6 + 22*a*b^4*c + 4
0*a^2*b^2*c^2)*d)*x)*sqrt(c*x^2 + b*x + a))/(c^2*x^4 + 2*b*c*x^3
+ 2*b*d*x + (b^2 + 2*c*d)*x^2 + d^2)))/((a*b^2*d + 4*c*d^3 - (b^2
 + 4*a*c)*d^2 + (a*b^2*c + 4*c^2*d^2 - (b^2*c + 4*a*c^2)*d)*x^2 +
 (a*b^3 + 4*b*c*d^2 - (b^3 + 4*a*b*c)*d)*x)*sqrt(a*b^2 + 4*c*d^2
- (b^2 + 4*a*c)*d)), -1/2*(2*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c
)*d)*sqrt(c*x^2 + b*x + a)*(2*c*x + b) - (8*c*d^2 - (b^2*c + 4*a*
c^2 - 8*c^2*d)*x^2 - (b^2 + 4*a*c)*d - (b^3 + 4*a*b*c - 8*b*c*d)*
x)*arctan(-1/2*(2*a*b^2 + (b^2*c + 4*a*c^2 - 8*c^2*d)*x^2 - (b^2
+ 4*a*c)*d + (b^3 + 4*a*b*c - 8*b*c*d)*x)*sqrt(-a*b^2 - 4*c*d^2 +
 (b^2 + 4*a*c)*d)/((a*b^3 + 4*b*c*d^2 - (b^3 + 4*a*b*c)*d + 2*(a*
b^2*c + 4*c^2*d^2 - (b^2*c + 4*a*c^2)*d)*x)*sqrt(c*x^2 + b*x + a)
)))/((a*b^2*d + 4*c*d^3 - (b^2 + 4*a*c)*d^2 + (a*b^2*c + 4*c^2*d^
2 - (b^2*c + 4*a*c^2)*d)*x^2 + (a*b^3 + 4*b*c*d^2 - (b^3 + 4*a*b*
c)*d)*x)*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d))]
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**2+b*x+d)**2/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.5 $\int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)^3}\,dx$

Optimal. Leaf size=224

$$-\frac{\left(16c^2\left(3a^2-8ad+8d^2\right)+8b^2c(a-4d)+3b^4\right)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{4(a-d)^{5/2}\left(b^2-4cd\right)^{5/2}}+\frac{3(b+2cx)\left(4c(a-2d)+b^2\right)\sqrt{a+bx+cx^2}}{4(a-d)^2\left(b^2-4cd\right)^2\left(bx+cx^2+d\right)}-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{2(a-d)\left(b^2-4cd\right)\left(bx+cx^2+d\right)^2}$$

```
[Out] -((b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(2*(a - d)*(b^2 - 4*c*d)*(d
+ b*x + c*x^2)^2) + (3*(b^2 + 4*c*(a - 2*d))*(b + 2*c*x)*Sqrt[a +
 b*x + c*x^2])/(4*(a - d)^2*(b^2 - 4*c*d)^2*(d + b*x + c*x^2)) -
((3*b^4 + 8*b^2*c*(a - 4*d) + 16*c^2*(3*a^2 - 8*a*d + 8*d^2))*Arc
Tanh[(Sqrt[a - d]*(b + 2*c*x))/(Sqrt[b^2 - 4*c*d]*Sqrt[a + b*x +
c*x^2])])/(4*(a - d)^(5/2)*(b^2 - 4*c*d)^(5/2))
```

Rubi [A] time = 0.971241, antiderivative size = 224, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$-\frac{\left(16c^2\left(3a^2-8ad+8d^2\right)+8b^2c(a-4d)+3b^4\right)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{4(a-d)^{5/2}\left(b^2-4cd\right)^{5/2}}+\frac{3(b+2cx)\left(4c(a-2d)+b^2\right)\sqrt{a+bx+cx^2}}{4(a-d)^2\left(b^2-4cd\right)^2\left(bx+cx^2+d\right)}-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{2(a-d)\left(b^2-4cd\right)\left(bx+cx^2+d\right)^2}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^3),x]
```

```
[Out] -((b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(2*(a - d)*(b^2 - 4*c*d)*(d
+ b*x + c*x^2)^2) + (3*(b^2 + 4*c*(a - 2*d))*(b + 2*c*x)*Sqrt[a +
 b*x + c*x^2])/(4*(a - d)^2*(b^2 - 4*c*d)^2*(d + b*x + c*x^2)) -
((3*b^4 + 8*b^2*c*(a - 4*d) + 16*c^2*(3*a^2 - 8*a*d + 8*d^2))*Arc
Tanh[(Sqrt[a - d]*(b + 2*c*x))/(Sqrt[b^2 - 4*c*d]*Sqrt[a + b*x +
c*x^2])])/(4*(a - d)^(5/2)*(b^2 - 4*c*d)^(5/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Mathematica [B] time = 1.11885, size = 486, normalized size = 2.17

$$\frac{\left(16c^2\left(3a^2-8ad+8d^2\right)+8b^2c(a-4d)+3b^4\right)(x(b+cx)+d)^2\log\left(-\sqrt{b^2-4cd}+b+2cx\right)-\left(16c^2\left(3a^2-8ad+8d^2\right)+8b\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^3),x]
```

```
[Out] (-2*Sqrt[a - d]*Sqrt[b^2 - 4*c*d]*(b + 2*c*x)*Sqrt[a + x*(b + c*x
)]*(2*(a - d)*(b^2 - 4*c*d) - 3*(b^2 + 4*c*(a - 2*d))*(d + x*(b +
 c*x))) + (3*b^4 + 8*b^2*c*(a - 4*d) + 16*c^2*(3*a^2 - 8*a*d + 8*
d^2))*(d + x*(b + c*x))^2*Log[b - Sqrt[b^2 - 4*c*d] + 2*c*x] - (3
*b^4 + 8*b^2*c*(a - 4*d) + 16*c^2*(3*a^2 - 8*a*d + 8*d^2))*(d + x
*(b + c*x))^2*Log[b + Sqrt[b^2 - 4*c*d] + 2*c*x] + (3*b^4 + 8*b^2
*c*(a - 4*d) + 16*c^2*(3*a^2 - 8*a*d + 8*d^2))*(d + x*(b + c*x))^
2*Log[b^2 + b*Sqrt[b^2 - 4*c*d] + 2*c*(-2*a + Sqrt[b^2 - 4*c*d]*x
 - 2*Sqrt[a - d]*Sqrt[a + x*(b + c*x)])] - (3*b^4 + 8*b^2*c*(a -
4*d) + 16*c^2*(3*a^2 - 8*a*d + 8*d^2))*(d + x*(b + c*x))^2*Log[-b
^2 + b*Sqrt[b^2 - 4*c*d] + 2*c*(2*a + Sqrt[b^2 - 4*c*d]*x + 2*Sqr
t[a - d]*Sqrt[a + x*(b + c*x)])])/(8*(a - d)^(5/2)*(b^2 - 4*c*d)^
(5/2)*(d + x*(b + c*x))^2)
```

Maple [B] time = 0.037, size = 1884, normalized size = 8.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2/(b^2-4*c*d)^(3/2)/(a-d)/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^(1/2))^
2*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*
(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)+3/4/(b^2-4*c*d)/(a-d)^2/(x+1
/2*b/c-1/2/c*(b^2-4*c*d)^(1/2))*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)
^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2
)-3/8/(b^2-4*c*d)^(3/2)/(a-d)^(5/2)*ln((2*a-2*d+(b^2-4*c*d)^(1/2)
*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-
4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/
2))/c)+a-d)^(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))*b^2+3/2/(b^2
-4*c*d)^(3/2)/(a-d)^(5/2)*ln((2*a-2*d+(b^2-4*c*d)^(1/2)*(x-1/2*(-
b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-4*c*d)^(1/
2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d
)^(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))*c*d-1/(b^2-4*c*d)^(3/2
)*c/(a-d)^(3/2)*ln((2*a-2*d+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c
*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c
+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(
x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))+3/(b^2-4*c*d)^2*c/(a-d)/(x+1/2*b
/c-1/2/c*(b^2-4*c*d)^(1/2))*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c
+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)-6*
c^2/(b^2-4*c*d)^(5/2)/(a-d)^(1/2)*ln((2*a-2*d+(b^2-4*c*d)^(1/2)*(
x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-4*
c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2)
)/c)+a-d)^(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))+1/2/(b^2-4*c*d
)^(3/2)/(a-d)/(x+1/2*b/c+1/2/c*(b^2-4*c*d)^(1/2))^2*((x+1/2*(b+(b
^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(
1/2))/c)+a-d)^(1/2)+3/4/(b^2-4*c*d)/(a-d)^2/(x+1/2*b/c+1/2/c*(b^2
-4*c*d)^(1/2))*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(
1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)+3/8/(b^2-4*c*d)^(
3/2)/(a-d)^(5/2)*ln((2*a-2*d-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c
*d)^(1/2))/c)+2*(a-d)^(1/2)*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-
(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x+
1/2*(b+(b^2-4*c*d)^(1/2))/c))*b^2-3/2/(b^2-4*c*d)^(3/2)/(a-d)^(5/
2)*ln((2*a-2*d-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+
2*(a-d)^(1/2)*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1
/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x+1/2*(b+(b^2-4*
c*d)^(1/2))/c))*c*d+1/(b^2-4*c*d)^(3/2)*c/(a-d)^(3/2)*ln((2*a-2*d
-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*
((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+
(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)
)+3/(b^2-4*c*d)^2*c/(a-d)/(x+1/2*b/c+1/2/c*(b^2-4*c*d)^(1/2))*((x
+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^
2-4*c*d)^(1/2))/c)+a-d)^(1/2)+6*c^2/(b^2-4*c*d)^(5/2)/(a-d)^(1/2)
*ln((2*a-2*d-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+2*
```

```
(a-d)^(1/2)*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2
)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x+1/2*(b+(b^2-4*c*
d)^(1/2))/c))
```

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}(cx^2 + bx + d)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^3),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^3), x)
```

Fricas [A] time = 1.79157, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^3),x, algorithm="fricas")
```

```
[Out] [-1/16*(4*(2*a*b^3 + 32*b*c*d^2 - 6*(b^2*c^2 + 4*a*c^3 - 8*c^3*d)
*x^3 - 9*(b^3*c + 4*a*b*c^2 - 8*b*c^2*d)*x^2 - 5*(b^3 + 4*a*b*c)*
d - (3*b^4 + 8*a*b^2*c - 64*c^2*d^2 - 2*(7*b^2*c - 20*a*c^2)*d)*x
)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d)*sqrt(c*x^2 + b*x + a) -
 (128*c^2*d^4 + (3*b^4*c^2 + 8*a*b^2*c^3 + 48*a^2*c^4 + 128*c^4*d
^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 - 32*(b^2*c + 4*a*c^2)*d^3 + 2
*(3*b^5*c + 8*a*b^3*c^2 + 48*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(b^3*
c^2 + 4*a*b*c^3)*d)*x^3 + (3*b^4 + 8*a*b^2*c + 48*a^2*c^2)*d^2 +
(3*b^6 + 8*a*b^4*c + 48*a^2*b^2*c^2 + 256*c^3*d^3 + 64*(b^2*c^2 -
 4*a*c^3)*d^2 - 2*(13*b^4*c + 56*a*b^2*c^2 - 48*a^2*c^3)*d)*x^2 +
 2*(128*b*c^2*d^3 - 32*(b^3*c + 4*a*b*c^2)*d^2 + (3*b^5 + 8*a*b^3
*c + 48*a^2*b*c^2)*d)*x)*log(((8*a^2*b^4 + (b^4*c^2 + 24*a*b^2*c^
3 + 16*a^2*c^4 + 128*c^4*d^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 + 2*
(b^5*c + 24*a*b^3*c^2 + 16*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(b^3*c^
2 + 4*a*b*c^3)*d)*x^3 + (b^4 + 24*a*b^2*c + 16*a^2*c^2)*d^2 + (b^
6 + 32*a*b^4*c + 48*a^2*b^2*c^2 + 32*(5*b^2*c^2 + 4*a*c^3)*d^2 -
2*(19*b^4*c + 104*a*b^2*c^2 + 48*a^2*c^3)*d)*x^2 - 8*(a*b^4 + 4*a
^2*b^2*c)*d + 2*(4*a*b^5 + 16*a^2*b^3*c + 16*(b^3*c + 4*a*b*c^2)*
d^2 - (3*b^5 + 40*a*b^3*c + 48*a^2*b*c^2)*d)*x)*sqrt(a*b^2 + 4*c*
d^2 - (b^2 + 4*a*c)*d) - 4*(2*a^2*b^5 - 4*(b^3*c + 4*a*b*c^2)*d^3
 + 2*(a*b^4*c^2 + 4*a^2*b^2*c^3 - 32*c^4*d^3 + 12*(b^2*c^3 + 4*a*
c^4)*d^2 - (b^4*c^2 + 16*a*b^2*c^3 + 16*a^2*c^4)*d)*x^3 + (b^5 +
16*a*b^3*c + 16*a^2*b*c^2)*d^2 + 3*(a*b^5*c + 4*a^2*b^3*c^2 - 32*
b*c^3*d^3 + 12*(b^3*c^2 + 4*a*b*c^3)*d^2 - (b^5*c + 16*a*b^3*c^2
+ 16*a^2*b*c^3)*d)*x^2 - 3*(a*b^5 + 4*a^2*b^3*c)*d + (a*b^6 + 8*a
^2*b^4*c - 8*(5*b^2*c^2 + 4*a*c^3)*d^3 + 2*(7*b^4*c + 40*a*b^2*c^
2 + 16*a^2*c^3)*d^2 - (b^6 + 22*a*b^4*c + 40*a^2*b^2*c^2)*d)*x)*s
qrt(c*x^2 + b*x + a))/(c^2*x^4 + 2*b*c*x^3 + 2*b*d*x + (b^2 + 2*c
*d)*x^2 + d^2)))/((a^2*b^4*d^2 + 16*c^2*d^6 - 8*(b^2*c + 4*a*c^2)
*d^5 + (b^4 + 16*a*b^2*c + 16*a^2*c^2)*d^4 + (a^2*b^4*c^2 + 16*c^
4*d^4 - 8*(b^2*c^3 + 4*a*c^4)*d^3 + (b^4*c^2 + 16*a*b^2*c^3 + 16*
a^2*c^4)*d^2 - 2*(a*b^4*c^2 + 4*a^2*b^2*c^3)*d)*x^4 - 2*(a*b^4 +
4*a^2*b^2*c)*d^3 + 2*(a^2*b^5*c + 16*b*c^3*d^4 - 8*(b^3*c^2 + 4*a
*b*c^3)*d^3 + (b^5*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*d^2 - 2*(a*b^
5*c + 4*a^2*b^3*c^2)*d)*x^3 + (a^2*b^6 - 64*a*c^3*d^4 + 32*c^3*d^
5 - 2*(3*b^4*c - 16*a^2*c^3)*d^3 + (b^6 + 12*a*b^4*c)*d^2 - 2*(a*
b^6 + 3*a^2*b^4*c)*d)*x^2 + 2*(a^2*b^5*d + 16*b*c^2*d^5 - 8*(b^3*
c + 4*a*b*c^2)*d^4 + (b^5 + 16*a*b^3*c + 16*a^2*b*c^2)*d^3 - 2*(a
*b^5 + 4*a^2*b^3*c)*d^2)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*
d)), -1/8*(2*(2*a*b^3 + 32*b*c*d^2 - 6*(b^2*c^2 + 4*a*c^3 - 8*c^3
```

```
*d)*x^3 - 9*(b^3*c + 4*a*b*c^2 - 8*b*c^2*d)*x^2 - 5*(b^3 + 4*a*b*
c)*d - (3*b^4 + 8*a*b^2*c - 64*c^2*d^2 - 2*(7*b^2*c - 20*a*c^2)*d
)*x)*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)*sqrt(c*x^2 + b*x +
a) - (128*c^2*d^4 + (3*b^4*c^2 + 8*a*b^2*c^3 + 48*a^2*c^4 + 128*c
^4*d^2 - 32*(b^2*c^3 + 4*a*c^4)*d)*x^4 - 32*(b^2*c + 4*a*c^2)*d^3
 + 2*(3*b^5*c + 8*a*b^3*c^2 + 48*a^2*b*c^3 + 128*b*c^3*d^2 - 32*(
b^3*c^2 + 4*a*b*c^3)*d)*x^3 + (3*b^4 + 8*a*b^2*c + 48*a^2*c^2)*d^
2 + (3*b^6 + 8*a*b^4*c + 48*a^2*b^2*c^2 + 256*c^3*d^3 + 64*(b^2*c
^2 - 4*a*c^3)*d^2 - 2*(13*b^4*c + 56*a*b^2*c^2 - 48*a^2*c^3)*d)*x
^2 + 2*(128*b*c^2*d^3 - 32*(b^3*c + 4*a*b*c^2)*d^2 + (3*b^5 + 8*a
*b^3*c + 48*a^2*b*c^2)*d)*x)*arctan(-1/2*(2*a*b^2 + (b^2*c + 4*a*
c^2 - 8*c^2*d)*x^2 - (b^2 + 4*a*c)*d + (b^3 + 4*a*b*c - 8*b*c*d)*
x)*sqrt(-a*b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)/((a*b^3 + 4*b*c*d^2 -
 (b^3 + 4*a*b*c)*d + 2*(a*b^2*c + 4*c^2*d^2 - (b^2*c + 4*a*c^2)*d
)*x)*sqrt(c*x^2 + b*x + a))))/((a^2*b^4*d^2 + 16*c^2*d^6 - 8*(b^2
*c + 4*a*c^2)*d^5 + (b^4 + 16*a*b^2*c + 16*a^2*c^2)*d^4 + (a^2*b^
4*c^2 + 16*c^4*d^4 - 8*(b^2*c^3 + 4*a*c^4)*d^3 + (b^4*c^2 + 16*a*
b^2*c^3 + 16*a^2*c^4)*d^2 - 2*(a*b^4*c^2 + 4*a^2*b^2*c^3)*d)*x^4
- 2*(a*b^4 + 4*a^2*b^2*c)*d^3 + 2*(a^2*b^5*c + 16*b*c^3*d^4 - 8*(
b^3*c^2 + 4*a*b*c^3)*d^3 + (b^5*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*
d^2 - 2*(a*b^5*c + 4*a^2*b^3*c^2)*d)*x^3 + (a^2*b^6 - 64*a*c^3*d^
4 + 32*c^3*d^5 - 2*(3*b^4*c - 16*a^2*c^3)*d^3 + (b^6 + 12*a*b^4*c
)*d^2 - 2*(a*b^6 + 3*a^2*b^4*c)*d)*x^2 + 2*(a^2*b^5*d + 16*b*c^2*
d^5 - 8*(b^3*c + 4*a*b*c^2)*d^4 + (b^5 + 16*a*b^3*c + 16*a^2*b*c^
2)*d^3 - 2*(a*b^5 + 4*a^2*b^3*c)*d^2)*x)*sqrt(-a*b^2 - 4*c*d^2 +
(b^2 + 4*a*c)*d))]
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^3),x, algorithm="giac")
```

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

3.6 $\int \frac{1}{\sqrt{a+bx+cx^2}(d+bx+cx^2)^4}\,dx$

Optimal. Leaf size=328

$$-\frac{(b+2cx)\left(16c^2\left(15a^2-44ad+44d^2\right)+8b^2c(7a-22d)+15b^4\right)\sqrt{a+bx+cx^2}}{24(a-d)^3\left(b^2-4cd\right)^3\left(bx+cx^2+d\right)}+\frac{\left(4c(a-2d)+b^2\right)\left(16c^2\left(5a^2-8ad+8d^2\right)-8b^2c(a+4d)+5b^4\right)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{8(a-d)^{7/2}\left(b^2-4cd\right)^{7/2}}+\frac{5(b+2cx)\left(4c(a-2d)+b^2\right)\sqrt{a+bx+cx^2}}{12(a-d)^2\left(b^2-4cd\right)^2\left(bx+cx^2+d\right)^2}-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{3(a-d)\left(b^2-4cd\right)\left(bx+cx^2+d\right)^3}$$

```
[Out] -((b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(3*(a - d)*(b^2 - 4*c*d)*(d
+ b*x + c*x^2)^3) + (5*(b^2 + 4*c*(a - 2*d))*(b + 2*c*x)*Sqrt[a +
 b*x + c*x^2])/(12*(a - d)^2*(b^2 - 4*c*d)^2*(d + b*x + c*x^2)^2)
 - ((15*b^4 + 8*b^2*c*(7*a - 22*d) + 16*c^2*(15*a^2 - 44*a*d + 44
*d^2))*(b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(24*(a - d)^3*(b^2 - 4*
c*d)^3*(d + b*x + c*x^2)) + ((b^2 + 4*c*(a - 2*d))*(5*b^4 - 8*b^2
*c*(a + 4*d) + 16*c^2*(5*a^2 - 8*a*d + 8*d^2))*ArcTanh[(Sqrt[a -
d]*(b + 2*c*x))/(Sqrt[b^2 - 4*c*d]*Sqrt[a + b*x + c*x^2])])/(8*(a
 - d)^(7/2)*(b^2 - 4*c*d)^(7/2))
```

Rubi [A] time = 2.11096, antiderivative size = 328, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$-\frac{(b+2cx)\left(16c^2\left(15a^2-44ad+44d^2\right)+8b^2c(7a-22d)+15b^4\right)\sqrt{a+bx+cx^2}}{24(a-d)^3\left(b^2-4cd\right)^3\left(bx+cx^2+d\right)}+\frac{\left(4c(a-2d)+b^2\right)\left(16c^2\left(5a^2-8ad+8d^2\right)-8b^2c(a+4d)+5b^4\right)\tanh^{-1}\left(\frac{\sqrt{a-d}(b+2cx)}{\sqrt{b^2-4cd}\sqrt{a+bx+cx^2}}\right)}{8(a-d)^{7/2}\left(b^2-4cd\right)^{7/2}}+\frac{5(b+2cx)\left(4c(a-2d)+b^2\right)\sqrt{a+bx+cx^2}}{12(a-d)^2\left(b^2-4cd\right)^2\left(bx+cx^2+d\right)^2}-\frac{(b+2cx)\sqrt{a+bx+cx^2}}{3(a-d)\left(b^2-4cd\right)\left(bx+cx^2+d\right)^3}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^4),x]
```

```
[Out] -((b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(3*(a - d)*(b^2 - 4*c*d)*(d
+ b*x + c*x^2)^3) + (5*(b^2 + 4*c*(a - 2*d))*(b + 2*c*x)*Sqrt[a +
 b*x + c*x^2])/(12*(a - d)^2*(b^2 - 4*c*d)^2*(d + b*x + c*x^2)^2)
 - ((15*b^4 + 8*b^2*c*(7*a - 22*d) + 16*c^2*(15*a^2 - 44*a*d + 44
*d^2))*(b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(24*(a - d)^3*(b^2 - 4*
c*d)^3*(d + b*x + c*x^2)) + ((b^2 + 4*c*(a - 2*d))*(5*b^4 - 8*b^2
*c*(a + 4*d) + 16*c^2*(5*a^2 - 8*a*d + 8*d^2))*ArcTanh[(Sqrt[a -
d]*(b + 2*c*x))/(Sqrt[b^2 - 4*c*d]*Sqrt[a + b*x + c*x^2])])/(8*(a
 - d)^(7/2)*(b^2 - 4*c*d)^(7/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+d)**4/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [B] time = 6.34836, size = 901, normalized size = 2.75

$$\frac{\left(cx^2+bx+a\right)\left(-\frac{-b-2cx}{3(a-d)(4cd-b^2)(cx^2+bx+d)^3}+\frac{15b^5+30cxb^4+56acb^3-176cdb^3+112ac^2xb^2-352c^2dxb^2+240a^2c^2b+704c^2d^2b-704ac^2db+480a^2c^3x+}{24(a-d)^3(4cd-b^2)^3(cx^2+bx+d)}\right.}{\sqrt{a+x(b+cx)}}$$
$$+\frac{\left(b^2+4ac-8cd\right)\left(5b^4-8acb^2-32cdb^2+80a^2c^2+128c^2d^2-128ac^2d\right)\sqrt{cx^2+bx+a}\log\left(b+2cx-\sqrt{b^2-4cd}\right)}{16\sqrt{a-d}(d-a)^3\left(b^2-4cd\right)^{7/2}\sqrt{a+x(b+cx)}}$$
$$-\frac{\left(b^2+4ac-8cd\right)\left(5b^4-8acb^2-32cdb^2+80a^2c^2+128c^2d^2-128ac^2d\right)\sqrt{cx^2+bx+a}\log\left(b+2cx+\sqrt{b^2-4cd}\right)}{16\sqrt{a-d}(d-a)^3\left(b^2-4cd\right)^{7/2}\sqrt{a+x(b+cx)}}$$
$$+\frac{\left(b^2+4ac-8cd\right)\left(5b^4-8acb^2-32cdb^2+80a^2c^2+128c^2d^2-128ac^2d\right)\sqrt{cx^2+bx+a}\log\left(b^2+\sqrt{b^2-4cd}b-4ac+2c\sqrt{b\right.}{16\sqrt{a-d}(d-a)^3\left(b^2-4cd\right)^{7/2}\sqrt{a+x(b+cx)}}$$
$$-\frac{\left(b^2+4ac-8cd\right)\left(5b^4-8acb^2-32cdb^2+80a^2c^2+128c^2d^2-128ac^2d\right)\sqrt{cx^2+bx+a}\log\left(-b^2+\sqrt{b^2-4cd}b+4ac+2c\right.}{16\sqrt{a-d}(d-a)^3\left(b^2-4cd\right)^{7/2}\sqrt{a+x(b+cx)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + b*x + c*x^2)^4),x]
```

```
[Out] ((a + b*x + c*x^2)*(-(-b - 2*c*x)/(3*(a - d)*(-b^2 + 4*c*d)*(d +
b*x + c*x^2)^3) + (5*(b^3 + 4*a*b*c - 8*b*c*d + 2*b^2*c*x + 8*a*c
^2*x - 16*c^2*d*x))/(12*(a - d)^2*(-b^2 + 4*c*d)^2*(d + b*x + c*x
^2)^2) + (15*b^5 + 56*a*b^3*c + 240*a^2*b*c^2 - 176*b^3*c*d - 704
*a*b*c^2*d + 704*b*c^2*d^2 + 30*b^4*c*x + 112*a*b^2*c^2*x + 480*a
^2*c^3*x - 352*b^2*c^2*d*x - 1408*a*c^3*d*x + 1408*c^3*d^2*x)/(24
*(a - d)^3*(-b^2 + 4*c*d)^3*(d + b*x + c*x^2))))/Sqrt[a + x*(b +
c*x)] + ((b^2 + 4*a*c - 8*c*d)*(5*b^4 - 8*a*b^2*c + 80*a^2*c^2 -
32*b^2*c*d - 128*a*c^2*d + 128*c^2*d^2)*Sqrt[a + b*x + c*x^2]*Log
[b - Sqrt[b^2 - 4*c*d] + 2*c*x])/(16*Sqrt[a - d]*(-a + d)^3*(b^2
- 4*c*d)^(7/2)*Sqrt[a + x*(b + c*x)]) - ((b^2 + 4*a*c - 8*c*d)*(5
*b^4 - 8*a*b^2*c + 80*a^2*c^2 - 32*b^2*c*d - 128*a*c^2*d + 128*c^
2*d^2)*Sqrt[a + b*x + c*x^2]*Log[b + Sqrt[b^2 - 4*c*d] + 2*c*x])/
(16*Sqrt[a - d]*(-a + d)^3*(b^2 - 4*c*d)^(7/2)*Sqrt[a + x*(b + c*
x)]) + ((b^2 + 4*a*c - 8*c*d)*(5*b^4 - 8*a*b^2*c + 80*a^2*c^2 - 3
2*b^2*c*d - 128*a*c^2*d + 128*c^2*d^2)*Sqrt[a + b*x + c*x^2]*Log[
b^2 - 4*a*c + b*Sqrt[b^2 - 4*c*d] + 2*c*Sqrt[b^2 - 4*c*d]*x - 4*c
*Sqrt[a - d]*Sqrt[a + b*x + c*x^2]])/(16*Sqrt[a - d]*(-a + d)^3*(
b^2 - 4*c*d)^(7/2)*Sqrt[a + x*(b + c*x)]) - ((b^2 + 4*a*c - 8*c*d
)*(5*b^4 - 8*a*b^2*c + 80*a^2*c^2 - 32*b^2*c*d - 128*a*c^2*d + 12
8*c^2*d^2)*Sqrt[a + b*x + c*x^2]*Log[-b^2 + 4*a*c + b*Sqrt[b^2 -
4*c*d] + 2*c*Sqrt[b^2 - 4*c*d]*x + 4*c*Sqrt[a - d]*Sqrt[a + b*x +
 c*x^2]])/(16*Sqrt[a - d]*(-a + d)^3*(b^2 - 4*c*d)^(7/2)*Sqrt[a +
 x*(b + c*x)])
```

Maple [B] time = 0.047, size = 3695, normalized size = 11.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 5/2/(b^2-4*c*d)^2/(a-d)^3/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^(1/2))*((x
-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(
b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)*c*d+5/2/(b^2-4*c*d)^2/(a-d)^3/(x+
1/2*b/c+1/2/c*(b^2-4*c*d)^(1/2))*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)
^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)
*c*d-5/4/(b^2-4*c*d)^(3/2)/(a-d)^(7/2)*ln((2*a-2*d+(b^2-4*c*d)^(1
/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b
```

```
^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^
(1/2))/c)+a-d)^(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))*c*d+5/4/(
b^2-4*c*d)^(3/2)/(a-d)^(7/2)*ln((2*a-2*d-(b^2-4*c*d)^(1/2)*(x+1/2
*(b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x+1/2*(b+(b^2-4*c*d)^(1
/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d
)^(1/2))/(x+1/2*(b+(b^2-4*c*d)^(1/2))/c))*c*d-5/12/(b^2-4*c*d)^(3
/2)/(a-d)^2/(x+1/2*b/c+1/2/c*(b^2-4*c*d)^(1/2))^2*((x+1/2*(b+(b^2
-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/
2))/c)+a-d)^(1/2)-5/16/(b^2-4*c*d)^(3/2)/(a-d)^(7/2)*ln((2*a-2*d-
(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*(
(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(
b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x+1/2*(b+(b^2-4*c*d)^(1/2))/c))
*b^2+3/4/(b^2-4*c*d)^(3/2)/(a-d)^(5/2)*c*ln((2*a-2*d-(b^2-4*c*d)^
(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x+1/2*(b+(b
^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(
1/2))/c)+a-d)^(1/2))/(x+1/2*(b+(b^2-4*c*d)^(1/2))/c))-20*c^3/(b^2
-4*c*d)^(7/2)/(a-d)^(1/2)*ln((2*a-2*d-(b^2-4*c*d)^(1/2)*(x+1/2*(b
+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x+1/2*(b+(b^2-4*c*d)^(1/2)
)/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(
1/2))/(x+1/2*(b+(b^2-4*c*d)^(1/2))/c))-3/(b^2-4*c*d)^(5/2)*c^2/(a
-d)^(3/2)*ln((2*a-2*d-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/
2))/c)+2*(a-d)^(1/2)*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*
c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x+1/2*(b+
(b^2-4*c*d)^(1/2))/c))-1/3/(b^2-4*c*d)^2/(a-d)/(x+1/2*b/c+1/2/c*(
b^2-4*c*d)^(1/2))^3*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c
*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)+20*c^3/(b^2-
4*c*d)^(7/2)/(a-d)^(1/2)*ln((2*a-2*d+(b^2-4*c*d)^(1/2)*(x-1/2*(-b
+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-4*c*d)^(1/2
))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)
^(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))+3/(b^2-4*c*d)^(5/2)*c^2
/(a-d)^(3/2)*ln((2*a-2*d+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)
^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b
^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x-1
/2*(-b+(b^2-4*c*d)^(1/2))/c))-1/3/(b^2-4*c*d)^2/(a-d)/(x+1/2*b/c-
1/2/c*(b^2-4*c*d)^(1/2))^3*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+
(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)+5/1
6/(b^2-4*c*d)^(3/2)/(a-d)^(7/2)*ln((2*a-2*d+(b^2-4*c*d)^(1/2)*(x-
1/2*(-b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-4*c*
d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/
c)+a-d)^(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))*b^2-3/4/(b^2-4*c
*d)^(3/2)/(a-d)^(5/2)*c*ln((2*a-2*d+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+
(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x-1/2*(-b+(b^2-4*c*d)^(1/2)
)/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^
(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c))+5/12/(b^2-4*c*d)^(3/2)/(
a-d)^2/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^(1/2))^2*((x-1/2*(-b+(b^2-4*c
*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))
/c)+a-d)^(1/2)-3/2/(b^2-4*c*d)^(5/2)*c/(a-d)^(5/2)*ln((2*a-2*d-(b
^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x
+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^
2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x+1/2*(b+(b^2-4*c*d)^(1/2))/c))*b
^2+6/(b^2-4*c*d)^(5/2)*c^2/(a-d)^(5/2)*ln((2*a-2*d-(b^2-4*c*d)^(1
/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/2)*((x+1/2*(b+(b^2
-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/
2))/c)+a-d)^(1/2))/(x+1/2*(b+(b^2-4*c*d)^(1/2))/c))*d-10/(b^2-4*c
*d)^3*c^2/(a-d)/(x+1/2*b/c+1/2/c*(b^2-4*c*d)^(1/2))*((x+1/2*(b+(b
^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(
1/2))/c)+a-d)^(1/2)-2/(b^2-4*c*d)^(5/2)*c/(a-d)/(x+1/2*b/c+1/2/c*
(b^2-4*c*d)^(1/2))^2*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4*
c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)-5/8/(b^2-4*
c*d)^2/(a-d)^3/(x+1/2*b/c+1/2/c*(b^2-4*c*d)^(1/2))*((x+1/2*(b+(b^
2-4*c*d)^(1/2))/c)^2*c-(b^2-4*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1
/2))/c)+a-d)^(1/2)*b^2-7/3/(b^2-4*c*d)^2*c/(a-d)^2/(x+1/2*b/c+1/2
/c*(b^2-4*c*d)^(1/2))*((x+1/2*(b+(b^2-4*c*d)^(1/2))/c)^2*c-(b^2-4
*c*d)^(1/2)*(x+1/2*(b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)-10/(b^2-4*
c*d)^3*c^2/(a-d)/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^(1/2))*((x-1/2*(-b+
(b^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d
)^(1/2))/c)+a-d)^(1/2)+2/(b^2-4*c*d)^(5/2)*c/(a-d)/(x+1/2*b/c-1/2
/c*(b^2-4*c*d)^(1/2))^2*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b^
2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)-7/3/(b
^2-4*c*d)^2*c/(a-d)^2/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^(1/2))*((x-1/2
*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-
4*c*d)^(1/2))/c)+a-d)^(1/2)+3/2/(b^2-4*c*d)^(5/2)*c/(a-d)^(5/2)*l
```

```
n((2*a-2*d+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+2*(
a-d)^(1/2)*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2
)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x-1/2*(-b+(b^2-4*
c*d)^(1/2))/c))*b^2-6/(b^2-4*c*d)^(5/2)*c^2/(a-d)^(5/2)*ln((2*a-2
*d+(b^2-4*c*d)^(1/2)*(x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+2*(a-d)^(1/
2)*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x-1/2
*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2))/(x-1/2*(-b+(b^2-4*c*d)^(1/
2))/c))*d-5/8/(b^2-4*c*d)^2/(a-d)^3/(x+1/2*b/c-1/2/c*(b^2-4*c*d)^
(1/2))*((x-1/2*(-b+(b^2-4*c*d)^(1/2))/c)^2*c+(b^2-4*c*d)^(1/2)*(x
-1/2*(-b+(b^2-4*c*d)^(1/2))/c)+a-d)^(1/2)*b^2
```

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

$$\int \frac{1}{\sqrt{cx^2+bx+a}(cx^2+bx+d)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4), x)
```

Fricas [A] time = 11.338, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4),x, algorithm="fricas")
```

```
[Out] [-1/96*(4*(8*a^2*b^5 + 1152*b*c^2*d^4 + 2*(15*b^4*c^3 + 56*a*b^2*
c^4 + 240*a^2*c^5 + 704*c^5*d^2 - 176*(b^2*c^4 + 4*a*c^5)*d)*x^5
+ 5*(15*b^5*c^2 + 56*a*b^3*c^3 + 240*a^2*b*c^4 + 704*b*c^4*d^2 -
176*(b^3*c^3 + 4*a*b*c^4)*d)*x^4 - 360*(b^3*c + 4*a*b*c^2)*d^3 +
4*(15*b^6*c + 51*a*b^4*c^2 + 220*a^2*b^2*c^3 + 864*c^4*d^3 + 4*(1
17*b^2*c^3 - 236*a*c^4)*d^2 - 4*(39*b^4*c^2 + 142*a*b^2*c^3 - 80*
a^2*c^4)*d)*x^3 + (33*b^5 + 344*a*b^3*c + 528*a^2*b*c^2)*d^2 + (1
5*b^7 + 26*a*b^5*c + 120*a^2*b^3*c^2 + 5184*b*c^3*d^3 - 8*(89*b^3
*c^2 + 708*a*b*c^3)*d^2 - 8*(7*b^5*c - 14*a*b^3*c^2 - 240*a^2*b*c
^3)*d)*x^2 - 26*(a*b^5 + 4*a^2*b^3*c)*d - 2*(5*a*b^6 + 12*a^2*b^4
*c - 1152*c^3*d^4 - 72*(7*b^2*c^2 - 20*a*c^3)*d^3 + (203*b^4*c +
600*a*b^2*c^2 - 528*a^2*c^3)*d^2 - 2*(10*b^6 + 55*a*b^4*c + 108*a
^2*b^2*c^2)*d)*x)*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d)*sqrt(c*
x^2 + b*x + a) - 3*(1024*c^3*d^6 - (5*b^6*c^3 + 12*a*b^4*c^4 + 48
*a^2*b^2*c^5 + 320*a^3*c^6 - 1024*c^6*d^3 + 384*(b^2*c^5 + 4*a*c^
6)*d^2 - 24*(3*b^4*c^4 + 8*a*b^2*c^5 + 48*a^2*c^6)*d)*x^6 - 384*(
b^2*c^2 + 4*a*c^3)*d^5 - 3*(5*b^7*c^2 + 12*a*b^5*c^3 + 48*a^2*b^3
*c^4 + 320*a^3*b*c^5 - 1024*b*c^5*d^3 + 384*(b^3*c^4 + 4*a*b*c^5)
*d^2 - 24*(3*b^5*c^3 + 8*a*b^3*c^4 + 48*a^2*b*c^5)*d)*x^5 + 24*(3
*b^4*c + 8*a*b^2*c^2 + 48*a^2*c^3)*d^4 - 3*(5*b^8*c + 12*a*b^6*c^
2 + 48*a^2*b^4*c^3 + 320*a^3*b^2*c^4 - 1024*c^5*d^4 - 128*(5*b^2*
c^4 - 12*a*c^5)*d^3 + 24*(13*b^4*c^3 + 56*a*b^2*c^4 - 48*a^2*c^5)
*d^2 - (67*b^6*c^2 + 180*a*b^4*c^3 + 1104*a^2*b^2*c^4 - 320*a^3*c
^5)*d)*x^4 - (5*b^6 + 12*a*b^4*c + 48*a^2*b^2*c^2 + 320*a^3*c^3)*
d^3 - (5*b^9 + 12*a*b^7*c + 48*a^2*b^5*c^2 + 320*a^3*b^3*c^3 - 61
44*b*c^4*d^4 + 256*(5*b^3*c^3 + 36*a*b*c^4)*d^3 - 48*(b^5*c^2 - 8
*a*b^3*c^3 + 144*a^2*b*c^4)*d^2 - 6*(7*b^7*c + 20*a*b^5*c^2 + 144
*a^2*b^3*c^3 - 320*a^3*b*c^4)*d)*x^3 + 3*(1024*c^4*d^5 + 128*(5*b
^2*c^3 - 12*a*c^4)*d^4 - 24*(13*b^4*c^2 + 56*a*b^2*c^3 - 48*a^2*c
^4)*d^3 + (67*b^6*c + 180*a*b^4*c^2 + 1104*a^2*b^2*c^3 - 320*a^3*
c^4)*d^2 - (5*b^8 + 12*a*b^6*c + 48*a^2*b^4*c^2 + 320*a^3*b^2*c^3
)*d)*x^2 + 3*(1024*b*c^3*d^5 - 384*(b^3*c^2 + 4*a*b*c^3)*d^4 + 24
*(3*b^5*c + 8*a*b^3*c^2 + 48*a^2*b*c^3)*d^3 - (5*b^7 + 12*a*b^5*c
```

```
 + 48*a^2*b^3*c^2 + 320*a^3*b*c^3)*d^2)*x)*log(((8*a^2*b^4 + (b^4
*c^2 + 24*a*b^2*c^3 + 16*a^2*c^4 + 128*c^4*d^2 - 32*(b^2*c^3 + 4*
a*c^4)*d)*x^4 + 2*(b^5*c + 24*a*b^3*c^2 + 16*a^2*b*c^3 + 128*b*c^
3*d^2 - 32*(b^3*c^2 + 4*a*b*c^3)*d)*x^3 + (b^4 + 24*a*b^2*c + 16*
a^2*c^2)*d^2 + (b^6 + 32*a*b^4*c + 48*a^2*b^2*c^2 + 32*(5*b^2*c^2
 + 4*a*c^3)*d^2 - 2*(19*b^4*c + 104*a*b^2*c^2 + 48*a^2*c^3)*d)*x^
2 - 8*(a*b^4 + 4*a^2*b^2*c)*d + 2*(4*a*b^5 + 16*a^2*b^3*c + 16*(b
^3*c + 4*a*b*c^2)*d^2 - (3*b^5 + 40*a*b^3*c + 48*a^2*b*c^2)*d)*x)
*sqrt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d) - 4*(2*a^2*b^5 - 4*(b^3*
c + 4*a*b*c^2)*d^3 + 2*(a*b^4*c^2 + 4*a^2*b^2*c^3 - 32*c^4*d^3 +
12*(b^2*c^3 + 4*a*c^4)*d^2 - (b^4*c^2 + 16*a*b^2*c^3 + 16*a^2*c^4
)*d)*x^3 + (b^5 + 16*a*b^3*c + 16*a^2*b*c^2)*d^2 + 3*(a*b^5*c + 4
*a^2*b^3*c^2 - 32*b*c^3*d^3 + 12*(b^3*c^2 + 4*a*b*c^3)*d^2 - (b^5
*c + 16*a*b^3*c^2 + 16*a^2*b*c^3)*d)*x^2 - 3*(a*b^5 + 4*a^2*b^3*c
)*d + (a*b^6 + 8*a^2*b^4*c - 8*(5*b^2*c^2 + 4*a*c^3)*d^3 + 2*(7*b
^4*c + 40*a*b^2*c^2 + 16*a^2*c^3)*d^2 - (b^6 + 22*a*b^4*c + 40*a^
2*b^2*c^2)*d)*x)*sqrt(c*x^2 + b*x + a))/(c^2*x^4 + 2*b*c*x^3 + 2*
b*d*x + (b^2 + 2*c*d)*x^2 + d^2)))/((a^3*b^6*d^3 + 64*c^3*d^9 - 4
8*(b^2*c^2 + 4*a*c^3)*d^8 + 12*(b^4*c + 12*a*b^2*c^2 + 16*a^2*c^3
)*d^7 - (b^6 + 36*a*b^4*c + 144*a^2*b^2*c^2 + 64*a^3*c^3)*d^6 + (
a^3*b^6*c^3 + 64*c^6*d^6 - 48*(b^2*c^5 + 4*a*c^6)*d^5 + 12*(b^4*c
^4 + 12*a*b^2*c^5 + 16*a^2*c^6)*d^4 - (b^6*c^3 + 36*a*b^4*c^4 + 1
44*a^2*b^2*c^5 + 64*a^3*c^6)*d^3 + 3*(a*b^6*c^3 + 12*a^2*b^4*c^4
+ 16*a^3*b^2*c^5)*d^2 - 3*(a^2*b^6*c^3 + 4*a^3*b^4*c^4)*d)*x^6 +
3*(a*b^6 + 12*a^2*b^4*c + 16*a^3*b^2*c^2)*d^5 + 3*(a^3*b^7*c^2 +
64*b*c^5*d^6 - 48*(b^3*c^4 + 4*a*b*c^5)*d^5 + 12*(b^5*c^3 + 12*a*
b^3*c^4 + 16*a^2*b*c^5)*d^4 - (b^7*c^2 + 36*a*b^5*c^3 + 144*a^2*b
^3*c^4 + 64*a^3*b*c^5)*d^3 + 3*(a*b^7*c^2 + 12*a^2*b^5*c^3 + 16*a
^3*b^3*c^4)*d^2 - 3*(a^2*b^7*c^2 + 4*a^3*b^5*c^3)*d)*x^5 - 3*(a^2
*b^6 + 4*a^3*b^4*c)*d^4 + 3*(a^3*b^8*c + 64*c^5*d^7 + 16*(b^2*c^4
 - 12*a*c^5)*d^6 - 12*(3*b^4*c^3 + 4*a*b^2*c^4 - 16*a^2*c^5)*d^5
+ (11*b^6*c^2 + 108*a*b^4*c^3 + 48*a^2*b^2*c^4 - 64*a^3*c^5)*d^4
- (b^8*c + 33*a*b^6*c^2 + 108*a^2*b^4*c^3 + 16*a^3*b^2*c^4)*d^3 +
 3*(a*b^8*c + 11*a^2*b^6*c^2 + 12*a^3*b^4*c^3)*d^2 - (3*a^2*b^8*c
 + 11*a^3*b^6*c^2)*d)*x^4 + (a^3*b^9 + 384*b*c^4*d^7 - 32*(7*b^3*
c^3 + 36*a*b*c^4)*d^6 + 24*(b^5*c^2 + 28*a*b^3*c^3 + 48*a^2*b*c^4
)*d^5 + 6*(b^7*c - 12*a*b^5*c^2 - 112*a^2*b^3*c^3 - 64*a^3*b*c^4)
*d^4 - (b^9 + 18*a*b^7*c - 72*a^2*b^5*c^2 - 224*a^3*b^3*c^3)*d^3
+ 3*(a*b^9 + 6*a^2*b^7*c - 8*a^3*b^5*c^2)*d^2 - 3*(a^2*b^9 + 2*a^
3*b^7*c)*d)*x^3 + 3*(a^3*b^8*d + 64*c^4*d^8 + 16*(b^2*c^3 - 12*a*
c^4)*d^7 - 12*(3*b^4*c^2 + 4*a*b^2*c^3 - 16*a^2*c^4)*d^6 + (11*b^
6*c + 108*a*b^4*c^2 + 48*a^2*b^2*c^3 - 64*a^3*c^4)*d^5 - (b^8 + 3
3*a*b^6*c + 108*a^2*b^4*c^2 + 16*a^3*b^2*c^3)*d^4 + 3*(a*b^8 + 11
*a^2*b^6*c + 12*a^3*b^4*c^2)*d^3 - (3*a^2*b^8 + 11*a^3*b^6*c)*d^2
)*x^2 + 3*(a^3*b^7*d^2 + 64*b*c^3*d^8 - 48*(b^3*c^2 + 4*a*b*c^3)*
d^7 + 12*(b^5*c + 12*a*b^3*c^2 + 16*a^2*b*c^3)*d^6 - (b^7 + 36*a*
b^5*c + 144*a^2*b^3*c^2 + 64*a^3*b*c^3)*d^5 + 3*(a*b^7 + 12*a^2*b
^5*c + 16*a^3*b^3*c^2)*d^4 - 3*(a^2*b^7 + 4*a^3*b^5*c)*d^3)*x)*sq
rt(a*b^2 + 4*c*d^2 - (b^2 + 4*a*c)*d)), -1/48*(2*(8*a^2*b^5 + 115
2*b*c^2*d^4 + 2*(15*b^4*c^3 + 56*a*b^2*c^4 + 240*a^2*c^5 + 704*c^
5*d^2 - 176*(b^2*c^4 + 4*a*c^5)*d)*x^5 + 5*(15*b^5*c^2 + 56*a*b^3
*c^3 + 240*a^2*b*c^4 + 704*b*c^4*d^2 - 176*(b^3*c^3 + 4*a*b*c^4)*
d)*x^4 - 360*(b^3*c + 4*a*b*c^2)*d^3 + 4*(15*b^6*c + 51*a*b^4*c^2
 + 220*a^2*b^2*c^3 + 864*c^4*d^3 + 4*(117*b^2*c^3 - 236*a*c^4)*d^
2 - 4*(39*b^4*c^2 + 142*a*b^2*c^3 - 80*a^2*c^4)*d)*x^3 + (33*b^5
+ 344*a*b^3*c + 528*a^2*b*c^2)*d^2 + (15*b^7 + 26*a*b^5*c + 120*a
^2*b^3*c^2 + 5184*b*c^3*d^3 - 8*(89*b^3*c^2 + 708*a*b*c^3)*d^2 -
8*(7*b^5*c - 14*a*b^3*c^2 - 240*a^2*b*c^3)*d)*x^2 - 26*(a*b^5 + 4
*a^2*b^3*c)*d - 2*(5*a*b^6 + 12*a^2*b^4*c - 1152*c^3*d^4 - 72*(7*
b^2*c^2 - 20*a*c^3)*d^3 + (203*b^4*c + 600*a*b^2*c^2 - 528*a^2*c^
3)*d^2 - 2*(10*b^6 + 55*a*b^4*c + 108*a^2*b^2*c^2)*d)*x)*sqrt(-a*
b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)*sqrt(c*x^2 + b*x + a) - 3*(1024*
c^3*d^6 - (5*b^6*c^3 + 12*a*b^4*c^4 + 48*a^2*b^2*c^5 + 320*a^3*c^
6 - 1024*c^6*d^3 + 384*(b^2*c^5 + 4*a*c^6)*d^2 - 24*(3*b^4*c^4 +
8*a*b^2*c^5 + 48*a^2*c^6)*d)*x^6 - 384*(b^2*c^2 + 4*a*c^3)*d^5 -
3*(5*b^7*c^2 + 12*a*b^5*c^3 + 48*a^2*b^3*c^4 + 320*a^3*b*c^5 - 10
24*b*c^5*d^3 + 384*(b^3*c^4 + 4*a*b*c^5)*d^2 - 24*(3*b^5*c^3 + 8*
a*b^3*c^4 + 48*a^2*b*c^5)*d)*x^5 + 24*(3*b^4*c + 8*a*b^2*c^2 + 48
*a^2*c^3)*d^4 - 3*(5*b^8*c + 12*a*b^6*c^2 + 48*a^2*b^4*c^3 + 320*
a^3*b^2*c^4 - 1024*c^5*d^4 - 128*(5*b^2*c^4 - 12*a*c^5)*d^3 + 24*
(13*b^4*c^3 + 56*a*b^2*c^4 - 48*a^2*c^5)*d^2 - (67*b^6*c^2 + 180*
a*b^4*c^3 + 1104*a^2*b^2*c^4 - 320*a^3*c^5)*d)*x^4 - (5*b^6 + 12*
```

```
a*b^4*c + 48*a^2*b^2*c^2 + 320*a^3*c^3)*d^3 - (5*b^9 + 12*a*b^7*c
 + 48*a^2*b^5*c^2 + 320*a^3*b^3*c^3 - 6144*b*c^4*d^4 + 256*(5*b^3
*c^3 + 36*a*b*c^4)*d^3 - 48*(b^5*c^2 - 8*a*b^3*c^3 + 144*a^2*b*c^
4)*d^2 - 6*(7*b^7*c + 20*a*b^5*c^2 + 144*a^2*b^3*c^3 - 320*a^3*b*
c^4)*d)*x^3 + 3*(1024*c^4*d^5 + 128*(5*b^2*c^3 - 12*a*c^4)*d^4 -
24*(13*b^4*c^2 + 56*a*b^2*c^3 - 48*a^2*c^4)*d^3 + (67*b^6*c + 180
*a*b^4*c^2 + 1104*a^2*b^2*c^3 - 320*a^3*c^4)*d^2 - (5*b^8 + 12*a*
b^6*c + 48*a^2*b^4*c^2 + 320*a^3*b^2*c^3)*d)*x^2 + 3*(1024*b*c^3*
d^5 - 384*(b^3*c^2 + 4*a*b*c^3)*d^4 + 24*(3*b^5*c + 8*a*b^3*c^2 +
 48*a^2*b*c^3)*d^3 - (5*b^7 + 12*a*b^5*c + 48*a^2*b^3*c^2 + 320*a
^3*b*c^3)*d^2)*x)*arctan(-1/2*(2*a*b^2 + (b^2*c + 4*a*c^2 - 8*c^2
*d)*x^2 - (b^2 + 4*a*c)*d + (b^3 + 4*a*b*c - 8*b*c*d)*x)*sqrt(-a*
b^2 - 4*c*d^2 + (b^2 + 4*a*c)*d)/((a*b^3 + 4*b*c*d^2 - (b^3 + 4*a
*b*c)*d + 2*(a*b^2*c + 4*c^2*d^2 - (b^2*c + 4*a*c^2)*d)*x)*sqrt(c
*x^2 + b*x + a))))/((a^3*b^6*d^3 + 64*c^3*d^9 - 48*(b^2*c^2 + 4*a
*c^3)*d^8 + 12*(b^4*c + 12*a*b^2*c^2 + 16*a^2*c^3)*d^7 - (b^6 + 3
6*a*b^4*c + 144*a^2*b^2*c^2 + 64*a^3*c^3)*d^6 + (a^3*b^6*c^3 + 64
*c^6*d^6 - 48*(b^2*c^5 + 4*a*c^6)*d^5 + 12*(b^4*c^4 + 12*a*b^2*c^
5 + 16*a^2*c^6)*d^4 - (b^6*c^3 + 36*a*b^4*c^4 + 144*a^2*b^2*c^5 +
 64*a^3*c^6)*d^3 + 3*(a*b^6*c^3 + 12*a^2*b^4*c^4 + 16*a^3*b^2*c^5
)*d^2 - 3*(a^2*b^6*c^3 + 4*a^3*b^4*c^4)*d)*x^6 + 3*(a*b^6 + 12*a^
2*b^4*c + 16*a^3*b^2*c^2)*d^5 + 3*(a^3*b^7*c^2 + 64*b*c^5*d^6 - 4
8*(b^3*c^4 + 4*a*b*c^5)*d^5 + 12*(b^5*c^3 + 12*a*b^3*c^4 + 16*a^2
*b*c^5)*d^4 - (b^7*c^2 + 36*a*b^5*c^3 + 144*a^2*b^3*c^4 + 64*a^3*
b*c^5)*d^3 + 3*(a*b^7*c^2 + 12*a^2*b^5*c^3 + 16*a^3*b^3*c^4)*d^2
- 3*(a^2*b^7*c^2 + 4*a^3*b^5*c^3)*d)*x^5 - 3*(a^2*b^6 + 4*a^3*b^4
*c)*d^4 + 3*(a^3*b^8*c + 64*c^5*d^7 + 16*(b^2*c^4 - 12*a*c^5)*d^6
 - 12*(3*b^4*c^3 + 4*a*b^2*c^4 - 16*a^2*c^5)*d^5 + (11*b^6*c^2 +
108*a*b^4*c^3 + 48*a^2*b^2*c^4 - 64*a^3*c^5)*d^4 - (b^8*c + 33*a*
b^6*c^2 + 108*a^2*b^4*c^3 + 16*a^3*b^2*c^4)*d^3 + 3*(a*b^8*c + 11
*a^2*b^6*c^2 + 12*a^3*b^4*c^3)*d^2 - (3*a^2*b^8*c + 11*a^3*b^6*c^
2)*d)*x^4 + (a^3*b^9 + 384*b*c^4*d^7 - 32*(7*b^3*c^3 + 36*a*b*c^4
)*d^6 + 24*(b^5*c^2 + 28*a*b^3*c^3 + 48*a^2*b*c^4)*d^5 + 6*(b^7*c
 - 12*a*b^5*c^2 - 112*a^2*b^3*c^3 - 64*a^3*b*c^4)*d^4 - (b^9 + 18
*a*b^7*c - 72*a^2*b^5*c^2 - 224*a^3*b^3*c^3)*d^3 + 3*(a*b^9 + 6*a
^2*b^7*c - 8*a^3*b^5*c^2)*d^2 - 3*(a^2*b^9 + 2*a^3*b^7*c)*d)*x^3
+ 3*(a^3*b^8*d + 64*c^4*d^8 + 16*(b^2*c^3 - 12*a*c^4)*d^7 - 12*(3
*b^4*c^2 + 4*a*b^2*c^3 - 16*a^2*c^4)*d^6 + (11*b^6*c + 108*a*b^4*
c^2 + 48*a^2*b^2*c^3 - 64*a^3*c^4)*d^5 - (b^8 + 33*a*b^6*c + 108*
a^2*b^4*c^2 + 16*a^3*b^2*c^3)*d^4 + 3*(a*b^8 + 11*a^2*b^6*c + 12*
a^3*b^4*c^2)*d^3 - (3*a^2*b^8 + 11*a^3*b^6*c)*d^2)*x^2 + 3*(a^3*b
^7*d^2 + 64*b*c^3*d^8 - 48*(b^3*c^2 + 4*a*b*c^3)*d^7 + 12*(b^5*c
+ 12*a*b^3*c^2 + 16*a^2*b*c^3)*d^6 - (b^7 + 36*a*b^5*c + 144*a^2*
b^3*c^2 + 64*a^3*b*c^3)*d^5 + 3*(a*b^7 + 12*a^2*b^5*c + 16*a^3*b^
3*c^2)*d^4 - 3*(a^2*b^7 + 4*a^3*b^5*c)*d^3)*x)*sqrt(-a*b^2 - 4*c*
d^2 + (b^2 + 4*a*c)*d))]
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**2+b*x+d)**4/(c*x**2+b*x+a)**(1/2),x)

[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(c*x^2 + b*x + d)^4),x, algorithm="giac")
```

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

3.7 $\int \frac{1}{\sqrt{d+ex+fx^2}(ae+bex+bfx^2)^2}\,dx$

Optimal. Leaf size=162

$$-\frac{\left(8aef-b\left(4df+e^2\right)\right)\tanh^{-1}\left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{e^{3/2}(bd-ae)^{3/2}(be-4af)^{3/2}}-\frac{b(e+2fx)\sqrt{d+ex+fx^2}}{e(bd-ae)(be-4af)\left(ae+bex+bfx^2\right)}$$

```
[Out] -((b*(e + 2*f*x)*Sqrt[d + e*x + f*x^2])/(e*(b*d - a*e)*(b*e - 4*a
*f)*(a*e + b*e*x + b*f*x^2))) - ((8*a*e*f - b*(e^2 + 4*d*f))*ArcT
anh[(Sqrt[b*d - a*e]*(e + 2*f*x))/(Sqrt[e]*Sqrt[b*e - 4*a*f]*Sqrt
[d + e*x + f*x^2])])/(e^(3/2)*(b*d - a*e)^(3/2)*(b*e - 4*a*f)^(3/
2))
```

Rubi [A] time = 0.685318, antiderivative size = 162, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.129$

$$-\frac{\left(8aef-b\left(4df+e^2\right)\right)\tanh^{-1}\left(\frac{(e+2fx)\sqrt{bd-ae}}{\sqrt{e}\sqrt{be-4af}\sqrt{d+ex+fx^2}}\right)}{e^{3/2}(bd-ae)^{3/2}(be-4af)^{3/2}}-\frac{b(e+2fx)\sqrt{d+ex+fx^2}}{e(bd-ae)(be-4af)\left(ae+bex+bfx^2\right)}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[d + e*x + f*x^2]*(a*e + b*e*x + b*f*x^2)^2),x]
```

```
[Out] -((b*(e + 2*f*x)*Sqrt[d + e*x + f*x^2])/(e*(b*d - a*e)*(b*e - 4*a
*f)*(a*e + b*e*x + b*f*x^2))) - ((8*a*e*f - b*(e^2 + 4*d*f))*ArcT
anh[(Sqrt[b*d - a*e]*(e + 2*f*x))/(Sqrt[e]*Sqrt[b*e - 4*a*f]*Sqrt
[d + e*x + f*x^2])])/(e^(3/2)*(b*d - a*e)^(3/2)*(b*e - 4*a*f)^(3/
2))
```

Rubi in Sympy [A] time = 134.701, size = 150, normalized size = 0.93

$$-\frac{b\left(e+2fx\right)\sqrt{d+ex+fx^2}}{e\left(ae-bd\right)\left(4af-be\right)\left(ae+bex+bfx^2\right)}-\frac{\left(-8aef+4bdf+be^2\right)\operatorname{atanh}\left(\frac{(e+2fx)\sqrt{ae-bd}}{\sqrt{e}\sqrt{4af-be}\sqrt{d+ex+fx^2}}\right)}{e^{\frac{3}{2}}\left(ae-bd\right)^{\frac{3}{2}}\left(4af-be\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(b*f*x**2+b*e*x+a*e)**2/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] -b*(e + 2*f*x)*sqrt(d + e*x + f*x**2)/(e*(a*e - b*d)*(4*a*f - b*e
)*(a*e + b*e*x + b*f*x**2)) - (-8*a*e*f + 4*b*d*f + b*e**2)*atanh
((e + 2*f*x)*sqrt(a*e - b*d)/(sqrt(e)*sqrt(4*a*f - b*e)*sqrt(d +
e*x + f*x**2)))/(e**(3/2)*(a*e - b*d)**(3/2)*(4*a*f - b*e)**(3/2)
)
```

Mathematica [B] time = 1.14257, size = 463, normalized size = 2.86

$$-\frac{\left(b\left(4df+e^2\right)-8aef\right)\left(ae+bx(e+fx)\right)\log\left(b(e+2fx)-\sqrt{b}\sqrt{e}\sqrt{be-4af}\right)-\left(b\left(4df+e^2\right)-8aef\right)\left(ae+bx(e+fx)\right)\cdots}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[d + e*x + f*x^2]*(a*e + b*e*x + b*f*x^2)^2),x]
```

```
[Out] -(2*b*Sqrt[e]*Sqrt[b*d - a*e]*Sqrt[b*e - 4*a*f]*(e + 2*f*x)*Sqrt[
d + x*(e + f*x)] + (-8*a*e*f + b*(e^2 + 4*d*f))*(a*e + b*x*(e + f
*x))*Log[-(Sqrt[b]*Sqrt[e]*Sqrt[b*e - 4*a*f]) + b*(e + 2*f*x)] -
(-8*a*e*f + b*(e^2 + 4*d*f))*(a*e + b*x*(e + f*x))*Log[Sqrt[b]*Sq
rt[e]*Sqrt[b*e - 4*a*f] + b*(e + 2*f*x)] + (-8*a*e*f + b*(e^2 + 4
*d*f))*(a*e + b*x*(e + f*x))*Log[Sqrt[b]*(e^(3/2)*Sqrt[b*e - 4*a*
f] + Sqrt[b]*(e^2 - 4*d*f) + 2*Sqrt[e]*f*Sqrt[b*e - 4*a*f]*x - 4*
Sqrt[b*d - a*e]*f*Sqrt[d + x*(e + f*x)])] - (-8*a*e*f + b*(e^2 +
4*d*f))*(a*e + b*x*(e + f*x))*Log[Sqrt[b]*(e^(3/2)*Sqrt[b*e - 4*a
*f] - Sqrt[b]*(e^2 - 4*d*f) + 2*Sqrt[e]*f*Sqrt[b*e - 4*a*f]*x + 4
*Sqrt[b*d - a*e]*f*Sqrt[d + x*(e + f*x)])])/(2*e^(3/2)*(b*d - a*e
)^(3/2)*(b*e - 4*a*f)^(3/2)*(a*e + b*x*(e + f*x)))
```

Maple [B] time = 0.049, size = 1377, normalized size = 8.5

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(b*f*x^2+b*e*x+a*e)^2/(f*x^2+e*x+d)^(1/2),x)
```

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

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

$$\int \frac{1}{\left(bfx^2 + bex + ae\right)^2 \sqrt{fx^2 + ex + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)),x, algorithm="maxim
```

```
[Out] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)), x)
```

Fricas [A] time = 1.00522, size = 1, normalized size = 0.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)),x, algorithm="frica
```

```
[Out] [-1/4*(4*sqrt(b^2*d*e^2 - a*b*e^3 - 4*(a*b*d*e - a^2*e^2)*f)*(2*b
*f*x + b*e)*sqrt(f*x^2 + e*x + d) + (a*b*e^3 + (b^2*e^2*f + 4*(b^
2*d - 2*a*b*e)*f^2)*x^2 + 4*(a*b*d*e - 2*a^2*e^2)*f + (b^2*e^3 +
4*(b^2*d*e - 2*a*b*e^2)*f)*x)*log(((8*b^2*d^2*e^4 - 8*a*b*d*e^5 +
 a^2*e^6 + 16*a^2*d^2*e^2*f^2 + (b^2*e^4*f^2 + 16*(b^2*d^2 - 8*a*
b*d*e + 8*a^2*e^2)*f^4 + 8*(3*b^2*d*e^2 - 4*a*b*e^3)*f^3)*x^4 + 2
*(b^2*e^5*f + 16*(b^2*d^2*e - 8*a*b*d*e^2 + 8*a^2*e^3)*f^3 + 8*(3
*b^2*d*e^3 - 4*a*b*e^4)*f^2)*x^3 + (b^2*e^6 - 32*(3*a*b*d^2*e - 4
*a^2*d*e^2)*f^3 + 16*(3*b^2*d^2*e^2 - 13*a*b*d*e^3 + 10*a^2*e^4)*
f^2 + 2*(16*b^2*d*e^4 - 19*a*b*e^5)*f)*x^2 - 8*(4*a*b*d^2*e^3 - 3
*a^2*d*e^4)*f + 2*(4*b^2*d*e^5 - 3*a*b*e^6 - 16*(3*a*b*d^2*e^2 -
4*a^2*d*e^3)*f^2 + 8*(2*b^2*d^2*e^3 - 5*a*b*d*e^4 + 2*a^2*e^5)*f)
*x)*sqrt(b^2*d*e^2 - a*b*e^3 - 4*(a*b*d*e - a^2*e^2)*f) - 4*(2*b^
3*d^2*e^5 - 3*a*b^2*d*e^6 + a^2*b*e^7 - 2*(16*(a*b^2*d^2*e - 3*a^
2*b*d*e^2 + 2*a^3*e^3)*f^4 - 4*(b^3*d^2*e^2 - 4*a*b^2*d*e^3 + 3*a
^2*b*e^4)*f^3 - (b^3*d*e^4 - a*b^2*e^5)*f^2)*x^3 + 16*(a^2*b*d^2*
e^3 - a^3*d*e^4)*f^2 - 3*(16*(a*b^2*d^2*e^2 - 3*a^2*b*d*e^3 + 2*a
^3*e^4)*f^3 - 4*(b^3*d^2*e^3 - 4*a*b^2*d*e^4 + 3*a^2*b*e^5)*f^2 -
 (b^3*d*e^5 - a*b^2*e^6)*f)*x^2 - 4*(3*a*b^2*d^2*e^4 - 4*a^2*b*d*
e^5 + a^3*e^6)*f + (b^3*d*e^6 - a*b^2*e^7 + 32*(a^2*b*d^2*e^2 - a
^3*d*e^3)*f^3 - 40*(a*b^2*d^2*e^3 - 2*a^2*b*d*e^4 + a^3*e^5)*f^2
+ 2*(4*b^3*d^2*e^4 - 11*a*b^2*d*e^5 + 7*a^2*b*e^6)*f)*x)*sqrt(f*x
^2 + e*x + d))/(b^2*f^2*x^4 + 2*b^2*e*f*x^3 + 2*a*b*e^2*x + a^2*e
^2 + (b^2*e^2 + 2*a*b*e*f)*x^2)))/((a*b^2*d*e^3 - a^2*b*e^4 - (4*
(a*b^2*d*e - a^2*b*e^2)*f^2 - (b^3*d*e^2 - a*b^2*e^3)*f)*x^2 - 4*
(a^2*b*d*e^2 - a^3*e^3)*f + (b^3*d*e^3 - a*b^2*e^4 - 4*(a*b^2*d*e
^2 - a^2*b*e^3)*f)*x)*sqrt(b^2*d*e^2 - a*b*e^3 - 4*(a*b*d*e - a^2
*e^2)*f)), -1/2*(2*sqrt(-b^2*d*e^2 + a*b*e^3 + 4*(a*b*d*e - a^2*e
^2)*f)*(2*b*f*x + b*e)*sqrt(f*x^2 + e*x + d) + (a*b*e^3 + (b^2*e^
2*f + 4*(b^2*d - 2*a*b*e)*f^2)*x^2 + 4*(a*b*d*e - 2*a^2*e^2)*f +
(b^2*e^3 + 4*(b^2*d*e - 2*a*b*e^2)*f)*x)*arctan(-1/2*sqrt(-b^2*d*
e^2 + a*b*e^3 + 4*(a*b*d*e - a^2*e^2)*f)*(2*b*d*e^2 - a*e^3 - 4*a
*d*e*f + (b*e^2*f + 4*(b*d - 2*a*e)*f^2)*x^2 + (b*e^3 + 4*(b*d*e
- 2*a*e^2)*f)*x)/((b^2*d*e^3 - a*b*e^4 - 4*(a*b*d*e^2 - a^2*e^3)*
f - 2*(4*(a*b*d*e - a^2*e^2)*f^2 - (b^2*d*e^2 - a*b*e^3)*f)*x)*sq
rt(f*x^2 + e*x + d))))/((a*b^2*d*e^3 - a^2*b*e^4 - (4*(a*b^2*d*e
- a^2*b*e^2)*f^2 - (b^3*d*e^2 - a*b^2*e^3)*f)*x^2 - 4*(a^2*b*d*e^
2 - a^3*e^3)*f + (b^3*d*e^3 - a*b^2*e^4 - 4*(a*b^2*d*e^2 - a^2*b*
e^3)*f)*x)*sqrt(-b^2*d*e^2 + a*b*e^3 + 4*(a*b*d*e - a^2*e^2)*f))]
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(b*f*x**2+b*e*x+a*e)**2/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((b*f*x^2 + b*e*x + a*e)^2*sqrt(f*x^2 + e*x + d)),x, algorithm="giac"

[Out] Exception raised: TypeError
```

3.8 $\int \frac{1}{(4+2x+x^2)\sqrt{5+2x+x^2}} dx$

Optimal. Leaf size=28

$$\frac{\tan^{-1}\left(\frac{x+1}{\sqrt{3}\sqrt{x^2+2x+5}}\right)}{\sqrt{3}}$$

```
[Out] ArcTan[(1 + x)/(Sqrt[3]*Sqrt[5 + 2*x + x^2])]/Sqrt[3]
```

Rubi [A] time = 0.0449474, antiderivative size = 28, 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

$$\frac{\tan^{-1}\left(\frac{x+1}{\sqrt{3}\sqrt{x^2+2x+5}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((4 + 2*x + x^2)*Sqrt[5 + 2*x + x^2]),x]

[Out] ArcTan[(1 + x)/(Sqrt[3]*Sqrt[5 + 2*x + x^2])]/Sqrt[3]
```

Rubi in Sympy [A] time = 15.435, size = 31, normalized size = 1.11

$$\frac{\sqrt{3}\operatorname{atan}\left(\frac{\sqrt{3}(2x+2)}{6\sqrt{x^2+2x+5}}\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**2+2*x+4)/(x**2+2*x+5)**(1/2),x)

[Out] sqrt(3)*atan(sqrt(3)*(2*x + 2)/(6*sqrt(x**2 + 2*x + 5)))/3
```

Mathematica [A] time = 0.0626008, size = 28, normalized size = 1.

$$\frac{\tan^{-1}\left(\frac{x+1}{\sqrt{3}\sqrt{x^2+2x+5}}\right)}{\sqrt{3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((4 + 2*x + x^2)*Sqrt[5 + 2*x + x^2]),x]

[Out] ArcTan[(1 + x)/(Sqrt[3]*Sqrt[5 + 2*x + x^2])]/Sqrt[3]
```

Maple [A] time = 0.019, size = 27, normalized size = 1.

$$\frac{\sqrt{3}}{3}\arctan\left(\frac{\sqrt{3}(2x+2)}{6}\frac{1}{\sqrt{x^2+2x+5}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^2+2*x+4)/(x^2+2*x+5)^(1/2),x)
```

```
[Out] 1/3*3^(1/2)*arctan(1/6*3^(1/2)/(x^2+2*x+5)^(1/2)*(2*x+2))
```

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

$$\int \frac{1}{\sqrt{x^2 + 2\,x + 5}(x^2 + 2\,x + 4)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)), x)
```

Fricas [A] time = 0.274123, size = 51, normalized size = 1.82

$$\frac{1}{3}\,\sqrt{3}\arctan\left(\frac{1}{3}\,\sqrt{3}\sqrt{x^2 + 2\,x + 5}(x + 1) - \frac{1}{3}\,\sqrt{3}\left(x^2 + 2\,x + 4\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(3)*arctan(1/3*sqrt(3)*sqrt(x^2 + 2*x + 5)*(x + 1) - 1/3*
sqrt(3)*(x^2 + 2*x + 4))
```

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

$$\int \frac{1}{(x^2 + 2x + 4)\sqrt{x^2 + 2x + 5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**2+2*x+4)/(x**2+2*x+5)**(1/2),x)
```

```
[Out] Integral(1/((x**2 + 2*x + 4)*sqrt(x**2 + 2*x + 5)), x)
```

GIAC/XCAS [A] time = 0.265977, size = 70, normalized size = 2.5

$$-\frac{1}{3}\,\sqrt{3}\arctan\left(-\frac{1}{3}\,\sqrt{3}\left(x - \sqrt{x^2 + 2\,x + 5} + 2\right)\right) + \frac{1}{3}\,\sqrt{3}\arctan\left(-\frac{1}{3}\,\sqrt{3}\left(x - \sqrt{x^2 + 2\,x + 5}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(x^2 + 2*x + 5)*(x^2 + 2*x + 4)),x, algorithm="giac")
```

```
[Out] -1/3*sqrt(3)*arctan(-1/3*sqrt(3)*(x - sqrt(x^2 + 2*x + 5) + 2)) +
 1/3*sqrt(3)*arctan(-1/3*sqrt(3)*(x - sqrt(x^2 + 2*x + 5)))
```

3.9 $\int \left(a+\frac{ex}{2}+cx^2\right)^p \left(2a+ex+2cx^2\right)^q \, dx$

Optimal. Leaf size=136

$$-\frac{2^{q+1}\left(-\frac{-\sqrt{e^2-16ac}+4cx+e}{\sqrt{e^2-16ac}}\right)^{-p-q-1}\left(2a+2cx^2+ex\right)^{p+q+1}{}_2F_1\left(-p-q,p+q+1;p+q+2;\frac{e+4cx+\sqrt{e^2-16ac}}{2\sqrt{e^2-16ac}}\right)}{(p+q+1)\sqrt{e^2-16ac}}$$

```
[Out] -((2^(1 + q)*(-((e - Sqrt[-16*a*c + e^2] + 4*c*x)/Sqrt[-16*a*c +
e^2]))^(-1 - p - q)*(2*a + e*x + 2*c*x^2)^(1 + p + q)*Hypergeomet
ric2F1[-p - q, 1 + p + q, 2 + p + q, (e + Sqrt[-16*a*c + e^2] + 4
*c*x)/(2*Sqrt[-16*a*c + e^2])])/(Sqrt[-16*a*c + e^2]*(1 + p + q))
)
```

Rubi [A] time = 0.221949, antiderivative size = 136, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 31, $\frac{\text{number of rules}}{\text{integrand size}} = 0.065$

$$-\frac{2^{q+1}\left(-\frac{-\sqrt{e^2-16ac}+4cx+e}{\sqrt{e^2-16ac}}\right)^{-p-q-1}\left(2a+2cx^2+ex\right)^{p+q+1}{}_2F_1\left(-p-q,p+q+1;p+q+2;\frac{e+4cx+\sqrt{e^2-16ac}}{2\sqrt{e^2-16ac}}\right)}{(p+q+1)\sqrt{e^2-16ac}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + (e*x)/2 + c*x^2)^p*(2*a + e*x + 2*c*x^2)^q,x]
```

```
[Out] -((2^(1 + q)*(-((e - Sqrt[-16*a*c + e^2] + 4*c*x)/Sqrt[-16*a*c +
e^2]))^(-1 - p - q)*(2*a + e*x + 2*c*x^2)^(1 + p + q)*Hypergeomet
ric2F1[-p - q, 1 + p + q, 2 + p + q, (e + Sqrt[-16*a*c + e^2] + 4
*c*x)/(2*Sqrt[-16*a*c + e^2])])/(Sqrt[-16*a*c + e^2]*(1 + p + q))
)
```

Rubi in Sympy [A] time = 28.2806, size = 126, normalized size = 0.93

$$-\frac{2^{-p}\left(\frac{-2cx-\frac{e}{2}+\frac{\sqrt{-16ac+e^2}}{2}}{\sqrt{-16ac+e^2}}\right)^{-p-q-1}\left(2a+2cx^2+ex\right)^{p+q+1}{}_2F_1\left(\begin{matrix}-p-q,p+q+1\\ p+q+2\end{matrix}\middle|\frac{2cx+\frac{e}{2}+\frac{\sqrt{-16ac+e^2}}{2}}{\sqrt{-16ac+e^2}}\right)}{\sqrt{-16ac+e^2}\,(p+q+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+1/2*e*x+c*x**2)**p*(2*c*x**2+e*x+2*a)**q,x)
```

```
[Out] -2**(-p)*((-2*c*x - e/2 + sqrt(-16*a*c + e**2)/2)/sqrt(-16*a*c +
e**2))**(-p - q - 1)*(2*a + 2*c*x**2 + e*x)**(p + q + 1)*hyper((-
p - q, p + q + 1), (p + q + 2,), (2*c*x + e/2 + sqrt(-16*a*c + e*
*2)/2)/sqrt(-16*a*c + e**2))/(sqrt(-16*a*c + e**2)*(p + q + 1))
```

Mathematica [A] time = 0.243209, size = 142, normalized size = 1.04

$$\frac{2^{q-2}\left(-\sqrt{e^2-16ac}+4cx+e\right)\left(\frac{\sqrt{e^2-16ac}+4cx+e}{\sqrt{e^2-16ac}}\right)^{-p-q}(2a+x(2cx+e))^{p+q}\,{}_2F_1\left(-p-q,p+q+1;p+q+2;\frac{-e-4cx+\sqrt{e^2-16ac}}{2\sqrt{e^2-16ac}}\right)}{c(p+q+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + (e*x)/2 + c*x^2)^p*(2*a + e*x + 2*c*x^2)^q,x]
```

```
[Out] (2^(-2 + q)*(e - Sqrt[-16*a*c + e^2] + 4*c*x)*((e + Sqrt[-16*a*c
+ e^2] + 4*c*x)/Sqrt[-16*a*c + e^2])^(-p - q)*(2*a + x*(e + 2*c*x
))^(p + q)*Hypergeometric2F1[-p - q, 1 + p + q, 2 + p + q, (-e +
Sqrt[-16*a*c + e^2] - 4*c*x)/(2*Sqrt[-16*a*c + e^2])])/(c*(1 + p
+ q))
```

Maple [F] time = 0.353, size = 0, normalized size = 0.

$$\int \left(a+\frac{ex}{2}+cx^2\right)^p \left(2\,cx^2+ex+2\,a\right)^q\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+1/2*e*x+c*x^2)^p*(2*c*x^2+e*x+2*a)^q,x)
```

```
[Out] int((a+1/2*e*x+c*x^2)^p*(2*c*x^2+e*x+2*a)^q,x)
```

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

$$\int \left(2\,cx^2+ex+2\,a\right)^q \left(cx^2+\frac{1}{2}\,ex+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p,x, algorithm="maxima")
```

```
[Out] integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p, x)
```

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

$$\text{integral}\left(\left(2\,cx^2+ex+2\,a\right)^q \left(cx^2+\frac{1}{2}\,ex+a\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p,x, algorithm="fricas")
```

```
[Out] integral((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + 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((a+1/2*e*x+c*x**2)**p*(2*c*x**2+e*x+2*a)**q,x)
```

```
[Out] Timed out
```

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

$$\int (2\,cx^2 + ex + 2\,a)^q \left(cx^2 + \frac{1}{2}\,ex + a\right)^p dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p,x, algorithm="giac")
```

```
[Out] integrate((2*c*x^2 + e*x + 2*a)^q*(c*x^2 + 1/2*e*x + a)^p, x)
```

3.10 $\int \left(a+\frac{cex}{f}+cx^2\right)^p \left(\frac{af}{c}+ex+fx^2\right)^q\,dx$

Optimal. Leaf size=200

$$-\frac{\sqrt{c}2^{p+q+1}\left(a+\frac{cex}{f}+cx^2\right)^p\left(\frac{af}{c}+ex+fx^2\right)^{q+1}\left(-\frac{\sqrt{c}\left(-\frac{\sqrt{ce^2-4af^2}}{\sqrt{c}}+e+2fx\right)}{\sqrt{ce^2-4af^2}}\right)^{-p-q-1}{}_2F_1\left(-p-q,p+q+1;p+q+2;\frac{\sqrt{c}\left(e+2fx\ldots\right.}{2\sqrt{ce\ldots}}\right.}{(p+q+1)\sqrt{ce^2-4af^2}}$$

```
[Out] -((2^(1 + p + q)*Sqrt[c]*(-((Sqrt[c]*(e - Sqrt[c*e^2 - 4*a*f^2]/S
qrt[c] + 2*f*x))/Sqrt[c*e^2 - 4*a*f^2]))^(-1 - p - q)*(a + (c*e*x
)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^(1 + q)*Hypergeometric2F1[
-p - q, 1 + p + q, 2 + p + q, (Sqrt[c]*(e + Sqrt[c*e^2 - 4*a*f^2]
/Sqrt[c] + 2*f*x))/(2*Sqrt[c*e^2 - 4*a*f^2])])/(Sqrt[c*e^2 - 4*a*
f^2]*(1 + p + q)))
```

Rubi [A] time = 0.296575, antiderivative size = 200, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 2, integrand size = 34, $\frac{\text{number of rules}}{\text{integrand size}} = 0.059$

$$-\frac{\sqrt{c}2^{p+q+1}\left(a+\frac{cex}{f}+cx^2\right)^p\left(\frac{af}{c}+ex+fx^2\right)^{q+1}\left(-\frac{\sqrt{c}\left(-\frac{\sqrt{ce^2-4af^2}}{\sqrt{c}}+e+2fx\right)}{\sqrt{ce^2-4af^2}}\right)^{-p-q-1}{}_2F_1\left(-p-q,p+q+1;p+q+2;\frac{\sqrt{c}\left(e+2fx\ldots\right.}{2\sqrt{ce\ldots}}\right.}{(p+q+1)\sqrt{ce^2-4af^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(a + (c*e*x)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^q,x]
```

```
[Out] -((2^(1 + p + q)*Sqrt[c]*(-((Sqrt[c]*(e - Sqrt[c*e^2 - 4*a*f^2]/S
qrt[c] + 2*f*x))/Sqrt[c*e^2 - 4*a*f^2]))^(-1 - p - q)*(a + (c*e*x
)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^(1 + q)*Hypergeometric2F1[
-p - q, 1 + p + q, 2 + p + q, (Sqrt[c]*(e + Sqrt[c*e^2 - 4*a*f^2]
/Sqrt[c] + 2*f*x))/(2*Sqrt[c*e^2 - 4*a*f^2])])/(Sqrt[c*e^2 - 4*a*
f^2]*(1 + p + q)))
```

Rubi in Sympy [A] time = 43.4744, size = 194, normalized size = 0.97

$$-\frac{f\left(\frac{-\frac{\sqrt{c}e}{2}-\sqrt{c}fx+\frac{\sqrt{-4af^2+ce^2}}{2}}{\sqrt{-4af^2+ce^2}}\right)^{-p-q-1}\left(a+\frac{cex}{f}+cx^2\right)^{-q}\left(a+\frac{cex}{f}+cx^2\right)^{p+q+1}\left(\frac{af}{c}+ex+fx^2\right)^q{}_2F_1\left(\begin{matrix}-p-q,p+q+1\\p+q+2\end{matrix}\middle|\frac{\frac{\sqrt{c}e}{2}+\sqrt{c}\ldots}{\sqrt{-\ldots}}\right.}{\sqrt{c}\sqrt{-4af^2+ce^2}\,(p+q+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((a+c*e*x/f+c*x**2)**p*(a*f/c+e*x+f*x**2)**q,x)
```

```
[Out] -f*((-sqrt(c)*e/2 - sqrt(c)*f*x + sqrt(-4*a*f**2 + c*e**2)/2)/sqr
t(-4*a*f**2 + c*e**2))**(-p - q - 1)*(a + c*e*x/f + c*x**2)**(-q)
*(a + c*e*x/f + c*x**2)**(p + q + 1)*(a*f/c + e*x + f*x**2)**q*hy
per((-p - q, p + q + 1), (p + q + 2,), (sqrt(c)*e/2 + sqrt(c)*f*x
 + sqrt(-4*a*f**2 + c*e**2)/2)/sqrt(-4*a*f**2 + c*e**2))/(sqrt(c)
*sqrt(-4*a*f**2 + c*e**2)*(p + q + 1))
```

Mathematica [A] time = 0.452786, size = 172, normalized size = 0.86

$$\frac{2^{p+q-1}\left(\sqrt{c}(e+2fx)-\sqrt{ce^2-4af^2}\right)\left(a+\frac{cx(e+fx)}{f}\right)^p\left(\frac{af}{c}+x(e+fx)\right)^q\left(\frac{\sqrt{c}(e+2fx)}{\sqrt{ce^2-4af^2}}+1\right)^{-p-q}{}_2F_1\left(-p-q,p+q+1;p+q\right.}{\sqrt{c}f(p+q+1)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(a + (c*e*x)/f + c*x^2)^p*((a*f)/c + e*x + f*x^2)^q,x]
```

```
[Out] (2^(-1 + p + q)*((a*f)/c + x*(e + f*x))^q*(a + (c*x*(e + f*x))/f)
^p*(-Sqrt[c*e^2 - 4*a*f^2] + Sqrt[c]*(e + 2*f*x))*(1 + (Sqrt[c]*(
e + 2*f*x))/Sqrt[c*e^2 - 4*a*f^2])^(-p - q)*Hypergeometric2F1[-p
- q, 1 + p + q, 2 + p + q, 1/2 - (Sqrt[c]*(e + 2*f*x))/(2*Sqrt[c*
e^2 - 4*a*f^2])])/(Sqrt[c]*f*(1 + p + q))
```

Maple [F] time = 0.409, size = 0, normalized size = 0.

$$\int \left(a+\frac{cex}{f}+cx^2\right)^p\left(\frac{fa}{c}+ex+fx^2\right)^q\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((a+c*e*x/f+c*x^2)^p*(a*f/c+e*x+f*x^2)^q,x)
```

```
[Out] int((a+c*e*x/f+c*x^2)^p*(a*f/c+e*x+f*x^2)^q,x)
```

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

$$\int \left(cx^2+\frac{cex}{f}+a\right)^p\left(fx^2+ex+\frac{af}{c}\right)^q\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q,x, algorithm="maxima")
```

```
[Out] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q, x)
```

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

$$\text{integral}\left(\left(\frac{cfx^2+cex+af}{c}\right)^q\left(\frac{cfx^2+cex+af}{f}\right)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q,x, algorithm="fricas")
```

```
[Out] integral((((c*f*x^2 + c*e*x + a*f)/c)^q*((c*f*x^2 + c*e*x + a*f)/f
)^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((a+c*e*x/f+c*x**2)**p*(a*f/c+e*x+f*x**2)**q,x)
```

```
[Out] Timed out
```

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

$$\int \left(cx^2 + \frac{cex}{f} + a\right)^p \left(fx^2 + ex + \frac{af}{c}\right)^q dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q,x, algorithm="giac")
```

```
[Out] integrate((c*x^2 + c*e*x/f + a)^p*(f*x^2 + e*x + a*f/c)^q, x)
```

3.11 $\int \frac{\sqrt{1+2x+x^2}}{\sqrt{1+x^2}}\,dx$

Optimal. Leaf size=48

$$\frac{\sqrt{x^2+1}\sqrt{x^2+2x+1}}{x+1}+\frac{\sqrt{x^2+2x+1}\,\sinh^{-1}(x)}{x+1}$$

```
[Out] (Sqrt[1 + x^2]*Sqrt[1 + 2*x + x^2])/(1 + x) + (Sqrt[1 + 2*x + x^2
]*ArcSinh[x])/(1 + x)
```

Rubi [A] time = 0.0523703, antiderivative size = 48, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$

$$\frac{\sqrt{x^2+1}\sqrt{x^2+2x+1}}{x+1}+\frac{\sqrt{x^2+2x+1}\,\sinh^{-1}(x)}{x+1}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[1 + 2*x + x^2]/Sqrt[1 + x^2],x]
```

```
[Out] (Sqrt[1 + x^2]*Sqrt[1 + 2*x + x^2])/(1 + x) + (Sqrt[1 + 2*x + x^2
]*ArcSinh[x])/(1 + x)
```

Rubi in Sympy [A] time = 11.459, size = 41, normalized size = 0.85

$$\frac{\sqrt{x^2+1}\sqrt{x^2+2x+1}}{x+1}+\frac{\sqrt{x^2+2x+1}\,\operatorname{asinh}(x)}{x+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(((1+x)**2)**(1/2)/(x**2+1)**(1/2),x)
```

```
[Out] sqrt(x**2 + 1)*sqrt(x**2 + 2*x + 1)/(x + 1) + sqrt(x**2 + 2*x + 1
)*asinh(x)/(x + 1)
```

Mathematica [A] time = 0.0266927, size = 27, normalized size = 0.56

$$\frac{\sqrt{(x+1)^2}\left(\sqrt{x^2+1}+\sinh^{-1}(x)\right)}{x+1}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[1 + 2*x + x^2]/Sqrt[1 + x^2],x]
```

```
[Out] (Sqrt[(1 + x)^2]*(Sqrt[1 + x^2] + ArcSinh[x]))/(1 + x)
```

Maple [C] time = 0.103, size = 16, normalized size = 0.3

$$csgn(1+x)\left(Arcsinh(x)+\sqrt{x^2+1}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(((1+x)^2)^(1/2)/(x^2+1)^(1/2),x)
```

```
[Out] csgn(1+x)*(arcsinh(x)+(x^2+1)^(1/2))
```

Maxima [A] time = 0.783481, size = 14, normalized size = 0.29

$$\sqrt{x^2+1}+\operatorname{arsinh}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((x + 1)^2)/sqrt(x^2 + 1),x, algorithm="maxima")
```

```
[Out] sqrt(x^2 + 1) + arcsinh(x)
```

Fricas [A] time = 0.2603, size = 73, normalized size = 1.52

$$-\frac{x^2+\left(x-\sqrt{x^2+1}\right)\log\left(-x+\sqrt{x^2+1}\right)-\sqrt{x^2+1}x+1}{x-\sqrt{x^2+1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((x + 1)^2)/sqrt(x^2 + 1),x, algorithm="fricas")
```

```
[Out] -(x^2 + (x - sqrt(x^2 + 1))*log(-x + sqrt(x^2 + 1)) - sqrt(x^2 +
1)*x + 1)/(x - sqrt(x^2 + 1))
```

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

$$\int\frac{\sqrt{(x+1)^2}}{\sqrt{x^2+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(((1+x)**2)**(1/2)/(x**2+1)**(1/2),x)
```

```
[Out] Integral(sqrt((x + 1)**2)/sqrt(x**2 + 1), x)
```

GIAC/XCAS [A] time = 0.267339, size = 66, normalized size = 1.38

$$-\left(\sqrt{2}-\ln\left(\sqrt{2}+1\right)\right)\operatorname{sign}(x+1)-\ln\left(-x+\sqrt{x^2+1}\right)\operatorname{sign}(x+1)+\sqrt{x^2+1}\operatorname{sign}(x+1)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt((x + 1)^2)/sqrt(x^2 + 1),x, algorithm="giac")
```

```
[Out] -(sqrt(2) - ln(sqrt(2) + 1))*sign(x + 1) - ln(-x + sqrt(x^2 + 1))
*sign(x + 1) + sqrt(x^2 + 1)*sign(x + 1)
```

3.12 $\int \frac{1}{(-1+x^2)^2\sqrt{-1+x+x^2}}\,dx$

Optimal. Leaf size=70

$$\frac{\sqrt{x^2+x-1}}{2(1-x^2)}-\frac{1}{8}\tan^{-1}\left(\frac{x+3}{2\sqrt{x^2+x-1}}\right)-\frac{5}{8}\tanh^{-1}\left(\frac{1-3x}{2\sqrt{x^2+x-1}}\right)$$

```
[Out] Sqrt[-1 + x + x^2]/(2*(1 - x^2)) - ArcTan[(3 + x)/(2*Sqrt[-1 + x
+ x^2])]/8 - (5*ArcTanh[(1 - 3*x)/(2*Sqrt[-1 + x + x^2])])/8
```

Rubi [A] time = 0.124569, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.278$

$$\frac{\sqrt{x^2+x-1}}{2(1-x^2)}-\frac{1}{8}\tan^{-1}\left(\frac{x+3}{2\sqrt{x^2+x-1}}\right)-\frac{5}{8}\tanh^{-1}\left(\frac{1-3x}{2\sqrt{x^2+x-1}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/((-1 + x^2)^2*Sqrt[-1 + x + x^2]),x]
```

```
[Out] Sqrt[-1 + x + x^2]/(2*(1 - x^2)) - ArcTan[(3 + x)/(2*Sqrt[-1 + x
+ x^2])]/8 - (5*ArcTanh[(1 - 3*x)/(2*Sqrt[-1 + x + x^2])])/8
```

Rubi in Sympy [A] time = 22.1084, size = 60, normalized size = 0.86

$$-\frac{\operatorname{atan}\left(-\frac{-x-3}{2\sqrt{x^2+x-1}}\right)}{8}+\frac{5\operatorname{atanh}\left(\frac{3x-1}{2\sqrt{x^2+x-1}}\right)}{8}+\frac{\sqrt{x^2+x-1}}{2(-x^2+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(x**2-1)**2/(x**2+x-1)**(1/2),x)
```

```
[Out] -atan(-(-x - 3)/(2*sqrt(x**2 + x - 1)))/8 + 5*atanh((3*x - 1)/(2*
sqrt(x**2 + x - 1)))/8 + sqrt(x**2 + x - 1)/(2*(-x**2 + 1))
```

Mathematica [A] time = 0.0716154, size = 72, normalized size = 1.03

$$\frac{1}{8}\left(-\frac{4\sqrt{x^2+x-1}}{x^2-1}+5\log\left(-2\sqrt{x^2+x-1}-3x+1\right)-\tan^{-1}\left(\frac{x+3}{2\sqrt{x^2+x-1}}\right)-5\log(1-x)\right)$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((-1 + x^2)^2*Sqrt[-1 + x + x^2]),x]
```

```
[Out] ((-4*Sqrt[-1 + x + x^2])/(-1 + x^2) - ArcTan[(3 + x)/(2*Sqrt[-1 +
 x + x^2])] - 5*Log[1 - x] + 5*Log[1 - 3*x - 2*Sqrt[-1 + x + x^2]
])/8
```

Maple [A] time = 0.026, size = 84, normalized size = 1.2

$$\frac{1}{4+4x}\sqrt{(1+x)^2-2-x}+\frac{1}{8}\arctan\left(\frac{-3-x}{2}\frac{1}{\sqrt{(1+x)^2-2-x}}\right)$$
$$-\frac{1}{-4+4x}\sqrt{(-1+x)^2+3x-2}+\frac{5}{8}Artanh\left(\frac{-1+3x}{2}\frac{1}{\sqrt{(-1+x)^2+3x-2}}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(x^2-1)^2/(x^2+x-1)^(1/2),x)
```

```
[Out] 1/4/(1+x)*((1+x)^2-2-x)^(1/2)+1/8*arctan(1/2*(-3-x)/((1+x)^2-2-x)
^(1/2))-1/4/(-1+x)*((-1+x)^2+3*x-2)^(1/2)+5/8*arctanh(1/2*(-1+3*x
)/((-1+x)^2+3*x-2)^(1/2))
```

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

$$\int \frac{1}{\sqrt{x^2+x-1}(x^2-1)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2), x)
```

Fricas [A] time = 0.272794, size = 348, normalized size = 4.97

$$\frac{32x^3+48x^2+2\left(8x^4+8x^3-11x^2-4\left(2x^3+x^2-2x-1\right)\sqrt{x^2+x-1}-8x+3\right)\arctan\left(-x+\sqrt{x^2+x-1}-1\right)+5\left(8\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2),x, algorithm="fricas")
```

```
[Out] 1/8*(32*x^3 + 48*x^2 + 2*(8*x^4 + 8*x^3 - 11*x^2 - 4*(2*x^3 + x^2
 - 2*x - 1)*sqrt(x^2 + x - 1) - 8*x + 3)*arctan(-x + sqrt(x^2 + x
 - 1) - 1) + 5*(8*x^4 + 8*x^3 - 11*x^2 - 4*(2*x^3 + x^2 - 2*x - 1
)*sqrt(x^2 + x - 1) - 8*x + 3)*log(-x + sqrt(x^2 + x - 1) + 2) -
5*(8*x^4 + 8*x^3 - 11*x^2 - 4*(2*x^3 + x^2 - 2*x - 1)*sqrt(x^2 +
x - 1) - 8*x + 3)*log(-x + sqrt(x^2 + x - 1)) - 4*(8*x^2 + 8*x -
3)*sqrt(x^2 + x - 1) - 16*x - 16)/(8*x^4 + 8*x^3 - 11*x^2 - 4*(2*
x^3 + x^2 - 2*x - 1)*sqrt(x^2 + x - 1) - 8*x + 3)
```

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

$$\int \frac{1}{(x-1)^2(x+1)^2\sqrt{x^2+x-1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(x**2-1)**2/(x**2+x-1)**(1/2),x)
```

```
[Out] Integral(1/((x - 1)**2*(x + 1)**2*sqrt(x**2 + x - 1)), x)
```

GIAC/XCAS [A] time = 0.270882, size = 193, normalized size = 2.76

$$\frac{2\left(x-\sqrt{x^2+x-1}\right)^3+3\left(x-\sqrt{x^2+x-1}\right)^2-x+\sqrt{x^2+x-1}-1}{2\left(\left(x-\sqrt{x^2+x-1}\right)^4-2\left(x-\sqrt{x^2+x-1}\right)^2-4x+4\sqrt{x^2+x-1}\right)}+\frac{1}{4}\arctan\left(-x+\sqrt{x^2+x-1}-1\right)+\frac{5}{8}\ln\left(\left|-x+\sqrt{x^2+x-1}+2\right|\right)-\frac{5}{8}\ln\left(\left|-x+\sqrt{x^2+x-1}\right|\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(x^2 + x - 1)*(x^2 - 1)^2),x, algorithm="giac")
```

```
[Out] 1/2*(2*(x - sqrt(x^2 + x - 1))^3 + 3*(x - sqrt(x^2 + x - 1))^2 -
x + sqrt(x^2 + x - 1) - 1)/((x - sqrt(x^2 + x - 1))^4 - 2*(x - sq
rt(x^2 + x - 1))^2 - 4*x + 4*sqrt(x^2 + x - 1)) + 1/4*arctan(-x +
 sqrt(x^2 + x - 1) - 1) + 5/8*ln(abs(-x + sqrt(x^2 + x - 1) + 2))
 - 5/8*ln(abs(-x + sqrt(x^2 + x - 1)))
```

3.13 $\int \frac{1}{\sqrt{a+bx+cx^2}\sqrt{d+fx^2}}\,dx$

Optimal. Leaf size=1077

result too large to display

```
[Out] -(((b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d - a*f))^(1/4)*(b + S
qrt[b^2 - 4*a*c] + 2*c*x)^(3/2)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c]
)*x]*Sqrt[((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)^2*(d + f*x^2))/(((
b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*
c*x)^2)]*(1 + (Sqrt[2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])
*f]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*Sqrt[b^2 -
 4*a*c]*d - 2*a*(c*d - a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))*Sq
rt[(1 - (4*(b + Sqrt[b^2 - 4*a*c])*(c*d + a*f)*(2*a + (b + Sqrt[b
^2 - 4*a*c])*x))/(((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sq
rt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d + (b + Sqrt[b^2 - 4*a*c])^2
*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 - 4*a*c]
)^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2))/(1 + (Sqrt[2
*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f]*(2*a + (b + Sqrt[
b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d
- a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))^2]*EllipticF[2*ArcTan[(
(2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f)^(1/4)*Sqrt[2*a
+ (b + Sqrt[b^2 - 4*a*c])*x])/((b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2
*a*(c*d - a*f))^(1/4)*Sqrt[b + Sqrt[b^2 - 4*a*c] + 2*c*x])], (1 +
 ((b + Sqrt[b^2 - 4*a*c])*(c*d + a*f))/(Sqrt[2*c^2*d - 2*a*c*f +
b*(b + Sqrt[b^2 - 4*a*c])*f]*Sqrt[b^2*d + b*Sqrt[b^2 - 4*a*c]*d -
 2*a*(c*d - a*f)]))/2])/((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)*(2*c
^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f)^(1/4)*Sqrt[a + b*x
+ c*x^2]*Sqrt[d + f*x^2]*Sqrt[1 - (4*(b + Sqrt[b^2 - 4*a*c])*(c*d
 + a*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(((b + Sqrt[b^2 - 4*a*
c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d +
 (b + Sqrt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2
)/(((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c]
 + 2*c*x)^2)]))
```

Rubi [A] time = 6.6378, antiderivative size = 1077, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.115$

$$-\frac{\sqrt[4]{db^2+\sqrt{b^2-4ac}\,db-2a(cd-af)}\left(b+2cx+\sqrt{b^2-4ac}\right)^{3/2}\sqrt{2a+\left(b+\sqrt{b^2-4ac}\right)x}\sqrt{\frac{\left(4ac-\left(b+\sqrt{b^2-4ac}\right)^2\right)^2(fx^2+d)}{\left(4fa^2+\left(b+\sqrt{b^2-4ac}\right)^2d\right)\left(b+2cx+\sqrt{b^2-\cdots\right.}}\cdots}{\cdots\left(4ac-\left(b+\sqrt{b^2-4\cdots\right.\right.}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + f*x^2]),x]
```


```
[Out] -(((b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d - a*f))^(1/4)*(b + S
qrt[b^2 - 4*a*c] + 2*c*x)^(3/2)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c]
)*x]*Sqrt[((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)^2*(d + f*x^2))/(((
b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*
c*x)^2)]*(1 + (Sqrt[2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])
*f]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*Sqrt[b^2 -
 4*a*c]*d - 2*a*(c*d - a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))*Sq
rt[(1 - (4*(b + Sqrt[b^2 - 4*a*c])*(c*d + a*f)*(2*a + (b + Sqrt[b
^2 - 4*a*c])*x))/(((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sq
rt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d + (b + Sqrt[b^2 - 4*a*c])^2
*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 - 4*a*c]
)^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2))/(1 + (Sqrt[2
*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f]*(2*a + (b + Sqrt[
```

```
b^2 - 4*a*c])*x))/(Sqrt[b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2*a*(c*d
- a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))^2]*EllipticF[2*ArcTan[(
(2*c^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f)^(1/4)*Sqrt[2*a
+ (b + Sqrt[b^2 - 4*a*c])*x])/((b^2*d + b*Sqrt[b^2 - 4*a*c]*d - 2
*a*(c*d - a*f))^(1/4)*Sqrt[b + Sqrt[b^2 - 4*a*c] + 2*c*x])], (1 +
 ((b + Sqrt[b^2 - 4*a*c])*(c*d + a*f))/(Sqrt[2*c^2*d - 2*a*c*f +
b*(b + Sqrt[b^2 - 4*a*c])*f]*Sqrt[b^2*d + b*Sqrt[b^2 - 4*a*c]*d -
 2*a*(c*d - a*f)]))/2])/((4*a*c - (b + Sqrt[b^2 - 4*a*c])^2)*(2*c
^2*d - 2*a*c*f + b*(b + Sqrt[b^2 - 4*a*c])*f)^(1/4)*Sqrt[a + b*x
+ c*x^2]*Sqrt[d + f*x^2]*Sqrt[1 - (4*(b + Sqrt[b^2 - 4*a*c])*(c*d
 + a*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(((b + Sqrt[b^2 - 4*a*
c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)) + ((4*c^2*d +
 (b + Sqrt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2
)/(((b + Sqrt[b^2 - 4*a*c])^2*d + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c]
 + 2*c*x)^2)]))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+d)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [C] time = 3.42084, size = 600, normalized size = 0.56

$$-\frac{2\sqrt{2}\left(\sqrt{f}x-i\sqrt{d}\right)\left(\sqrt{b^2-4ac}-b-2cx\right)\sqrt{-\frac{c\sqrt{b^2-4ac}\left(\sqrt{f}x+i\sqrt{d}\right)}{\left(\sqrt{b^2-4ac}-b-2cx\right)\left(\sqrt{f}\left(\sqrt{b^2-4ac}+b\right)-2ic\sqrt{d}\right)}}\sqrt{\frac{c\left(-i\sqrt{d}\left(\sqrt{b^2-4ac}+2cx\right)+\sqrt{f}\left(x\sqrt{b^2-4ac}-2\cdots\right.\right.}{\left(\sqrt{b^2-4ac}-b-2cx\right)\left(\sqrt{f}\left(\sqrt{b^2-4ac}\cdots\right.\right.}}\cdots}{\sqrt{d+fx^2}\sqrt{a+x(b+cx)}\left(\sqrt{f}\left(\sqrt{b^2-4ac}-b\right)-2ic\sqrt{d}\right)\sqrt{\frac{\cdots}{\left(\sqrt{b\cdots\right.}}\cdots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + f*x^2]),x]
```

```
[Out] (-2*Sqrt[2]*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x)*((-I)*Sqrt[d] + Sqrt
[f]*x)*Sqrt[-((c*Sqrt[b^2 - 4*a*c]*(I*Sqrt[d] + Sqrt[f]*x))/(((-2
*I)*c*Sqrt[d] + (b + Sqrt[b^2 - 4*a*c])*Sqrt[f])*(-b + Sqrt[b^2 -
 4*a*c] - 2*c*x)))]*Sqrt[(c*((-I)*Sqrt[d]*(Sqrt[b^2 - 4*a*c] + 2*
c*x) + Sqrt[f]*(-2*a + Sqrt[b^2 - 4*a*c]*x) + b*((-I)*Sqrt[d] - S
qrt[f]*x)))/(((2*I)*c*Sqrt[d] + (b + Sqrt[b^2 - 4*a*c])*Sqrt[f])*
(-b + Sqrt[b^2 - 4*a*c] - 2*c*x))]*EllipticF[ArcSin[Sqrt[(((-2*I)
*c*Sqrt[d] + (-b + Sqrt[b^2 - 4*a*c])*Sqrt[f])*(b + Sqrt[b^2 - 4*
a*c] + 2*c*x))/(((2*I)*c*Sqrt[d] + (b + Sqrt[b^2 - 4*a*c])*Sqrt[f
])*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x))]], (c*d - I*Sqrt[b^2 - 4*a*c
]*Sqrt[d]*Sqrt[f] + a*f)/(c*d + I*Sqrt[b^2 - 4*a*c]*Sqrt[d]*Sqrt[
f] + a*f)])/(((-2*I)*c*Sqrt[d] + (-b + Sqrt[b^2 - 4*a*c])*Sqrt[f]
)*Sqrt[(I*c*Sqrt[b^2 - 4*a*c]*(Sqrt[d] + I*Sqrt[f]*x))/(((2*I)*c*
Sqrt[d] + (b + Sqrt[b^2 - 4*a*c])*Sqrt[f])*(-b + Sqrt[b^2 - 4*a*c
] - 2*c*x))]*Sqrt[d + f*x^2]*Sqrt[a + x*(b + c*x)])
```

Maple [A] time = 0.268, size = 666, normalized size = 0.6

$$4\,\frac{\left(bf^2x^2+2\,x^2cf\sqrt{-df}+\sqrt{-4\,ac+b^2}f^2x^2+2\,xbf\sqrt{-df}-4\,cxfd+2\,xf\sqrt{-4\,ac+b^2}\sqrt{-df}-bdf-2\,cd\sqrt{-df}-\sqrt{-4\,a\cdots}\right.}{\sqrt{-df}\left(-2\sqrt{-df}c+f\sqrt{-4\,ac+b^2}+bf\right)\sqrt{cfx^4+bfx^3+afx^2+cdx^2+bdx+ad}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^2+b*x+a)^(1/2)/(f*x^2+d)^(1/2),x)
```

```
[Out] 4*(b*f^2*x^2+2*x^2*c*f*(-d*f)^(1/2)+(-4*a*c+b^2)^(1/2)*f^2*x^2+2*
x*b*f*(-d*f)^(1/2)-4*c*x*f*d+2*x*f*(-4*a*c+b^2)^(1/2)*(-d*f)^(1/2
)-b*d*f-2*c*d*(-d*f)^(1/2)-(-4*a*c+b^2)^(1/2)*d*f)*EllipticF(((2*
(-d*f)^(1/2)*c-f*(-4*a*c+b^2)^(1/2)-b*f)*(-f*x+(-d*f)^(1/2))/(2*(
-d*f)^(1/2)*c+f*(-4*a*c+b^2)^(1/2)+b*f)/(f*x+(-d*f)^(1/2)))^(1/2)
,((2*(-d*f)^(1/2)*c+f*(-4*a*c+b^2)^(1/2)-b*f)*(2*(-d*f)^(1/2)*c+f
*(-4*a*c+b^2)^(1/2)+b*f)/(2*(-d*f)^(1/2)*c-f*(-4*a*c+b^2)^(1/2)+b
*f)/(2*(-d*f)^(1/2)*c-f*(-4*a*c+b^2)^(1/2)-b*f))^(1/2))*((-d*f)^(
1/2)*(b+2*c*x+(-4*a*c+b^2)^(1/2))*f/(2*(-d*f)^(1/2)*c+f*(-4*a*c+b
^2)^(1/2)+b*f)/(f*x+(-d*f)^(1/2)))^(1/2)*(-(-d*f)^(1/2)*(-2*c*x+(
-4*a*c+b^2)^(1/2)-b)*f/(2*(-d*f)^(1/2)*c-f*(-4*a*c+b^2)^(1/2)+b*f
)/(f*x+(-d*f)^(1/2)))^(1/2)*((2*(-d*f)^(1/2)*c-f*(-4*a*c+b^2)^(1/
2)-b*f)*(-f*x+(-d*f)^(1/2))/(2*(-d*f)^(1/2)*c+f*(-4*a*c+b^2)^(1/2
)+b*f)/(f*x+(-d*f)^(1/2)))^(1/2)*(c*x^2+b*x+a)^(1/2)*(f*x^2+d)^(1
/2)/(1/c/f*(-f*x+(-d*f)^(1/2))*(f*x+(-d*f)^(1/2))*(-2*c*x+(-4*a*c
+b^2)^(1/2)-b)*(b+2*c*x+(-4*a*c+b^2)^(1/2)))^(1/2)/(-d*f)^(1/2)/(
-2*(-d*f)^(1/2)*c+f*(-4*a*c+b^2)^(1/2)+b*f)/(c*f*x^4+b*f*x^3+a*f*
x^2+c*d*x^2+b*d*x+a*d)^(1/2)
```

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)), x)
```

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

$$\text{integral}\left(\frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)), x)
```

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

$$\int \frac{1}{\sqrt{d + fx^2}\sqrt{a + bx + cx^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+d)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(d + f*x**2)*sqrt(a + b*x + c*x**2)), x)
```

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + d)), x)
```

3.14 $\int \frac{\sqrt{-3-4x-x^2}}{3+4x+2x^2}\,dx$

Optimal. Leaf size=98

$$-\frac{\tan^{-1}\left(\frac{1-\frac{x+3}{\sqrt{-x^2-4x-3}}}{\sqrt{2}}\right)}{\sqrt{2}}+\frac{\tan^{-1}\left(\frac{\frac{x+3}{\sqrt{-x^2-4x-3}}+1}{\sqrt{2}}\right)}{\sqrt{2}}-\frac{1}{2}\tanh^{-1}\left(\frac{x}{\sqrt{-x^2-4x-3}}\right)-\frac{1}{2}\sin^{-1}(x+2)$$

```
[Out] -ArcSin[2 + x]/2 - ArcTan[(1 - (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt
[2]]/Sqrt[2] + ArcTan[(1 + (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt[2]]
/Sqrt[2] - ArcTanh[x/Sqrt[-3 - 4*x - x^2]]/2
```

Rubi [A] time = 0.488633, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 16, number of rules used = 12, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444

$$-\frac{\tan^{-1}\left(\frac{1-\frac{x+3}{\sqrt{-x^2-4x-3}}}{\sqrt{2}}\right)}{\sqrt{2}}+\frac{\tan^{-1}\left(\frac{\frac{x+3}{\sqrt{-x^2-4x-3}}+1}{\sqrt{2}}\right)}{\sqrt{2}}-\frac{1}{2}\tanh^{-1}\left(\frac{x}{\sqrt{-x^2-4x-3}}\right)-\frac{1}{2}\sin^{-1}(x+2)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[-3 - 4*x - x^2]/(3 + 4*x + 2*x^2),x]
```

```
[Out] -ArcSin[2 + x]/2 - ArcTan[(1 - (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt
[2]]/Sqrt[2] + ArcTan[(1 + (3 + x)/Sqrt[-3 - 4*x - x^2])/Sqrt[2]]
/Sqrt[2] - ArcTanh[x/Sqrt[-3 - 4*x - x^2]]/2
```

Rubi in Sympy [A] time = 72.3176, size = 116, normalized size = 1.18

$$\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}\left(\frac{3\left(\frac{x}{3}+1\right)}{2\sqrt{-x^2-4x-3}}-\frac{1}{2}\right)\right)}{2}+\frac{\sqrt{2}\,\mathrm{atan}\left(\sqrt{2}\left(\frac{3\left(\frac{x}{3}+1\right)}{2\sqrt{-x^2-4x-3}}+\frac{1}{2}\right)\right)}{2}-\frac{\mathrm{atan}\left(-\frac{-2x-4}{2\sqrt{-x^2-4x-3}}\right)}{2}-\frac{\mathrm{atanh}\left(\frac{x}{\sqrt{-x^2-4x-3}}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((-x**2-4*x-3)**(1/2)/(2*x**2+4*x+3),x)
```

```
[Out] sqrt(2)*atan(sqrt(2)*(3*(x/3 + 1)/(2*sqrt(-x**2 - 4*x - 3)) - 1/2
))/2 + sqrt(2)*atan(sqrt(2)*(3*(x/3 + 1)/(2*sqrt(-x**2 - 4*x - 3)
) + 1/2))/2 - atan(-(-2*x - 4)/(2*sqrt(-x**2 - 4*x - 3)))/2 - ata
nh(x/sqrt(-x**2 - 4*x - 3))/2
```

Mathematica [C] time = 6.27466, size = 1087, normalized size = 11.09

$$-\frac{1}{2}\sin^{-1}(x+2)$$

$$+\frac{i\left(i+2\sqrt{2}\right)\tan^{-1}\left(\frac{6i\sqrt{2}x^4-16x^4+18i\sqrt{1-2i\sqrt{2}}\sqrt{-x^2-4x-3}x^3+68i\sqrt{2}x^3-68x^3+72i\sqrt{1-2i\sqrt{2}}\sqrt{-x^2-4x-3}x^2+185i\sqrt{2}x^2-44x^2+99i\sqrt{1-2i\sqrt{2}}\sqrt{-x^2-4x-3x}}{32\sqrt{2}x^4+66ix^4+208\sqrt{2}x^3+304ix^3+466\sqrt{2}x^2+493ix^2+440\sqrt{2}x+340ix+150\sqrt{2}+93i}\right.}{4\sqrt{1-2i\sqrt{2}}}$$

$$+\frac{i\left(-i+2\sqrt{2}\right)\tan^{-1}\left(\frac{6i\sqrt{2}x^4+16x^4+18i\sqrt{1+2i\sqrt{2}}\sqrt{-x^2-4x-3}x^3+68i\sqrt{2}x^3+68x^3+72i\sqrt{1+2i\sqrt{2}}\sqrt{-x^2-4x-3}x^2+185i\sqrt{2}x^2+44x^2+99i\sqrt{1+2i\sqrt{2}}\sqrt{-x^2-4x-3}}{32\sqrt{2}x^4-66ix^4+208\sqrt{2}x^3-304ix^3+466\sqrt{2}x^2-493ix^2+440\sqrt{2}x-340ix+150\sqrt{2}-9}\right.}{4\sqrt{1+2i\sqrt{2}}}$$

$$-\frac{\left(i+2\sqrt{2}\right)\log\left(\left(-2ix+\sqrt{2}-2i\right)^2\left(2ix+\sqrt{2}+2i\right)^2\right)}{8\sqrt{1-2i\sqrt{2}}}$$

$$-\frac{\left(-i+2\sqrt{2}\right)\log\left(\left(-2ix+\sqrt{2}-2i\right)^2\left(2ix+\sqrt{2}+2i\right)^2\right)}{8\sqrt{1+2i\sqrt{2}}}$$

$$+\frac{\left(i+2\sqrt{2}\right)\log\left(\left(2x^2+4x+3\right)\left(2i\sqrt{2}x^2+2x^2-2\sqrt{2\left(1-2i\sqrt{2}\right)}\sqrt{-x^2-4x-3}x+8i\sqrt{2}x+4x-2\sqrt{2\left(1-2i\sqrt{2}\right)}\sqrt{-x^2-}\right.\right.}{8\sqrt{1-2i\sqrt{2}}}$$

$$+\frac{\left(-i+2\sqrt{2}\right)\log\left(\left(2x^2+4x+3\right)\left(-2i\sqrt{2}x^2+2x^2-2\sqrt{2\left(1+2i\sqrt{2}\right)}\sqrt{-x^2-4x-3}x-8i\sqrt{2}x+4x-2\sqrt{2\left(1+2i\sqrt{2}\right)}\sqrt{-x}\right.\right.}{8\sqrt{1+2i\sqrt{2}}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[-3 - 4*x - x^2]/(3 + 4*x + 2*x^2),x]
```

```
[Out] -ArcSin[2 + x]/2 + ((I/4)*(I + 2*Sqrt[2])*ArcTan[(60 + (51*I)*Sqr
t[2] + 68*x + (176*I)*Sqrt[2]*x - 44*x^2 + (185*I)*Sqrt[2]*x^2 -
68*x^3 + (68*I)*Sqrt[2]*x^3 - 16*x^4 + (6*I)*Sqrt[2]*x^4 + (54*I)
*Sqrt[1 - (2*I)*Sqrt[2]]*Sqrt[-3 - 4*x - x^2] + (99*I)*Sqrt[1 - (
2*I)*Sqrt[2]]*x*Sqrt[-3 - 4*x - x^2] + (72*I)*Sqrt[1 - (2*I)*Sqrt
[2]]*x^2*Sqrt[-3 - 4*x - x^2] + (18*I)*Sqrt[1 - (2*I)*Sqrt[2]]*x^
3*Sqrt[-3 - 4*x - x^2])/(93*I + 150*Sqrt[2] + (340*I)*x + 440*Sqr
t[2]*x + (493*I)*x^2 + 466*Sqrt[2]*x^2 + (304*I)*x^3 + 208*Sqrt[2
]*x^3 + (66*I)*x^4 + 32*Sqrt[2]*x^4)])/Sqrt[1 - (2*I)*Sqrt[2]] +
((I/4)*(-I + 2*Sqrt[2])*ArcTan[(-60 + (51*I)*Sqrt[2] - 68*x + (17
6*I)*Sqrt[2]*x + 44*x^2 + (185*I)*Sqrt[2]*x^2 + 68*x^3 + (68*I)*S
qrt[2]*x^3 + 16*x^4 + (6*I)*Sqrt[2]*x^4 + (54*I)*Sqrt[1 + (2*I)*S
qrt[2]]*Sqrt[-3 - 4*x - x^2] + (99*I)*Sqrt[1 + (2*I)*Sqrt[2]]*x*S
qrt[-3 - 4*x - x^2] + (72*I)*Sqrt[1 + (2*I)*Sqrt[2]]*x^2*Sqrt[-3
- 4*x - x^2] + (18*I)*Sqrt[1 + (2*I)*Sqrt[2]]*x^3*Sqrt[-3 - 4*x -
 x^2])/(-93*I + 150*Sqrt[2] - (340*I)*x + 440*Sqrt[2]*x - (493*I)
*x^2 + 466*Sqrt[2]*x^2 - (304*I)*x^3 + 208*Sqrt[2]*x^3 - (66*I)*x
^4 + 32*Sqrt[2]*x^4)])/Sqrt[1 + (2*I)*Sqrt[2]] - ((-I + 2*Sqrt[2]
)*Log[(-2*I + Sqrt[2] - (2*I)*x)^2*(2*I + Sqrt[2] + (2*I)*x)^2])/
(8*Sqrt[1 + (2*I)*Sqrt[2]]) - ((I + 2*Sqrt[2])*Log[(-2*I + Sqrt[2
] - (2*I)*x)^2*(2*I + Sqrt[2] + (2*I)*x)^2])/(8*Sqrt[1 - (2*I)*Sq
rt[2]]) + ((I + 2*Sqrt[2])*Log[(3 + 4*x + 2*x^2)*(3 + (6*I)*Sqrt[
2] + 4*x + (8*I)*Sqrt[2]*x + 2*x^2 + (2*I)*Sqrt[2]*x^2 - 2*Sqrt[2
*(1 - (2*I)*Sqrt[2])]*Sqrt[-3 - 4*x - x^2] - 2*Sqrt[2*(1 - (2*I)*
Sqrt[2])]*x*Sqrt[-3 - 4*x - x^2])])/(8*Sqrt[1 - (2*I)*Sqrt[2]]) +
 ((-I + 2*Sqrt[2])*Log[(3 + 4*x + 2*x^2)*(3 - (6*I)*Sqrt[2] + 4*x
 - (8*I)*Sqrt[2]*x + 2*x^2 - (2*I)*Sqrt[2]*x^2 - 2*Sqrt[2*(1 + (2
*I)*Sqrt[2])]*Sqrt[-3 - 4*x - x^2] - 2*Sqrt[2*(1 + (2*I)*Sqrt[2])
]*x*Sqrt[-3 - 4*x - x^2])])/(8*Sqrt[1 + (2*I)*Sqrt[2]])
```

Maple [B] time = 0.04, size = 341, normalized size = 3.5

$$-\frac{\arcsin(2+x)}{2}$$
$$+\frac{\sqrt{3}\sqrt{4}}{12}\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}\left(\sqrt{2}\arctan\left(\frac{\sqrt{2}}{6}\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}\right)-Artanh\left(3\frac{x}{-3/2-x}\frac{1}{\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}}\right)\right)\frac{\quad}{\sqrt{1\left(x^2\left(-\right.\right.}}$$
$$-\frac{\sqrt{3}\sqrt{4}\sqrt{2}}{3}\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}\arctan\left(\frac{\sqrt{2}}{6}\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}\right)\frac{1}{\sqrt{1\left(x^2\left(-\frac{3}{2}-x\right)^{-2}-4\right)\left(1+x\left(-\frac{3}{2}-x\right)^{-1}\right)^{-2}}}\left(1+x\right.$$
$$+\frac{\sqrt{3}\sqrt{4}}{6}\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}\left(\sqrt{2}\arctan\left(\frac{\sqrt{2}}{6}\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}\right)+Artanh\left(3\frac{x}{-3/2-x}\frac{1}{\sqrt{3\frac{x^2}{(-3/2-x)^2}-12}}\right)\right)\frac{\quad}{\sqrt{1\left(x^2\left(-\right.\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((-x^2-4*x-3)^(1/2)/(2*x^2+4*x+3),x)
```

```
[Out] -1/2*arcsin(2+x)+1/12*3^(1/2)*4^(1/2)*(3*x^2/(-3/2-x)^2-12)^(1/2)
*(2^(1/2)*arctan(1/6*(3*x^2/(-3/2-x)^2-12)^(1/2)*2^(1/2))-arctanh
(3*x/(-3/2-x)/(3*x^2/(-3/2-x)^2-12)^(1/2)))/((x^2/(-3/2-x)^2-4)/(
1+x/(-3/2-x))^2)^(1/2)/(1+x/(-3/2-x))-1/3*3^(1/2)*4^(1/2)/((x^2/(
-3/2-x)^2-4)/(1+x/(-3/2-x))^2)^(1/2)/(1+x/(-3/2-x))*(3*x^2/(-3/2-
x)^2-12)^(1/2)*2^(1/2)*arctan(1/6*(3*x^2/(-3/2-x)^2-12)^(1/2)*2^(
1/2))+1/6*3^(1/2)*4^(1/2)*(3*x^2/(-3/2-x)^2-12)^(1/2)*(2^(1/2)*ar
ctan(1/6*(3*x^2/(-3/2-x)^2-12)^(1/2)*2^(1/2))+arctanh(3*x/(-3/2-x
)/(3*x^2/(-3/2-x)^2-12)^(1/2)))/((x^2/(-3/2-x)^2-4)/(1+x/(-3/2-x)
)^2)^(1/2)/(1+x/(-3/2-x))
```

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

$$\int \frac{\sqrt{-x^2-4x-3}}{2x^2+4x+3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3), x)
```

Fricas [A] time = 0.28974, size = 213, normalized size = 2.17

$$-\frac{1}{16}\sqrt{2}\left(4\sqrt{2}\arctan\left(\frac{x+2}{\sqrt{-x^2-4x-3}}\right)-\sqrt{2}\log\left(-\frac{2\sqrt{-x^2-4x-3}x+4x+3}{x^2}\right)+\sqrt{2}\log\left(\frac{2\sqrt{-x^2-4x-3}x-4x-3}{x^2}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3),x, algorithm="fricas")
```

```
[Out] -1/16*sqrt(2)*(4*sqrt(2)*arctan((x + 2)/sqrt(-x^2 - 4*x - 3)) - s
qrt(2)*log(-(2*sqrt(-x^2 - 4*x - 3)*x + 4*x + 3)/x^2) + sqrt(2)*l
og((2*sqrt(-x^2 - 4*x - 3)*x - 4*x - 3)/x^2) + 4*arctan(1/2*(sqrt
(2)*x + 3*sqrt(2)*sqrt(-x^2 - 4*x - 3))/(2*x + 3)) + 4*arctan(-1/
2*(sqrt(2)*x - 3*sqrt(2)*sqrt(-x^2 - 4*x - 3))/(2*x + 3)))
```

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

$$\int \frac{\sqrt{-(x+1)(x+3)}}{2x^2+4x+3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((-x**2-4*x-3)**(1/2)/(2*x**2+4*x+3),x)
```

```
[Out] Integral(sqrt(-(x + 1)*(x + 3))/(2*x**2 + 4*x + 3), x)
```

GIAC/XCAS [A] time = 0.272664, size = 231, normalized size = 2.36

$$-\frac{1}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\frac{3\left(\sqrt{-x^2-4x-3}-1\right)}{x+2}+1\right)\right) - \frac{1}{2}\sqrt{2}\arctan\left(\frac{1}{2}\sqrt{2}\left(\frac{\sqrt{-x^2-4x-3}-1}{x+2}+1\right)\right) - \frac{1}{2}\arcsin(x+2) - \frac{1}{4}\ln\left(\frac{2\left(\sqrt{-x^2-4x-3}-1\right)}{x+2}+\frac{3\left(\sqrt{-x^2-4x-3}-1\right)^2}{(x+2)^2}+1\right) + \frac{1}{4}\ln\left(\frac{2\left(\sqrt{-x^2-4x-3}-1\right)}{x+2}+\frac{\left(\sqrt{-x^2-4x-3}-1\right)^2}{(x+2)^2}+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(-x^2 - 4*x - 3)/(2*x^2 + 4*x + 3),x, algorithm="giac")
```

```
[Out] -1/2*sqrt(2)*arctan(1/2*sqrt(2)*(3*(sqrt(-x^2 - 4*x - 3) - 1)/(x
+ 2) + 1)) - 1/2*sqrt(2)*arctan(1/2*sqrt(2)*((sqrt(-x^2 - 4*x - 3
) - 1)/(x + 2) + 1)) - 1/2*arcsin(x + 2) - 1/4*ln(2*(sqrt(-x^2 -
4*x - 3) - 1)/(x + 2) + 3*(sqrt(-x^2 - 4*x - 3) - 1)^2/(x + 2)^2
+ 1) + 1/4*ln(2*(sqrt(-x^2 - 4*x - 3) - 1)/(x + 2) + (sqrt(-x^2 -
 4*x - 3) - 1)^2/(x + 2)^2 + 3)
```

3.15 $\int (3-x+2x^2)\left(2+3x+5x^2\right)^4\,dx$

Optimal. Leaf size=68

$$\frac{1250x^{11}}{11}+\frac{475x^{10}}{2}+\frac{5075x^9}{9}+\frac{3415x^8}{4}+1176x^7+\frac{2377x^6}{2}+\frac{5099x^5}{5}+656x^4+\frac{1064x^3}{3}+136x^2+48x$$

```
[Out] 48*x + 136*x^2 + (1064*x^3)/3 + 656*x^4 + (5099*x^5)/5 + (2377*x^
6)/2 + 1176*x^7 + (3415*x^8)/4 + (5075*x^9)/9 + (475*x^10)/2 + (1
250*x^11)/11
```

Rubi [A] time = 0.0795423, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.043

$$\frac{1250x^{11}}{11}+\frac{475x^{10}}{2}+\frac{5075x^9}{9}+\frac{3415x^8}{4}+1176x^7+\frac{2377x^6}{2}+\frac{5099x^5}{5}+656x^4+\frac{1064x^3}{3}+136x^2+48x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] 48*x + 136*x^2 + (1064*x^3)/3 + 656*x^4 + (5099*x^5)/5 + (2377*x^
6)/2 + 1176*x^7 + (3415*x^8)/4 + (5075*x^9)/9 + (475*x^10)/2 + (1
250*x^11)/11
```

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

$$\frac{1250x^{11}}{11}+\frac{475x^{10}}{2}+\frac{5075x^9}{9}+\frac{3415x^8}{4}+1176x^7+\frac{2377x^6}{2}+\frac{5099x^5}{5}+656x^4+\frac{1064x^3}{3}+48x+272\int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)*(5*x**2+3*x+2)**4,x)
```

```
[Out] 1250*x**11/11 + 475*x**10/2 + 5075*x**9/9 + 3415*x**8/4 + 1176*x*
*7 + 2377*x**6/2 + 5099*x**5/5 + 656*x**4 + 1064*x**3/3 + 48*x +
272*Integral(x, x)
```

Mathematica [A] time = 0.0049031, size = 68, normalized size = 1.

$$\frac{1250x^{11}}{11}+\frac{475x^{10}}{2}+\frac{5075x^9}{9}+\frac{3415x^8}{4}+1176x^7+\frac{2377x^6}{2}+\frac{5099x^5}{5}+656x^4+\frac{1064x^3}{3}+136x^2+48x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] 48*x + 136*x^2 + (1064*x^3)/3 + 656*x^4 + (5099*x^5)/5 + (2377*x^
6)/2 + 1176*x^7 + (3415*x^8)/4 + (5075*x^9)/9 + (475*x^10)/2 + (1
250*x^11)/11
```

Maple [A] time = 0.002, size = 55, normalized size = 0.8

$$48\,x+136\,x^2+\frac{1064\,x^3}{3}+656\,x^4+\frac{5099\,x^5}{5}+\frac{2377\,x^6}{2}+1176\,x^7+\frac{3415\,x^8}{4}+\frac{5075\,x^9}{9}+\frac{475\,x^{10}}{2}+\frac{1250\,x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((2*x^2-x+3)*(5*x^2+3*x+2)^4,x)
```

```
[Out] 48*x+136*x^2+1064/3*x^3+656*x^4+5099/5*x^5+2377/2*x^6+1176*x^7+34
15/4*x^8+5075/9*x^9+475/2*x^10+1250/11*x^11
```

Maxima [A] time = 0.698285, size = 73, normalized size = 1.07

$$\frac{1250}{11}\,x^{11}+\frac{475}{2}\,x^{10}+\frac{5075}{9}\,x^{9}+\frac{3415}{4}\,x^{8}+1176\,x^{7}+\frac{2377}{2}\,x^{6}+\frac{5099}{5}\,x^{5}+656\,x^{4}+\frac{1064}{3}\,x^{3}+136\,x^{2}+48\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 1250/11*x^11 + 475/2*x^10 + 5075/9*x^9 + 3415/4*x^8 + 1176*x^7 +
2377/2*x^6 + 5099/5*x^5 + 656*x^4 + 1064/3*x^3 + 136*x^2 + 48*x
```

Fricas [A] time = 0.231218, size = 1, normalized size = 0.01

$$\frac{1250}{11}x^{11}+\frac{475}{2}x^{10}+\frac{5075}{9}x^{9}+\frac{3415}{4}x^{8}+1176x^{7}+\frac{2377}{2}x^{6}+\frac{5099}{5}x^{5}+656x^{4}+\frac{1064}{3}x^{3}+136x^{2}+48x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1250/11*x^11 + 475/2*x^10 + 5075/9*x^9 + 3415/4*x^8 + 1176*x^7 +
2377/2*x^6 + 5099/5*x^5 + 656*x^4 + 1064/3*x^3 + 136*x^2 + 48*x
```

Sympy [A] time = 0.068012, size = 65, normalized size = 0.96

$$\frac{1250x^{11}}{11}+\frac{475x^{10}}{2}+\frac{5075x^{9}}{9}+\frac{3415x^{8}}{4}+1176x^{7}+\frac{2377x^{6}}{2}+\frac{5099x^{5}}{5}+656x^{4}+\frac{1064x^{3}}{3}+136x^{2}+48x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x**2-x+3)*(5*x**2+3*x+2)**4,x)
```

```
[Out] 1250*x**11/11 + 475*x**10/2 + 5075*x**9/9 + 3415*x**8/4 + 1176*x*
*7 + 2377*x**6/2 + 5099*x**5/5 + 656*x**4 + 1064*x**3/3 + 136*x**
2 + 48*x
```

GIAC/XCAS [A] time = 0.262765, size = 73, normalized size = 1.07

$$\frac{1250}{11}\,x^{11}+\frac{475}{2}\,x^{10}+\frac{5075}{9}\,x^{9}+\frac{3415}{4}\,x^{8}+1176\,x^{7}+\frac{2377}{2}\,x^{6}+\frac{5099}{5}\,x^{5}+656\,x^{4}+\frac{1064}{3}\,x^{3}+136\,x^{2}+48\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1250/11*x^11 + 475/2*x^10 + 5075/9*x^9 + 3415/4*x^8 + 1176*x^7 +
2377/2*x^6 + 5099/5*x^5 + 656*x^4 + 1064/3*x^3 + 136*x^2 + 48*x
```

3.16 $\int (3 - x + 2x^2) (2 + 3x + 5x^2)^3 \, dx$

Optimal. Leaf size=56

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 50x^2 + 24x$$

```
[Out] 24*x + 50*x^2 + (322*x^3)/3 + (579*x^4)/4 + (876*x^5)/5 + 134*x^6
 + (720*x^7)/7 + (325*x^8)/8 + (250*x^9)/9
```

Rubi [A] time = 0.0654634, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 50x^2 + 24x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] 24*x + 50*x^2 + (322*x^3)/3 + (579*x^4)/4 + (876*x^5)/5 + 134*x^6
 + (720*x^7)/7 + (325*x^8)/8 + (250*x^9)/9
```

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

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 24x + 100 \int x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)*(5*x**2+3*x+2)**3,x)
```

```
[Out] 250*x**9/9 + 325*x**8/8 + 720*x**7/7 + 134*x**6 + 876*x**5/5 + 57
9*x**4/4 + 322*x**3/3 + 24*x + 100*Integral(x, x)
```

Mathematica [A] time = 0.00278641, size = 56, normalized size = 1.

$$\frac{250x^9}{9} + \frac{325x^8}{8} + \frac{720x^7}{7} + 134x^6 + \frac{876x^5}{5} + \frac{579x^4}{4} + \frac{322x^3}{3} + 50x^2 + 24x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] 24*x + 50*x^2 + (322*x^3)/3 + (579*x^4)/4 + (876*x^5)/5 + 134*x^6
 + (720*x^7)/7 + (325*x^8)/8 + (250*x^9)/9
```

Maple [A] time = 0.002, size = 45, normalized size = 0.8

$$24\,x + 50\,x^2 + \frac{322\,x^3}{3} + \frac{579\,x^4}{4} + \frac{876\,x^5}{5} + 134\,x^6 + \frac{720\,x^7}{7} + \frac{325\,x^8}{8} + \frac{250\,x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)*(5*x^2+3*x+2)^3,x)
```

```
[Out] 24*x+50*x^2+322/3*x^3+579/4*x^4+876/5*x^5+134*x^6+720/7*x^7+325/8
*x^8+250/9*x^9
```

Maxima [A] time = 0.690697, size = 59, normalized size = 1.05

$$\frac{250}{9}\,x^9+\frac{325}{8}\,x^8+\frac{720}{7}\,x^7+134\,x^6+\frac{876}{5}\,x^5+\frac{579}{4}\,x^4+\frac{322}{3}\,x^3+50\,x^2+24\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 250/9*x^9 + 325/8*x^8 + 720/7*x^7 + 134*x^6 + 876/5*x^5 + 579/4*x
^4 + 322/3*x^3 + 50*x^2 + 24*x
```

Fricas [A] time = 0.230585, size = 1, normalized size = 0.02

$$\frac{250}{9}x^9+\frac{325}{8}x^8+\frac{720}{7}x^7+134x^6+\frac{876}{5}x^5+\frac{579}{4}x^4+\frac{322}{3}x^3+50x^2+24x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 250/9*x^9 + 325/8*x^8 + 720/7*x^7 + 134*x^6 + 876/5*x^5 + 579/4*x
^4 + 322/3*x^3 + 50*x^2 + 24*x
```

Sympy [A] time = 0.062597, size = 53, normalized size = 0.95

$$\frac{250x^9}{9}+\frac{325x^8}{8}+\frac{720x^7}{7}+134x^6+\frac{876x^5}{5}+\frac{579x^4}{4}+\frac{322x^3}{3}+50x^2+24x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)*(5*x**2+3*x+2)**3,x)
```

```
[Out] 250*x**9/9 + 325*x**8/8 + 720*x**7/7 + 134*x**6 + 876*x**5/5 + 57
9*x**4/4 + 322*x**3/3 + 50*x**2 + 24*x
```

GIAC/XCAS [A] time = 0.263466, size = 59, normalized size = 1.05

$$\frac{250}{9}\,x^9+\frac{325}{8}\,x^8+\frac{720}{7}\,x^7+134\,x^6+\frac{876}{5}\,x^5+\frac{579}{4}\,x^4+\frac{322}{3}\,x^3+50\,x^2+24\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 250/9*x^9 + 325/8*x^8 + 720/7*x^7 + 134*x^6 + 876/5*x^5 + 579/4*x
^4 + 322/3*x^3 + 50*x^2 + 24*x
```

3.17 $\int (3 - x + 2x^2) (2 + 3x + 5x^2)^2 \, dx$

Optimal. Leaf size=44

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

```
[Out] 12*x + 16*x^2 + (83*x^3)/3 + (85*x^4)/4 + (103*x^5)/5 + (35*x^6)/
6 + (50*x^7)/7
```

Rubi [A] time = 0.0480806, antiderivative size = 44, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

Antiderivative was successfully verified.

```
[In] Int[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] 12*x + 16*x^2 + (83*x^3)/3 + (85*x^4)/4 + (103*x^5)/5 + (35*x^6)/
6 + (50*x^7)/7
```

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

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 12x + 32 \int x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((2*x**2-x+3)*(5*x**2+3*x+2)**2,x)
```

```
[Out] 50*x**7/7 + 35*x**6/6 + 103*x**5/5 + 85*x**4/4 + 83*x**3/3 + 12*x
 + 32*Integral(x, x)
```

Mathematica [A] time = 0.00202069, size = 44, normalized size = 1.

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

Antiderivative was successfully verified.

```
[In] Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] 12*x + 16*x^2 + (83*x^3)/3 + (85*x^4)/4 + (103*x^5)/5 + (35*x^6)/
6 + (50*x^7)/7
```

Maple [A] time = 0.001, size = 35, normalized size = 0.8

$$12\,x + 16\,x^2 + \frac{83\,x^3}{3} + \frac{85\,x^4}{4} + \frac{103\,x^5}{5} + \frac{35\,x^6}{6} + \frac{50\,x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)*(5*x^2+3*x+2)^2,x)
```

```
[Out] 12*x+16*x^2+83/3*x^3+85/4*x^4+103/5*x^5+35/6*x^6+50/7*x^7
```

Maxima [A] time = 0.689429, size = 46, normalized size = 1.05

$$\frac{50}{7}\,x^7 + \frac{35}{6}\,x^6 + \frac{103}{5}\,x^5 + \frac{85}{4}\,x^4 + \frac{83}{3}\,x^3 + 16\,x^2 + 12\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 50/7*x^7 + 35/6*x^6 + 103/5*x^5 + 85/4*x^4 + 83/3*x^3 + 16*x^2 +
12*x
```

Fricas [A] time = 0.230769, size = 1, normalized size = 0.02

$$\frac{50}{7}x^7 + \frac{35}{6}x^6 + \frac{103}{5}x^5 + \frac{85}{4}x^4 + \frac{83}{3}x^3 + 16x^2 + 12x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 50/7*x^7 + 35/6*x^6 + 103/5*x^5 + 85/4*x^4 + 83/3*x^3 + 16*x^2 +
12*x
```

Sympy [A] time = 0.055798, size = 41, normalized size = 0.93

$$\frac{50x^7}{7} + \frac{35x^6}{6} + \frac{103x^5}{5} + \frac{85x^4}{4} + \frac{83x^3}{3} + 16x^2 + 12x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)*(5*x**2+3*x+2)**2,x)
```

```
[Out] 50*x**7/7 + 35*x**6/6 + 103*x**5/5 + 85*x**4/4 + 83*x**3/3 + 16*x
**2 + 12*x
```

GIAC/XCAS [A] time = 0.262348, size = 46, normalized size = 1.05

$$\frac{50}{7}\,x^7 + \frac{35}{6}\,x^6 + \frac{103}{5}\,x^5 + \frac{85}{4}\,x^4 + \frac{83}{3}\,x^3 + 16\,x^2 + 12\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 50/7*x^7 + 35/6*x^6 + 103/5*x^5 + 85/4*x^4 + 83/3*x^3 + 16*x^2 +
12*x
```

3.18 $\int (3 - x + 2x^2) (2 + 3x + 5x^2) \, dx$

Optimal. Leaf size=30

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + \frac{7x^2}{2} + 6x$$

```
[Out] 6*x + (7*x^2)/2 + (16*x^3)/3 + x^4/4 + 2*x^5
```

Rubi [A] time = 0.0305126, antiderivative size = 30, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.048$

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + \frac{7x^2}{2} + 6x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2),x]

[Out] 6*x + (7*x^2)/2 + (16*x^3)/3 + x^4/4 + 2*x^5
```

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

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + 6x + 7\int x \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)*(5*x**2+3*x+2),x)

[Out] 2*x**5 + x**4/4 + 16*x**3/3 + 6*x + 7*Integral(x, x)
```

Mathematica [A] time = 0.00166519, size = 30, normalized size = 1.

$$2x^5 + \frac{x^4}{4} + \frac{16x^3}{3} + \frac{7x^2}{2} + 6x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)*(2 + 3*x + 5*x^2),x]

[Out] 6*x + (7*x^2)/2 + (16*x^3)/3 + x^4/4 + 2*x^5
```

Maple [A] time = 0.001, size = 25, normalized size = 0.8

$$6x + \frac{7x^2}{2} + \frac{16x^3}{3} + \frac{x^4}{4} + 2x^5$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)*(5*x^2+3*x+2),x)
```

```
[Out] 6*x+7/2*x^2+16/3*x^3+1/4*x^4+2*x^5
```

Maxima [A] time = 0.688089, size = 32, normalized size = 1.07

$$2\,x^5+\frac{1}{4}\,x^4+\frac{16}{3}\,x^3+\frac{7}{2}\,x^2+6\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 2*x^5 + 1/4*x^4 + 16/3*x^3 + 7/2*x^2 + 6*x
```

Fricas [A] time = 0.238017, size = 1, normalized size = 0.03

$$2x^5+\frac{1}{4}x^4+\frac{16}{3}x^3+\frac{7}{2}x^2+6x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 2*x^5 + 1/4*x^4 + 16/3*x^3 + 7/2*x^2 + 6*x
```

Sympy [A] time = 0.040809, size = 26, normalized size = 0.87

$$2x^5+\frac{x^4}{4}+\frac{16x^3}{3}+\frac{7x^2}{2}+6x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)*(5*x**2+3*x+2),x)
```

```
[Out] 2*x**5 + x**4/4 + 16*x**3/3 + 7*x**2/2 + 6*x
```

GIAC/XCAS [A] time = 0.262154, size = 32, normalized size = 1.07

$$2\,x^5+\frac{1}{4}\,x^4+\frac{16}{3}\,x^3+\frac{7}{2}\,x^2+6\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 2*x^5 + 1/4*x^4 + 16/3*x^3 + 7/2*x^2 + 6*x
```

3.19 $\int \frac{3-x+2x^2}{2+3x+5x^2} dx$

Optimal. Leaf size=42

$$-\frac{11}{50}\log\left(5x^2+3x+2\right)+\frac{2x}{5}+\frac{143\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{25\sqrt{31}}$$

```
[Out] (2*x)/5 + (143*ArcTan[(3 + 10*x)/Sqrt[31]])/(25*Sqrt[31]) - (11*L
og[2 + 3*x + 5*x^2])/50
```

Rubi [A] time = 0.079735, antiderivative size = 42, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.217$

$$-\frac{11}{50}\log\left(5x^2+3x+2\right)+\frac{2x}{5}+\frac{143\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{25\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2),x]
```

```
[Out] (2*x)/5 + (143*ArcTan[(3 + 10*x)/Sqrt[31]])/(25*Sqrt[31]) - (11*L
og[2 + 3*x + 5*x^2])/50
```

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

$$-\frac{11\log\left(5x^2+3x+2\right)}{50}+\frac{143\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{775}+\int\frac{2}{5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)/(5*x**2+3*x+2),x)
```

```
[Out] -11*log(5*x**2 + 3*x + 2)/50 + 143*sqrt(31)*atan(sqrt(31)*(10*x/3
1 + 3/31))/775 + Integral(2/5, x)
```

Mathematica [A] time = 0.0278974, size = 42, normalized size = 1.

$$-\frac{11}{50}\log\left(5x^2+3x+2\right)+\frac{2x}{5}+\frac{143\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{25\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2),x]
```

```
[Out] (2*x)/5 + (143*ArcTan[(3 + 10*x)/Sqrt[31]])/(25*Sqrt[31]) - (11*L
og[2 + 3*x + 5*x^2])/50
```

Maple [A] time = 0.006, size = 34, normalized size = 0.8

$$\frac{2\,x}{5}-\frac{11\,\ln\left(5\,x^2+3\,x+2\right)}{50}+\frac{143\,\sqrt{31}}{775}\arctan\left(\frac{(3+10\,x)\sqrt{31}}{31}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((2*x^2-x+3)/(5*x^2+3*x+2),x)
```

```
[Out] 2/5*x-11/50*ln(5*x^2+3*x+2)+143/775*arctan(1/31*(3+10*x)*31^(1/2)
)*31^(1/2)
```

Maxima [A] time = 0.782048, size = 45, normalized size = 1.07

$$\frac{143}{775}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{2}{5}x-\frac{11}{50}\log\left(5x^2+3x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="maxima")
```

```
[Out] 143/775*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 2/5*x - 11/50
*log(5*x^2 + 3*x + 2)
```

Fricas [A] time = 0.261923, size = 55, normalized size = 1.31

$$\frac{1}{1550}\sqrt{31}\left(20\sqrt{31}x-11\sqrt{31}\log\left(5x^2+3x+2\right)+286\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="fricas")
```

```
[Out] 1/1550*sqrt(31)*(20*sqrt(31)*x - 11*sqrt(31)*log(5*x^2 + 3*x + 2)
 + 286*arctan(1/31*sqrt(31)*(10*x + 3)))
```

Sympy [A] time = 0.134828, size = 49, normalized size = 1.17

$$\frac{2x}{5}-\frac{11\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{50}+\frac{143\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{775}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x**2-x+3)/(5*x**2+3*x+2),x)
```

```
[Out] 2*x/5 - 11*log(x**2 + 3*x/5 + 2/5)/50 + 143*sqrt(31)*atan(10*sqrt
(31)*x/31 + 3*sqrt(31)/31)/775
```

GIAC/XCAS [A] time = 0.265926, size = 45, normalized size = 1.07

$$\frac{143}{775}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{2}{5}x-\frac{11}{50}\ln\left(5x^2+3x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="giac")
```

```
[Out] 143/775*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 2/5*x - 11/50
*ln(5*x^2 + 3*x + 2)
```

3.20 $\int \frac{3-x+2x^2}{(2+3x+5x^2)^2} dx$

Optimal. Leaf size=43

$$\frac{11(13x+7)}{155(5x^2+3x+2)}+\frac{82\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{31\sqrt{31}}$$

```
[Out] (11*(7 + 13*x))/(155*(2 + 3*x + 5*x^2)) + (82*ArcTan[(3 + 10*x)/S
qrt[31]])/(31*Sqrt[31])
```

Rubi [A] time = 0.0507247, antiderivative size = 43, 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

$$\frac{11(13x+7)}{155(5x^2+3x+2)}+\frac{82\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{31\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (11*(7 + 13*x))/(155*(2 + 3*x + 5*x^2)) + (82*ArcTan[(3 + 10*x)/S
qrt[31]])/(31*Sqrt[31])
```

Rubi in Sympy [A] time = 9.29388, size = 37, normalized size = 0.86

$$\frac{143x+77}{155(5x^2+3x+2)}+\frac{82\sqrt{31}\,\text{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{961}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)/(5*x**2+3*x+2)**2,x)
```

```
[Out] (143*x + 77)/(155*(5*x**2 + 3*x + 2)) + 82*sqrt(31)*atan(sqrt(31)
*(10*x/31 + 3/31))/961
```

Mathematica [A] time = 0.030926, size = 43, normalized size = 1.

$$\frac{11(13x+7)}{155(5x^2+3x+2)}+\frac{82\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{31\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (11*(7 + 13*x))/(155*(2 + 3*x + 5*x^2)) + (82*ArcTan[(3 + 10*x)/S
qrt[31]])/(31*Sqrt[31])
```

Maple [A] time = 0.009, size = 34, normalized size = 0.8

$$1\left(\frac{143\,x}{775}+\frac{77}{775}\right)\left(x^2+\frac{3\,x}{5}+\frac{2}{5}\right)^{-1}+\frac{82\sqrt{31}}{961}\arctan\left(\frac{(50\,x+15)\sqrt{31}}{155}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)/(5*x^2+3*x+2)^2,x)
```

```
[Out] (143/775*x+77/775)/(x^2+3/5*x+2/5)+82/961*31^(1/2)*arctan(1/155*(
50*x+15)*31^(1/2))
```

Maxima [A] time = 0.78835, size = 49, normalized size = 1.14

$$\frac{82}{961}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{11(13x+7)}{155(5x^2+3x+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")
```

```
[Out] 82/961*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11/155*(13*x +
 7)/(5*x^2 + 3*x + 2)
```

Fricas [A] time = 0.258145, size = 69, normalized size = 1.6

$$\frac{\sqrt{31}\left(410\left(5x^2+3x+2\right)\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+11\sqrt{31}(13x+7)\right)}{4805(5x^2+3x+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")
```

```
[Out] 1/4805*sqrt(31)*(410*(5*x^2 + 3*x + 2)*arctan(1/31*sqrt(31)*(10*x
 + 3)) + 11*sqrt(31)*(13*x + 7))/(5*x^2 + 3*x + 2)
```

Sympy [A] time = 0.174392, size = 42, normalized size = 0.98

$$\frac{143x+77}{775x^2+465x+310}+\frac{82\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{961}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)/(5*x**2+3*x+2)**2,x)
```

```
[Out] (143*x + 77)/(775*x**2 + 465*x + 310) + 82*sqrt(31)*atan(10*sqrt(
31)*x/31 + 3*sqrt(31)/31)/961
```

GIAC/XCAS [A] time = 0.264983, size = 49, normalized size = 1.14

$$\frac{82}{961}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{11(13x+7)}{155(5x^2+3x+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")
```

```
[Out] 82/961*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11/155*(13*x +
 7)/(5*x^2 + 3*x + 2)
```

3.21 $\int \frac{3-x+2x^2}{(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=64

$$\frac{553(10x+3)}{9610\,(5x^2+3x+2)}+\frac{11(13x+7)}{310\,(5x^2+3x+2)^2}+\frac{1106\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

```
[Out] (11*(7 + 13*x))/(310*(2 + 3*x + 5*x^2)^2) + (553*(3 + 10*x))/(961
0*(2 + 3*x + 5*x^2)) + (1106*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sq
rt[31])
```

Rubi [A] time = 0.0659882, antiderivative size = 64, 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

$$\frac{553(10x+3)}{9610\,(5x^2+3x+2)}+\frac{11(13x+7)}{310\,(5x^2+3x+2)^2}+\frac{1106\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (11*(7 + 13*x))/(310*(2 + 3*x + 5*x^2)^2) + (553*(3 + 10*x))/(961
0*(2 + 3*x + 5*x^2)) + (1106*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sq
rt[31])
```

Rubi in Sympy [A] time = 9.85074, size = 56, normalized size = 0.88

$$\frac{553\,(10x+3)}{9610\,(5x^2+3x+2)}+\frac{143x+77}{310\,(5x^2+3x+2)^2}+\frac{1106\sqrt{31}\,\operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{29791}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)/(5*x**2+3*x+2)**3,x)
```

```
[Out] 553*(10*x + 3)/(9610*(5*x**2 + 3*x + 2)) + (143*x + 77)/(310*(5*x
**2 + 3*x + 2)**2) + 1106*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31)
)/29791
```

Mathematica [A] time = 0.0518193, size = 53, normalized size = 0.83

$$\frac{\frac{31(5530x^3+4977x^2+4094x+1141)}{(5x^2+3x+2)^2}+2212\sqrt{31}\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{59582}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] ((31*(1141 + 4094*x + 4977*x^2 + 5530*x^3))/(2 + 3*x + 5*x^2)^2 +
 2212*Sqrt[31]*ArcTan[(3 + 10*x)/Sqrt[31]])/59582
```

Maple [A] time = 0.009, size = 47, normalized size = 0.7

$$25 \frac{1}{(5x^2+3x+2)^2} \left(\frac{553 x^3}{4805} + \frac{4977 x^2}{48050} + \frac{2047 x}{24025} + \frac{1141}{48050}\right) + \frac{1106 \sqrt{31}}{29791} \arctan\left(\frac{(250 x+75)\sqrt{31}}{775}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((2*x^2-x+3)/(5*x^2+3*x+2)^3,x)
```

```
[Out] 25*(553/4805*x^3+4977/48050*x^2+2047/24025*x+1141/48050)/(5*x^2+3
*x+2)^2+1106/29791*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))
```

Maxima [A] time = 0.786788, size = 76, normalized size = 1.19

$$\frac{1106}{29791} \sqrt{31} \arctan\left(\frac{1}{31} \sqrt{31}(10 x+3)\right) + \frac{5530 x^3 + 4977 x^2 + 4094 x + 1141}{1922 (25 x^4 + 30 x^3 + 29 x^2 + 12 x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] 1106/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1/1922*(55
30*x^3 + 4977*x^2 + 4094*x + 1141)/(25*x^4 + 30*x^3 + 29*x^2 + 12
*x + 4)
```

Fricas [A] time = 0.267808, size = 108, normalized size = 1.69

$$\frac{\sqrt{31}\left(2212 \left(25 x^4 + 30 x^3 + 29 x^2 + 12 x + 4\right) \arctan\left(\frac{1}{31} \sqrt{31}(10 x+3)\right) + \sqrt{31}\left(5530 x^3 + 4977 x^2 + 4094 x + 1141\right)\right)}{59582 (25 x^4 + 30 x^3 + 29 x^2 + 12 x + 4)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] 1/59582*sqrt(31)*(2212*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arct
an(1/31*sqrt(31)*(10*x + 3)) + sqrt(31)*(5530*x^3 + 4977*x^2 + 40
94*x + 1141))/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)
```

Sympy [A] time = 0.225381, size = 63, normalized size = 0.98

$$\frac{5530x^3 + 4977x^2 + 4094x + 1141}{48050x^4 + 57660x^3 + 55738x^2 + 23064x + 7688} + \frac{1106\sqrt{31} \operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{29791}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x**2-x+3)/(5*x**2+3*x+2)**3,x)
```

```
[Out] (5530*x**3 + 4977*x**2 + 4094*x + 1141)/(48050*x**4 + 57660*x**3
+ 55738*x**2 + 23064*x + 7688) + 1106*sqrt(31)*atan(10*sqrt(31)*x
/31 + 3*sqrt(31)/31)/29791
```

GIAC/XCAS [A] time = 0.264558, size = 62, normalized size = 0.97

$$\frac{1106}{29791}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)+\frac{5530\,x^{3}+4977\,x^{2}+4094\,x+1141}{1922\,(5\,x^{2}+3\,x+2)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")
```

```
[Out] 1106/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1/1922*(55
30*x^3 + 4977*x^2 + 4094*x + 1141)/(5*x^2 + 3*x + 2)^2
```

3.22 $\int \left(3-x+2x^2\right)^2 \left(2+3x+5x^2\right)^4 \, dx$

Optimal. Leaf size=80

$$\frac{2500x^{13}}{13}+\frac{875x^{12}}{3}+\frac{11525x^{11}}{11}+1571x^{10}+\frac{24859x^9}{9}+3315x^8+\frac{27763x^7}{7}+\frac{10771x^6}{3}+\frac{14801x^5}{5}+1838x^4+\frac{3016x^3}{3}+384x^2+144x$$

```
[Out] 144*x + 384*x^2 + (3016*x^3)/3 + 1838*x^4 + (14801*x^5)/5 + (1077
1*x^6)/3 + (27763*x^7)/7 + 3315*x^8 + (24859*x^9)/9 + 1571*x^10 +
 (11525*x^11)/11 + (875*x^12)/3 + (2500*x^13)/13
```

Rubi [A] time = 0.0975811, antiderivative size = 80, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{2500x^{13}}{13}+\frac{875x^{12}}{3}+\frac{11525x^{11}}{11}+1571x^{10}+\frac{24859x^9}{9}+3315x^8+\frac{27763x^7}{7}+\frac{10771x^6}{3}+\frac{14801x^5}{5}+1838x^4+\frac{3016x^3}{3}+384x^2+144x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] 144*x + 384*x^2 + (3016*x^3)/3 + 1838*x^4 + (14801*x^5)/5 + (1077
1*x^6)/3 + (27763*x^7)/7 + 3315*x^8 + (24859*x^9)/9 + 1571*x^10 +
 (11525*x^11)/11 + (875*x^12)/3 + (2500*x^13)/13
```

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

$$\frac{13925x^{11}}{286}-\frac{591x^{10}}{4}+\frac{124337x^9}{936}-\frac{6836x^8}{13}-\frac{135241x^7}{728}-\frac{68531x^6}{78}-\frac{338541x^5}{520}-\frac{12535x^4}{13}-\frac{170195x^3}{312}-\frac{1935x}{26}+\frac{(120x+146)\left(2x^2-x+3\right)^3\left(5x^2+3x+2\right)^3}{624}-\frac{19347\int x\,dx}{26}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**4,x)
```

```
[Out] 13925*x**11/286 - 591*x**10/4 + 124337*x**9/936 - 6836*x**8/13 -
135241*x**7/728 - 68531*x**6/78 - 338541*x**5/520 - 12535*x**4/13
 - 170195*x**3/312 - 1935*x/26 + (120*x + 146)*(2*x**2 - x + 3)**
3*(5*x**2 + 3*x + 2)**3/624 - 19347*Integral(x, x)/26
```

Mathematica [A] time = 0.00526244, size = 80, normalized size = 1.

$$\frac{2500x^{13}}{13}+\frac{875x^{12}}{3}+\frac{11525x^{11}}{11}+1571x^{10}+\frac{24859x^9}{9}+3315x^8+\frac{27763x^7}{7}+\frac{10771x^6}{3}+\frac{14801x^5}{5}+1838x^4+\frac{3016x^3}{3}+384x^2+144x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] 144*x + 384*x^2 + (3016*x^3)/3 + 1838*x^4 + (14801*x^5)/5 + (1077
1*x^6)/3 + (27763*x^7)/7 + 3315*x^8 + (24859*x^9)/9 + 1571*x^10 +
 (11525*x^11)/11 + (875*x^12)/3 + (2500*x^13)/13
```

Maple [A] time = 0.002, size = 65, normalized size = 0.8

$$144 x + 384 x^{2} + \frac{3016 x^{3}}{3} + 1838 x^{4} + \frac{14801 x^{5}}{5} + \frac{10771 x^{6}}{3} + \frac{27763 x^{7}}{7} + 3315 x^{8} + \frac{24859 x^{9}}{9} + 1571 x^{10} + \frac{11525 x^{11}}{11} + \frac{875 x^{12}}{3} + \frac{2500 x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^2*(5*x^2+3*x+2)^4,x)
```

```
[Out] 144*x+384*x^2+3016/3*x^3+1838*x^4+14801/5*x^5+10771/3*x^6+27763/7
*x^7+3315*x^8+24859/9*x^9+1571*x^10+11525/11*x^11+875/3*x^12+2500
/13*x^13
```

Maxima [A] time = 0.696833, size = 86, normalized size = 1.08

$$\frac{2500}{13} x^{13} + \frac{875}{3} x^{12} + \frac{11525}{11} x^{11} + 1571 x^{10} + \frac{24859}{9} x^{9} + 3315 x^{8} + \frac{27763}{7} x^{7} + \frac{10771}{3} x^{6} + \frac{14801}{5} x^{5} + 1838 x^{4} + \frac{3016}{3} x^{3} + 384 x^{2} + 144 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] 2500/13*x^13 + 875/3*x^12 + 11525/11*x^11 + 1571*x^10 + 24859/9*x
^9 + 3315*x^8 + 27763/7*x^7 + 10771/3*x^6 + 14801/5*x^5 + 1838*x^
4 + 3016/3*x^3 + 384*x^2 + 144*x
```

Fricas [A] time = 0.25058, size = 1, normalized size = 0.01

$$\frac{2500}{13} x^{13} + \frac{875}{3} x^{12} + \frac{11525}{11} x^{11} + 1571 x^{10} + \frac{24859}{9} x^{9} + 3315 x^{8} + \frac{27763}{7} x^{7} + \frac{10771}{3} x^{6} + \frac{14801}{5} x^{5} + 1838 x^{4} + \frac{3016}{3} x^{3} + 384 x^{2} + 144 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] 2500/13*x^13 + 875/3*x^12 + 11525/11*x^11 + 1571*x^10 + 24859/9*x
^9 + 3315*x^8 + 27763/7*x^7 + 10771/3*x^6 + 14801/5*x^5 + 1838*x^
4 + 3016/3*x^3 + 384*x^2 + 144*x
```

Sympy [A] time = 0.07978, size = 76, normalized size = 0.95

$$\frac{2500x^{13}}{13} + \frac{875x^{12}}{3} + \frac{11525x^{11}}{11} + 1571x^{10} + \frac{24859x^{9}}{9} + 3315x^{8} + \frac{27763x^{7}}{7} + \frac{10771x^{6}}{3} + \frac{14801x^{5}}{5} + 1838x^{4} + \frac{3016x^{3}}{3} + 384x^{2} + 144x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**4,x)
```

```
[Out] 2500*x**13/13 + 875*x**12/3 + 11525*x**11/11 + 1571*x**10 + 24859
*x**9/9 + 3315*x**8 + 27763*x**7/7 + 10771*x**6/3 + 14801*x**5/5
+ 1838*x**4 + 3016*x**3/3 + 384*x**2 + 144*x
```

GIAC/XCAS [A] time = 0.263289, size = 86, normalized size = 1.08

$$\frac{2500}{13}x^{13} + \frac{875}{3}x^{12} + \frac{11525}{11}x^{11} + 1571x^{10} + \frac{24859}{9}x^9 + 3315x^8 + \frac{27763}{7}x^7 + \frac{10771}{3}x^6 + \frac{14801}{5}x^5 + 1838x^4 + \frac{3016}{3}x^3 + 384x^2 + 144x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 2500/13*x^13 + 875/3*x^12 + 11525/11*x^11 + 1571*x^10 + 24859/9*x
^9 + 3315*x^8 + 27763/7*x^7 + 10771/3*x^6 + 14801/5*x^5 + 1838*x^
4 + 3016/3*x^3 + 384*x^2 + 144*x
```

3.23 $\int \left(3-x+2x^2\right)^2 \left(2+3x+5x^2\right)^3 \, dx$

Optimal. Leaf size=66

$$\frac{500x^{11}}{11}+40x^{10}+\frac{1865x^9}{9}+\frac{1863x^8}{8}+444x^7+449x^6+\frac{2693x^5}{5}+\frac{1615x^4}{4}+\frac{914x^3}{3}+138x^2+72x$$

```
[Out] 72*x + 138*x^2 + (914*x^3)/3 + (1615*x^4)/4 + (2693*x^5)/5 + 449*
x^6 + 444*x^7 + (1863*x^8)/8 + (1865*x^9)/9 + 40*x^10 + (500*x^11
)/11
```

Rubi [A] time = 0.0810002, antiderivative size = 66, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{500x^{11}}{11}+40x^{10}+\frac{1865x^9}{9}+\frac{1863x^8}{8}+444x^7+449x^6+\frac{2693x^5}{5}+\frac{1615x^4}{4}+\frac{914x^3}{3}+138x^2+72x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] 72*x + 138*x^2 + (914*x^3)/3 + (1615*x^4)/4 + (2693*x^5)/5 + 449*
x^6 + 444*x^7 + (1863*x^8)/8 + (1865*x^9)/9 + 40*x^10 + (500*x^11
)/11
```

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

$$\frac{1363x^9}{99}-\frac{14631x^8}{440}+\frac{14233x^7}{220}-\frac{23809x^6}{220}+\frac{1241x^5}{22}-\frac{26469x^4}{220}-\frac{3593x^3}{132}-\frac{576x}{55}+\frac{(100x+118)\left(2x^2-x+3\right)^3\left(5x^2+3x+2\right)^2}{440}-\frac{22389\int x\,dx}{110}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**3,x)
```

```
[Out] 1363*x**9/99 - 14631*x**8/440 + 14233*x**7/220 - 23809*x**6/220 +
 1241*x**5/22 - 26469*x**4/220 - 3593*x**3/132 - 576*x/55 + (100*
x + 118)*(2*x**2 - x + 3)**3*(5*x**2 + 3*x + 2)**2/440 - 22389*In
tegral(x, x)/110
```

Mathematica [A] time = 0.00485606, size = 66, normalized size = 1.

$$\frac{500x^{11}}{11}+40x^{10}+\frac{1865x^9}{9}+\frac{1863x^8}{8}+444x^7+449x^6+\frac{2693x^5}{5}+\frac{1615x^4}{4}+\frac{914x^3}{3}+138x^2+72x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] 72*x + 138*x^2 + (914*x^3)/3 + (1615*x^4)/4 + (2693*x^5)/5 + 449*
x^6 + 444*x^7 + (1863*x^8)/8 + (1865*x^9)/9 + 40*x^10 + (500*x^11
)/11
```

Maple [A] time = 0.002, size = 55, normalized size = 0.8

$$72\,x+138\,x^{2}+\frac{914\,x^{3}}{3}+\frac{1615\,x^{4}}{4}+\frac{2693\,x^{5}}{5}+449\,x^{6}+444\,x^{7}+\frac{1863\,x^{8}}{8}+\frac{1865\,x^{9}}{9}+40\,x^{10}+\frac{500\,x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^2*(5*x^2+3*x+2)^3,x)
```

```
[Out] 72*x+138*x^2+914/3*x^3+1615/4*x^4+2693/5*x^5+449*x^6+444*x^7+1863
/8*x^8+1865/9*x^9+40*x^10+500/11*x^11
```

Maxima [A] time = 0.69438, size = 73, normalized size = 1.11

$$\frac{500}{11}\,x^{11}+40\,x^{10}+\frac{1865}{9}\,x^{9}+\frac{1863}{8}\,x^{8}+444\,x^{7}+449\,x^{6}+\frac{2693}{5}\,x^{5}+\frac{1615}{4}\,x^{4}+\frac{914}{3}\,x^{3}+138\,x^{2}+72\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] 500/11*x^11 + 40*x^10 + 1865/9*x^9 + 1863/8*x^8 + 444*x^7 + 449*x
^6 + 2693/5*x^5 + 1615/4*x^4 + 914/3*x^3 + 138*x^2 + 72*x
```

Fricas [A] time = 0.230541, size = 1, normalized size = 0.02

$$\frac{500}{11}x^{11}+40x^{10}+\frac{1865}{9}x^{9}+\frac{1863}{8}x^{8}+444x^{7}+449x^{6}+\frac{2693}{5}x^{5}+\frac{1615}{4}x^{4}+\frac{914}{3}x^{3}+138x^{2}+72x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] 500/11*x^11 + 40*x^10 + 1865/9*x^9 + 1863/8*x^8 + 444*x^7 + 449*x
^6 + 2693/5*x^5 + 1615/4*x^4 + 914/3*x^3 + 138*x^2 + 72*x
```

Sympy [A] time = 0.07288, size = 63, normalized size = 0.95

$$\frac{500x^{11}}{11}+40x^{10}+\frac{1865x^{9}}{9}+\frac{1863x^{8}}{8}+444x^{7}+449x^{6}+\frac{2693x^{5}}{5}+\frac{1615x^{4}}{4}+\frac{914x^{3}}{3}+138x^{2}+72x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**3,x)
```

```
[Out] 500*x**11/11 + 40*x**10 + 1865*x**9/9 + 1863*x**8/8 + 444*x**7 +
449*x**6 + 2693*x**5/5 + 1615*x**4/4 + 914*x**3/3 + 138*x**2 + 72
*x
```

GIAC/XCAS [A] time = 0.262148, size = 73, normalized size = 1.11

$$\frac{500}{11}\,x^{11}+40\,x^{10}+\frac{1865}{9}\,x^{9}+\frac{1863}{8}\,x^{8}+444\,x^{7}+449\,x^{6}+\frac{2693}{5}\,x^{5}+\frac{1615}{4}\,x^{4}+\frac{914}{3}\,x^{3}+138\,x^{2}+72\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 500/11*x^11 + 40*x^10 + 1865/9*x^9 + 1863/8*x^8 + 444*x^7 + 449*x
^6 + 2693/5*x^5 + 1615/4*x^4 + 914/3*x^3 + 138*x^2 + 72*x
```

3.24 $\int \left(3-x+2x^2\right)^2 \left(2+3x+5x^2\right)^2 \, dx$

Optimal. Leaf size=54

$$\frac{100x^9}{9}+\frac{5x^8}{2}+\frac{321x^7}{7}+\frac{86x^6}{3}+78x^5+59x^4+\frac{241x^3}{3}+42x^2+36x$$

```
[Out] 36*x + 42*x^2 + (241*x^3)/3 + 59*x^4 + 78*x^5 + (86*x^6)/3 + (321
*x^7)/7 + (5*x^8)/2 + (100*x^9)/9
```

Rubi [A] time = 0.0723085, antiderivative size = 54, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{100x^9}{9}+\frac{5x^8}{2}+\frac{321x^7}{7}+\frac{86x^6}{3}+78x^5+59x^4+\frac{241x^3}{3}+42x^2+36x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] 36*x + 42*x^2 + (241*x^3)/3 + 59*x^4 + 78*x^5 + (86*x^6)/3 + (321
*x^7)/7 + (5*x^8)/2 + (100*x^9)/9
```

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

$$\frac{1091x^7}{252}-\frac{551x^6}{72}+\frac{383x^5}{16}-\frac{229x^4}{9}+\frac{439x^3}{12}+\frac{201x}{16}+\frac{(80x+90)\left(2x^2-x+3\right)^3\left(5x^2+3x+2\right)}{288}-\frac{87\int x\,dx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**2,x)
```

```
[Out] 1091*x**7/252 - 551*x**6/72 + 383*x**5/16 - 229*x**4/9 + 439*x**3
/12 + 201*x/16 + (80*x + 90)*(2*x**2 - x + 3)**3*(5*x**2 + 3*x +
2)/288 - 87*Integral(x, x)/2
```

Mathematica [A] time = 0.00368844, size = 54, normalized size = 1.

$$\frac{100x^9}{9}+\frac{5x^8}{2}+\frac{321x^7}{7}+\frac{86x^6}{3}+78x^5+59x^4+\frac{241x^3}{3}+42x^2+36x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] 36*x + 42*x^2 + (241*x^3)/3 + 59*x^4 + 78*x^5 + (86*x^6)/3 + (321
*x^7)/7 + (5*x^8)/2 + (100*x^9)/9
```

Maple [A] time = 0.001, size = 45, normalized size = 0.8

$$36\,x+42\,x^2+\frac{241\,x^3}{3}+59\,x^4+78\,x^5+\frac{86\,x^6}{3}+\frac{321\,x^7}{7}+\frac{5\,x^8}{2}+\frac{100\,x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((2*x^2-x+3)^2*(5*x^2+3*x+2)^2,x)
```

```
[Out] 36*x+42*x^2+241/3*x^3+59*x^4+78*x^5+86/3*x^6+321/7*x^7+5/2*x^8+10
0/9*x^9
```

Maxima [A] time = 0.693591, size = 59, normalized size = 1.09

$$\frac{100}{9}\,x^{9} + \frac{5}{2}\,x^{8} + \frac{321}{7}\,x^{7} + \frac{86}{3}\,x^{6} + 78\,x^{5} + 59\,x^{4} + \frac{241}{3}\,x^{3} + 42\,x^{2} + 36\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] 100/9*x^9 + 5/2*x^8 + 321/7*x^7 + 86/3*x^6 + 78*x^5 + 59*x^4 + 24
1/3*x^3 + 42*x^2 + 36*x
```

Fricas [A] time = 0.235007, size = 1, normalized size = 0.02

$$\frac{100}{9}x^{9} + \frac{5}{2}x^{8} + \frac{321}{7}x^{7} + \frac{86}{3}x^{6} + 78x^{5} + 59x^{4} + \frac{241}{3}x^{3} + 42x^{2} + 36x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] 100/9*x^9 + 5/2*x^8 + 321/7*x^7 + 86/3*x^6 + 78*x^5 + 59*x^4 + 24
1/3*x^3 + 42*x^2 + 36*x
```

Sympy [A] time = 0.062997, size = 51, normalized size = 0.94

$$\frac{100x^{9}}{9} + \frac{5x^{8}}{2} + \frac{321x^{7}}{7} + \frac{86x^{6}}{3} + 78x^{5} + 59x^{4} + \frac{241x^{3}}{3} + 42x^{2} + 36x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x**2-x+3)**2*(5*x**2+3*x+2)**2,x)
```

```
[Out] 100*x**9/9 + 5*x**8/2 + 321*x**7/7 + 86*x**6/3 + 78*x**5 + 59*x**
4 + 241*x**3/3 + 42*x**2 + 36*x
```

GIAC/XCAS [A] time = 0.263692, size = 59, normalized size = 1.09

$$\frac{100}{9}\,x^{9} + \frac{5}{2}\,x^{8} + \frac{321}{7}\,x^{7} + \frac{86}{3}\,x^{6} + 78\,x^{5} + 59\,x^{4} + \frac{241}{3}\,x^{3} + 42\,x^{2} + 36\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 100/9*x^9 + 5/2*x^8 + 321/7*x^7 + 86/3*x^6 + 78*x^5 + 59*x^4 + 24
1/3*x^3 + 42*x^2 + 36*x
```

3.25 $\int \left(3-x+2x^2\right)^2 \left(2+3x+5x^2\right) \, dx$

Optimal. Leaf size=46

$$\frac{20x^7}{7}-\frac{4x^6}{3}+\frac{61x^5}{5}+\frac{x^4}{4}+\frac{53x^3}{3}+\frac{15x^2}{2}+18x$$

```
[Out] 18*x + (15*x^2)/2 + (53*x^3)/3 + x^4/4 + (61*x^5)/5 - (4*x^6)/3 +
 (20*x^7)/7
```

Rubi [A] time = 0.0470669, antiderivative size = 46, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{20x^7}{7}-\frac{4x^6}{3}+\frac{61x^5}{5}+\frac{x^4}{4}+\frac{53x^3}{3}+\frac{15x^2}{2}+18x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2),x]
```

```
[Out] 18*x + (15*x^2)/2 + (53*x^3)/3 + x^4/4 + (61*x^5)/5 - (4*x^6)/3 +
 (20*x^7)/7
```

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

$$\frac{20x^7}{7}-\frac{4x^6}{3}+\frac{61x^5}{5}+\frac{x^4}{4}+\frac{53x^3}{3}+18x+15\int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2*(5*x**2+3*x+2),x)
```

```
[Out] 20*x**7/7 - 4*x**6/3 + 61*x**5/5 + x**4/4 + 53*x**3/3 + 18*x + 15
*Integral(x, x)
```

Mathematica [A] time = 0.00256626, size = 46, normalized size = 1.

$$\frac{20x^7}{7}-\frac{4x^6}{3}+\frac{61x^5}{5}+\frac{x^4}{4}+\frac{53x^3}{3}+\frac{15x^2}{2}+18x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2),x]
```

```
[Out] 18*x + (15*x^2)/2 + (53*x^3)/3 + x^4/4 + (61*x^5)/5 - (4*x^6)/3 +
 (20*x^7)/7
```

Maple [A] time = 0.001, size = 35, normalized size = 0.8

$$18\,x+\frac{15\,x^2}{2}+\frac{53\,x^3}{3}+\frac{x^4}{4}+\frac{61\,x^5}{5}-\frac{4\,x^6}{3}+\frac{20\,x^7}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^2*(5*x^2+3*x+2),x)
```

```
[Out] 18*x+15/2*x^2+53/3*x^3+1/4*x^4+61/5*x^5-4/3*x^6+20/7*x^7
```

Maxima [A] time = 0.699221, size = 46, normalized size = 1.

$$\frac{20}{7}x^7 - \frac{4}{3}x^6 + \frac{61}{5}x^5 + \frac{1}{4}x^4 + \frac{53}{3}x^3 + \frac{15}{2}x^2 + 18\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] 20/7*x^7 - 4/3*x^6 + 61/5*x^5 + 1/4*x^4 + 53/3*x^3 + 15/2*x^2 + 1
8*x
```

Fricas [A] time = 0.234106, size = 1, normalized size = 0.02

$$\frac{20}{7}x^7 - \frac{4}{3}x^6 + \frac{61}{5}x^5 + \frac{1}{4}x^4 + \frac{53}{3}x^3 + \frac{15}{2}x^2 + 18x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] 20/7*x^7 - 4/3*x^6 + 61/5*x^5 + 1/4*x^4 + 53/3*x^3 + 15/2*x^2 + 1
8*x
```

Sympy [A] time = 0.054093, size = 41, normalized size = 0.89

$$\frac{20x^7}{7} - \frac{4x^6}{3} + \frac{61x^5}{5} + \frac{x^4}{4} + \frac{53x^3}{3} + \frac{15x^2}{2} + 18x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**2*(5*x**2+3*x+2),x)
```

```
[Out] 20*x**7/7 - 4*x**6/3 + 61*x**5/5 + x**4/4 + 53*x**3/3 + 15*x**2/2
 + 18*x
```

GIAC/XCAS [A] time = 0.263107, size = 46, normalized size = 1.

$$\frac{20}{7}x^7 - \frac{4}{3}x^6 + \frac{61}{5}x^5 + \frac{1}{4}x^4 + \frac{53}{3}x^3 + \frac{15}{2}x^2 + 18\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 20/7*x^7 - 4/3*x^6 + 61/5*x^5 + 1/4*x^4 + 53/3*x^3 + 15/2*x^2 + 1
8*x
```

3.26 $\int \frac{(3-x+2x^2)^2}{2+3x+5x^2} \, dx$

Optimal. Leaf size=56

$$\frac{4x^3}{15}-\frac{16x^2}{25}-\frac{1573\log\left(5x^2+3x+2\right)}{1250}+\frac{381x}{125}+\frac{8349\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{625\sqrt{31}}$$

```
[Out] (381*x)/125 - (16*x^2)/25 + (4*x^3)/15 + (8349*ArcTan[(3 + 10*x)/
Sqrt[31]])/(625*Sqrt[31]) - (1573*Log[2 + 3*x + 5*x^2])/1250
```

Rubi [A] time = 0.0937176, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{4x^3}{15}-\frac{16x^2}{25}-\frac{1573\log\left(5x^2+3x+2\right)}{1250}+\frac{381x}{125}+\frac{8349\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{625\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2),x]
```

```
[Out] (381*x)/125 - (16*x^2)/25 + (4*x^3)/15 + (8349*ArcTan[(3 + 10*x)/
Sqrt[31]])/(625*Sqrt[31]) - (1573*Log[2 + 3*x + 5*x^2])/1250
```

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

$$-\left(-\frac{2x}{15}+\frac{19}{75}\right)\left(2x^2-x+3\right)-\frac{1573\log\left(5x^2+3x+2\right)}{1250}+\frac{8349\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{19375}-\frac{\int\left(-\frac{1796}{5}\right)dx}{150}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2),x)
```

```
[Out] -(-2*x/15 + 19/75)*(2*x**2 - x + 3) - 1573*log(5*x**2 + 3*x + 2)/
1250 + 8349*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/19375 - Inte
gral(-1796/5, x)/150
```

Mathematica [A] time = 0.0430483, size = 53, normalized size = 0.95

$$\frac{10x\left(100x^2-240x+1143\right)-4719\log\left(5x^2+3x+2\right)}{3750}+\frac{8349\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{625\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2),x]
```

```
[Out] (8349*ArcTan[(3 + 10*x)/Sqrt[31]])/(625*Sqrt[31]) + (10*x*(1143 -
 240*x + 100*x^2) - 4719*Log[2 + 3*x + 5*x^2])/3750
```

Maple [A] time = 0.005, size = 44, normalized size = 0.8

$$\frac{381\,x}{125}-\frac{16\,x^{2}}{25}+\frac{4\,x^{3}}{15}-\frac{1573\,\ln\left(5\,x^{2}+3\,x+2\right)}{1250}+\frac{8349\,\sqrt{31}}{19375}\arctan\left(\frac{(3+10\,x)\,\sqrt{31}}{31}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^2/(5*x^2+3*x+2),x)
```

```
[Out] 381/125*x-16/25*x^2+4/15*x^3-1573/1250*ln(5*x^2+3*x+2)+8349/19375
*arctan(1/31*(3+10*x)*31^(1/2))*31^(1/2)
```

Maxima [A] time = 0.770752, size = 58, normalized size = 1.04

$$\frac{4}{15}\,x^{3}-\frac{16}{25}\,x^{2}+\frac{8349}{19375}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\frac{381}{125}\,x-\frac{1573}{1250}\,\log\left(5\,x^{2}+3\,x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2),x, algorithm="maxima")
```

```
[Out] 4/15*x^3 - 16/25*x^2 + 8349/19375*sqrt(31)*arctan(1/31*sqrt(31)*(
10*x + 3)) + 381/125*x - 1573/1250*log(5*x^2 + 3*x + 2)
```

Fricas [A] time = 0.257687, size = 73, normalized size = 1.3

$$\frac{1}{116250}\,\sqrt{31}\left(10\,\sqrt{31}\left(100\,x^{3}-240\,x^{2}+1143\,x\right)-4719\,\sqrt{31}\log\left(5\,x^{2}+3\,x+2\right)+50094\,\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2),x, algorithm="fricas")
```

```
[Out] 1/116250*sqrt(31)*(10*sqrt(31)*(100*x^3 - 240*x^2 + 1143*x) - 471
9*sqrt(31)*log(5*x^2 + 3*x + 2) + 50094*arctan(1/31*sqrt(31)*(10*
x + 3)))
```

Sympy [A] time = 0.148787, size = 63, normalized size = 1.12

$$\frac{4x^{3}}{15}-\frac{16x^{2}}{25}+\frac{381x}{125}-\frac{1573\log\left(x^{2}+\frac{3x}{5}+\frac{2}{5}\right)}{1250}+\frac{8349\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{19375}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**2/(5*x**2+3*x+2),x)
```

```
[Out] 4*x**3/15 - 16*x**2/25 + 381*x/125 - 1573*log(x**2 + 3*x/5 + 2/5)
/1250 + 8349*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/1937
5
```

GIAC/XCAS [A] time = 0.265185, size = 58, normalized size = 1.04

$$\frac{4}{15}\,x^{3}-\frac{16}{25}\,x^{2}+\frac{8349}{19375}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\frac{381}{125}\,x-\frac{1573}{1250}\ln\left(5\,x^{2}+3\,x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2),x, algorithm="giac")
```

```
[Out] 4/15*x^3 - 16/25*x^2 + 8349/19375*sqrt(31)*arctan(1/31*sqrt(31)*(
10*x + 3)) + 381/125*x - 1573/1250*ln(5*x^2 + 3*x + 2)
```

3.27 $\int \frac{(3-x+2x^2)^2}{(2+3x+5x^2)^2} \, dx$

Optimal. Leaf size=63

$$\frac{121(69x+61)}{3875(5x^2+3x+2)} - \frac{22}{125}\log\left(5x^2+3x+2\right) + \frac{4x}{25} + \frac{41932\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{3875\sqrt{31}}$$

```
[Out] (4*x)/25 + (121*(61 + 69*x))/(3875*(2 + 3*x + 5*x^2)) + (41932*Ar
cTan[(3 + 10*x)/Sqrt[31]])/(3875*Sqrt[31]) - (22*Log[2 + 3*x + 5*
x^2])/125
```

Rubi [A] time = 0.110633, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{121(69x+61)}{3875(5x^2+3x+2)} - \frac{22}{125}\log\left(5x^2+3x+2\right) + \frac{4x}{25} + \frac{41932\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{3875\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (4*x)/25 + (121*(61 + 69*x))/(3875*(2 + 3*x + 5*x^2)) + (41932*Ar
cTan[(3 + 10*x)/Sqrt[31]])/(3875*Sqrt[31]) - (22*Log[2 + 3*x + 5*
x^2])/125
```

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

$$-\frac{8x^3}{31} + \frac{(10x+3)\left(2x^2-x+3\right)^2}{31(5x^2+3x+2)} - \frac{22\log\left(5x^2+3x+2\right)}{125} + \frac{41932\sqrt{31}\,\text{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{120125} - \frac{\int \frac{542}{25}\,dx}{31} + \frac{104\int x\,dx}{155}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**2,x)
```

```
[Out] -8*x**3/31 + (10*x + 3)*(2*x**2 - x + 3)**2/(31*(5*x**2 + 3*x + 2
)) - 22*log(5*x**2 + 3*x + 2)/125 + 41932*sqrt(31)*atan(sqrt(31)*
(10*x/31 + 3/31))/120125 - Integral(542/25, x)/31 + 104*Integral(
x, x)/155
```

Mathematica [A] time = 0.0554694, size = 59, normalized size = 0.94

$$\frac{\frac{3751(69x+61)}{5x^2+3x+2} - 21142\log\left(5x^2+3x+2\right) + 19220x + 41932\sqrt{31}\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{120125}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (19220*x + (3751*(61 + 69*x))/(2 + 3*x + 5*x^2) + 41932*Sqrt[31]*
ArcTan[(3 + 10*x)/Sqrt[31]] - 21142*Log[2 + 3*x + 5*x^2])/120125
```

Maple [A] time = 0.009, size = 51, normalized size = 0.8

$$\frac{4\,x}{25}-\frac{11}{25}\left(-\frac{759\,x}{775}-\frac{671}{775}\right)\left(x^{2}+\frac{3\,x}{5}+\frac{2}{5}\right)^{-1}-\frac{22\,\ln\left(25\,x^{2}+15\,x+10\right)}{125}+\frac{41932\,\sqrt{31}}{120125}\arctan\left(\frac{(50\,x+15)\,\sqrt{31}}{155}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^2/(5*x^2+3*x+2)^2,x)
```

```
[Out] 4/25*x-11/25*(-759/775*x-671/775)/(x^2+3/5*x+2/5)-22/125*ln(25*x^
2+15*x+10)+41932/120125*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))
```

Maxima [A] time = 0.775687, size = 70, normalized size = 1.11

$$\frac{41932}{120125}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\frac{4}{25}\,x+\frac{121\,(69\,x+61)}{3875\,(5\,x^{2}+3\,x+2)}-\frac{22}{125}\,\log\left(5\,x^{2}+3\,x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")
```

```
[Out] 41932/120125*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 4/25*x +
 121/3875*(69*x + 61)/(5*x^2 + 3*x + 2) - 22/125*log(5*x^2 + 3*x
+ 2)
```

Fricas [A] time = 0.259865, size = 117, normalized size = 1.86

$$-\frac{\sqrt{31}\left(682\,\sqrt{31}\left(5\,x^{2}+3\,x+2\right)\log\left(5\,x^{2}+3\,x+2\right)-41932\,\left(5\,x^{2}+3\,x+2\right)\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)-\sqrt{31}(3100\,x^{3}+186\right.}{120125\,(5\,x^{2}+3\,x+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")
```

```
[Out] -1/120125*sqrt(31)*(682*sqrt(31)*(5*x^2 + 3*x + 2)*log(5*x^2 + 3*
x + 2) - 41932*(5*x^2 + 3*x + 2)*arctan(1/31*sqrt(31)*(10*x + 3))
 - sqrt(31)*(3100*x^3 + 1860*x^2 + 9589*x + 7381))/(5*x^2 + 3*x +
 2)
```

Sympy [A] time = 0.209593, size = 65, normalized size = 1.03

$$\frac{4x}{25}+\frac{8349x+7381}{19375x^{2}+11625x+7750}-\frac{22\log\left(x^{2}+\frac{3x}{5}+\frac{2}{5}\right)}{125}+\frac{41932\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{120125}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**2,x)
```

```
[Out] 4*x/25 + (8349*x + 7381)/(19375*x**2 + 11625*x + 7750) - 22*log(x
**2 + 3*x/5 + 2/5)/125 + 41932*sqrt(31)*atan(10*sqrt(31)*x/31 + 3
*sqrt(31)/31)/120125
```

GIAC/XCAS [A] time = 0.264785, size = 70, normalized size = 1.11

$$\frac{41932}{120125}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)+\frac{4}{25}\,x+\frac{121\,(69\,x+61)}{3875\,(5\,x^2+3\,x+2)}-\frac{22}{125}\ln\left(5\,x^2+3\,x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")
```

```
[Out] 41932/120125*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 4/25*x +
 121/3875*(69*x + 61)/(5*x^2 + 3*x + 2) - 22/125*ln(5*x^2 + 3*x +
 2)
```

3.28 $\int \frac{(3-x+2x^2)^2}{(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=64

$$\frac{121(69x+61)}{7750\,(5x^2+3x+2)^2}+\frac{11(45710x+17557)}{240250\,(5x^2+3x+2)}+\frac{4330\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

```
[Out] (121*(61 + 69*x))/(7750*(2 + 3*x + 5*x^2)^2) + (11*(17557 + 45710
*x))/(240250*(2 + 3*x + 5*x^2)) + (4330*ArcTan[(3 + 10*x)/Sqrt[31
]])/(961*Sqrt[31])
```

Rubi [A] time = 0.0937121, antiderivative size = 64, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$\frac{121(69x+61)}{7750\,(5x^2+3x+2)^2}+\frac{11(45710x+17557)}{240250\,(5x^2+3x+2)}+\frac{4330\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (121*(61 + 69*x))/(7750*(2 + 3*x + 5*x^2)^2) + (11*(17557 + 45710
*x))/(240250*(2 + 3*x + 5*x^2)) + (4330*ArcTan[(3 + 10*x)/Sqrt[31
]])/(961*Sqrt[31])
```

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

$$\frac{(10x+3)\left(2x^2-x+3\right)^2}{62\,(5x^2+3x+2)^2}+\frac{22\,(1712x+1053)}{24025\,(5x^2+3x+2)}+\frac{4330\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{29791}-\frac{\int\frac{8}{5}\,dx}{62}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**3,x)
```

```
[Out] (10*x + 3)*(2*x**2 - x + 3)**2/(62*(5*x**2 + 3*x + 2)**2) + 22*(1
712*x + 1053)/(24025*(5*x**2 + 3*x + 2)) + 4330*sqrt(31)*atan(sqr
t(31)*(10*x/31 + 3/31))/29791 - Integral(8/5, x)/62
```

Mathematica [A] time = 0.0513349, size = 53, normalized size = 0.83

$$\frac{11\left(45710x^3+44983x^2+33524x+11183\right)}{48050\,(5x^2+3x+2)^2}+\frac{4330\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{961\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (11*(11183 + 33524*x + 44983*x^2 + 45710*x^3))/(48050*(2 + 3*x +
5*x^2)^2) + (4330*ArcTan[(3 + 10*x)/Sqrt[31]])/(961*Sqrt[31])
```

Maple [A] time = 0.008, size = 47, normalized size = 0.7

$$25\frac{1}{\left(5x^{2}+3x+2\right)^{2}}\left(\frac{50281x^{3}}{120125}+\frac{494813x^{2}}{1201250}+\frac{184382x}{600625}+\frac{123013}{1201250}\right)+\frac{4330\sqrt{31}}{29791}\arctan\left(\frac{(250x+75)\sqrt{31}}{775}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^2/(5*x^2+3*x+2)^3,x)
```

```
[Out] 25*(50281/120125*x^3+494813/1201250*x^2+184382/600625*x+123013/12
01250)/(5*x^2+3*x+2)^2+4330/29791*31^(1/2)*arctan(1/775*(250*x+75
)*31^(1/2))
```

Maxima [A] time = 0.771819, size = 76, normalized size = 1.19

$$\frac{4330}{29791}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{11\left(45710x^{3}+44983x^{2}+33524x+11183\right)}{48050\left(25x^{4}+30x^{3}+29x^{2}+12x+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] 4330/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11/48050*(
45710*x^3 + 44983*x^2 + 33524*x + 11183)/(25*x^4 + 30*x^3 + 29*x^
2 + 12*x + 4)
```

Fricas [A] time = 0.258176, size = 109, normalized size = 1.7

$$\frac{\sqrt{31}\left(216500\left(25x^{4}+30x^{3}+29x^{2}+12x+4\right)\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+11\sqrt{31}\left(45710x^{3}+44983x^{2}+33524x+11183\right)\right)}{1489550\left(25x^{4}+30x^{3}+29x^{2}+12x+4\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] 1/1489550*sqrt(31)*(216500*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*
arctan(1/31*sqrt(31)*(10*x + 3)) + 11*sqrt(31)*(45710*x^3 + 44983
*x^2 + 33524*x + 11183))/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)
```

Sympy [A] time = 0.2428, size = 63, normalized size = 0.98

$$\frac{502810x^{3}+494813x^{2}+368764x+123013}{1201250x^{4}+1441500x^{3}+1393450x^{2}+576600x+192200}+\frac{4330\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{29791}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**3,x)
```

```
[Out] (502810*x**3 + 494813*x**2 + 368764*x + 123013)/(1201250*x**4 + 1
441500*x**3 + 1393450*x**2 + 576600*x + 192200) + 4330*sqrt(31)*a
tan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/29791
```

GIAC/XCAS [A] time = 0.265557, size = 62, normalized size = 0.97

$$\frac{4330}{29791}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)+\frac{11\,\left(45710\,x^3+44983\,x^2+33524\,x+11183\right)}{48050\,\left(5\,x^2+3\,x+2\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")
```

```
[Out] 4330/29791*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 11/48050*(
45710*x^3 + 44983*x^2 + 33524*x + 11183)/(5*x^2 + 3*x + 2)^2
```

3.29 $\int \frac{(3-x+2x^2)^2}{(2+3x+5x^2)^4}\,dx$

Optimal. Leaf size=85

$$\frac{16688(10x+3)}{148955\,(5x^2+3x+2)}+\frac{11(12060x+4579)}{120125\,(5x^2+3x+2)^2}+\frac{121(69x+61)}{11625\,(5x^2+3x+2)^3}+\frac{66752\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{29791\sqrt{31}}$$

```
[Out] (121*(61 + 69*x))/(11625*(2 + 3*x + 5*x^2)^3) + (11*(4579 + 12060
*x))/(120125*(2 + 3*x + 5*x^2)^2) + (16688*(3 + 10*x))/(148955*(2
 + 3*x + 5*x^2)) + (66752*ArcTan[(3 + 10*x)/Sqrt[31]])/(29791*Sqr
t[31])
```

Rubi [A] time = 0.112044, antiderivative size = 85, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{16688(10x+3)}{148955\,(5x^2+3x+2)}+\frac{11(12060x+4579)}{120125\,(5x^2+3x+2)^2}+\frac{121(69x+61)}{11625\,(5x^2+3x+2)^3}+\frac{66752\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{29791\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (121*(61 + 69*x))/(11625*(2 + 3*x + 5*x^2)^3) + (11*(4579 + 12060
*x))/(120125*(2 + 3*x + 5*x^2)^2) + (16688*(3 + 10*x))/(148955*(2
 + 3*x + 5*x^2)) + (66752*ArcTan[(3 + 10*x)/Sqrt[31]])/(29791*Sqr
t[31])
```

Rubi in Sympy [A] time = 49.8025, size = 100, normalized size = 1.18

$$\frac{(10x+3)\left(2x^2-x+3\right)^2}{93\,(5x^2+3x+2)^3}+\frac{54362\,(10x+3)}{744775\,(5x^2+3x+2)}+\frac{22\,(2471x+1724)}{72075\,(5x^2+3x+2)^2}+\frac{2\,(13450x+5399)}{72075\,(5x^2+3x+2)}+\frac{66752\sqrt{31}\,\operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{923521}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**4,x)
```

```
[Out] (10*x + 3)*(2*x**2 - x + 3)**2/(93*(5*x**2 + 3*x + 2)**3) + 54362
*(10*x + 3)/(744775*(5*x**2 + 3*x + 2)) + 22*(2471*x + 1724)/(720
75*(5*x**2 + 3*x + 2)**2) + 2*(13450*x + 5399)/(72075*(5*x**2 + 3
*x + 2)) + 66752*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/923521
```

Mathematica [A] time = 0.0861477, size = 63, normalized size = 0.74

$$\frac{12516000x^5+18774000x^4+21491796x^3+12780597x^2+5674908x+1259239}{446865\,(5x^2+3x+2)^3}+\frac{66752\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{29791\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^2/(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (1259239 + 5674908*x + 12780597*x^2 + 21491796*x^3 + 18774000*x^4
 + 12516000*x^5)/(446865*(2 + 3*x + 5*x^2)^3) + (66752*ArcTan[(3
+ 10*x)/Sqrt[31]])/(29791*Sqrt[31])
```

Maple [A] time = 0.011, size = 57, normalized size = 0.7

$$125\,\frac{1}{\left(5\,x^{2}+3\,x+2\right)^{3}}\left(\frac{33376\,x^{5}}{148955}+\frac{50064\,x^{4}}{148955}+\frac{7163932\,x^{3}}{18619375}+\frac{4260199\,x^{2}}{18619375}+\frac{1891636\,x}{18619375}+\frac{1259239}{55858125}\right)+\frac{66752\,\sqrt{31}}{923521}\arctan\left(\frac{(1250\,x+375)\,\sqrt{31}}{3875}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^2/(5*x^2+3*x+2)^4,x)
```

```
[Out] 125*(33376/148955*x^5+50064/148955*x^4+7163932/18619375*x^3+42601
99/18619375*x^2+1891636/18619375*x+1259239/55858125)/(5*x^2+3*x+2
)^3+66752/923521*31^(1/2)*arctan(1/3875*(1250*x+375)*31^(1/2))
```

Maxima [A] time = 0.767763, size = 103, normalized size = 1.21

$$\frac{66752}{923521}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\frac{12516000\,x^{5}+18774000\,x^{4}+21491796\,x^{3}+12780597\,x^{2}+5674908\,x+1259239}{446865\,(125\,x^{6}+225\,x^{5}+285\,x^{4}+207\,x^{3}+114\,x^{2}+36\,x+8)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^4,x, algorithm="maxima")
```

```
[Out] 66752/923521*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1/446865
*(12516000*x^5 + 18774000*x^4 + 21491796*x^3 + 12780597*x^2 + 567
4908*x + 1259239)/(125*x^6 + 225*x^5 + 285*x^4 + 207*x^3 + 114*x^
2 + 36*x + 8)
```

Fricas [A] time = 0.26565, size = 149, normalized size = 1.75

$$\frac{\sqrt{31}\left(1001280\,\left(125\,x^{6}+225\,x^{5}+285\,x^{4}+207\,x^{3}+114\,x^{2}+36\,x+8\right)\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\sqrt{31}\left(12516000\,x^{5}+1877\right.\right.}{13852815\,(125\,x^{6}+225\,x^{5}+285\,x^{4}+207\,x^{3}+114\,x^{2}+36\,x+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^4,x, algorithm="fricas")
```

```
[Out] 1/13852815*sqrt(31)*(1001280*(125*x^6 + 225*x^5 + 285*x^4 + 207*x
^3 + 114*x^2 + 36*x + 8)*arctan(1/31*sqrt(31)*(10*x + 3)) + sqrt(
31)*(12516000*x^5 + 18774000*x^4 + 21491796*x^3 + 12780597*x^2 +
5674908*x + 1259239))/(125*x^6 + 225*x^5 + 285*x^4 + 207*x^3 + 11
4*x^2 + 36*x + 8)
```

Sympy [A] time = 0.291172, size = 83, normalized size = 0.98

$$\frac{12516000x^5 + 18774000x^4 + 21491796x^3 + 12780597x^2 + 5674908x + 1259239}{55858125x^6 + 100544625x^5 + 127356525x^4 + 92501055x^3 + 50942610x^2 + 16087140x + 3574920} + \frac{66752\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{923521}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**2/(5*x**2+3*x+2)**4,x)
```

```
[Out] (12516000*x**5 + 18774000*x**4 + 21491796*x**3 + 12780597*x**2 +
5674908*x + 1259239)/(55858125*x**6 + 100544625*x**5 + 127356525*
x**4 + 92501055*x**3 + 50942610*x**2 + 16087140*x + 3574920) + 66
752*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/923521
```

GIAC/XCAS [A] time = 0.263303, size = 76, normalized size = 0.89

$$\frac{66752}{923521}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x + 3)\right) + \frac{12516000\,x^5 + 18774000\,x^4 + 21491796\,x^3 + 12780597\,x^2 + 5674908\,x + 1259239}{446865\,(5\,x^2 + 3\,x + 2)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^2/(5*x^2 + 3*x + 2)^4,x, algorithm="giac")
```

```
[Out] 66752/923521*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 1/446865
*(12516000*x^5 + 18774000*x^4 + 21491796*x^3 + 12780597*x^2 + 567
4908*x + 1259239)/(5*x^2 + 3*x + 2)^3
```

3.30 $\int (3-x+2x^2)^3 (2+3x+5x^2)^4 \, dx$

Optimal. Leaf size=96

$$\frac{1000x^{15}}{3}+\frac{2250x^{14}}{7}+\frac{27050x^{13}}{13}+\frac{30395x^{12}}{12}+\frac{68583x^{11}}{11}+\frac{75311x^{10}}{10}+\frac{103583x^9}{9}+\frac{94881x^8}{8}+\frac{91349x^7}{7}+\frac{64529x^6}{6}+\frac{43083x^5}{5}+5144x^4+2856x^3+1080x^2+432x$$

```
[Out] 432*x + 1080*x^2 + 2856*x^3 + 5144*x^4 + (43083*x^5)/5 + (64529*x
^6)/6 + (91349*x^7)/7 + (94881*x^8)/8 + (103583*x^9)/9 + (75311*x
^10)/10 + (68583*x^11)/11 + (30395*x^12)/12 + (27050*x^13)/13 + (
2250*x^14)/7 + (1000*x^15)/3
```

Rubi [A] time = 0.127977, antiderivative size = 96, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.04

$$\frac{1000x^{15}}{3}+\frac{2250x^{14}}{7}+\frac{27050x^{13}}{13}+\frac{30395x^{12}}{12}+\frac{68583x^{11}}{11}+\frac{75311x^{10}}{10}+\frac{103583x^9}{9}+\frac{94881x^8}{8}+\frac{91349x^7}{7}+\frac{64529x^6}{6}+\frac{43083x^5}{5}+5144x^4+2856x^3+1080x^2+432x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] 432*x + 1080*x^2 + 2856*x^3 + 5144*x^4 + (43083*x^5)/5 + (64529*x
^6)/6 + (91349*x^7)/7 + (94881*x^8)/8 + (103583*x^9)/9 + (75311*x
^10)/10 + (68583*x^11)/11 + (30395*x^12)/12 + (27050*x^13)/13 + (
2250*x^14)/7 + (1000*x^15)/3
```

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

$$\frac{26860x^{13}}{273}-\frac{19391x^{12}}{84}+\frac{453247x^{11}}{770}-\frac{125153x^{10}}{120}+\frac{336929x^9}{360}-\frac{65529x^8}{35}+\frac{14419x^7}{120}-\frac{618133x^6}{280}-\frac{224143x^5}{280}-\frac{226157x^4}{120}-\frac{221671x^3}{280}-\frac{5193x}{70}+\frac{(140x+163)\left(2x^2-x+3\right)^4\left(5x^2+3x+2\right)^3}{840}-\frac{100593\int x\,dx}{70}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**4,x)
```

```
[Out] 26860*x**13/273 - 19391*x**12/84 + 453247*x**11/770 - 125153*x**1
0/120 + 336929*x**9/360 - 65529*x**8/35 + 14419*x**7/120 - 618133
*x**6/280 - 224143*x**5/280 - 226157*x**4/120 - 221671*x**3/280 -
 5193*x/70 + (140*x + 163)*(2*x**2 - x + 3)**4*(5*x**2 + 3*x + 2)
**3/840 - 100593*Integral(x, x)/70
```

Mathematica [A] time = 0.00536835, size = 96, normalized size = 1.

$$\frac{1000x^{15}}{3}+\frac{2250x^{14}}{7}+\frac{27050x^{13}}{13}+\frac{30395x^{12}}{12}+\frac{68583x^{11}}{11}+\frac{75311x^{10}}{10}+\frac{103583x^9}{9}+\frac{94881x^8}{8}+\frac{91349x^7}{7}+\frac{64529x^6}{6}+\frac{43083x^5}{5}+5144x^4+2856x^3+1080x^2+432x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] 432*x + 1080*x^2 + 2856*x^3 + 5144*x^4 + (43083*x^5)/5 + (64529*x
^6)/6 + (91349*x^7)/7 + (94881*x^8)/8 + (103583*x^9)/9 + (75311*x
^10)/10 + (68583*x^11)/11 + (30395*x^12)/12 + (27050*x^13)/13 + (
2250*x^14)/7 + (1000*x^15)/3
```

Maple [A] time = 0.002, size = 75, normalized size = 0.8

$$432\,x+1080\,x^2+2856\,x^3+5144\,x^4+\frac{43083\,x^5}{5}+\frac{64529\,x^6}{6}+\frac{91349\,x^7}{7}+\frac{94881\,x^8}{8}+\frac{103583\,x^9}{9}+\frac{75311\,x^{10}}{10}+\frac{68583\,x^{11}}{11}+\frac{30395\,x^{12}}{12}+\frac{27050\,x^{13}}{13}+\frac{2250\,x^{14}}{7}+\frac{1000\,x^{15}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^3*(5*x^2+3*x+2)^4,x)
```

```
[Out] 432*x+1080*x^2+2856*x^3+5144*x^4+43083/5*x^5+64529/6*x^6+91349/7*
x^7+94881/8*x^8+103583/9*x^9+75311/10*x^10+68583/11*x^11+30395/12
*x^12+27050/13*x^13+2250/7*x^14+1000/3*x^15
```

Maxima [A] time = 0.689604, size = 100, normalized size = 1.04

$$\frac{1000}{3}\,x^{15}+\frac{2250}{7}\,x^{14}+\frac{27050}{13}\,x^{13}+\frac{30395}{12}\,x^{12}+\frac{68583}{11}\,x^{11}+\frac{75311}{10}\,x^{10}+\frac{103583}{9}\,x^9+\frac{94881}{8}\,x^8+\frac{91349}{7}\,x^7+\frac{64529}{6}\,x^6+\frac{43083}{5}\,x^5+5144\,x^4+2856\,x^3+1080\,x^2+432\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] 1000/3*x^15 + 2250/7*x^14 + 27050/13*x^13 + 30395/12*x^12 + 68583
/11*x^11 + 75311/10*x^10 + 103583/9*x^9 + 94881/8*x^8 + 91349/7*x
^7 + 64529/6*x^6 + 43083/5*x^5 + 5144*x^4 + 2856*x^3 + 1080*x^2 +
 432*x
```

Fricas [A] time = 0.234892, size = 1, normalized size = 0.01

$$\frac{1000}{3}x^{15}+\frac{2250}{7}x^{14}+\frac{27050}{13}x^{13}+\frac{30395}{12}x^{12}+\frac{68583}{11}x^{11}+\frac{75311}{10}x^{10}+\frac{103583}{9}x^9+\frac{94881}{8}x^8+\frac{91349}{7}x^7+\frac{64529}{6}x^6+\frac{43083}{5}x^5+5144x^4+2856x^3+1080x^2+432x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] 1000/3*x^15 + 2250/7*x^14 + 27050/13*x^13 + 30395/12*x^12 + 68583
/11*x^11 + 75311/10*x^10 + 103583/9*x^9 + 94881/8*x^8 + 91349/7*x
^7 + 64529/6*x^6 + 43083/5*x^5 + 5144*x^4 + 2856*x^3 + 1080*x^2 +
 432*x
```

Sympy [A] time = 0.089148, size = 92, normalized size = 0.96

$$\frac{1000x^{15}}{3}+\frac{2250x^{14}}{7}+\frac{27050x^{13}}{13}+\frac{30395x^{12}}{12}+\frac{68583x^{11}}{11}+\frac{75311x^{10}}{10}+\frac{103583x^{9}}{9}+\frac{94881x^{8}}{8}+\frac{91349x^{7}}{7}+\frac{64529x^{6}}{6}+\frac{43083x^{5}}{5}+5144x^4+2856x^3+1080x^2+432x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**4,x)
```

```
[Out] 1000*x**15/3 + 2250*x**14/7 + 27050*x**13/13 + 30395*x**12/12 + 6
8583*x**11/11 + 75311*x**10/10 + 103583*x**9/9 + 94881*x**8/8 + 9
1349*x**7/7 + 64529*x**6/6 + 43083*x**5/5 + 5144*x**4 + 2856*x**3
 + 1080*x**2 + 432*x
```

GIAC/XCAS [A] time = 0.263652, size = 100, normalized size = 1.04

$$\frac{1000}{3}x^{15}+\frac{2250}{7}x^{14}+\frac{27050}{13}x^{13}+\frac{30395}{12}x^{12}+\frac{68583}{11}x^{11}+\frac{75311}{10}x^{10}+\frac{103583}{9}x^{9}+\frac{94881}{8}x^{8}+\frac{91349}{7}x^{7}+\frac{64529}{6}x^{6}+\frac{43083}{5}x^{5}+5144x^4+2856x^3+1080x^2+432x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 1000/3*x^15 + 2250/7*x^14 + 27050/13*x^13 + 30395/12*x^12 + 68583
/11*x^11 + 75311/10*x^10 + 103583/9*x^9 + 94881/8*x^8 + 91349/7*x
^7 + 64529/6*x^6 + 43083/5*x^5 + 5144*x^4 + 2856*x^3 + 1080*x^2 +
 432*x
```

3.31 $\int \left(3-x+2x^2\right)^3 \left(2+3x+5x^2\right)^3 \, dx$

Optimal. Leaf size=82

$$\frac{1000x^{13}}{13}+25x^{12}+\frac{4830x^{11}}{11}+\frac{3061x^{10}}{10}+\frac{3316x^9}{3}+\frac{7869x^8}{8}+\frac{12016x^7}{7}+\frac{2873x^6}{2}+\frac{8292x^5}{5}+\frac{4483x^4}{4}+870x^3+378x^2+216x$$

```
[Out] 216*x + 378*x^2 + 870*x^3 + (4483*x^4)/4 + (8292*x^5)/5 + (2873*x
^6)/2 + (12016*x^7)/7 + (7869*x^8)/8 + (3316*x^9)/3 + (3061*x^10)
/10 + (4830*x^11)/11 + 25*x^12 + (1000*x^13)/13
```

Rubi [A] time = 0.106771, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.04$

$$\frac{1000x^{13}}{13}+25x^{12}+\frac{4830x^{11}}{11}+\frac{3061x^{10}}{10}+\frac{3316x^9}{3}+\frac{7869x^8}{8}+\frac{12016x^7}{7}+\frac{2873x^6}{2}+\frac{8292x^5}{5}+\frac{4483x^4}{4}+870x^3+378x^2+216x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] 216*x + 378*x^2 + 870*x^3 + (4483*x^4)/4 + (8292*x^5)/5 + (2873*x
^6)/2 + (12016*x^7)/7 + (7869*x^8)/8 + (3316*x^9)/3 + (3061*x^10)
/10 + (4830*x^11)/11 + 25*x^12 + (1000*x^13)/13
```

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

$$\frac{3830x^{11}}{143}-\frac{3616x^{10}}{65}+\frac{7318x^9}{39}-\frac{52491x^8}{208}+\frac{296929x^7}{728}-\frac{79743x^6}{208}+\frac{43367x^5}{130}-\frac{58499x^4}{208}+\frac{11235x^3}{104}+\frac{1917x}{52}+\frac{(120x+135)\left(2x^2-x+3\right)^4\left(5x^2+3x+2\right)^2}{624}-\frac{2997\int x\,dx}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**3,x)
```

```
[Out] 3830*x**11/143 - 3616*x**10/65 + 7318*x**9/39 - 52491*x**8/208 +
296929*x**7/728 - 79743*x**6/208 + 43367*x**5/130 - 58499*x**4/20
8 + 11235*x**3/104 + 1917*x/52 + (120*x + 135)*(2*x**2 - x + 3)**
4*(5*x**2 + 3*x + 2)**2/624 - 2997*Integral(x, x)/8
```

Mathematica [A] time = 0.00342286, size = 82, normalized size = 1.

$$\frac{1000x^{13}}{13}+25x^{12}+\frac{4830x^{11}}{11}+\frac{3061x^{10}}{10}+\frac{3316x^9}{3}+\frac{7869x^8}{8}+\frac{12016x^7}{7}+\frac{2873x^6}{2}+\frac{8292x^5}{5}+\frac{4483x^4}{4}+870x^3+378x^2+216x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] 216*x + 378*x^2 + 870*x^3 + (4483*x^4)/4 + (8292*x^5)/5 + (2873*x
^6)/2 + (12016*x^7)/7 + (7869*x^8)/8 + (3316*x^9)/3 + (3061*x^10)
/10 + (4830*x^11)/11 + 25*x^12 + (1000*x^13)/13
```

Maple [A] time = 0.002, size = 65, normalized size = 0.8

$$216\,x+378\,x^{2}+870\,x^{3}+\frac{4483\,x^{4}}{4}+\frac{8292\,x^{5}}{5}+\frac{2873\,x^{6}}{2}+\frac{12016\,x^{7}}{7}+\frac{7869\,x^{8}}{8}+\frac{3316\,x^{9}}{3}+\frac{3061\,x^{10}}{10}+\frac{4830\,x^{11}}{11}+25\,x^{12}+\frac{1000\,x^{13}}{13}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^3*(5*x^2+3*x+2)^3,x)
```

```
[Out] 216*x+378*x^2+870*x^3+4483/4*x^4+8292/5*x^5+2873/2*x^6+12016/7*x^
7+7869/8*x^8+3316/3*x^9+3061/10*x^10+4830/11*x^11+25*x^12+1000/13
*x^13
```

Maxima [A] time = 0.699519, size = 86, normalized size = 1.05

$$\frac{1000}{13}\,x^{13}+25\,x^{12}+\frac{4830}{11}\,x^{11}+\frac{3061}{10}\,x^{10}+\frac{3316}{3}\,x^{9}+\frac{7869}{8}\,x^{8}+\frac{12016}{7}\,x^{7}+\frac{2873}{2}\,x^{6}+\frac{8292}{5}\,x^{5}+\frac{4483}{4}\,x^{4}+870\,x^{3}+378\,x^{2}+216\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] 1000/13*x^13 + 25*x^12 + 4830/11*x^11 + 3061/10*x^10 + 3316/3*x^9
 + 7869/8*x^8 + 12016/7*x^7 + 2873/2*x^6 + 8292/5*x^5 + 4483/4*x^
4 + 870*x^3 + 378*x^2 + 216*x
```

Fricas [A] time = 0.234223, size = 1, normalized size = 0.01

$$\frac{1000}{13}x^{13}+25x^{12}+\frac{4830}{11}x^{11}+\frac{3061}{10}x^{10}+\frac{3316}{3}x^{9}+\frac{7869}{8}x^{8}+\frac{12016}{7}x^{7}+\frac{2873}{2}x^{6}+\frac{8292}{5}x^{5}+\frac{4483}{4}x^{4}+870x^{3}+378x^{2}+216x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] 1000/13*x^13 + 25*x^12 + 4830/11*x^11 + 3061/10*x^10 + 3316/3*x^9
 + 7869/8*x^8 + 12016/7*x^7 + 2873/2*x^6 + 8292/5*x^5 + 4483/4*x^
4 + 870*x^3 + 378*x^2 + 216*x
```

Sympy [A] time = 0.074609, size = 78, normalized size = 0.95

$$\frac{1000x^{13}}{13}+25x^{12}+\frac{4830x^{11}}{11}+\frac{3061x^{10}}{10}+\frac{3316x^{9}}{3}+\frac{7869x^{8}}{8}+\frac{12016x^{7}}{7}+\frac{2873x^{6}}{2}+\frac{8292x^{5}}{5}+\frac{4483x^{4}}{4}+870x^{3}+378x^{2}+216x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**3,x)
```

```
[Out] 1000*x**13/13 + 25*x**12 + 4830*x**11/11 + 3061*x**10/10 + 3316*x
**9/3 + 7869*x**8/8 + 12016*x**7/7 + 2873*x**6/2 + 8292*x**5/5 +
4483*x**4/4 + 870*x**3 + 378*x**2 + 216*x
```

GIAC/XCAS [A] time = 0.262009, size = 86, normalized size = 1.05

$$\frac{1000}{13}x^{13} + 25x^{12} + \frac{4830}{11}x^{11} + \frac{3061}{10}x^{10} + \frac{3316}{3}x^{9} + \frac{7869}{8}x^{8} + \frac{12016}{7}x^{7} + \frac{2873}{2}x^{6} + \frac{8292}{5}x^{5} + \frac{4483}{4}x^{4} + 870x^{3} + 378x^{2} + 216x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 1000/13*x^13 + 25*x^12 + 4830/11*x^11 + 3061/10*x^10 + 3316/3*x^9
 + 7869/8*x^8 + 12016/7*x^7 + 2873/2*x^6 + 8292/5*x^5 + 4483/4*x^
4 + 870*x^3 + 378*x^2 + 216*x
```

3.32 $\int \left(3-x+2x^2\right)^3 \left(2+3x+5x^2\right)^2 \, dx$

Optimal. Leaf size=68

$$\frac{200x^{11}}{11}-6x^{10}+\frac{922x^9}{9}+\frac{83x^8}{8}+\frac{1571x^7}{7}+\frac{299x^6}{3}+\frac{1416x^5}{5}+\frac{635x^4}{4}+237x^3+108x^2+108x$$

```
[Out] 108*x + 108*x^2 + 237*x^3 + (635*x^4)/4 + (1416*x^5)/5 + (299*x^6
)/3 + (1571*x^7)/7 + (83*x^8)/8 + (922*x^9)/9 - 6*x^10 + (200*x^1
1)/11
```

Rubi [A] time = 0.0879937, antiderivative size = 68, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.04

$$\frac{200x^{11}}{11}-6x^{10}+\frac{922x^9}{9}+\frac{83x^8}{8}+\frac{1571x^7}{7}+\frac{299x^6}{3}+\frac{1416x^5}{5}+\frac{635x^4}{4}+237x^3+108x^2+108x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] 108*x + 108*x^2 + 237*x^3 + (635*x^4)/4 + (1416*x^5)/5 + (299*x^6
)/3 + (1571*x^7)/7 + (83*x^8)/8 + (922*x^9)/9 - 6*x^10 + (200*x^1
1)/11
```

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

$$\frac{3892x^9}{495}-\frac{6387x^8}{440}+\frac{44619x^7}{770}-\frac{89849x^6}{1320}+\frac{61947x^5}{440}-\frac{22329x^4}{220}+\frac{31041x^3}{220}+\frac{28431x}{440}+\frac{(100x+107)\left(2x^2-x+3\right)^4\left(5x^2+3x+2\right)}{440}-\frac{21627\int x\,dx}{220}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**2,x)
```

```
[Out] 3892*x**9/495 - 6387*x**8/440 + 44619*x**7/770 - 89849*x**6/1320
+ 61947*x**5/440 - 22329*x**4/220 + 31041*x**3/220 + 28431*x/440
+ (100*x + 107)*(2*x**2 - x + 3)**4*(5*x**2 + 3*x + 2)/440 - 2162
7*Integral(x, x)/220
```

Mathematica [A] time = 0.00366861, size = 68, normalized size = 1.

$$\frac{200x^{11}}{11}-6x^{10}+\frac{922x^9}{9}+\frac{83x^8}{8}+\frac{1571x^7}{7}+\frac{299x^6}{3}+\frac{1416x^5}{5}+\frac{635x^4}{4}+237x^3+108x^2+108x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] 108*x + 108*x^2 + 237*x^3 + (635*x^4)/4 + (1416*x^5)/5 + (299*x^6
)/3 + (1571*x^7)/7 + (83*x^8)/8 + (922*x^9)/9 - 6*x^10 + (200*x^1
1)/11
```

Maple [A] time = 0.002, size = 55, normalized size = 0.8

$$108\,x+108\,x^{2}+237\,x^{3}+\frac{635\,x^{4}}{4}+\frac{1416\,x^{5}}{5}+\frac{299\,x^{6}}{3}+\frac{1571\,x^{7}}{7}+\frac{83\,x^{8}}{8}+\frac{922\,x^{9}}{9}-6\,x^{10}+\frac{200\,x^{11}}{11}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^3*(5*x^2+3*x+2)^2,x)
```

```
[Out] 108*x+108*x^2+237*x^3+635/4*x^4+1416/5*x^5+299/3*x^6+1571/7*x^7+8
3/8*x^8+922/9*x^9-6*x^10+200/11*x^11
```

Maxima [A] time = 0.688306, size = 73, normalized size = 1.07

$$\frac{200}{11}\,x^{11}-6\,x^{10}+\frac{922}{9}\,x^{9}+\frac{83}{8}\,x^{8}+\frac{1571}{7}\,x^{7}+\frac{299}{3}\,x^{6}+\frac{1416}{5}\,x^{5}+\frac{635}{4}\,x^{4}+237\,x^{3}+108\,x^{2}+108\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] 200/11*x^11 - 6*x^10 + 922/9*x^9 + 83/8*x^8 + 1571/7*x^7 + 299/3*
x^6 + 1416/5*x^5 + 635/4*x^4 + 237*x^3 + 108*x^2 + 108*x
```

Fricas [A] time = 0.234438, size = 1, normalized size = 0.01

$$\frac{200}{11}x^{11}-6x^{10}+\frac{922}{9}x^{9}+\frac{83}{8}x^{8}+\frac{1571}{7}x^{7}+\frac{299}{3}x^{6}+\frac{1416}{5}x^{5}+\frac{635}{4}x^{4}+237x^{3}+108x^{2}+108x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] 200/11*x^11 - 6*x^10 + 922/9*x^9 + 83/8*x^8 + 1571/7*x^7 + 299/3*
x^6 + 1416/5*x^5 + 635/4*x^4 + 237*x^3 + 108*x^2 + 108*x
```

Sympy [A] time = 0.068309, size = 65, normalized size = 0.96

$$\frac{200x^{11}}{11}-6x^{10}+\frac{922x^{9}}{9}+\frac{83x^{8}}{8}+\frac{1571x^{7}}{7}+\frac{299x^{6}}{3}+\frac{1416x^{5}}{5}+\frac{635x^{4}}{4}+237x^{3}+108x^{2}+108x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**3*(5*x**2+3*x+2)**2,x)
```

```
[Out] 200*x**11/11 - 6*x**10 + 922*x**9/9 + 83*x**8/8 + 1571*x**7/7 + 2
99*x**6/3 + 1416*x**5/5 + 635*x**4/4 + 237*x**3 + 108*x**2 + 108*
x
```

GIAC/XCAS [A] time = 0.261301, size = 73, normalized size = 1.07

$$\frac{200}{11}\,x^{11}-6\,x^{10}+\frac{922}{9}\,x^{9}+\frac{83}{8}\,x^{8}+\frac{1571}{7}\,x^{7}+\frac{299}{3}\,x^{6}+\frac{1416}{5}\,x^{5}+\frac{635}{4}\,x^{4}+237\,x^{3}+108\,x^{2}+108\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 200/11*x^11 - 6*x^10 + 922/9*x^9 + 83/8*x^8 + 1571/7*x^7 + 299/3*
x^6 + 1416/5*x^5 + 635/4*x^4 + 237*x^3 + 108*x^2 + 108*x
```

3.33 $\int \left(3-x+2x^2\right)^3 \left(2+3x+5x^2\right) \, dx$

Optimal. Leaf size=56

$$\frac{40x^9}{9}-\frac{9x^8}{2}+\frac{190x^7}{7}-\frac{83x^6}{6}+\frac{288x^5}{5}-5x^4+60x^3+\frac{27x^2}{2}+54x$$

```
[Out] 54*x + (27*x^2)/2 + 60*x^3 - 5*x^4 + (288*x^5)/5 - (83*x^6)/6 + (
190*x^7)/7 - (9*x^8)/2 + (40*x^9)/9
```

Rubi [A] time = 0.0601136, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 2, number of rules used = 1, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.043$

$$\frac{40x^9}{9}-\frac{9x^8}{2}+\frac{190x^7}{7}-\frac{83x^6}{6}+\frac{288x^5}{5}-5x^4+60x^3+\frac{27x^2}{2}+54x$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2),x]
```

```
[Out] 54*x + (27*x^2)/2 + 60*x^3 - 5*x^4 + (288*x^5)/5 - (83*x^6)/6 + (
190*x^7)/7 - (9*x^8)/2 + (40*x^9)/9
```

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

$$\frac{40x^9}{9}-\frac{9x^8}{2}+\frac{190x^7}{7}-\frac{83x^6}{6}+\frac{288x^5}{5}-5x^4+60x^3+54x+27\int x\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**3*(5*x**2+3*x+2),x)
```

```
[Out] 40*x**9/9 - 9*x**8/2 + 190*x**7/7 - 83*x**6/6 + 288*x**5/5 - 5*x*
*4 + 60*x**3 + 54*x + 27*Integral(x, x)
```

Mathematica [A] time = 0.00201941, size = 56, normalized size = 1.

$$\frac{40x^9}{9}-\frac{9x^8}{2}+\frac{190x^7}{7}-\frac{83x^6}{6}+\frac{288x^5}{5}-5x^4+60x^3+\frac{27x^2}{2}+54x$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2),x]
```

```
[Out] 54*x + (27*x^2)/2 + 60*x^3 - 5*x^4 + (288*x^5)/5 - (83*x^6)/6 + (
190*x^7)/7 - (9*x^8)/2 + (40*x^9)/9
```

Maple [A] time = 0.002, size = 45, normalized size = 0.8

$$54\,x+\frac{27\,x^2}{2}+60\,x^3-5\,x^4+\frac{288\,x^5}{5}-\frac{83\,x^6}{6}+\frac{190\,x^7}{7}-\frac{9\,x^8}{2}+\frac{40\,x^9}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((2*x^2-x+3)^3*(5*x^2+3*x+2),x)
```

```
[Out] 54*x+27/2*x^2+60*x^3-5*x^4+288/5*x^5-83/6*x^6+190/7*x^7-9/2*x^8+4
0/9*x^9
```

Maxima [A] time = 0.686941, size = 59, normalized size = 1.05

$$\frac{40}{9}\,x^{9} - \frac{9}{2}\,x^{8} + \frac{190}{7}\,x^{7} - \frac{83}{6}\,x^{6} + \frac{288}{5}\,x^{5} - 5\,x^{4} + 60\,x^{3} + \frac{27}{2}\,x^{2} + 54\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] 40/9*x^9 - 9/2*x^8 + 190/7*x^7 - 83/6*x^6 + 288/5*x^5 - 5*x^4 + 6
0*x^3 + 27/2*x^2 + 54*x
```

Fricas [A] time = 0.232509, size = 1, normalized size = 0.02

$$\frac{40}{9}x^{9} - \frac{9}{2}x^{8} + \frac{190}{7}x^{7} - \frac{83}{6}x^{6} + \frac{288}{5}x^{5} - 5x^{4} + 60x^{3} + \frac{27}{2}x^{2} + 54x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] 40/9*x^9 - 9/2*x^8 + 190/7*x^7 - 83/6*x^6 + 288/5*x^5 - 5*x^4 + 6
0*x^3 + 27/2*x^2 + 54*x
```

Sympy [A] time = 0.061963, size = 53, normalized size = 0.95

$$\frac{40x^{9}}{9} - \frac{9x^{8}}{2} + \frac{190x^{7}}{7} - \frac{83x^{6}}{6} + \frac{288x^{5}}{5} - 5x^{4} + 60x^{3} + \frac{27x^{2}}{2} + 54x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((2*x**2-x+3)**3*(5*x**2+3*x+2),x)
```

```
[Out] 40*x**9/9 - 9*x**8/2 + 190*x**7/7 - 83*x**6/6 + 288*x**5/5 - 5*x*
*4 + 60*x**3 + 27*x**2/2 + 54*x
```

GIAC/XCAS [A] time = 0.263895, size = 59, normalized size = 1.05

$$\frac{40}{9}\,x^{9} - \frac{9}{2}\,x^{8} + \frac{190}{7}\,x^{7} - \frac{83}{6}\,x^{6} + \frac{288}{5}\,x^{5} - 5\,x^{4} + 60\,x^{3} + \frac{27}{2}\,x^{2} + 54\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 40/9*x^9 - 9/2*x^8 + 190/7*x^7 - 83/6*x^6 + 288/5*x^5 - 5*x^4 + 6
0*x^3 + 27/2*x^2 + 54*x
```

3.34 $\int \frac{(3-x+2x^2)^3}{2+3x+5x^2}\,dx$

Optimal. Leaf size=70

$$\frac{8x^5}{25}-\frac{21x^4}{25}+\frac{1222x^3}{375}-\frac{7451x^2}{1250}-\frac{158389\log\left(5x^2+3x+2\right)}{31250}+\frac{49508x}{3125}+\frac{328757\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15625\sqrt{31}}$$

```
[Out] (49508*x)/3125 - (7451*x^2)/1250 + (1222*x^3)/375 - (21*x^4)/25 +
 (8*x^5)/25 + (328757*ArcTan[(3 + 10*x)/Sqrt[31]])/(15625*Sqrt[31
]) - (158389*Log[2 + 3*x + 5*x^2])/31250
```

Rubi [A] time = 0.102539, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{8x^5}{25}-\frac{21x^4}{25}+\frac{1222x^3}{375}-\frac{7451x^2}{1250}-\frac{158389\log\left(5x^2+3x+2\right)}{31250}+\frac{49508x}{3125}+\frac{328757\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15625\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2),x]
```

```
[Out] (49508*x)/3125 - (7451*x^2)/1250 + (1222*x^3)/375 - (21*x^4)/25 +
 (8*x^5)/25 + (328757*ArcTan[(3 + 10*x)/Sqrt[31]])/(15625*Sqrt[31
]) - (158389*Log[2 + 3*x + 5*x^2])/31250
```

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

$$\frac{637x^3}{375}-\frac{(-40x+65)\left(2x^2-x+3\right)^2}{500}-\frac{158389\log\left(5x^2+3x+2\right)}{31250}+\frac{328757\sqrt{31}\,\operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{484375}-\frac{\int\left(-\frac{179282}{25}\right)dx}{500}-\frac{9477\int x\,dx}{1250}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**3/(5*x**2+3*x+2),x)
```

```
[Out] 637*x**3/375 - (-40*x + 65)*(2*x**2 - x + 3)**2/500 - 158389*log(
5*x**2 + 3*x + 2)/31250 + 328757*sqrt(31)*atan(sqrt(31)*(10*x/31
+ 3/31))/484375 - Integral(-179282/25, x)/500 - 9477*Integral(x,
x)/1250
```

Mathematica [A] time = 0.040395, size = 63, normalized size = 0.9

$$\frac{31\left(5x\left(6000x^4-15750x^3+61100x^2-111765x+297048\right)-475167\log\left(5x^2+3x+2\right)\right)+1972542\sqrt{31}\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{2906250}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2),x]
```

```
[Out] (1972542*Sqrt[31]*ArcTan[(3 + 10*x)/Sqrt[31]] + 31*(5*x*(297048 -
 111765*x + 61100*x^2 - 15750*x^3 + 6000*x^4) - 475167*Log[2 + 3*
```

```
x + 5*x^2]))/2906250
```

Maple [A] time = 0.005, size = 54, normalized size = 0.8

$$\frac{49508\,x}{3125}-\frac{7451\,x^2}{1250}+\frac{1222\,x^3}{375}-\frac{21\,x^4}{25}+\frac{8\,x^5}{25}-\frac{158389\,\ln\left(5\,x^2+3\,x+2\right)}{31250}+\frac{328757\,\sqrt{31}}{484375}\arctan\left(\frac{(3+10\,x)\sqrt{31}}{31}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^3/(5*x^2+3*x+2),x)
```

```
[Out] 49508/3125*x-7451/1250*x^2+1222/375*x^3-21/25*x^4+8/25*x^5-158389
/31250*ln(5*x^2+3*x+2)+328757/484375*arctan(1/31*(3+10*x)*31^(1/2
))*31^(1/2)
```

Maxima [A] time = 0.768738, size = 72, normalized size = 1.03

$$\frac{8}{25}\,x^5-\frac{21}{25}\,x^4+\frac{1222}{375}\,x^3-\frac{7451}{1250}\,x^2+\frac{328757}{484375}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\frac{49508}{3125}\,x-\frac{158389}{31250}\,\log\left(5\,x^2+3\,x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2),x, algorithm="maxima")
```

```
[Out] 8/25*x^5 - 21/25*x^4 + 1222/375*x^3 - 7451/1250*x^2 + 328757/4843
75*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 49508/3125*x - 158
389/31250*log(5*x^2 + 3*x + 2)
```

Fricas [A] time = 0.262724, size = 86, normalized size = 1.23

$$\frac{1}{2906250}\,\sqrt{31}\left(5\,\sqrt{31}\left(6000\,x^5-15750\,x^4+61100\,x^3-111765\,x^2+297048\,x\right)-475167\,\sqrt{31}\log\left(5\,x^2+3\,x+2\right)+1972542\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2),x, algorithm="fricas")
```

```
[Out] 1/2906250*sqrt(31)*(5*sqrt(31)*(6000*x^5 - 15750*x^4 + 61100*x^3
- 111765*x^2 + 297048*x) - 475167*sqrt(31)*log(5*x^2 + 3*x + 2) +
 1972542*arctan(1/31*sqrt(31)*(10*x + 3)))
```

Sympy [A] time = 0.158155, size = 76, normalized size = 1.09

$$\frac{8x^5}{25}-\frac{21x^4}{25}+\frac{1222x^3}{375}-\frac{7451x^2}{1250}+\frac{49508x}{3125}-\frac{158389\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{31250}+\frac{328757\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{484375}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**3/(5*x**2+3*x+2),x)
```

```
[Out] 8*x**5/25 - 21*x**4/25 + 1222*x**3/375 - 7451*x**2/1250 + 49508*x
/3125 - 158389*log(x**2 + 3*x/5 + 2/5)/31250 + 328757*sqrt(31)*at
an(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/484375
```

GIAC/XCAS [A] time = 0.265556, size = 72, normalized size = 1.03

$$\frac{8}{25}x^5 - \frac{21}{25}x^4 + \frac{1222}{375}x^3 - \frac{7451}{1250}x^2 + \frac{328757}{484375}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) + \frac{49508}{3125}x - \frac{158389}{31250}\ln\left(5x^2+3x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2),x, algorithm="giac")
```

```
[Out] 8/25*x^5 - 21/25*x^4 + 1222/375*x^3 - 7451/1250*x^2 + 328757/4843
75*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 49508/3125*x - 158
389/31250*ln(5*x^2 + 3*x + 2)
```

3.35 $\int \frac{(3-x+2x^2)^3}{(2+3x+5x^2)^2} \, dx$

Optimal. Leaf size=77

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1331(247x+443)}{96875(5x^2+3x+2)} - \frac{10769\log(5x^2+3x+2)}{6250} + \frac{1466x}{625} + \frac{3819607\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{96875\sqrt{31}}$$

```
[Out] (1466*x)/625 - (54*x^2)/125 + (8*x^3)/75 + (1331*(443 + 247*x))/(
96875*(2 + 3*x + 5*x^2)) + (3819607*ArcTan[(3 + 10*x)/Sqrt[31]])/
(96875*Sqrt[31]) - (10769*Log[2 + 3*x + 5*x^2])/6250
```

Rubi [A] time = 0.125044, antiderivative size = 77, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1331(247x+443)}{96875(5x^2+3x+2)} - \frac{10769\log(5x^2+3x+2)}{6250} + \frac{1466x}{625} + \frac{3819607\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{96875\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (1466*x)/625 - (54*x^2)/125 + (8*x^3)/75 + (1331*(443 + 247*x))/(
96875*(2 + 3*x + 5*x^2)) + (3819607*ArcTan[(3 + 10*x)/Sqrt[31]])/
(96875*Sqrt[31]) - (10769*Log[2 + 3*x + 5*x^2])/6250
```

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

$$-\frac{16x^5}{31} + \frac{144x^4}{155} - \frac{6328x^3}{2325} + \frac{(10x+3)(2x^2-x+3)^3}{31(5x^2+3x+2)} - \frac{10769\log(5x^2+3x+2)}{6250} + \frac{3819607\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{3003125} - \frac{\int \frac{31217}{625}\,dx}{31} + \frac{19124\int x\,dx}{3875}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**2,x)
```

```
[Out] -16*x**5/31 + 144*x**4/155 - 6328*x**3/2325 + (10*x + 3)*(2*x**2
- x + 3)**3/(31*(5*x**2 + 3*x + 2)) - 10769*log(5*x**2 + 3*x + 2)
/6250 + 3819607*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/3003125
- Integral(31217/625, x)/31 + 19124*Integral(x, x)/3875
```

Mathematica [A] time = 0.0539002, size = 77, normalized size = 1.

$$\frac{8x^3}{75} - \frac{54x^2}{125} + \frac{1331(247x+443)}{96875(5x^2+3x+2)} - \frac{10769\log(5x^2+3x+2)}{6250} + \frac{1466x}{625} + \frac{3819607\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{96875\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (1466*x)/625 - (54*x^2)/125 + (8*x^3)/75 + (1331*(443 + 247*x))/(
96875*(2 + 3*x + 5*x^2)) + (3819607*ArcTan[(3 + 10*x)/Sqrt[31]])/
```

```
(96875*Sqrt[31]) - (10769*Log[2 + 3*x + 5*x^2])/6250
```

Maple [A] time = 0.009, size = 61, normalized size = 0.8

$$\frac{8\,x^3}{75}-\frac{54\,x^2}{125}+\frac{1466\,x}{625}-\frac{121}{625}\left(-\frac{2717\,x}{775}-\frac{4873}{775}\right)\left(x^2+\frac{3\,x}{5}+\frac{2}{5}\right)^{-1}-\frac{10769\,\ln\left(25\,x^2+15\,x+10\right)}{6250}+\frac{3819607\,\sqrt{31}}{3003125}\arctan\left(\frac{(50\,x+15)\,\sqrt{31}}{155}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^3/(5*x^2+3*x+2)^2,x)
```

```
[Out] 8/75*x^3-54/125*x^2+1466/625*x-121/625*(-2717/775*x-4873/775)/(x^
2+3/5*x+2/5)-10769/6250*ln(25*x^2+15*x+10)+3819607/3003125*31^(1/
2)*arctan(1/155*(50*x+15)*31^(1/2))
```

Maxima [A] time = 0.771164, size = 84, normalized size = 1.09

$$\frac{8}{75}\,x^3-\frac{54}{125}\,x^2+\frac{3819607}{3003125}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\frac{1466}{625}\,x+\frac{1331\,(247\,x+443)}{96875\,(5\,x^2+3\,x+2)}-\frac{10769}{6250}\,\log\left(5\,x^2+3\,x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")
```

```
[Out] 8/75*x^3 - 54/125*x^2 + 3819607/3003125*sqrt(31)*arctan(1/31*sqrt
(31)*(10*x + 3)) + 1466/625*x + 1331/96875*(247*x + 443)/(5*x^2 +
 3*x + 2) - 10769/6250*log(5*x^2 + 3*x + 2)
```

Fricas [A] time = 0.265656, size = 131, normalized size = 1.7

$$-\frac{\sqrt{31}\Big(1001517\,\sqrt{31}\left(5\,x^2+3\,x+2\right)\log\left(5\,x^2+3\,x+2\right)-22917642\left(5\,x^2+3\,x+2\right)\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)-2\,\sqrt{31}(155\cdots}{18018750\,(5\,x^2+3\,x+2)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")
```

```
[Out] -1/18018750*sqrt(31)*(1001517*sqrt(31)*(5*x^2 + 3*x + 2)*log(5*x^
2 + 3*x + 2) - 22917642*(5*x^2 + 3*x + 2)*arctan(1/31*sqrt(31)*(1
0*x + 3)) - 2*sqrt(31)*(155000*x^5 - 534750*x^4 + 3093800*x^3 + 1
793970*x^2 + 2349651*x + 1768899))/(5*x^2 + 3*x + 2)
```

Sympy [A] time = 0.220291, size = 78, normalized size = 1.01

$$\frac{8x^3}{75}-\frac{54x^2}{125}+\frac{1466x}{625}+\frac{328757x+589633}{484375x^2+290625x+193750}-\frac{10769\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{6250}+\frac{3819607\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{3003125}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**2,x)
```

```
[Out] 8*x**3/75 - 54*x**2/125 + 1466*x/625 + (328757*x + 589633)/(48437
5*x**2 + 290625*x + 193750) - 10769*log(x**2 + 3*x/5 + 2/5)/6250
+ 3819607*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/3003125
```

GIAC/XCAS [A] time = 0.264709, size = 84, normalized size = 1.09

$$\frac{8}{75}\,x^{3} - \frac{54}{125}\,x^{2} + \frac{3819607}{3003125}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x + 3)\right) + \frac{1466}{625}\,x + \frac{1331\,(247\,x + 443)}{96875\,(5\,x^{2} + 3\,x + 2)} - \frac{10769}{6250}\,\ln\left(5\,x^{2} + 3\,x + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")
```

```
[Out] 8/75*x^3 - 54/125*x^2 + 3819607/3003125*sqrt(31)*arctan(1/31*sqrt
(31)*(10*x + 3)) + 1466/625*x + 1331/96875*(247*x + 443)/(5*x^2 +
 3*x + 2) - 10769/6250*ln(5*x^2 + 3*x + 2)
```

3.36 $\int \frac{(3-x+2x^2)^3}{(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=84

$$\frac{121(342840x+188381)}{6006250\left(5x^2+3x+2\right)}+\frac{1331(247x+443)}{193750\left(5x^2+3x+2\right)^2}-\frac{66}{625}\log\left(5x^2+3x+2\right)+\frac{8x}{125}+\frac{11341176\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{600625\sqrt{31}}$$

```
[Out] (8*x)/125 + (1331*(443 + 247*x))/(193750*(2 + 3*x + 5*x^2)^2) + (
121*(188381 + 342840*x))/(6006250*(2 + 3*x + 5*x^2)) + (11341176*
ArcTan[(3 + 10*x)/Sqrt[31]])/(600625*Sqrt[31]) - (66*Log[2 + 3*x
+ 5*x^2])/625
```

Rubi [A] time = 0.148799, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{121(342840x+188381)}{6006250\left(5x^2+3x+2\right)}+\frac{1331(247x+443)}{193750\left(5x^2+3x+2\right)^2}-\frac{66}{625}\log\left(5x^2+3x+2\right)+\frac{8x}{125}+\frac{11341176\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{600625\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (8*x)/125 + (1331*(443 + 247*x))/(193750*(2 + 3*x + 5*x^2)^2) + (
121*(188381 + 342840*x))/(6006250*(2 + 3*x + 5*x^2)) + (11341176*
ArcTan[(3 + 10*x)/Sqrt[31]])/(600625*Sqrt[31]) - (66*Log[2 + 3*x
+ 5*x^2])/625
```

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

$$-\frac{8x^3}{155}+\frac{(10x+3)\left(2x^2-x+3\right)^3}{62\left(5x^2+3x+2\right)^2}+\frac{14883\,(69x+61)}{240250\left(5x^2+3x+2\right)}-\frac{66\log\left(5x^2+3x+2\right)}{625}$$
$$+\frac{11341176\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{18619375}-\frac{\int\frac{2112}{125}\,dx}{62}+\frac{192\int x\,dx}{775}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**3,x)
```

```
[Out] -8*x**3/155 + (10*x + 3)*(2*x**2 - x + 3)**3/(62*(5*x**2 + 3*x +
2)**2) + 14883*(69*x + 61)/(240250*(5*x**2 + 3*x + 2)) - 66*log(5
*x**2 + 3*x + 2)/625 + 11341176*sqrt(31)*atan(sqrt(31)*(10*x/31 +
 3/31))/18619375 - Integral(2112/125, x)/62 + 192*Integral(x, x)/
775
```

Mathematica [A] time = 0.0725325, size = 78, normalized size = 0.93

$$\frac{\frac{3751(342840x+188381)}{5x^2+3x+2}+\frac{1279091(247x+443)}{(5x^2+3x+2)^2}-19662060\log\left(5x^2+3x+2\right)+11916400x+113411760\sqrt{31}\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{186193750}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^3/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (11916400*x + (1279091*(443 + 247*x))/(2 + 3*x + 5*x^2)^2 + (3751
*(188381 + 342840*x))/(2 + 3*x + 5*x^2) + 113411760*Sqrt[31]*ArcT
an[(3 + 10*x)/Sqrt[31]] - 19662060*Log[2 + 3*x + 5*x^2])/18619375
0
```

Maple [A] time = 0.01, size = 63, normalized size = 0.8

$$\frac{8x}{125} - \frac{11}{5\,(5x^2+3x+2)^2}\left(-\frac{377124x^3}{24025} - \frac{866987x^2}{48050} - \frac{293711x}{24025} - \frac{232243}{48050}\right) - \frac{66\ln(125x^2+75x+50)}{625} + \frac{11341176\sqrt{31}}{18619375}\arctan\left(\frac{(250x+75)\sqrt{31}}{775}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^3/(5*x^2+3*x+2)^3,x)
```

```
[Out] 8/125*x-11/5*(-377124/24025*x^3-866987/48050*x^2-293711/24025*x-2
32243/48050)/(5*x^2+3*x+2)^2-66/625*ln(125*x^2+75*x+50)+11341176/
18619375*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))
```

Maxima [A] time = 0.777997, size = 97, normalized size = 1.15

$$\frac{11341176}{18619375}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) + \frac{8}{125}x + \frac{121\left(68568x^3+78817x^2+53402x+21113\right)}{240250\,(25x^4+30x^3+29x^2+12x+4)} - \frac{66}{625}\log\left(5x^2+3x+2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] 11341176/18619375*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 8/1
25*x + 121/240250*(68568*x^3 + 78817*x^2 + 53402*x + 21113)/(25*x
^4 + 30*x^3 + 29*x^2 + 12*x + 4) - 66/625*log(5*x^2 + 3*x + 2)
```

Fricas [A] time = 0.265603, size = 171, normalized size = 2.04

$$-\frac{\sqrt{31}\Big(126852\sqrt{31}\left(25x^4+30x^3+29x^2+12x+4\right)\log\left(5x^2+3x+2\right) - 22682352\left(25x^4+30x^3+29x^2+12x+4\right)\text{arcta}}{37238750\,(25x^4+30x^3+29}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] -1/37238750*sqrt(31)*(126852*sqrt(31)*(25*x^4 + 30*x^3 + 29*x^2 +
 12*x + 4)*log(5*x^2 + 3*x + 2) - 22682352*(25*x^4 + 30*x^3 + 29*
x^2 + 12*x + 4)*arctan(1/31*sqrt(31)*(10*x + 3)) - 5*sqrt(31)*(38
4400*x^5 + 461280*x^4 + 8742632*x^3 + 9721369*x^2 + 6523146*x + 2
554673))/(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)
```

Sympy [A] time = 0.282666, size = 85, normalized size = 1.01

$$\frac{8x}{125} + \frac{8296728x^3 + 9536857x^2 + 6461642x + 2554673}{6006250x^4 + 7207500x^3 + 6967250x^2 + 2883000x + 961000} - \frac{66\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{625} + \frac{11341176\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{18619375}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**3/(5*x**2+3*x+2)**3,x)
```

```
[Out] 8*x/125 + (8296728*x**3 + 9536857*x**2 + 6461642*x + 2554673)/(60
06250*x**4 + 7207500*x**3 + 6967250*x**2 + 2883000*x + 961000) -
66*log(x**2 + 3*x/5 + 2/5)/625 + 11341176*sqrt(31)*atan(10*sqrt(3
1)*x/31 + 3*sqrt(31)/31)/18619375
```

GIAC/XCAS [A] time = 0.266685, size = 84, normalized size = 1.

$$\frac{11341176}{18619375}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x + 3)\right) + \frac{8}{125}x + \frac{121\left(68568x^3 + 78817x^2 + 53402x + 21113\right)}{240250\left(5x^2 + 3x + 2\right)^2} - \frac{66}{625}\ln\left(5x^2 + 3x + 2\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^3/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")
```

```
[Out] 11341176/18619375*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 8/1
25*x + 121/240250*(68568*x^3 + 78817*x^2 + 53402*x + 21113)/(5*x^
2 + 3*x + 2)^2 - 66/625*ln(5*x^2 + 3*x + 2)
```

3.37 $\int \frac{(2+3x+5x^2)^4}{3-x+2x^2} \, dx$

Optimal. Leaf size=84

$$\frac{625x^7}{14}+\frac{3625x^6}{24}+\frac{1855x^5}{8}+\frac{6245x^4}{64}-\frac{21229x^3}{96}-\frac{28747x^2}{128}+\frac{307461}{512}\log\left(2x^2-x+3\right)+\frac{122691x}{128}+\frac{1156639\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{256\sqrt{23}}$$

```
[Out] (122691*x)/128 - (28747*x^2)/128 - (21229*x^3)/96 + (6245*x^4)/64
 + (1855*x^5)/8 + (3625*x^6)/24 + (625*x^7)/14 + (1156639*ArcTan[
(1 - 4*x)/Sqrt[23]])/(256*Sqrt[23]) + (307461*Log[3 - x + 2*x^2])
/512
```

Rubi [A] time = 0.112129, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{625x^7}{14}+\frac{3625x^6}{24}+\frac{1855x^5}{8}+\frac{6245x^4}{64}-\frac{21229x^3}{96}-\frac{28747x^2}{128}+\frac{307461}{512}\log\left(2x^2-x+3\right)+\frac{122691x}{128}+\frac{1156639\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{256\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2),x]
```

```
[Out] (122691*x)/128 - (28747*x^2)/128 - (21229*x^3)/96 + (6245*x^4)/64
 + (1855*x^5)/8 + (3625*x^6)/24 + (625*x^7)/14 + (1156639*ArcTan[
(1 - 4*x)/Sqrt[23]])/(256*Sqrt[23]) + (307461*Log[3 - x + 2*x^2])
/512
```

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

$$\frac{20x^5}{7}-\frac{61605x^4}{448}-\frac{254623x^3}{672}+\frac{(60x+95)\left(5x^2+3x+2\right)^3}{168}+\frac{307461\log\left(2x^2-x+3\right)}{512}-\frac{1156639\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{5888}-\frac{\int\left(-\frac{2514111}{16}\right)dx}{168}-\frac{270509\int x\,dx}{448}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3),x)
```

```
[Out] 20*x**5/7 - 61605*x**4/448 - 254623*x**3/672 + (60*x + 95)*(5*x**
2 + 3*x + 2)**3/168 + 307461*log(2*x**2 - x + 3)/512 - 1156639*sq
rt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/5888 - Integral(-2514111/16
, x)/168 - 270509*Integral(x, x)/448
```

Mathematica [A] time = 0.0517153, size = 72, normalized size = 0.86

$$\frac{307461}{512}\log\left(2x^2-x+3\right)+\frac{x\left(120000x^6+406000x^5+623280x^4+262290x^3-594412x^2-603687x+2576511\right)}{2688}-\frac{1156639\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{256\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]   Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2),x]
```

```
[Out] (x*(2576511 - 603687*x - 594412*x^2 + 262290*x^3 + 623280*x^4 + 4
06000*x^5 + 120000*x^6))/2688 - (1156639*ArcTan[(-1 + 4*x)/Sqrt[2
3]])/(256*Sqrt[23]) + (307461*Log[3 - x + 2*x^2])/512
```

Maple [A] time = 0.007, size = 64, normalized size = 0.8

$$\frac{625x^7}{14}+\frac{3625x^6}{24}+\frac{1855x^5}{8}+\frac{6245x^4}{64}-\frac{21229x^3}{96}-\frac{28747x^2}{128}+\frac{122691x}{128}+\frac{307461\ln(2x^2-x+3)}{512}-\frac{1156639\sqrt{23}}{5888}\arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((5*x^2+3*x+2)^4/(2*x^2-x+3),x)
```

```
[Out] 625/14*x^7+3625/24*x^6+1855/8*x^5+6245/64*x^4-21229/96*x^3-28747/
128*x^2+122691/128*x+307461/512*ln(2*x^2-x+3)-1156639/5888*23^(1/
2)*arctan(1/23*(4*x-1)*23^(1/2))
```

Maxima [A] time = 0.77404, size = 85, normalized size = 1.01

$$\frac{625}{14}x^7+\frac{3625}{24}x^6+\frac{1855}{8}x^5+\frac{6245}{64}x^4-\frac{21229}{96}x^3-\frac{28747}{128}x^2-\frac{1156639}{5888}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{122691}{128}x+\frac{307461}{512}\log(2x^2-x+3)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 625/14*x^7 + 3625/24*x^6 + 1855/8*x^5 + 6245/64*x^4 - 21229/96*x^
3 - 28747/128*x^2 - 1156639/5888*sqrt(23)*arctan(1/23*sqrt(23)*(4
*x - 1)) + 122691/128*x + 307461/512*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.26226, size = 100, normalized size = 1.19

$$\frac{1}{247296}\sqrt{23}\left(4\sqrt{23}\left(120000x^7+406000x^6+623280x^5+262290x^4-594412x^3-603687x^2+2576511x\right)+6456681\sqrt{23}\,\mathrm{l}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/247296*sqrt(23)*(4*sqrt(23)*(120000*x^7 + 406000*x^6 + 623280*x
^5 + 262290*x^4 - 594412*x^3 - 603687*x^2 + 2576511*x) + 6456681*
sqrt(23)*log(2*x^2 - x + 3) - 48578838*arctan(1/23*sqrt(23)*(4*x
- 1)))
```

Sympy [A] time = 0.169111, size = 87, normalized size = 1.04

$$\frac{625x^7}{14} + \frac{3625x^6}{24} + \frac{1855x^5}{8} + \frac{6245x^4}{64} - \frac{21229x^3}{96} - \frac{28747x^2}{128} + \frac{122691x}{128} + \frac{307461\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{512} - \frac{1156639\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{5888}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**4/(2*x**2-x+3),x)
```

```
[Out] 625*x**7/14 + 3625*x**6/24 + 1855*x**5/8 + 6245*x**4/64 - 21229*x
**3/96 - 28747*x**2/128 + 122691*x/128 + 307461*log(x**2 - x/2 +
3/2)/512 - 1156639*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/5
888
```

GIAC/XCAS [A] time = 0.266343, size = 85, normalized size = 1.01

$$\frac{625}{14}\,x^7 + \frac{3625}{24}\,x^6 + \frac{1855}{8}\,x^5 + \frac{6245}{64}\,x^4 - \frac{21229}{96}\,x^3 - \frac{28747}{128}\,x^2 - \frac{1156639}{5888}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x - 1)\right) + \frac{122691}{128}\,x + \frac{307461}{512}\,\ln\left(2\,x^2 - x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 625/14*x^7 + 3625/24*x^6 + 1855/8*x^5 + 6245/64*x^4 - 21229/96*x^
3 - 28747/128*x^2 - 1156639/5888*sqrt(23)*arctan(1/23*sqrt(23)*(4
*x - 1)) + 122691/128*x + 307461/512*ln(2*x^2 - x + 3)
```

3.38 $\int \frac{(2+3x+5x^2)^3}{3-x+2x^2}\,dx$

Optimal. Leaf size=70

$$\frac{25x^5}{2}+\frac{575x^4}{16}+\frac{965x^3}{24}-\frac{829x^2}{32}+\frac{1331}{128}\log\left(2x^2-x+3\right)-\frac{4795x}{32}-\frac{59895\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{23}}$$

```
[Out] (-4795*x)/32 - (829*x^2)/32 + (965*x^3)/24 + (575*x^4)/16 + (25*x
^5)/2 - (59895*ArcTan[(1 - 4*x)/Sqrt[23]])/(64*Sqrt[23]) + (1331*
Log[3 - x + 2*x^2])/128
```

Rubi [A] time = 0.0968413, antiderivative size = 70, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$\frac{25x^5}{2}+\frac{575x^4}{16}+\frac{965x^3}{24}-\frac{829x^2}{32}+\frac{1331}{128}\log\left(2x^2-x+3\right)-\frac{4795x}{32}-\frac{59895\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2),x]
```

```
[Out] (-4795*x)/32 - (829*x^2)/32 + (965*x^3)/24 + (575*x^4)/16 + (25*x
^5)/2 - (59895*ArcTan[(1 - 4*x)/Sqrt[23]])/(64*Sqrt[23]) + (1331*
Log[3 - x + 2*x^2])/128
```

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

$$\frac{7x^3}{12}+\frac{(40x+67)\left(5x^2+3x+2\right)^2}{80}+\frac{1331\log\left(2x^2-x+3\right)}{128}+\frac{59895\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{1472}-\frac{\int\frac{25903}{2}\,dx}{80}-\frac{8991\int x\,dx}{80}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3),x)
```

```
[Out] 7*x**3/12 + (40*x + 67)*(5*x**2 + 3*x + 2)**2/80 + 1331*log(2*x**
2 - x + 3)/128 + 59895*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/14
72 - Integral(25903/2, x)/80 - 8991*Integral(x, x)/80
```

Mathematica [A] time = 0.0436943, size = 63, normalized size = 0.9

$$\frac{1}{384}\left(3993\log\left(2x^2-x+3\right)+4x\left(1200x^4+3450x^3+3860x^2-2487x-14385\right)\right)+\frac{59895\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{64\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2),x]
```

```
[Out] (59895*ArcTan[(-1 + 4*x)/Sqrt[23]])/(64*Sqrt[23]) + (4*x*(-14385
- 2487*x + 3860*x^2 + 3450*x^3 + 1200*x^4) + 3993*Log[3 - x + 2*x
```

```
^2])/384
```

Maple [A] time = 0.005, size = 54, normalized size = 0.8

$$\frac{25\,x^{5}}{2}+\frac{575\,x^{4}}{16}+\frac{965\,x^{3}}{24}-\frac{829\,x^{2}}{32}-\frac{4795\,x}{32}+\frac{1331\,\ln\left(2\,x^{2}-x+3\right)}{128}+\frac{59895\,\sqrt{23}}{1472}\arctan\left(\frac{(4\,x-1)\,\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^3/(2*x^2-x+3),x)
```

```
[Out] 25/2*x^5+575/16*x^4+965/24*x^3-829/32*x^2-4795/32*x+1331/128*ln(2
*x^2-x+3)+59895/1472*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))
```

Maxima [A] time = 0.772582, size = 72, normalized size = 1.03

$$\frac{25}{2}\,x^{5}+\frac{575}{16}\,x^{4}+\frac{965}{24}\,x^{3}-\frac{829}{32}\,x^{2}+\frac{59895}{1472}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\frac{4795}{32}\,x+\frac{1331}{128}\,\log\left(2\,x^{2}-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 25/2*x^5 + 575/16*x^4 + 965/24*x^3 - 829/32*x^2 + 59895/1472*sqrt
(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 4795/32*x + 1331/128*log(2
*x^2 - x + 3)
```

Fricas [A] time = 0.260527, size = 86, normalized size = 1.23

$$\frac{1}{8832}\,\sqrt{23}\left(4\,\sqrt{23}\left(1200\,x^{5}+3450\,x^{4}+3860\,x^{3}-2487\,x^{2}-14385\,x\right)+3993\,\sqrt{23}\log\left(2\,x^{2}-x+3\right)+359370\,\arctan\left(\frac{1}{23}\,\sqrt{2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/8832*sqrt(23)*(4*sqrt(23)*(1200*x^5 + 3450*x^4 + 3860*x^3 - 248
7*x^2 - 14385*x) + 3993*sqrt(23)*log(2*x^2 - x + 3) + 359370*arct
an(1/23*sqrt(23)*(4*x - 1)))
```

Sympy [A] time = 0.156804, size = 73, normalized size = 1.04

$$\frac{25x^{5}}{2}+\frac{575x^{4}}{16}+\frac{965x^{3}}{24}-\frac{829x^{2}}{32}-\frac{4795x}{32}+\frac{1331\log\left(x^{2}-\frac{x}{2}+\frac{3}{2}\right)}{128}+\frac{59895\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{1472}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**3/(2*x**2-x+3),x)
```

```
[Out] 25*x**5/2 + 575*x**4/16 + 965*x**3/24 - 829*x**2/32 - 4795*x/32 +
 1331*log(x**2 - x/2 + 3/2)/128 + 59895*sqrt(23)*atan(4*sqrt(23)*
```

```
x/23 - sqrt(23)/23)/1472
```

GIAC/XCAS [A] time = 0.26472, size = 72, normalized size = 1.03

$$\frac{25}{2}\,x^5 + \frac{575}{16}\,x^4 + \frac{965}{24}\,x^3 - \frac{829}{32}\,x^2 + \frac{59895}{1472}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right) - \frac{4795}{32}\,x + \frac{1331}{128}\,\ln\left(2\,x^2 - x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 25/2*x^5 + 575/16*x^4 + 965/24*x^3 - 829/32*x^2 + 59895/1472*sqrt
(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 4795/32*x + 1331/128*ln(2*
x^2 - x + 3)
```

3.39 $\int \frac{(2+3x+5x^2)^2}{3-x+2x^2}\,dx$

Optimal. Leaf size=56

$$\frac{25x^3}{6}+\frac{85x^2}{8}-\frac{363}{32}\log\left(2x^2-x+3\right)+\frac{51x}{8}+\frac{847\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16\sqrt{23}}$$

```
[Out] (51*x)/8 + (85*x^2)/8 + (25*x^3)/6 + (847*ArcTan[(1 - 4*x)/Sqrt[2
3]])/(16*Sqrt[23]) - (363*Log[3 - x + 2*x^2])/32
```

Rubi [A] time = 0.0878965, antiderivative size = 56, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{25x^3}{6}+\frac{85x^2}{8}-\frac{363}{32}\log\left(2x^2-x+3\right)+\frac{51x}{8}+\frac{847\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2),x]
```

```
[Out] (51*x)/8 + (85*x^2)/8 + (25*x^3)/6 + (847*ArcTan[(1 - 4*x)/Sqrt[2
3]])/(16*Sqrt[23]) - (363*Log[3 - x + 2*x^2])/32
```

Rubi in Sympy [A] time = 27.1914, size = 58, normalized size = 1.04

$$-\frac{x}{6}+\left(\frac{5x}{6}+\frac{13}{8}\right)\left(5x^2+3x+2\right)-\frac{363\log\left(2x^2-x+3\right)}{32}-\frac{847\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{368}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3),x)
```

```
[Out] -x/6 + (5*x/6 + 13/8)*(5*x**2 + 3*x + 2) - 363*log(2*x**2 - x + 3
)/32 - 847*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/368
```

Mathematica [A] time = 0.0317148, size = 52, normalized size = 0.93

$$\frac{1}{24}x\left(100x^2+255x+153\right)-\frac{363}{32}\log\left(2x^2-x+3\right)-\frac{847\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{16\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2),x]
```

```
[Out] (x*(153 + 255*x + 100*x^2))/24 - (847*ArcTan[(-1 + 4*x)/Sqrt[23]]
)/(16*Sqrt[23]) - (363*Log[3 - x + 2*x^2])/32
```

Maple [A] time = 0.005, size = 44, normalized size = 0.8

$$\frac{25\,x^3}{6}+\frac{85\,x^2}{8}+\frac{51\,x}{8}-\frac{363\,\ln\left(2\,x^2-x+3\right)}{32}-\frac{847\,\sqrt{23}}{368}\arctan\left(\frac{(4\,x-1)\,\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((5*x^2+3*x+2)^2/(2*x^2-x+3),x)
```

```
[Out] 25/6*x^3+85/8*x^2+51/8*x-363/32*ln(2*x^2-x+3)-847/368*23^(1/2)*ar
ctan(1/23*(4*x-1)*23^(1/2))
```

Maxima [A] time = 0.766298, size = 58, normalized size = 1.04

$$\frac{25}{6}\,x^3+\frac{85}{8}\,x^2-\frac{847}{368}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{51}{8}\,x-\frac{363}{32}\,\log\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 25/6*x^3 + 85/8*x^2 - 847/368*sqrt(23)*arctan(1/23*sqrt(23)*(4*x
- 1)) + 51/8*x - 363/32*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.270894, size = 73, normalized size = 1.3

$$\frac{1}{2208}\,\sqrt{23}\left(4\,\sqrt{23}\left(100\,x^3+255\,x^2+153\,x\right)-1089\,\sqrt{23}\log\left(2\,x^2-x+3\right)-5082\,\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/2208*sqrt(23)*(4*sqrt(23)*(100*x^3 + 255*x^2 + 153*x) - 1089*sq
rt(23)*log(2*x^2 - x + 3) - 5082*arctan(1/23*sqrt(23)*(4*x - 1)))
```

Sympy [A] time = 0.153796, size = 60, normalized size = 1.07

$$\frac{25x^3}{6}+\frac{85x^2}{8}+\frac{51x}{8}-\frac{363\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{32}-\frac{847\sqrt{23}\,\text{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{368}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x**2+3*x+2)**2/(2*x**2-x+3),x)
```

```
[Out] 25*x**3/6 + 85*x**2/8 + 51*x/8 - 363*log(x**2 - x/2 + 3/2)/32 - 8
47*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/368
```

GIAC/XCAS [A] time = 0.264858, size = 58, normalized size = 1.04

$$\frac{25}{6}\,x^3+\frac{85}{8}\,x^2-\frac{847}{368}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{51}{8}\,x-\frac{363}{32}\,\ln\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 25/6*x^3 + 85/8*x^2 - 847/368*sqrt(23)*arctan(1/23*sqrt(23)*(4*x
- 1)) + 51/8*x - 363/32*ln(2*x^2 - x + 3)
```

3.40 $\int \frac{2+3x+5x^2}{3-x+2x^2} dx$

Optimal. Leaf size=42

$$\frac{11}{8}\log\left(2x^2-x+3\right)+\frac{5x}{2}+\frac{33\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{23}}$$

```
[Out] (5*x)/2 + (33*ArcTan[(1 - 4*x)/Sqrt[23]])/(4*Sqrt[23]) + (11*Log[
3 - x + 2*x^2])/8
```

Rubi [A] time = 0.0672588, antiderivative size = 42, 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

$$\frac{11}{8}\log\left(2x^2-x+3\right)+\frac{5x}{2}+\frac{33\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2),x]
```

```
[Out] (5*x)/2 + (33*ArcTan[(1 - 4*x)/Sqrt[23]])/(4*Sqrt[23]) + (11*Log[
3 - x + 2*x^2])/8
```

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

$$\frac{11\log\left(2x^2-x+3\right)}{8}-\frac{33\sqrt{23}\operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{92}+\int\frac{5}{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3),x)
```

```
[Out] 11*log(2*x**2 - x + 3)/8 - 33*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/
23))/92 + Integral(5/2, x)
```

Mathematica [A] time = 0.0197414, size = 42, normalized size = 1.

$$\frac{11}{8}\log\left(2x^2-x+3\right)+\frac{5x}{2}-\frac{33\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{4\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2),x]
```

```
[Out] (5*x)/2 - (33*ArcTan[(-1 + 4*x)/Sqrt[23]])/(4*Sqrt[23]) + (11*Log
[3 - x + 2*x^2])/8
```

Maple [A] time = 0.004, size = 34, normalized size = 0.8

$$\frac{5x}{2}+\frac{11\ln\left(2x^2-x+3\right)}{8}-\frac{33\sqrt{23}}{92}\arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((5*x^2+3*x+2)/(2*x^2-x+3),x)
```

```
[Out] 5/2*x+11/8*ln(2*x^2-x+3)-33/92*23^(1/2)*arctan(1/23*(4*x-1)*23^(1
/2))
```

Maxima [A] time = 0.769842, size = 45, normalized size = 1.07

$$-\frac{33}{92}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{5}{2}x+\frac{11}{8}\log\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] -33/92*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 5/2*x + 11/8*lo
g(2*x^2 - x + 3)
```

Fricas [A] time = 0.268168, size = 55, normalized size = 1.31

$$\frac{1}{184}\sqrt{23}\left(20\sqrt{23}x+11\sqrt{23}\log\left(2x^2-x+3\right)-66\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/184*sqrt(23)*(20*sqrt(23)*x + 11*sqrt(23)*log(2*x^2 - x + 3) -
66*arctan(1/23*sqrt(23)*(4*x - 1)))
```

Sympy [A] time = 0.135538, size = 46, normalized size = 1.1

$$\frac{5x}{2}+\frac{11\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{8}-\frac{33\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{92}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x**2+3*x+2)/(2*x**2-x+3),x)
```

```
[Out] 5*x/2 + 11*log(x**2 - x/2 + 3/2)/8 - 33*sqrt(23)*atan(4*sqrt(23)*
x/23 - sqrt(23)/23)/92
```

GIAC/XCAS [A] time = 0.264574, size = 45, normalized size = 1.07

$$-\frac{33}{92}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{5}{2}x+\frac{11}{8}\ln\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] -33/92*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 5/2*x + 11/8*ln
(2*x^2 - x + 3)
```

3.41 $\int \frac{1}{(3-x+2x^2)(2+3x+5x^2)}\,dx$

Optimal. Leaf size=73

$$-\frac{1}{44}\log\left(2x^2-x+3\right)+\frac{1}{44}\log\left(5x^2+3x+2\right)+\frac{3\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{22\sqrt{23}}+\frac{13\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{22\sqrt{31}}$$

```
[Out] (3*ArcTan[(1 - 4*x)/Sqrt[23]])/(22*Sqrt[23]) + (13*ArcTan[(3 + 10
*x)/Sqrt[31]])/(22*Sqrt[31]) - Log[3 - x + 2*x^2]/44 + Log[2 + 3*
x + 5*x^2]/44
```

Rubi [A] time = 0.115147, antiderivative size = 73, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$-\frac{1}{44}\log\left(2x^2-x+3\right)+\frac{1}{44}\log\left(5x^2+3x+2\right)+\frac{3\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{22\sqrt{23}}+\frac{13\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{22\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (3*ArcTan[(1 - 4*x)/Sqrt[23]])/(22*Sqrt[23]) + (13*ArcTan[(3 + 10
*x)/Sqrt[31]])/(22*Sqrt[31]) - Log[3 - x + 2*x^2]/44 + Log[2 + 3*
x + 5*x^2]/44
```

Rubi in Sympy [A] time = 27.3021, size = 71, normalized size = 0.97

$$-\frac{\log\left(2x^2-x+3\right)}{44}+\frac{\log\left(5x^2+3x+2\right)}{44}-\frac{3\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{506}+\frac{13\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{682}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2),x)
```

```
[Out] -log(2*x**2 - x + 3)/44 + log(5*x**2 + 3*x + 2)/44 - 3*sqrt(23)*a
tan(sqrt(23)*(4*x/23 - 1/23))/506 + 13*sqrt(31)*atan(sqrt(31)*(10
*x/31 + 3/31))/682
```

Mathematica [A] time = 0.065768, size = 73, normalized size = 1.

$$-\frac{1}{44}\log\left(2x^2-x+3\right)+\frac{1}{44}\log\left(5x^2+3x+2\right)-\frac{3\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{22\sqrt{23}}+\frac{13\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{22\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (-3*ArcTan[(-1 + 4*x)/Sqrt[23]])/(22*Sqrt[23]) + (13*ArcTan[(3 +
10*x)/Sqrt[31]])/(22*Sqrt[31]) - Log[3 - x + 2*x^2]/44 + Log[2 +
3*x + 5*x^2]/44
```

Maple [A] time = 0.005, size = 60, normalized size = 0.8

$$\frac{\ln\left(5x^2+3x+2\right)}{44}+\frac{13\sqrt{31}}{682}\arctan\left(\frac{(3+10x)\sqrt{31}}{31}\right)-\frac{\ln\left(2x^2-x+3\right)}{44}-\frac{3\sqrt{23}}{506}\arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)/(5*x^2+3*x+2),x)
```

```
[Out] 1/44*ln(5*x^2+3*x+2)+13/682*arctan(1/31*(3+10*x)*31^(1/2))*31^(1/
2)-1/44*ln(2*x^2-x+3)-3/506*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2)
)
```

Maxima [A] time = 0.772028, size = 80, normalized size = 1.1

$$\frac{13}{682}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)-\frac{3}{506}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{1}{44}\log\left(5x^2+3x+2\right)-\frac{1}{44}\log\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] 13/682*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 3/506*sqrt(23)
*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/44*log(5*x^2 + 3*x + 2) - 1/
44*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.270253, size = 105, normalized size = 1.44

$$\frac{1}{31372}\sqrt{31}\sqrt{23}\left(\sqrt{31}\sqrt{23}\log\left(5x^2+3x+2\right)-\sqrt{31}\sqrt{23}\log\left(2x^2-x+3\right)+26\sqrt{23}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)-6\sqrt{31}\,\mathrm{arct}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] 1/31372*sqrt(31)*sqrt(23)*(sqrt(31)*sqrt(23)*log(5*x^2 + 3*x + 2)
 - sqrt(31)*sqrt(23)*log(2*x^2 - x + 3) + 26*sqrt(23)*arctan(1/31
*sqrt(31)*(10*x + 3)) - 6*sqrt(31)*arctan(1/23*sqrt(23)*(4*x - 1)
))
```

Sympy [A] time = 0.319944, size = 83, normalized size = 1.14

$$-\frac{\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{44}+\frac{\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{44}-\frac{3\sqrt{23}\,\mathrm{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{506}+\frac{13\sqrt{31}\,\mathrm{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{682}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2),x)
```

```
[Out] -log(x**2 - x/2 + 3/2)/44 + log(x**2 + 3*x/5 + 2/5)/44 - 3*sqrt(2
3)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/506 + 13*sqrt(31)*atan(10*
sqrt(31)*x/31 + 3*sqrt(31)/31)/682
```

GIAC/XCAS [A] time = 0.265433, size = 80, normalized size = 1.1

$$\frac{13}{682}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)-\frac{3}{506}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)$$
$$+\frac{1}{44}\ln\left(5\,x^2+3\,x+2\right)-\frac{1}{44}\ln\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] 13/682*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 3/506*sqrt(23)
*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/44*ln(5*x^2 + 3*x + 2) - 1/4
4*ln(2*x^2 - x + 3)
```

3.42 $\int \frac{1}{(3-x+2x^2)(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=94

$$\frac{65x+4}{682\left(5x^2+3x+2\right)}+\frac{3}{968}\log\left(2x^2-x+3\right)-\frac{3}{968}\log\left(5x^2+3x+2\right)+\frac{7\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{484\sqrt{23}}+\frac{2891\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15004\sqrt{31}}$$

```
[Out] (4 + 65*x)/(682*(2 + 3*x + 5*x^2)) + (7*ArcTan[(1 - 4*x)/Sqrt[23]
])/(484*Sqrt[23]) + (2891*ArcTan[(3 + 10*x)/Sqrt[31]])/(15004*Sqr
t[31]) + (3*Log[3 - x + 2*x^2])/968 - (3*Log[2 + 3*x + 5*x^2])/96
8
```

Rubi [A] time = 0.185965, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24

$$\frac{65x+4}{682\left(5x^2+3x+2\right)}+\frac{3}{968}\log\left(2x^2-x+3\right)-\frac{3}{968}\log\left(5x^2+3x+2\right)+\frac{7\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{484\sqrt{23}}+\frac{2891\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15004\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] (4 + 65*x)/(682*(2 + 3*x + 5*x^2)) + (7*ArcTan[(1 - 4*x)/Sqrt[23]
])/(484*Sqrt[23]) + (2891*ArcTan[(3 + 10*x)/Sqrt[31]])/(15004*Sqr
t[31]) + (3*Log[3 - x + 2*x^2])/968 - (3*Log[2 + 3*x + 5*x^2])/96
8
```

Rubi in Sympy [A] time = 50.3403, size = 90, normalized size = 0.96

$$\frac{715x+44}{7502\left(5x^2+3x+2\right)}+\frac{3\log\left(2x^2-x+3\right)}{968}-\frac{3\log\left(5x^2+3x+2\right)}{968}-\frac{7\sqrt{23}\,\text{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{11132}+\frac{2891\sqrt{31}\,\text{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{465124}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**2,x)
```

```
[Out] (715*x + 44)/(7502*(5*x**2 + 3*x + 2)) + 3*log(2*x**2 - x + 3)/96
8 - 3*log(5*x**2 + 3*x + 2)/968 - 7*sqrt(23)*atan(sqrt(23)*(4*x/2
3 - 1/23))/11132 + 2891*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/
465124
```

Mathematica [A] time = 0.160035, size = 94, normalized size = 1.

$$\frac{65x+4}{682\left(5x^2+3x+2\right)}+\frac{3}{968}\log\left(2x^2-x+3\right)-\frac{3}{968}\log\left(5x^2+3x+2\right)-\frac{7\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{484\sqrt{23}}+\frac{2891\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{15004\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] (4 + 65*x)/(682*(2 + 3*x + 5*x^2)) - (7*ArcTan[(-1 + 4*x)/Sqrt[23
]])/(484*Sqrt[23]) + (2891*ArcTan[(3 + 10*x)/Sqrt[31]])/(15004*Sq
rt[31]) + (3*Log[3 - x + 2*x^2])/968 - (3*Log[2 + 3*x + 5*x^2])/9
68
```

Maple [A] time = 0.008, size = 77, normalized size = 0.8

$$-\frac{1}{484}\left(-\frac{286x}{31}-\frac{88}{155}\right)\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)^{-1}-\frac{3\ln\left(25x^2+15x+10\right)}{968}+\frac{2891\sqrt{31}}{465124}\arctan\left(\frac{(50x+15)\sqrt{31}}{155}\right)+\frac{3\ln\left(2x^2-x+3\right)}{968}-\frac{7\sqrt{23}}{11132}\arctan\left(\frac{(4x-1)\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)/(5*x^2+3*x+2)^2,x)
```

```
[Out] -1/484*(-286/31*x-88/155)/(x^2+3/5*x+2/5)-3/968*ln(25*x^2+15*x+10
)+2891/465124*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))+3/968*ln(
2*x^2-x+3)-7/11132*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))
```

Maxima [A] time = 0.769735, size = 105, normalized size = 1.12

$$\frac{2891}{465124}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)-\frac{7}{11132}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{65x+4}{682\left(5x^2+3x+2\right)}-\frac{3}{968}\log\left(5x^2+3x+2\right)+\frac{3}{968}\log\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] 2891/465124*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 7/11132*s
qrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/682*(65*x + 4)/(5*x^2
 + 3*x + 2) - 3/968*log(5*x^2 + 3*x + 2) + 3/968*log(2*x^2 - x +
3)
```

Fricas [A] time = 0.272644, size = 194, normalized size = 2.06

$$-\frac{\sqrt{31}\sqrt{23}\left(93\sqrt{31}\sqrt{23}\left(5x^2+3x+2\right)\log\left(5x^2+3x+2\right)-93\sqrt{31}\sqrt{23}\left(5x^2+3x+2\right)\log\left(2x^2-x+3\right)-5782\sqrt{23}\left(5x^2 + \right.\right.}{21395704\left(5x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] -1/21395704*sqrt(31)*sqrt(23)*(93*sqrt(31)*sqrt(23)*(5*x^2 + 3*x
+ 2)*log(5*x^2 + 3*x + 2) - 93*sqrt(31)*sqrt(23)*(5*x^2 + 3*x + 2
)*log(2*x^2 - x + 3) - 5782*sqrt(23)*(5*x^2 + 3*x + 2)*arctan(1/3
1*sqrt(31)*(10*x + 3)) + 434*sqrt(31)*(5*x^2 + 3*x + 2)*arctan(1/
23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(65*x + 4))/(5*x^2
+ 3*x + 2)
```

Sympy [A] time = 0.427136, size = 102, normalized size = 1.09

$$\frac{65x+4}{3410x^2+2046x+1364}+\frac{3\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{968}-\frac{3\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{968}-\frac{7\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{11132}+\frac{2891\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{465124}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**2,x)
```

```
[Out] (65*x + 4)/(3410*x**2 + 2046*x + 1364) + 3*log(x**2 - x/2 + 3/2)/
968 - 3*log(x**2 + 3*x/5 + 2/5)/968 - 7*sqrt(23)*atan(4*sqrt(23)*
x/23 - sqrt(23)/23)/11132 + 2891*sqrt(31)*atan(10*sqrt(31)*x/31 +
 3*sqrt(31)/31)/465124
```

GIAC/XCAS [A] time = 0.26642, size = 105, normalized size = 1.12

$$\frac{2891}{465124}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)-\frac{7}{11132}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{65x+4}{682(5x^2+3x+2)}-\frac{3}{968}\ln\left(5x^2+3x+2\right)+\frac{3}{968}\ln\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] 2891/465124*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 7/11132*s
qrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/682*(65*x + 4)/(5*x^2
 + 3*x + 2) - 3/968*ln(5*x^2 + 3*x + 2) + 3/968*ln(2*x^2 - x + 3)
```

3.43 $\int \frac{1}{(3-x+2x^2)(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=115

$$\frac{65x+4}{1364\,(5x^2+3x+2)^2}+\frac{21605x+7923}{465124\,(5x^2+3x+2)}-\frac{\log\left(2x^2-x+3\right)}{21296}+\frac{\log\left(5x^2+3x+2\right)}{21296}-\frac{45\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{10648\sqrt{23}}+\frac{847793\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10232728\sqrt{31}}$$

```
[Out] (4 + 65*x)/(1364*(2 + 3*x + 5*x^2)^2) + (7923 + 21605*x)/(465124*
(2 + 3*x + 5*x^2)) - (45*ArcTan[(1 - 4*x)/Sqrt[23]])/(10648*Sqrt[
23]) + (847793*ArcTan[(3 + 10*x)/Sqrt[31]])/(10232728*Sqrt[31]) -
 Log[3 - x + 2*x^2]/21296 + Log[2 + 3*x + 5*x^2]/21296
```

Rubi [A] time = 0.270809, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\frac{65x+4}{1364\,(5x^2+3x+2)^2}+\frac{21605x+7923}{465124\,(5x^2+3x+2)}-\frac{\log\left(2x^2-x+3\right)}{21296}+\frac{\log\left(5x^2+3x+2\right)}{21296}-\frac{45\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{10648\sqrt{23}}+\frac{847793\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10232728\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] (4 + 65*x)/(1364*(2 + 3*x + 5*x^2)^2) + (7923 + 21605*x)/(465124*
(2 + 3*x + 5*x^2)) - (45*ArcTan[(1 - 4*x)/Sqrt[23]])/(10648*Sqrt[
23]) + (847793*ArcTan[(3 + 10*x)/Sqrt[31]])/(10232728*Sqrt[31]) -
 Log[3 - x + 2*x^2]/21296 + Log[2 + 3*x + 5*x^2]/21296
```

Rubi in Sympy [A] time = 74.2623, size = 105, normalized size = 0.91

$$\frac{715x+44}{15004\,(5x^2+3x+2)^2}+\frac{5228410x+1917366}{112560008\,(5x^2+3x+2)}-\frac{\log\left(2x^2-x+3\right)}{21296}+\frac{\log\left(5x^2+3x+2\right)}{21296}+\frac{45\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{244904}+\frac{847793\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{317214568}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**3,x)
```

```
[Out] (715*x + 44)/(15004*(5*x**2 + 3*x + 2)**2) + (5228410*x + 1917366
)/(112560008*(5*x**2 + 3*x + 2)) - log(2*x**2 - x + 3)/21296 + lo
g(5*x**2 + 3*x + 2)/21296 + 45*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1
/23))/244904 + 847793*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/31
7214568
```

Mathematica [A] time = 0.285927, size = 104, normalized size = 0.9

$$\frac{31\left(-961\log\left(2x^2-x+3\right)+961\log\left(5x^2+3x+2\right)+\frac{44\left(108025x^3+104430x^2+89144x+17210\right)}{\left(5x^2+3x+2\right)^2}\right)+1695586\sqrt{31}\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{634429136}+\frac{45\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{10648\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] (45*ArcTan[(-1 + 4*x)/Sqrt[23]])/(10648*Sqrt[23]) + (1695586*Sqrt
[31]*ArcTan[(3 + 10*x)/Sqrt[31]] + 31*((44*(17210 + 89144*x + 104
430*x^2 + 108025*x^3))/(2 + 3*x + 5*x^2)^2 - 961*Log[3 - x + 2*x^
2] + 961*Log[2 + 3*x + 5*x^2]))/634429136
```

Maple [A] time = 0.01, size = 89, normalized size = 0.8

$$\frac{25}{10648\,(5\,x^2+3\,x+2)^2}\left(\frac{95062\,x^3}{961}+\frac{459492\,x^2}{4805}+\frac{1961168\,x}{24025}+\frac{75724}{4805}\right)+\frac{\ln\left(125\,x^2+75\,x+50\right)}{21296}+\frac{847793\,\sqrt{31}}{317214568}\arctan\left(\frac{(250\,x+75)\,\sqrt{31}}{775}\right)-\frac{\ln\left(2\,x^2-x+3\right)}{21296}+\frac{45\,\sqrt{23}}{244904}\arctan\left(\frac{(4\,x-1)\,\sqrt{23}}{23}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)/(5*x^2+3*x+2)^3,x)
```

```
[Out] 25/10648*(95062/961*x^3+459492/4805*x^2+1961168/24025*x+75724/480
5)/(5*x^2+3*x+2)^2+1/21296*ln(125*x^2+75*x+50)+847793/317214568*3
1^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))-1/21296*ln(2*x^2-x+3)+4
5/244904*23^(1/2)*arctan(1/23*(4*x-1)*23^(1/2))
```

Maxima [A] time = 0.77007, size = 132, normalized size = 1.15

$$\frac{847793}{317214568}\,\sqrt{31}\arctan\left(\frac{1}{31}\,\sqrt{31}(10\,x+3)\right)+\frac{45}{244904}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{108025\,x^3+104430\,x^2+89144\,x+17210}{465124\,(25\,x^4+30\,x^3+29\,x^2+12\,x+4)}+\frac{1}{21296}\,\log\left(5\,x^2+3\,x+2\right)-\frac{1}{21296}\,\log\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] 847793/317214568*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 45/2
44904*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/465124*(108025
*x^3 + 104430*x^2 + 89144*x + 17210)/(25*x^4 + 30*x^3 + 29*x^2 +
12*x + 4) + 1/21296*log(5*x^2 + 3*x + 2) - 1/21296*log(2*x^2 - x
+ 3)
```

Fricas [A] time = 0.274712, size = 275, normalized size = 2.39

$$\frac{\sqrt{31}\sqrt{23}\Big(961\,\sqrt{31}\sqrt{23}\left(25\,x^4+30\,x^3+29\,x^2+12\,x+4\right)\log\left(5\,x^2+3\,x+2\right)-961\,\sqrt{31}\sqrt{23}\left(25\,x^4+30\,x^3+29\,x^2+12\,x+4\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] 1/14591870128*sqrt(31)*sqrt(23)*(961*sqrt(31)*sqrt(23)*(25*x^4 +
30*x^3 + 29*x^2 + 12*x + 4)*log(5*x^2 + 3*x + 2) - 961*sqrt(31)*s
qrt(23)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*log(2*x^2 - x + 3)
```

```
+ 1695586*sqrt(23)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(1
/31*sqrt(31)*(10*x + 3)) + 86490*sqrt(31)*(25*x^4 + 30*x^3 + 29*x
^2 + 12*x + 4)*arctan(1/23*sqrt(23)*(4*x - 1)) + 44*sqrt(31)*sqrt
(23)*(108025*x^3 + 104430*x^2 + 89144*x + 17210))/(25*x^4 + 30*x^
3 + 29*x^2 + 12*x + 4)
```

Sympy [A] time = 0.507479, size = 119, normalized size = 1.03

$$\frac{108025x^3 + 104430x^2 + 89144x + 17210}{11628100x^4 + 13953720x^3 + 13488596x^2 + 5581488x + 1860496} - \frac{\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{21296} + \frac{\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{21296} + \frac{45\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{244904} + \frac{847793\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{317214568}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate(1/(2*x**2-x+3)/(5*x**2+3*x+2)**3,x)
```

```
[Out] (108025*x**3 + 104430*x**2 + 89144*x + 17210)/(11628100*x**4 + 13
953720*x**3 + 13488596*x**2 + 5581488*x + 1860496) - log(x**2 - x
/2 + 3/2)/21296 + log(x**2 + 3*x/5 + 2/5)/21296 + 45*sqrt(23)*ata
n(4*sqrt(23)*x/23 - sqrt(23)/23)/244904 + 847793*sqrt(31)*atan(10
*sqrt(31)*x/31 + 3*sqrt(31)/31)/317214568
```

GIAC/XCAS [A] time = 0.26658, size = 119, normalized size = 1.03

$$\frac{847793}{317214568}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x + 3)\right) + \frac{45}{244904}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) + \frac{108025x^3 + 104430x^2 + 89144x + 17210}{465124(5x^2 + 3x + 2)^2} + \frac{1}{21296}\ln\left(5x^2 + 3x + 2\right) - \frac{1}{21296}\ln\left(2x^2 - x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] 847793/317214568*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 45/2
44904*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/465124*(108025
*x^3 + 104430*x^2 + 89144*x + 17210)/(5*x^2 + 3*x + 2)^2 + 1/2129
6*ln(5*x^2 + 3*x + 2) - 1/21296*ln(2*x^2 - x + 3)
```

3.44 $\int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^2}\,dx$

Optimal. Leaf size=91

$$\frac{125x^5}{4}+\frac{2125x^4}{16}+\frac{9775x^3}{48}-\frac{1185x^2}{8}-\frac{14641(79x+101)}{2944\,(2x^2-x+3)}-\frac{30613}{128}\log\left(2x^2-x+3\right)-\frac{89359x}{64}-\frac{13292697\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1472\sqrt{23}}$$

```
[Out] (-89359*x)/64 - (1185*x^2)/8 + (9775*x^3)/48 + (2125*x^4)/16 + (1
25*x^5)/4 - (14641*(101 + 79*x))/(2944*(3 - x + 2*x^2)) - (132926
97*ArcTan[(1 - 4*x)/Sqrt[23]])/(1472*Sqrt[23]) - (30613*Log[3 - x
 + 2*x^2])/128
```

Rubi [A] time = 0.14216, antiderivative size = 91, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{125x^5}{4}+\frac{2125x^4}{16}+\frac{9775x^3}{48}-\frac{1185x^2}{8}-\frac{14641(79x+101)}{2944\,(2x^2-x+3)}-\frac{30613}{128}\log\left(2x^2-x+3\right)-\frac{89359x}{64}-\frac{13292697\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1472\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^2,x]
```

```
[Out] (-89359*x)/64 - (1185*x^2)/8 + (9775*x^3)/48 + (2125*x^4)/16 + (1
25*x^5)/4 - (14641*(101 + 79*x))/(2944*(3 - x + 2*x^2)) - (132926
97*ArcTan[(1 - 4*x)/Sqrt[23]])/(1472*Sqrt[23]) - (30613*Log[3 - x
 + 2*x^2])/128
```

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

$$-\frac{1250x^7}{23}-\frac{6625x^6}{46}-\frac{6025x^5}{46}+\frac{42445x^4}{368}+\frac{185467x^3}{552}-\frac{(-4x+1)\left(5x^2+3x+2\right)^4}{23\,(2x^2-x+3)}-\frac{30613\log\left(2x^2-x+3\right)}{128}+\frac{13292697\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{33856}-\frac{\int\frac{1164693}{32}\,dx}{23}-\frac{72755\int x\,dx}{368}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**2,x)
```

```
[Out] -1250*x**7/23 - 6625*x**6/46 - 6025*x**5/46 + 42445*x**4/368 + 18
5467*x**3/552 - (-4*x + 1)*(5*x**2 + 3*x + 2)**4/(23*(2*x**2 - x
+ 3)) - 30613*log(2*x**2 - x + 3)/128 + 13292697*sqrt(23)*atan(sq
rt(23)*(4*x/23 - 1/23))/33856 - Integral(1164693/32, x)/23 - 7275
5*Integral(x, x)/368
```

Mathematica [A] time = 0.107934, size = 91, normalized size = 1.

$$\frac{125x^5}{4}+\frac{2125x^4}{16}+\frac{9775x^3}{48}-\frac{1185x^2}{8}-\frac{14641(79x+101)}{2944\,(2x^2-x+3)}-\frac{30613}{128}\log\left(2x^2-x+3\right)-\frac{89359x}{64}+\frac{13292697\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{1472\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^2,x]
```

```
[Out] (-89359*x)/64 - (1185*x^2)/8 + (9775*x^3)/48 + (2125*x^4)/16 + (1
25*x^5)/4 - (14641*(101 + 79*x))/(2944*(3 - x + 2*x^2)) + (132926
97*ArcTan[(-1 + 4*x)/Sqrt[23]])/(1472*Sqrt[23]) - (30613*Log[3 -
x + 2*x^2])/128
```

Maple [A] time = 0.011, size = 71, normalized size = 0.8

$$\frac{125\,x^5}{4}+\frac{2125\,x^4}{16}+\frac{9775\,x^3}{48}-\frac{1185\,x^2}{8}-\frac{89359\,x}{64}-\frac{1331}{64}\left(\frac{869\,x}{92}+\frac{1111}{92}\right)\left(x^2-\frac{x}{2}+\frac{3}{2}\right)^{-1}-\frac{30613\,\ln\left(4\,x^2-2\,x+6\right)}{128}+\frac{13292697\,\sqrt{23}}{33856}\arctan\left(\frac{(8\,x-2)\,\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^4/(2*x^2-x+3)^2,x)
```

```
[Out] 125/4*x^5+2125/16*x^4+9775/48*x^3-1185/8*x^2-89359/64*x-1331/64*(
869/92*x+1111/92)/(x^2-1/2*x+3/2)-30613/128*ln(4*x^2-2*x+6)+13292
697/33856*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))
```

Maxima [A] time = 0.778631, size = 97, normalized size = 1.07

$$\frac{125}{4}\,x^5+\frac{2125}{16}\,x^4+\frac{9775}{48}\,x^3-\frac{1185}{8}\,x^2+\frac{13292697}{33856}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\frac{89359}{64}\,x-\frac{14641\,(79\,x+101)}{2944\,(2\,x^2-x+3)}-\frac{30613}{128}\,\log\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] 125/4*x^5 + 2125/16*x^4 + 9775/48*x^3 - 1185/8*x^2 + 13292697/338
56*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 89359/64*x - 14641/
2944*(79*x + 101)/(2*x^2 - x + 3) - 30613/128*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.26568, size = 144, normalized size = 1.58

$$-\frac{\sqrt{23}\Big(2112297\,\sqrt{23}(2\,x^2-x+3)\,\log\left(2\,x^2-x+3\right)-79756182\,(2\,x^2-x+3)\,\arctan\left(\tfrac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\sqrt{23}(552000\,x^7}{203136\,(2\,x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] -1/203136*sqrt(23)*(2112297*sqrt(23)*(2*x^2 - x + 3)*log(2*x^2 -
x + 3) - 79756182*(2*x^2 - x + 3)*arctan(1/23*sqrt(23)*(4*x - 1))
 - sqrt(23)*(552000*x^7 + 2070000*x^6 + 3252200*x^5 - 896080*x^4
- 17959044*x^3 + 8406822*x^2 - 40464543*x - 4436223))/(2*x^2 - x
+ 3)
```

Sympy [A] time = 0.227643, size = 88, normalized size = 0.97

$$\frac{125x^5}{4} + \frac{2125x^4}{16} + \frac{9775x^3}{48} - \frac{1185x^2}{8} - \frac{89359x}{64} - \frac{1156639x + 1478741}{5888x^2 - 2944x + 8832} - \frac{30613\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{128} + \frac{13292697\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{33856}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**2,x)
```

```
[Out] 125*x**5/4 + 2125*x**4/16 + 9775*x**3/48 - 1185*x**2/8 - 89359*x/
64 - (1156639*x + 1478741)/(5888*x**2 - 2944*x + 8832) - 30613*lo
g(x**2 - x/2 + 3/2)/128 + 13292697*sqrt(23)*atan(4*sqrt(23)*x/23
- sqrt(23)/23)/33856
```

GIAC/XCAS [A] time = 0.264532, size = 97, normalized size = 1.07

$$\frac{125}{4}x^5 + \frac{2125}{16}x^4 + \frac{9775}{48}x^3 - \frac{1185}{8}x^2 + \frac{13292697}{33856}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) - \frac{89359}{64}x - \frac{14641(79x + 101)}{2944(2x^2 - x + 3)} - \frac{30613}{128}\ln\left(2x^2 - x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 125/4*x^5 + 2125/16*x^4 + 9775/48*x^3 - 1185/8*x^2 + 13292697/338
56*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 89359/64*x - 14641/
2944*(79*x + 101)/(2*x^2 - x + 3) - 30613/128*ln(2*x^2 - x + 3)
```

3.45 $\int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^2}\,dx$

Optimal. Leaf size=77

$$\frac{125x^3}{12}+\frac{175x^2}{4}-\frac{1331(17-45x)}{736\left(2x^2-x+3\right)}-\frac{2057}{32}\log\left(2x^2-x+3\right)+\frac{915x}{16}+\frac{223971\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{368\sqrt{23}}$$

```
[Out] (915*x)/16 + (175*x^2)/4 + (125*x^3)/12 - (1331*(17 - 45*x))/(736
*(3 - x + 2*x^2)) + (223971*ArcTan[(1 - 4*x)/Sqrt[23]])/(368*Sqrt
[23]) - (2057*Log[3 - x + 2*x^2])/32
```

Rubi [A] time = 0.125291, antiderivative size = 77, 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

$$\frac{125x^3}{12}+\frac{175x^2}{4}-\frac{1331(17-45x)}{736\left(2x^2-x+3\right)}-\frac{2057}{32}\log\left(2x^2-x+3\right)+\frac{915x}{16}+\frac{223971\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{368\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In] Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^2,x]
```

```
[Out] (915*x)/16 + (175*x^2)/4 + (125*x^3)/12 - (1331*(17 - 45*x))/(736
*(3 - x + 2*x^2)) + (223971*ArcTan[(1 - 4*x)/Sqrt[23]])/(368*Sqrt
[23]) - (2057*Log[3 - x + 2*x^2])/32
```

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

$$-\frac{250x^5}{23}-\frac{1025x^4}{46}-\frac{595x^3}{138}-\frac{(-4x+1)\left(5x^2+3x+2\right)^3}{23\left(2x^2-x+3\right)}-\frac{2057\log\left(2x^2-x+3\right)}{32}$$
$$-\frac{223971\sqrt{23}\operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{8464}-\frac{\int\left(-\frac{14903}{8}\right)dx}{23}+\frac{10673\int x\,dx}{92}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**2,x)
```

```
[Out] -250*x**5/23 - 1025*x**4/46 - 595*x**3/138 - (-4*x + 1)*(5*x**2 +
 3*x + 2)**3/(23*(2*x**2 - x + 3)) - 2057*log(2*x**2 - x + 3)/32
- 223971*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/8464 - Integral(
-14903/8, x)/23 + 10673*Integral(x, x)/92
```

Mathematica [A] time = 0.0523671, size = 77, normalized size = 1.

$$\frac{125x^3}{12}+\frac{175x^2}{4}+\frac{1331(45x-17)}{736\left(2x^2-x+3\right)}-\frac{2057}{32}\log\left(2x^2-x+3\right)+\frac{915x}{16}-\frac{223971\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{368\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^2,x]
```

```
[Out] (915*x)/16 + (175*x^2)/4 + (125*x^3)/12 + (1331*(-17 + 45*x))/(73
6*(3 - x + 2*x^2)) - (223971*ArcTan[(-1 + 4*x)/Sqrt[23]])/(368*Sq
```

```
rt[23]) - (2057*Log[3 - x + 2*x^2])/32
```

Maple [A] time = 0.009, size = 61, normalized size = 0.8

$$\frac{125\,x^{3}}{12}+\frac{175\,x^{2}}{4}+\frac{915\,x}{16}-\frac{121}{16}\left(-\frac{495\,x}{92}+\frac{187}{92}\right)\left(x^{2}-\frac{x}{2}+\frac{3}{2}\right)^{-1}-\frac{2057\,\ln\left(4\,x^{2}-2\,x+6\right)}{32}-\frac{223971\,\sqrt{23}}{8464}\arctan\left(\frac{(8\,x-2)\,\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^3/(2*x^2-x+3)^2,x)
```

```
[Out] 125/12*x^3+175/4*x^2+915/16*x-121/16*(-495/92*x+187/92)/(x^2-1/2*
x+3/2)-2057/32*ln(4*x^2-2*x+6)-223971/8464*23^(1/2)*arctan(1/46*(
8*x-2)*23^(1/2))
```

Maxima [A] time = 0.771388, size = 84, normalized size = 1.09

$$\frac{125}{12}\,x^{3}+\frac{175}{4}\,x^{2}-\frac{223971}{8464}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{915}{16}\,x+\frac{1331\,(45\,x-17)}{736\,(2\,x^{2}-x+3)}-\frac{2057}{32}\,\log\left(2\,x^{2}-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] 125/12*x^3 + 175/4*x^2 - 223971/8464*sqrt(23)*arctan(1/23*sqrt(23
)*(4*x - 1)) + 915/16*x + 1331/736*(45*x - 17)/(2*x^2 - x + 3) -
2057/32*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.264602, size = 131, normalized size = 1.7

$$-\frac{\sqrt{23}\left(141933\,\sqrt{23}\left(2\,x^{2}-x+3\right)\,\log\left(2\,x^{2}-x+3\right)+1343826\,\left(2\,x^{2}-x+3\right)\,\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\sqrt{23}\left(46000\,x^{5}+17\right.\right.}{50784\,(2\,x^{2}-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] -1/50784*sqrt(23)*(141933*sqrt(23)*(2*x^2 - x + 3)*log(2*x^2 - x
+ 3) + 1343826*(2*x^2 - x + 3)*arctan(1/23*sqrt(23)*(4*x - 1)) -
sqrt(23)*(46000*x^5 + 170200*x^4 + 224940*x^3 + 163530*x^2 + 5584
95*x - 67881))/(2*x^2 - x + 3)
```

Sympy [A] time = 0.220337, size = 75, normalized size = 0.97

$$\frac{125x^{3}}{12}+\frac{175x^{2}}{4}+\frac{915x}{16}+\frac{59895x-22627}{1472x^{2}-736x+2208}-\frac{2057\log\left(x^{2}-\frac{x}{2}+\frac{3}{2}\right)}{32}-\frac{223971\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{8464}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**2,x)
```

```
[Out] 125*x**3/12 + 175*x**2/4 + 915*x/16 + (59895*x - 22627)/(1472*x**
2 - 736*x + 2208) - 2057*log(x**2 - x/2 + 3/2)/32 - 223971*sqrt(2
3)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/8464
```

GIAC/XCAS [A] time = 0.266306, size = 84, normalized size = 1.09

$$\frac{125}{12}\,x^3+\frac{175}{4}\,x^2-\frac{223971}{8464}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{915}{16}\,x+\frac{1331\,(45\,x-17)}{736\,(2\,x^2-x+3)}-\frac{2057}{32}\,\ln\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 125/12*x^3 + 175/4*x^2 - 223971/8464*sqrt(23)*arctan(1/23*sqrt(23
)*(4*x - 1)) + 915/16*x + 1331/736*(45*x - 17)/(2*x^2 - x + 3) -
2057/32*ln(2*x^2 - x + 3)
```

3.46 $\int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^2}\,dx$

Optimal. Leaf size=63

$$\frac{121(19-7x)}{184(2x^2-x+3)}+\frac{55}{8}\log\left(2x^2-x+3\right)+\frac{25x}{4}+\frac{1859\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{92\sqrt{23}}$$

```
[Out] (25*x)/4 + (121*(19 - 7*x))/(184*(3 - x + 2*x^2)) + (1859*ArcTan[
(1 - 4*x)/Sqrt[23]])/(92*Sqrt[23]) + (55*Log[3 - x + 2*x^2])/8
```

Rubi [A] time = 0.110354, antiderivative size = 63, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{121(19-7x)}{184(2x^2-x+3)}+\frac{55}{8}\log\left(2x^2-x+3\right)+\frac{25x}{4}+\frac{1859\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{92\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^2,x]
```

```
[Out] (25*x)/4 + (121*(19 - 7*x))/(184*(3 - x + 2*x^2)) + (1859*ArcTan[
(1 - 4*x)/Sqrt[23]])/(92*Sqrt[23]) + (55*Log[3 - x + 2*x^2])/8
```

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

$$-\frac{50x^3}{23}-\frac{(-4x+1)\left(5x^2+3x+2\right)^2}{23\left(2x^2-x+3\right)}+\frac{55\log\left(2x^2-x+3\right)}{8}-\frac{1859\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{2116}-\frac{\int\left(-\frac{279}{2}\right)dx}{23}-\frac{145\int x\,dx}{23}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**2,x)
```

```
[Out] -50*x**3/23 - (-4*x + 1)*(5*x**2 + 3*x + 2)**2/(23*(2*x**2 - x +
3)) + 55*log(2*x**2 - x + 3)/8 - 1859*sqrt(23)*atan(sqrt(23)*(4*x
/23 - 1/23))/2116 - Integral(-279/2, x)/23 - 145*Integral(x, x)/2
3
```

Mathematica [A] time = 0.0592621, size = 63, normalized size = 1.

$$-\frac{121(7x-19)}{184(2x^2-x+3)}+\frac{55}{8}\log\left(2x^2-x+3\right)+\frac{25x}{4}-\frac{1859\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{92\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^2,x]
```

```
[Out] (25*x)/4 - (121*(-19 + 7*x))/(184*(3 - x + 2*x^2)) - (1859*ArcTan
[(-1 + 4*x)/Sqrt[23]])/(92*Sqrt[23]) + (55*Log[3 - x + 2*x^2])/8
```

Maple [A] time = 0.009, size = 51, normalized size = 0.8

$$\frac{25x}{4}+\frac{11}{4}\left(-\frac{77x}{92}+\frac{209}{92}\right)\left(x^2-\frac{x}{2}+\frac{3}{2}\right)^{-1}+\frac{55\ln\left(4x^2-2x+6\right)}{8}-\frac{1859\sqrt{23}}{2116}\arctan\left(\frac{(8x-2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^2/(2*x^2-x+3)^2,x)
```

```
[Out] 25/4*x+11/4*(-77/92*x+209/92)/(x^2-1/2*x+3/2)+55/8*ln(4*x^2-2*x+6
)-1859/2116*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))
```

Maxima [A] time = 0.769517, size = 70, normalized size = 1.11

$$-\frac{1859}{2116}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{25}{4}x-\frac{121(7x-19)}{184(2x^2-x+3)}+\frac{55}{8}\log\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] -1859/2116*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 25/4*x - 12
1/184*(7*x - 19)/(2*x^2 - x + 3) + 55/8*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.260563, size = 116, normalized size = 1.84

$$\frac{\sqrt{23}\Big(1265\sqrt{23}\left(2x^2-x+3\right)\log\left(2x^2-x+3\right)-3718\left(2x^2-x+3\right)\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\sqrt{23}\big(2300x^3-1150x^2+$$
$$4232\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] 1/4232*sqrt(23)*(1265*sqrt(23)*(2*x^2 - x + 3)*log(2*x^2 - x + 3)
 - 3718*(2*x^2 - x + 3)*arctan(1/23*sqrt(23)*(4*x - 1)) + sqrt(23
)*(2300*x^3 - 1150*x^2 + 2603*x + 2299))/(2*x^2 - x + 3)
```

Sympy [A] time = 0.208861, size = 61, normalized size = 0.97

$$\frac{25x}{4}-\frac{847x-2299}{368x^2-184x+552}+\frac{55\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{8}-\frac{1859\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{2116}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**2,x)
```

```
[Out] 25*x/4 - (847*x - 2299)/(368*x**2 - 184*x + 552) + 55*log(x**2 -
x/2 + 3/2)/8 - 1859*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/
2116
```

GIAC/XCAS [A] time = 0.265023, size = 70, normalized size = 1.11

$$-\frac{1859}{2116}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{25}{4}x-\frac{121(7x-19)}{184(2x^2-x+3)}+\frac{55}{8}\ln\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] -1859/2116*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 25/4*x - 12
1/184*(7*x - 19)/(2*x^2 - x + 3) + 55/8*ln(2*x^2 - x + 3)
```

3.47 $\int \frac{2+3x+5x^2}{(3-x+2x^2)^2}\,dx$

Optimal. Leaf size=43

$$-\frac{11(3x+5)}{46(2x^2-x+3)}-\frac{82\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{23\sqrt{23}}$$

```
[Out] (-11*(5 + 3*x))/(46*(3 - x + 2*x^2)) - (82*ArcTan[(1 - 4*x)/Sqrt[
23]])/(23*Sqrt[23])
```

Rubi [A] time = 0.0488336, antiderivative size = 43, 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

$$-\frac{11(3x+5)}{46(2x^2-x+3)}-\frac{82\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{23\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^2,x]
```

```
[Out] (-11*(5 + 3*x))/(46*(3 - x + 2*x^2)) - (82*ArcTan[(1 - 4*x)/Sqrt[
23]])/(23*Sqrt[23])
```

Rubi in Sympy [A] time = 9.56137, size = 37, normalized size = 0.86

$$-\frac{33x+55}{46(2x^2-x+3)}+\frac{82\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{529}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**2,x)
```

```
[Out] -(33*x + 55)/(46*(2*x**2 - x + 3)) + 82*sqrt(23)*atan(sqrt(23)*(4
*x/23 - 1/23))/529
```

Mathematica [A] time = 0.0302141, size = 43, normalized size = 1.

$$\frac{82\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{23\sqrt{23}}-\frac{11(3x+5)}{46(2x^2-x+3)}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^2,x]
```

```
[Out] (-11*(5 + 3*x))/(46*(3 - x + 2*x^2)) + (82*ArcTan[(-1 + 4*x)/Sqrt
[23]])/(23*Sqrt[23])
```

Maple [A] time = 0.007, size = 34, normalized size = 0.8

$$1\left(-\frac{33\,x}{92}-\frac{55}{92}\right)\left(x^2-\frac{x}{2}+\frac{3}{2}\right)^{-1}+\frac{82\,\sqrt{23}}{529}\arctan\left(\frac{(8\,x-2)\,\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)/(2*x^2-x+3)^2,x)
```

```
[Out] (-33/92*x-55/92)/(x^2-1/2*x+3/2)+82/529*23^(1/2)*arctan(1/46*(8*x
-2)*23^(1/2))
```

Maxima [A] time = 0.765322, size = 49, normalized size = 1.14

$$\frac{82}{529}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{11(3x+5)}{46(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^2,x, algorithm="maxima")
```

```
[Out] 82/529*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11/46*(3*x + 5)
/(2*x^2 - x + 3)
```

Fricas [A] time = 0.258337, size = 69, normalized size = 1.6

$$\frac{\sqrt{23}\left(164\left(2x^2-x+3\right)\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-11\sqrt{23}(3x+5)\right)}{1058(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^2,x, algorithm="fricas")
```

```
[Out] 1/1058*sqrt(23)*(164*(2*x^2 - x + 3)*arctan(1/23*sqrt(23)*(4*x -
1)) - 11*sqrt(23)*(3*x + 5))/(2*x^2 - x + 3)
```

Sympy [A] time = 0.170158, size = 41, normalized size = 0.95

$$-\frac{33x+55}{92x^2-46x+138}+\frac{82\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{529}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)/(2*x**2-x+3)**2,x)
```

```
[Out] -(33*x + 55)/(92*x**2 - 46*x + 138) + 82*sqrt(23)*atan(4*sqrt(23)
*x/23 - sqrt(23)/23)/529
```

GIAC/XCAS [A] time = 0.26524, size = 49, normalized size = 1.14

$$\frac{82}{529}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{11(3x+5)}{46(2x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^2,x, algorithm="giac")
```

```
[Out] 82/529*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11/46*(3*x + 5)
/(2*x^2 - x + 3)
```

3.48 $\int \frac{1}{(3-x+2x^2)^2(2+3x+5x^2)}\,dx$

Optimal. Leaf size=94

$$\frac{13-6x}{506(2x^2-x+3)}-\frac{13}{968}\log\left(2x^2-x+3\right)+\frac{13}{968}\log\left(5x^2+3x+2\right)+\frac{241\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{11132\sqrt{23}}+\frac{69\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{484\sqrt{31}}$$

```
[Out] (13 - 6*x)/(506*(3 - x + 2*x^2)) + (241*ArcTan[(1 - 4*x)/Sqrt[23]
])/(11132*Sqrt[23]) + (69*ArcTan[(3 + 10*x)/Sqrt[31]])/(484*Sqrt[
31]) - (13*Log[3 - x + 2*x^2])/968 + (13*Log[2 + 3*x + 5*x^2])/96
8
```

Rubi [A] time = 0.193253, antiderivative size = 94, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24

$$\frac{13-6x}{506(2x^2-x+3)}-\frac{13}{968}\log\left(2x^2-x+3\right)+\frac{13}{968}\log\left(5x^2+3x+2\right)+\frac{241\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{11132\sqrt{23}}+\frac{69\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{484\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (13 - 6*x)/(506*(3 - x + 2*x^2)) + (241*ArcTan[(1 - 4*x)/Sqrt[23]
])/(11132*Sqrt[23]) + (69*ArcTan[(3 + 10*x)/Sqrt[31]])/(484*Sqrt[
31]) - (13*Log[3 - x + 2*x^2])/968 + (13*Log[2 + 3*x + 5*x^2])/96
8
```

Rubi in Sympy [A] time = 50.4487, size = 90, normalized size = 0.96

$$\frac{-66x+143}{5566(2x^2-x+3)}-\frac{13\log\left(2x^2-x+3\right)}{968}+\frac{13\log\left(5x^2+3x+2\right)}{968}-\frac{241\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{256036}+\frac{69\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{15004}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2),x)
```

```
[Out] (-66*x + 143)/(5566*(2*x**2 - x + 3)) - 13*log(2*x**2 - x + 3)/96
8 + 13*log(5*x**2 + 3*x + 2)/968 - 241*sqrt(23)*atan(sqrt(23)*(4*
x/23 - 1/23))/256036 + 69*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31)
)/15004
```

Mathematica [A] time = 0.110443, size = 94, normalized size = 1.

$$\frac{13-6x}{506(2x^2-x+3)}-\frac{13}{968}\log\left(2x^2-x+3\right)+\frac{13}{968}\log\left(5x^2+3x+2\right)-\frac{241\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{11132\sqrt{23}}+\frac{69\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{484\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (13 - 6*x)/(506*(3 - x + 2*x^2)) - (241*ArcTan[(-1 + 4*x)/Sqrt[23
]])/(11132*Sqrt[23]) + (69*ArcTan[(3 + 10*x)/Sqrt[31]])/(484*Sqrt
[31]) - (13*Log[3 - x + 2*x^2])/968 + (13*Log[2 + 3*x + 5*x^2])/9
68
```

Maple [A] time = 0.008, size = 77, normalized size = 0.8

$$\frac{13\ln\left(5x^2+3x+2\right)}{968}+\frac{69\sqrt{31}}{15004}\arctan\left(\frac{(3+10x)\sqrt{31}}{31}\right)-\frac{1}{484}\left(\frac{66x}{23}-\frac{143}{23}\right)\left(x^2-\frac{x}{2}+\frac{3}{2}\right)^{-1}-\frac{13\ln\left(4x^2-2x+6\right)}{968}-\frac{241\sqrt{23}}{256036}\arctan\left(\frac{(8x-2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^2/(5*x^2+3*x+2),x)
```

```
[Out] 13/968*ln(5*x^2+3*x+2)+69/15004*arctan(1/31*(3+10*x)*31^(1/2))*31
^(1/2)-1/484*(66/23*x-143/23)/(x^2-1/2*x+3/2)-13/968*ln(4*x^2-2*x
+6)-241/256036*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))
```

Maxima [A] time = 0.773167, size = 105, normalized size = 1.12

$$\frac{69}{15004}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)-\frac{241}{256036}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{6x-13}{506\left(2x^2-x+3\right)}+\frac{13}{968}\log\left(5x^2+3x+2\right)-\frac{13}{968}\log\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2),x, algorithm="maxima")
```

```
[Out] 69/15004*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 241/256036*s
qrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/506*(6*x - 13)/(2*x^2
 - x + 3) + 13/968*log(5*x^2 + 3*x + 2) - 13/968*log(2*x^2 - x +
3)
```

Fricas [A] time = 0.277864, size = 194, normalized size = 2.06

$$\frac{\sqrt{31}\sqrt{23}\left(299\sqrt{31}\sqrt{23}\left(2x^2-x+3\right)\log\left(5x^2+3x+2\right)-299\sqrt{31}\sqrt{23}\left(2x^2-x+3\right)\log\left(2x^2-x+3\right)+3174\sqrt{23}\left(2x^2-\right.\right.}{15874232\left(2x^2-x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2),x, algorithm="fricas")
```

```
[Out] 1/15874232*sqrt(31)*sqrt(23)*(299*sqrt(31)*sqrt(23)*(2*x^2 - x +
3)*log(5*x^2 + 3*x + 2) - 299*sqrt(31)*sqrt(23)*(2*x^2 - x + 3)*l
og(2*x^2 - x + 3) + 3174*sqrt(23)*(2*x^2 - x + 3)*arctan(1/31*sqr
t(31)*(10*x + 3)) - 482*sqrt(31)*(2*x^2 - x + 3)*arctan(1/23*sqrt
(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(6*x - 13))/(2*x^2 - x + 3
)
```

Sympy [A] time = 0.413215, size = 102, normalized size = 1.09

$$-\frac{6x-13}{1012x^2-506x+1518}-\frac{13\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{968}+\frac{13\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{968}-\frac{241\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{256036}+\frac{69\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{15004}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2),x)
```

```
[Out] -(6*x - 13)/(1012*x**2 - 506*x + 1518) - 13*log(x**2 - x/2 + 3/2)
/968 + 13*log(x**2 + 3*x/5 + 2/5)/968 - 241*sqrt(23)*atan(4*sqrt(
23)*x/23 - sqrt(23)/23)/256036 + 69*sqrt(31)*atan(10*sqrt(31)*x/3
1 + 3*sqrt(31)/31)/15004
```

GIAC/XCAS [A] time = 0.264435, size = 105, normalized size = 1.12

$$\frac{69}{15004}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)-\frac{241}{256036}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{6\,x-13}{506\,(2\,x^2-x+3)}+\frac{13}{968}\ln\left(5\,x^2+3\,x+2\right)-\frac{13}{968}\ln\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2),x, algorithm="giac")
```

```
[Out] 69/15004*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 241/256036*s
qrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/506*(6*x - 13)/(2*x^2
 - x + 3) + 13/968*ln(5*x^2 + 3*x + 2) - 13/968*ln(2*x^2 - x + 3)
```

3.49 $\int \frac{1}{(3-x+2x^2)^2(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=127

$$-\frac{25(117-137x)}{172546\left(5x^2+3x+2\right)}+\frac{13-6x}{506\left(2x^2-x+3\right)\left(5x^2+3x+2\right)}+\frac{19\log\left(2x^2-x+3\right)}{10648}-\frac{19\log\left(5x^2+3x+2\right)}{10648}+\frac{2769\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{122452\sqrt{23}}+\frac{12643\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{165044\sqrt{31}}$$

```
[Out] (-25*(117 - 137*x))/(172546*(2 + 3*x + 5*x^2)) + (13 - 6*x)/(506*
(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)) + (2769*ArcTan[(1 - 4*x)/Sqrt[
23]])/(122452*Sqrt[23]) + (12643*ArcTan[(3 + 10*x)/Sqrt[31]])/(16
5044*Sqrt[31]) + (19*Log[3 - x + 2*x^2])/10648 - (19*Log[2 + 3*x
+ 5*x^2])/10648
```

Rubi [A] time = 0.27894, antiderivative size = 127, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$-\frac{25(117-137x)}{172546\left(5x^2+3x+2\right)}+\frac{13-6x}{506\left(2x^2-x+3\right)\left(5x^2+3x+2\right)}+\frac{19\log\left(2x^2-x+3\right)}{10648}-\frac{19\log\left(5x^2+3x+2\right)}{10648}+\frac{2769\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{122452\sqrt{23}}+\frac{12643\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{165044\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] (-25*(117 - 137*x))/(172546*(2 + 3*x + 5*x^2)) + (13 - 6*x)/(506*
(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)) + (2769*ArcTan[(1 - 4*x)/Sqrt[
23]])/(122452*Sqrt[23]) + (12643*ArcTan[(3 + 10*x)/Sqrt[31]])/(16
5044*Sqrt[31]) + (19*Log[3 - x + 2*x^2])/10648 - (19*Log[2 + 3*x
+ 5*x^2])/10648
```

Rubi in Sympy [A] time = 75.7914, size = 116, normalized size = 0.91

$$-\frac{-331540x+647834}{41756132\left(2x^2-x+3\right)}+\frac{715x+44}{7502\left(2x^2-x+3\right)\left(5x^2+3x+2\right)}+\frac{19\log\left(2x^2-x+3\right)}{10648}-\frac{19\log\left(5x^2+3x+2\right)}{10648}-\frac{2769\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{2816396}+\frac{12643\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{5116364}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**2,x)
```

```
[Out] -(-331540*x + 647834)/(41756132*(2*x**2 - x + 3)) + (715*x + 44)/
(7502*(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)) + 19*log(2*x**2 - x +
3)/10648 - 19*log(5*x**2 + 3*x + 2)/10648 - 2769*sqrt(23)*atan(sq
rt(23)*(4*x/23 - 1/23))/2816396 + 12643*sqrt(31)*atan(sqrt(31)*(1
0*x/31 + 3/31))/5116364
```

Mathematica [A] time = 0.101342, size = 106, normalized size = 0.83

$$\frac{9659011\log\left(2x^2-x+3\right)-9659011\log\left(5x^2+3x+2\right)+\frac{31372\left(6850x^3-9275x^2+11154x-4342\right)}{10x^4+x^3+16x^2+7x+6}-5322018\sqrt{23}\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)+133}{5413113112}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] ((31372*(-4342 + 11154*x - 9275*x^2 + 6850*x^3))/(6 + 7*x + 16*x^
2 + x^3 + 10*x^4) - 5322018*Sqrt[23]*ArcTan[(-1 + 4*x)/Sqrt[23]]
+ 13376294*Sqrt[31]*ArcTan[(3 + 10*x)/Sqrt[31]] + 9659011*Log[3 -
 x + 2*x^2] - 9659011*Log[2 + 3*x + 5*x^2])/5413113112
```

Maple [A] time = 0.013, size = 94, normalized size = 0.7

$$-\frac{1}{5324}\left(-\frac{759\,x}{31}+\frac{1078}{155}\right)\left(x^{2}+\frac{3\,x}{5}+\frac{2}{5}\right)^{-1}-\frac{19\,\ln\left(25\,x^{2}+15\,x+10\right)}{10648}+\frac{12643\,\sqrt{31}}{5116364}\arctan\left(\frac{(50\,x+15)\,\sqrt{31}}{155}\right)+\frac{1}{5324}\left(-\frac{77\,x}{23}-\frac{341}{46}\right)\left(x^{2}-\frac{x}{2}+\frac{3}{2}\right)^{-1}+\frac{19\,\ln\left(4\,x^{2}-2\,x+6\right)}{10648}-\frac{2769\,\sqrt{23}}{2816396}\arctan\left(\frac{(8\,x-2)\,\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^2/(5*x^2+3*x+2)^2,x)
```

```
[Out] -1/5324*(-759/31*x+1078/155)/(x^2+3/5*x+2/5)-19/10648*ln(25*x^2+1
5*x+10)+12643/5116364*31^(1/2)*arctan(1/155*(50*x+15)*31^(1/2))+1
/5324*(-77/23*x-341/46)/(x^2-1/2*x+3/2)+19/10648*ln(4*x^2-2*x+6)-
2769/2816396*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))
```

Maxima [A] time = 0.770609, size = 130, normalized size = 1.02

$$\frac{12643}{5116364}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)-\frac{2769}{2816396}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)+\frac{6850\,x^{3}-9275\,x^{2}+11154\,x-4342}{172546\left(10\,x^{4}+x^{3}+16\,x^{2}+7\,x+6\right)}-\frac{19}{10648}\log\left(5\,x^{2}+3\,x+2\right)+\frac{19}{10648}\log\left(2\,x^{2}-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2),x, algorithm="maxima")
```

```
[Out] 12643/5116364*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 2769/28
16396*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/172546*(6850*x
^3 - 9275*x^2 + 11154*x - 4342)/(10*x^4 + x^3 + 16*x^2 + 7*x + 6)
 - 19/10648*log(5*x^2 + 3*x + 2) + 19/10648*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.272488, size = 262, normalized size = 2.06

$$-\frac{\sqrt{31}\sqrt{23}\left(13547\,\sqrt{31}\sqrt{23}\left(10\,x^{4}+x^{3}+16\,x^{2}+7\,x+6\right)\log\left(5\,x^{2}+3\,x+2\right)-13547\,\sqrt{31}\sqrt{23}\left(10\,x^{4}+x^{3}+16\,x^{2}+7\,x+6\right)\,\mathrm{l}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2),x, algorithm="fricas")
```

```
[Out] -1/5413113112*sqrt(31)*sqrt(23)*(13547*sqrt(31)*sqrt(23)*(10*x^4
+ x^3 + 16*x^2 + 7*x + 6)*log(5*x^2 + 3*x + 2) - 13547*sqrt(31)*s
```

```
qrt(23)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*log(2*x^2 - x + 3) - 58
1578*sqrt(23)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*arctan(1/31*sqrt(
31)*(10*x + 3)) + 171678*sqrt(31)*(10*x^4 + x^3 + 16*x^2 + 7*x +
6)*arctan(1/23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(6850*x
^3 - 9275*x^2 + 11154*x - 4342))/(10*x^4 + x^3 + 16*x^2 + 7*x + 6
)
```

Sympy [A] time = 0.493037, size = 122, normalized size = 0.96

$$\frac{6850x^3 - 9275x^2 + 11154x - 4342}{1725460x^4 + 172546x^3 + 2760736x^2 + 1207822x + 1035276} + \frac{19\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{10648} - \frac{19\log\left(x^2 + \frac{3x}{5} + \frac{2}{5}\right)}{10648} - \frac{2769\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{2816396} + \frac{12643\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31} + \frac{3\sqrt{31}}{31}\right)}{5116364}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**2,x)
```

```
[Out] (6850*x**3 - 9275*x**2 + 11154*x - 4342)/(1725460*x**4 + 172546*x
**3 + 2760736*x**2 + 1207822*x + 1035276) + 19*log(x**2 - x/2 + 3
/2)/10648 - 19*log(x**2 + 3*x/5 + 2/5)/10648 - 2769*sqrt(23)*atan
(4*sqrt(23)*x/23 - sqrt(23)/23)/2816396 + 12643*sqrt(31)*atan(10*
sqrt(31)*x/31 + 3*sqrt(31)/31)/5116364
```

GIAC/XCAS [A] time = 0.265824, size = 130, normalized size = 1.02

$$\frac{12643}{5116364}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right) - \frac{2769}{2816396}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{6850x^3 - 9275x^2 + 11154x - 4342}{172546\left(10x^4 + x^3 + 16x^2 + 7x + 6\right)} - \frac{19}{10648}\ln\left(5x^2 + 3x + 2\right) + \frac{19}{10648}\ln\left(2x^2 - x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^2),x, algorithm="giac")
```

```
[Out] 12643/5116364*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 2769/28
16396*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/172546*(6850*x
^3 - 9275*x^2 + 11154*x - 4342)/(10*x^4 + x^3 + 16*x^2 + 7*x + 6)
 - 19/10648*ln(5*x^2 + 3*x + 2) + 19/10648*ln(2*x^2 - x + 3)
```

3.50 $\int \frac{1}{(3-x+2x^2)^2(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=148

$$-\frac{9446-5765x}{690184\left(5x^2+3x+2\right)^2}+\frac{3996965x+1765599}{235352744\left(5x^2+3x+2\right)}+\frac{13-6x}{506\left(2x^2-x+3\right)\left(5x^2+3x+2\right)^2}+\frac{97\log\left(2x^2-x+3\right)}{468512}-\frac{97\log\left(5x^2+3x+2\right)}{468512}-\frac{25557\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5387888\sqrt{23}}+\frac{4464079\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{225120016\sqrt{31}}$$

```
[Out] -(9446 - 5765*x)/(690184*(2 + 3*x + 5*x^2)^2) + (13 - 6*x)/(506*(
3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (1765599 + 3996965*x)/(2353
52744*(2 + 3*x + 5*x^2)) - (25557*ArcTan[(1 - 4*x)/Sqrt[23]])/(53
87888*Sqrt[23]) + (4464079*ArcTan[(3 + 10*x)/Sqrt[31]])/(22512001
6*Sqrt[31]) + (97*Log[3 - x + 2*x^2])/468512 - (97*Log[2 + 3*x +
5*x^2])/468512
```

Rubi [A] time = 0.365485, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28

$$-\frac{9446-5765x}{690184\left(5x^2+3x+2\right)^2}+\frac{3996965x+1765599}{235352744\left(5x^2+3x+2\right)}+\frac{13-6x}{506\left(2x^2-x+3\right)\left(5x^2+3x+2\right)^2}+\frac{97\log\left(2x^2-x+3\right)}{468512}-\frac{97\log\left(5x^2+3x+2\right)}{468512}-\frac{25557\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5387888\sqrt{23}}+\frac{4464079\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{225120016\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] -(9446 - 5765*x)/(690184*(2 + 3*x + 5*x^2)^2) + (13 - 6*x)/(506*(
3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (1765599 + 3996965*x)/(2353
52744*(2 + 3*x + 5*x^2)) - (25557*ArcTan[(1 - 4*x)/Sqrt[23]])/(53
87888*Sqrt[23]) + (4464079*ArcTan[(3 + 10*x)/Sqrt[31]])/(22512001
6*Sqrt[31]) + (97*Log[3 - x + 2*x^2])/468512 - (97*Log[2 + 3*x +
5*x^2])/468512
```

Rubi in Sympy [A] time = 106.206, size = 143, normalized size = 0.97

$$-\frac{-279026x+764115}{83512264\left(2x^2-x+3\right)\left(5x^2+3x+2\right)}+\frac{715x+44}{15004\left(2x^2-x+3\right)\left(5x^2+3x+2\right)^2}+\frac{10639920830x+4700024538}{626509004528\left(5x^2+3x+2\right)}+\frac{97\log\left(2x^2-x+3\right)}{468512}-\frac{97\log\left(5x^2+3x+2\right)}{468512}+\frac{25557\sqrt{23}\operatorname{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{123921424}+\frac{4464079\sqrt{31}\operatorname{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{6978720496}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**3,x)
```

```
[Out] -(-279026*x + 764115)/(83512264*(2*x**2 - x + 3)*(5*x**2 + 3*x +
2)) + (715*x + 44)/(15004*(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2)
 + (10639920830*x + 4700024538)/(626509004528*(5*x**2 + 3*x + 2))
 + 97*log(2*x**2 - x + 3)/468512 - 97*log(5*x**2 + 3*x + 2)/46851
2 + 25557*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/123921424 + 446
4079*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/31))/6978720496
```

Mathematica [A] time = 0.127716, size = 136, normalized size = 0.92

$$\frac{90x-11}{244904\left(2x^2-x+3\right)}+\frac{164380x+67573}{10232728\left(5x^2+3x+2\right)}+\frac{345x-98}{30008\left(5x^2+3x+2\right)^2}+\frac{97\log\left(2x^2-x+3\right)}{468512}-\frac{97\log\left(5x^2+3x+2\right)}{468512}+\frac{25557\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{5387888\sqrt{23}}+\frac{4464079\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{225120016\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] (-11 + 90*x)/(244904*(3 - x + 2*x^2)) + (-98 + 345*x)/(30008*(2 +
 3*x + 5*x^2)^2) + (67573 + 164380*x)/(10232728*(2 + 3*x + 5*x^2)
) + (25557*ArcTan[(-1 + 4*x)/Sqrt[23]])/(5387888*Sqrt[23]) + (446
4079*ArcTan[(3 + 10*x)/Sqrt[31]])/(225120016*Sqrt[31]) + (97*Log[
3 - x + 2*x^2])/468512 - (97*Log[2 + 3*x + 5*x^2])/468512
```

Maple [A] time = 0.013, size = 106, normalized size = 0.7

$$-\frac{25}{234256\,\left(5\,x^2+3\,x+2\right)^2}\left(-\frac{723272\,x^3}{961}-\frac{3656422\,x^2}{4805}-\frac{14280728\,x}{24025}-\frac{2238016}{24025}\right)-\frac{97\,\ln\left(125\,x^2+75\,x+50\right)}{468512}+\frac{4464079\,\sqrt{31}}{6978720496}\arctan\left(\frac{(250\,x+75)\sqrt{31}}{775}\right)+\frac{1}{234256}\left(\frac{990\,x}{23}-\frac{121}{23}\right)\left(x^2-\frac{x}{2}+\frac{3}{2}\right)^{-1}+\frac{97\,\ln\left(4\,x^2-2\,x+6\right)}{468512}+\frac{25557\,\sqrt{23}}{123921424}\arctan\left(\frac{(8\,x-2)\sqrt{23}}{46}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^2/(5*x^2+3*x+2)^3,x)
```

```
[Out] -25/234256*(-723272/961*x^3-3656422/4805*x^2-14280728/24025*x-223
8016/24025)/(5*x^2+3*x+2)^2-97/468512*ln(125*x^2+75*x+50)+4464079
/6978720496*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))+1/234256*(
990/23*x-121/23)/(x^2-1/2*x+3/2)+97/468512*ln(4*x^2-2*x+6)+25557/
123921424*23^(1/2)*arctan(1/46*(8*x-2)*23^(1/2))
```

Maxima [A] time = 0.766927, size = 159, normalized size = 1.07

$$\frac{4464079}{6978720496}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)+\frac{25557}{123921424}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)+\frac{39969650\,x^5+21652955\,x^4+69648769\,x^3+47820302\,x^2+42668920\,x+6976948}{235352744\left(50\,x^6+35\,x^5+103\,x^4+85\,x^3+83\,x^2+32\,x+12\right)}-\frac{97}{468512}\log\left(5\,x^2+3\,x+2\right)+\frac{97}{468512}\log\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2),x, algorithm="maxima")
```

```
[Out] 4464079/6978720496*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 25
557/123921424*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/235352
744*(39969650*x^5 + 21652955*x^4 + 69648769*x^3 + 47820302*x^2 +
```

```
42668920*x + 6976948)/(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^
2 + 32*x + 12) - 97/468512*log(5*x^2 + 3*x + 2) + 97/468512*log(2
*x^2 - x + 3)
```

Fricas [A] time = 0.275344, size = 356, normalized size = 2.41

$$-\frac{\sqrt{31}\sqrt{23}\left(2143991\sqrt{31}\sqrt{23}\left(50x^6+35x^5+103x^4+85x^3+83x^2+32x+12\right)\log\left(5x^2+3x+2\right)-2143991\sqrt{31}\sqrt{23}\left(50\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2),x, algorithm="fricas")
```

```
[Out] -1/7383486284768*sqrt(31)*sqrt(23)*(2143991*sqrt(31)*sqrt(23)*(50
*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*log(5*x^2
+ 3*x + 2) - 2143991*sqrt(31)*sqrt(23)*(50*x^6 + 35*x^5 + 103*x^4
 + 85*x^3 + 83*x^2 + 32*x + 12)*log(2*x^2 - x + 3) - 205347634*sq
rt(23)*(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*
arctan(1/31*sqrt(31)*(10*x + 3)) - 49120554*sqrt(31)*(50*x^6 + 35
*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*arctan(1/23*sqrt(23
)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(39969650*x^5 + 21652955*x^4
+ 69648769*x^3 + 47820302*x^2 + 42668920*x + 6976948))/(50*x^6 +
35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)
```

Sympy [A] time = 0.578618, size = 143, normalized size = 0.97

$$\frac{39969650x^5+21652955x^4+69648769x^3+47820302x^2+42668920x+6976948}{11767637200x^6+8237346040x^5+24241332632x^4+20004983240x^3+19534277752x^2+7531287808x+2824232928}+\frac{97\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{468512}-\frac{97\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{468512}+\frac{25557\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{123921424}+\frac{4464079\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{6978720496}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**2/(5*x**2+3*x+2)**3,x)
```

```
[Out] (39969650*x**5 + 21652955*x**4 + 69648769*x**3 + 47820302*x**2 +
42668920*x + 6976948)/(11767637200*x**6 + 8237346040*x**5 + 24241
332632*x**4 + 20004983240*x**3 + 19534277752*x**2 + 7531287808*x
+ 2824232928) + 97*log(x**2 - x/2 + 3/2)/468512 - 97*log(x**2 + 3
*x/5 + 2/5)/468512 + 25557*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(2
3)/23)/123921424 + 4464079*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqr
t(31)/31)/6978720496
```

GIAC/XCAS [A] time = 0.266338, size = 149, normalized size = 1.01

$$\frac{4464079}{6978720496}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{25557}{123921424}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{39969650x^5+21652955x^4+69648769x^3+47820302x^2+42668920x+6976948}{235352744\left(5x^2+3x+2\right)^2\left(2x^2-x+3\right)}-\frac{97}{468512}\ln\left(5x^2+3x+2\right)+\frac{97}{468512}\ln\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^2),x, algorithm="giac")
```

```
[Out] 4464079/6978720496*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 25
557/123921424*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/235352
744*(39969650*x^5 + 21652955*x^4 + 69648769*x^3 + 47820302*x^2 +
42668920*x + 6976948)/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)) - 97/
468512*ln(5*x^2 + 3*x + 2) + 97/468512*ln(2*x^2 - x + 3)
```

3.51 $\int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^3}\,dx$

Optimal. Leaf size=98

$$\frac{625x^3}{24}+\frac{4875x^2}{32}+\frac{1331(76420x+5229)}{135424\,(2x^2-x+3)}-\frac{14641(79x+101)}{5888\,(2x^2-x+3)^2}-\frac{13915}{64}\log\left(2x^2-x+3\right)+\frac{2725x}{8}+\frac{63799791\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16928\sqrt{23}}$$

```
[Out] (2725*x)/8 + (4875*x^2)/32 + (625*x^3)/24 - (14641*(101 + 79*x))/
(5888*(3 - x + 2*x^2)^2) + (1331*(5229 + 76420*x))/(135424*(3 - x
 + 2*x^2)) + (63799791*ArcTan[(1 - 4*x)/Sqrt[23]])/(16928*Sqrt[23
]) - (13915*Log[3 - x + 2*x^2])/64
```

Rubi [A] time = 0.17256, antiderivative size = 98, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.24$

$$\frac{625x^3}{24}+\frac{4875x^2}{32}+\frac{1331(76420x+5229)}{135424\,(2x^2-x+3)}-\frac{14641(79x+101)}{5888\,(2x^2-x+3)^2}-\frac{13915}{64}\log\left(2x^2-x+3\right)+\frac{2725x}{8}+\frac{63799791\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16928\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^3,x]
```

```
[Out] (2725*x)/8 + (4875*x^2)/32 + (625*x^3)/24 - (14641*(101 + 79*x))/
(5888*(3 - x + 2*x^2)^2) + (1331*(5229 + 76420*x))/(135424*(3 - x
 + 2*x^2)) + (63799791*ArcTan[(1 - 4*x)/Sqrt[23]])/(16928*Sqrt[23
]) - (13915*Log[3 - x + 2*x^2])/64
```

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

$$-\frac{625x^5}{46}-\frac{7875x^4}{184}-\frac{8575x^3}{552}-\frac{1331\,(-8249x+1677)}{33856\,(2x^2-x+3)}-\frac{(-4x+1)\left(5x^2+3x+2\right)^4}{46\,(2x^2-x+3)^2}-\frac{13915\log\left(2x^2-x+3\right)}{64}-\frac{63799791\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{389344}-\frac{\int\left(-\frac{335319}{16}\right)dx}{46}+\frac{35215\int x\,dx}{92}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**3,x)
```

```
[Out] -625*x**5/46 - 7875*x**4/184 - 8575*x**3/552 - 1331*(-8249*x + 16
77)/(33856*(2*x**2 - x + 3)) - (-4*x + 1)*(5*x**2 + 3*x + 2)**4/(
46*(2*x**2 - x + 3)**2) - 13915*log(2*x**2 - x + 3)/64 - 63799791
*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/389344 - Integral(-33531
9/16, x)/46 + 35215*Integral(x, x)/92
```

Mathematica [A] time = 0.0706951, size = 98, normalized size = 1.

$$\frac{625x^3}{24}+\frac{4875x^2}{32}+\frac{1331(76420x+5229)}{135424(2x^2-x+3)}-\frac{14641(79x+101)}{5888(2x^2-x+3)^2}-\frac{13915}{64}\log(2x^2-x+3)+\frac{2725x}{8}-\frac{63799791\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{16928\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^3,x]
```

```
[Out] (2725*x)/8 + (4875*x^2)/32 + (625*x^3)/24 - (14641*(101 + 79*x))/
(5888*(3 - x + 2*x^2)^2) + (1331*(5229 + 76420*x))/(135424*(3 - x
 + 2*x^2)) - (63799791*ArcTan[(-1 + 4*x)/Sqrt[23]])/(16928*Sqrt[2
3]) - (13915*Log[3 - x + 2*x^2])/64
```

Maple [A] time = 0.012, size = 73, normalized size = 0.7

$$\frac{625\,x^3}{24}+\frac{4875\,x^2}{32}+\frac{2725\,x}{8}-\frac{121}{4\,(2\,x^2-x+3)^2}\left(-\frac{210155\,x^3}{4232}+\frac{362791\,x^2}{16928}-\frac{561121\,x}{8464}+\frac{54263}{16928}\right)-\frac{13915\,\ln(8\,x^2-4\,x+12)}{64}-\frac{63799791\,\sqrt{23}}{389344}\arctan\left(\frac{(16\,x-4)\,\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^4/(2*x^2-x+3)^3,x)
```

```
[Out] 625/24*x^3+4875/32*x^2+2725/8*x-121/4*(-210155/4232*x^3+362791/16
928*x^2-561121/8464*x+54263/16928)/(2*x^2-x+3)^2-13915/64*ln(8*x^
2-4*x+12)-63799791/389344*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))
```

Maxima [A] time = 0.774088, size = 111, normalized size = 1.13

$$\frac{625}{24}\,x^3+\frac{4875}{32}\,x^2-\frac{63799791}{389344}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{2725}{8}\,x+\frac{1331\,(76420\,x^3-32981\,x^2+102022\,x-4933)}{67712\,(4\,x^4-4\,x^3+13\,x^2-6\,x+9)}-\frac{13915}{64}\,\log(2\,x^2-x+3)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] 625/24*x^3 + 4875/32*x^2 - 63799791/389344*sqrt(23)*arctan(1/23*s
qrt(23)*(4*x - 1)) + 2725/8*x + 1331/67712*(76420*x^3 - 32981*x^2
 + 102022*x - 4933)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9) - 13915/64
*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.263768, size = 185, normalized size = 1.89

$$-\frac{\sqrt{23}\Big(44166210\,\sqrt{23}(4\,x^4-4\,x^3+13\,x^2-6\,x+9)\,\log(2\,x^2-x+3)+765597492\,(4\,x^4-4\,x^3+13\,x^2-6\,x+9)\,\arctan\Big(}{46721}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] -1/4672128*sqrt(23)*(44166210*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 -
6*x + 9)*log(2*x^2 - x + 3) + 765597492*(4*x^4 - 4*x^3 + 13*x^2 -
 6*x + 9)*arctan(1/23*sqrt(23)*(4*x - 1)) - sqrt(23)*(21160000*x^
7 + 102626000*x^6 + 221756800*x^5 + 93791700*x^4 + 1066587660*x^3
 - 268333833*x^2 + 1030112646*x - 19697469))/(4*x^4 - 4*x^3 + 13*
x^2 - 6*x + 9)
```

Sympy [A] time = 0.285192, size = 95, normalized size = 0.97

$$\frac{625x^3}{24} + \frac{4875x^2}{32} + \frac{2725x}{8} + \frac{101715020x^3 - 43897711x^2 + 135791282x - 6565823}{270848x^4 - 270848x^3 + 880256x^2 - 406272x + 609408} - \frac{13915\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{64} - \frac{63799791\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{389344}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**3,x)
```

```
[Out] 625*x**3/24 + 4875*x**2/32 + 2725*x/8 + (101715020*x**3 - 4389771
1*x**2 + 135791282*x - 6565823)/(270848*x**4 - 270848*x**3 + 8802
56*x**2 - 406272*x + 609408) - 13915*log(x**2 - x/2 + 3/2)/64 - 6
3799791*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/389344
```

GIAC/XCAS [A] time = 0.265993, size = 97, normalized size = 0.99

$$\frac{625}{24}x^3 + \frac{4875}{32}x^2 - \frac{63799791}{389344}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{2725}{8}x + \frac{1331\left(76420x^3 - 32981x^2 + 102022x - 4933\right)}{67712\left(2x^2 - x + 3\right)^2} - \frac{13915}{64}\ln\left(2x^2 - x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 625/24*x^3 + 4875/32*x^2 - 63799791/389344*sqrt(23)*arctan(1/23*s
qrt(23)*(4*x - 1)) + 2725/8*x + 1331/67712*(76420*x^3 - 32981*x^2
 + 102022*x - 4933)/(2*x^2 - x + 3)^2 - 13915/64*ln(2*x^2 - x + 3
)
```

3.52 $\int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^3}\,dx$

Optimal. Leaf size=84

$$\frac{121(21193-12828x)}{33856\,(2x^2-x+3)}-\frac{1331(17-45x)}{1472\,(2x^2-x+3)^2}+\frac{825}{32}\log\left(2x^2-x+3\right)+\frac{125x}{8}+\frac{165099\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8464\sqrt{23}}$$

```
[Out] (125*x)/8 - (1331*(17 - 45*x))/(1472*(3 - x + 2*x^2)^2) + (121*(2
1193 - 12828*x))/(33856*(3 - x + 2*x^2)) + (165099*ArcTan[(1 - 4*
x)/Sqrt[23]])/(8464*Sqrt[23]) + (825*Log[3 - x + 2*x^2])/32
```

Rubi [A] time = 0.149614, antiderivative size = 84, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.24

$$\frac{121(21193-12828x)}{33856\,(2x^2-x+3)}-\frac{1331(17-45x)}{1472\,(2x^2-x+3)^2}+\frac{825}{32}\log\left(2x^2-x+3\right)+\frac{125x}{8}+\frac{165099\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8464\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^3,x]
```

```
[Out] (125*x)/8 - (1331*(17 - 45*x))/(1472*(3 - x + 2*x^2)^2) + (121*(2
1193 - 12828*x))/(33856*(3 - x + 2*x^2)) + (165099*ArcTan[(1 - 4*
x)/Sqrt[23]])/(8464*Sqrt[23]) + (825*Log[3 - x + 2*x^2])/32
```

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

$$-\frac{125x^3}{46}+\frac{14883\,(-7x+19)}{8464\,(2x^2-x+3)}-\frac{(-4x+1)\left(5x^2+3x+2\right)^3}{46\,(2x^2-x+3)^2}+\frac{825\log\left(2x^2-x+3\right)}{32}$$
$$-\frac{165099\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{194672}-\frac{\int\left(-\frac{1155}{2}\right)\,dx}{46}-\frac{1275\int x\,dx}{92}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**3,x)
```

```
[Out] -125*x**3/46 + 14883*(-7*x + 19)/(8464*(2*x**2 - x + 3)) - (-4*x
+ 1)*(5*x**2 + 3*x + 2)**3/(46*(2*x**2 - x + 3)**2) + 825*log(2*x
**2 - x + 3)/32 - 165099*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/
194672 - Integral(-1155/2, x)/46 - 1275*Integral(x, x)/92
```

Mathematica [A] time = 0.0696539, size = 84, normalized size = 1.

$$-\frac{121(12828x-21193)}{33856\,(2x^2-x+3)}+\frac{1331(45x-17)}{1472\,(2x^2-x+3)^2}+\frac{825}{32}\log\left(2x^2-x+3\right)+\frac{125x}{8}-\frac{165099\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{8464\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^3,x]
```

```
[Out] (125*x)/8 + (1331*(-17 + 45*x))/(1472*(3 - x + 2*x^2)^2) - (121*(
-21193 + 12828*x))/(33856*(3 - x + 2*x^2)) - (165099*ArcTan[(-1 +
 4*x)/Sqrt[23]])/(8464*Sqrt[23]) + (825*Log[3 - x + 2*x^2])/32
```

Maple [A] time = 0.01, size = 63, normalized size = 0.8

$$\frac{125\,x}{8}+\frac{11}{2\,\left(2\,x^{2}-x+3\right)^{2}}\left(-\frac{35277\,x^{3}}{2116}+\frac{303677\,x^{2}}{8464}-\frac{132803\,x}{4232}+\frac{326029}{8464}\right)+\frac{825\,\ln\left(8\,x^{2}-4\,x+12\right)}{32}-\frac{165099\,\sqrt{23}}{194672}\arctan\left(\frac{(16\,x-4)\,\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^3/(2*x^2-x+3)^3,x)
```

```
[Out] 125/8*x+11/2*(-35277/2116*x^3+303677/8464*x^2-132803/4232*x+32602
9/8464)/(2*x^2-x+3)^2+825/32*ln(8*x^2-4*x+12)-165099/194672*23^(1
/2)*arctan(1/92*(16*x-4)*23^(1/2))
```

Maxima [A] time = 0.769468, size = 97, normalized size = 1.15

$$-\frac{165099}{194672}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)+\frac{125}{8}\,x-\frac{121\,\left(12828\,x^{3}-27607\,x^{2}+24146\,x-29639\right)}{16928\,(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9)}+\frac{825}{32}\log\left(2\,x^{2}-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] -165099/194672*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 125/8*x
 - 121/16928*(12828*x^3 - 27607*x^2 + 24146*x - 29639)/(4*x^4 - 4
*x^3 + 13*x^2 - 6*x + 9) + 825/32*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.265633, size = 170, normalized size = 2.02

$$\frac{\sqrt{23}\Big(436425\,\sqrt{23}(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9)\log\left(2\,x^{2}-x+3\right)-330198\left(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9\right)\arctan\left(\frac{1}{23}\sqrt{23}(4\right.}{389344\,(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] 1/389344*sqrt(23)*(436425*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x
+ 9)*log(2*x^2 - x + 3) - 330198*(4*x^4 - 4*x^3 + 13*x^2 - 6*x +
9)*arctan(1/23*sqrt(23)*(4*x - 1)) + sqrt(23)*(1058000*x^5 - 1058
000*x^4 + 1886312*x^3 + 1753447*x^2 - 541166*x + 3586319))/(4*x^4
 - 4*x^3 + 13*x^2 - 6*x + 9)
```

Sympy [A] time = 0.281622, size = 82, normalized size = 0.98

$$\frac{125x}{8} - \frac{1552188x^3 - 3340447x^2 + 2921666x - 3586319}{67712x^4 - 67712x^3 + 220064x^2 - 101568x + 152352} + \frac{825\log\left(x^2 - \frac{x}{2} + \frac{3}{2}\right)}{32} - \frac{165099\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23} - \frac{\sqrt{23}}{23}\right)}{194672}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**3,x)
```

```
[Out] 125*x/8 - (1552188*x**3 - 3340447*x**2 + 2921666*x - 3586319)/(67
712*x**4 - 67712*x**3 + 220064*x**2 - 101568*x + 152352) + 825*lo
g(x**2 - x/2 + 3/2)/32 - 165099*sqrt(23)*atan(4*sqrt(23)*x/23 - s
qrt(23)/23)/194672
```

GIAC/XCAS [A] time = 0.265513, size = 84, normalized size = 1.

$$-\frac{165099}{194672}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x - 1)\right) + \frac{125}{8}x - \frac{121\left(12828x^3 - 27607x^2 + 24146x - 29639\right)}{16928\left(2x^2 - x + 3\right)^2} + \frac{825}{32}\ln\left(2x^2 - x + 3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] -165099/194672*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 125/8*x
 - 121/16928*(12828*x^3 - 27607*x^2 + 24146*x - 29639)/(2*x^2 - x
 + 3)^2 + 825/32*ln(2*x^2 - x + 3)
```

3.53 $\int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^3}\,dx$

Optimal. Leaf size=64

$$\frac{121(19-7x)}{368\,(2x^2-x+3)^2}-\frac{55(332x+975)}{8464\,(2x^2-x+3)}-\frac{4330\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

```
[Out] (121*(19 - 7*x))/(368*(3 - x + 2*x^2)^2) - (55*(975 + 332*x))/(84
64*(3 - x + 2*x^2)) - (4330*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt
[23])
```

Rubi [A] time = 0.0964378, antiderivative size = 64, 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

$$\frac{121(19-7x)}{368\,(2x^2-x+3)^2}-\frac{55(332x+975)}{8464\,(2x^2-x+3)}-\frac{4330\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^3,x]
```

```
[Out] (121*(19 - 7*x))/(368*(3 - x + 2*x^2)^2) - (55*(975 + 332*x))/(84
64*(3 - x + 2*x^2)) - (4330*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt
[23])
```

Rubi in Sympy [A] time = 45.7313, size = 71, normalized size = 1.11

$$-\frac{25x}{46}-\frac{(-4x+1)\left(5x^2+3x+2\right)^2}{46\,(2x^2-x+3)^2}-\frac{11\,(323x+201)}{2116\,(2x^2-x+3)}+\frac{4330\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**3,x)
```

```
[Out] -25*x/46 - (-4*x + 1)*(5*x**2 + 3*x + 2)**2/(46*(2*x**2 - x + 3)*
*2) - 11*(323*x + 201)/(2116*(2*x**2 - x + 3)) + 4330*sqrt(23)*at
an(sqrt(23)*(4*x/23 - 1/23))/12167
```

Mathematica [A] time = 0.0610723, size = 51, normalized size = 0.8

$$\frac{4330\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{529\sqrt{23}}-\frac{11\left(1660x^3+4045x^2+938x+4909\right)}{4232\,(-2x^2+x-3)^2}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^3,x]
```

```
[Out] (-11*(4909 + 938*x + 4045*x^2 + 1660*x^3))/(4232*(-3 + x - 2*x^2)
^2) + (4330*ArcTan[(-1 + 4*x)/Sqrt[23]])/(529*Sqrt[23])
```

Maple [A] time = 0.008, size = 47, normalized size = 0.7

$$4\,\frac{1}{\left(2\,x^{2}-x+3\right)^{2}}\left(-\frac{4565\,x^{3}}{4232}-\frac{44495\,x^{2}}{16928}-\frac{5159\,x}{8464}-\frac{53999}{16928}\right)+\frac{4330\,\sqrt{23}}{12167}\arctan\left(\frac{\left(16\,x-4\right)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((5*x^2+3*x+2)^2/(2*x^2-x+3)^3,x)
```

```
[Out] 4*(-4565/4232*x^3-44495/16928*x^2-5159/8464*x-53999/16928)/(2*x^2
-x+3)^2+4330/12167*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))
```

Maxima [A] time = 0.76933, size = 76, normalized size = 1.19

$$\frac{4330}{12167}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\frac{11\,\left(1660\,x^{3}+4045\,x^{2}+938\,x+4909\right)}{4232\,\left(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] 4330/12167*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11/4232*(16
60*x^3 + 4045*x^2 + 938*x + 4909)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x +
 9)
```

Fricas [A] time = 0.265559, size = 109, normalized size = 1.7

$$\frac{\sqrt{23}\left(34640\,\left(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9\right)\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-11\,\sqrt{23}\left(1660\,x^{3}+4045\,x^{2}+938\,x+4909\right)\right)}{97336\,\left(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] 1/97336*sqrt(23)*(34640*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan
(1/23*sqrt(23)*(4*x - 1)) - 11*sqrt(23)*(1660*x^3 + 4045*x^2 + 93
8*x + 4909))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)
```

Sympy [A] time = 0.243519, size = 61, normalized size = 0.95

$$-\frac{18260x^{3}+44495x^{2}+10318x+53999}{16928x^{4}-16928x^{3}+55016x^{2}-25392x+38088}+\frac{4330\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**3,x)
```

```
[Out] -(18260*x**3 + 44495*x**2 + 10318*x + 53999)/(16928*x**4 - 16928*
x**3 + 55016*x**2 - 25392*x + 38088) + 4330*sqrt(23)*atan(4*sqrt(
23)*x/23 - sqrt(23)/23)/12167
```

GIAC/XCAS [A] time = 0.263694, size = 62, normalized size = 0.97

$$\frac{4330}{12167}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\frac{11\,\left(1660\,x^{3}+4045\,x^{2}+938\,x+4909\right)}{4232\,\left(2\,x^{2}-x+3\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 4330/12167*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 11/4232*(16
60*x^3 + 4045*x^2 + 938*x + 4909)/(2*x^2 - x + 3)^2
```

3.54 $\int \frac{2+3x+5x^2}{(3-x+2x^2)^3}\,dx$

Optimal. Leaf size=64

$$-\frac{131(1-4x)}{2116\,(2x^2-x+3)}-\frac{11(3x+5)}{92\,(2x^2-x+3)^2}-\frac{262\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

```
[Out] (-11*(5 + 3*x))/(92*(3 - x + 2*x^2)^2) - (131*(1 - 4*x))/(2116*(3
 - x + 2*x^2)) - (262*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt[23])
```

Rubi [A] time = 0.0648295, antiderivative size = 64, 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

$$-\frac{131(1-4x)}{2116\,(2x^2-x+3)}-\frac{11(3x+5)}{92\,(2x^2-x+3)^2}-\frac{262\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{529\sqrt{23}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^3,x]
```

```
[Out] (-11*(5 + 3*x))/(92*(3 - x + 2*x^2)^2) - (131*(1 - 4*x))/(2116*(3
 - x + 2*x^2)) - (262*ArcTan[(1 - 4*x)/Sqrt[23]])/(529*Sqrt[23])
```

Rubi in Sympy [A] time = 10.737, size = 54, normalized size = 0.84

$$-\frac{131\,(-4x+1)}{2116\,(2x^2-x+3)}-\frac{33x+55}{92\,(2x^2-x+3)^2}+\frac{262\sqrt{23}\,\text{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**3,x)
```

```
[Out] -131*(-4*x + 1)/(2116*(2*x**2 - x + 3)) - (33*x + 55)/(92*(2*x**2
 - x + 3)**2) + 262*sqrt(23)*atan(sqrt(23)*(4*x/23 - 1/23))/12167
```

Mathematica [A] time = 0.0531866, size = 51, normalized size = 0.8

$$\frac{\frac{46(524x^3-393x^2+472x-829)}{(-2x^2+x-3)^2}+1048\sqrt{23}\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{48668}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^3,x]
```

```
[Out] ((46*(-829 + 472*x - 393*x^2 + 524*x^3))/(-3 + x - 2*x^2)^2 + 104
8*Sqrt[23]*ArcTan[(-1 + 4*x)/Sqrt[23]])/48668
```

Maple [A] time = 0.008, size = 47, normalized size = 0.7

$$4\,\frac{1}{(2\,x^2-x+3)^2}\left(\frac{131\,x^3}{1058}-\frac{393\,x^2}{4232}+\frac{59\,x}{529}-\frac{829}{4232}\right)+\frac{262\,\sqrt{23}}{12167}\arctan\left(\frac{(16\,x-4)\,\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((5*x^2+3*x+2)/(2*x^2-x+3)^3,x)
```

```
[Out] 4*(131/1058*x^3-393/4232*x^2+59/529*x-829/4232)/(2*x^2-x+3)^2+262
/12167*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))
```

Maxima [A] time = 0.762616, size = 76, normalized size = 1.19

$$\frac{262}{12167}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{524\,x^3-393\,x^2+472\,x-829}{1058\,(4\,x^4-4\,x^3+13\,x^2-6\,x+9)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^3,x, algorithm="maxima")
```

```
[Out] 262/12167*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/1058*(524*
x^3 - 393*x^2 + 472*x - 829)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)
```

Fricas [A] time = 0.26332, size = 108, normalized size = 1.69

$$\frac{\sqrt{23}\Big(524\,(4\,x^4-4\,x^3+13\,x^2-6\,x+9)\,\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\sqrt{23}(524\,x^3-393\,x^2+472\,x-829)\Big)}{24334\,(4\,x^4-4\,x^3+13\,x^2-6\,x+9)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^3,x, algorithm="fricas")
```

```
[Out] 1/24334*sqrt(23)*(524*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(1
/23*sqrt(23)*(4*x - 1)) + sqrt(23)*(524*x^3 - 393*x^2 + 472*x - 8
29))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)
```

Sympy [A] time = 0.232826, size = 61, normalized size = 0.95

$$\frac{524x^3-393x^2+472x-829}{4232x^4-4232x^3+13754x^2-6348x+9522}+\frac{262\sqrt{23}\,\mathrm{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{12167}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   integrate((5*x**2+3*x+2)/(2*x**2-x+3)**3,x)
```

```
[Out] (524*x**3 - 393*x**2 + 472*x - 829)/(4232*x**4 - 4232*x**3 + 1375
4*x**2 - 6348*x + 9522) + 262*sqrt(23)*atan(4*sqrt(23)*x/23 - sqr
t(23)/23)/12167
```

GIAC/XCAS [A] time = 0.26231, size = 62, normalized size = 0.97

$$\frac{262}{12167}\,\sqrt{23}\arctan\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{524\,x^3-393\,x^2+472\,x-829}{1058\,(2\,x^2-x+3)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^3,x, algorithm="giac")
```

```
[Out] 262/12167*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/1058*(524*
x^3 - 393*x^2 + 472*x - 829)/(2*x^2 - x + 3)^2
```

3.55 $\int \frac{1}{(3-x+2x^2)^3(2+3x+5x^2)}\,dx$

Optimal. Leaf size=115

$$\frac{3625-746x}{256036(2x^2-x+3)}+\frac{13-6x}{1012(2x^2-x+3)^2}-\frac{119\log(2x^2-x+3)}{21296}+\frac{119\log(5x^2+3x+2)}{21296}-\frac{53403\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5632792\sqrt{23}}+\frac{247\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10648\sqrt{31}}$$

```
[Out] (13 - 6*x)/(1012*(3 - x + 2*x^2)^2) + (3625 - 746*x)/(256036*(3 -
 x + 2*x^2)) - (53403*ArcTan[(1 - 4*x)/Sqrt[23]])/(5632792*Sqrt[2
3]) + (247*ArcTan[(3 + 10*x)/Sqrt[31]])/(10648*Sqrt[31]) - (119*L
og[3 - x + 2*x^2])/21296 + (119*Log[2 + 3*x + 5*x^2])/21296
```

Rubi [A] time = 0.280958, antiderivative size = 115, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.28

$$\frac{3625-746x}{256036(2x^2-x+3)}+\frac{13-6x}{1012(2x^2-x+3)^2}-\frac{119\log(2x^2-x+3)}{21296}+\frac{119\log(5x^2+3x+2)}{21296}-\frac{53403\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{5632792\sqrt{23}}+\frac{247\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{10648\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (13 - 6*x)/(1012*(3 - x + 2*x^2)^2) + (3625 - 746*x)/(256036*(3 -
 x + 2*x^2)) - (53403*ArcTan[(1 - 4*x)/Sqrt[23]])/(5632792*Sqrt[2
3]) + (247*ArcTan[(3 + 10*x)/Sqrt[31]])/(10648*Sqrt[31]) - (119*L
og[3 - x + 2*x^2])/21296 + (119*Log[2 + 3*x + 5*x^2])/21296
```

Rubi in Sympy [A] time = 77.8536, size = 107, normalized size = 0.93

$$\frac{-180532x+877250}{61960712(2x^2-x+3)}+\frac{-66x+143}{11132(2x^2-x+3)^2}-\frac{119\log(2x^2-x+3)}{21296}+\frac{119\log(5x^2+3x+2)}{21296}+\frac{53403\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{129554216}+\frac{247\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{330088}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2),x)
```

```
[Out] (-180532*x + 877250)/(61960712*(2*x**2 - x + 3)) + (-66*x + 143)/
(11132*(2*x**2 - x + 3)**2) - 119*log(2*x**2 - x + 3)/21296 + 119
*log(5*x**2 + 3*x + 2)/21296 + 53403*sqrt(23)*atan(sqrt(23)*(4*x/
23 - 1/23))/129554216 + 247*sqrt(31)*atan(sqrt(31)*(10*x/31 + 3/3
1))/330088
```

Mathematica [A] time = 0.33811, size = 99, normalized size = 0.86

$$\frac{713\left(-62951\log(2x^2-x+3)+62951\log(5x^2+3x+2)-\frac{44(1492x^3-7996x^2+7381x-14164)}{(-2x^2+x-3)^2}\right)+3310986\sqrt{23}\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)+60}{8032361392}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (3310986*Sqrt[23]*ArcTan[(-1 + 4*x)/Sqrt[23]] + 6010498*Sqrt[31]*
ArcTan[(3 + 10*x)/Sqrt[31]] + 713*((-44*(-14164 + 7381*x - 7996*x
^2 + 1492*x^3))/(-3 + x - 2*x^2)^2 - 62951*Log[3 - x + 2*x^2] + 6
2951*Log[2 + 3*x + 5*x^2]))/8032361392
```

Maple [A] time = 0.01, size = 89, normalized size = 0.8

$$\frac{119\ \ln\left(5x^2+3x+2\right)}{21296}+\frac{247\sqrt{31}}{330088}\arctan\left(\frac{(3+10x)\sqrt{31}}{31}\right)-\frac{1}{2662\ (2x^2-x+3)^2}\left(\frac{8206\,x^3}{529}-\frac{43978\,x^2}{529}+\frac{81191\,x}{1058}-\frac{77902}{529}\right)-\frac{119\ \ln\left(8x^2-4x+12\right)}{21296}+\frac{53403\sqrt{23}}{129554216}\arctan\left(\frac{(16x-4)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^3/(5*x^2+3*x+2),x)
```

```
[Out] 119/21296*ln(5*x^2+3*x+2)+247/330088*arctan(1/31*(3+10*x)*31^(1/2
))*31^(1/2)-1/2662*(8206/529*x^3-43978/529*x^2+81191/1058*x-77902
/529)/(2*x^2-x+3)^2-119/21296*ln(8*x^2-4*x+12)+53403/129554216*23
^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))
```

Maxima [A] time = 0.767025, size = 132, normalized size = 1.15

$$\frac{247}{330088}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{53403}{129554216}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{1492x^3-7996x^2+7381x-14164}{256036\,(4x^4-4x^3+13x^2-6x+9)}+\frac{119}{21296}\log\left(5x^2+3x+2\right)-\frac{119}{21296}\log\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3),x, algorithm="maxima")
```

```
[Out] 247/330088*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 53403/1295
54216*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/256036*(1492*x
^3 - 7996*x^2 + 7381*x - 14164)/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9
) + 119/21296*log(5*x^2 + 3*x + 2) - 119/21296*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.271669, size = 275, normalized size = 2.39

$$\sqrt{31}\sqrt{23}\left(62951\sqrt{31}\sqrt{23}\left(4x^4-4x^3+13x^2-6x+9\right)\log\left(5x^2+3x+2\right)-62951\sqrt{31}\sqrt{23}\left(4x^4-4x^3+13x^2-6x+9\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3),x, algorithm="fricas")
```

```
[Out] 1/8032361392*sqrt(31)*sqrt(23)*(62951*sqrt(31)*sqrt(23)*(4*x^4 -
4*x^3 + 13*x^2 - 6*x + 9)*log(5*x^2 + 3*x + 2) - 62951*sqrt(31)*s
```

```
qrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(2*x^2 - x + 3) + 2
61326*sqrt(23)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(1/31*sqr
t(31)*(10*x + 3)) + 106806*sqrt(31)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x
 + 9)*arctan(1/23*sqrt(23)*(4*x - 1)) - 44*sqrt(31)*sqrt(23)*(149
2*x^3 - 7996*x^2 + 7381*x - 14164))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x
 + 9)
```

Sympy [A] time = 0.486023, size = 122, normalized size = 1.06

$$-\frac{1492x^3-7996x^2+7381x-14164}{1024144x^4-1024144x^3+3328468x^2-1536216x+2304324}-\frac{119\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{21296}+\frac{119\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{21296}+\frac{53403\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{129554216}+\frac{247\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{330088}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2),x)
```

```
[Out] -(1492*x**3 - 7996*x**2 + 7381*x - 14164)/(1024144*x**4 - 1024144
*x**3 + 3328468*x**2 - 1536216*x + 2304324) - 119*log(x**2 - x/2
+ 3/2)/21296 + 119*log(x**2 + 3*x/5 + 2/5)/21296 + 53403*sqrt(23)
*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/129554216 + 247*sqrt(31)*ata
n(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/330088
```

GIAC/XCAS [A] time = 0.265309, size = 119, normalized size = 1.03

$$\frac{247}{330088}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{53403}{129554216}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{1492x^3-7996x^2+7381x-14164}{256036\left(2x^2-x+3\right)^2}+\frac{119}{21296}\ln\left(5x^2+3x+2\right)-\frac{119}{21296}\ln\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^3),x, algorithm="giac")
```

```
[Out] 247/330088*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 53403/1295
54216*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/256036*(1492*x
^3 - 7996*x^2 + 7381*x - 14164)/(2*x^2 - x + 3)^2 + 119/21296*ln(
5*x^2 + 3*x + 2) - 119/21296*ln(2*x^2 - x + 3)
```

3.56 $\int \frac{1}{(3-x+2x^2)^3(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=160

$$\frac{9665-1446x}{512072\,(2x^2-x+3)\,(5x^2+3x+2)}-\frac{252815x+2328909}{174616552\,(5x^2+3x+2)}+\frac{13-6x}{1012\,(2x^2-x+3)^2\,(5x^2+3x+2)}+\frac{181\log\left(2x^2-x+3\right)}{468512}-\frac{181\log\left(5x^2+3x+2\right)}{468512}+\frac{2038497\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{123921424\sqrt{23}}+\frac{246757\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{7261936\sqrt{31}}$$

```
[Out] -(2328909 + 252815*x)/(174616552*(2 + 3*x + 5*x^2)) + (13 - 6*x)/
(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)) + (9665 - 1446*x)/(512
072*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)) + (2038497*ArcTan[(1 - 4*x
)/Sqrt[23]])/(123921424*Sqrt[23]) + (246757*ArcTan[(3 + 10*x)/Sqr
t[31]])/(7261936*Sqrt[31]) + (181*Log[3 - x + 2*x^2])/468512 - (1
81*Log[2 + 3*x + 5*x^2])/468512
```

Rubi [A] time = 0.36646, antiderivative size = 160, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\frac{9665-1446x}{512072\,(2x^2-x+3)\,(5x^2+3x+2)}-\frac{252815x+2328909}{174616552\,(5x^2+3x+2)}+\frac{13-6x}{1012\,(2x^2-x+3)^2\,(5x^2+3x+2)}+\frac{181\log\left(2x^2-x+3\right)}{468512}-\frac{181\log\left(5x^2+3x+2\right)}{468512}+\frac{2038497\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{123921424\sqrt{23}}+\frac{246757\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{7261936\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] -(2328909 + 252815*x)/(174616552*(2 + 3*x + 5*x^2)) + (13 - 6*x)/
(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)) + (9665 - 1446*x)/(512
072*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)) + (2038497*ArcTan[(1 - 4*x
)/Sqrt[23]])/(123921424*Sqrt[23]) + (246757*ArcTan[(3 + 10*x)/Sqr
t[31]])/(7261936*Sqrt[31]) + (181*Log[3 - x + 2*x^2])/468512 - (1
81*Log[2 + 3*x + 5*x^2])/468512
```

Rubi in Sympy [A] time = 101.504, size = 134, normalized size = 0.84

$$-\frac{-715594x+1179387}{83512264\,(2x^2-x+3)^2}+\frac{715x+44}{7502\,(2x^2-x+3)^2\,(5x^2+3x+2)}-\frac{269197412x+2183705150}{464829261424\,(2x^2-x+3)}+\frac{181\log\left(2x^2-x+3\right)}{468512}-\frac{181\log\left(5x^2+3x+2\right)}{468512}-\frac{2038497\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{2850192752}+\frac{246757\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{225120016}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**2,x)
```

```
[Out] -(-715594*x + 1179387)/(83512264*(2*x**2 - x + 3)**2) + (715*x +
44)/(7502*(2*x**2 - x + 3)**2*(5*x**2 + 3*x + 2)) - (269197412*x
+ 2183705150)/(464829261424*(2*x**2 - x + 3)) + 181*log(2*x**2 -
x + 3)/468512 - 181*log(5*x**2 + 3*x + 2)/468512 - 2038497*sqrt(2
3)*atan(sqrt(23)*(4*x/23 - 1/23))/2850192752 + 246757*sqrt(31)*at
an(sqrt(31)*(10*x/31 + 3/31))/225120016
```

Mathematica [A] time = 0.204017, size = 136, normalized size = 0.85

$$\frac{-2923x-1782}{1408198\left(2x^2-x+3\right)}+\frac{1235x-1474}{330088\left(5x^2+3x+2\right)}+\frac{-14x-31}{22264\left(2x^2-x+3\right)^2}+\frac{181\log\left(2x^2-x+3\right)}{468512}-\frac{181\log\left(5x^2+3x+2\right)}{468512}-\frac{2038497\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{123921424\sqrt{23}}+\frac{246757\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{7261936\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] (-31 - 14*x)/(22264*(3 - x + 2*x^2)^2) + (-1782 - 2923*x)/(140819
8*(3 - x + 2*x^2)) + (-1474 + 1235*x)/(330088*(2 + 3*x + 5*x^2))
- (2038497*ArcTan[(-1 + 4*x)/Sqrt[23]])/(123921424*Sqrt[23]) + (2
46757*ArcTan[(3 + 10*x)/Sqrt[31]])/(7261936*Sqrt[31]) + (181*Log[
3 - x + 2*x^2])/468512 - (181*Log[2 + 3*x + 5*x^2])/468512
```

Maple [A] time = 0.013, size = 106, normalized size = 0.7

$$-\frac{1}{234256}\left(-\frac{5434\,x}{31}+\frac{32428}{155}\right)\left(x^2+\frac{3\,x}{5}+\frac{2}{5}\right)^{-1}-\frac{181\,\ln\left(25\,x^2+15\,x+10\right)}{468512}+\frac{246757\,\sqrt{31}}{225120016}\arctan\left(\frac{(50\,x+15)\sqrt{31}}{155}\right)+\frac{1}{58564\,\left(2\,x^2-x+3\right)^2}\left(-\frac{128612\,x^3}{529}-\frac{14102\,x^2}{529}-\frac{173195\,x}{529}-\frac{321497}{1058}\right)+\frac{181\,\ln\left(8\,x^2-4\,x+12\right)}{468512}-\frac{2038497\,\sqrt{23}}{2850192752}\arctan\left(\frac{(16\,x-4)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^3/(5*x^2+3*x+2)^2,x)
```

```
[Out] -1/234256*(-5434/31*x+32428/155)/(x^2+3/5*x+2/5)-181/468512*ln(25
*x^2+15*x+10)+246757/225120016*31^(1/2)*arctan(1/155*(50*x+15)*31
^(1/2))+1/58564*(-128612/529*x^3-14102/529*x^2-173195/529*x-32149
7/1058)/(2*x^2-x+3)^2+181/468512*ln(8*x^2-4*x+12)-2038497/2850192
752*23^(1/2)*arctan(1/92*(16*x-4)*23^(1/2))
```

Maxima [A] time = 0.764744, size = 157, normalized size = 0.98

$$\frac{246757}{225120016}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)-\frac{2038497}{2850192752}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{1011260\,x^5+8304376\,x^4-5042869\,x^3+21674311\,x^2-5887820\,x+8829788}{174616552\left(20\,x^6-8\,x^5+61\,x^4+x^3+53\,x^2+15\,x+18\right)}-\frac{181}{468512}\log\left(5\,x^2+3\,x+2\right)+\frac{181}{468512}\log\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3),x, algorithm="maxima")
```

```
[Out] 246757/225120016*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 2038
497/2850192752*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/17461
6552*(1011260*x^5 + 8304376*x^4 - 5042869*x^3 + 21674311*x^2 - 58
```

```
87820*x + 8829788)/(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x
 + 18) - 181/468512*log(5*x^2 + 3*x + 2) + 181/468512*log(2*x^2 -
 x + 3)
```

Fricas [A] time = 0.272332, size = 343, normalized size = 2.14

$$-\frac{\sqrt{31}\sqrt{23}\Big(2968219\sqrt{31}\sqrt{23}\left(20\,x^6-8\,x^5+61\,x^4+x^3+53\,x^2+15\,x+18\right)\log\left(5\,x^2+3\,x+2\right)-2968219\sqrt{31}\sqrt{23}\left(20\,x^6-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3),x, algorithm="fricas")
```

```
[Out] -1/5478070469344*sqrt(31)*sqrt(23)*(2968219*sqrt(31)*sqrt(23)*(20
*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*log(5*x^2 + 3*x
 + 2) - 2968219*sqrt(31)*sqrt(23)*(20*x^6 - 8*x^5 + 61*x^4 + x^3
+ 53*x^2 + 15*x + 18)*log(2*x^2 - x + 3) - 261068906*sqrt(23)*(20
*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)*arctan(1/31*sqr
t(31)*(10*x + 3)) + 126386814*sqrt(31)*(20*x^6 - 8*x^5 + 61*x^4 +
 x^3 + 53*x^2 + 15*x + 18)*arctan(1/23*sqrt(23)*(4*x - 1)) + 44*s
qrt(31)*sqrt(23)*(1011260*x^5 + 8304376*x^4 - 5042869*x^3 + 21674
311*x^2 - 5887820*x + 8829788))/(20*x^6 - 8*x^5 + 61*x^4 + x^3 +
53*x^2 + 15*x + 18)
```

Sympy [A] time = 0.595515, size = 143, normalized size = 0.89

$$-\frac{1011260x^5+8304376x^4-5042869x^3+21674311x^2-5887820x+8829788}{3492331040x^6-1396932416x^5+10651609672x^4+174616552x^3+9254677256x^2+2619248280x+3143097936}+\frac{181\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{468512}-\frac{181\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{468512}-\frac{2038497\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{2850192752}+\frac{246757\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{225120016}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**2,x)
```

```
[Out] -(1011260*x**5 + 8304376*x**4 - 5042869*x**3 + 21674311*x**2 - 58
87820*x + 8829788)/(3492331040*x**6 - 1396932416*x**5 + 106516096
72*x**4 + 174616552*x**3 + 9254677256*x**2 + 2619248280*x + 31430
97936) + 181*log(x**2 - x/2 + 3/2)/468512 - 181*log(x**2 + 3*x/5
+ 2/5)/468512 - 2038497*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/
23)/2850192752 + 246757*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(3
1)/31)/225120016
```

GIAC/XCAS [A] time = 0.267255, size = 149, normalized size = 0.93

$$\frac{246757}{225120016}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10\,x+3)\right)-\frac{2038497}{2850192752}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{1011260\,x^5+8304376\,x^4-5042869\,x^3+21674311\,x^2-5887820\,x+8829788}{174616552\,(5\,x^2+3\,x+2)(2\,x^2-x+3)^2}-\frac{181}{468512}\ln\left(5\,x^2+3\,x+2\right)+\frac{181}{468512}\ln\left(2\,x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^3),x, algorithm="giac")
```

```
[Out] 246757/225120016*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) - 2038
497/2850192752*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) - 1/17461
6552*(1011260*x^5 + 8304376*x^4 - 5042869*x^3 + 21674311*x^2 - 58
87820*x + 8829788)/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^2) - 181/46
8512*ln(5*x^2 + 3*x + 2) + 181/468512*ln(2*x^2 - x + 3)
```

3.57 $\int \frac{1}{(3-x+2x^2)^3(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=181

$$\frac{5(302-35x)}{64009\left(2x^2-x+3\right)\left(5x^2+3x+2\right)^2}+\frac{15(7140435x+2618306)}{14886061058\left(5x^2+3x+2\right)}-\frac{5(77020x+223707)}{87308276\left(5x^2+3x+2\right)^2}+\frac{13-6x}{1012\left(2x^2-x+3\right)^2\left(5x^2+3x+2\right)^2}+\frac{405\log\left(2x^2-x+3\right)}{1288408}-\frac{405\log\left(5x^2+3x+2\right)}{1288408}-\frac{880575\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{340783916\sqrt{23}}+\frac{2768835\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{619080044\sqrt{31}}$$

```
[Out] (-5*(223707 + 77020*x))/(87308276*(2 + 3*x + 5*x^2)^2) + (13 - 6*
x)/(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2) + (5*(302 - 35*x)
)/(64009*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (15*(2618306 + 71
40435*x))/(14886061058*(2 + 3*x + 5*x^2)) - (880575*ArcTan[(1 - 4
*x)/Sqrt[23]])/(340783916*Sqrt[23]) + (2768835*ArcTan[(3 + 10*x)/
Sqrt[31]])/(619080044*Sqrt[31]) + (405*Log[3 - x + 2*x^2])/128840
8 - (405*Log[2 + 3*x + 5*x^2])/1288408
```

Rubi [A] time = 0.454219, antiderivative size = 181, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 7, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.28$

$$\frac{5(302-35x)}{64009\left(2x^2-x+3\right)\left(5x^2+3x+2\right)^2}+\frac{15(7140435x+2618306)}{14886061058\left(5x^2+3x+2\right)}-\frac{5(77020x+223707)}{87308276\left(5x^2+3x+2\right)^2}+\frac{13-6x}{1012\left(2x^2-x+3\right)^2\left(5x^2+3x+2\right)^2}+\frac{405\log\left(2x^2-x+3\right)}{1288408}-\frac{405\log\left(5x^2+3x+2\right)}{1288408}-\frac{880575\tan^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{340783916\sqrt{23}}+\frac{2768835\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{619080044\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] (-5*(223707 + 77020*x))/(87308276*(2 + 3*x + 5*x^2)^2) + (13 - 6*
x)/(1012*(3 - x + 2*x^2)^2*(2 + 3*x + 5*x^2)^2) + (5*(302 - 35*x)
)/(64009*(3 - x + 2*x^2)*(2 + 3*x + 5*x^2)^2) + (15*(2618306 + 71
40435*x))/(14886061058*(2 + 3*x + 5*x^2)) - (880575*ArcTan[(1 - 4
*x)/Sqrt[23]])/(340783916*Sqrt[23]) + (2768835*ArcTan[(3 + 10*x)/
Sqrt[31]])/(619080044*Sqrt[31]) + (405*Log[3 - x + 2*x^2])/128840
8 - (405*Log[2 + 3*x + 5*x^2])/1288408
```

Rubi in Sympy [A] time = 126.545, size = 172, normalized size = 0.95

$$-\frac{-663080x+1295668}{167024528\left(2x^2-x+3\right)^2\left(5x^2+3x+2\right)}+\frac{715x+44}{15004\left(2x^2-x+3\right)^2\left(5x^2+3x+2\right)^2}-\frac{1640217920x+2959824560}{929658522848\left(2x^2-x+3\right)\left(5x^2+3x+2\right)}+\frac{50180692240800x+18400616710080}{6974298238405696\left(5x^2+3x+2\right)}+\frac{405\log\left(2x^2-x+3\right)}{1288408}-\frac{405\log\left(5x^2+3x+2\right)}{1288408}+\frac{880575\sqrt{23}\,\mathrm{atan}\left(\sqrt{23}\left(\frac{4x}{23}-\frac{1}{23}\right)\right)}{7838030068}+\frac{2768835\sqrt{31}\,\mathrm{atan}\left(\sqrt{31}\left(\frac{10x}{31}+\frac{3}{31}\right)\right)}{19191481364}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**3,x)
```

```
[Out] -(-663080*x + 1295668)/(167024528*(2*x**2 - x + 3)**2*(5*x**2 + 3
*x + 2)) + (715*x + 44)/(15004*(2*x**2 - x + 3)**2*(5*x**2 + 3*x
+ 2)**2) - (1640217920*x + 2959824560)/(929658522848*(2*x**2 - x
+ 3)*(5*x**2 + 3*x + 2)) + (50180692240800*x + 18400616710080)/(6
974298238405696*(5*x**2 + 3*x + 2)) + 405*log(2*x**2 - x + 3)/128
8408 - 405*log(5*x**2 + 3*x + 2)/1288408 + 880575*sqrt(23)*atan(s
qrt(23)*(4*x/23 - 1/23))/7838030068 + 2768835*sqrt(31)*atan(sqrt(
31)*(10*x/31 + 3/31))/19191481364
```

Mathematica [A] time = 0.164006, size = 151, normalized size = 0.83

$$\frac{405\log\left(2x^2-x+3\right)}{1288408}-\frac{405\log\left(5x^2+3x+2\right)}{1288408}+\frac{6850x^3-9275x^2+11154x-4342}{345092\left(10x^4+x^3+16x^2+7x+6\right)^2}+\frac{5\left(42842610x^3-5711469x^2+51156233x+14085977\right)}{14886061058\left(10x^4+x^3+16x^2+7x+6\right)}+\frac{880575\tan^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{340783916\sqrt{23}}+\frac{2768835\tan^{-1}\left(\frac{10x+3}{\sqrt{31}}\right)}{619080044\sqrt{31}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^3*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] (-4342 + 11154*x - 9275*x^2 + 6850*x^3)/(345092*(6 + 7*x + 16*x^2
 + x^3 + 10*x^4)^2) + (5*(14085977 + 51156233*x - 5711469*x^2 + 4
2842610*x^3))/(14886061058*(6 + 7*x + 16*x^2 + x^3 + 10*x^4)) + (
880575*ArcTan[(-1 + 4*x)/Sqrt[23]])/(340783916*Sqrt[23]) + (27688
35*ArcTan[(3 + 10*x)/Sqrt[31]])/(619080044*Sqrt[31]) + (405*Log[3
 - x + 2*x^2])/1288408 - (405*Log[2 + 3*x + 5*x^2])/1288408
```

Maple [A] time = 0.014, size = 118, normalized size = 0.7

$$-\frac{25}{2576816\left(5x^2+3x+2\right)^2}\left(-\frac{3013197x^3}{961}-\frac{14516062x^2}{4805}-\frac{51193868x}{24025}-\frac{5423968}{24025}\right)-\frac{405\ln\left(125x^2+75x+50\right)}{1288408}+\frac{2768835\sqrt{31}}{19191481364}\arctan\left(\frac{(250x+75)\sqrt{31}}{775}\right)+\frac{1}{644204\left(2x^2-x+3\right)^2}\left(\frac{302907x^3}{529}-\frac{368291x^2}{529}+\frac{2501587x}{2116}-\frac{665819}{1058}\right)+\frac{405\ln\left(8x^2-4x+12\right)}{1288408}+\frac{880575\sqrt{23}}{7838030068}\arctan\left(\frac{(16x-4)\sqrt{23}}{92}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^3/(5*x^2+3*x+2)^3,x)
```

```
[Out] -25/2576816*(-3013197/961*x^3-14516062/4805*x^2-51193868/24025*x-
5423968/24025)/(5*x^2+3*x+2)^2-405/1288408*ln(125*x^2+75*x+50)+27
68835/19191481364*31^(1/2)*arctan(1/775*(250*x+75)*31^(1/2))+1/64
4204*(302907/529*x^3-368291/529*x^2+2501587/2116*x-665819/1058)/(
2*x^2-x+3)^2+405/1288408*ln(8*x^2-4*x+12)+880575/7838030068*23^(1
/2)*arctan(1/92*(16*x-4)*23^(1/2))
```

Maxima [A] time = 0.768326, size = 186, normalized size = 1.03

$$\frac{2768835}{19191481364}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{880575}{7838030068}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{4284261000x^7-142720800x^6+11913326210x^5+4005307690x^4+11087580870x^3+4691822415x^2+5017681412x+4}{29772122116(100x^8+20x^7+321x^6+172x^5+390x^4+236x^3+241x^2+84x+36)}-\frac{405}{1288408}\log\left(5x^2+3x+2\right)+\frac{405}{1288408}\log\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3),x, algorithm="maxima")
```

```
[Out] 2768835/19191481364*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 8
80575/7838030068*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/297
72122116*(4284261000*x^7 - 142720800*x^6 + 11913326210*x^5 + 4005
307690*x^4 + 11087580870*x^3 + 4691822415*x^2 + 5017681412*x + 47
0561254)/(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^
3 + 241*x^2 + 84*x + 36) - 405/1288408*log(5*x^2 + 3*x + 2) + 405
/1288408*log(2*x^2 - x + 3)
```

Fricas [A] time = 0.279969, size = 437, normalized size = 2.41

$$-\frac{\sqrt{31}\sqrt{23}\left(205889445\sqrt{31}\sqrt{23}\left(100x^8+20x^7+321x^6+172x^5+390x^4+236x^3+241x^2+84x+36\right)\log\left(5x^2+3x+2\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3),x, algorithm="fricas")
```

```
[Out] -1/467005507511576*sqrt(31)*sqrt(23)*(205889445*sqrt(31)*sqrt(23)
*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*
x^2 + 84*x + 36)*log(5*x^2 + 3*x + 2) - 205889445*sqrt(31)*sqrt(2
3)*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 24
1*x^2 + 84*x + 36)*log(2*x^2 - x + 3) - 2929427430*sqrt(23)*(100*
x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 +
84*x + 36)*arctan(1/31*sqrt(31)*(10*x + 3)) - 1692465150*sqrt(31)
*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*
x^2 + 84*x + 36)*arctan(1/23*sqrt(23)*(4*x - 1)) - 22*sqrt(31)*sq
rt(23)*(4284261000*x^7 - 142720800*x^6 + 11913326210*x^5 + 400530
7690*x^4 + 11087580870*x^3 + 4691822415*x^2 + 5017681412*x + 4705
61254))/(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*x^3
 + 241*x^2 + 84*x + 36)
```

Sympy [A] time = 0.69941, size = 163, normalized size = 0.9

$$\frac{4284261000x^7-142720800x^6+11913326210x^5+4005307690x^4+11087580870x^3+4691822415x}{2977212211600x^8+595442442320x^7+9556851199236x^6+5120805003952x^5+11611127625240x^4+7026220819376x^3+7}+\frac{405\log\left(x^2-\frac{x}{2}+\frac{3}{2}\right)}{1288408}-\frac{405\log\left(x^2+\frac{3x}{5}+\frac{2}{5}\right)}{1288408}+\frac{880575\sqrt{23}\operatorname{atan}\left(\frac{4\sqrt{23}x}{23}-\frac{\sqrt{23}}{23}\right)}{7838030068}+\frac{2768835\sqrt{31}\operatorname{atan}\left(\frac{10\sqrt{31}x}{31}+\frac{3\sqrt{31}}{31}\right)}{19191481364}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**3/(5*x**2+3*x+2)**3,x)
```

```
[Out] (4284261000*x**7 - 142720800*x**6 + 11913326210*x**5 + 4005307690
*x**4 + 11087580870*x**3 + 4691822415*x**2 + 5017681412*x + 47056
```

```
1254)/(2977212211600*x**8 + 595442442320*x**7 + 9556851199236*x**
6 + 5120805003952*x**5 + 11611127625240*x**4 + 7026220819376*x**3
 + 7175081429956*x**2 + 2500858257744*x + 1071796396176) + 405*lo
g(x**2 - x/2 + 3/2)/1288408 - 405*log(x**2 + 3*x/5 + 2/5)/1288408
 + 880575*sqrt(23)*atan(4*sqrt(23)*x/23 - sqrt(23)/23)/7838030068
 + 2768835*sqrt(31)*atan(10*sqrt(31)*x/31 + 3*sqrt(31)/31)/191914
81364
```

GIAC/XCAS [A] time = 0.267992, size = 157, normalized size = 0.87

$$\frac{2768835}{19191481364}\sqrt{31}\arctan\left(\frac{1}{31}\sqrt{31}(10x+3)\right)+\frac{880575}{7838030068}\sqrt{23}\arctan\left(\frac{1}{23}\sqrt{23}(4x-1)\right)$$
$$+\frac{4284261000x^7-142720800x^6+11913326210x^5+4005307690x^4+11087580870x^3+4691822415x^2+5017681412x+4}{29772122116\left(10x^4+x^3+16x^2+7x+6\right)^2}$$
$$-\frac{405}{1288408}\ln\left(5x^2+3x+2\right)+\frac{405}{1288408}\ln\left(2x^2-x+3\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^3),x, algorithm="giac")
```

```
[Out] 2768835/19191481364*sqrt(31)*arctan(1/31*sqrt(31)*(10*x + 3)) + 8
80575/7838030068*sqrt(23)*arctan(1/23*sqrt(23)*(4*x - 1)) + 1/297
72122116*(4284261000*x^7 - 142720800*x^6 + 11913326210*x^5 + 4005
307690*x^4 + 11087580870*x^3 + 4691822415*x^2 + 5017681412*x + 47
0561254)/(10*x^4 + x^3 + 16*x^2 + 7*x + 6)^2 - 405/1288408*ln(5*x
^2 + 3*x + 2) + 405/1288408*ln(2*x^2 - x + 3)
```

3.58 $\int \sqrt{3-x+2x^2}\left(2+3x+5x^2\right)^4\,dx$

Optimal. Leaf size=208

$$-\frac{83948353\left(2x^2-x+3\right)^{3/2}x^2}{2293760}+\frac{804243809\left(2x^2-x+3\right)^{3/2}x}{36700160}+\frac{27185733541\left(2x^2-x+3\right)^{3/2}}{440401920}-\frac{359471503(1-4x)\sqrt{2x^2-x+3}}{67108864}$$

$$+\frac{125}{4}\left(2x^2-x+3\right)^{3/2}x^7+\frac{14125}{144}\left(2x^2-x+3\right)^{3/2}x^6+\frac{233225\left(2x^2-x+3\right)^{3/2}x^5}{1536}+\frac{4796405\left(2x^2-x+3\right)^{3/2}x^4}{43008}+\frac{8325631\,(2x}{10}$$

```
[Out] (-359471503*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/67108864 + (2718573354
1*(3 - x + 2*x^2)^(3/2))/440401920 + (804243809*x*(3 - x + 2*x^2)
^(3/2))/36700160 - (83948353*x^2*(3 - x + 2*x^2)^(3/2))/2293760 +
 (8325631*x^3*(3 - x + 2*x^2)^(3/2))/1032192 + (4796405*x^4*(3 -
x + 2*x^2)^(3/2))/43008 + (233225*x^5*(3 - x + 2*x^2)^(3/2))/1536
 + (14125*x^6*(3 - x + 2*x^2)^(3/2))/144 + (125*x^7*(3 - x + 2*x^
2)^(3/2))/4 - (8267844569*ArcSinh[(1 - 4*x)/Sqrt[23]])/(134217728
*Sqrt[2])
```

Rubi [A] time = 0.483532, antiderivative size = 208, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$-\frac{83948353\left(2x^2-x+3\right)^{3/2}x^2}{2293760}+\frac{804243809\left(2x^2-x+3\right)^{3/2}x}{36700160}+\frac{27185733541\left(2x^2-x+3\right)^{3/2}}{440401920}-\frac{359471503(1-4x)\sqrt{2x^2-x+3}}{67108864}$$

$$+\frac{125}{4}\left(2x^2-x+3\right)^{3/2}x^7+\frac{14125}{144}\left(2x^2-x+3\right)^{3/2}x^6+\frac{233225\left(2x^2-x+3\right)^{3/2}x^5}{1536}+\frac{4796405\left(2x^2-x+3\right)^{3/2}x^4}{43008}+\frac{8325631\,(2x}{10}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (-359471503*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/67108864 + (2718573354
1*(3 - x + 2*x^2)^(3/2))/440401920 + (804243809*x*(3 - x + 2*x^2)
^(3/2))/36700160 - (83948353*x^2*(3 - x + 2*x^2)^(3/2))/2293760 +
 (8325631*x^3*(3 - x + 2*x^2)^(3/2))/1032192 + (4796405*x^4*(3 -
x + 2*x^2)^(3/2))/43008 + (233225*x^5*(3 - x + 2*x^2)^(3/2))/1536
 + (14125*x^6*(3 - x + 2*x^2)^(3/2))/144 + (125*x^7*(3 - x + 2*x^
2)^(3/2))/4 - (8267844569*ArcSinh[(1 - 4*x)/Sqrt[23]])/(134217728
*Sqrt[2])
```

Rubi in Sympy [A] time = 102.482, size = 192, normalized size = 0.92

$$
\begin{aligned}
&-\frac{\left(-\frac{3847264125x}{8}+\frac{6356151165}{32}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{604800000} \\
&-\frac{\left(-\frac{170205x}{2}+\frac{6162015}{8}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^3}{1008000} \\
&+\frac{\left(90x+\frac{241}{2}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^3}{360} \\
&+\frac{\left(\frac{31895887634775x}{32}+\frac{185297635332855}{128}\right)\left(-\frac{2126392508985x^2}{64}-\frac{440352854355x}{64}+\frac{122592566805}{32}\right)\sqrt{2x^2-x+3}}{964531642075596000000} \\
&+\frac{\left(\frac{1259687335261370714967506625x}{8192}+\frac{4386253495668036882421670167 5}{32768}\right)\sqrt{2x^2-x+3}}{7716253136604768000000} \\
&+\frac{8267844569\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{268435456}
\end{aligned}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**4*(2*x**2-x+3)**(1/2),x)
```

```
[Out] -(-3847264125*x/8 + 6356151165/32)*sqrt(2*x**2 - x + 3)*(5*x**2 +
 3*x + 2)**2/604800000 - (-170205*x/2 + 6162015/8)*sqrt(2*x**2 -
x + 3)*(5*x**2 + 3*x + 2)**3/1008000 + (90*x + 241/2)*(2*x**2 - x
 + 3)**(3/2)*(5*x**2 + 3*x + 2)**3/360 + (31895887634775*x/32 + 1
85297635332855/128)*(-2126392508985*x**2/64 - 440352854355*x/64 +
 122592566805/32)*sqrt(2*x**2 - x + 3)/964531642075596000000 + (1
259687335261370714967506625*x/8192 + 438625349566803688242167016 7
5/32768)*sqrt(2*x**2 - x + 3)/7716253136604768000000 + 8267844569
*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/268435
456
```

Mathematica [A] time = 0.112816, size = 85, normalized size = 0.41

$$
\frac{4\sqrt{2x^2-x+3}\left(1321205760000x^9+3486515200000x^8+6327795712000x^7+7725962035200x^6+7612808028160x^5+53547\right.}{84557}
$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(3801512106459 + 537752185764*x - 17441807
7792*x^2 + 2211683657856*x^3 + 5354741991424*x^4 + 7612808028160*
x^5 + 7725962035200*x^6 + 6327795712000*x^7 + 3486515200000*x^8 +
 1321205760000*x^9) + 2604371039235*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sq
rt[23]])/84557168640
```

Maple [A] time = 0.039, size = 166, normalized size = 0.8

$$
\begin{aligned}
&\frac{1437886012\,x-359471503}{67108864}\sqrt{2\,x^2-x+3}+\frac{8267844569\,\sqrt{2}}{268435456}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right) \\
&+\frac{27185733541}{440401920}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{804243809\,x}{36700160}\left(2\,x^2-x+3\right)^{\frac{3}{2}} \\
&-\frac{83948353\,x^2}{2293760}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{8325631\,x^3}{1032192}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{4796405\,x^4}{43008}\left(2\,x^2-x+3\right)^{\frac{3}{2}} \\
&+\frac{233225\,x^5}{1536}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{14125\,x^6}{144}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{125\,x^7}{4}\left(2\,x^2-x+3\right)^{\frac{3}{2}}
\end{aligned}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^4*(2*x^2-x+3)^(1/2),x)
```

```
[Out] 359471503/67108864*(4*x-1)*(2*x^2-x+3)^(1/2)+8267844569/268435456
*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+27185733541/440401920*(2*
x^2-x+3)^(3/2)+804243809/36700160*x*(2*x^2-x+3)^(3/2)-83948353/22
93760*x^2*(2*x^2-x+3)^(3/2)+8325631/1032192*x^3*(2*x^2-x+3)^(3/2)
+4796405/43008*x^4*(2*x^2-x+3)^(3/2)+233225/1536*x^5*(2*x^2-x+3)^
(3/2)+14125/144*x^6*(2*x^2-x+3)^(3/2)+125/4*x^7*(2*x^2-x+3)^(3/2)
```

Maxima [A] time = 0.795224, size = 239, normalized size = 1.15

$$\frac{125}{4}\left(2x^2-x+3\right)^{\frac{3}{2}}x^7+\frac{14125}{144}\left(2x^2-x+3\right)^{\frac{3}{2}}x^6+\frac{233225}{1536}\left(2x^2-x+3\right)^{\frac{3}{2}}x^5+\frac{4796405}{43008}\left(2x^2-x+3\right)^{\frac{3}{2}}x^4+\frac{8325631}{1032192}\left(2x^2-x+3\right)^{\frac{3}{2}}x^3-\frac{83948353}{2293760}\left(2x^2-x+3\right)^{\frac{3}{2}}x^2+\frac{804243809}{36700160}\left(2x^2-x+3\right)^{\frac{3}{2}}x+\frac{27185733541}{440401920}\left(2x^2-x+3\right)^{\frac{3}{2}}+\frac{359471503}{16777216}\sqrt{2x^2-x+3}x+\frac{8267844569}{268435456}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{359471503}{67108864}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 125/4*(2*x^2 - x + 3)^(3/2)*x^7 + 14125/144*(2*x^2 - x + 3)^(3/2)
*x^6 + 233225/1536*(2*x^2 - x + 3)^(3/2)*x^5 + 4796405/43008*(2*x
^2 - x + 3)^(3/2)*x^4 + 8325631/1032192*(2*x^2 - x + 3)^(3/2)*x^3
 - 83948353/2293760*(2*x^2 - x + 3)^(3/2)*x^2 + 804243809/3670016
0*(2*x^2 - x + 3)^(3/2)*x + 27185733541/440401920*(2*x^2 - x + 3)
^(3/2) + 359471503/16777216*sqrt(2*x^2 - x + 3)*x + 8267844569/26
8435456*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 359471503/6710
8864*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.283938, size = 143, normalized size = 0.69

$$\frac{1}{169114337280}\sqrt{2}\left(4\sqrt{2}\left(1321205760000x^9+3486515200000x^8+6327795712000x^7+7725962035200x^6+761280802816\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/169114337280*sqrt(2)*(4*sqrt(2)*(1321205760000*x^9 + 3486515200
000*x^8 + 6327795712000*x^7 + 7725962035200*x^6 + 7612808028160*x
^5 + 5354741991424*x^4 + 2211683657856*x^3 - 174418077792*x^2 + 5
37752185764*x + 3801512106459)*sqrt(2*x^2 - x + 3) + 260437103923
5*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x
- 1)))
```

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

$$\int \sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**4*(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**4, x)
```

GIAC/XCAS [A] time = 0.270402, size = 126, normalized size = 0.61

$$\frac{1}{21139292160}(4(8(4(16(20(40(140(160(36x+95)x+27587)x+4715553)x+185859571)x+2614620113)x+1727877857$$
$$-\frac{8267844569}{268435456}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4*sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/21139292160*(4*(8*(4*(16*(20*(40*(140*(160*(36*x + 95)*x + 2758
7)*x + 4715553)*x + 185859571)*x + 2614620113)*x + 17278778577)*x
 - 5450564931)*x + 134438046441)*x + 3801512106459)*sqrt(2*x^2 -
x + 3) - 8267844569/268435456*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x -
sqrt(2*x^2 - x + 3)) + 1)
```

3.59 $\int \sqrt{3-x+2x^2}\left(2+3x+5x^2\right)^3 dx$

Optimal. Leaf size=166

$$\frac{531681\left(2x^2-x+3\right)^{3/2}x^2}{71680}-\frac{9627393\left(2x^2-x+3\right)^{3/2}x}{1146880}-\frac{22548119\left(2x^2-x+3\right)^{3/2}}{4587520}-\frac{6766097(1-4x)\sqrt{2x^2-x+3}}{2097152}+\frac{125}{16}\left(2x^2-x+3\right)^{3/2}x^5+\frac{8825}{448}\left(2x^2-x+3\right)^{3/2}x^4+\frac{247435\left(2x^2-x+3\right)^{3/2}x^3}{10752}-\frac{155620231\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4194304\sqrt{2}}$$

```
[Out] (-6766097*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/2097152 - (22548119*(3 -
 x + 2*x^2)^(3/2))/4587520 - (9627393*x*(3 - x + 2*x^2)^(3/2))/11
46880 + (531681*x^2*(3 - x + 2*x^2)^(3/2))/71680 + (247435*x^3*(3
 - x + 2*x^2)^(3/2))/10752 + (8825*x^4*(3 - x + 2*x^2)^(3/2))/448
 + (125*x^5*(3 - x + 2*x^2)^(3/2))/16 - (155620231*ArcSinh[(1 - 4
*x)/Sqrt[23]])/(4194304*Sqrt[2])
```

Rubi [A] time = 0.311495, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{531681\left(2x^2-x+3\right)^{3/2}x^2}{71680}-\frac{9627393\left(2x^2-x+3\right)^{3/2}x}{1146880}-\frac{22548119\left(2x^2-x+3\right)^{3/2}}{4587520}-\frac{6766097(1-4x)\sqrt{2x^2-x+3}}{2097152}+\frac{125}{16}\left(2x^2-x+3\right)^{3/2}x^5+\frac{8825}{448}\left(2x^2-x+3\right)^{3/2}x^4+\frac{247435\left(2x^2-x+3\right)^{3/2}x^3}{10752}-\frac{155620231\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4194304\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (-6766097*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/2097152 - (22548119*(3 -
 x + 2*x^2)^(3/2))/4587520 - (9627393*x*(3 - x + 2*x^2)^(3/2))/11
46880 + (531681*x^2*(3 - x + 2*x^2)^(3/2))/71680 + (247435*x^3*(3
 - x + 2*x^2)^(3/2))/10752 + (8825*x^4*(3 - x + 2*x^2)^(3/2))/448
 + (125*x^5*(3 - x + 2*x^2)^(3/2))/16 - (155620231*ArcSinh[(1 - 4
*x)/Sqrt[23]])/(4194304*Sqrt[2])
```

Rubi in Sympy [A] time = 68.4031, size = 153, normalized size = 0.92

$$-\frac{\left(-\frac{836463255x}{8}+\frac{1760991321}{32}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)}{80640000}-\frac{\left(-\frac{83975x}{2}+\frac{2357587}{8}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{336000}+\frac{\left(70x+\frac{185}{2}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^2}{224}-\frac{\left(\frac{306519103821x}{32}+\frac{1490800160271}{128}\right)\sqrt{2x^2-x+3}}{645120000}+\frac{155620231\sqrt{2}\,\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{8388608}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**3*(2*x**2-x+3)**(1/2),x)
```

```
[Out] -(-836463255*x/8 + 1760991321/32)*sqrt(2*x**2 - x + 3)*(5*x**2 +
3*x + 2)/80640000 - (-83975*x/2 + 2357587/8)*sqrt(2*x**2 - x + 3)
```

```
*(5*x**2 + 3*x + 2)**2/336000 + (70*x + 185/2)*(2*x**2 - x + 3)**
(3/2)*(5*x**2 + 3*x + 2)**2/224 - (306519103821*x/32 + 1490800160
271/128)*sqrt(2*x**2 - x + 3)/645120000 + 155620231*sqrt(2)*atanh
(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/8388608
```

Mathematica [A] time = 0.0900378, size = 75, normalized size = 0.45

$$\frac{4\sqrt{2x^2-x+3}\,(3440640000x^7+6955008000x^6+10958233600x^5+11212171264x^4+9872163456x^3+4583812128x^2-162}{880803840}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(-3957369321 - 1621307916*x + 4583812128*x
^2 + 9872163456*x^3 + 11212171264*x^4 + 10958233600*x^5 + 6955008
000*x^6 + 3440640000*x^7) + 16340124255*Sqrt[2]*ArcSinh[(-1 + 4*x
)/Sqrt[23]])/880803840
```

Maple [A] time = 0.01, size = 132, normalized size = 0.8

$$\frac{27064388\,x-6766097}{2097152}\sqrt{2\,x^2-x+3}+\frac{155620231\,\sqrt{2}}{8388608}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)$$
$$-\frac{22548119}{4587520}\left(2\,x^2-x+3\right)^{\frac{3}{2}}-\frac{9627393\,x}{1146880}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{531681\,x^2}{71680}\left(2\,x^2-x+3\right)^{\frac{3}{2}}$$
$$+\frac{247435\,x^3}{10752}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{8825\,x^4}{448}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{125\,x^5}{16}\left(2\,x^2-x+3\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^3*(2*x^2-x+3)^(1/2),x)
```

```
[Out] 6766097/2097152*(4*x-1)*(2*x^2-x+3)^(1/2)+155620231/8388608*2^(1/
2)*arcsinh(4/23*23^(1/2)*(x-1/4))-22548119/4587520*(2*x^2-x+3)^(3
/2)-9627393/1146880*x*(2*x^2-x+3)^(3/2)+531681/71680*x^2*(2*x^2-x
+3)^(3/2)+247435/10752*x^3*(2*x^2-x+3)^(3/2)+8825/448*x^4*(2*x^2-
x+3)^(3/2)+125/16*x^5*(2*x^2-x+3)^(3/2)
```

Maxima [A] time = 0.77788, size = 193, normalized size = 1.16

$$\frac{125}{16}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x^5+\frac{8825}{448}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x^4+\frac{247435}{10752}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x^3$$
$$+\frac{531681}{71680}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x^2-\frac{9627393}{1146880}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x-\frac{22548119}{4587520}\left(2\,x^2-x+3\right)^{\frac{3}{2}}$$
$$+\frac{6766097}{524288}\sqrt{2\,x^2-x+3}x+\frac{155620231}{8388608}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{6766097}{2097152}\sqrt{2\,x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 125/16*(2*x^2 - x + 3)^(3/2)*x^5 + 8825/448*(2*x^2 - x + 3)^(3/2)
*x^4 + 247435/10752*(2*x^2 - x + 3)^(3/2)*x^3 + 531681/71680*(2*x
^2 - x + 3)^(3/2)*x^2 - 9627393/1146880*(2*x^2 - x + 3)^(3/2)*x -
 22548119/4587520*(2*x^2 - x + 3)^(3/2) + 6766097/524288*sqrt(2*x
^2 - x + 3)*x + 155620231/8388608*sqrt(2)*arcsinh(1/23*sqrt(23)*(
```

```
4*x - 1)) - 6766097/2097152*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.281996, size = 130, normalized size = 0.78

$$\frac{1}{1761607680}\sqrt{2}\left(4\sqrt{2}\left(3440640000\,x^{7}+6955008000\,x^{6}+10958233600\,x^{5}+11212171264\,x^{4}+9872163456\,x^{3}+4583812128\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/1761607680*sqrt(2)*(4*sqrt(2)*(3440640000*x^7 + 6955008000*x^6
+ 10958233600*x^5 + 11212171264*x^4 + 9872163456*x^3 + 4583812128
*x^2 - 1621307916*x - 3957369321)*sqrt(2*x^2 - x + 3) + 163401242
55*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x
 - 1)))
```

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

$$\int \sqrt{2x^2 - x + 3}\left(5x^2 + 3x + 2\right)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**3*(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**3, x)
```

GIAC/XCAS [A] time = 0.270052, size = 112, normalized size = 0.67

$$\frac{1}{220200960}\left(4\left(8\left(4\left(16\left(100\left(120\left(140\,x+283\right)x+53507\right)x+5474693\right)x+77126277\right)x+143244129\right)x-405326979\right)x-3957\right.$$
$$-\frac{155620231}{8388608}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/220200960*(4*(8*(4*(16*(100*(120*(140*x + 283)*x + 53507)*x + 5
474693)*x + 77126277)*x + 143244129)*x - 405326979)*x - 395736932
1)*sqrt(2*x^2 - x + 3) - 155620231/8388608*sqrt(2)*ln(-2*sqrt(2)*
(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

3.60 $\int \sqrt{3-x+2x^2}\left(2+3x+5x^2\right)^2\,dx$

Optimal. Leaf size=124

$$\frac{63}{16}\left(2x^2-x+3\right)^{3/2}x^2+\frac{769}{256}\left(2x^2-x+3\right)^{3/2}x-\frac{2107\left(2x^2-x+3\right)^{3/2}}{3072}+\frac{12371(1-4x)\sqrt{2x^2-x+3}}{16384}+\frac{25}{12}\left(2x^2-x+3\right)^{3/2}x^3+\frac{284533\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32768\sqrt{2}}$$

```
[Out] (12371*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/16384 - (2107*(3 - x + 2*x^
2)^(3/2))/3072 + (769*x*(3 - x + 2*x^2)^(3/2))/256 + (63*x^2*(3 -
 x + 2*x^2)^(3/2))/16 + (25*x^3*(3 - x + 2*x^2)^(3/2))/12 + (2845
33*ArcSinh[(1 - 4*x)/Sqrt[23]])/(32768*Sqrt[2])
```

Rubi [A] time = 0.174966, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{63}{16}\left(2x^2-x+3\right)^{3/2}x^2+\frac{769}{256}\left(2x^2-x+3\right)^{3/2}x-\frac{2107\left(2x^2-x+3\right)^{3/2}}{3072}+\frac{12371(1-4x)\sqrt{2x^2-x+3}}{16384}+\frac{25}{12}\left(2x^2-x+3\right)^{3/2}x^3+\frac{284533\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32768\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (12371*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/16384 - (2107*(3 - x + 2*x^
2)^(3/2))/3072 + (769*x*(3 - x + 2*x^2)^(3/2))/256 + (63*x^2*(3 -
 x + 2*x^2)^(3/2))/16 + (25*x^3*(3 - x + 2*x^2)^(3/2))/12 + (2845
33*ArcSinh[(1 - 4*x)/Sqrt[23]])/(32768*Sqrt[2])
```

Rubi in Sympy [A] time = 23.1646, size = 105, normalized size = 0.85

$$-\frac{\left(-\frac{6429x}{2}+\frac{81141}{8}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{5760}+\frac{12371\left(-4x+1\right)\sqrt{2x^2-x+3}}{16384}+\frac{\left(50x+\frac{129}{2}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)}{120}-\frac{284533\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{65536}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**2*(2*x**2-x+3)**(1/2),x)
```

```
[Out] -(-6429*x/2 + 81141/8)*(2*x**2 - x + 3)**(3/2)/5760 + 12371*(-4*x
 + 1)*sqrt(2*x**2 - x + 3)/16384 + (50*x + 129/2)*(2*x**2 - x + 3
)**(3/2)*(5*x**2 + 3*x + 2)/120 - 284533*sqrt(2)*atanh(sqrt(2)*(4
*x - 1)/(4*sqrt(2*x**2 - x + 3)))/65536
```

Mathematica [A] time = 0.0787136, size = 65, normalized size = 0.52

$$\frac{4\sqrt{2x^2-x+3}\left(204800x^5+284672x^4+408960x^3+365536x^2+328204x-64023\right)-853599\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{196608}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(-64023 + 328204*x + 365536*x^2 + 408960*x
^3 + 284672*x^4 + 204800*x^5) - 853599*Sqrt[2]*ArcSinh[(-1 + 4*x)
/Sqrt[23]])/196608
```

Maple [A] time = 0.009, size = 98, normalized size = 0.8

$$-\frac{49484\,x-12371}{16384}\sqrt{2\,x^2-x+3}-\frac{284533\,\sqrt{2}}{65536}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)-\frac{2107}{3072}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{769\,x}{256}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{63\,x^2}{16}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{25\,x^3}{12}\left(2\,x^2-x+3\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^2*(2*x^2-x+3)^(1/2),x)
```

```
[Out] -12371/16384*(4*x-1)*(2*x^2-x+3)^(1/2)-284533/65536*2^(1/2)*arcsi
nh(4/23*23^(1/2)*(x-1/4))-2107/3072*(2*x^2-x+3)^(3/2)+769/256*x*(
2*x^2-x+3)^(3/2)+63/16*x^2*(2*x^2-x+3)^(3/2)+25/12*x^3*(2*x^2-x+3
)^(3/2)
```

Maxima [A] time = 0.769964, size = 147, normalized size = 1.19

$$\frac{25}{12}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x^3+\frac{63}{16}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x^2+\frac{769}{256}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x-\frac{2107}{3072}\left(2\,x^2-x+3\right)^{\frac{3}{2}}-\frac{12371}{4096}\sqrt{2\,x^2-x+3}x-\frac{284533}{65536}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)+\frac{12371}{16384}\sqrt{2\,x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 25/12*(2*x^2 - x + 3)^(3/2)*x^3 + 63/16*(2*x^2 - x + 3)^(3/2)*x^2
 + 769/256*(2*x^2 - x + 3)^(3/2)*x - 2107/3072*(2*x^2 - x + 3)^(3
/2) - 12371/4096*sqrt(2*x^2 - x + 3)*x - 284533/65536*sqrt(2)*arc
sinh(1/23*sqrt(23)*(4*x - 1)) + 12371/16384*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.27817, size = 116, normalized size = 0.94

$$\frac{1}{393216}\sqrt{2}\Big(4\sqrt{2}\left(204800\,x^5+284672\,x^4+408960\,x^3+365536\,x^2+328204\,x-64023\right)\sqrt{2\,x^2-x+3}+853599\,\log\Big(-\sqrt{2}(32$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/393216*sqrt(2)*(4*sqrt(2)*(204800*x^5 + 284672*x^4 + 408960*x^3
 + 365536*x^2 + 328204*x - 64023)*sqrt(2*x^2 - x + 3) + 853599*lo
g(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1)
))
```

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

$$\int\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**2*(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2, x)
```

GIAC/XCAS [A] time = 0.270643, size = 99, normalized size = 0.8

$$\frac{1}{49152}\left(4\left(8\left(4\left(16\left(100\,x+139\right)x+3195\right)x+11423\right)x+82051\right)x-64023\right)\sqrt{2\,x^2-x+3}+\frac{284533}{65536}\,\sqrt{2}\ln\left(-2\,\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/49152*(4*(8*(4*(16*(100*x + 139)*x + 3195)*x + 11423)*x + 82051
)*x - 64023)*sqrt(2*x^2 - x + 3) + 284533/65536*sqrt(2)*ln(-2*sqr
t(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

3.61 $\int \sqrt{3-x+2x^2}\left(2+3x+5x^2\right)\,dx$

Optimal. Leaf size=82

$$\frac{5}{8}x\left(2x^2-x+3\right)^{3/2}+\frac{73}{96}\left(2x^2-x+3\right)^{3/2}-\frac{81}{512}(1-4x)\sqrt{2x^2-x+3}-\frac{1863\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1024\sqrt{2}}$$

```
[Out] (-81*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/512 + (73*(3 - x + 2*x^2)^(3/
2))/96 + (5*x*(3 - x + 2*x^2)^(3/2))/8 - (1863*ArcSinh[(1 - 4*x)/
Sqrt[23]])/(1024*Sqrt[2])
```

Rubi [A] time = 0.0854822, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{5}{8}x\left(2x^2-x+3\right)^{3/2}+\frac{73}{96}\left(2x^2-x+3\right)^{3/2}-\frac{81}{512}(1-4x)\sqrt{2x^2-x+3}-\frac{1863\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1024\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2),x]
```

```
[Out] (-81*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/512 + (73*(3 - x + 2*x^2)^(3/
2))/96 + (5*x*(3 - x + 2*x^2)^(3/2))/8 - (1863*ArcSinh[(1 - 4*x)/
Sqrt[23]])/(1024*Sqrt[2])
```

Rubi in Sympy [A] time = 10.173, size = 73, normalized size = 0.89

$$-\frac{81\left(-4x+1\right)\sqrt{2x^2-x+3}}{512}+\frac{\left(30x+\frac{73}{2}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{48}+\frac{1863\sqrt{2}\,\text{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{2048}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] rubi_integrate((5*x**2+3*x+2)*(2*x**2-x+3)**(1/2),x)
```

```
[Out] -81*(-4*x + 1)*sqrt(2*x**2 - x + 3)/512 + (30*x + 73/2)*(2*x**2 -
 x + 3)**(3/2)/48 + 1863*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(
2*x**2 - x + 3)))/2048
```

Mathematica [A] time = 0.0511416, size = 55, normalized size = 0.67

$$\frac{4\sqrt{2x^2-x+3}\left(1920x^3+1376x^2+2684x+3261\right)+5589\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{6144}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2),x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(3261 + 2684*x + 1376*x^2 + 1920*x^3) + 55
89*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/6144
```

Maple [A] time = 0.008, size = 64, normalized size = 0.8

$$\frac{324x-81}{512}\sqrt{2x^2-x+3}+\frac{1863\sqrt{2}}{2048}Arcsinh\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{73}{96}\left(2x^2-x+3\right)^{\frac{3}{2}}+\frac{5x}{8}\left(2x^2-x+3\right)^{\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)*(2*x^2-x+3)^(1/2),x)
```

```
[Out] 81/512*(4*x-1)*(2*x^2-x+3)^(1/2)+1863/2048*2^(1/2)*arcsinh(4/23*2
3^(1/2)*(x-1/4))+73/96*(2*x^2-x+3)^(3/2)+5/8*x*(2*x^2-x+3)^(3/2)
```

Maxima [A] time = 0.771803, size = 101, normalized size = 1.23

$$\frac{5}{8}\left(2x^2-x+3\right)^{\frac{3}{2}}x+\frac{73}{96}\left(2x^2-x+3\right)^{\frac{3}{2}}+\frac{81}{128}\sqrt{2x^2-x+3}x+\frac{1863}{2048}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{81}{512}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 5/8*(2*x^2 - x + 3)^(3/2)*x + 73/96*(2*x^2 - x + 3)^(3/2) + 81/12
8*sqrt(2*x^2 - x + 3)*x + 1863/2048*sqrt(2)*arcsinh(1/23*sqrt(23)
*(4*x - 1)) - 81/512*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.277699, size = 103, normalized size = 1.26

$$\frac{1}{12288}\sqrt{2}\left(4\sqrt{2}\left(1920x^3+1376x^2+2684x+3261\right)\sqrt{2x^2-x+3}+5589\log\left(-\sqrt{2}\left(32x^2-16x+25\right)-8\sqrt{2x^2-x+3}(4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/12288*sqrt(2)*(4*sqrt(2)*(1920*x^3 + 1376*x^2 + 2684*x + 3261)*
sqrt(2*x^2 - x + 3) + 5589*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*
sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)*(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [A] time = 0.270001, size = 85, normalized size = 1.04

$$\frac{1}{1536}\left(4\left(8\left(60x+43\right)x+671\right)x+3261\right)\sqrt{2x^2-x+3}-\frac{1863}{2048}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/1536*(4*(8*(60*x + 43)*x + 671)*x + 3261)*sqrt(2*x^2 - x + 3) -
 1863/2048*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)
) + 1)
```

3.62 $\int \frac{\sqrt{3-x+2x^2}}{2+3x+5x^2}\,dx$

Optimal. Leaf size=174

$$\frac{1}{5}\sqrt{\frac{11}{31}\left(13+10\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(13+10\sqrt{2}\right)}}\left(\left(20+13\sqrt{2}\right)x+7\sqrt{2}+6\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{5}\sqrt{\frac{11}{31}\left(10\sqrt{2}-13\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(10\sqrt{2}-13\right)}}\left(\left(20-13\sqrt{2}\right)x-7\sqrt{2}+6\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{5}\sqrt{2}\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)$$

```
[Out] -(Sqrt[2]*ArcSinh[(1 - 4*x)/Sqrt[23]])/5 + (Sqrt[(11*(13 + 10*Sqr
t[2]))/31]*ArcTan[(Sqrt[11/(62*(13 + 10*Sqrt[2]))]*(6 + 7*Sqrt[2]
 + (20 + 13*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/5 - (Sqrt[(11*(-13
 + 10*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-13 + 10*Sqrt[2]))]*(6
- 7*Sqrt[2] + (20 - 13*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/5
```

Rubi [A] time = 0.861891, antiderivative size = 174, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.259$

$$\frac{1}{5}\sqrt{\frac{11}{31}\left(13+10\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(13+10\sqrt{2}\right)}}\left(\left(20+13\sqrt{2}\right)x+7\sqrt{2}+6\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{5}\sqrt{\frac{11}{31}\left(10\sqrt{2}-13\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(10\sqrt{2}-13\right)}}\left(\left(20-13\sqrt{2}\right)x-7\sqrt{2}+6\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{5}\sqrt{2}\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2),x]
```

```
[Out] -(Sqrt[2]*ArcSinh[(1 - 4*x)/Sqrt[23]])/5 + (Sqrt[(11*(13 + 10*Sqr
t[2]))/31]*ArcTan[(Sqrt[11/(62*(13 + 10*Sqrt[2]))]*(6 + 7*Sqrt[2]
 + (20 + 13*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/5 - (Sqrt[(11*(-13
 + 10*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-13 + 10*Sqrt[2]))]*(6
- 7*Sqrt[2] + (20 - 13*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/5
```

Rubi in Sympy [A] time = 75.4788, size = 204, normalized size = 1.17

$$\frac{\sqrt{341}\left(726+847\sqrt{2}\right)\left(242\sqrt{2}+484\right)\operatorname{atan}\left(\frac{\sqrt{682}\left(x\left(1573\sqrt{2}+2420\right)+726+847\sqrt{2}\right)}{7502\sqrt{13+10\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9077420\sqrt{13+10\sqrt{2}}}+\frac{\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{5}+\frac{\sqrt{341}\left(-847\sqrt{2}+726\right)\left(-242\sqrt{2}+484\right)\operatorname{atanh}\left(\frac{\sqrt{682}\left(x\left(-1573\sqrt{2}+2420\right)-847\sqrt{2}+726\right)}{7502\sqrt{-13+10\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9077420\sqrt{-13+10\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2),x)
```

```
[Out] sqrt(341)*(726 + 847*sqrt(2))*(242*sqrt(2) + 484)*atan(sqrt(682)*
(x*(1573*sqrt(2) + 2420) + 726 + 847*sqrt(2))/(7502*sqrt(13 + 10*
sqrt(2))*sqrt(2*x**2 - x + 3)))/(9077420*sqrt(13 + 10*sqrt(2))) +
 sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/5 + sq
rt(341)*(-847*sqrt(2) + 726)*(-242*sqrt(2) + 484)*atanh(sqrt(682)
*(x*(-1573*sqrt(2) + 2420) - 847*sqrt(2) + 726)/(7502*sqrt(-13 +
10*sqrt(2))*sqrt(2*x**2 - x + 3)))/(9077420*sqrt(-13 + 10*sqrt(2)
))
```

Mathematica [C] time = 6.41229, size = 1133, normalized size = 6.51

$$\frac{1}{5}\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right) - \frac{i\left(-13i+\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(1100\sqrt{31}x^4-8675ix^4+2970\sqrt{31}x^3-31860ix^3\cdots\right.}{-262775i\sqrt{31}x^4+443300x^4+10000i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-143180i\sqrt{31}x^3+514910x^3+3500i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^2\cdots}\right.}{5\sqrt{\frac{62}{11}}\left(13+i\sqrt{\cdots}\right.} - \frac{i\left(13i+\sqrt{31}\right)\tanh^{-1}\left(\frac{262775\sqrt{31}x^4-443300ix^4+55000\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+143180\sqrt{31}x^3-514910ix^3-124500\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^2\cdots}{34100\sqrt{31}x^4+1493925ix^4+92070\sqrt{31}x^3-2052340ix^3+838\cdots}\right.}{5\sqrt{\frac{62}{11}}\left(-13+i\cdots\right.}$$

$$+\frac{i\left(13i+\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{10\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}} - \frac{\left(-13i+\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{10\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

$$-\frac{i\left(13i+\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+i\sqrt{682\cdots}\right.\right.}{10\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}} + \frac{\left(-13i+\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-63i\sqrt{2\cdots}\right.\right.}{10\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2),x]
```

```
[Out] (Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/5 - ((I/5)*(-13*I + Sqrt[3
1])*ArcTan[(31*(7588*I + 4224*Sqrt[31] - (27836*I)*x + 3872*Sqrt[
31]*x + (4347*I)*x^2 + 2706*Sqrt[31]*x^2 - (31860*I)*x^3 + 2970*S
qrt[31]*x^3 - (8675*I)*x^4 + 1100*Sqrt[31]*x^4))/(65472 + (35044*
I)*Sqrt[31] + 1083016*x - (46668*I)*Sqrt[31]*x + 340318*x^2 - (30
8889*I)*Sqrt[31]*x^2 + 514910*x^3 - (143180*I)*Sqrt[31]*x^3 + 443
300*x^4 - (262775*I)*Sqrt[31]*x^4 - (1000*I)*Sqrt[682*(13 + I*Sqr
t[31])]*Sqrt[3 - x + 2*x^2] + (2500*I)*Sqrt[682*(13 + I*Sqrt[31])
]*x*Sqrt[3 - x + 2*x^2] + (3500*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^
2*Sqrt[3 - x + 2*x^2] + (10000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3
*Sqrt[3 - x + 2*x^2])])/Sqrt[(62*(13 + I*Sqrt[31]))/11] - ((I/5)*
(13*I + Sqrt[31])*ArcTanh[(-65472*I - 35044*Sqrt[31] - (1083016*I
)*x + 46668*Sqrt[31]*x - (340318*I)*x^2 + 308889*Sqrt[31]*x^2 - (
514910*I)*x^3 + 143180*Sqrt[31]*x^3 - (443300*I)*x^4 + 262775*Sqr
t[31]*x^4 - 63000*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2]
 - 72500*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 1245
```

```
00*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 55000*Sq
rt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(1764772*I + 1
30944*Sqrt[31] + (2352916*I)*x + 120032*Sqrt[31]*x + (3090243*I)*
x^2 + 83886*Sqrt[31]*x^2 - (2052340*I)*x^3 + 92070*Sqrt[31]*x^3 +
 (1493925*I)*x^4 + 34100*Sqrt[31]*x^4)])/Sqrt[(62*(-13 + I*Sqrt[3
1]))/11] - ((-13*I + Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2
*(3*I + Sqrt[31] + (10*I)*x)^2])/(10*Sqrt[(62*(13 + I*Sqrt[31]))/
11]) + ((I/10)*(13*I + Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)
^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[(62*(-13 + I*Sqrt[31]))/1
1] - ((I/10)*(13*I + Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66
*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]
*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)
*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[(62*(
-13 + I*Sqrt[31]))/11] + ((-13*I + Sqrt[31])*Log[(2 + 3*x + 5*x^2
)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x
^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 -
 x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*
x^2])])/(10*Sqrt[(62*(13 + I*Sqrt[31]))/11])
```

Maple [B] time = 0.187, size = 2065, normalized size = 11.9

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(1/2)/(5*x^2+3*x+2),x)
```

```
[Out] 1/5*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+1/52855*(8*(2^(1/2)-1+
x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-
3*2^(1/2))^(1/2)*2^(1/2)*(-285*2^(1/2)*arctan(1/11692487*(-775687
+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2
^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1
/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(
-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)-386*arct
an(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(
-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2
^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(
1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x
)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)
-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2
^(1/2))^(1/2)+274846*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x
)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/
(-8866+6820*2^(1/2))^(1/2))*2^(1/2)+1543366*arctanh(31/2*(8*(2^(1
/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x
)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-
1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+
8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)
-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2)+1/2
1142*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(151*2^(1/2)*arctan(1
/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/
2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)
+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+
82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x
)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/
2))^(1/2)+218*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-
23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-
41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2
^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1
+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3
*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)
*(-775687+549362*2^(1/2))^(1/2)+401698*arctanh(31/2*(8*(2^(1/2)-1
+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8
-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-63426*arcta
```

```
nh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x
)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)
))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/
(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(
1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^
(1/2))^(1/2)+3/21142*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)
*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(369*
2^(1/2)*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+
3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(
1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)
-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/
(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/
2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775
687+549362*2^(1/2))^(1/2)+520*arctan(1/11692487*(-775687+549362*2
^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-
x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)
+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016
)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)
+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+682
0*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+465124*arctanh(31
/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(
2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(
1/2)-866822*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(
1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+68
20*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)
*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2
^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2
))/(-8866+6820*2^(1/2))^(1/2)
```

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

$$\int \frac{\sqrt{2\,x^2 - x + 3}}{5\,x^2 + 3\,x + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2), x)
```

Fricas [A] time = 0.337173, size = 1397, normalized size = 8.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="fricas")
```

```
[Out] -1/480500*sqrt(155)*sqrt(31)*sqrt(5)*(2*sqrt(155)*sqrt(31)*sqrt(5
)*(13*sqrt(2) - 20)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369))*l
og(-4*sqrt(2)*sqrt(2*x^2 - x + 3)*(4*x - 1) - 32*x^2 + 16*x - 25)
 - 5*242^(1/4)*sqrt(31)*(10*sqrt(2) - 13)*log(-8/5*(2*242^(1/4)*s
qrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(61198*x + 25353) -
 86551*x - 35845)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 3
464300*x^2 + 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3
) - 14140*x + 42420) - 49985*sqrt(2)*(49*x^2 - 151*x + 200) - 106
75700*x + 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2)) + 5*242^(1/4)
*sqrt(31)*(10*sqrt(2) - 13)*log(8/5*(2*242^(1/4)*sqrt(155)*sqrt(5
)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(61198*x + 25353) - 86551*x - 3584
5)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) - 3464300*x^2 - 22
0*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 4
2420) + 49985*sqrt(2)*(49*x^2 - 151*x + 200) + 10675700*x - 14140
000)/(9997*sqrt(2)*x^2 - 14140*x^2)) + 620*242^(1/4)*arctan(31*(s
```

```
qrt(155)*sqrt(5)*(10*sqrt(2)*(x - 6) - 13*x + 78)*sqrt((13*sqrt(2
) - 20)/(260*sqrt(2) - 369)) + 10*242^(1/4)*sqrt(2*x^2 - x + 3)*(
3*sqrt(2) - 7))/(2*sqrt(155)*sqrt(31)*sqrt(5)*sqrt(2/5)*(10*sqrt(
2)*x - 13*x)*sqrt(-(2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x
+ 3)*(sqrt(2)*(61198*x + 25353) - 86551*x - 35845)*sqrt((13*sqrt(
2) - 20)/(260*sqrt(2) - 369)) + 3464300*x^2 + 220*sqrt(2)*(28280*
x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) - 49985*sqr
t(2)*(49*x^2 - 151*x + 200) - 10675700*x + 14140000)/(9997*sqrt(2
)*x^2 - 14140*x^2))*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) +
 sqrt(155)*sqrt(31)*sqrt(5)*(10*sqrt(2)*(19*x - 22) - 247*x + 286
)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) - 310*242^(1/4)*sqr
t(31)*sqrt(2*x^2 - x + 3)*(sqrt(2) - 1))) + 620*242^(1/4)*arctan(
-31*(sqrt(155)*sqrt(5)*(10*sqrt(2)*(x - 6) - 13*x + 78)*sqrt((13*
sqrt(2) - 20)/(260*sqrt(2) - 369)) - 10*242^(1/4)*sqrt(2*x^2 - x
+ 3)*(3*sqrt(2) - 7))/(2*sqrt(155)*sqrt(31)*sqrt(5)*sqrt(2/5)*(10
*sqrt(2)*x - 13*x)*sqrt((2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2
 - x + 3)*(sqrt(2)*(61198*x + 25353) - 86551*x - 35845)*sqrt((13*
sqrt(2) - 20)/(260*sqrt(2) - 369)) - 3464300*x^2 - 220*sqrt(2)*(2
8280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) + 4998
5*sqrt(2)*(49*x^2 - 151*x + 200) + 10675700*x - 14140000)/(9997*s
qrt(2)*x^2 - 14140*x^2))*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 36
9)) + sqrt(155)*sqrt(31)*sqrt(5)*(10*sqrt(2)*(19*x - 22) - 247*x
+ 286)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 310*242^(1/4
)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2) - 1))))/((10*sqrt(2) - 13
)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)))
```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{5x^2 + 3x + 2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2),x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)/(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2),x, algorithm="giac")
```

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

3.63 $\int \frac{\sqrt{3-x+2x^2}}{(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=188

$$\frac{\sqrt{2x^2-x+3}(10x+3)}{31\,(5x^2+3x+2)}+\frac{1}{62}\sqrt{\frac{1}{682}\left(70517+49942\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(70517+49942\sqrt{2}\right)}}\left(\left(973+696\sqrt{2}\right)x+277\sqrt{2}+419\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{62}\sqrt{\frac{1}{682}\left(49942\sqrt{2}-70517\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(49942\sqrt{2}-70517\right)}}\left(\left(973-696\sqrt{2}\right)x-277\sqrt{2}+419\right)}{\sqrt{2x^2-x+3}}\right)$$

```
[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(31*(2 + 3*x + 5*x^2)) + (Sqrt[(
70517 + 49942*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(70517 + 49942*Sq
rt[2]))]*(419 + 277*Sqrt[2] + (973 + 696*Sqrt[2])*x))/Sqrt[3 - x
+ 2*x^2]])/62 - (Sqrt[(-70517 + 49942*Sqrt[2])/682]*ArcTanh[(Sqrt
[11/(31*(-70517 + 49942*Sqrt[2]))]*(419 - 277*Sqrt[2] + (973 - 69
6*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/62
```

Rubi [A] time = 0.807527, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{\sqrt{2x^2-x+3}(10x+3)}{31\,(5x^2+3x+2)}+\frac{1}{62}\sqrt{\frac{1}{682}\left(70517+49942\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(70517+49942\sqrt{2}\right)}}\left(\left(973+696\sqrt{2}\right)x+277\sqrt{2}+419\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{62}\sqrt{\frac{1}{682}\left(49942\sqrt{2}-70517\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(49942\sqrt{2}-70517\right)}}\left(\left(973-696\sqrt{2}\right)x-277\sqrt{2}+419\right)}{\sqrt{2x^2-x+3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2)^2,x]
```


```
[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(31*(2 + 3*x + 5*x^2)) + (Sqrt[(
70517 + 49942*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(70517 + 49942*Sq
rt[2]))]*(419 + 277*Sqrt[2] + (973 + 696*Sqrt[2])*x))/Sqrt[3 - x
+ 2*x^2]])/62 - (Sqrt[(-70517 + 49942*Sqrt[2])/682]*ArcTanh[(Sqrt
[11/(31*(-70517 + 49942*Sqrt[2]))]*(419 - 277*Sqrt[2] + (973 - 69
6*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/62
```

Rubi in Sympy [A] time = 80.3057, size = 219, normalized size = 1.16

$$\frac{(10x+3)\sqrt{2x^2-x+3}}{31\,(5x^2+3x+2)} + \frac{\sqrt{682}\left(935+693\sqrt{2}\right)\left(\frac{3047\sqrt{2}}{2}+\frac{4609}{2}\right)\operatorname{atan}\left(\frac{2\sqrt{341}\left(x\left(\frac{10703}{2}+3828\sqrt{2}\right)+\frac{3047\sqrt{2}}{2}+\frac{4609}{2}\right)}{341\sqrt{70517+49942\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{2558182\sqrt{70517+49942\sqrt{2}}} + \frac{\sqrt{682}\left(-\frac{3047\sqrt{2}}{2}+\frac{4609}{2}\right)\left(-693\sqrt{2}+935\right)\operatorname{atanh}\left(\frac{2\sqrt{341}\left(x\left(-3828\sqrt{2}+\frac{10703}{2}\right)-\frac{3047\sqrt{2}}{2}+\frac{4609}{2}\right)}{341\sqrt{-70517+49942\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{2558182\sqrt{-70517+49942\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] (10*x + 3)*sqrt(2*x**2 - x + 3)/(31*(5*x**2 + 3*x + 2)) + sqrt(68
2)*(935 + 693*sqrt(2))*(3047*sqrt(2)/2 + 4609/2)*atan(2*sqrt(341)
*(x*(10703/2 + 3828*sqrt(2)) + 3047*sqrt(2)/2 + 4609/2)/(341*sqrt
(70517 + 49942*sqrt(2))*sqrt(2*x**2 - x + 3)))/(2558182*sqrt(7051
7 + 49942*sqrt(2))) + sqrt(682)*(-3047*sqrt(2)/2 + 4609/2)*(-693*
sqrt(2) + 935)*atanh(2*sqrt(341)*(x*(-3828*sqrt(2) + 10703/2) - 3
047*sqrt(2)/2 + 4609/2)/(341*sqrt(-70517 + 49942*sqrt(2))*sqrt(2*
x**2 - x + 3)))/(2558182*sqrt(-70517 + 49942*sqrt(2)))
```

Mathematica [C] time = 6.54671, size = 1148, normalized size = 6.11

$$\frac{\sqrt{2x^2-x+3}(10x+3)}{31\,(5x^2+3x+2)}$$

$$-\frac{i\left(-348i+11\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(266200\sqrt{31}x^4+13070650ix^4+1710\cdots\right.}{-239143300i\sqrt{31}x^4+261069600x^4+12485500i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-92760910i\sqrt{31}x^3+826454420x^3+4369925i\sqrt{682\left(\cdots\right.}}\right.}{\cdots}$$

$$-\frac{i\left(348i+11\sqrt{31}\right)\tanh^{-1}\left(\frac{11\left(750200\sqrt{31}x^4+102207600ix^4+482174\cdots\right.}{239143300\sqrt{31}x^4-261069600ix^4+68670250\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+92760910\sqrt{31}x^3-826454420ix^3-155444475\sqrt{22\left(-\cdots\right.}}\right.}{\cdots}$$

$$+\frac{i\left(348i+11\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{62\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{\left(-348i+11\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{62\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$-\frac{i\left(348i+11\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+i\sqrt{\cdots}\right.\right.}{62\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{\left(-348i+11\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-63i\cdots\right.\right.}{62\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(31*(2 + 3*x + 5*x^2)) - ((I/31)
*(-348*I + 11*Sqrt[31])*ArcTan[(31*(5587181*I + 4790313*Sqrt[31]
- (27549757*I)*x + 1169289*Sqrt[31]*x + (32828614*I)*x^2 + 267082
2*Sqrt[31]*x^2 - (28337220*I)*x^3 + 1710940*Sqrt[31]*x^3 + (13070
650*I)*x^4 + 266200*Sqrt[31]*x^4))/(274003389 + (48486603*I)*Sqrt
[31] + 1344149367*x - (112716791*I)*Sqrt[31]*x + 95778716*x^2 - (
264613118*I)*Sqrt[31]*x^2 + 826454420*x^3 - (92760910*I)*Sqrt[31]
*x^3 + 261069600*x^4 - (239143300*I)*Sqrt[31]*x^4 - (1248550*I)*S
qrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (3121375*I)*Sqrt
[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (4369925*I)*Sqrt[
682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (12485500*I)*Sqr
t[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13
+ I*Sqrt[31])] - ((I/31)*(348*I + 11*Sqrt[31])*ArcTanh[(11*(21126
3399*I + 13499973*Sqrt[31] + (246761997*I)*x + 3295269*Sqrt[31]*x
 + (273535156*I)*x^2 + 7526862*Sqrt[31]*x^2 - (265194380*I)*x^3 +
 4821740*Sqrt[31]*x^3 + (102207600*I)*x^4 + 750200*Sqrt[31]*x^4))
/(-274003389*I - 48486603*Sqrt[31] - (1344149367*I)*x + 112716791
*Sqrt[31]*x - (95778716*I)*x^2 + 264613118*Sqrt[31]*x^2 - (826454
420*I)*x^3 + 92760910*Sqrt[31]*x^3 - (261069600*I)*x^4 + 23914330
0*Sqrt[31]*x^4 - 78658650*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x
+ 2*x^2] - 90519875*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*
x^2] - 155444475*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x
^2] + 68670250*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2
])])/Sqrt[682*(-13 + I*Sqrt[31])] - ((-348*I + 11*Sqrt[31])*Log[(
-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(62
*Sqrt[682*(13 + I*Sqrt[31])]) + ((I/62)*(348*I + 11*Sqrt[31])*Log
[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/S
qrt[682*(-13 + I*Sqrt[31])] - ((I/62)*(348*I + 11*Sqrt[31])*Log[(
2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*
x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])
]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt
[3 - x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31])] + ((-348*I + 11*S
qrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*
x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[2
2*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I
*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(62*Sqrt[682*(13 + I*Sqrt[31
])])
```

Maple [B] time = 0.248, size = 16357, normalized size = 87.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(1/2)/(5*x^2+3*x+2)^2,x)
```

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

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

$$\int \frac{\sqrt{2\,x^2 - x + 3}}{\left(5\,x^2 + 3\,x + 2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2, x)
```

Fricas [A] time = 0.354029, size = 1465, normalized size = 7.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")
```

```
[Out] -1/44646566236976*232562^(3/4)*sqrt(24971)*sqrt(31)*(8*232562^(1/
4)*sqrt(24971)*sqrt(31)*sqrt(2*x^2 - x + 3)*(70517*sqrt(2)*(10*x
+ 3) - 998840*x - 299652)*sqrt((70517*sqrt(2) - 99884)/(704352002
8*sqrt(2) - 9961054017)) - 88412*sqrt(24971)*sqrt(2)*(5*x^2 + 3*x
 + 2)*arctan(31*(232562^(1/4)*sqrt(24971)*(70517*sqrt(2)*(x - 6)
- 99884*x + 599304)*sqrt((70517*sqrt(2) - 99884)/(7043520028*sqrt
(2) - 9961054017)) + 44*sqrt(24971)*sqrt(2*x^2 - x + 3)*(277*sqrt
(2) - 419))/(2*232562^(1/4)*sqrt(24971)*sqrt(31)*(70517*sqrt(2)*x
 - 99884*x)*sqrt(-sqrt(2)*(46*232562^(1/4)*sqrt(2*x^2 - x + 3)*(s
qrt(2)*(38160719038345833*x + 15806687373343727) - 53967406411689
560*x - 22354031665002106)*sqrt((70517*sqrt(2) - 99884)/(70435200
28*sqrt(2) - 9961054017)) + 349945327259084480*x^2 + sqrt(2)*(974
27960430086020*x^2 - 1405958600593541*sqrt(2)*(49*x^2 - 151*x + 2
00) - 300237184182509980*x + 397665144612596000) - 12372435685223
1608*sqrt(2)*(2*x^2 - x + 3) - 174972663629542240*x + 52491799088
8626720)/(1405958600593541*sqrt(2)*x^2 - 1988325723062980*x^2))*s
qrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(2) - 9961054017)) +
232562^(1/4)*sqrt(24971)*sqrt(31)*(70517*sqrt(2)*(19*x - 22) - 18
97796*x + 2197448)*sqrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(
2) - 9961054017)) - 1364*sqrt(24971)*sqrt(31)*sqrt(2*x^2 - x + 3)
*(63*sqrt(2) - 85))) - 88412*sqrt(24971)*sqrt(2)*(5*x^2 + 3*x + 2
)*arctan(-31*(232562^(1/4)*sqrt(24971)*(70517*sqrt(2)*(x - 6) - 9
9884*x + 599304)*sqrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(2)
 - 9961054017)) - 44*sqrt(24971)*sqrt(2*x^2 - x + 3)*(277*sqrt(2)
 - 419))/(2*232562^(1/4)*sqrt(24971)*sqrt(31)*(70517*sqrt(2)*x -
99884*x)*sqrt(sqrt(2)*(46*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(
2)*(38160719038345833*x + 15806687373343727) - 53967406411689560*
x - 22354031665002106)*sqrt((70517*sqrt(2) - 99884)/(7043520028*s
qrt(2) - 9961054017)) - 349945327259084480*x^2 - sqrt(2)*(9742796
0430086020*x^2 - 1405958600593541*sqrt(2)*(49*x^2 - 151*x + 200)
- 300237184182509980*x + 397665144612596000) + 123724356852231608
*sqrt(2)*(2*x^2 - x + 3) + 174972663629542240*x - 524917990888626
720)/(1405958600593541*sqrt(2)*x^2 - 1988325723062980*x^2))*sqrt(
(70517*sqrt(2) - 99884)/(7043520028*sqrt(2) - 9961054017)) + 2325
62^(1/4)*sqrt(24971)*sqrt(31)*(70517*sqrt(2)*(19*x - 22) - 189779
6*x + 2197448)*sqrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(2) -
 9961054017)) + 1364*sqrt(24971)*sqrt(31)*sqrt(2*x^2 - x + 3)*(63
*sqrt(2) - 85))) - sqrt(24971)*sqrt(31)*(499420*x^2 - 70517*sqrt(
2)*(5*x^2 + 3*x + 2) + 299652*x + 199768)*log(-2494203364*sqrt(2)
*(46*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(38160719038345833
*x + 15806687373343727) - 53967406411689560*x - 22354031665002106
)*sqrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(2) - 9961054017))
 + 349945327259084480*x^2 + sqrt(2)*(97427960430086020*x^2 - 1405
958600593541*sqrt(2)*(49*x^2 - 151*x + 200) - 300237184182509980*
x + 397665144612596000) - 123724356852231608*sqrt(2)*(2*x^2 - x +
 3) - 174972663629542240*x + 524917990888626720)/(140595860059354
1*sqrt(2)*x^2 - 1988325723062980*x^2)) + sqrt(24971)*sqrt(31)*(49
9420*x^2 - 70517*sqrt(2)*(5*x^2 + 3*x + 2) + 299652*x + 199768)*l
og(2494203364*sqrt(2)*(46*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(
2)*(38160719038345833*x + 15806687373343727) - 53967406411689560*
x - 22354031665002106)*sqrt((70517*sqrt(2) - 99884)/(7043520028*s
qrt(2) - 9961054017)) - 349945327259084480*x^2 - sqrt(2)*(9742796
0430086020*x^2 - 1405958600593541*sqrt(2)*(49*x^2 - 151*x + 200)
- 300237184182509980*x + 397665144612596000) + 123724356852231608
*sqrt(2)*(2*x^2 - x + 3) + 174972663629542240*x - 524917990888626
720)/(1405958600593541*sqrt(2)*x^2 - 1988325723062980*x^2)))/((49
9420*x^2 - 70517*sqrt(2)*(5*x^2 + 3*x + 2) + 299652*x + 199768)*s
qrt((70517*sqrt(2) - 99884)/(7043520028*sqrt(2) - 9961054017)))
```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{(5x^2 + 3x + 2)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)/(5*x**2 + 3*x + 2)**2, x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.64 $\int \frac{\sqrt{3-x+2x^2}}{(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=223

$$\frac{\sqrt{2x^2-x+3}(10x+3)}{62(5x^2+3x+2)^2}+\frac{(13665x+3464)\sqrt{2x^2-x+3}}{84568(5x^2+3x+2)}+\frac{\sqrt{\frac{1}{682}\left(112285869463+79399380740\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(112285869463+79399380740\sqrt{2}\right)}}\left(\left(1235163+872375\sqrt{2}\right)x+362788\sqrt{2}+509587\right)}{\sqrt{2x^2-x+3}}\right)}{169136}-\frac{\sqrt{\frac{1}{682}\left(79399380740\sqrt{2}-112285869463\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(79399380740\sqrt{2}-112285869463\right)}}\left(\left(1235163-872375\sqrt{2}\right)x-362788\sqrt{2}+509587\right)}{\sqrt{2x^2-x+3}}\right)}{169136}$$

```
[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(62*(2 + 3*x + 5*x^2)^2) + ((346
4 + 13665*x)*Sqrt[3 - x + 2*x^2])/(84568*(2 + 3*x + 5*x^2)) + (Sq
rt[(112285869463 + 79399380740*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*
(112285869463 + 79399380740*Sqrt[2]))]*(509587 + 362788*Sqrt[2] +
 (1235163 + 872375*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/169136 - (S
qrt[(-112285869463 + 79399380740*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(
31*(-112285869463 + 79399380740*Sqrt[2]))]*(509587 - 362788*Sqrt[
2] + (1235163 - 872375*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/169136
```

Rubi [A] time = 0.970659, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$\frac{\sqrt{2x^2-x+3}(10x+3)}{62(5x^2+3x+2)^2}+\frac{(13665x+3464)\sqrt{2x^2-x+3}}{84568(5x^2+3x+2)}+\frac{\sqrt{\frac{1}{682}\left(112285869463+79399380740\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(112285869463+79399380740\sqrt{2}\right)}}\left(\left(1235163+872375\sqrt{2}\right)x+362788\sqrt{2}+509587\right)}{\sqrt{2x^2-x+3}}\right)}{169136}-\frac{\sqrt{\frac{1}{682}\left(79399380740\sqrt{2}-112285869463\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(79399380740\sqrt{2}-112285869463\right)}}\left(\left(1235163-872375\sqrt{2}\right)x-362788\sqrt{2}+509587\right)}{\sqrt{2x^2-x+3}}\right)}{169136}$$

Antiderivative was successfully verified.

```
[In]  Int[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2)^3,x]
```


```
[Out] ((3 + 10*x)*Sqrt[3 - x + 2*x^2])/(62*(2 + 3*x + 5*x^2)^2) + ((346
4 + 13665*x)*Sqrt[3 - x + 2*x^2])/(84568*(2 + 3*x + 5*x^2)) + (Sq
rt[(112285869463 + 79399380740*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*
(112285869463 + 79399380740*Sqrt[2]))]*(509587 + 362788*Sqrt[2] +
 (1235163 + 872375*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/169136 - (S
qrt[(-112285869463 + 79399380740*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(
31*(-112285869463 + 79399380740*Sqrt[2]))]*(509587 - 362788*Sqrt[
2] + (1235163 - 872375*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/169136
```

Rubi in Sympy [A] time = 104.314, size = 252, normalized size = 1.13

$$\frac{(10x+3)\sqrt{2x^2-x+3}}{62\,(5x^2+3x+2)^2}+\frac{\left(\frac{150315x}{2}+19052\right)\sqrt{2x^2-x+3}}{465124\,(5x^2+3x+2)}$$
$$+\frac{\sqrt{682}\left(\frac{61660027}{4}+10974337\sqrt{2}\right)\left(4686088\sqrt{2}+\frac{13317381}{2}\right)\operatorname{atan}\left(\frac{4\sqrt{341}\left(x\left(\frac{105557375\sqrt{2}}{4}+\frac{149454723}{4}\right)+\frac{61660027}{4}+10974337\sqrt{2}\right)}{3751\sqrt{112285869463+79399380740\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{211106295004\sqrt{112285869463+79399380740\sqrt{2}}}$$
$$+\frac{\sqrt{682}\left(-10974337\sqrt{2}+\frac{61660027}{4}\right)\left(-4686088\sqrt{2}+\frac{13317381}{2}\right)\operatorname{atanh}\left(\frac{4\sqrt{341}\left(x\left(-\frac{105557375\sqrt{2}}{4}+\frac{149454723}{4}\right)-10974337\sqrt{2}+\frac{61660027}{4}\right)}{3751\sqrt{-112285869463+79399380740\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{211106295004\sqrt{-112285869463+79399380740\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] (10*x + 3)*sqrt(2*x**2 - x + 3)/(62*(5*x**2 + 3*x + 2)**2) + (150
315*x/2 + 19052)*sqrt(2*x**2 - x + 3)/(465124*(5*x**2 + 3*x + 2))
 + sqrt(682)*(61660027/4 + 10974337*sqrt(2))*(4686088*sqrt(2) + 1
3317381/2)*atan(4*sqrt(341)*(x*(105557375*sqrt(2)/4 + 149454723/4
) + 61660027/4 + 10974337*sqrt(2))/(3751*sqrt(112285869463 + 7939
9380740*sqrt(2))*sqrt(2*x**2 - x + 3)))/(211106295004*sqrt(112285
869463 + 79399380740*sqrt(2))) + sqrt(682)*(-10974337*sqrt(2) + 6
1660027/4)*(-4686088*sqrt(2) + 13317381/2)*atanh(4*sqrt(341)*(x*(
-105557375*sqrt(2)/4 + 149454723/4) - 10974337*sqrt(2) + 61660027
/4)/(3751*sqrt(-112285869463 + 79399380740*sqrt(2))*sqrt(2*x**2 -
 x + 3)))/(211106295004*sqrt(-112285869463 + 79399380740*sqrt(2))
)
```

Mathematica [C] time = 6.47419, size = 1170, normalized size = 5.25

$$\sqrt{2x^2-x+3}\left(\frac{10x+3}{62\left(5x^2+3x+2\right)^2}+\frac{13665x+3464}{84568\left(5x^2+3x+2\right)}\right)$$

$$-\frac{5i\left(-174475i+6521\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(4677578510\cdots\right.}{-32372991877825i\sqrt{31}x^4+38797325297500x^4+1587987614800i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-13468529326720i\sqrt{31}\cdots}\right.}{\cdots}$$

$$-\frac{5i\left(174475i+6521\sqrt{31}\right)\tanh^{-1}\left(\frac{32372991877825\sqrt{31}x^4-38797325297500ix^4+8733931881400\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+13468529326720\sqrt{31}x^3\cdots}{1450049338100\sqrt{31}x^4\cdots}\right.}{\cdots}$$

$$+\frac{5i\left(174475i+6521\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{338272\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{5\left(-174475i+6521\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{338272\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$-\frac{5i\left(174475i+6521\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469i\cdots\right.\right.}{338272\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{5\left(-174475i+6521\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041i\cdots\right.\right.}{338272\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[Sqrt[3 - x + 2*x^2]/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((3 + 10*x)/(62*(2 + 3*x + 5*x^2)^2) + (3464
+ 13665*x)/(84568*(2 + 3*x + 5*x^2))) - (((5*I)/169136)*(-174475*
I + 6521*Sqrt[31])*ArcTan[(31*(779181710662*I + 621237299826*Sqrt
[31] - (3659080865574*I)*x + 210477093398*Sqrt[31]*x + (378669847
5623*I)*x^2 + 345136479754*Sqrt[31]*x^2 - (3744647381480*I)*x^3 +
 254982903010*Sqrt[31]*x^3 + (1313174142725*I)*x^4 + 46775785100*
Sqrt[31]*x^4))/(31886584896738 + (6160809644426*I)*Sqrt[31] + 173
254405285214*x - (13553199916122*I)*Sqrt[31]*x + 18159288904922*x
^2 - (36221356993731*I)*Sqrt[31]*x^2 + 103190181962890*x^3 - (134
68529326720*I)*Sqrt[31]*x^3 + 38797325297500*x^4 - (3237299187782
5*I)*Sqrt[31]*x^4 - (158798761480*I)*Sqrt[682*(13 + I*Sqrt[31])]*
Sqrt[3 - x + 2*x^2] + (396996903700*I)*Sqrt[682*(13 + I*Sqrt[31])
]*x*Sqrt[3 - x + 2*x^2] + (555795665180*I)*Sqrt[682*(13 + I*Sqrt[
31])]*x^2*Sqrt[3 - x + 2*x^2] + (1587987614800*I)*Sqrt[682*(13 +
I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13 + I*Sqrt[31]
)] - (((5*I)/169136)*(174475*I + 6521*Sqrt[31])*ArcTanh[(-3188658
4896738*I - 6160809644426*Sqrt[31] - (173254405285214*I)*x + 1355
3199916122*Sqrt[31]*x - (18159288904922*I)*x^2 + 36221356993731*S
qrt[31]*x^2 - (103190181962890*I)*x^3 + 13468529326720*Sqrt[31]*x
^3 - (38797325297500*I)*x^4 + 32372991877825*Sqrt[31]*x^4 - 10004
321973240*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 11512
910207300*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 197
70445804260*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] +
 8733931881400*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2
])/(293442889929478*I + 19258356294606*Sqrt[31] + (35004166143799
4*I)*x + 6524789895338*Sqrt[31]*x + (394738353028687*I)*x^2 + 106
99230872374*Sqrt[31]*x^2 - (366664166073320*I)*x^3 + 790446999331
0*Sqrt[31]*x^3 + (153820084388525*I)*x^4 + 1450049338100*Sqrt[31]
```

```
*x^4)])/Sqrt[682*(-13 + I*Sqrt[31])] - (5*(-174475*I + 6521*Sqrt[
31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*
x)^2])/(338272*Sqrt[682*(13 + I*Sqrt[31])]) + (((5*I)/338272)*(17
4475*I + 6521*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I +
 Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 + I*Sqrt[31])] - (((5*I)/
338272)*(174475*I + 6521*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I
+ 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt
[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (
4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[6
82*(-13 + I*Sqrt[31])] + (5*(-174475*I + 6521*Sqrt[31])*Log[(2 +
3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x
- (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31]
)]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt
[3 - x + 2*x^2])])/(338272*Sqrt[682*(13 + I*Sqrt[31])])
```

Maple [B] time = 0.401, size = 43932, normalized size = 197.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(1/2)/(5*x^2+3*x+2)^3,x)

[Out] result too large to display
```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{(5x^2 + 3x + 2)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")

[Out] integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3, x)
```

Fricas [A] time = 0.374415, size = 1646, normalized size = 7.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")

[Out] 1/387269780651700194040320*sqrt(39699690370)*930248^(3/4)*sqrt(31
)*(4*sqrt(39699690370)*930248^(1/4)*sqrt(31)*(10849925378121000*x
^3 + 9260349775706200*x^2 - 112285869463*sqrt(2)*(68325*x^3 + 583
15*x^2 + 51362*x + 11020) + 8156221987135760*x + 1749962351509600
)*sqrt(2*x^2 - x + 3)*sqrt((112285869463*sqrt(2) - 158798761480)/
(17830857002429352685240*sqrt(2) - 25216639804852841803569)) - 14
205421276*sqrt(19849845185)*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 1
2*x + 4)*arctan(615345200735*(sqrt(39699690370)*930248^(1/4)*(112
285869463*sqrt(2)*(x - 6) - 158798761480*x + 952792568880)*sqrt((
112285869463*sqrt(2) - 158798761480)/(17830857002429352685240*sqr
t(2) - 25216639804852841803569)) + 88*sqrt(19849845185)*sqrt(2*x^
2 - x + 3)*(362788*sqrt(2) - 509587))/(2*sqrt(39699690370)*sqrt(1
9849845185)*930248^(1/4)*sqrt(31)*(112285869463*sqrt(2)*x - 15879
8761480*x)*sqrt(-sqrt(2)*(23*sqrt(39699690370)*sqrt(19849845185)*
```

```
930248^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(1938810595429719147626
80500544591271657*x + 80308164349964553475021076455894155685) - 2
74189223892936468237701577000485427342*x - 1135728951930073612876
59424088697115972)*sqrt((112285869463*sqrt(2) - 158798761480)/(17
830857002429352685240*sqrt(2) - 25216639804852841803569)) + 27978
898313001090717344418964781724346768361600*x^2 + 19849845185*sqrt
(2)*(392425208930440881841647027891343640*x^2 - 56629903335359625
46294362498068647*sqrt(2)*(49*x^2 - 151*x + 200) - 12093103377244
19860369157167583528360*x + 1601735546654860742210804195474872000
) - 9892034363625952575303331210194060391812493160*sqrt(2)*(2*x^2
 - x + 3) - 13989449156500545358672209482390862173384180800*x + 4
1968347469501636076016628447172586520152542400)/(5662990333535962
546294362498068647*sqrt(2)*x^2 - 80086777332743037110540209773743
60*x^2))*sqrt((112285869463*sqrt(2) - 158798761480)/(178308570024
29352685240*sqrt(2) - 25216639804852841803569)) + 19849845185*sqr
t(39699690370)*930248^(1/4)*sqrt(31)*(112285869463*sqrt(2)*(19*x
- 22) - 3017176468120*x + 3493572752560)*sqrt((112285869463*sqrt(
2) - 158798761480)/(17830857002429352685240*sqrt(2) - 25216639804
852841803569)) - 54150377664680*sqrt(19849845185)*sqrt(31)*sqrt(2
*x^2 - x + 3)*(77456*sqrt(2) - 110061))) - 14205421276*sqrt(19849
845185)*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(-615
345200735*(sqrt(39699690370)*930248^(1/4)*(112285869463*sqrt(2)*(
x - 6) - 158798761480*x + 952792568880)*sqrt((112285869463*sqrt(2
) - 158798761480)/(17830857002429352685240*sqrt(2) - 252166398048
52841803569)) - 88*sqrt(19849845185)*sqrt(2*x^2 - x + 3)*(362788*
sqrt(2) - 509587))/(2*sqrt(39699690370)*sqrt(19849845185)*930248^
(1/4)*sqrt(31)*(112285869463*sqrt(2)*x - 158798761480*x)*sqrt(sqr
t(2)*(23*sqrt(39699690370)*sqrt(19849845185)*930248^(1/4)*sqrt(2*
x^2 - x + 3)*(sqrt(2)*(193881059542971914762680500544591271657*x
+ 80308164349964553475021076455894155685) - 274189223892936468237
701577000485427342*x - 113572895193007361287659424088697115972)*s
qrt((112285869463*sqrt(2) - 158798761480)/(1783085700242935268524
0*sqrt(2) - 25216639804852841803569)) - 2797889831300109071734441
8964781724346768361600*x^2 - 19849845185*sqrt(2)*(392425208930440
881841647027891343640*x^2 - 5662990333535962546294362498068647*sq
rt(2)*(49*x^2 - 151*x + 200) - 1209310337724419860369157167583528
360*x + 1601735546654860742210804195474872000) + 9892034363625952
575303331210194060391812493160*sqrt(2)*(2*x^2 - x + 3) + 13989449
156500545358672209482390862173384180800*x - 419683474695016360760
16628447172586520152542400)/(5662990333535962546294362498068647*s
qrt(2)*x^2 - 8008677733274303711054020977374360*x^2))*sqrt((11228
5869463*sqrt(2) - 158798761480)/(17830857002429352685240*sqrt(2)
- 25216639804852841803569)) + 19849845185*sqrt(39699690370)*93024
8^(1/4)*sqrt(31)*(112285869463*sqrt(2)*(19*x - 22) - 301717646812
0*x + 3493572752560)*sqrt((112285869463*sqrt(2) - 158798761480)/(
17830857002429352685240*sqrt(2) - 25216639804852841803569)) + 541
50377664680*sqrt(19849845185)*sqrt(31)*sqrt(2*x^2 - x + 3)*(77456
*sqrt(2) - 110061))) + sqrt(19849845185)*sqrt(31)*(3969969037000*
x^4 + 4763962844400*x^3 + 4605164082920*x^2 - 112285869463*sqrt(2
)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 1905585137760*x + 63519
5045920)*log(-79399380740*sqrt(2)*(23*sqrt(39699690370)*sqrt(1984
9845185)*930248^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(1938810595429
71914762680500544591271657*x + 8030816434996455347502107645589415
5685) - 274189223892936468237701577000485427342*x - 1135728951930
07361287659424088697115972)*sqrt((112285869463*sqrt(2) - 15879876
1480)/(17830857002429352685240*sqrt(2) - 25216639804852841803569)
) + 27978898313001090717344418964781724346768361600*x^2 + 1984984
5185*sqrt(2)*(392425208930440881841647027891343640*x^2 - 56629903
33535962546294362498068647*sqrt(2)*(49*x^2 - 151*x + 200) - 12093
10337724419860369157167583528360*x + 1601735546654860742210804195
474872000) - 9892034363625952575303331210194060391812493160*sqrt(
2)*(2*x^2 - x + 3) - 13989449156500545358672209482390862173384180
800*x + 41968347469501636076016628447172586520152542400)/(5662990
333535962546294362498068647*sqrt(2)*x^2 - 80086777332743037110540
20977374360*x^2)) - sqrt(19849845185)*sqrt(31)*(3969969037000*x^4
 + 4763962844400*x^3 + 4605164082920*x^2 - 112285869463*sqrt(2)*(
25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 1905585137760*x + 63519504
5920)*log(79399380740*sqrt(2)*(23*sqrt(39699690370)*sqrt(19849845
185)*930248^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(19388105954297191
4762680500544591271657*x + 80308164349964553475021076455894155685
) - 274189223892936468237701577000485427342*x - 11357289519300736
1287659424088697115972)*sqrt((112285869463*sqrt(2) - 158798761480
```

```
)/(17830857002429352685240*sqrt(2) - 25216639804852841803569)) -
27978898313001090717344418964781724346768361600*x^2 - 19849845185
*sqrt(2)*(39242520893044088184164702789134364О*x^2 - 566299033353
5962546294362498068647*sqrt(2)*(49*x^2 - 151*x + 200) - 120931033
7724419860369157167583528360*x + 160173554665486074221080419547748
72000) + 9892034363625952575303331210194060391812493160*sqrt(2)*(
2*x^2 - x + 3) + 139894491565005453586722094823908621733841808OO*
x - 419683474695016360760166284471725865201525424OO)/(56629903335
35962546294362498068647*sqrt(2)*x^2 - 800867773327430371105402097
7374360*x^2)))/((3969969037000*x^4 + 4763962844400*x^3 + 46051640
82920*x^2 - 112285869463*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x
 + 4) + 1905585137760*x + 635195045920)*sqrt((112285869463*sqrt(2
) - 158798761480)/(17830857002429352685240*sqrt(2) - 252166398048
52841803569)))
```

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

$$\int \frac{\sqrt{2x^2 - x + 3}}{(5x^2 + 3x + 2)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(1/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] Integral(sqrt(2*x**2 - x + 3)/(5*x**2 + 3*x + 2)**3, x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(sqrt(2*x^2 - x + 3)/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.65 $\int \left(3 - x + 2x^2\right)^{3/2} \left(2 + 3x + 5x^2\right)^4 \, dx$

Optimal. Leaf size=231

$$-\frac{56422489 \left(2x^2 - x + 3\right)^{5/2} x^2}{8257536} + \frac{48669967 \left(2x^2 - x + 3\right)^{5/2} x}{22020096} + \frac{2124689283 \left(2x^2 - x + 3\right)^{5/2}}{146800640} - \frac{382121949(1 - 4x) \left(2x^2 - x + 3\right)^{3/2}}{134217728} - \frac{26366414481(1 - 4x)\sqrt{2x^2 - x + 3}}{2147483648}$$

$$+\frac{625}{24} \left(2x^2 - x + 3\right)^{5/2} x^7 + \frac{7625}{96} \left(2x^2 - x + 3\right)^{5/2} x^6 + \frac{95165}{768} \left(2x^2 - x + 3\right)^{5/2} x^5 + \frac{941905 \left(2x^2 - x + 3\right)^{5/2} x^4}{9216} + \frac{10444117 \left(2x^2 - \ldots\right.}{294912}$$

```
[Out] (-26366414481*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/2147483648 - (382121
949*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/134217728 + (2124689283*(3 -
 x + 2*x^2)^(5/2))/146800640 + (48669967*x*(3 - x + 2*x^2)^(5/2))
/22020096 - (56422489*x^2*(3 - x + 2*x^2)^(5/2))/8257536 + (10444
117*x^3*(3 - x + 2*x^2)^(5/2))/294912 + (941905*x^4*(3 - x + 2*x^
2)^(5/2))/9216 + (95165*x^5*(3 - x + 2*x^2)^(5/2))/768 + (7625*x^
6*(3 - x + 2*x^2)^(5/2))/96 + (625*x^7*(3 - x + 2*x^2)^(5/2))/24
- (606427533063*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4294967296*Sqrt[2])
```

Rubi [A] time = 0.538663, antiderivative size = 231, normalized size of antiderivative = 1., number of steps used = 12, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$-\frac{56422489 \left(2x^2 - x + 3\right)^{5/2} x^2}{8257536} + \frac{48669967 \left(2x^2 - x + 3\right)^{5/2} x}{22020096} + \frac{2124689283 \left(2x^2 - x + 3\right)^{5/2}}{146800640} - \frac{382121949(1 - 4x) \left(2x^2 - x + 3\right)^{3/2}}{134217728} - \frac{26366414481(1 - 4x)\sqrt{2x^2 - x + 3}}{2147483648}$$

$$+\frac{625}{24} \left(2x^2 - x + 3\right)^{5/2} x^7 + \frac{7625}{96} \left(2x^2 - x + 3\right)^{5/2} x^6 + \frac{95165}{768} \left(2x^2 - x + 3\right)^{5/2} x^5 + \frac{941905 \left(2x^2 - x + 3\right)^{5/2} x^4}{9216} + \frac{10444117 \left(2x^2 - \ldots\right.}{294912}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (-26366414481*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/2147483648 - (382121
949*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/134217728 + (2124689283*(3 -
 x + 2*x^2)^(5/2))/146800640 + (48669967*x*(3 - x + 2*x^2)^(5/2))
/22020096 - (56422489*x^2*(3 - x + 2*x^2)^(5/2))/8257536 + (10444
117*x^3*(3 - x + 2*x^2)^(5/2))/294912 + (941905*x^4*(3 - x + 2*x^
2)^(5/2))/9216 + (95165*x^5*(3 - x + 2*x^2)^(5/2))/768 + (7625*x^
6*(3 - x + 2*x^2)^(5/2))/96 + (625*x^7*(3 - x + 2*x^2)^(5/2))/24
- (606427533063*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4294967296*Sqrt[2])
```

Rubi in Sympy [A] time = 127.504, size = 226, normalized size = 0.98

$$-\frac{\left(-\frac{21379503915x}{8}+\frac{126950071545}{32}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^3}{6652800000}-\frac{\left(-\frac{451935x}{2}+\frac{8762457}{8}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^3}{2376000}+\frac{\left(110x+\frac{275}{2}\right)\left(2x^2-x+3\right)^{\frac{5}{2}}\left(5x^2+3x+2\right)^3}{528}+\frac{\left(\frac{219498174484875x}{32}+\frac{282329758130805}{128}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{3991680000000}+\frac{\left(\frac{248326213547973825x}{128}+\frac{2095081800537234465}{512}\right)\left(-\frac{16555080903198255x^2}{256}-\frac{36050504278588965x}{256}+\frac{8081700197787315}{128}\right)\sqrt{2x^2-x+3}}{12390484751189701972200000000}+\frac{\left(\frac{227190025067637992913833407501064625x}{131072}+\frac{433754321570688993821911951868261 4075}{524288}\right)\sqrt{2x^2-x+3}}{99123878009517615777600000000}+\frac{606427533063\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{8589934592}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**4,x)
```

```
[Out] -(-21379503915*x/8 + 126950071545/32)*sqrt(2*x**2 - x + 3)*(5*x**
2 + 3*x + 2)**3/6652800000 - (-451935*x/2 + 8762457/8)*(2*x**2 -
x + 3)**(3/2)*(5*x**2 + 3*x + 2)**3/2376000 + (110*x + 275/2)*(2*
x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**3/528 + (219498174484875
*x/32 + 282329758130805/128)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x +
 2)**2/3991680000000 + (248326213547973825*x/128 + 20950818005372
34465/512)*(-16555080903198255*x**2/256 - 36050504278588965*x/256
 + 8081700197787315/128)*sqrt(2*x**2 - x + 3)/1239048475118970197
2200000000 + (227190025067637992913833407501064625*x/131072 + 433
7543215706889938219119518682614075/524288)*sqrt(2*x**2 - x + 3)/9
9123878009517615777600000000 + 606427533063*sqrt(2)*atanh(sqrt(2)
*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/8589934592
```

Mathematica [A] time = 0.132113, size = 95, normalized size = 0.41

$$\frac{191024672914845\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)+4\sqrt{2x^2-x+3}\left(70464307200000x^{11}+144451829760000x^{10}+349379651174400x^9+\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(74032009514181 + 12971175524316*x + 65151
998063712*x^2 + 239021184223104*x^3 + 451581382260736*x^4 + 67547
9464714240*x^5 + 765087080448000*x^6 + 745133229998080*x^7 + 5340
38708224000*x^8 + 349379651174400*x^9 + 144451829760000*x^10 + 70
464307200000*x^11) + 191024672914845*Sqrt[2]*ArcSinh[(-1 + 4*x)/S
qrt[23]])/2705829396480
```

Maple [A] time = 0.046, size = 185, normalized size = 0.8

$$\frac{1528487796\,x-382121949}{134217728}\left(2\,x^{2}-x+3\right)^{\frac{3}{2}}+\frac{105465657924\,x-26366414481}{2147483648}\sqrt{2\,x^{2}-x+3}+\frac{606427533063\,\sqrt{2}}{8589934592}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{2124689283}{146800640}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{48669967\,x}{22020096}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}-\frac{56422489\,x^{2}}{8257536}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{10444117\,x^{3}}{294912}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{941905\,x^{4}}{9216}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{95165\,x^{5}}{768}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{7625\,x^{6}}{96}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{625\,x^{7}}{24}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(3/2)*(5*x^2+3*x+2)^4,x)
```

```
[Out] 382121949/134217728*(4*x-1)*(2*x^2-x+3)^(3/2)+26366414481/2147483
648*(4*x-1)*(2*x^2-x+3)^(1/2)+606427533063/8589934592*2^(1/2)*arc
sinh(4/23*23^(1/2)*(x-1/4))+2124689283/146800640*(2*x^2-x+3)^(5/2
)+48669967/22020096*x*(2*x^2-x+3)^(5/2)-56422489/8257536*x^2*(2*x
^2-x+3)^(5/2)+10444117/294912*x^3*(2*x^2-x+3)^(5/2)+941905/9216*x
^4*(2*x^2-x+3)^(5/2)+95165/768*x^5*(2*x^2-x+3)^(5/2)+7625/96*x^6*
(2*x^2-x+3)^(5/2)+625/24*x^7*(2*x^2-x+3)^(5/2)
```

Maxima [A] time = 0.779083, size = 278, normalized size = 1.2

$$\frac{625}{24}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x^{7}+\frac{7625}{96}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x^{6}+\frac{95165}{768}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x^{5}+\frac{941905}{9216}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x^{4}+\frac{10444117}{294912}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x^{3}-\frac{56422489}{8257536}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x^{2}+\frac{48669967}{22020096}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x+\frac{2124689283}{146800640}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{382121949}{33554432}\left(2\,x^{2}-x+3\right)^{\frac{3}{2}}x-\frac{382121949}{134217728}\left(2\,x^{2}-x+3\right)^{\frac{3}{2}}+\frac{26366414481}{536870912}\sqrt{2\,x^{2}-x+3x}+\frac{606427533063}{8589934592}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{26366414481}{2147483648}\sqrt{2\,x^{2}-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 625/24*(2*x^2 - x + 3)^(5/2)*x^7 + 7625/96*(2*x^2 - x + 3)^(5/2)*
x^6 + 95165/768*(2*x^2 - x + 3)^(5/2)*x^5 + 941905/9216*(2*x^2 -
x + 3)^(5/2)*x^4 + 10444117/294912*(2*x^2 - x + 3)^(5/2)*x^3 - 56
422489/8257536*(2*x^2 - x + 3)^(5/2)*x^2 + 48669967/22020096*(2*x
^2 - x + 3)^(5/2)*x + 2124689283/146800640*(2*x^2 - x + 3)^(5/2)
+ 382121949/33554432*(2*x^2 - x + 3)^(3/2)*x - 382121949/13421772
8*(2*x^2 - x + 3)^(3/2) + 26366414481/536870912*sqrt(2*x^2 - x +
3)*x + 606427533063/8589934592*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x
 - 1)) - 26366414481/2147483648*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.285715, size = 157, normalized size = 0.68

$$\frac{1}{5411658792960}\sqrt{2}\Big(4\sqrt{2}\big(70464307200000\,x^{11}+144451829760000\,x^{10}+349379651174400\,x^{9}+534038708224000\,x^{8}+745$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/5411658792960*sqrt(2)*(4*sqrt(2)*(70464307200000*x^11 + 1444518
29760000*x^10 + 349379651174400*x^9 + 534038708224000*x^8 + 74513
3229998080*x^7 + 765087080448000*x^6 + 675479464714240*x^5 + 4515
81382260736*x^4 + 239021184223104*x^3 + 65151998063712*x^2 + 1297
1175524316*x + 74032009514181)*sqrt(2*x^2 - x + 3) + 191024672914
845*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*
x - 1)))
```

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

$$\int \left(2x^2 - x + 3\right)^{\frac{3}{2}} \left(5x^2 + 3x + 2\right)^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**4,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**4, x)
```

GIAC/XCAS [A] time = 0.271196, size = 139, normalized size = 0.6

$$\frac{1}{676457349120}\left(4\left(8\left(4\left(16\left(20\left(8\left(28\left(160\left(12\left(200\left(20x+41\right)x+19833\right)x+363785\right)x+81213077\right)x+2334860475\right)x+164911\right.\right.\right.\right.\right.\right.\right.\right.\right.\right.$$
$$-\frac{606427533063}{8589934592}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] 1/676457349120*(4*(8*(4*(16*(20*(8*(28*(160*(12*(200*(20*x + 41)*
x + 19833)*x + 363785)*x + 81213077)*x + 2334860475)*x + 16491197
869)*x + 220498721807)*x + 1867353001743)*x + 2035999939491)*x +
3242793881079)*x + 74032009514181)*sqrt(2*x^2 - x + 3) - 60642753
3063/8589934592*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x
 + 3)) + 1)
```

3.66 $\int \left(3-x+2x^2\right)^{3/2} \left(2+3x+5x^2\right)^3 \, dx$

Optimal. Leaf size=189

$$\frac{384739\left(2x^2-x+3\right)^{5/2}x^2}{43008}-\frac{81685\left(2x^2-x+3\right)^{5/2}x}{114688}-\frac{4625907\left(2x^2-x+3\right)^{5/2}}{2293760}-\frac{667795(1-4x)\left(2x^2-x+3\right)^{3/2}}{2097152}-\frac{46077855(1-4x)\sqrt{2x^2-x+3}}{33554432}+\frac{25}{4}\left(2x^2-x+3\right)^{5/2}x^5+\frac{725}{48}\left(2x^2-x+3\right)^{5/2}x^4+\frac{27785\left(2x^2-x+3\right)^{5/2}x^3}{1536}-\frac{1059790665\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{67108864\sqrt{2}}$$

```
[Out] (-46077855*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/33554432 - (667795*(1 -
 4*x)*(3 - x + 2*x^2)^(3/2))/2097152 - (4625907*(3 - x + 2*x^2)^(
5/2))/2293760 - (81685*x*(3 - x + 2*x^2)^(5/2))/114688 + (384739*
x^2*(3 - x + 2*x^2)^(5/2))/43008 + (27785*x^3*(3 - x + 2*x^2)^(5/
2))/1536 + (725*x^4*(3 - x + 2*x^2)^(5/2))/48 + (25*x^5*(3 - x +
2*x^2)^(5/2))/4 - (1059790665*ArcSinh[(1 - 4*x)/Sqrt[23]])/(67108
864*Sqrt[2])
```

Rubi [A] time = 0.31363, antiderivative size = 189, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{384739\left(2x^2-x+3\right)^{5/2}x^2}{43008}-\frac{81685\left(2x^2-x+3\right)^{5/2}x}{114688}-\frac{4625907\left(2x^2-x+3\right)^{5/2}}{2293760}-\frac{667795(1-4x)\left(2x^2-x+3\right)^{3/2}}{2097152}-\frac{46077855(1-4x)\sqrt{2x^2-x+3}}{33554432}+\frac{25}{4}\left(2x^2-x+3\right)^{5/2}x^5+\frac{725}{48}\left(2x^2-x+3\right)^{5/2}x^4+\frac{27785\left(2x^2-x+3\right)^{5/2}x^3}{1536}-\frac{1059790665\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{67108864\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (-46077855*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/33554432 - (667795*(1 -
 4*x)*(3 - x + 2*x^2)^(3/2))/2097152 - (4625907*(3 - x + 2*x^2)^(
5/2))/2293760 - (81685*x*(3 - x + 2*x^2)^(5/2))/114688 + (384739*
x^2*(3 - x + 2*x^2)^(5/2))/43008 + (27785*x^3*(3 - x + 2*x^2)^(5/
2))/1536 + (725*x^4*(3 - x + 2*x^2)^(5/2))/48 + (25*x^5*(3 - x +
2*x^2)^(5/2))/4 - (1059790665*ArcSinh[(1 - 4*x)/Sqrt[23]])/(67108
864*Sqrt[2])
```

Rubi in Sympy [A] time = 96.9671, size = 201, normalized size = 1.06

$$-\frac{32\left(-\frac{16247415752631662297803333852 5x}{8192}+\frac{30353753242439435221024946539 5}{32768}\right)\sqrt{2x^2-x+3}\left(\frac{194050502594980298595x^2}{1024}-\frac{390881927068704600 75x}{1024}\right.}{53564170318588630546347517042138138 07578125}-\frac{\left(-\frac{276465x}{2}+\frac{3734733}{8}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^2}{1008000}+\frac{\left(90x+\frac{219}{2}\right)\left(2x^2-x+3\right)^{\frac{5}{2}}\left(5x^2+3x+2\right)^2}{360}+\frac{\left(\frac{6977314125x}{8}+\frac{35164168335}{32}\right)\sqrt{2x^2-x+3}\left(\frac{279092565x^2}{16}-\frac{205812081x}{16}+\frac{14206635}{8}\right)^2}{18402140886793466906250}-\frac{4\left(\frac{126616143705108377661926630830352774411578481697 5625x}{33554432}+\frac{278723676850442675651868048361603776454016802344 7075}{134217728}\right)\sqrt{2x^2-x+3}}{53564170318588630546347517042138138 07578125}+\frac{1059790665\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{134217728}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**3,x)
```

```
[Out] -32*(-1624741575263166229780333338525*x/8192 + 3035375324243943522
10249465395/32768)*sqrt(2*x**2 - x + 3)*(19405050259498029859 5*x*
*2/1024 - 39088192706870460075*x/1024 + 97626563836837610535/512)
/5356417031858863054634751704213813807578125 - (-276465*x/2 + 373
4733/8)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2/1008000 + (
90*x + 219/2)*(2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**2/360 +
 (6977314125*x/8 + 35164168335/32)*sqrt(2*x**2 - x + 3)*(27909256
5*x**2/16 - 205812081*x/16 + 14206635/8)**2/18402140886793466906 2
50 - 4*(12661614370510837766192663083035277441157848169756 25*x/33
554432 + 278723676850442675651868048361603776454016802344707 5/134
217728)*sqrt(2*x**2 - x + 3)/53564170318588630546347517042138138 0
7578125 + 1059790665*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x*
*2 - x + 3)))/134217728
```

Mathematica [A] time = 0.10956, size = 85, normalized size = 0.45

$$\frac{4\sqrt{2x^2-x+3}\,(88080384000x^9+124780544000x^8+328328806400x^7+430820229120x^6+571298324480x^5+48789188403\ldots}{14092861440\ldots}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(-72152399943 + 53985432012*x + 1996150645
44*x^2 + 389257196928*x^3 + 487891884032*x^4 + 571298324480*x^5 +
 430820229120*x^6 + 328328806400*x^7 + 124780544000*x^8 + 8808038
4000*x^9) + 111278019825*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/14
092861440
```

Maple [A] time = 0.01, size = 151, normalized size = 0.8

$$\frac{2671180\,x-667795}{2097152}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{184311420\,x-46077855}{33554432}\sqrt{2\,x^2-x+3}+\frac{1059790665\,\sqrt{2}}{134217728}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)-\frac{4625907}{2293760}\left(2\,x^2-x+3\right)^{\frac{5}{2}}-\frac{81685\,x}{114688}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{384739\,x^2}{43008}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{27785\,x^3}{1536}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{725\,x^4}{48}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{25\,x^5}{4}\left(2\,x^2-x+3\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(3/2)*(5*x^2+3*x+2)^3,x)
```

```
[Out] 667795/2097152*(4*x-1)*(2*x^2-x+3)^(3/2)+46077855/33554432*(4*x-1
)*(2*x^2-x+3)^(1/2)+1059790665/134217728*2^(1/2)*arcsinh(4/23*23^
(1/2)*(x-1/4))-4625907/2293760*(2*x^2-x+3)^(5/2)-81685/114688*x*(
2*x^2-x+3)^(5/2)+384739/43008*x^2*(2*x^2-x+3)^(5/2)+27785/1536*x^
3*(2*x^2-x+3)^(5/2)+725/48*x^4*(2*x^2-x+3)^(5/2)+25/4*x^5*(2*x^2-
x+3)^(5/2)
```

Maxima [A] time = 0.770314, size = 232, normalized size = 1.23

$$\frac{25}{4}\left(2x^2-x+3\right)^{\frac{5}{2}}x^5+\frac{725}{48}\left(2x^2-x+3\right)^{\frac{5}{2}}x^4+\frac{27785}{1536}\left(2x^2-x+3\right)^{\frac{5}{2}}x^3+\frac{384739}{43008}\left(2x^2-x+3\right)^{\frac{5}{2}}x^2-\frac{81685}{114688}\left(2x^2-x+3\right)^{\frac{5}{2}}x-\frac{4625907}{2293760}\left(2x^2-x+3\right)^{\frac{5}{2}}+\frac{667795}{524288}\left(2x^2-x+3\right)^{\frac{3}{2}}x-\frac{667795}{2097152}\left(2x^2-x+3\right)^{\frac{3}{2}}+\frac{46077855}{8388608}\sqrt{2x^2-x+3x}+\frac{1059790665}{134217728}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{46077855}{33554432}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 25/4*(2*x^2 - x + 3)^(5/2)*x^5 + 725/48*(2*x^2 - x + 3)^(5/2)*x^4
 + 27785/1536*(2*x^2 - x + 3)^(5/2)*x^3 + 384739/43008*(2*x^2 - x
 + 3)^(5/2)*x^2 - 81685/114688*(2*x^2 - x + 3)^(5/2)*x - 4625907/
2293760*(2*x^2 - x + 3)^(5/2) + 667795/524288*(2*x^2 - x + 3)^(3/
2)*x - 667795/2097152*(2*x^2 - x + 3)^(3/2) + 46077855/8388608*sq
rt(2*x^2 - x + 3)*x + 1059790665/134217728*sqrt(2)*arcsinh(1/23*s
qrt(23)*(4*x - 1)) - 46077855/33554432*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.287477, size = 143, normalized size = 0.76

$$\frac{1}{28185722880}\sqrt{2}\Big(4\sqrt{2}\big(88080384000\,x^9+124780544000\,x^8+328328806400\,x^7+430820229120\,x^6+571298324480\,x^5+48$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/28185722880*sqrt(2)*(4*sqrt(2)*(88080384000*x^9 + 124780544000*
x^8 + 328328806400*x^7 + 430820229120*x^6 + 571298324480*x^5 + 48
7891884032*x^4 + 389257196928*x^3 + 199615064544*x^2 + 5398543201
2*x - 72152399943)*sqrt(2*x^2 - x + 3) + 111278019825*log(-sqrt(2
)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**3,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**3, x)
```

GIAC/XCAS [A] time = 0.269215, size = 126, normalized size = 0.67

$$\frac{1}{3523215360}(4(8(4(16(20(8(140(160(12x+17)x+7157)x+1314759)x+13947713)x+238228459)x+3041071851)x+6-\frac{1059790665}{134217728}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] 1/3523215360*(4*(8*(4*(16*(20*(8*(140*(160*(12*x + 17)*x + 7157)*
x + 1314759)*x + 13947713)*x + 238228459)*x + 3041071851)*x + 623
7970767)*x + 13496358003)*x - 72152399943)*sqrt(2*x^2 - x + 3) -
1059790665/134217728*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^
2 - x + 3)) + 1)
```

3.67 $\int \left(3-x+2x^2\right)^{3/2} \left(2+3x+5x^2\right)^2 \, dx$

Optimal. Leaf size=147

$$\frac{1235}{448}\left(2x^2-x+3\right)^{5/2}x^2+\frac{24499\left(2x^2-x+3\right)^{5/2}x}{10752}+\frac{73861\left(2x^2-x+3\right)^{5/2}}{215040}+\frac{24293(1-4x)\left(2x^2-x+3\right)^{3/2}}{196608}+\frac{558739(1-4x)\sqrt{2x^2-x+3}}{1048576}+\frac{25}{16}\left(2x^2-x+3\right)^{5/2}x^3+\frac{12850997\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2097152\sqrt{2}}$$

```
[Out] (558739*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1048576 + (24293*(1 - 4*x)
*(3 - x + 2*x^2)^(3/2))/196608 + (73861*(3 - x + 2*x^2)^(5/2))/21
5040 + (24499*x*(3 - x + 2*x^2)^(5/2))/10752 + (1235*x^2*(3 - x +
 2*x^2)^(5/2))/448 + (25*x^3*(3 - x + 2*x^2)^(5/2))/16 + (1285099
7*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2097152*Sqrt[2])
```

Rubi [A] time = 0.198204, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{1235}{448}\left(2x^2-x+3\right)^{5/2}x^2+\frac{24499\left(2x^2-x+3\right)^{5/2}x}{10752}+\frac{73861\left(2x^2-x+3\right)^{5/2}}{215040}+\frac{24293(1-4x)\left(2x^2-x+3\right)^{3/2}}{196608}+\frac{558739(1-4x)\sqrt{2x^2-x+3}}{1048576}+\frac{25}{16}\left(2x^2-x+3\right)^{5/2}x^3+\frac{12850997\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2097152\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (558739*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1048576 + (24293*(1 - 4*x)
*(3 - x + 2*x^2)^(3/2))/196608 + (73861*(3 - x + 2*x^2)^(5/2))/21
5040 + (24499*x*(3 - x + 2*x^2)^(5/2))/10752 + (1235*x^2*(3 - x +
 2*x^2)^(5/2))/448 + (25*x^3*(3 - x + 2*x^2)^(5/2))/16 + (1285099
7*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2097152*Sqrt[2])
```

Rubi in Sympy [A] time = 24.137, size = 126, normalized size = 0.86

$$-\frac{\left(-\frac{30215x}{2}+\frac{82619}{8}\right)\left(2x^2-x+3\right)^{\frac{5}{2}}}{26880}+\frac{24293\left(-4x+1\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{196608}+\frac{558739\left(-4x+1\right)\sqrt{2x^2-x+3}}{1048576}+\frac{\left(70x+\frac{163}{2}\right)\left(2x^2-x+3\right)^{\frac{5}{2}}\left(5x^2+3x+2\right)}{224}-\frac{12850997\sqrt{2}\,\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{4194304}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**2,x)
```

```
[Out] -(-30215*x/2 + 82619/8)*(2*x**2 - x + 3)**(5/2)/26880 + 24293*(-4
*x + 1)*(2*x**2 - x + 3)**(3/2)/196608 + 558739*(-4*x + 1)*sqrt(2
*x**2 - x + 3)/1048576 + (70*x + 163/2)*(2*x**2 - x + 3)**(5/2)*(
5*x**2 + 3*x + 2)/224 - 12850997*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/
```

```
(4*sqrt(2*x**2 - x + 3)))/4194304
```

Mathematica [A] time = 0.092039, size = 75, normalized size = 0.51

$$\frac{4\sqrt{2x^2-x+3}\left(688128000x^7+525926400x^6+2025840640x^5+2061273088x^4+2728413312x^3+1799647136x^2+1619403\right.}{440401920}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(439831323 + 1619403428*x + 1799647136*x^2
 + 2728413312*x^3 + 2061273088*x^4 + 2025840640*x^5 + 525926400*x
^6 + 688128000*x^7) - 1349354685*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[
23]])/440401920
```

Maple [A] time = 0.009, size = 117, normalized size = 0.8

$$-\frac{97172\,x-24293}{196608}\left(2\,x^2-x+3\right)^{\frac{3}{2}}-\frac{2234956\,x-558739}{1048576}\sqrt{2\,x^2-x+3}-\frac{12850997\,\sqrt{2}}{4194304}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{73861}{215040}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{24499\,x}{10752}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{1235\,x^2}{448}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{25\,x^3}{16}\left(2\,x^2-x+3\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(3/2)*(5*x^2+3*x+2)^2,x)
```

```
[Out] -24293/196608*(4*x-1)*(2*x^2-x+3)^(3/2)-558739/1048576*(4*x-1)*(2
*x^2-x+3)^(1/2)-12850997/4194304*2^(1/2)*arcsinh(4/23*23^(1/2)*(x
-1/4))+73861/215040*(2*x^2-x+3)^(5/2)+24499/10752*x*(2*x^2-x+3)^(
5/2)+1235/448*x^2*(2*x^2-x+3)^(5/2)+25/16*x^3*(2*x^2-x+3)^(5/2)
```

Maxima [A] time = 0.77507, size = 186, normalized size = 1.27

$$\frac{25}{16}\left(2\,x^2-x+3\right)^{\frac{5}{2}}x^3+\frac{1235}{448}\left(2\,x^2-x+3\right)^{\frac{5}{2}}x^2+\frac{24499}{10752}\left(2\,x^2-x+3\right)^{\frac{5}{2}}x+\frac{73861}{215040}\left(2\,x^2-x+3\right)^{\frac{5}{2}}-\frac{24293}{49152}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x+\frac{24293}{196608}\left(2\,x^2-x+3\right)^{\frac{3}{2}}-\frac{558739}{262144}\sqrt{2\,x^2-x+3x}-\frac{12850997}{4194304}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)+\frac{558739}{1048576}\sqrt{2\,x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 25/16*(2*x^2 - x + 3)^(5/2)*x^3 + 1235/448*(2*x^2 - x + 3)^(5/2)*
x^2 + 24499/10752*(2*x^2 - x + 3)^(5/2)*x + 73861/215040*(2*x^2 -
 x + 3)^(5/2) - 24293/49152*(2*x^2 - x + 3)^(3/2)*x + 24293/19660
8*(2*x^2 - x + 3)^(3/2) - 558739/262144*sqrt(2*x^2 - x + 3)*x - 1
2850997/4194304*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) + 558739
/1048576*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.282343, size = 130, normalized size = 0.88

$$\frac{1}{880803840}\sqrt{2}\Big(4\sqrt{2}\big(688128000\,x^7+525926400\,x^6+2025840640\,x^5+2061273088\,x^4+2728413312\,x^3+1799647136\,x^2+1$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/880803840*sqrt(2)*(4*sqrt(2)*(688128000*x^7 + 525926400*x^6 + 2
025840640*x^5 + 2061273088*x^4 + 2728413312*x^3 + 1799647136*x^2
+ 1619403428*x + 439831323)*sqrt(2*x^2 - x + 3) + 1349354685*log(
-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int \left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2)**2,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2, x)
```

GIAC/XCAS [A] time = 0.269531, size = 112, normalized size = 0.76

$$\frac{1}{110100480}\left(4\left(8\left(4\left(16\left(20\left(120\left(140\,x+107\right)x+49459\right)x+1006481\right)x+21315729\right)x+56238973\right)x+404850857\right)x+4398313\right.$$
$$+\frac{12850997}{4194304}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] 1/110100480*(4*(8*(4*(16*(20*(120*(140*x + 107)*x + 49459)*x + 10
06481)*x + 21315729)*x + 56238973)*x + 404850857)*x + 439831323)*
sqrt(2*x^2 - x + 3) + 12850997/4194304*sqrt(2)*ln(-2*sqrt(2)*(sqr
t(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

3.68 $\int \left(3-x+2x^2\right)^{3/2} \left(2+3x+5x^2\right)\, dx$

Optimal. Leaf size=105

$$\frac{5}{12}x\left(2x^2-x+3\right)^{5/2}+\frac{107}{240}\left(2x^2-x+3\right)^{5/2}-\frac{179(1-4x)\left(2x^2-x+3\right)^{3/2}}{1536}-\frac{4117(1-4x)\sqrt{2x^2-x+3}}{8192}-\frac{94691\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16384\sqrt{2}}$$

```
[Out] (-4117*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/8192 - (179*(1 - 4*x)*(3 -
x + 2*x^2)^(3/2))/1536 + (107*(3 - x + 2*x^2)^(5/2))/240 + (5*x*(
3 - x + 2*x^2)^(5/2))/12 - (94691*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1
6384*Sqrt[2])
```

Rubi [A] time = 0.104106, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{5}{12}x\left(2x^2-x+3\right)^{5/2}+\frac{107}{240}\left(2x^2-x+3\right)^{5/2}-\frac{179(1-4x)\left(2x^2-x+3\right)^{3/2}}{1536}-\frac{4117(1-4x)\sqrt{2x^2-x+3}}{8192}-\frac{94691\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{16384\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2),x]
```

```
[Out] (-4117*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/8192 - (179*(1 - 4*x)*(3 -
x + 2*x^2)^(3/2))/1536 + (107*(3 - x + 2*x^2)^(5/2))/240 + (5*x*(
3 - x + 2*x^2)^(5/2))/12 - (94691*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1
6384*Sqrt[2])
```

Rubi in Sympy [A] time = 11.0901, size = 94, normalized size = 0.9

$$-\frac{179\left(-4x+1\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{1536}-\frac{4117\left(-4x+1\right)\sqrt{2x^2-x+3}}{8192}+\frac{\left(50x+\frac{107}{2}\right)\left(2x^2-x+3\right)^{\frac{5}{2}}}{120}+\frac{94691\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{32768}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2),x)
```

```
[Out] -179*(-4*x + 1)*(2*x**2 - x + 3)**(3/2)/1536 - 4117*(-4*x + 1)*sq
rt(2*x**2 - x + 3)/8192 + (50*x + 107/2)*(2*x**2 - x + 3)**(5/2)/
120 + 94691*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x +
3)))/32768
```

Mathematica [A] time = 0.0724042, size = 65, normalized size = 0.62

$$\frac{4\sqrt{2x^2-x+3}\left(204800x^5+14336x^4+561024x^3+319072x^2+565276x+388341\right)+1420365\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{491520}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2),x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(388341 + 565276*x + 319072*x^2 + 561024*x
^3 + 14336*x^4 + 204800*x^5) + 1420365*Sqrt[2]*ArcSinh[(-1 + 4*x)
/Sqrt[23]])/491520
```

Maple [A] time = 0.007, size = 83, normalized size = 0.8

$$\frac{716\,x-179}{1536}\left(2\,x^{2}-x+3\right)^{\frac{3}{2}}+\frac{16468\,x-4117}{8192}\sqrt{2\,x^{2}-x+3}+\frac{94691\sqrt{2}}{32768}Arcsinh\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{107}{240}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{5\,x}{12}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(3/2)*(5*x^2+3*x+2),x)
```

```
[Out] 179/1536*(4*x-1)*(2*x^2-x+3)^(3/2)+4117/8192*(4*x-1)*(2*x^2-x+3)^
(1/2)+94691/32768*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+107/240*
(2*x^2-x+3)^(5/2)+5/12*x*(2*x^2-x+3)^(5/2)
```

Maxima [A] time = 0.7676, size = 140, normalized size = 1.33

$$\frac{5}{12}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}x+\frac{107}{240}\left(2\,x^{2}-x+3\right)^{\frac{5}{2}}+\frac{179}{384}\left(2\,x^{2}-x+3\right)^{\frac{3}{2}}x-\frac{179}{1536}\left(2\,x^{2}-x+3\right)^{\frac{3}{2}}+\frac{4117}{2048}\sqrt{2\,x^{2}-x+3}x+\frac{94691}{32768}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{4117}{8192}\sqrt{2\,x^{2}-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 5/12*(2*x^2 - x + 3)^(5/2)*x + 107/240*(2*x^2 - x + 3)^(5/2) + 17
9/384*(2*x^2 - x + 3)^(3/2)*x - 179/1536*(2*x^2 - x + 3)^(3/2) +
4117/2048*sqrt(2*x^2 - x + 3)*x + 94691/32768*sqrt(2)*arcsinh(1/2
3*sqrt(23)*(4*x - 1)) - 4117/8192*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.279311, size = 116, normalized size = 1.1

$$\frac{1}{983040}\sqrt{2}\left(4\sqrt{2}\left(204800\,x^{5}+14336\,x^{4}+561024\,x^{3}+319072\,x^{2}+565276\,x+388341\right)\sqrt{2\,x^{2}-x+3}+1420365\,\log\left(-\sqrt{2}(3\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/983040*sqrt(2)*(4*sqrt(2)*(204800*x^5 + 14336*x^4 + 561024*x^3
+ 319072*x^2 + 565276*x + 388341)*sqrt(2*x^2 - x + 3) + 1420365*l
og(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1
)))
```

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

$$\int\left(2x^{2}-x+3\right)^{\frac{3}{2}}\left(5x^{2}+3x+2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(3/2)*(5*x**2+3*x+2),x)
```

```
[Out] Integral((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [A] time = 0.268669, size = 99, normalized size = 0.94

$$\frac{1}{122880}\left(4\left(8\left(4\left(16\left(100\,x+7\right)x+4383\right)x+9971\right)x+141319\right)x+388341\right)\sqrt{2\,x^{2}-x+3}-\frac{94691}{32768}\,\sqrt{2}\ln\left(-2\,\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^{2}-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] 1/122880*(4*(8*(4*(16*(100*x + 7)*x + 4383)*x + 9971)*x + 141319)
*x + 388341)*sqrt(2*x^2 - x + 3) - 94691/32768*sqrt(2)*ln(-2*sqrt
(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

3.69 $\int \frac{(3-x+2x^2)^{3/2}}{2+3x+5x^2}\,dx$

Optimal. Leaf size=197

$$-\frac{1}{100}\sqrt{2x^2-x+3}(49-20x)+\frac{11}{125}\sqrt{\frac{11}{31}\left(247+500\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(247+500\sqrt{2}\right)}}\left(\left(130+69\sqrt{2}\right)x+61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right)-\frac{11}{125}\sqrt{\frac{11}{31}\left(500\sqrt{2}-247\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(500\sqrt{2}-247\right)}}\left(\left(130-69\sqrt{2}\right)x-61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right)-\frac{2203\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1000\sqrt{2}}$$

```
[Out] -((49 - 20*x)*Sqrt[3 - x + 2*x^2])/100 - (2203*ArcSinh[(1 - 4*x)/
Sqrt[23]])/(1000*Sqrt[2]) + (11*Sqrt[(11*(247 + 500*Sqrt[2]))/31]
*ArcTan[(Sqrt[11/(62*(247 + 500*Sqrt[2]))]*(8 + 61*Sqrt[2] + (130
 + 69*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/125 - (11*Sqrt[(11*(-247
 + 500*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-247 + 500*Sqrt[2]))]*
(8 - 61*Sqrt[2] + (130 - 69*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/12
5
```

Rubi [A] time = 1.00766, antiderivative size = 197, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 8, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.296$

$$-\frac{1}{100}\sqrt{2x^2-x+3}(49-20x)+\frac{11}{125}\sqrt{\frac{11}{31}\left(247+500\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(247+500\sqrt{2}\right)}}\left(\left(130+69\sqrt{2}\right)x+61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right)-\frac{11}{125}\sqrt{\frac{11}{31}\left(500\sqrt{2}-247\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(500\sqrt{2}-247\right)}}\left(\left(130-69\sqrt{2}\right)x-61\sqrt{2}+8\right)}{\sqrt{2x^2-x+3}}\right)-\frac{2203\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1000\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2),x]
```

```
[Out] -((49 - 20*x)*Sqrt[3 - x + 2*x^2])/100 - (2203*ArcSinh[(1 - 4*x)/
Sqrt[23]])/(1000*Sqrt[2]) + (11*Sqrt[(11*(247 + 500*Sqrt[2]))/31]
*ArcTan[(Sqrt[11/(62*(247 + 500*Sqrt[2]))]*(8 + 61*Sqrt[2] + (130
 + 69*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/125 - (11*Sqrt[(11*(-247
 + 500*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-247 + 500*Sqrt[2]))]*
(8 - 61*Sqrt[2] + (130 - 69*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/12
5
```

Rubi in Sympy [A] time = 101.444, size = 226, normalized size = 1.15

$$-\frac{\left(-10x+\frac{49}{2}\right)\sqrt{2x^2-x+3}}{50}+\frac{\sqrt{341}\left(21296+162382\sqrt{2}\right)\left(15972\sqrt{2}+85184\right)\operatorname{atan}\left(\frac{\sqrt{682}\left(x\left(183678\sqrt{2}+346060\right)+21296+162382\sqrt{2}\right)}{165044\sqrt{247+500\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9985162000\sqrt{247+500\sqrt{2}}}+\frac{2203\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{2000}+\frac{\sqrt{341}\left(-162382\sqrt{2}+21296\right)\left(-15972\sqrt{2}+85184\right)\operatorname{atanh}\left(\frac{\sqrt{682}\left(x\left(-183678\sqrt{2}+346060\right)-162382\sqrt{2}+21296\right)}{165044\sqrt{-247+500\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{9985162000\sqrt{-247+500\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2),x)
```

```
[Out] -(-10*x + 49/2)*sqrt(2*x**2 - x + 3)/50 + sqrt(341)*(21296 + 1623
82*sqrt(2))*(15972*sqrt(2) + 85184)*atan(sqrt(682)*(x*(183678*sqr
t(2) + 346060) + 21296 + 162382*sqrt(2))/(165044*sqrt(247 + 500*s
qrt(2))*sqrt(2*x**2 - x + 3)))/(9985162000*sqrt(247 + 500*sqrt(2)
)) + 2203*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)
))/2000 + sqrt(341)*(-162382*sqrt(2) + 21296)*(-15972*sqrt(2) + 8
5184)*atanh(sqrt(682)*(x*(-183678*sqrt(2) + 346060) - 162382*sqrt
(2) + 21296)/(165044*sqrt(-247 + 500*sqrt(2))*sqrt(2*x**2 - x + 3
)))/(9985162000*sqrt(-247 + 500*sqrt(2)))
```

Mathematica [C] time = 6.45433, size = 1175, normalized size = 5.96

$$\sqrt{2x^2-x+3}\left(\frac{x}{5}-\frac{49}{100}\right)+\frac{2203\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{1000\sqrt{2}}$$

$$+\frac{11\left(69i+13\sqrt{31}\right)\tan^{-1}\left(\frac{-12631475i\sqrt{31}x^4-30587700x^4-2750000i\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-9329420i\sqrt{31}x^3-1428790x^3+6225000i\sqrt{22\left(-13+i\sqrt{3\right.}}}{5762900\sqrt{31}x^4+136148325ix^4+6693830\sqrt{31}x^3-}\right.}{125}$$

$$-\frac{11i\left(-69i+13\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(185900\sqrt{31}x^4-2416075ix^4+215930\sqrt{3}\right.}{-12631475i\sqrt{31}x^4+30587700x^4+500000i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-9329420i\sqrt{31}x^3+1428790x^3+175000i\sqrt{682\left(13+i\sqrt{3\right.}}}\right.}{125}$$

$$+\frac{11i\left(69i+13\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{250\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{11\left(-69i+13\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{250\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

$$-\frac{11i\left(69i+13\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+i\right.\right.}{250\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{11\left(-69i+13\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-6\right.\right.}{250\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2),x]
```

```
[Out] (-49/100 + x/5)*Sqrt[3 - x + 2*x^2] + (2203*ArcSinh[(-1 + 4*x)/Sq
rt[23]])/(1000*Sqrt[2]) + (11*(69*I + 13*Sqrt[31])*ArcTan[(108274
32 + (603036*I)*Sqrt[31] - 28693104*x + (2334908*I)*Sqrt[31]*x -
30301942*x^2 - (15923341*I)*Sqrt[31]*x^2 - 1428790*x^3 - (9329420
*I)*Sqrt[31]*x^3 - 30587700*x^4 - (12631475*I)*Sqrt[31]*x^4 + (31
50000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (36250
00*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (622500
0*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - (27500
00*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(82622
268*I + 5966136*Sqrt[31] + (117642204*I)*x + 12374208*Sqrt[31]*x
+ (229312267*I)*x^2 + 7834134*Sqrt[31]*x^2 - (63298460*I)*x^3 + 6
693830*Sqrt[31]*x^3 + (136148325*I)*x^4 + 5762900*Sqrt[31]*x^4)])
/(125*Sqrt[(62*(-13 + I*Sqrt[31]))/11]) - (((11*I)/125)*(-69*I +
13*Sqrt[31])*ArcTan[(31*(560572*I + 192456*Sqrt[31] - (1391684*I)
*x + 399168*Sqrt[31]*x - (2195557*I)*x^2 + 252714*Sqrt[31]*x^2 -
(2861340*I)*x^3 + 215930*Sqrt[31]*x^3 - (2416075*I)*x^4 + 185900*
Sqrt[31]*x^4))/(-10827432 + (603036*I)*Sqrt[31] + 28693104*x + (2
334908*I)*Sqrt[31]*x + 30301942*x^2 - (15923341*I)*Sqrt[31]*x^2 +
 1428790*x^3 - (9329420*I)*Sqrt[31]*x^3 + 30587700*x^4 - (1263147
5*I)*Sqrt[31]*x^4 - (50000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3
- x + 2*x^2] + (125000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 -
x + 2*x^2] + (175000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 -
x + 2*x^2] + (500000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 -
x + 2*x^2])])/Sqrt[(62*(13 + I*Sqrt[31]))/11] - (11*(-69*I + 13*S
qrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10
*I)*x)^2])/(250*Sqrt[(62*(13 + I*Sqrt[31]))/11]) + (((11*I)/250)*
(69*I + 13*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sq
```

```
rt[31] + (10*I)*x)^2])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] - (((11*I
)/250)*(69*I + 13*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sq
rt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^
2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sq
rt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[(62*(-13
 + I*Sqrt[31]))/11] + (11*(-69*I + 13*Sqrt[31])*Log[(2 + 3*x + 5*
x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I
)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[
3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x +
 2*x^2])])/(250*Sqrt[(62*(13 + I*Sqrt[31]))/11])
```

Maple [B] time = 0.058, size = 3460, normalized size = 17.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(3/2)/(5*x^2+3*x+2),x)
```

```
[Out] 2203/2000*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-49/100*(2*x^2-x+
3)^(1/2)+1/5*x*(2*x^2-x+3)^(1/2)-2/1321375*(8*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2
))^(1/2)*2^(1/2)*(4245*2^(1/2)*arctan(1/11692487*(-775687+549362*
2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1
-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+3201
6)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+68
20*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+6154*arctan(1/11
692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^
(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-
x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(
2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))
^(1/2)+12325786*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3
*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-886
6+6820*2^(1/2))^(1/2))*2^(1/2)-359414*arctanh(31/2*(8*(2^(1/2)-1+
x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-
3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^
(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/
(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2)-2/264275*
(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(
1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(2365*2^(1/2)*arctan(1/116
92487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(
1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(
2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x
)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(
2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2
^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^
(1/2)+3338*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*
(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41)
)^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1
/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)
^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^
(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-
775687+549362*2^(1/2))^(1/2)+3192442*arctanh(31/2*(8*(2^(1/2)-1+x
)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3
*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-5264358*arcta
nh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x
)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)
))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/
(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(
1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^
(1/2))^(1/2)+13/105710*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/
2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(-2
```

```
85*2^(1/2)*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*
(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41)
)^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1
/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)
^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^
(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-
775687+549362*2^(1/2))^(1/2)-386*arctan(1/11692487*(-775687+54936
2*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)
+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1
/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32
016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1
/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+
6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+274846*arctanh
(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^
2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*
2^(1/2)+1543366*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3
*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-886
6+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(
1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x
)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^
(1/2))/(-8866+6820*2^(1/2))^(1/2)+3/10571*(8*(2^(1/2)-1+x)^2/(2^(
1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2)
)^(1/2)*2^(1/2)*(151*2^(1/2)*arctan(1/11692487*(-775687+549362*2^
(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x
)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+
1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)
/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+
1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820
*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+218*arctan(1/11692
487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/
2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^
(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^
2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^
(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(
1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1
/2)+401698*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1
/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+682
0*2^(1/2))^(1/2))*2^(1/2)-63426*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(
2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1
/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1
/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))
/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/
2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2)+9/21142*(8*(2^(
1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-
x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(369*2^(1/2)*arctan(1/11692487*(-
775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x
)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-
1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+2237
9*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-
1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1
-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+52
0*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1
/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(
6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^
2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/
2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2
^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+54
9362*2^(1/2))^(1/2)+465124*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/
2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^
(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-866822*arctanh(31/2*(8*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/((8*(2^(
1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-
x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^
(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2
)
```

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

$$\int \frac{\left(2\,x^2 - x + 3\right)^{\frac{3}{2}}}{5\,x^2 + 3\,x + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2),x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2), x)
```

Fricas [A] time = 0.346855, size = 1486, normalized size = 7.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2),x, algorithm="fricas")
```

```
[Out] -1/96100000*sqrt(155)*sqrt(31)*sqrt(10)*(2203*sqrt(155)*sqrt(31)*
sqrt(10)*(500*sqrt(2) - 247)*sqrt((247*sqrt(2) - 1000)/(247000*sq
rt(2) - 561009))*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2
 - x + 3)*(4*x - 1)) - 20*sqrt(155)*sqrt(31)*sqrt(10)*sqrt(2*x^2
- x + 3)*(247*sqrt(2)*(20*x - 49) - 20000*x + 49000)*sqrt((247*sq
rt(2) - 1000)/(247000*sqrt(2) - 561009)) - 220*968^(1/4)*sqrt(31)
*(247*sqrt(2) - 1000)*log(-968/5*(968^(1/4)*sqrt(155)*sqrt(10)*sq
rt(2*x^2 - x + 3)*(sqrt(2)*(13924547751*x + 10961882026) - 248864
29777*x - 2962665725)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) -
 561009)) + 167341615000*x^2 + 220*sqrt(2)*(1366054000*x^2 - 3855
69223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) - 19278
46115*sqrt(2)*(49*x^2 - 151*x + 200) - 515685385000*x + 683027000
000)/(385569223*sqrt(2)*x^2 - 683027000*x^2)) + 220*968^(1/4)*sqr
t(31)*(247*sqrt(2) - 1000)*log(968/5*(968^(1/4)*sqrt(155)*sqrt(10
)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(13924547751*x + 10961882026) - 24
886429777*x - 2962665725)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(
2) - 561009)) - 167341615000*x^2 - 220*sqrt(2)*(1366054000*x^2 -
385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000) + 1
927846115*sqrt(2)*(49*x^2 - 151*x + 200) + 515685385000*x - 68302
7000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2)) - 3246320*968^(
1/4)*sqrt(2)*arctan(31*(sqrt(155)*sqrt(10)*(500*sqrt(2)*(x - 6) -
 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009
)) + 10*968^(1/4)*sqrt(2*x^2 - x + 3)*(4*sqrt(2) - 61))/(2*sqrt(1
55)*sqrt(31)*sqrt(10)*sqrt(2/5)*(500*sqrt(2)*x - 247*x)*sqrt(-(96
8^(1/4)*sqrt(155)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(13924547
751*x + 10961882026) - 24886429777*x - 2962665725)*sqrt((247*sqrt
(2) - 1000)/(247000*sqrt(2) - 561009)) + 167341615000*x^2 + 220*s
qrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 6830
27000*x + 2049081000) - 1927846115*sqrt(2)*(49*x^2 - 151*x + 200)
 - 515685385000*x + 683027000000)/(385569223*sqrt(2)*x^2 - 683027
000*x^2))*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) +
sqrt(155)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693*x + 5
434)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 310*9
68^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(8*sqrt(2) - 3))) - 3246320
*968^(1/4)*sqrt(2)*arctan(-31*(sqrt(155)*sqrt(10)*(500*sqrt(2)*(x
 - 6) - 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) -
 561009)) - 10*968^(1/4)*sqrt(2*x^2 - x + 3)*(4*sqrt(2) - 61))/(2
*sqrt(155)*sqrt(31)*sqrt(10)*sqrt(2/5)*(500*sqrt(2)*x - 247*x)*sq
rt((968^(1/4)*sqrt(155)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(13
924547751*x + 10961882026) - 24886429777*x - 2962665725)*sqrt((24
7*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 167341615000*x^2 -
 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3)
- 683027000*x + 2049081000) + 1927846115*sqrt(2)*(49*x^2 - 151*x
+ 200) + 515685385000*x - 683027000000)/(385569223*sqrt(2)*x^2 -
683027000*x^2))*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 56100
9)) + sqrt(155)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693
```

```
*x + 5434)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) +
 310*968^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(8*sqrt(2) - 3))))/((
247*sqrt(2) - 1000)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 5
61009)))
```

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

$$\int \frac{(2x^2 - x + 3)^{\frac{3}{2}}}{5x^2 + 3x + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2),x)
```

```
[Out] Integral((2*x**2 - x + 3)**(3/2)/(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2),x, algorithm="giac")
```

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

3.70 $\int \frac{(3-x+2x^2)^{3/2}}{(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=232

$$\frac{(10x+3)\left(2x^2-x+3\right)^{3/2}}{31\left(5x^2+3x+2\right)}+\frac{4}{155}(4-5x)\sqrt{2x^2-x+3}+\frac{\sqrt{\frac{11}{31}\left(3169333+2265350\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(3169333+2265350\sqrt{2}\right)}}\left(\left(9440+6477\sqrt{2}\right)x+2963\sqrt{2}+3514\right)}{\sqrt{2x^2-x+3}}\right)}{1550}-\frac{\sqrt{\frac{11}{31}\left(2265350\sqrt{2}-3169333\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(2265350\sqrt{2}-3169333\right)}}\left(\left(9440-6477\sqrt{2}\right)x-2963\sqrt{2}+3514\right)}{\sqrt{2x^2-x+3}}\right)}{1550}-\frac{2}{25}\sqrt{2}\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)$$

```
[Out] (4*(4 - 5*x)*Sqrt[3 - x + 2*x^2])/155 + ((3 + 10*x)*(3 - x + 2*x^
2)^(3/2))/(31*(2 + 3*x + 5*x^2)) - (2*Sqrt[2]*ArcSinh[(1 - 4*x)/S
qrt[23]])/25 + (Sqrt[(11*(3169333 + 2265350*Sqrt[2]))/31]*ArcTan[
(Sqrt[11/(62*(3169333 + 2265350*Sqrt[2]))]*(3514 + 2963*Sqrt[2] +
 (9440 + 6477*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/1550 - (Sqrt[(11
*(-3169333 + 2265350*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-3169333
 + 2265350*Sqrt[2]))]*(3514 - 2963*Sqrt[2] + (9440 - 6477*Sqrt[2]
)*x))/Sqrt[3 - x + 2*x^2]])/1550
```

Rubi [A] time = 1.16423, antiderivative size = 232, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{(10x+3)\left(2x^2-x+3\right)^{3/2}}{31\left(5x^2+3x+2\right)}+\frac{4}{155}(4-5x)\sqrt{2x^2-x+3}+\frac{\sqrt{\frac{11}{31}\left(3169333+2265350\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(3169333+2265350\sqrt{2}\right)}}\left(\left(9440+6477\sqrt{2}\right)x+2963\sqrt{2}+3514\right)}{\sqrt{2x^2-x+3}}\right)}{1550}-\frac{\sqrt{\frac{11}{31}\left(2265350\sqrt{2}-3169333\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(2265350\sqrt{2}-3169333\right)}}\left(\left(9440-6477\sqrt{2}\right)x-2963\sqrt{2}+3514\right)}{\sqrt{2x^2-x+3}}\right)}{1550}-\frac{2}{25}\sqrt{2}\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2)^2,x]
```


```
[Out] (4*(4 - 5*x)*Sqrt[3 - x + 2*x^2])/155 + ((3 + 10*x)*(3 - x + 2*x^
2)^(3/2))/(31*(2 + 3*x + 5*x^2)) - (2*Sqrt[2]*ArcSinh[(1 - 4*x)/S
qrt[23]])/25 + (Sqrt[(11*(3169333 + 2265350*Sqrt[2]))/31]*ArcTan[
(Sqrt[11/(62*(3169333 + 2265350*Sqrt[2]))]*(3514 + 2963*Sqrt[2] +
 (9440 + 6477*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/1550 - (Sqrt[(11
*(-3169333 + 2265350*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(-3169333
 + 2265350*Sqrt[2]))]*(3514 - 2963*Sqrt[2] + (9440 - 6477*Sqrt[2]
)*x))/Sqrt[3 - x + 2*x^2]])/1550
```

Rubi in Sympy [A] time = 127.233, size = 255, normalized size = 1.1

$$\frac{(-400x+320)\sqrt{2x^2-x+3}}{3100}+\frac{(10x+3)\left(2x^2-x+3\right)^{\frac{3}{2}}}{31\left(5x^2+3x+2\right)}+\frac{\sqrt{341}\left(4251940+3585230\sqrt{2}\right)\left(1328580\sqrt{2}+2124760\right)\operatorname{atan}\left(-\frac{\sqrt{682}\left(x\left(-11422400-7837170\sqrt{2}\right)-3585230\sqrt{2}-4251940\right)}{75020\sqrt{3169333+2265350\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{281400020000\sqrt{3169333+2265350\sqrt{2}}}+\frac{2\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{25}-\frac{\sqrt{341}\left(-3585230\sqrt{2}+4251940\right)\left(-1328580\sqrt{2}+2124760\right)\operatorname{atanh}\left(\frac{\sqrt{682}\left(x\left(-11422400+7837170\sqrt{2}\right)-4251940+3585230\sqrt{2}\right)}{75020\sqrt{-3169333+2265350\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{281400020000\sqrt{-3169333+2265350\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] (-400*x + 320)*sqrt(2*x**2 - x + 3)/3100 + (10*x + 3)*(2*x**2 - x
 + 3)**(3/2)/(31*(5*x**2 + 3*x + 2)) + sqrt(341)*(4251940 + 35852
30*sqrt(2))*(1328580*sqrt(2) + 2124760)*atan(-sqrt(682)*(x*(-1142
2400 - 7837170*sqrt(2)) - 3585230*sqrt(2) - 4251940)/(75020*sqrt(
3169333 + 2265350*sqrt(2))*sqrt(2*x**2 - x + 3)))/(281400020000*s
qrt(3169333 + 2265350*sqrt(2))) + 2*sqrt(2)*atanh(sqrt(2)*(4*x -
1)/(4*sqrt(2*x**2 - x + 3)))/25 - sqrt(341)*(-3585230*sqrt(2) + 4
251940)*(-1328580*sqrt(2) + 2124760)*atanh(sqrt(682)*(x*(-1142240
0 + 7837170*sqrt(2)) - 4251940 + 3585230*sqrt(2))/(75020*sqrt(-31
69333 + 2265350*sqrt(2))*sqrt(2*x**2 - x + 3)))/(281400020000*sqr
t(-3169333 + 2265350*sqrt(2)))
```

Mathematica [C] time = 6.46918, size = 1180, normalized size = 5.09

$$\frac{11\sqrt{2x^2-x+3}(13x+7)}{155\left(5x^2+3x+2\right)}+\frac{2}{25}\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)$$

$$-\frac{i\left(-6477i+329\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(119065100\sqrt{31}x^4+630709\cdots\right.}{-51859993775i\sqrt{31}x^4+72664815300x^4+2265350000i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-24348414380i\sqrt{31}x^3+138879039310x^3\cdots}\right.}{\cdots}$$

$$-\frac{i\left(6477i+329\sqrt{31}\right)\tanh^{-1}\left(\frac{51859993775\sqrt{31}x^4-72664815300ix^4+12459425000\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+24348414380\sqrt{31}x^3-138879039310ix^3\cdots}{3691018100\sqrt{31}x^4+257953385925i\cdots}\right.}{\cdots}$$

$$+\frac{i\left(6477i+329\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{3100\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{\left(-6477i+329\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{3100\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

$$-\frac{i\left(6477i+329\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+\cdots\right.\right.}{3100\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{\left(-6477i+329\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-\cdots\right.\right.}{3100\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (11*(7 + 13*x)*Sqrt[3 - x + 2*x^2])/(155*(2 + 3*x + 5*x^2)) + (2*
Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/25 - ((I/1550)*(-6477*I + 3
29*Sqrt[31])*ArcTan[(31*(1332489508*I + 919236384*Sqrt[31] - (567
4354076*I)*x + 503954352*Sqrt[31]*x + (3996168827*I)*x^2 + 521299
746*Sqrt[31]*x^2 - (5894056260*I)*x^3 + 480711770*Sqrt[31]*x^3 +
(630709325*I)*x^4 + 119065100*Sqrt[31]*x^4))/(35246261952 + (8643
872004*I)*Sqrt[31] + 251068416456*x - (16524047788*I)*Sqrt[31]*x
+ 44889007438*x^2 - (59243175649*I)*Sqrt[31]*x^2 + 138879039310*x
^3 - (24348414380*I)*Sqrt[31]*x^3 + 72664815300*x^4 - (5185999377
5*I)*Sqrt[31]*x^4 - (226535000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqr
t[3 - x + 2*x^2] + (566337500*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sq
rt[3 - x + 2*x^2] + (792872500*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2
*Sqrt[3 - x + 2*x^2] + (2265350000*I)*Sqrt[682*(13 + I*Sqrt[31])]
*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[(62*(13 + I*Sqrt[31]))/11] - ((I
/1550)*(6477*I + 329*Sqrt[31])*ArcTanh[(-35246261952*I - 86438720
04*Sqrt[31] - (251068416456*I)*x + 16524047788*Sqrt[31]*x - (4488
9007438*I)*x^2 + 59243175649*Sqrt[31]*x^2 - (138879039310*I)*x^3
+ 24348414380*Sqrt[31]*x^3 - (72664815300*I)*x^4 + 51859993775*Sq
rt[31]*x^4 - 14271705000*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x +
 2*x^2] - 16423787500*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x +
2*x^2] - 28203607500*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x +
 2*x^2] + 12459425000*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x
+ 2*x^2])/(411762825252*I + 28496327904*Sqrt[31] + (513442126356*
I)*x + 15622584912*Sqrt[31]*x + (606694141363*I)*x^2 + 1616029212
6*Sqrt[31]*x^2 - (505950655940*I)*x^3 + 14902064870*Sqrt[31]*x^3
+ (257953385925*I)*x^4 + 3691018100*Sqrt[31]*x^4)])/Sqrt[(62*(-13
 + I*Sqrt[31]))/11] - ((-6477*I + 329*Sqrt[31])*Log[(-3*I + Sqrt[
31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(3100*Sqrt[(62*
```

```
(13 + I*Sqrt[31]))/11]) + ((I/3100)*(6477*I + 329*Sqrt[31])*Log[(
-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqr
t[(62*(-13 + I*Sqrt[31]))/11] - ((I/3100)*(6477*I + 329*Sqrt[31])
*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqr
t[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqr
t[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*
x*Sqrt[3 - x + 2*x^2])])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] + ((-64
77*I + 329*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31]
 + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (
63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqr
t[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(3100*Sqrt[(62*(
13 + I*Sqrt[31]))/11])
```

Maple [B] time = 0.182, size = 28185, normalized size = 121.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(3/2)/(5*x^2+3*x+2)^2,x)

[Out] result too large to display
```

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

$$\int \frac{\left(2\,x^2-x+3\right)^{\frac{3}{2}}}{\left(5\,x^2+3\,x+2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")

[Out] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2, x)
```

Fricas [A] time = 0.372002, size = 1548, normalized size = 6.67

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")

[Out] -1/8708005400*sqrt(45307)*(7688*sqrt(45307)*(22653500*x^2 - 31693
33*sqrt(2)*(5*x^2 + 3*x + 2) + 13592100*x + 9061400)*sqrt((316933
3*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 20308292909889))*l
og(-4*sqrt(2)*sqrt(2*x^2 - x + 3)*(4*x - 1) - 32*x^2 + 16*x - 25)
 - 496759268258^(1/4)*sqrt(31)*(15846665*x^2 - 2265350*sqrt(2)*(5
*x^2 + 3*x + 2) + 9507999*x + 6338666)*log(-362456*(2*49675926825
8^(1/4)*sqrt(45307)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(383885
744793046756031052*x + 1590107005804632800834 27) - 54289644537351
0036114479*x - 2248750442125834759476 25)*sqrt((3169333*sqrt(2) -
4530700)/(14359297023100*sqrt(2) - 20308292909889)) + 40633351680
6083570266906700*x^2 + 1993508*sqrt(2)*(3660591410221185538 00*x^2
 - 129421409915536404037*sqrt(2)*(2*x^2 - x + 3) - 18302957051105
9276900*x + 549088711533177830700) - 5863695819043207857704359*sq
rt(2)*(49*x^2 - 151*x + 200) - 1252170633422828961434753300*x + 1
6585041502289125317016 60000)/(129421409915536404037*sqrt(2)*x^2 -
```

```
183029570511059276900*x^2)) + 496759268258^(1/4)*sqrt(31)*(15846
665*x^2 - 2265350*sqrt(2)*(5*x^2 + 3*x + 2) + 9507999*x + 6338666
)*log(362456*(2*496759268258^(1/4)*sqrt(45307)*sqrt(31)*sqrt(2*x^
2 - x + 3)*(sqrt(2)*(38388574479304675603l052*x + 159010700580463
280083427) - 54289644537351003611447 9*x - 224875044212583475947 62
5)*sqrt((3169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 203
08292909889)) - 40633351680608357026690670 0*x^2 - 1993508*sqrt(2)
*(36605914102211855380 0*x^2 - 129421409915536404037*sqrt(2)*(2*x^
2 - x + 3) - 183029570511059276900*x + 549088711533177830700) + 5
8636958190432078577043 59*sqrt(2)*(49*x^2 - 151*x + 200) + 1252170
633422828961434753300*x - 1658504150228912531701660000)/(12942140
9915536404037*sqrt(2)*x^2 - 183029570511059276900*x^2)) + 13640*s
qrt(45307)*sqrt(2*x^2 - x + 3)*(2265350*sqrt(2)*(13*x + 7) - 4120
1329*x - 22185331)*sqrt((3169333*sqrt(2) - 4530700)/(143592970231
00*sqrt(2) - 20308292909889)) - 10421084*496759268258^(1/4)*(5*x^
2 + 3*x + 2)*arctan(45307*(sqrt(45307)*sqrt(31)*(2265350*sqrt(2)*
(x - 6) - 3169333*x + 19015998)*sqrt((3169333*sqrt(2) - 4530700)/
(14359297023100*sqrt(2) - 20308292909889)) + 2*496759268258^(1/4)
*sqrt(2*x^2 - x + 3)*(1757*sqrt(2) - 2963))/(2*sqrt(90614)*sqrt(4
5307)*(2265350*sqrt(2)*x - 3169333*x)*sqrt(-(2*496759268258^(1/4)
*sqrt(45307)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(3838857447930
46756031052*x + 159010700580463280083427) - 542896445373510036114
479*x - 2248750442125834759476 25)*sqrt((3169333*sqrt(2) - 4530700
)/(14359297023100*sqrt(2) - 20308292909889)) + 406333516806083570
266906700*x^2 + 1993508*sqrt(2)*(366059141022118553800*x^2 - 1294
21409915536404037*sqrt(2)*(2*x^2 - x + 3) - 183029570511059276900
*x + 549088711533177830700) - 586369581904320785770 4359*sqrt(2)*(
49*x^2 - 151*x + 200) - 1252170633422828961434753300*x + 16585041
50228912531701660000)/(129421409915536404037*sqrt(2)*x^2 - 183029
570511059276900*x^2))*sqrt((3169333*sqrt(2) - 4530700)/(143592970
23100*sqrt(2) - 20308292909889)) - 90614*496759268258^(1/4)*sqrt(
31)*sqrt(2*x^2 - x + 3)*(439*sqrt(2) - 549) + 45307*sqrt(45307)*(
2265350*sqrt(2)*(19*x - 22) - 60217327*x + 69725326)*sqrt((316933
3*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 20308292909889))))
 - 10421084*496759268258^(1/4)*(5*x^2 + 3*x + 2)*arctan(-45307*(s
qrt(45307)*sqrt(31)*(2265350*sqrt(2)*(x - 6) - 3169333*x + 190159
98)*sqrt((3169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 20
308292909889)) - 2*496759268258^(1/4)*sqrt(2*x^2 - x + 3)*(1757*s
qrt(2) - 2963))/(2*sqrt(90614)*sqrt(45307)*(2265350*sqrt(2)*x - 3
169333*x)*sqrt((2*496759268258^(1/4)*sqrt(45307)*sqrt(31)*sqrt(2*
x^2 - x + 3)*(sqrt(2)*(383885744793046756031052*x + 1590107005804
63280083427) - 542896445373510036114479*x - 224875044212583475947
625)*sqrt((3169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 2
0308292909889)) - 406333516806083570266906700*x^2 - 1993508*sqrt(
2)*(366059141022118553800*x^2 - 129421409915536404037*sqrt(2)*(2*
x^2 - x + 3) - 183029570511059276900*x + 549088711533177830700) +
 586369581904320785770 4359*sqrt(2)*(49*x^2 - 151*x + 200) + 12521
70633422828961434753300*x - 1658504150228912531701660000)/(129421
409915536404037*sqrt(2)*x^2 - 183029570511059276900*x^2))*sqrt((3
169333*sqrt(2) - 4530700)/(14359297023100*sqrt(2) - 2030829290988
9)) + 90614*496759268258^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(439*
sqrt(2) - 549) + 45307*sqrt(45307)*(2265350*sqrt(2)*(19*x - 22) -
 60217327*x + 69725326)*sqrt((3169333*sqrt(2) - 4530700)/(1435929
7023100*sqrt(2) - 20308292909889)))))/((15846665*x^2 - 2265350*sq
rt(2)*(5*x^2 + 3*x + 2) + 9507999*x + 6338666)*sqrt((3169333*sqrt
(2) - 4530700)/(14359297023100*sqrt(2) - 20308292909889)))
```

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

$$\int \frac{(2x^2 - x + 3)^{\frac{3}{2}}}{(5x^2 + 3x + 2)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(3/2)/(5*x**2 + 3*x + 2)**2, x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")
```

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

3.71 $\int \frac{(3-x+2x^2)^{3/2}}{(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=223

$$\frac{(10x+3)(2x^2-x+3)^{3/2}}{62(5x^2+3x+2)^2}+\frac{3(696x+277)\sqrt{2x^2-x+3}}{3844(5x^2+3x+2)}+\frac{3\sqrt{\frac{1}{682}\left(366990269+259509026\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(366990269+259509026\sqrt{2}\right)}}\left(\left(70517+49942\sqrt{2}\right)x+20575\sqrt{2}+29367\right)}{\sqrt{2x^2-x+3}}\right)}{7688}-\frac{3\sqrt{\frac{1}{682}\left(259509026\sqrt{2}-366990269\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(259509026\sqrt{2}-366990269\right)}}\left(\left(70517-49942\sqrt{2}\right)x-20575\sqrt{2}+29367\right)}{\sqrt{2x^2-x+3}}\right)}{7688}$$

```
[Out] ((3 + 10*x)*(3 - x + 2*x^2)^(3/2))/(62*(2 + 3*x + 5*x^2)^2) + (3*
(277 + 696*x)*Sqrt[3 - x + 2*x^2])/(3844*(2 + 3*x + 5*x^2)) + (3*
Sqrt[(366990269 + 259509026*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(36
6990269 + 259509026*Sqrt[2]))]*(29367 + 20575*Sqrt[2] + (70517 +
49942*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/7688 - (3*Sqrt[(-3669902
69 + 259509026*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-366990269 + 2
59509026*Sqrt[2]))]*(29367 - 20575*Sqrt[2] + (70517 - 49942*Sqrt[
2])*x))/Sqrt[3 - x + 2*x^2]])/7688
```

Rubi [A] time = 0.911228, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{(10x+3)(2x^2-x+3)^{3/2}}{62(5x^2+3x+2)^2}+\frac{3(696x+277)\sqrt{2x^2-x+3}}{3844(5x^2+3x+2)}+\frac{3\sqrt{\frac{1}{682}\left(366990269+259509026\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(366990269+259509026\sqrt{2}\right)}}\left(\left(70517+49942\sqrt{2}\right)x+20575\sqrt{2}+29367\right)}{\sqrt{2x^2-x+3}}\right)}{7688}-\frac{3\sqrt{\frac{1}{682}\left(259509026\sqrt{2}-366990269\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(259509026\sqrt{2}-366990269\right)}}\left(\left(70517-49942\sqrt{2}\right)x-20575\sqrt{2}+29367\right)}{\sqrt{2x^2-x+3}}\right)}{7688}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2)^3,x]
```


```
[Out] ((3 + 10*x)*(3 - x + 2*x^2)^(3/2))/(62*(2 + 3*x + 5*x^2)^2) + (3*
(277 + 696*x)*Sqrt[3 - x + 2*x^2])/(3844*(2 + 3*x + 5*x^2)) + (3*
Sqrt[(366990269 + 259509026*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(36
6990269 + 259509026*Sqrt[2]))]*(29367 + 20575*Sqrt[2] + (70517 +
49942*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/7688 - (3*Sqrt[(-3669902
69 + 259509026*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-366990269 + 2
59509026*Sqrt[2]))]*(29367 - 20575*Sqrt[2] + (70517 - 49942*Sqrt[
2])*x))/Sqrt[3 - x + 2*x^2]])/7688
```

Rubi in Sympy [A] time = 92.9457, size = 284, normalized size = 1.27

$$\frac{(10x+3)\left(2x^2-x+3\right)^{\frac{3}{2}}}{62\left(5x^2+3x+2\right)^2}+\frac{\left(1044x+\frac{831}{2}\right)\sqrt{2x^2-x+3}}{1922\left(5x^2+3x+2\right)}+\frac{1404928\cdot 2^{\frac{47}{114}}\cdot 3^{\frac{3}{19}}\sqrt{341}\cdot 5^{\frac{32}{57}}\cdot 7^{\frac{40}{57}}\left(\frac{206481}{2}+\frac{146949\sqrt{2}}{2}\right)\left(\frac{678975\sqrt{2}}{4}+\frac{969111}{4}\right)\operatorname{atan}\left(-\frac{5619712\cdot 2^{\frac{52}{57}}\cdot 3^{\frac{3}{19}}\sqrt{341}\cdot 5^{\frac{32}{57}}\cdot 7^{\frac{40}{57}}\left(x\left(-\frac{824043\sqrt{2}}{2}-\frac{2327061}{4}\cdots\right.\right.}{842926025390625\sqrt{2x^2-x+3}}\cdots\right.}{98016281158447265625}-\frac{\sqrt{682}\left(-\frac{678975\sqrt{2}}{4}+\frac{969111}{4}\right)\left(-\frac{146949\sqrt{2}}{2}+\frac{206481}{2}\right)\operatorname{atanh}\left(\frac{4\sqrt{341}\left(x\left(-\frac{2327061}{4}+\frac{824043\sqrt{2}}{2}\right)-\frac{969111}{4}+\frac{678975\sqrt{2}}{4}\right)}{1023\sqrt{-366990269+259509026\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{237910926\sqrt{-366990269+259509026\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] (10*x + 3)*(2*x**2 - x + 3)**(3/2)/(62*(5*x**2 + 3*x + 2)**2) + (
1044*x + 831/2)*sqrt(2*x**2 - x + 3)/(1922*(5*x**2 + 3*x + 2)) +
1404928*2**(47/114)*3**(3/19)*sqrt(341)*5**(32/57)*7**(40/57)*(20
6481/2 + 146949*sqrt(2)/2)*(678975*sqrt(2)/4 + 969111/4)*atan(-56
19712*2**(52/57)*3**(3/19)*sqrt(341)*5**(32/57)*7**(40/57)*(x*(-8
24043*sqrt(2)/2 - 2327061/4) - 969111/4 - 678975*sqrt(2)/4)/(8429
26025390625*sqrt(2*x**2 - x + 3)))/98016281158447265625 - sqrt(68
2)*(-678975*sqrt(2)/4 + 969111/4)*(-146949*sqrt(2)/2 + 206481/2)*
atanh(4*sqrt(341)*(x*(-2327061/4 + 824043*sqrt(2)/2) - 969111/4 +
 678975*sqrt(2)/4)/(1023*sqrt(-366990269 + 259509026*sqrt(2))*sqr
t(2*x**2 - x + 3)))/(237910926*sqrt(-366990269 + 259509026*sqrt(2
)))
```

Mathematica [C] time = 6.57501, size = 1171, normalized size = 5.25

$$\sqrt{2x^2-x+3}\left(\frac{11(13x+7)}{310\left(5x^2+3x+2\right)^2}+\frac{11680x+3163}{19220\left(5x^2+3x+2\right)}\right)-\frac{3i\left(-24971i+902\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(1789928800\sqrt{31}x^4+\cdots\right.}{-1305722486200i\sqrt{31}x^4+1536126024400x^4+64877256500i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-535663546990i\sqrt{31}x^3+42342\cdots}\cdots\right.}{\cdots}-\frac{3i\left(24971i+902\sqrt{31}\right)\tanh^{-1}\left(\frac{11\left(5044344800\sqrt{31}x^4+56\cdots\right.}{1305722486200\sqrt{31}x^4-1536126024400ix^4+356824910750\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+535663546990\sqrt{31}x^3-4234217\cdots}\cdots\right.}{\cdots}+\frac{3i\left(24971i+902\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{7688\sqrt{682\left(-13+i\sqrt{31}\right)}}-\frac{3\left(-24971i+902\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{7688\sqrt{682\left(13+i\sqrt{31}\right)}}-\frac{3i\left(24971i+902\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix\cdots\right.\right.}{7688\sqrt{682\left(-13+i\sqrt{31}\right)}}+\frac{3\left(-24971i+902\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix\cdots\right.\right.}{7688\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(3/2)/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((11*(7 + 13*x))/(310*(2 + 3*x + 5*x^2)^2) +
(3163 + 11680*x)/(19220*(2 + 3*x + 5*x^2))) - (((3*I)/3844)*(-249
71*I + 902*Sqrt[31])*ArcTan[(31*(31227856109*I + 25278538857*Sqrt
[31] - (148151300773*I)*x + 8050492021*Sqrt[31]*x + (158238605196
*I)*x^2 + 14045028558*Sqrt[31]*x^2 - (151681537680*I)*x^3 + 10089
483360*Sqrt[31]*x^3 + (56810945600*I)*x^4 + 1789928800*Sqrt[31]*x
^4))/(1329350472021 + (251835138467*I)*Sqrt[31] + 7060303464863*x
 - (560818641999*I)*Sqrt[31]*x + 689282588324*x^2 - (145761395980
2*I)*Sqrt[31]*x^2 + 4234217180380*x^3 - (535663546990*I)*Sqrt[31]
*x^3 + 1536126024400*x^4 - (1305722486200*I)*Sqrt[31]*x^4 - (6487
725650*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (1621
9314125*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (2
2707039775*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2]
 + (64877256500*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2
*x^2])])/Sqrt[682*(13 + I*Sqrt[31])] - (((3*I)/3844)*(24971*I + 9
02*Sqrt[31])*ArcTanh[(11*(1091580705511*I + 71239518597*Sqrt[31]
+ (1296309231133*I)*x + 22687750241*Sqrt[31]*x + (1456138041834*I
)*x^2 + 39581444118*Sqrt[31]*x^2 - (1365505300720*I)*x^3 + 284339
98560*Sqrt[31]*x^3 + (562393146150*I)*x^4 + 5044344800*Sqrt[31]*x
^4))/(-1329350472021*I - 251835138467*Sqrt[31] - (7060303464863*I
)*x + 560818641999*Sqrt[31]*x - (689282588324*I)*x^2 + 1457613959
802*Sqrt[31]*x^2 - (4234217180380*I)*x^3 + 535663546990*Sqrt[31]*
x^3 - (1536126024400*I)*x^4 + 1305722486200*Sqrt[31]*x^4 - 408726
715950*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 47036010
9625*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 80772184
3425*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 356824
910750*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqr
t[682*(-13 + I*Sqrt[31])] - (3*(-24971*I + 902*Sqrt[31])*Log[(-3*
I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(7688*
Sqrt[682*(13 + I*Sqrt[31])]) + (((3*I)/7688)*(24971*I + 902*Sqrt[
31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*
x)^2])/Sqrt[682*(-13 + I*Sqrt[31])] - (((3*I)/7688)*(24971*I + 90
2*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)
*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(
-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*
Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31])]
+ (3*(-24971*I + 902*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 6
6*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[3
1]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] +
(22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(7688*
Sqrt[682*(13 + I*Sqrt[31])])
```

Maple [B] time = 0.373, size = 81415, normalized size = 365.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(3/2)/(5*x^2+3*x+2)^3,x)
```

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

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

$$\int \frac{\left(2\,x^2 - x + 3\right)^{\frac{3}{2}}}{\left(5\,x^2 + 3\,x + 2\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3, x)
```

Fricas [A] time = 0.367025, size = 1601, normalized size = 7.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] 1/28767113409191937472*sqrt(129754513)*232562^(3/4)*sqrt(31)*(8*s
qrt(129754513)*232562^(1/4)*sqrt(31)*(6062130847360*x^3 + 5278932
606892*x^2 - 366990269*sqrt(2)*(11680*x^3 + 10171*x^2 + 8343*x +
2220) + 4330167607836*x + 1152220075440)*sqrt(2*x^2 - x + 3)*sqrt
((366990269*sqrt(2) - 519018052)/(190474574519335988*sqrt(2) - 26
9371726691629713)) + 189113268*sqrt(129754513)*sqrt(2)*(25*x^4 +
30*x^3 + 29*x^2 + 12*x + 4)*arctan(31*(sqrt(129754513)*232562^(1/
4)*(366990269*sqrt(2)*(x - 6) - 519018052*x + 3114108312)*sqrt((3
66990269*sqrt(2) - 519018052)/(190474574519335988*sqrt(2) - 26937
1726691629713)) + 44*sqrt(129754513)*sqrt(2*x^2 - x + 3)*(20575*s
qrt(2) - 29367))/(2*sqrt(129754513)*232562^(1/4)*sqrt(31)*(366990
269*sqrt(2)*x - 519018052*x)*sqrt(-sqrt(2)*(46*232562^(1/4)*sqrt(
2*x^2 - x + 3)*(sqrt(2)*(386989138339976299220055293849*x + 16029
61495914960605820879462277) - 547285287931472359802143240076*x - 2
2669298874848023863796734762 2)*sqrt((366990269*sqrt(2) - 51901805
2)/(190474574519335988*sqrt(2) - 269371726691629713)) + 492119618
377005305669981891 20*x^2 + sqrt(2)*(137010575570870795328574503 80
*x^2 - 197716545062110269247518173*sqrt(2)*(49*x^2 - 151*x + 200)
 - 4222162634939079611145867362 0*x + 559226839064778756443161240 0
0) - 173990559654657036937815992 24*sqrt(2)*(2*x^2 - x + 3) - 2460
598091885026528349909456 0*x + 738179427565507958504972836 80)/(197
716545062110269247518173*sqrt(2)*x^2 - 279613419532389378221580 62
0*x^2))*sqrt((366990269*sqrt(2) - 519018052)/(190474574519335988*
sqrt(2) - 269371726691629713)) + sqrt(129754513)*232562^(1/4)*sqr
t(31)*(366990269*sqrt(2)*(19*x - 22) - 9861342988*x + 11418397144
)*sqrt((366990269*sqrt(2) - 519018052)/(190474574519335988*sqrt(2
) - 269371726691629713)) - 1364*sqrt(129754513)*sqrt(31)*sqrt(2*x
^2 - x + 3)*(4453*sqrt(2) - 6257))) + 189113268*sqrt(129754513)*s
qrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(-31*(sqrt(129
754513)*232562^(1/4)*(366990269*sqrt(2)*(x - 6) - 519018052*x + 3
114108312)*sqrt((366990269*sqrt(2) - 519018052)/(190474574519335 9
88*sqrt(2) - 269371726691629713)) - 44*sqrt(129754513)*sqrt(2*x^2
 - x + 3)*(20575*sqrt(2) - 29367))/(2*sqrt(129754513)*232562^(1/4
)*sqrt(31)*(366990269*sqrt(2)*x - 519018052*x)*sqrt(sqrt(2)*(46*2
32562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(3869891383399762992200 5
5293849*x + 1602961495914960605820879462277) - 547285287931472359 8
02143240076*x - 22669298874848023863796734762 2)*sqrt((366990269*s
qrt(2) - 519018052)/(190474574519335988*sqrt(2) - 269371726691629
713)) - 492119618377005305669981891 20*x^2 - sqrt(2)*(13701057557 0
870795328574503 80*x^2 - 197716545062110269247518173*sqrt(2)*(49*x
^2 - 151*x + 200) - 4222162634939079611145867362 0*x + 55922683906
4778756443161240 00) + 173990559654657036937815992 24*sqrt(2)*(2*x^
2 - x + 3) + 2460598091885026528349909456 0*x - 738179427565507958
50497283680)/(197716545062110269247518173*sqrt(2)*x^2 - 279613419
532389378221580620*x^2))*sqrt((366990269*sqrt(2) - 519018052)/(19
0474574519335988*sqrt(2) - 269371726691629713)) + sqrt(129754513)
*232562^(1/4)*sqrt(31)*(366990269*sqrt(2)*(19*x - 22) - 986134298
8*x + 11418397144)*sqrt((366990269*sqrt(2) - 519018052)/(19047457
4519335988*sqrt(2) - 269371726691629713)) + 1364*sqrt(129754513)*
sqrt(31)*sqrt(2*x^2 - x + 3)*(4453*sqrt(2) - 6257))) + 3*sqrt(129
754513)*sqrt(31)*(12975451300*x^4 + 15570541560*x^3 + 15051523508
*x^2 - 366990269*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) +
6228216624*x + 2076072208)*log(-6061044111792180 84*sqrt(2)*(46*23
2562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(386989138339976299220055
293849*x + 1602961495914960605820879462277) - 547285287931472359 80
```

```
2143240076*x - 2266929887484802386379673476 22)*sqrt((366990269*sq
rt(2) - 519018052)/(190474574519335988*sqrt(2) - 2693717266916297
13)) + 4921196183770053056699818912 0*x^2 + sqrt(2)*(1370105755708
7079532857450380*x^2 - 19771654506211026924751817 3*sqrt(2)*(49*x^
2 - 151*x + 200) - 4222162634939079611145867362 0*x + 559226839064
77875644316124000) - 17399055965465703693781599224*sqrt(2)*(2*x^2
 - x + 3) - 24605980918850265283499094560*x + 7381794275655079585
0497283680)/(19771654506211026924751817 3*sqrt(2)*x^2 - 2796134195
32389378221580620*x^2)) - 3*sqrt(129754513)*sqrt(31)*(12975451300
*x^4 + 15570541560*x^3 + 15051523508*x^2 - 366990269*sqrt(2)*(25*
x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 6228216624*x + 2076072208)*lo
g(606104411179218084*sqrt(2)*(46*232562^(1/4)*sqrt(2*x^2 - x + 3)
*(sqrt(2)*(386989138339976299220055293849*x + 1602961495914960605
82087946227) - 547285287931472359802143240076*x - 226692988748480
238637967347622)*sqrt((366990269*sqrt(2) - 519018052)/(1904745745
19335988*sqrt(2) - 269371726691629713)) - 4921196183770053056699 8
189120*x^2 - sqrt(2)*(13701057557087079532857450380*x^2 - 1977165
450621102692475181 73*sqrt(2)*(49*x^2 - 151*x + 200) - 42221626349
390796111458673620*x + 55922683906477875644316124000) + 173990559
65465703693781599224*sqrt(2)*(2*x^2 - x + 3) + 246059809188502652
83499094560*x - 73817942756550795850497283680)/(19771654506211026
9247518173*sqrt(2)*x^2 - 279613419532389378221580620*x^2)))/((129
75451300*x^4 + 15570541560*x^3 + 15051523508*x^2 - 366990269*sqrt
(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 6228216624*x + 207607
2208)*sqrt((366990269*sqrt(2) - 519018052)/(190474574519335988*sq
rt(2) - 269371726691629713)))
```

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

$$\int \frac{\left(2x^2 - x + 3\right)^{\frac{3}{2}}}{\left(5x^2 + 3x + 2\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**3,x)

[Out] Integral((2*x**2 - x + 3)**(3/2)/(5*x**2 + 3*x + 2)**3, x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x^2 - x + 3)^(3/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")

[Out] Exception raised: RuntimeError
```

3.72 $\int \left(3-x+2x^2\right)^{5/2} \left(2+3x+5x^2\right)^4 \, dx$

Optimal. Leaf size=254

$$\frac{122595067 \left(2x^2-x+3\right)^{7/2} x^2}{19169280} + \frac{112244125 \left(2x^2-x+3\right)^{7/2} x}{122683392} + \frac{25250178739 \left(2x^2-x+3\right)^{7/2}}{5725224960} - \frac{401135647(1-4x) \left(2x^2-x+3\right)^{5/2}}{335544320} - \frac{9226119881(1-4x) \left(2x^2-x+3\right)^{3/2}}{2147483648} - \frac{636602271789(1-4x)\sqrt{2x^2-x+3}}{34359738368}$$

$$+ \frac{625}{28} \left(2x^2-x+3\right)^{7/2} x^7 + \frac{13875}{208} \left(2x^2-x+3\right)^{7/2} x^6 + \frac{1046225 \left(2x^2-x+3\right)^{7/2} x^5}{9984} + \frac{3684995 \left(2x^2-x+3\right)^{7/2} x^4}{39936} + 23460839 (\ldots$$

```
[Out] (-636602271789*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/34359738368 - (9226
119881*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/2147483648 - (401135647*(
1 - 4*x)*(3 - x + 2*x^2)^(5/2))/335544320 + (25250178739*(3 - x +
 2*x^2)^(7/2))/5725224960 + (112244125*x*(3 - x + 2*x^2)^(7/2))/1
22683392 + (122595067*x^2*(3 - x + 2*x^2)^(7/2))/19169280 + (2346
0839*x^3*(3 - x + 2*x^2)^(7/2))/532480 + (3684995*x^4*(3 - x + 2*
x^2)^(7/2))/39936 + (1046225*x^5*(3 - x + 2*x^2)^(7/2))/9984 + (1
3875*x^6*(3 - x + 2*x^2)^(7/2))/208 + (625*x^7*(3 - x + 2*x^2)^(7
/2))/28 - (14641852251147*ArcSinh[(1 - 4*x)/Sqrt[23]])/(687194767
36*Sqrt[2])
```

Rubi [A] time = 0.604329, antiderivative size = 254, normalized size of antiderivative = 1., number of steps used = 13, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{122595067 \left(2x^2-x+3\right)^{7/2} x^2}{19169280} + \frac{112244125 \left(2x^2-x+3\right)^{7/2} x}{122683392} + \frac{25250178739 \left(2x^2-x+3\right)^{7/2}}{5725224960} - \frac{401135647(1-4x) \left(2x^2-x+3\right)^{5/2}}{335544320} - \frac{9226119881(1-4x) \left(2x^2-x+3\right)^{3/2}}{2147483648} - \frac{636602271789(1-4x)\sqrt{2x^2-x+3}}{34359738368}$$

$$+ \frac{625}{28} \left(2x^2-x+3\right)^{7/2} x^7 + \frac{13875}{208} \left(2x^2-x+3\right)^{7/2} x^6 + \frac{1046225 \left(2x^2-x+3\right)^{7/2} x^5}{9984} + \frac{3684995 \left(2x^2-x+3\right)^{7/2} x^4}{39936} + 23460839 (\ldots$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (-636602271789*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/34359738368 - (9226
119881*(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/2147483648 - (401135647*(
1 - 4*x)*(3 - x + 2*x^2)^(5/2))/335544320 + (25250178739*(3 - x +
 2*x^2)^(7/2))/5725224960 + (112244125*x*(3 - x + 2*x^2)^(7/2))/1
22683392 + (122595067*x^2*(3 - x + 2*x^2)^(7/2))/19169280 + (2346
0839*x^3*(3 - x + 2*x^2)^(7/2))/532480 + (3684995*x^4*(3 - x + 2*
x^2)^(7/2))/39936 + (1046225*x^5*(3 - x + 2*x^2)^(7/2))/9984 + (1
3875*x^6*(3 - x + 2*x^2)^(7/2))/208 + (625*x^7*(3 - x + 2*x^2)^(7
/2))/28 - (14641852251147*ArcSinh[(1 - 4*x)/Sqrt[23]])/(687194767
36*Sqrt[2])
```

Rubi in Sympy [A] time = 128.005, size = 246, normalized size = 0.97

$$-\frac{\left(-\frac{68243649705x}{8}+\frac{362629622751}{32}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^3}{21621600000}-\frac{\left(-\frac{945065x}{2}+\frac{11877899}{8}\right)\left(2x^2-x+3\right)^{\frac{5}{2}}\left(5x^2+3x+2\right)^3}{4804800}-\frac{636602271789\left(-4x+1\right)\sqrt{2x^2-x+3}}{34359738368}+\frac{\left(130x+\frac{309}{2}\right)\left(2x^2-x+3\right)^{\frac{7}{2}}\left(5x^2+3x+2\right)^3}{728}+\frac{\left(\frac{1719653051422845x}{32}+\frac{2254414002500583}{128}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^2}{24216192000000}+\frac{\left(\frac{7211421563490750375x}{128}+\frac{41400525906772259535}{512}\right)\left(-\frac{288456862539630015x^2}{256}-\frac{382553649481777389x}{256}+\frac{30255323481274815}{128}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{3274371922020603774470100000000}+\frac{\left(\frac{52558098024608188084793573247595880295x}{131072}+\frac{1598024049869061092244937230038073366225}{524288}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{157169852256988981174564800000000}+\frac{14641852251147\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{137438953472}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**4,x)
```

```
[Out] -(-68243649705*x/8 + 362629622751/32)*(2*x**2 - x + 3)**(3/2)*(5*
x**2 + 3*x + 2)**3/21621600000 - (-945065*x/2 + 11877899/8)*(2*x*
*2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**3/4804800 - 636602271789*(
-4*x + 1)*sqrt(2*x**2 - x + 3)/34359738368 + (130*x + 309/2)*(2*x
**2 - x + 3)**(7/2)*(5*x**2 + 3*x + 2)**3/728 + (1719653051422845
*x/32 + 2254414002500583/128)*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3
*x + 2)**2/24216192000000 + (7211421563490750375*x/128 + 41400525
906772259535/512)*(-288456862539630015*x**2/256 - 382553649481777
389*x/256 + 30255323481274815/128)*(2*x**2 - x + 3)**(3/2)/327437
1922020603774470100000000 + (525580980246081880847935732475958802
95*x/131072 + 1598024049869061092244937230038073366225/524288)*(2
*x**2 - x + 3)**(3/2)/157169852256988981174564800000000 + 1464185
2251147*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))
/137438953472
```

Mathematica [A] time = 0.15309, size = 105, normalized size = 0.41

$$\frac{59958384968446965\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)+4\sqrt{2x^2-x+3}\left(25125558681600000x^{13}+37398427729920000x^{12}+137233466130\ldots\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^4,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(10820567498568669 + 12071614275862524*x +
 50064174038215008*x^2 + 142490931553577856*x^3 + 257786732552566
784*x^4 + 405468382284161024*x^5 + 485091164642279424*x^6 + 53050
2956133122048*x^7 + 439064558846345216*x^8 + 363646430503501824*x
^9 + 204932411660697600*x^10 + 137233466130432000*x^11 + 37398427
729920000*x^12 + 25125558681600000*x^13) + 59958384968446965*Sqrt
[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/562812514467840
```

Maple [A] time = 0.054, size = 204, normalized size = 0.8

$$\frac{1604542588\,x-401135647}{335544320}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{36904479524\,x-9226119881}{2147483648}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{2546409087156\,x-636602271789}{34359738368}\sqrt{2\,x^2-x+3}+\frac{14641852251147\,\sqrt{2}}{137438953472}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{25250178739}{5725224960}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{112244125\,x}{122683392}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{122595067\,x^2}{19169280}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{23460839\,x^3}{532480}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{3684995\,x^4}{39936}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{1046225\,x^5}{9984}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{13875\,x^6}{208}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{625\,x^7}{28}\left(2\,x^2-x+3\right)^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2)^4,x)
```

```
[Out] 401135647/335544320*(4*x-1)*(2*x^2-x+3)^(5/2)+9226119881/21474836
48*(4*x-1)*(2*x^2-x+3)^(3/2)+636602271789/34359738368*(4*x-1)*(2*
x^2-x+3)^(1/2)+14641852251147/137438953472*2^(1/2)*arcsinh(4/23*2
3^(1/2)*(x-1/4))+25250178739/5725224960*(2*x^2-x+3)^(7/2)+1122441
25/122683392*x*(2*x^2-x+3)^(7/2)+122595067/19169280*x^2*(2*x^2-x+
3)^(7/2)+23460839/532480*x^3*(2*x^2-x+3)^(7/2)+3684995/39936*x^4*
(2*x^2-x+3)^(7/2)+1046225/9984*x^5*(2*x^2-x+3)^(7/2)+13875/208*x^
6*(2*x^2-x+3)^(7/2)+625/28*x^7*(2*x^2-x+3)^(7/2)
```

Maxima [A] time = 0.799668, size = 317, normalized size = 1.25

$$\frac{625}{28}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^7+\frac{13875}{208}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^6+\frac{1046225}{9984}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^5+\frac{3684995}{39936}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^4+\frac{23460839}{532480}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^3+\frac{122595067}{19169280}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^2+\frac{112244125}{122683392}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x+\frac{25250178739}{5725224960}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{401135647}{83886080}\left(2\,x^2-x+3\right)^{\frac{5}{2}}x-\frac{401135647}{335544320}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{9226119881}{536870912}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x-\frac{9226119881}{2147483648}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{636602271789}{8589934592}\sqrt{2\,x^2-x+3}x+\frac{14641852251147}{137438953472}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{636602271789}{34359738368}\sqrt{2\,x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 625/28*(2*x^2 - x + 3)^(7/2)*x^7 + 13875/208*(2*x^2 - x + 3)^(7/2
)*x^6 + 1046225/9984*(2*x^2 - x + 3)^(7/2)*x^5 + 3684995/39936*(2
*x^2 - x + 3)^(7/2)*x^4 + 23460839/532480*(2*x^2 - x + 3)^(7/2)*x
^3 + 122595067/19169280*(2*x^2 - x + 3)^(7/2)*x^2 + 112244125/122
683392*(2*x^2 - x + 3)^(7/2)*x + 25250178739/5725224960*(2*x^2 -
x + 3)^(7/2) + 401135647/83886080*(2*x^2 - x + 3)^(5/2)*x - 40113
5647/335544320*(2*x^2 - x + 3)^(5/2) + 9226119881/536870912*(2*x^
2 - x + 3)^(3/2)*x - 9226119881/2147483648*(2*x^2 - x + 3)^(3/2)
+ 636602271789/8589934592*sqrt(2*x^2 - x + 3)*x + 14641852251147/
137438953472*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 636602271
789/34359738368*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.292602, size = 170, normalized size = 0.67

$$\frac{1}{1125625028935680}\sqrt{2}\Big(4\,\sqrt{2}\big(25125558681600000\,x^{13}+37398427729920000\,x^{12}+137233466130432000\,x^{11}+20493241166$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/1125625028935680*sqrt(2)*(4*sqrt(2)*(25125558681600000*x^13 + 3
7398427729920000*x^12 + 137233466130432000*x^11 + 204932411660697
600*x^10 + 363646430503501824*x^9 + 439064558846345216*x^8 + 5305
02956133122048*x^7 + 485091164642279424*x^6 + 405468382284161024*
x^5 + 257786732552566784*x^4 + 142490931553577856*x^3 + 500641740
38215008*x^2 + 12071614275862524*x + 10820567498568669)*sqrt(2*x^
2 - x + 3) + 59958384968446965*log(-sqrt(2)*(32*x^2 - 16*x + 25)
- 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int \left(2x^2 - x + 3\right)^{\frac{5}{2}} \left(5x^2 + 3x + 2\right)^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**4,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**4, x)
```

GIAC/XCAS [A] time = 0.273533, size = 153, normalized size = 0.6

$$\frac{1}{140703128616960}(4(8(4(16(4(8(4(32(12(200(20(240(260x+387)x+340823)x+10179103)x+3612502719)x+523405$$
$$-\frac{14641852251147}{137438953472}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] 1/140703128616960*(4*(8*(4*(16*(4*(8*(4*(32*(12*(200*(20*(240*(26
0*x + 387)*x + 340823)*x + 10179103)*x + 3612502719)*x + 52340574
127)*x + 2023708176167)*x + 7401903757359)*x + 49495652134297)*x
+ 125872428004183)*x + 1113210402762327)*x + 1564505438694219)*x
+ 3017903568965631)*x + 10820567498568669)*sqrt(2*x^2 - x + 3) -
14641852251147/137438953472*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sq
rt(2*x^2 - x + 3)) + 1)
```

3.73 $\int \left(3-x+2x^2\right)^{5/2} \left(2+3x+5x^2\right)^3 \, dx$

Optimal. Leaf size=212

$$\frac{80483\left(2x^2-x+3\right)^{7/2}x^2}{9216}+\frac{509257\left(2x^2-x+3\right)^{7/2}x}{294912}-\frac{1696165\left(2x^2-x+3\right)^{7/2}}{2752512}-\frac{57915(1-4x)\left(2x^2-x+3\right)^{5/2}}{2097152}-\frac{6660225(1-4x)\left(2x^2-x+3\right)^{3/2}}{67108864}-\frac{459555525(1-4x)\sqrt{2x^2-x+3}}{1073741824}+\frac{125}{24}\left(2x^2-x+3\right)^{7/2}x^5+\frac{1175}{96}\left(2x^2-x+3\right)^{7/2}x^4+\frac{3823}{256}\left(2x^2-x+3\right)^{7/2}x^3-\frac{10569777075\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2147483648\sqrt{2}}$$

```
[Out] (-459555525*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1073741824 - (6660225*
(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/67108864 - (57915*(1 - 4*x)*(3 -
 x + 2*x^2)^(5/2))/2097152 - (1696165*(3 - x + 2*x^2)^(7/2))/2752
512 + (509257*x*(3 - x + 2*x^2)^(7/2))/294912 + (80483*x^2*(3 - x
 + 2*x^2)^(7/2))/9216 + (3823*x^3*(3 - x + 2*x^2)^(7/2))/256 + (1
175*x^4*(3 - x + 2*x^2)^(7/2))/96 + (125*x^5*(3 - x + 2*x^2)^(7/2
))/24 - (10569777075*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2147483648*Sqr
t[2])
```

Rubi [A] time = 0.369172, antiderivative size = 212, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{80483\left(2x^2-x+3\right)^{7/2}x^2}{9216}+\frac{509257\left(2x^2-x+3\right)^{7/2}x}{294912}-\frac{1696165\left(2x^2-x+3\right)^{7/2}}{2752512}-\frac{57915(1-4x)\left(2x^2-x+3\right)^{5/2}}{2097152}-\frac{6660225(1-4x)\left(2x^2-x+3\right)^{3/2}}{67108864}-\frac{459555525(1-4x)\sqrt{2x^2-x+3}}{1073741824}+\frac{125}{24}\left(2x^2-x+3\right)^{7/2}x^5+\frac{1175}{96}\left(2x^2-x+3\right)^{7/2}x^4+\frac{3823}{256}\left(2x^2-x+3\right)^{7/2}x^3-\frac{10569777075\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2147483648\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (-459555525*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/1073741824 - (6660225*
(1 - 4*x)*(3 - x + 2*x^2)^(3/2))/67108864 - (57915*(1 - 4*x)*(3 -
 x + 2*x^2)^(5/2))/2097152 - (1696165*(3 - x + 2*x^2)^(7/2))/2752
512 + (509257*x*(3 - x + 2*x^2)^(7/2))/294912 + (80483*x^2*(3 - x
 + 2*x^2)^(7/2))/9216 + (3823*x^3*(3 - x + 2*x^2)^(7/2))/256 + (1
175*x^4*(3 - x + 2*x^2)^(7/2))/96 + (125*x^5*(3 - x + 2*x^2)^(7/2
))/24 - (10569777075*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2147483648*Sqr
t[2])
```

Rubi in Sympy [A] time = 96.8315, size = 221, normalized size = 1.04

$$-\frac{32\left(-\frac{12567702364502818458541932241695x}{8192}+\frac{5982091748009989536759139882665}{32768}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(\frac{3139688559102733218339x^2}{1024}+\frac{2492126897929380\ldots}{1024}\right.}{7844060888663380369127335209622566358625214375}$$
$$-\frac{\left(-\frac{647955x}{2}+\frac{5493279}{8}\right)\left(2x^2-x+3\right)^{\frac{5}{2}}\left(5x^2+3x+2\right)^2}{2376000}$$
$$-\frac{459555525(-4x+1)\sqrt{2x^2-x+3}}{1073741824}+\frac{\left(110x+\frac{253}{2}\right)\left(2x^2-x+3\right)^{\frac{7}{2}}\left(5x^2+3x+2\right)^2}{528}$$
$$+\frac{\left(\frac{28019950035x}{8}+\frac{111669293241}{32}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}\left(\frac{800570001x^2}{16}-\frac{390192693x}{16}+\frac{62395707}{8}\right)^2}{666228363397935031039500}$$
$$-\frac{2\left(\frac{4592512541975180182314768057999433328279346523437598275x}{33554432}+\frac{15162300112699042851601654176430304348808713213789752725}{134217728}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{23532182665990141107382005628867699075875643125}$$
$$+\frac{10569777075\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{4294967296}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**3,x)
```

```
[Out] -32*(-12567702364502818458541932241695*x/8192 + 59820917480099895
36759139882665/32768)*(2*x**2 - x + 3)**(3/2)*(313968855910273321
8339*x**2/1024 + 249212689792938092133*x/1024 + 11017646836331706
44703/512)/7844060888663380369127335209622566358625214375 - (-647
955*x/2 + 5493279/8)*(2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**
2/2376000 - 459555525*(-4*x + 1)*sqrt(2*x**2 - x + 3)/1073741824
+ (110*x + 253/2)*(2*x**2 - x + 3)**(7/2)*(5*x**2 + 3*x + 2)**2/5
28 + (28019950035*x/8 + 111669293241/32)*(2*x**2 - x + 3)**(3/2)*
(800570001*x**2/16 - 390192693*x/16 + 62395707/8)**2/666228363397
935031039500 - 2*(45925125419751801823147680579994333282793465234
37598275*x/33554432 + 1516230011269904285160165417643030434880871
3213789752725/134217728)*(2*x**2 - x + 3)**(3/2)/2353218266599014
1107382005628867699075875643125 + 10569777075*sqrt(2)*atanh(sqrt(
2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/4294967296
```

Mathematica [A] time = 0.125707, size = 95, normalized size = 0.45

$$\frac{665895955725\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)+4\sqrt{2x^2-x+3}\left(2818572288000x^{11}+2395786444800x^{10}+12943588589568x^9+1434189\ldots\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(-1191399152715 + 4560943728924*x + 100607
31582048*x^2 + 20384824684416*x^3 + 26186527209472*x^4 + 34378613
923840*x^5 + 28347538538496*x^6 + 27835561148416*x^7 + 1434189404
5696*x^8 + 12943588589568*x^9 + 2395786444800*x^10 + 281857228800
0*x^11) + 665895955725*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/2705
82939648
```

Maple [A] time = 0.01, size = 170, normalized size = 0.8

$$\frac{231660x-57915}{2097152}\left(2x^2-x+3\right)^{\frac{5}{2}}+\frac{26640900x-6660225}{67108864}\left(2x^2-x+3\right)^{\frac{3}{2}}+\frac{1838222100x-459555525}{1073741824}\sqrt{2x^2-x+3}+\frac{10569777075\sqrt{2}}{4294967296}\mathit{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)-\frac{1696165}{2752512}\left(2x^2-x+3\right)^{\frac{7}{2}}+\frac{509257x}{294912}\left(2x^2-x+3\right)^{\frac{7}{2}}+\frac{80483x^2}{9216}\left(2x^2-x+3\right)^{\frac{7}{2}}+\frac{3823x^3}{256}\left(2x^2-x+3\right)^{\frac{7}{2}}+\frac{1175x^4}{96}\left(2x^2-x+3\right)^{\frac{7}{2}}+\frac{125x^5}{24}\left(2x^2-x+3\right)^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2)^3,x)
```

```
[Out] 57915/2097152*(4*x-1)*(2*x^2-x+3)^(5/2)+6660225/67108864*(4*x-1)*
(2*x^2-x+3)^(3/2)+459555525/1073741824*(4*x-1)*(2*x^2-x+3)^(1/2)+
10569777075/4294967296*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-169
6165/2752512*(2*x^2-x+3)^(7/2)+509257/294912*x*(2*x^2-x+3)^(7/2)+
80483/9216*x^2*(2*x^2-x+3)^(7/2)+3823/256*x^3*(2*x^2-x+3)^(7/2)+1
175/96*x^4*(2*x^2-x+3)^(7/2)+125/24*x^5*(2*x^2-x+3)^(7/2)
```

Maxima [A] time = 0.790145, size = 271, normalized size = 1.28

$$\frac{125}{24}\left(2x^2-x+3\right)^{\frac{7}{2}}x^5+\frac{1175}{96}\left(2x^2-x+3\right)^{\frac{7}{2}}x^4+\frac{3823}{256}\left(2x^2-x+3\right)^{\frac{7}{2}}x^3+\frac{80483}{9216}\left(2x^2-x+3\right)^{\frac{7}{2}}x^2+\frac{509257}{294912}\left(2x^2-x+3\right)^{\frac{7}{2}}x-\frac{1696165}{2752512}\left(2x^2-x+3\right)^{\frac{7}{2}}+\frac{57915}{524288}\left(2x^2-x+3\right)^{\frac{5}{2}}x-\frac{57915}{2097152}\left(2x^2-x+3\right)^{\frac{5}{2}}+\frac{6660225}{16777216}\left(2x^2-x+3\right)^{\frac{3}{2}}x-\frac{6660225}{67108864}\left(2x^2-x+3\right)^{\frac{3}{2}}+\frac{459555525}{268435456}\sqrt{2x^2-x+3x}+\frac{10569777075}{4294967296}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{459555525}{1073741824}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 125/24*(2*x^2 - x + 3)^(7/2)*x^5 + 1175/96*(2*x^2 - x + 3)^(7/2)*
x^4 + 3823/256*(2*x^2 - x + 3)^(7/2)*x^3 + 80483/9216*(2*x^2 - x
+ 3)^(7/2)*x^2 + 509257/294912*(2*x^2 - x + 3)^(7/2)*x - 1696165/
2752512*(2*x^2 - x + 3)^(7/2) + 57915/524288*(2*x^2 - x + 3)^(5/2
)*x - 57915/2097152*(2*x^2 - x + 3)^(5/2) + 6660225/16777216*(2*x
^2 - x + 3)^(3/2)*x - 6660225/67108864*(2*x^2 - x + 3)^(3/2) + 45
9555525/268435456*sqrt(2*x^2 - x + 3)*x + 10569777075/4294967296*
sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 459555525/1073741824*s
qrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.286218, size = 157, normalized size = 0.74

$$\frac{1}{541165879296}\sqrt{2}\Big(4\sqrt{2}\big(2818572288000x^{11}+2395786444800x^{10}+12943588589568x^9+14341894045696x^8+278355611$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/541165879296*sqrt(2)*(4*sqrt(2)*(2818572288000*x^11 + 239578644
4800*x^10 + 12943588589568*x^9 + 14341894045696*x^8 + 27835561148
```

```
416*x^7 + 28347538538496*x^6 + 34378613923840*x^5 + 2618652720947
2*x^4 + 20384824684416*x^3 + 10060731582048*x^2 + 4560943728924*x
 - 1191399152715)*sqrt(2*x^2 - x + 3) + 665895955725*log(-sqrt(2)
*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int \left(2x^2 - x + 3\right)^{\frac{5}{2}} \left(5x^2 + 3x + 2\right)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**3,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**3, x)
```

GIAC/XCAS [A] time = 0.273106, size = 139, normalized size = 0.66

$$\frac{1}{67645734912}\left(4\left(8\left(4\left(16\left(4\left(8\left(28\left(32\left(12\left(200\left(20x + 17\right)x + 18369\right)x + 244241\right)x + 15169177\right)x + 432549111\right)x + 4196608145\right.\right.\right.\right.\right.\right.\right.\right.\right.$$
$$- \frac{10569777075}{4294967296}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] 1/67645734912*(4*(8*(4*(16*(4*(8*(28*(32*(12*(200*(20*x + 17)*x +
 18369)*x + 244241)*x + 15169177)*x + 432549111)*x + 4196608145)*
x + 12786390239)*x + 159256442847)*x + 314397861939)*x + 11402359
32231)*x - 1191399152715)*sqrt(2*x^2 - x + 3) - 10569777075/42949
67296*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1
)
```

3.74 $\int \left(3-x+2x^2\right)^{5/2}\left(2+3x+5x^2\right)^2\,dx$

Optimal. Leaf size=170

$$\frac{305}{144}x^2\left(2x^2-x+3\right)^{7/2}+\frac{8467x\left(2x^2-x+3\right)^{7/2}}{4608}+\frac{23225\left(2x^2-x+3\right)^{7/2}}{43008}-\frac{1547(1-4x)\left(2x^2-x+3\right)^{5/2}}{98304}-\frac{177905(1-4x)\left(2x^2-x+3\right)^{3/2}}{3145728}-\frac{4091815(1-4x)\sqrt{2x^2-x+3}}{16777216}+\frac{5}{4}x^3\left(2x^2-x+3\right)^{7/2}-\frac{94111745\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{33554432\sqrt{2}}$$

```
[Out] (-4091815*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/16777216 - (177905*(1 -
4*x)*(3 - x + 2*x^2)^(3/2))/3145728 - (1547*(1 - 4*x)*(3 - x + 2*
x^2)^(5/2))/98304 + (23225*(3 - x + 2*x^2)^(7/2))/43008 + (8467*x
*(3 - x + 2*x^2)^(7/2))/4608 + (305*x^2*(3 - x + 2*x^2)^(7/2))/14
4 + (5*x^3*(3 - x + 2*x^2)^(7/2))/4 - (94111745*ArcSinh[(1 - 4*x)
/Sqrt[23]])/(33554432*Sqrt[2])
```

Rubi [A] time = 0.233033, antiderivative size = 170, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{305}{144}x^2\left(2x^2-x+3\right)^{7/2}+\frac{8467x\left(2x^2-x+3\right)^{7/2}}{4608}+\frac{23225\left(2x^2-x+3\right)^{7/2}}{43008}-\frac{1547(1-4x)\left(2x^2-x+3\right)^{5/2}}{98304}-\frac{177905(1-4x)\left(2x^2-x+3\right)^{3/2}}{3145728}-\frac{4091815(1-4x)\sqrt{2x^2-x+3}}{16777216}+\frac{5}{4}x^3\left(2x^2-x+3\right)^{7/2}-\frac{94111745\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{33554432\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (-4091815*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/16777216 - (177905*(1 -
4*x)*(3 - x + 2*x^2)^(3/2))/3145728 - (1547*(1 - 4*x)*(3 - x + 2*
x^2)^(5/2))/98304 + (23225*(3 - x + 2*x^2)^(7/2))/43008 + (8467*x
*(3 - x + 2*x^2)^(7/2))/4608 + (305*x^2*(3 - x + 2*x^2)^(7/2))/14
4 + (5*x^3*(3 - x + 2*x^2)^(7/2))/4 - (94111745*ArcSinh[(1 - 4*x)
/Sqrt[23]])/(33554432*Sqrt[2])
```

Rubi in Sympy [A] time = 25.2146, size = 146, normalized size = 0.86

$$-\frac{\left(-\frac{83321x}{2}+\frac{4649}{8}\right)\left(2x^2-x+3\right)^{\frac{7}{2}}}{80640}-\frac{1547\left(-4x+1\right)\left(2x^2-x+3\right)^{\frac{5}{2}}}{98304}-\frac{177905\left(-4x+1\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{3145728}-\frac{4091815\left(-4x+1\right)\sqrt{2x^2-x+3}}{16777216}+\frac{\left(90x+\frac{197}{2}\right)\left(2x^2-x+3\right)^{\frac{7}{2}}\left(5x^2+3x+2\right)}{360}+\frac{94111745\sqrt{2}\,\mathrm{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{67108864}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**2,x)
```

```
[Out] -(-83321*x/2 + 4649/8)*(2*x**2 - x + 3)**(7/2)/80640 - 1547*(-4*x
 + 1)*(2*x**2 - x + 3)**(5/2)/98304 - 177905*(-4*x + 1)*(2*x**2 -
```

```
 x + 3)**(3/2)/3145728 - 4091815*(-4*x + 1)*sqrt(2*x**2 - x + 3)/
16777216 + (90*x + 197/2)*(2*x**2 - x + 3)**(7/2)*(5*x**2 + 3*x +
 2)/360 + 94111745*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2
 - x + 3)))/67108864
```

Mathematica [A] time = 0.110783, size = 85, normalized size = 0.5

$$\frac{4\sqrt{2x^2-x+3}\left(10569646080x^9+2055208960x^8+44163137536x^7+26401898496x^6+75389820928x^5+57147467776x^4+\right.}{4227858432}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(14824182519 + 39533249652*x + 42992644128
*x^2 + 77872272000*x^3 + 57147467776*x^4 + 75389820928*x^5 + 2640
1898496*x^6 + 44163137536*x^7 + 2055208960*x^8 + 10569646080*x^9)
 + 5929039935*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/4227858432
```

Maple [A] time = 0.01, size = 136, normalized size = 0.8

$$\frac{6188\,x-1547}{98304}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{711620\,x-177905}{3145728}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{16367260\,x-4091815}{16777216}\sqrt{2\,x^2-x+3}+\frac{94111745\,\sqrt{2}}{67108864}\mathit{Arcsinh}\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{23225}{43008}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{8467\,x}{4608}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{305\,x^2}{144}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{5\,x^3}{4}\left(2\,x^2-x+3\right)^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2)^2,x)
```

```
[Out] 1547/98304*(4*x-1)*(2*x^2-x+3)^(5/2)+177905/3145728*(4*x-1)*(2*x^
2-x+3)^(3/2)+4091815/16777216*(4*x-1)*(2*x^2-x+3)^(1/2)+94111745/
67108864*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+23225/43008*(2*x^
2-x+3)^(7/2)+8467/4608*x*(2*x^2-x+3)^(7/2)+305/144*x^2*(2*x^2-x+3
)^(7/2)+5/4*x^3*(2*x^2-x+3)^(7/2)
```

Maxima [A] time = 0.783013, size = 225, normalized size = 1.32

$$\frac{5}{4}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^3+\frac{305}{144}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x^2+\frac{8467}{4608}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x+\frac{23225}{43008}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{1547}{24576}\left(2\,x^2-x+3\right)^{\frac{5}{2}}x-\frac{1547}{98304}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{177905}{786432}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x-\frac{177905}{3145728}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{4091815}{4194304}\sqrt{2\,x^2-x+3}x+\frac{94111745}{67108864}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{4091815}{16777216}\sqrt{2\,x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 5/4*(2*x^2 - x + 3)^(7/2)*x^3 + 305/144*(2*x^2 - x + 3)^(7/2)*x^2
 + 8467/4608*(2*x^2 - x + 3)^(7/2)*x + 23225/43008*(2*x^2 - x + 3
)^(7/2) + 1547/24576*(2*x^2 - x + 3)^(5/2)*x - 1547/98304*(2*x^2
```

```
- x + 3)^(5/2) + 177905/786432*(2*x^2 - x + 3)^(3/2)*x - 177905/3
145728*(2*x^2 - x + 3)^(3/2) + 4091815/4194304*sqrt(2*x^2 - x + 3
)*x + 94111745/67108864*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1))
- 4091815/16777216*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.277675, size = 143, normalized size = 0.84

$$\frac{1}{8455716864}\sqrt{2}\Big(4\sqrt{2}\big(10569646080\,x^9 + 2055208960\,x^8 + 44163137536\,x^7 + 26401898496\,x^6 + 75389820928\,x^5 + 57147467$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/8455716864*sqrt(2)*(4*sqrt(2)*(10569646080*x^9 + 2055208960*x^8
 + 44163137536*x^7 + 26401898496*x^6 + 75389820928*x^5 + 57147467
776*x^4 + 77872272000*x^3 + 42992644128*x^2 + 39533249652*x + 148
24182519)*sqrt(2*x^2 - x + 3) + 5929039935*log(-sqrt(2)*(32*x^2 -
 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int \left(2x^2 - x + 3\right)^{\frac{5}{2}} \left(5x^2 + 3x + 2\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2)**2,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**2, x)
```

GIAC/XCAS [A] time = 0.269756, size = 126, normalized size = 0.74

$$\frac{1}{1056964608}\left(4\left(8\left(4\left(16\left(4\left(8\left(28\left(160\left(36\,x + 7\right)x + 24067\right)x + 402861\right)x + 9202859\right)x + 27904037\right)x + 608377125\right)x + 1343520\right.\right.\right.\right.\right.$$
$$-\frac{94111745}{67108864}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2\,x^2 - x + 3}\right) + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] 1/1056964608*(4*(8*(4*(16*(4*(8*(28*(160*(36*x + 7)*x + 24067)*x
+ 402861)*x + 9202859)*x + 27904037)*x + 608377125)*x + 134352012
9)*x + 9883312413)*x + 14824182519)*sqrt(2*x^2 - x + 3) - 9411174
5/67108864*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)
) + 1)
```

3.75 $\int \left(3-x+2x^2\right)^{5/2} \left(2+3x+5x^2\right)\, dx$

Optimal. Leaf size=128

$$\frac{5}{16}x\left(2x^2-x+3\right)^{7/2}+\frac{141}{448}\left(2x^2-x+3\right)^{7/2}-\frac{277(1-4x)\left(2x^2-x+3\right)^{5/2}}{3072}-\frac{31855(1-4x)\left(2x^2-x+3\right)^{3/2}}{98304}-\frac{732665(1-4x)\sqrt{2x^2-x+3}}{524288}-\frac{16851295\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1048576\sqrt{2}}$$

```
[Out] (-732665*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/524288 - (31855*(1 - 4*x)
*(3 - x + 2*x^2)^(3/2))/98304 - (277*(1 - 4*x)*(3 - x + 2*x^2)^(5
/2))/3072 + (141*(3 - x + 2*x^2)^(7/2))/448 + (5*x*(3 - x + 2*x^2
)^(7/2))/16 - (16851295*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1048576*Sqr
t[2])
```

Rubi [A] time = 0.123681, antiderivative size = 128, 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

$$\frac{5}{16}x\left(2x^2-x+3\right)^{7/2}+\frac{141}{448}\left(2x^2-x+3\right)^{7/2}-\frac{277(1-4x)\left(2x^2-x+3\right)^{5/2}}{3072}-\frac{31855(1-4x)\left(2x^2-x+3\right)^{3/2}}{98304}-\frac{732665(1-4x)\sqrt{2x^2-x+3}}{524288}-\frac{16851295\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{1048576\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2),x]
```

```
[Out] (-732665*(1 - 4*x)*Sqrt[3 - x + 2*x^2])/524288 - (31855*(1 - 4*x)
*(3 - x + 2*x^2)^(3/2))/98304 - (277*(1 - 4*x)*(3 - x + 2*x^2)^(5
/2))/3072 + (141*(3 - x + 2*x^2)^(7/2))/448 + (5*x*(3 - x + 2*x^2
)^(7/2))/16 - (16851295*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1048576*Sqr
t[2])
```

Rubi in Sympy [A] time = 11.8862, size = 114, normalized size = 0.89

$$-\frac{277\left(-4x+1\right)\left(2x^2-x+3\right)^{\frac{5}{2}}}{3072}-\frac{31855\left(-4x+1\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{98304}-\frac{732665\left(-4x+1\right)\sqrt{2x^2-x+3}}{524288}+\frac{\left(70x+\frac{141}{2}\right)\left(2x^2-x+3\right)^{\frac{7}{2}}}{224}+\frac{16851295\sqrt{2}\,\text{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{2097152}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2),x)
```

```
[Out] -277*(-4*x + 1)*(2*x**2 - x + 3)**(5/2)/3072 - 31855*(-4*x + 1)*(
2*x**2 - x + 3)**(3/2)/98304 - 732665*(-4*x + 1)*sqrt(2*x**2 - x
+ 3)/524288 + (70*x + 141/2)*(2*x**2 - x + 3)**(7/2)/224 + 168512
95*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/2097
152
```

Mathematica [A] time = 0.0868747, size = 75, normalized size = 0.59

$$\frac{4\sqrt{2x^2-x+3}\left(27525120x^7-13565952x^6+118808576x^5-1619968x^4+172684416x^3+67272352x^2+148957444x+5853\right.}{44040192}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2),x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(58536675 + 148957444*x + 67272352*x^2 + 1
72684416*x^3 - 1619968*x^4 + 118808576*x^5 - 13565952*x^6 + 27525
120*x^7) + 353877195*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/440401
92
```

Maple [A] time = 0.008, size = 102, normalized size = 0.8

$$\frac{1108\,x-277}{3072}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{127420\,x-31855}{98304}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{2930660\,x-732665}{524288}\sqrt{2\,x^2-x+3}+\frac{16851295\,\sqrt{2}}{2097152}\mathit{Arcsinh}\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{141}{448}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{5\,x}{16}\left(2\,x^2-x+3\right)^{\frac{7}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(5/2)*(5*x^2+3*x+2),x)
```

```
[Out] 277/3072*(4*x-1)*(2*x^2-x+3)^(5/2)+31855/98304*(4*x-1)*(2*x^2-x+3
)^(3/2)+732665/524288*(4*x-1)*(2*x^2-x+3)^(1/2)+16851295/2097152*
2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+141/448*(2*x^2-x+3)^(7/2)+
5/16*x*(2*x^2-x+3)^(7/2)
```

Maxima [A] time = 0.793881, size = 180, normalized size = 1.41

$$\frac{5}{16}\left(2\,x^2-x+3\right)^{\frac{7}{2}}x+\frac{141}{448}\left(2\,x^2-x+3\right)^{\frac{7}{2}}+\frac{277}{768}\left(2\,x^2-x+3\right)^{\frac{5}{2}}x-\frac{277}{3072}\left(2\,x^2-x+3\right)^{\frac{5}{2}}+\frac{31855}{24576}\left(2\,x^2-x+3\right)^{\frac{3}{2}}x-\frac{31855}{98304}\left(2\,x^2-x+3\right)^{\frac{3}{2}}+\frac{732665}{131072}\sqrt{2\,x^2-x+3}x+\frac{16851295}{2097152}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{732665}{524288}\sqrt{2\,x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 5/16*(2*x^2 - x + 3)^(7/2)*x + 141/448*(2*x^2 - x + 3)^(7/2) + 27
7/768*(2*x^2 - x + 3)^(5/2)*x - 277/3072*(2*x^2 - x + 3)^(5/2) +
31855/24576*(2*x^2 - x + 3)^(3/2)*x - 31855/98304*(2*x^2 - x + 3)
^(3/2) + 732665/131072*sqrt(2*x^2 - x + 3)*x + 16851295/2097152*s
qrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 732665/524288*sqrt(2*x^
2 - x + 3)
```

Fricas [A] time = 0.282765, size = 130, normalized size = 1.02

$$\frac{1}{88080384}\sqrt{2}\Big(4\,\sqrt{2}\big(27525120\,x^7-13565952\,x^6+118808576\,x^5-1619968\,x^4+172684416\,x^3+67272352\,x^2+148957444\,x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/88080384*sqrt(2)*(4*sqrt(2)*(27525120*x^7 - 13565952*x^6 + 1188
08576*x^5 - 1619968*x^4 + 172684416*x^3 + 67272352*x^2 + 14895744
4*x + 58536675)*sqrt(2*x^2 - x + 3) + 353877195*log(-sqrt(2)*(32*
x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int \left(2x^2 - x + 3\right)^{\frac{5}{2}} \left(5x^2 + 3x + 2\right) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x**2-x+3)**(5/2)*(5*x**2+3*x+2),x)
```

```
[Out] Integral((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [A] time = 0.272936, size = 112, normalized size = 0.88

$$\frac{1}{11010048} \left(4 \left(8 \left(4 \left(16 \left(4 \left(24 \left(140 x - 69\right)x + 14503\right)x - 791\right)x + 1349097\right)x + 2102261\right)x + 37239361\right)x + 58536675\right)\sqrt{2 x^2 - x} \\ - \frac{16851295}{2097152} \sqrt{2} \ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] 1/11010048*(4*(8*(4*(16*(4*(24*(140*x - 69)*x + 14503)*x - 791)*x
 + 1349097)*x + 2102261)*x + 37239361)*x + 58536675)*sqrt(2*x^2 -
 x + 3) - 16851295/2097152*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqr
t(2*x^2 - x + 3)) + 1)
```

3.76 $\int \frac{(3-x+2x^2)^{5/2}}{2+3x+5x^2}\,dx$

Optimal. Leaf size=222

$$-\frac{1}{600}(103-60x)\left(2x^2-x+3\right)^{3/2}-\frac{(226249-99620x)\sqrt{2x^2-x+3}}{80000}-\frac{121\sqrt{\frac{11}{31}\left(25000\sqrt{2}-15457\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(25000\sqrt{2}-15457\right)}}\left(-\left(690+247\sqrt{2}\right)x-443\sqrt{2}+196\right)}{\sqrt{2x^2-x+3}}\right)}{3125}+\frac{121\sqrt{\frac{11}{31}\left(15457+25000\sqrt{2}\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(15457+25000\sqrt{2}\right)}}\left(-\left(690-247\sqrt{2}\right)x+443\sqrt{2}+196\right)}{\sqrt{2x^2-x+3}}\right)}{3125}-\frac{7216203\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{800000\sqrt{2}}$$

```
[Out] -((226249 - 99620*x)*Sqrt[3 - x + 2*x^2])/80000 - ((103 - 60*x)*(
3 - x + 2*x^2)^(3/2))/600 - (7216203*ArcSinh[(1 - 4*x)/Sqrt[23]])
/(800000*Sqrt[2]) - (121*Sqrt[(11*(-15457 + 25000*Sqrt[2]))/31]*A
rcTan[(Sqrt[11/(62*(-15457 + 25000*Sqrt[2]))]*(196 - 443*Sqrt[2]
- (690 + 247*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/3125 + (121*Sqrt[
(11*(15457 + 25000*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(15457 + 25
000*Sqrt[2]))]*(196 + 443*Sqrt[2] - (690 - 247*Sqrt[2])*x))/Sqrt[
3 - x + 2*x^2]])/3125
```

Rubi [A] time = 1.11301, antiderivative size = 222, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333

$$-\frac{1}{600}(103-60x)\left(2x^2-x+3\right)^{3/2}-\frac{(226249-99620x)\sqrt{2x^2-x+3}}{80000}-\frac{121\sqrt{\frac{11}{31}\left(25000\sqrt{2}-15457\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(25000\sqrt{2}-15457\right)}}\left(-\left(690+247\sqrt{2}\right)x-443\sqrt{2}+196\right)}{\sqrt{2x^2-x+3}}\right)}{3125}+\frac{121\sqrt{\frac{11}{31}\left(15457+25000\sqrt{2}\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(15457+25000\sqrt{2}\right)}}\left(-\left(690-247\sqrt{2}\right)x+443\sqrt{2}+196\right)}{\sqrt{2x^2-x+3}}\right)}{3125}-\frac{7216203\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{800000\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2),x]
```


```
[Out] -((226249 - 99620*x)*Sqrt[3 - x + 2*x^2])/80000 - ((103 - 60*x)*(
3 - x + 2*x^2)^(3/2))/600 - (7216203*ArcSinh[(1 - 4*x)/Sqrt[23]])
/(800000*Sqrt[2]) - (121*Sqrt[(11*(-15457 + 25000*Sqrt[2]))/31]*A
rcTan[(Sqrt[11/(62*(-15457 + 25000*Sqrt[2]))]*(196 - 443*Sqrt[2]
- (690 + 247*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/3125 + (121*Sqrt[
(11*(15457 + 25000*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/(62*(15457 + 25
000*Sqrt[2]))]*(196 + 443*Sqrt[2] - (690 - 247*Sqrt[2])*x))/Sqrt[
3 - x + 2*x^2]])/3125
```

Rubi in Sympy [A] time = 129.99, size = 250, normalized size = 1.13

$$-\frac{\left(-\frac{74715x}{2}+\frac{678747}{8}\right)\sqrt{2x^2-x+3}}{30000}-\frac{\left(-30x+\frac{103}{2}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{300}+\frac{\sqrt{341}\left(-311326224\sqrt{2}+137742528\right)\left(-15460896\sqrt{2}+151797888\right)\operatorname{atan}\left(\frac{\sqrt{682}\left(x\left(-484909920-173583696\sqrt{2}\right)-311326224\sqrt{2}+137742528\right)}{43571616\sqrt{-15457+25000\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{1581649660800000\sqrt{-15457+25000\sqrt{2}}}+\frac{7216203\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{1600000}+\frac{\sqrt{341}\left(137742528+311326224\sqrt{2}\right)\left(15460896\sqrt{2}+151797888\right)\operatorname{atanh}\left(\frac{\sqrt{682}\left(x\left(-484909920+173583696\sqrt{2}\right)+137742528+311326224\sqrt{2}\right)}{43571616\sqrt{15457+25000\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{1581649660800000\sqrt{15457+25000\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2),x)
```

```
[Out] -(-74715*x/2 + 678747/8)*sqrt(2*x**2 - x + 3)/30000 - (-30*x + 10
3/2)*(2*x**2 - x + 3)**(3/2)/300 + sqrt(341)*(-311326224*sqrt(2)
+ 137742528)*(-15460896*sqrt(2) + 151797888)*atan(sqrt(682)*(x*(-
484909920 - 173583696*sqrt(2)) - 311326224*sqrt(2) + 137742528)/(
43571616*sqrt(-15457 + 25000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(158
1649660800000*sqrt(-15457 + 25000*sqrt(2))) + 7216203*sqrt(2)*ata
nh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/1600000 + sqrt(341
)*(137742528 + 311326224*sqrt(2))*(15460896*sqrt(2) + 151797888)*
atanh(sqrt(682)*(x*(-484909920 + 173583696*sqrt(2)) + 137742528 +
 311326224*sqrt(2))/(43571616*sqrt(15457 + 25000*sqrt(2))*sqrt(2*
x**2 - x + 3)))/(1581649660800000*sqrt(15457 + 25000*sqrt(2)))
```

Mathematica [C] time = 6.45856, size = 1189, normalized size = 5.36

$$\sqrt{2x^2-x+3}\left(\frac{x^3}{5}-\frac{133x^2}{300}+\frac{20603x}{12000}-\frac{267449}{80000}\right)+\frac{7216203\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{800000\sqrt{2}}$$

$$+\frac{121\left(247i+119\sqrt{31}\right)\tan^{-1}\left(\frac{-214634275i\sqrt{31}x^4-1002301300x^4-137500000i\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-285779980i\sqrt{31}x^3+1188688490x^3+311250\ldots}{482890100\sqrt{31}x^4+8825296925ix^4+248\ldots}\right.}{\ldots}$$

$$-\frac{121i\left(-247i+119\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(15577100\sqrt{31}x^4-185896675ix\ldots\right.}{-214634275i\sqrt{31}x^4+1002301300x^4+25000000i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-285779980i\sqrt{31}x^3-1188688490x^3+87500\ldots}\right.}{\ldots}$$

$$+\frac{121i\left(247i+119\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{6250\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{121\left(-247i+119\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{6250\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

$$-\frac{121i\left(247i+119\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix\ldots\right.\right.}{6250\sqrt{\frac{62}{11}\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{121\left(-247i+119\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix\ldots\right.\right.}{6250\sqrt{\frac{62}{11}\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*(-267449/80000 + (20603*x)/12000 - (133*x^2)/
300 + x^3/5) + (7216203*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(800000*Sqr
t[2]) + (121*(247*I + 119*Sqrt[31])*ArcTan[(910772808 - (46000516
*I)*Sqrt[31] + 727715824*x + (277778652*I)*Sqrt[31]*x - 124003899
8*x^2 - (326488029*I)*Sqrt[31]*x^2 + 1188688490*x^3 - (285779980*
I)*Sqrt[31]*x^3 - 1002301300*x^4 - (214634275*I)*Sqrt[31]*x^4 + (
157500000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (1
81250000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (
311250000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2]
- (137500000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^
2])/(4168906492*I + 186603384*Sqrt[31] + (4941322076*I)*x + 67309
0352*Sqrt[31]*x + (14142713923*I)*x^2 + 603640246*Sqrt[31]*x^2 -
(1371093740*I)*x^3 + 248749270*Sqrt[31]*x^3 + (8825296925*I)*x^4
+ 482890100*Sqrt[31]*x^4)])/(3125*Sqrt[(62*(-13 + I*Sqrt[31]))/11
]) - (((121*I)/3125)*(-247*I + 119*Sqrt[31])*ArcTan[(31*(26809468
*I + 6019464*Sqrt[31] - (39236196*I)*x + 21712592*Sqrt[31]*x - (1
96135933*I)*x^2 + 19472266*Sqrt[31]*x^2 - (200932460*I)*x^3 + 802
4170*Sqrt[31]*x^3 - (185896675*I)*x^4 + 15577100*Sqrt[31]*x^4))/(
-910772808 - (46000516*I)*Sqrt[31] - 727715824*x + (277778652*I)*
Sqrt[31]*x + 1240038998*x^2 - (326488029*I)*Sqrt[31]*x^2 - 118868
8490*x^3 - (285779980*I)*Sqrt[31]*x^3 + 1002301300*x^4 - (2146342
75*I)*Sqrt[31]*x^4 - (2500000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt
[3 - x + 2*x^2] + (6250000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[
3 - x + 2*x^2] + (8750000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt
[3 - x + 2*x^2] + (25000000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sq
rt[3 - x + 2*x^2])])/Sqrt[(62*(13 + I*Sqrt[31]))/11] - (121*(-247
*I + 119*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt
```

```
[31] + (10*I)*x)^2])/(6250*Sqrt[(62*(13 + I*Sqrt[31]))/11]) + (((
121*I)/6250)*(247*I + 119*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)
*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[(62*(-13 + I*Sqrt[31])
)/11] - (((121*I)/6250)*(247*I + 119*Sqrt[31])*Log[(2 + 3*x + 5*x
^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x
^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x
+ 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^
2]])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] + (121*(-247*I + 119*Sqrt[
31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x -
22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(1
3 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqr
t[31])]*x*Sqrt[3 - x + 2*x^2]])/(6250*Sqrt[(62*(13 + I*Sqrt[31])
)/11])
```

Maple [B] time = 0.064, size = 4860, normalized size = 21.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(5/2)/(5*x^2+3*x+2),x)
```

```
[Out] 7216203/1600000*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-267449/800
00*(2*x^2-x+3)^(1/2)+20603/12000*x*(2*x^2-x+3)^(1/2)-133/300*x^2*
(2*x^2-x+3)^(1/2)+1/5*x^3*(2*x^2-x+3)^(1/2)+4/33034375*(8*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^
2+8-3*2^(1/2))^(1/2)*2^(1/2)*(75195*2^(1/2)*arctan(1/11692487*(-7
75687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)
^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1
+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379
*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1
+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-
x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+106
294*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^
(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)
*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x
)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(
1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*
(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+
549362*2^(1/2))^(1/2)+108099046*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(
2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1
/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-158290154*arctanh(
31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/
((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2
)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/
2))^(1/2)+6/6606875*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(10915
*2^(1/2)*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8
+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^
(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4
/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1
/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-77
5687+549362*2^(1/2))^(1/2)+14918*arctan(1/11692487*(-775687+54936
2*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)
+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1
/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32
016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1
/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+
6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)-5052938*arctan
h(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)
^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))
*2^(1/2)-51565338*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2
+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8
866+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2
```

```
^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1
+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*
2^(1/2))/(-8866+6820*2^(1/2))^(1/2)-21/1321375*(8*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^
(1/2))^(1/2)*2^(1/2)*(4245*2^(1/2)*arctan(1/11692487*(-775687+549
362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/
2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+
32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-886
6+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+6154*arctan(
1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23
*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1
/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4
+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+
x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1
/2))^(1/2)+12325786*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)
^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(
-8866+6820*2^(1/2))^(1/2))*2^(1/2)-359414*arctanh(31/2*(8*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^
2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+
x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-
3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1
+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2)-37/52
8550*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(2365*2^(1/2)*arctan(
1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23
*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1
/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4
+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+
x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1
/2))^(1/2)+3338*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*
(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2
)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)
-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8
+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/
2)*(-775687+549362*2^(1/2))^(1/2)+3192442*arctanh(31/2*(8*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^
2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-5264358*
arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^
(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+
x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))
^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+68
20*2^(1/2))^(1/2)+63/105710*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*
2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2
)*(-285*2^(1/2)*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*
(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2
)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)
-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8
+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/
2)*(-775687+549362*2^(1/2))^(1/2)-386*arctan(1/11692487*(-775687+
549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/
(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/
2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/
(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-
8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+274846*ar
ctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-
1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1
/2))*2^(1/2)+1543366*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x
)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/
(-8866+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+
3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2
)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8
+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2)+27/21142*(8*(2^(1/2)-1+x)^
2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2
^(1/2))^(1/2)*2^(1/2)*(151*2^(1/2)*arctan(1/11692487*(-775687+549
```

```
362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/
2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+
32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-886
6+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)+218*arctan(1
/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/
2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)
+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+
82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x
)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/
2))^(1/2)+401698*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+
3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-88
66+6820*2^(1/2))^(1/2))*2^(1/2)-63426*arctanh(31/2*(8*(2^(1/2)-1+
x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-
3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^
(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/
(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2))^(1/2)+27/21142*
(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(
1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(369*2^(1/2)*arctan(1/1169
2487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1
/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2
^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)
^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2
^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^
(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^(1/2))^(
1/2)+520*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8
+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^
(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4
/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1
/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-77
5687+549362*2^(1/2))^(1/2)+465124*arctanh(31/2*(8*(2^(1/2)-1+x)^2
/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^
(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-866822*arctanh(3
1/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/
(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2)))/(
(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(
1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^2)^(1/2)
/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+6820*2^(1/2
))^(1/2)
```

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

$$\int \frac{\left(2\,x^2 - x + 3\right)^{\frac{5}{2}}}{5\,x^2 + 3\,x + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2),x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2), x)
```

Fricas [A] time = 0.417159, size = 1519, normalized size = 6.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2),x, algorithm="fricas")
```

```
[Out] 1/115320000000*sqrt(155)*sqrt(31)*sqrt(5)*(21648609*sqrt(155)*sqr
t(31)*sqrt(5)*(25000*sqrt(2) + 15457)*sqrt((15457*sqrt(2) + 50000
)/(772850000*sqrt(2) + 1488918849))*log(-sqrt(2)*(32*x^2 - 16*x +
 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)) + 20*sqrt(155)*sqrt(31)*s
qrt(5)*(2400000000*x^3 - 5320000000*x^2 + 15457*sqrt(2)*(48000*x^
3 - 106400*x^2 + 412060*x - 802347) + 20603000000*x - 40117350000
)*sqrt(2*x^2 - x + 3)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqr
t(2) + 1488918849)) - 232320*242^(1/4)*sqrt(31)*(15457*sqrt(2) +
50000)*log(468512/5*(2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x
 + 3)*(sqrt(2)*(25340070869392033*x - 63023045494527892) + 376829
74625135859*x - 88363116363919925)*sqrt((15457*sqrt(2) + 50000)/(
772850000*sqrt(2) + 1488918849)) + 24092767700750000*x^2 + 220*sq
rt(2)*(196675654700000*x^2 + 61656718648993*sqrt(2)*(2*x^2 - x +
3) - 98337827350000*x + 295013482050000) + 308283593244965*sqrt(2
)*(49*x^2 - 151*x + 200) - 74245059649250000*x + 9833782735000000
0)/(61656718648993*sqrt(2)*x^2 + 98337827350000*x^2)) + 232320*24
2^(1/4)*sqrt(31)*(15457*sqrt(2) + 50000)*log(-468512/5*(2*242^(1/
4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(25340070869392
033*x - 63023045494527892) + 37682974625135859*x - 88363116363919
925)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849
)) - 24092767700750000*x^2 - 220*sqrt(2)*(196675654700000*x^2 + 6
1656718648993*sqrt(2)*(2*x^2 - x + 3) - 98337827350000*x + 295013
482050000) - 308283593244965*sqrt(2)*(49*x^2 - 151*x + 200) + 742
45059649250000*x - 98337827350000000)/(61656718648993*sqrt(2)*x^2
 + 98337827350000*x^2)) + 164520660480*242^(1/4)*sqrt(2)*arctan(3
1*(sqrt(155)*sqrt(5)*(25000*sqrt(2)*(x - 6) + 15457*x - 92742)*sq
rt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 10
*242^(1/4)*sqrt(2*x^2 - x + 3)*(98*sqrt(2) + 443))/(2*sqrt(155)*s
qrt(31)*sqrt(5)*sqrt(2/5)*(25000*sqrt(2)*x + 15457*x)*sqrt((2*242
^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(2534007086
9392033*x - 63023045494527892) + 37682974625135859*x - 8836311636
3919925)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 148891
8849)) + 24092767700750000*x^2 + 220*sqrt(2)*(196675654700000*x^2
 + 61656718648993*sqrt(2)*(2*x^2 - x + 3) - 98337827350000*x + 29
5013482050000) + 308283593244965*sqrt(2)*(49*x^2 - 151*x + 200) -
 74245059649250000*x + 98337827350000000)/(61656718648993*sqrt(2)
*x^2 + 98337827350000*x^2))*sqrt((15457*sqrt(2) + 50000)/(7728500
00*sqrt(2) + 1488918849)) + sqrt(155)*sqrt(31)*sqrt(5)*(25000*sqr
t(2)*(19*x - 22) + 293683*x - 340054)*sqrt((15457*sqrt(2) + 50000
)/(772850000*sqrt(2) + 1488918849)) + 310*242^(1/4)*sqrt(31)*sqrt
(2*x^2 - x + 3)*(54*sqrt(2) + 11))) + 164520660480*242^(1/4)*sqrt
(2)*arctan(-31*(sqrt(155)*sqrt(5)*(25000*sqrt(2)*(x - 6) + 15457*
x - 92742)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488
918849)) - 10*242^(1/4)*sqrt(2*x^2 - x + 3)*(98*sqrt(2) + 443))/(
2*sqrt(155)*sqrt(31)*sqrt(5)*sqrt(2/5)*(25000*sqrt(2)*x + 15457*x
)*sqrt(-(2*242^(1/4)*sqrt(155)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(
2)*(25340070869392033*x - 63023045494527892) + 37682974625135859*
x - 88363116363919925)*sqrt((15457*sqrt(2) + 50000)/(772850000*sq
rt(2) + 1488918849)) - 24092767700750000*x^2 - 220*sqrt(2)*(19667
5654700000*x^2 + 61656718648993*sqrt(2)*(2*x^2 - x + 3) - 9833782
7350000*x + 295013482050000) - 308283593244965*sqrt(2)*(49*x^2 -
151*x + 200) + 74245059649250000*x - 98337827350000000)/(61656718
648993*sqrt(2)*x^2 + 98337827350000*x^2))*sqrt((15457*sqrt(2) + 5
0000)/(772850000*sqrt(2) + 1488918849)) + sqrt(155)*sqrt(31)*sqrt
(5)*(25000*sqrt(2)*(19*x - 22) + 293683*x - 340054)*sqrt((15457*s
qrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) - 310*242^(1/4)
*sqrt(31)*sqrt(2*x^2 - x + 3)*(54*sqrt(2) + 11))))/((15457*sqrt(2
) + 50000)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488
918849)))
```

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

$$\int \frac{\left(2x^2 - x + 3\right)^{\frac{5}{2}}}{5x^2 + 3x + 2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2),x)
```

```
[Out] Integral((2*x**2 - x + 3)**(5/2)/(5*x**2 + 3*x + 2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.77 $\int \frac{(3-x+2x^2)^{5/2}}{(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=255

$$\frac{(10x+3)\left(2x^2-x+3\right)^{5/2}}{31\left(5x^2+3x+2\right)}+\frac{4}{155}(4-5x)\left(2x^2-x+3\right)^{3/2}-\frac{(2240x+1277)\sqrt{2x^2-x+3}}{7750}+\frac{11\sqrt{\frac{11}{31}\left(224510383+194487500\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(224510383+194487500\sqrt{2}\right)}}\left(\left(87710+54423\sqrt{2}\right)x+33287\sqrt{2}+21136\right)}{\sqrt{2x^2-x+3}}\right)}{38750}-\frac{11\sqrt{\frac{11}{31}\left(194487500\sqrt{2}-224510383\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(194487500\sqrt{2}-224510383\right)}}\left(\left(87710-54423\sqrt{2}\right)x-33287\sqrt{2}+21136\right)}{\sqrt{2x^2-x+3}}\right)}{38750}-\frac{4799\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2500\sqrt{2}}$$

```
[Out] -((1277 + 2240*x)*Sqrt[3 - x + 2*x^2])/7750 + (4*(4 - 5*x)*(3 - x
 + 2*x^2)^(3/2))/155 + ((3 + 10*x)*(3 - x + 2*x^2)^(5/2))/(31*(2
+ 3*x + 5*x^2)) - (4799*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2500*Sqrt[2
]) + (11*Sqrt[(11*(224510383 + 194487500*Sqrt[2]))/31]*ArcTan[(Sq
rt[11/(62*(224510383 + 194487500*Sqrt[2]))]*(21136 + 33287*Sqrt[2
] + (87710 + 54423*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/38750 - (11
*Sqrt[(11*(-224510383 + 194487500*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/
(62*(-224510383 + 194487500*Sqrt[2]))]*(21136 - 33287*Sqrt[2] + (
87710 - 54423*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/38750
```

Rubi [A] time = 1.38489, antiderivative size = 255, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 9, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$

$$\frac{(10x+3)\left(2x^2-x+3\right)^{5/2}}{31\left(5x^2+3x+2\right)}+\frac{4}{155}(4-5x)\left(2x^2-x+3\right)^{3/2}-\frac{(2240x+1277)\sqrt{2x^2-x+3}}{7750}+\frac{11\sqrt{\frac{11}{31}\left(224510383+194487500\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(224510383+194487500\sqrt{2}\right)}}\left(\left(87710+54423\sqrt{2}\right)x+33287\sqrt{2}+21136\right)}{\sqrt{2x^2-x+3}}\right)}{38750}-\frac{11\sqrt{\frac{11}{31}\left(194487500\sqrt{2}-224510383\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(194487500\sqrt{2}-224510383\right)}}\left(\left(87710-54423\sqrt{2}\right)x-33287\sqrt{2}+21136\right)}{\sqrt{2x^2-x+3}}\right)}{38750}-\frac{4799\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2500\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] -((1277 + 2240*x)*Sqrt[3 - x + 2*x^2])/7750 + (4*(4 - 5*x)*(3 - x
 + 2*x^2)^(3/2))/155 + ((3 + 10*x)*(3 - x + 2*x^2)^(5/2))/(31*(2
+ 3*x + 5*x^2)) - (4799*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2500*Sqrt[2
]) + (11*Sqrt[(11*(224510383 + 194487500*Sqrt[2]))/31]*ArcTan[(Sq
rt[11/(62*(224510383 + 194487500*Sqrt[2]))]*(21136 + 33287*Sqrt[2
] + (87710 + 54423*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/38750 - (11
*Sqrt[(11*(-224510383 + 194487500*Sqrt[2]))/31]*ArcTanh[(Sqrt[11/
(62*(-224510383 + 194487500*Sqrt[2]))]*(21136 - 33287*Sqrt[2] + (
87710 - 54423*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/38750
```

Rubi in Sympy [A] time = 152.489, size = 270, normalized size = 1.06

$$\frac{(-2400x+1920)\left(2x^2-x+3\right)^{\frac{3}{2}}}{18600}+\frac{(10x+3)\left(2x^2-x+3\right)^{\frac{5}{2}}}{31\left(5x^2+3x+2\right)}-\frac{(537600x+306480)\sqrt{2x^2-x+3}}{1860000}$$
$$+\frac{\sqrt{341}\left(6751683840+10633199280\sqrt{2}\right)\left(2428382880\sqrt{2}+5923695360\right)\operatorname{atan}\left(\frac{\sqrt{682}\left(x\left(17384883120\sqrt{2}+28018082400\right)+6751683840+106\cdots\right.}{19805280\sqrt{224510383+194487500\sqrt{2}}\sqrt{2x^2-x+\cdots}}\right.}{44573763168000000\sqrt{224510383+194487500\sqrt{2}}}$$
$$+\frac{4799\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{5000}$$
$$+\frac{\sqrt{341}\left(-10633199280\sqrt{2}+6751683840\right)\left(-2428382880\sqrt{2}+5923695360\right)\operatorname{atanh}\left(\frac{\sqrt{682}\left(x\left(-17384883120\sqrt{2}+28018082400\right)-1063319\cdots\right.}{19805280\sqrt{-224510383+194487500\sqrt{2}}\sqrt{\cdots}}\right.}{44573763168000000\sqrt{-224510383+194487500\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] (-2400*x + 1920)*(2*x**2 - x + 3)**(3/2)/18600 + (10*x + 3)*(2*x*
*2 - x + 3)**(5/2)/(31*(5*x**2 + 3*x + 2)) - (537600*x + 306480)*
sqrt(2*x**2 - x + 3)/1860000 + sqrt(341)*(6751683840 + 1063319928
0*sqrt(2))*(2428382880*sqrt(2) + 5923695360)*atan(sqrt(682)*(x*(1
7384883120*sqrt(2) + 28018082400) + 6751683840 + 10633199280*sqrt
(2))/(19805280*sqrt(224510383 + 194487500*sqrt(2))*sqrt(2*x**2 -
x + 3)))/(44573763168000000*sqrt(224510383 + 194487500*sqrt(2)))
+ 4799*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/
5000 + sqrt(341)*(-10633199280*sqrt(2) + 6751683840)*(-2428382880
*sqrt(2) + 5923695360)*atanh(sqrt(682)*(x*(-17384883120*sqrt(2) +
 28018082400) - 10633199280*sqrt(2) + 6751683840)/(19805280*sqrt(
-224510383 + 194487500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(445737631
68000000*sqrt(-224510383 + 194487500*sqrt(2)))
```

Mathematica [C] time = 6.48089, size = 1196, normalized size = 4.69

result too large to display

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^2,x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*(-93/250 + (2*x)/25 + (121*(61 + 69*x))/(3875
*(2 + 3*x + 5*x^2))) + (4799*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(2500*
Sqrt[2]) + (11*(54423*I + 5471*Sqrt[31])*ArcTan[(229424911848 + (
598135009404*I)*Sqrt[31] - 19618154755056*x - (442968415588*I)*Sq
rt[31]*x - 8562978915238*x^2 - (6467393362549*I)*Sqrt[31]*x^2 - 7
951179150310*x^3 - (3217382742380*I)*Sqrt[31]*x^3 - 1015321474530
0*x^4 - (5398817571275*I)*Sqrt[31]*x^4 + (1225271250000*I)*Sqrt[2
2*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (1410034375000*I)*Sqr
t[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (2421369375000*I
)*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - (10696812
50000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(33
567280351452*I + 2566573445304*Sqrt[31] + (46558455544956*I)*x +
3109048142112*Sqrt[31]*x + (67464554574163*I)*x^2 + 1920538422726
*Sqrt[31]*x^2 - (36372791374940*I)*x^3 + 2132710526870*Sqrt[31]*x
^3 + (35258085140925*I)*x^4 + 1020675778100*Sqrt[31]*x^4)])/(3875
0*Sqrt[(62*(-13 + I*Sqrt[31]))/11]) - (((11*I)/38750)*(-54423*I +
 5471*Sqrt[31])*ArcTan[(31*(171942569308*I + 82792691784*Sqrt[31]
 - (567090904676*I)*x + 100291875552*Sqrt[31]*x - (152978574973*I
)*x^2 + 61952852346*Sqrt[31]*x^2 - (733916407260*I)*x^3 + 6879711
3770*Sqrt[31]*x^3 - (368818270675*I)*x^4 + 32925025100*Sqrt[31]*x
^4))/(-229424911848 + (598135009404*I)*Sqrt[31] + 19618154755056*
x - (442968415588*I)*Sqrt[31]*x + 8562978915238*x^2 - (6467393362
```

```
549*I)*Sqrt[31]*x^2 + 7951179150310*x^3 - (3217382742380*I)*Sqrt[
31]*x^3 + 10153214745300*x^4 - (5398817571275*I)*Sqrt[31]*x^4 - (
19448750000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] +
(48621875000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2]
 + (68070625000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2
*x^2] + (194487500000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 -
 x + 2*x^2])])/Sqrt[(62*(13 + I*Sqrt[31]))/11] - (11*(-54423*I +
5471*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31]
 + (10*I)*x)^2])/(77500*Sqrt[(62*(13 + I*Sqrt[31]))/11]) + (((11*
I)/77500)*(54423*I + 5471*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)
*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[(62*(-13 + I*Sqrt[31])
)/11] - (((11*I)/77500)*(54423*I + 5471*Sqrt[31])*Log[(2 + 3*x +
5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I
)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 -
 x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2
*x^2])])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] + (11*(-54423*I + 5471*
Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)
*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[
22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 +
I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(77500*Sqrt[(62*(13 + I*Sqr
t[31]))/11])
```

Maple [B] time = 0.185, size = 40028, normalized size = 157.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(5/2)/(5*x^2+3*x+2)^2,x)
```

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

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

$$\int \frac{\left(2\,x^2 - x + 3\right)^{\frac{5}{2}}}{\left(5\,x^2 + 3\,x + 2\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2, x)
```

Fricas [A] time = 0.383538, size = 1621, normalized size = 6.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="fricas")
```

```
[Out] -1/115879542250000*sqrt(155590)*sqrt(155)*sqrt(31)*(148769*sqrt(1
55590)*sqrt(155)*sqrt(31)*(1122551915*x^2 - 194487500*sqrt(2)*(5*
x^2 + 3*x + 2) + 673531149*x + 449020766)*sqrt((224510383*sqrt(2)
 - 388975000)/(87328926227425000*sqrt(2) - 126055687387306689))*l
og(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1
)) - 20*sqrt(155590)*sqrt(155)*sqrt(31)*(1205822500000*x^3 - 4883
```

```
581125000*x^2 - 224510383*sqrt(2)*(3100*x^3 - 12555*x^2 + 9289*x
+ 8996) + 3613188775000*x + 3499219100000)*sqrt(2*x^2 - x + 3)*sq
rt((224510383*sqrt(2) - 388975000)/(87328926227425000*sqrt(2) - 1
26055687387306689)) + 194625006620*234335841608^(1/4)*sqrt(2)*(5*
x^2 + 3*x + 2)*arctan(31*(sqrt(155590)*sqrt(155)*(194487500*sqrt(
2)*(x - 6) - 224510383*x + 1347062298)*sqrt((224510383*sqrt(2) -
388975000)/(87328926227425000*sqrt(2) - 126055687387306689)) + 10
*234335841608^(1/4)*sqrt(2*x^2 - x + 3)*(10568*sqrt(2) - 33287))/
(sqrt(155590)*sqrt(155)*sqrt(31)*(194487500*sqrt(2)*(19*x - 22) -
 4265697277*x + 4939228426)*sqrt((224510383*sqrt(2) - 388975000)/
(87328926227425000*sqrt(2) - 126055687387306689)) + 4*sqrt(155)*s
qrt(31)*(194487500*sqrt(2)*x - 224510383*x)*sqrt(-(234335841608^(
1/4)*sqrt(155590)*sqrt(155)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(1636166
538266142926655786830673*x + 6800033756166137455641017604 98) - 23
16169913882756672219888591171*x - 9561631626495291810916850701 75)
*sqrt((224510383*sqrt(2) - 388975000)/(87328926227425000*sqrt(2)
- 126055687387306689)) + 336386016052924364123033140375000*x^2 +
3422980*sqrt(2)*(176490024700146966122650000*x^2 - 62269579733965
133460851887*sqrt(2)*(2*x^2 - x + 3) - 882450123500734830613250 00
*x + 264735037050220449183975000) - 48442619554038175575869725491
65*sqrt(2)*(49*x^2 - 151*x + 200) - 1036618131101868958828122534 6
25000*x + 1373004147154793322951155675000000)/(622695797339651334
60851887*sqrt(2)*x^2 - 88245012350073483061325000*x^2))*sqrt((224
510383*sqrt(2) - 388975000)/(87328926227425000*sqrt(2) - 12605568
7387306689)) - 310*234335841608^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3
)*(4636*sqrt(2) - 3801))) + 194625006620*234335841608^(1/4)*sqrt(
2)*(5*x^2 + 3*x + 2)*arctan(-31*(sqrt(155590)*sqrt(155)*(19448750
0*sqrt(2)*(x - 6) - 224510383*x + 1347062298)*sqrt((224510383*sqr
t(2) - 388975000)/(87328926227425000*sqrt(2) - 126055687387306689
)) - 10*234335841608^(1/4)*sqrt(2*x^2 - x + 3)*(10568*sqrt(2) - 3
3287))/(sqrt(155590)*sqrt(155)*sqrt(31)*(194487500*sqrt(2)*(19*x
- 22) - 4265697277*x + 4939228426)*sqrt((224510383*sqrt(2) - 3889
75000)/(87328926227425000*sqrt(2) - 126055687387306689)) + 4*sqrt
(155)*sqrt(31)*(194487500*sqrt(2)*x - 224510383*x)*sqrt((23433584
1608^(1/4)*sqrt(155590)*sqrt(155)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(1
636166538266142926655786830673*x + 680003375616613745564101760498
) - 2316169913882756672219888591171*x - 956163162649529181091685 0
70175)*sqrt((224510383*sqrt(2) - 388975000)/(87328926227425000*sq
rt(2) - 126055687387306689)) - 336386016052924364123033140375000*
x^2 - 3422980*sqrt(2)*(176490024700146966122650000*x^2 - 62269579
733965133460851887*sqrt(2)*(2*x^2 - x + 3) - 88245012350073483061
325000*x + 264735037050220449183975000) + 48442619554038175575869
72549165*sqrt(2)*(49*x^2 - 151*x + 200) + 103661813110186895882 81
22534625000*x - 1373004147154793322951155675000000)/(622695797339
65133460851887*sqrt(2)*x^2 - 88245012350073483061325000*x^2))*sqr
t((224510383*sqrt(2) - 388975000)/(87328926227425000*sqrt(2) - 12
6055687387306689)) + 310*234335841608^(1/4)*sqrt(31)*sqrt(2*x^2 -
 x + 3)*(4636*sqrt(2) - 3801))) - 55*234335841608^(1/4)*sqrt(31)*
(1944875000*x^2 - 224510383*sqrt(2)*(5*x^2 + 3*x + 2) + 116692500
0*x + 777950000)*log(-75305560*(234335841608^(1/4)*sqrt(155590)*s
qrt(155)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(16361665382661429266557868
30673*x + 680003375616613745564101760498) - 23161699138827566722 1
9888591171*x - 9561631626495291810916850701 75)*sqrt((224510383*sq
rt(2) - 388975000)/(87328926227425000*sqrt(2) - 12605568738730668
9)) + 336386016052924364123033140375000*x^2 + 3422980*sqrt(2)*(17
6490024700146966122650000*x^2 - 62269579733965133460851887*sqrt(2
)*(2*x^2 - x + 3) - 88245012350073483061325000*x + 26473503705022
0449183975000) - 4844261955403817557586972549165*sqrt(2)*(49*x^2
- 151*x + 200) - 10366181311018689588281225346 25000*x + 137300414
7154793322951155675000000)/(62269579733965133460851887*sqrt(2)*x^
2 - 88245012350073483061325000*x^2)) + 55*234335841608^(1/4)*sqrt
(31)*(1944875000*x^2 - 224510383*sqrt(2)*(5*x^2 + 3*x + 2) + 1166
925000*x + 777950000)*log(75305560*(234335841608^(1/4)*sqrt(15559
0)*sqrt(155)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(1636166538266142926655
786830673*x + 680003375616613745564101760498) - 2316169913882756 6
72219888591171*x - 956163162649529181091685070175)*sqrt((22451038
3*sqrt(2) - 388975000)/(87328926227425000*sqrt(2) - 1260556873873
06689)) - 336386016052924364123033140375000*x^2 - 3422980*sqrt(2)
*(176490024700146966122650000*x^2 - 62269579733965133460851887*sq
rt(2)*(2*x^2 - x + 3) - 88245012350073483061325000*x + 2647350370
50220449183975000) + 4844261955403817557586972549165*sqrt(2)*(49*
x^2 - 151*x + 200) + 1036618131101868958828122534625000*x - 13730
```

```
041471547933229511556750000000)/(622695797339651334608518887*sqrt(2
)*x^2 - 882450123500734830613250000*x^2)))/((1944875000*x^2 - 2245
10383*sqrt(2)*(5*x^2 + 3*x + 2) + 1166925000*x + 777950000)*sqrt(
(224510383*sqrt(2) - 388975000)/(87328926227425000*sqrt(2) - 1260
55687387306689)))
```

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

$$\int \frac{(2x^2 - x + 3)^{\frac{5}{2}}}{(5x^2 + 3x + 2)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2,x)

[Out] Integral((2*x**2 - x + 3)**(5/2)/(5*x**2 + 3*x + 2)**2, x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^2,x, algorithm="giac")

[Out] Exception raised: TypeError
```

3.78 $\int \frac{(3-x+2x^2)^{5/2}}{(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=281

$$\frac{(10x+3)\left(2x^2-x+3\right)^{5/2}}{62\left(5x^2+3x+2\right)^2}+\frac{(2336x+769)\left(2x^2-x+3\right)^{3/2}}{3844\left(5x^2+3x+2\right)}+\frac{(11359-12920x)\sqrt{2x^2-x+3}}{48050}+\frac{\sqrt{11\left(1+4\sqrt{2}\right)}\left(2937349+1978861\sqrt{2}\right)\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(3531015707557+2498852071250\sqrt{2}\right)}}\left(\left(9832420+6895071\sqrt{2}\right)x+2937349\sqrt{2}+3957722\right)}{\sqrt{2x^2-x+3}}\right)}{29791000}-\frac{\left(2937349-1978861\sqrt{2}\right)\sqrt{11\left(4\sqrt{2}-1\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(2498852071250\sqrt{2}-3531015707557\right)}}\left(\left(9832420-6895071\sqrt{2}\right)x-2937349\sqrt{2}+3957722\right)}{\sqrt{2x^2-x+3}}\right)}{29791000}-\frac{4}{125}\sqrt{2}\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)$$

```
[Out] ((11359 - 12920*x)*Sqrt[3 - x + 2*x^2])/48050 + ((3 + 10*x)*(3 -
x + 2*x^2)^(5/2))/(62*(2 + 3*x + 5*x^2)^2) + ((769 + 2336*x)*(3 -
 x + 2*x^2)^(3/2))/(3844*(2 + 3*x + 5*x^2)) - (4*Sqrt[2]*ArcSinh[
(1 - 4*x)/Sqrt[23]])/125 + (Sqrt[11*(1 + 4*Sqrt[2])]*(2937349 + 1
978861*Sqrt[2])*ArcTan[(Sqrt[11/(62*(3531015707557 + 249885207125
0*Sqrt[2]))]*(3957722 + 2937349*Sqrt[2] + (9832420 + 6895071*Sqrt
[2])*x))/Sqrt[3 - x + 2*x^2]])/29791000 - ((2937349 - 1978861*Sqr
t[2])*Sqrt[11*(-1 + 4*Sqrt[2])]*ArcTanh[(Sqrt[11/(62*(-3531015707
557 + 2498852071250*Sqrt[2]))]*(3957722 - 2937349*Sqrt[2] + (9832
420 - 6895071*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/29791000
```

Rubi [A] time = 1.38483, antiderivative size = 281, normalized size of antiderivative = 1., number of steps used = 11, number of rules used = 10, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.37

$$\frac{(10x+3)\left(2x^2-x+3\right)^{5/2}}{62\left(5x^2+3x+2\right)^2}+\frac{(2336x+769)\left(2x^2-x+3\right)^{3/2}}{3844\left(5x^2+3x+2\right)}+\frac{(11359-12920x)\sqrt{2x^2-x+3}}{48050}+\frac{\sqrt{11\left(1+4\sqrt{2}\right)}\left(2937349+1978861\sqrt{2}\right)\tan^{-1}\left(\frac{\sqrt{\frac{11}{62\left(3531015707557+2498852071250\sqrt{2}\right)}}\left(\left(9832420+6895071\sqrt{2}\right)x+2937349\sqrt{2}+3957722\right)}{\sqrt{2x^2-x+3}}\right)}{29791000}-\frac{\left(2937349-1978861\sqrt{2}\right)\sqrt{11\left(4\sqrt{2}-1\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{62\left(2498852071250\sqrt{2}-3531015707557\right)}}\left(\left(9832420-6895071\sqrt{2}\right)x-2937349\sqrt{2}+3957722\right)}{\sqrt{2x^2-x+3}}\right)}{29791000}-\frac{4}{125}\sqrt{2}\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] ((11359 - 12920*x)*Sqrt[3 - x + 2*x^2])/48050 + ((3 + 10*x)*(3 -
x + 2*x^2)^(5/2))/(62*(2 + 3*x + 5*x^2)^2) + ((769 + 2336*x)*(3 -
 x + 2*x^2)^(3/2))/(3844*(2 + 3*x + 5*x^2)) - (4*Sqrt[2]*ArcSinh[
(1 - 4*x)/Sqrt[23]])/125 + (Sqrt[11*(1 + 4*Sqrt[2])]*(2937349 + 1
978861*Sqrt[2])*ArcTan[(Sqrt[11/(62*(3531015707557 + 249885207125
0*Sqrt[2]))]*(3957722 + 2937349*Sqrt[2] + (9832420 + 6895071*Sqrt
[2])*x))/Sqrt[3 - x + 2*x^2]])/29791000 - ((2937349 - 1978861*Sqr
t[2])*Sqrt[11*(-1 + 4*Sqrt[2])]*ArcTanh[(Sqrt[11/(62*(-3531015707
557 + 2498852071250*Sqrt[2]))]*(3957722 - 2937349*Sqrt[2] + (9832
420 - 6895071*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/29791000
```

Rubi in Sympy [A] time = 155.682, size = 284, normalized size = 1.01

$$\frac{(-258400x+227180)\sqrt{2x^2-x+3}}{961000}+\frac{(10x+3)\left(2x^2-x+3\right)^{\frac{5}{2}}}{62\left(5x^2+3x+2\right)^2}+\frac{\left(5840x+\frac{3845}{2}\right)\left(2x^2-x+3\right)^{\frac{3}{2}}}{9610\left(5x^2+3x+2\right)}$$
$$+\frac{\sqrt{341}\left(2394421810+1777096145\sqrt{2}\right)\left(732566670\sqrt{2}+1071689740\right)\operatorname{atan}\left(\frac{\sqrt{682}\left(x\left(4171517955\sqrt{2}+5948614100\right)+2394421810+17770961\right.}{37510\sqrt{3531015707557+2498852071250\sqrt{2}}\sqrt{2x^2-x+3}}\right.}{43617003100000\sqrt{3531015707557+2498852071250\sqrt{2}}}$$
$$+\frac{4\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{125}$$
$$+\frac{\sqrt{341}\left(-1777096145\sqrt{2}+2394421810\right)\left(-732566670\sqrt{2}+1071689740\right)\operatorname{atanh}\left(\frac{\sqrt{682}\left(x\left(-4171517955\sqrt{2}+5948614100\right)-1777096145\sqrt{2}\right.}{37510\sqrt{-3531015707557+2498852071250\sqrt{2}}\sqrt{2x}}\right.}{43617003100000\sqrt{-3531015707557+2498852071250\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] (-258400*x + 227180)*sqrt(2*x**2 - x + 3)/961000 + (10*x + 3)*(2*
x**2 - x + 3)**(5/2)/(62*(5*x**2 + 3*x + 2)**2) + (5840*x + 3845/
2)*(2*x**2 - x + 3)**(3/2)/(9610*(5*x**2 + 3*x + 2)) + sqrt(341)*
(2394421810 + 1777096145*sqrt(2))*(732566670*sqrt(2) + 1071689740
)*atan(sqrt(682)*(x*(4171517955*sqrt(2) + 5948614100) + 239442181
0 + 1777096145*sqrt(2))/(37510*sqrt(3531015707557 + 2498852071250
*sqrt(2))*sqrt(2*x**2 - x + 3)))/(43617003100000*sqrt(35310157075
57 + 2498852071250*sqrt(2))) + 4*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/
(4*sqrt(2*x**2 - x + 3)))/125 + sqrt(341)*(-1777096145*sqrt(2) +
2394421810)*(-732566670*sqrt(2) + 1071689740)*atanh(sqrt(682)*(x*
(-4171517955*sqrt(2) + 5948614100) - 1777096145*sqrt(2) + 2394421
810)/(37510*sqrt(-3531015707557 + 2498852071250*sqrt(2))*sqrt(2*x
**2 - x + 3)))/(43617003100000*sqrt(-3531015707557 + 249885207125
0*sqrt(2)))
```

Mathematica [C] time = 6.50899, size = 1203, normalized size = 4.28

result too large to display

Antiderivative was successfully verified.

```
[In]  Integrate[(3 - x + 2*x^2)^(5/2)/(2 + 3*x + 5*x^2)^3,x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((121*(61 + 69*x))/(7750*(2 + 3*x + 5*x^2)^2)
 + (11*(35579 + 97155*x))/(480500*(2 + 3*x + 5*x^2))) + (4*Sqrt[2
]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/125 - ((I/961000)*(-6895071*I + 2
80267*Sqrt[31])*ArcTan[(31*(1286646864280132*I + 987421307406336*
Sqrt[31] - (5888947864615004*I)*x + 386335744679808*Sqrt[31]*x +
(5595672650742083*I)*x^2 + 549395637070434*Sqrt[31]*x^2 - (602954
7074679540*I)*x^3 + 433781845112330*Sqrt[31]*x^3 + (1742846817367
925*I)*x^4 + 86404550417900*Sqrt[31]*x^4))/(47470658398910208 + (
9672976872245316*I)*Sqrt[31] + 274205806118598024*x - (2059873282
4854252*I)*Sqrt[31]*x + 338160258179291O2*x^2 - (5917231661129952
1*I)*Sqrt[31]*x^2 + 160404448215022990*x^3 - (22636449983151020*I
)*Sqrt[31]*x^3 + 65896915460933700*x^4 - (52587956640176975*I)*Sq
rt[31]*x^4 - (249885207125000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt
[3 - x + 2*x^2] + (624713017812500*I)*Sqrt[682*(13 + I*Sqrt[31])]
*x*Sqrt[3 - x + 2*x^2] + (874598224937500*I)*Sqrt[682*(13 + I*Sqr
t[31])]*x^2*Sqrt[3 - x + 2*x^2] + (2498852071250000*I)*Sqrt[682*(
13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[(62*(13 + I*Sqr
t[31]))/11] - ((I/961000)*(6895071*I + 280267*Sqrt[31])*ArcTanh[(
-47470658398910208*I - 9672976872245316*Sqrt[31] - (2742058061185
```

```
98024*I)*x + 20598732824854252*Sqrt[31]*x - (33816025817929102*I)
*x^2 + 59172316611299521*Sqrt[31]*x^2 - (160404448215022990*I)*x^
3 + 22636449983151020*Sqrt[31]*x^3 - (65896915460933700*I)*x^4 +
52587956640176975*Sqrt[31]*x^4 - 15742768048875000*Sqrt[22*(-13 +
 I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 18116677516562500*Sqrt[22*(-1
3 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 31110708287062500*Sqrt[2
2*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 13743686391875000
*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(4598843614
57315908*I + 30610060529596416*Sqrt[31] + (554886342419315124*I)*
x + 11976408085074048*Sqrt[31]*x + (632413940805120427*I)*x^2 + 1
7031264749183454*Sqrt[31]*x^2 - (572735070344934260*I)*x^3 + 1344
7237198482230*Sqrt[31]*x^3 + (252081127389719325*I)*x^4 + 2678541
062954900*Sqrt[31]*x^4)])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] - ((-6
895071*I + 280267*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3
*I + Sqrt[31] + (10*I)*x)^2])/(1922000*Sqrt[(62*(13 + I*Sqrt[31])
)/11]) + ((I/1922000)*(6895071*I + 280267*Sqrt[31])*Log[(-3*I + S
qrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[(62*(-
13 + I*Sqrt[31]))/11] - ((I/1922000)*(6895071*I + 280267*Sqrt[31]
)*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sq
rt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sq
rt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]
*x*Sqrt[3 - x + 2*x^2])])/Sqrt[(62*(-13 + I*Sqrt[31]))/11] + ((-6
895071*I + 280267*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*S
qrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*
x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22
*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(1922000*
Sqrt[(62*(13 + I*Sqrt[31]))/11])
```

Maple [B] time = 0.42, size = 119321, normalized size = 424.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((2*x^2-x+3)^(5/2)/(5*x^2+3*x+2)^3,x)
```

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

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

$$\int \frac{\left(2\,x^2 - x + 3\right)^{\frac{5}{2}}}{\left(5\,x^2 + 3\,x + 2\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="maxima")
```

```
[Out] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3, x)
```

Fricas [A] time = 0.479522, size = 1773, normalized size = 6.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="fricas")
```

```
[Out] -1/915712169913331312000*sqrt(1999081657)*7688^(3/4)*sqrt(31)*(61
504*sqrt(1999081657)*7688^(1/4)*sqrt(31)*(88275392688925*x^4 + 10
5930471226710*x^3 + 102399455519153*x^2 - 2498852071250*sqrt(2)*(
25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 42372188490684*x + 1412406
2830228)*sqrt((3531015707557*sqrt(2) - 4997704142500)/(1764697182
889018745487250 0*sqrt(2) - 24956595274995091500033249))*log(-4*sq
rt(2)*sqrt(2*x^2 - x + 3)*(4*x - 1) - 32*x^2 + 16*x - 25) - 220*s
qrt(1999081657)*7688^(1/4)*sqrt(31)*(485551945964587500*x^3 + 469
14448326476000 0*x^2 - 3531015707557*sqrt(2)*(97155*x^3 + 93872*x^
2 + 69621*x + 22552) + 347945160104992500*x + 112708223821660000)
*sqrt(2*x^2 - x + 3)*sqrt((3531015707557*sqrt(2) - 4997704142500)
/(17646971828890187454872500*sqrt(2) - 24956595274995091500033249
)) + 3184949732636*sqrt(21989898227)*sqrt(2)*(25*x^4 + 30*x^3 + 2
9*x^2 + 12*x + 4)*arctan(31*(sqrt(1999081657)*7688^(1/4)*(3531015
707557*sqrt(2)*(x - 6) - 4997704142500*x + 29986224855000)*sqrt((
3531015707557*sqrt(2) - 4997704142500)/(176469718288901874548725
0 0*sqrt(2) - 24956595274995091500033249)) + 4*sqrt(21989898227)*sq
rt(2*x^2 - x + 3)*(2937349*sqrt(2) - 3957722))/(sqrt(1999081657)*
7688^(1/4)*sqrt(31)*(3531015707557*sqrt(2)*(19*x - 22) - 94956378
707500*x + 109949491135000)*sqrt((3531015707557*sqrt(2) - 4997704
142500)/(17646971828890187454872500*sqrt(2) - 249565952749950915 0
0033249)) + 2*7688^(1/4)*sqrt(31)*(3531015707557*sqrt(2)*x - 4997
704142500*x)*sqrt(-sqrt(2)*(2*sqrt(21989898227)*sqrt(1999081657)*
7688^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(550642599639613857505865
87846248749646067369 4*x + 22808363279435102396507924165828776995 8
016919) - 77872623243396488147094512012077526641869061 3*x - 32255
8966845262833540786636804199726502656775)*sqrt((3531015707557*sqr
t(2) - 4997704142500)/(17646971828890187454872500*sqrt(2) - 24956
595274995091500033249)) + 877305985610599641020614356284341193934
81953320000*x^2 + 1999081657*sqrt(2)*(1221810830226386477320930 92
51619370427500*x^2 - 1763164741349757670235096842660918126 93*sqrt
(2)*(49*x^2 - 151*x + 200) - 376517215028947669541756264692760190
72500*x + 498698298051586317273849357208953895 00000) - 3101745057
577275982366592538688209718525613436248 8*sqrt(2)*(2*x^2 - x + 3)
- 438652992805299820510307178142170596967409766600 00*x + 13159589
78415899461530921534426511790902229299800 00)/(1763164741349757670
23509684266091812693*sqrt(2)*x^2 - 249349149025793158636924678604
476947500*x^2))*sqrt((3531015707557*sqrt(2) - 4997704142500)/(176
46971828890187454872500*sqrt(2) - 24956595274995091500033249)) -
124*sqrt(21989898227)*sqrt(31)*sqrt(2*x^2 - x + 3)*(605427*sqrt(2
) - 885694))) + 3184949732636*sqrt(21989898227)*sqrt(2)*(25*x^4 +
 30*x^3 + 29*x^2 + 12*x + 4)*arctan(-31*(sqrt(1999081657)*7688^(1
/4)*(3531015707557*sqrt(2)*(x - 6) - 4997704142500*x + 2998622485
5000)*sqrt((3531015707557*sqrt(2) - 4997704142500)/(1764697182889
0187454872500*sqrt(2) - 24956595274995091500033249)) - 4*sqrt(219
89898227)*sqrt(2*x^2 - x + 3)*(2937349*sqrt(2) - 3957722))/(sqrt(
1999081657)*7688^(1/4)*sqrt(31)*(3531015707557*sqrt(2)*(19*x - 22
) - 94956378707500*x + 109949491135000)*sqrt((3531015707557*sqrt(
2) - 4997704142500)/(17646971828890187454872500*sqrt(2) - 2495659
5274995091500033249)) + 2*7688^(1/4)*sqrt(31)*(3531015707557*sqrt
(2)*x - 4997704142500*x)*sqrt(sqrt(2)*(2*sqrt(21989898227)*sqrt(1
999081657)*7688^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(5506425996396
13857505865878462487496460673694*x + 228083632794351023965079 2416
58287769958016919) - 778726232433964881470945120120775266418 69061
3*x - 322558966845262833540786636804199726502656775)*sqrt((353101
5707557*sqrt(2) - 4997704142500)/(17646971828890187454872500*sqrt
(2) - 24956595274995091500033249)) - 877305985610599641020614356 2
843411939348195332 0000*x^2 - 1999081657*sqrt(2)*(1221810830226386
477320930925161937042750 0*x^2 - 1763164741349757670235096842660 91
812693*sqrt(2)*(49*x^2 - 151*x + 200) - 376517215028947669541756 2
6469276019072500*x + 498698298051586317273849357208953895 00000) +
 3101745057577275982366592538688209718525613436248 8*sqrt(2)*(2*x^
2 - x + 3) + 438652992805299820510307178142170596967409766600 00*x
 - 131595897841589946153092153442651179090222929980000)/(17631647
41349757670235096842660918126 93*sqrt(2)*x^2 - 249349149025793158 6
36924678604476947500*x^2))*sqrt((3531015707557*sqrt(2) - 49977041
42500)/(17646971828890187454872500*sqrt(2) - 24956595274995091500
033249)) + 124*sqrt(21989898227)*sqrt(31)*sqrt(2*x^2 - x + 3)*(60
5427*sqrt(2) - 885694))) - sqrt(21989898227)*sqrt(31)*(1249426035
62500*x^4 + 149931124275000*x^3 + 144933420132500*x^2 - 353101570
7557*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 599724497100
00*x + 19990816570000)*log(-199908165700*sqrt(2)*(2*sqrt(21989898
```

```
227)*sqrt(1999081657)*7688^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(55
0642599639613857505865878462487496460673694*x + 22808363279435102
3965079241658287769958016919) - 778726232433964881470945120120775
266418690613*x - 322558966845262833540786636804199726502656775)*s
qrt((3531015707557*sqrt(2) - 4997704142500)/(17646971828890187454
872500*sqrt(2) - 24956595274995091500033249)) + 87730598561059964
1020614356284341193934819533200000*x^2 + 1999081657*sqrt(2)*(12218
108302263864773209309251619370427500*x^2 - 1763164741349757670235
09684266091812693*sqrt(2)*(49*x^2 - 151*x + 200) - 37651721502894
766954175626469276019072500*x + 498698298051586317273849357208953
89500000) - 31017450575772759823665925386882097185256134362488*sq
rt(2)*(2*x^2 - x + 3) - 43865299280529982051030717814217059696740
976660000*x + 131595897841589946153092153442651179090222929980000
)/(176316474134975767023509684266091812693*sqrt(2)*x^2 - 24934914
9025793158636924678604476947500*x^2)) + sqrt(21989898227)*sqrt(31
)*(124942603562500*x^4 + 149931124275000*x^3 + 144933420132500*x^
2 - 3531015707557*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) +
 59972449710000*x + 19990816570000)*log(199908165700*sqrt(2)*(2*s
qrt(21989898227)*sqrt(1999081657)*7688^(1/4)*sqrt(2*x^2 - x + 3)*
(sqrt(2)*(550642599639613857505865878462487496460673694*x + 22808
3632794351023965079241658287769958016919) - 778726232433964881470
945120120775266418690613*x - 322558966845262833540786636804199726
502656775)*sqrt((3531015707557*sqrt(2) - 4997704142500)/(17646971
828890187454872500*sqrt(2) - 24956595274995091500033249)) - 87730
5985610599641020614356284341193934819533200000*x^2 - 1999081657*sq
rt(2)*(12218108302263864773209309251619370427500*x^2 - 1763164741
34975767023509684266091812693*sqrt(2)*(49*x^2 - 151*x + 200) - 37
651721502894766954175626469276019072500*x + 498698298051586317273
84935720895389500000) + 31017450575772759823665925386882097185256
134362488*sqrt(2)*(2*x^2 - x + 3) + 43865299280529982051030717814
217059696740976660000*x - 131595897841589946153092153442651179090
222929980000)/(176316474134975767023509684266091812693*sqrt(2)*x^
2 - 249349149025793158636924678604476947500*x^2)))/((124942603562
500*x^4 + 149931124275000*x^3 + 144933420132500*x^2 - 35310157075
57*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 59972449710000
*x + 19990816570000)*sqrt((3531015707557*sqrt(2) - 4997704142500)
/(17646971828890187454872500*sqrt(2) - 24956595274995091500033249
)))
```

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

$$\int \frac{\left(2x^2 - x + 3\right)^{\frac{5}{2}}}{\left(5x^2 + 3x + 2\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] Integral((2*x**2 - x + 3)**(5/2)/(5*x**2 + 3*x + 2)**3, x)
```

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

$$undef$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((2*x^2 - x + 3)^(5/2)/(5*x^2 + 3*x + 2)^3,x, algorithm="giac")
```

```
[Out] undef
```

3.79 $\int \frac{(2+3x+5x^2)^4}{\sqrt{3-x+2x^2}}\,dx$

Optimal. Leaf size=185

$$-\frac{15428243\sqrt{2x^2-x+3}\,x^2}{131072}+\frac{1572007407\sqrt{2x^2-x+3}\,x}{7340032}+\frac{16493087661\sqrt{2x^2-x+3}}{29360128}+\frac{625}{16}\sqrt{2x^2-x+3}\,x^7+\frac{57375}{448}\sqrt{2x^2-x+3}\,x^6+\frac{2116475\sqrt{2x^2-x+3}\,x^5}{10752}+\frac{686531\sqrt{2x^2-x+3}\,x^4}{6144}-\frac{19750457\sqrt{2x^2-x+3}\,x^3}{229376}+\frac{2899366573\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8388608\sqrt{2}}$$

```
[Out] (16493087661*Sqrt[3 - x + 2*x^2])/29360128 + (1572007407*x*Sqrt[3
 - x + 2*x^2])/7340032 - (15428243*x^2*Sqrt[3 - x + 2*x^2])/13107
2 - (19750457*x^3*Sqrt[3 - x + 2*x^2])/229376 + (686531*x^4*Sqrt[
3 - x + 2*x^2])/6144 + (2116475*x^5*Sqrt[3 - x + 2*x^2])/10752 +
(57375*x^6*Sqrt[3 - x + 2*x^2])/448 + (625*x^7*Sqrt[3 - x + 2*x^2
])/16 + (2899366573*ArcSinh[(1 - 4*x)/Sqrt[23]])/(8388608*Sqrt[2]
)
```

Rubi [A] time = 0.513263, antiderivative size = 185, 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

$$-\frac{15428243\sqrt{2x^2-x+3}\,x^2}{131072}+\frac{1572007407\sqrt{2x^2-x+3}\,x}{7340032}+\frac{16493087661\sqrt{2x^2-x+3}}{29360128}+\frac{625}{16}\sqrt{2x^2-x+3}\,x^7+\frac{57375}{448}\sqrt{2x^2-x+3}\,x^6+\frac{2116475\sqrt{2x^2-x+3}\,x^5}{10752}+\frac{686531\sqrt{2x^2-x+3}\,x^4}{6144}-\frac{19750457\sqrt{2x^2-x+3}\,x^3}{229376}+\frac{2899366573\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8388608\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^4/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (16493087661*Sqrt[3 - x + 2*x^2])/29360128 + (1572007407*x*Sqrt[3
 - x + 2*x^2])/7340032 - (15428243*x^2*Sqrt[3 - x + 2*x^2])/13107
2 - (19750457*x^3*Sqrt[3 - x + 2*x^2])/229376 + (686531*x^4*Sqrt[
3 - x + 2*x^2])/6144 + (2116475*x^5*Sqrt[3 - x + 2*x^2])/10752 +
(57375*x^6*Sqrt[3 - x + 2*x^2])/448 + (625*x^7*Sqrt[3 - x + 2*x^2
])/16 + (2899366573*ArcSinh[(1 - 4*x)/Sqrt[23]])/(8388608*Sqrt[2]
)
```

Rubi in Sympy [A] time = 71.6786, size = 153, normalized size = 0.83

$$-\frac{\left(-\frac{41075x}{2}+\frac{3837043}{8}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{134400}+\frac{\left(70x+\frac{207}{2}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^3}{224}-\frac{\left(\frac{5922013305x}{8}+\frac{2296932969}{32}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)}{32256000}+\frac{\left(\frac{2393219058531x}{32}+\frac{19051129604481}{128}\right)\sqrt{2x^2-x+3}}{258048000}-\frac{2899366573\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{16777216}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(1/2),x)
```

```
[Out] -(-41075*x/2 + 3837043/8)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)
**2/134400 + (70*x + 207/2)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x +
2)**3/224 - (5922013305*x/8 + 2296932969/32)*sqrt(2*x**2 - x + 3)
*(5*x**2 + 3*x + 2)/32256000 + (2393219058531*x/32 + 190511296044
81/128)*sqrt(2*x**2 - x + 3)/258048000 - 2899366573*sqrt(2)*atanh
(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/16777216
```

Mathematica [A] time = 0.11255, size = 75, normalized size = 0.41

$$\frac{4\sqrt{2x^2-x+3}\,(3440640000x^7+11280384000x^6+17338163200x^5+9842108416x^4-7584175488x^3-10367779296x^2+18}{352321536}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^4/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(49479262983 + 18864088884*x - 10367779296
*x^2 - 7584175488*x^3 + 9842108416*x^4 + 17338163200*x^5 + 112803
84000*x^6 + 3440640000*x^7) - 60886698033*Sqrt[2]*ArcSinh[(-1 + 4
*x)/Sqrt[23]])/352321536
```

Maple [A] time = 0.025, size = 147, normalized size = 0.8

$$-\frac{2899366573\sqrt{2}}{16777216}\mathit{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{16493087661}{29360128}\sqrt{2x^2-x+3}+\frac{1572007407x}{7340032}\sqrt{2x^2-x+3}-\frac{15428243x^2}{131072}\sqrt{2x^2-x+3}-\frac{19750457x^3}{229376}\sqrt{2x^2-x+3}+\frac{686531x^4}{6144}\sqrt{2x^2-x+3}+\frac{2116475x^5}{10752}\sqrt{2x^2-x+3}+\frac{57375x^6}{448}\sqrt{2x^2-x+3}+\frac{625x^7}{16}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^4/(2*x^2-x+3)^(1/2),x)
```

```
[Out] -2899366573/16777216*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+16493
087661/29360128*(2*x^2-x+3)^(1/2)+1572007407/7340032*x*(2*x^2-x+3
)^(1/2)-15428243/131072*x^2*(2*x^2-x+3)^(1/2)-19750457/229376*x^3
*(2*x^2-x+3)^(1/2)+686531/6144*x^4*(2*x^2-x+3)^(1/2)+2116475/1075
2*x^5*(2*x^2-x+3)^(1/2)+57375/448*x^6*(2*x^2-x+3)^(1/2)+625/16*x^
7*(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.784457, size = 200, normalized size = 1.08

$$\frac{625}{16}\sqrt{2x^2-x+3}x^7+\frac{57375}{448}\sqrt{2x^2-x+3}x^6+\frac{2116475}{10752}\sqrt{2x^2-x+3}x^5+\frac{686531}{6144}\sqrt{2x^2-x+3}x^4-\frac{19750457}{229376}\sqrt{2x^2-x+3}x^3-\frac{15428243}{131072}\sqrt{2x^2-x+3}x^2+\frac{1572007407}{7340032}\sqrt{2x^2-x+3}x-\frac{2899366573}{16777216}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{16493087661}{29360128}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^4/sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 625/16*sqrt(2*x^2 - x + 3)*x^7 + 57375/448*sqrt(2*x^2 - x + 3)*x^
6 + 2116475/10752*sqrt(2*x^2 - x + 3)*x^5 + 686531/6144*sqrt(2*x^
```

```
2 - x + 3)*x^4 - 19750457/229376*sqrt(2*x^2 - x + 3)*x^3 - 154282
43/131072*sqrt(2*x^2 - x + 3)*x^2 + 1572007407/7340032*sqrt(2*x^2
 - x + 3)*x - 2899366573/16777216*sqrt(2)*arcsinh(1/23*sqrt(23)*(
4*x - 1)) + 16493087661/29360128*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.284851, size = 130, normalized size = 0.7

$$\frac{1}{704643072}\sqrt{2}\left(4\sqrt{2}\left(3440640000\,x^{7}+11280384000\,x^{6}+17338163200\,x^{5}+9842108416\,x^{4}-7584175488\,x^{3}-10367779296\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/704643072*sqrt(2)*(4*sqrt(2)*(3440640000*x^7 + 11280384000*x^6
+ 17338163200*x^5 + 9842108416*x^4 - 7584175488*x^3 - 10367779296
*x^2 + 18864088884*x + 49479262983)*sqrt(2*x^2 - x + 3) + 6088669
8033*log(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4
*x - 1)))
```

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

$$\int \frac{\left(5x^{2}+3x+2\right)^{4}}{\sqrt{2x^{2}-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**4/sqrt(2*x**2 - x + 3), x)
```

GIAC/XCAS [A] time = 0.277107, size = 112, normalized size = 0.61

$$\frac{1}{88080384}\left(4\left(8\left(4\left(16\left(100\left(120\left(140\,x+459\right)x+84659\right)x+4805717\right)x-59251371\right)x-323993103\right)x+4716022221\right)x+4947\right.$$
$$+\frac{2899366573}{16777216}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^{2}-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/88080384*(4*(8*(4*(16*(100*(120*(140*x + 459)*x + 84659)*x + 48
05717)*x - 59251371)*x - 323993103)*x + 4716022221)*x + 494792629
83)*sqrt(2*x^2 - x + 3) + 2899366573/16777216*sqrt(2)*ln(-2*sqrt(
2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

3.80 $\int \frac{(2+3x+5x^2)^3}{\sqrt{3-x+2x^2}}\,dx$

Optimal. Leaf size=143

$$-\frac{3387\sqrt{2x^2-x+3}x^2}{1024}-\frac{372783\sqrt{2x^2-x+3}x}{8192}-\frac{203373\sqrt{2x^2-x+3}}{32768}+\frac{125}{12}\sqrt{2x^2-x+3}x^5+\frac{1355}{48}\sqrt{2x^2-x+3}x^4+\frac{8185}{256}\sqrt{2x^2-x+3}x^3-\frac{9267707\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{65536\sqrt{2}}$$

```
[Out] (-203373*Sqrt[3 - x + 2*x^2])/32768 - (372783*x*Sqrt[3 - x + 2*x^
2])/8192 - (3387*x^2*Sqrt[3 - x + 2*x^2])/1024 + (8185*x^3*Sqrt[3
 - x + 2*x^2])/256 + (1355*x^4*Sqrt[3 - x + 2*x^2])/48 + (125*x^5
*Sqrt[3 - x + 2*x^2])/12 - (9267707*ArcSinh[(1 - 4*x)/Sqrt[23]])/
(65536*Sqrt[2])
```

Rubi [A] time = 0.286926, antiderivative size = 143, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$-\frac{3387\sqrt{2x^2-x+3}x^2}{1024}-\frac{372783\sqrt{2x^2-x+3}x}{8192}-\frac{203373\sqrt{2x^2-x+3}}{32768}+\frac{125}{12}\sqrt{2x^2-x+3}x^5+\frac{1355}{48}\sqrt{2x^2-x+3}x^4+\frac{8185}{256}\sqrt{2x^2-x+3}x^3-\frac{9267707\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{65536\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^3/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (-203373*Sqrt[3 - x + 2*x^2])/32768 - (372783*x*Sqrt[3 - x + 2*x^
2])/8192 - (3387*x^2*Sqrt[3 - x + 2*x^2])/1024 + (8185*x^3*Sqrt[3
 - x + 2*x^2])/256 + (1355*x^4*Sqrt[3 - x + 2*x^2])/48 + (125*x^5
*Sqrt[3 - x + 2*x^2])/12 - (9267707*ArcSinh[(1 - 4*x)/Sqrt[23]])/
(65536*Sqrt[2])
```

Rubi in Sympy [A] time = 45.5465, size = 124, normalized size = 0.87

$$\frac{\left(-\frac{11685x}{2}+\frac{257403}{8}\right)\left(-\frac{779x^2}{4}+\frac{16103x}{4}+\frac{2207}{2}\right)\sqrt{2x^2-x+3}}{1121760}+\frac{\left(50x+\frac{151}{2}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{120}-\frac{\left(\frac{47223864585x}{32}+\frac{46377749763}{128}\right)\sqrt{2x^2-x+3}}{8974080}+\frac{9267707\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{131072}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)
```

```
[Out] (-11685*x/2 + 257403/8)*(-779*x**2/4 + 16103*x/4 + 2207/2)*sqrt(2
*x**2 - x + 3)/1121760 + (50*x + 151/2)*sqrt(2*x**2 - x + 3)*(5*x
**2 + 3*x + 2)**2/120 - (47223864585*x/32 + 46377749763/128)*sqrt
(2*x**2 - x + 3)/8974080 + 9267707*sqrt(2)*atanh(sqrt(2)*(4*x - 1
)/(4*sqrt(2*x**2 - x + 3)))/131072
```

Mathematica [A] time = 0.0860002, size = 65, normalized size = 0.45

$$\frac{4\sqrt{2x^2-x+3}\left(1024000x^5+2775040x^4+3143040x^3-325152x^2-4473396x-610119\right)+27803121\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{393216}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^3/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(-610119 - 4473396*x - 325152*x^2 + 314304
0*x^3 + 2775040*x^4 + 1024000*x^5) + 27803121*Sqrt[2]*ArcSinh[(-1
 + 4*x)/Sqrt[23]])/393216
```

Maple [A] time = 0.009, size = 113, normalized size = 0.8

$$\frac{9267707\sqrt{2}}{131072}Arcsinh\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)-\frac{203373}{32768}\sqrt{2x^2-x+3}-\frac{372783x}{8192}\sqrt{2x^2-x+3}-\frac{3387x^2}{1024}\sqrt{2x^2-x+3}+\frac{8185x^3}{256}\sqrt{2x^2-x+3}+\frac{1355x^4}{48}\sqrt{2x^2-x+3}+\frac{125x^5}{12}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^3/(2*x^2-x+3)^(1/2),x)
```

```
[Out] 9267707/131072*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-203373/3276
8*(2*x^2-x+3)^(1/2)-372783/8192*x*(2*x^2-x+3)^(1/2)-3387/1024*x^2
*(2*x^2-x+3)^(1/2)+8185/256*x^3*(2*x^2-x+3)^(1/2)+1355/48*x^4*(2*
x^2-x+3)^(1/2)+125/12*x^5*(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.790606, size = 154, normalized size = 1.08

$$\frac{125}{12}\sqrt{2x^2-x+3}x^5+\frac{1355}{48}\sqrt{2x^2-x+3}x^4+\frac{8185}{256}\sqrt{2x^2-x+3}x^3-\frac{3387}{1024}\sqrt{2x^2-x+3}x^2-\frac{372783}{8192}\sqrt{2x^2-x+3}x+\frac{9267707}{131072}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{203373}{32768}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 125/12*sqrt(2*x^2 - x + 3)*x^5 + 1355/48*sqrt(2*x^2 - x + 3)*x^4
+ 8185/256*sqrt(2*x^2 - x + 3)*x^3 - 3387/1024*sqrt(2*x^2 - x + 3
)*x^2 - 372783/8192*sqrt(2*x^2 - x + 3)*x + 9267707/131072*sqrt(2
)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 203373/32768*sqrt(2*x^2 - x
+ 3)
```

Fricas [A] time = 0.280654, size = 116, normalized size = 0.81

$$\frac{1}{786432}\sqrt{2}\Big(4\sqrt{2}\left(1024000x^5+2775040x^4+3143040x^3-325152x^2-4473396x-610119\right)\sqrt{2x^2-x+3}+27803121\log$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/786432*sqrt(2)*(4*sqrt(2)*(1024000*x^5 + 2775040*x^4 + 3143040*
x^3 - 325152*x^2 - 4473396*x - 610119)*sqrt(2*x^2 - x + 3) + 2780
3121*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4
*x - 1)))
```

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

$$\int \frac{(5x^2+3x+2)^3}{\sqrt{2x^2-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**3/sqrt(2*x**2 - x + 3), x)
```

GIAC/XCAS [A] time = 0.27489, size = 99, normalized size = 0.69

$$\frac{1}{98304}\left(4\left(8\left(20\left(16\left(100x+271\right)x+4911\right)x-10161\right)x-1118349\right)x-610119\right)\sqrt{2x^2-x+3} - \frac{9267707}{131072}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/98304*(4*(8*(20*(16*(100*x + 271)*x + 4911)*x - 10161)*x - 1118
349)*x - 610119)*sqrt(2*x^2 - x + 3) - 9267707/131072*sqrt(2)*ln(
-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

3.81 $\int \frac{(2+3x+5x^2)^2}{\sqrt{3-x+2x^2}}\,dx$

Optimal. Leaf size=101

$$\frac{655}{96}\sqrt{2x^2-x+3}\,x^2+\frac{3443}{768}\sqrt{2x^2-x+3}\,x-\frac{11373\sqrt{2x^2-x+3}}{1024}+\frac{25}{8}\sqrt{2x^2-x+3}\,x^3+\frac{30725\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2048\sqrt{2}}$$

```
[Out] (-11373*Sqrt[3 - x + 2*x^2])/1024 + (3443*x*Sqrt[3 - x + 2*x^2])/
768 + (655*x^2*Sqrt[3 - x + 2*x^2])/96 + (25*x^3*Sqrt[3 - x + 2*x
^2])/8 + (30725*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2048*Sqrt[2])
```

Rubi [A] time = 0.160384, antiderivative size = 101, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148

$$\frac{655}{96}\sqrt{2x^2-x+3}\,x^2+\frac{3443}{768}\sqrt{2x^2-x+3}\,x-\frac{11373\sqrt{2x^2-x+3}}{1024}+\frac{25}{8}\sqrt{2x^2-x+3}\,x^3+\frac{30725\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2048\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^2/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (-11373*Sqrt[3 - x + 2*x^2])/1024 + (3443*x*Sqrt[3 - x + 2*x^2])/
768 + (655*x^2*Sqrt[3 - x + 2*x^2])/96 + (25*x^3*Sqrt[3 - x + 2*x
^2])/8 + (30725*ArcSinh[(1 - 4*x)/Sqrt[23]])/(2048*Sqrt[2])
```

Rubi in Sympy [A] time = 22.3852, size = 85, normalized size = 0.84

$$-\frac{\left(-\frac{203x}{2}+\frac{40199}{8}\right)\sqrt{2x^2-x+3}}{384}+\frac{\left(30x+\frac{95}{2}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)}{48}-\frac{30725\sqrt{2}\,\mathrm{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{4096}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(1/2),x)
```

```
[Out] -(-203*x/2 + 40199/8)*sqrt(2*x**2 - x + 3)/384 + (30*x + 95/2)*sq
rt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)/48 - 30725*sqrt(2)*atanh(sq
rt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/4096
```

Mathematica [A] time = 0.0627727, size = 55, normalized size = 0.54

$$\frac{4\sqrt{2x^2-x+3}\left(9600x^3+20960x^2+13772x-34119\right)-92175\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{12288}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^2/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (4*Sqrt[3 - x + 2*x^2]*(-34119 + 13772*x + 20960*x^2 + 9600*x^3)
- 92175*Sqrt[2]*ArcSinh[(-1 + 4*x)/Sqrt[23]])/12288
```

Maple [A] time = 0.01, size = 79, normalized size = 0.8

$$-\frac{30725\sqrt{2}}{4096}Arcsinh\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)-\frac{11373}{1024}\sqrt{2x^2-x+3}+\frac{3443x}{768}\sqrt{2x^2-x+3}+\frac{655x^2}{96}\sqrt{2x^2-x+3}+\frac{25x^3}{8}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^2/(2*x^2-x+3)^(1/2),x)
```

```
[Out] -30725/4096*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-11373/1024*(2*
x^2-x+3)^(1/2)+3443/768*x*(2*x^2-x+3)^(1/2)+655/96*x^2*(2*x^2-x+3
)^(1/2)+25/8*x^3*(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.778093, size = 108, normalized size = 1.07

$$\frac{25}{8}\sqrt{2x^2-x+3}x^3+\frac{655}{96}\sqrt{2x^2-x+3}x^2+\frac{3443}{768}\sqrt{2x^2-x+3}x-\frac{30725}{4096}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)-\frac{11373}{1024}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 25/8*sqrt(2*x^2 - x + 3)*x^3 + 655/96*sqrt(2*x^2 - x + 3)*x^2 + 3
443/768*sqrt(2*x^2 - x + 3)*x - 30725/4096*sqrt(2)*arcsinh(1/23*s
qrt(23)*(4*x - 1)) - 11373/1024*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.274822, size = 103, normalized size = 1.02

$$\frac{1}{24576}\sqrt{2}\left(4\sqrt{2}\left(9600x^3+20960x^2+13772x-34119\right)\sqrt{2x^2-x+3}+92175\log\left(-\sqrt{2}\left(32x^2-16x+25\right)+8\sqrt{2x^2-x+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/24576*sqrt(2)*(4*sqrt(2)*(9600*x^3 + 20960*x^2 + 13772*x - 3411
9)*sqrt(2*x^2 - x + 3) + 92175*log(-sqrt(2)*(32*x^2 - 16*x + 25)
+ 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))
```

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

$$\int\frac{\left(5x^2+3x+2\right)^2}{\sqrt{2x^2-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**2/sqrt(2*x**2 - x + 3), x)
```

GIAC/XCAS [A] time = 0.273535, size = 85, normalized size = 0.84

$$\frac{1}{3072}\left(4\left(40\left(60\,x+131\right)x+3443\right)x-34119\right)\sqrt{2\,x^2-x+3}+\frac{30725}{4096}\,\sqrt{2}\ln\left(-2\,\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^2/sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/3072*(4*(40*(60*x + 131)*x + 3443)*x - 34119)*sqrt(2*x^2 - x +
3) + 30725/4096*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x
 + 3)) + 1)
```

3.82 $\int \frac{2+3x+5x^2}{\sqrt{3-x+2x^2}}\,dx$

Optimal. Leaf size=59

$$\frac{5}{4}\sqrt{2x^2-x+3}x+\frac{39}{16}\sqrt{2x^2-x+3}+\frac{17\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32\sqrt{2}}$$

```
[Out] (39*Sqrt[3 - x + 2*x^2])/16 + (5*x*Sqrt[3 - x + 2*x^2])/4 + (17*A
rcSinh[(1 - 4*x)/Sqrt[23]])/(32*Sqrt[2])
```

Rubi [A] time = 0.0727913, antiderivative size = 59, 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

$$\frac{5}{4}\sqrt{2x^2-x+3}x+\frac{39}{16}\sqrt{2x^2-x+3}+\frac{17\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{32\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (39*Sqrt[3 - x + 2*x^2])/16 + (5*x*Sqrt[3 - x + 2*x^2])/4 + (17*A
rcSinh[(1 - 4*x)/Sqrt[23]])/(32*Sqrt[2])
```

Rubi in Sympy [A] time = 9.67027, size = 53, normalized size = 0.9

$$\frac{\left(10x+\frac{39}{2}\right)\sqrt{2x^2-x+3}}{8}-\frac{17\sqrt{2}\,\mathrm{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(1/2),x)
```

```
[Out] (10*x + 39/2)*sqrt(2*x**2 - x + 3)/8 - 17*sqrt(2)*atanh(sqrt(2)*(
4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/64
```

Mathematica [A] time = 0.0501154, size = 46, normalized size = 0.78

$$\left(\frac{5x}{4}+\frac{39}{16}\right)\sqrt{2x^2-x+3}-\frac{17\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{32\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)/Sqrt[3 - x + 2*x^2],x]
```

```
[Out] (39/16 + (5*x)/4)*Sqrt[3 - x + 2*x^2] - (17*ArcSinh[(-1 + 4*x)/Sq
rt[23]])/(32*Sqrt[2])
```

Maple [A] time = 0.007, size = 45, normalized size = 0.8

$$-\frac{17\sqrt{2}}{64}\mathit{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{39}{16}\sqrt{2\,x^2-x+3}+\frac{5\,x}{4}\sqrt{2\,x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)/(2*x^2-x+3)^(1/2),x)
```

```
[Out] -17/64*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+39/16*(2*x^2-x+3)^(
1/2)+5/4*x*(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.783725, size = 62, normalized size = 1.05

$$\frac{5}{4}\sqrt{2x^2-x+3}x-\frac{17}{64}\sqrt{2}\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right)+\frac{39}{16}\sqrt{2x^2-x+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/sqrt(2*x^2 - x + 3),x, algorithm="maxima")
```

```
[Out] 5/4*sqrt(2*x^2 - x + 3)*x - 17/64*sqrt(2)*arcsinh(1/23*sqrt(23)*(
4*x - 1)) + 39/16*sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.281637, size = 89, normalized size = 1.51

$$\frac{1}{128}\sqrt{2}\left(4\sqrt{2}\sqrt{2x^2-x+3}(20x+39)+17\log\left(-\sqrt{2}\left(32x^2-16x+25\right)+8\sqrt{2x^2-x+3}(4x-1)\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/sqrt(2*x^2 - x + 3),x, algorithm="fricas")
```

```
[Out] 1/128*sqrt(2)*(4*sqrt(2)*sqrt(2*x^2 - x + 3)*(20*x + 39) + 17*log
(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1))
)
```

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

$$\int\frac{5x^2+3x+2}{\sqrt{2x^2-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)/sqrt(2*x**2 - x + 3), x)
```

GIAC/XCAS [A] time = 0.271618, size = 72, normalized size = 1.22

$$\frac{1}{16}\sqrt{2x^2-x+3}(20x+39)+\frac{17}{64}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)/sqrt(2*x^2 - x + 3),x, algorithm="giac")
```

```
[Out] 1/16*sqrt(2*x^2 - x + 3)*(20*x + 39) + 17/64*sqrt(2)*ln(-2*sqrt(2
)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
```

3.83 $\int \frac{1}{\sqrt{3-x+2x^2}(2+3x+5x^2)}\,dx$

Optimal. Leaf size=148

$$\sqrt{\frac{1}{682}\left(13+10\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(13+10\sqrt{2}\right)}}\left(\left(13+10\sqrt{2}\right)x+3\sqrt{2}+7\right)}{\sqrt{2x^2-x+3}}\right)-\sqrt{\frac{1}{682}\left(10\sqrt{2}-13\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(10\sqrt{2}-13\right)}}\left(\left(13-10\sqrt{2}\right)x-3\sqrt{2}+7\right)}{\sqrt{2x^2-x+3}}\right)$$

```
[Out] Sqrt[(13 + 10*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(13 + 10*Sqrt[2])
)]*(7 + 3*Sqrt[2] + (13 + 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]] -
Sqrt[(-13 + 10*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-13 + 10*Sqrt[
2]))]*(7 - 3*Sqrt[2] + (13 - 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]
```

Rubi [A] time = 0.627494, antiderivative size = 148, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\sqrt{\frac{1}{682}\left(13+10\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(13+10\sqrt{2}\right)}}\left(\left(13+10\sqrt{2}\right)x+3\sqrt{2}+7\right)}{\sqrt{2x^2-x+3}}\right)-\sqrt{\frac{1}{682}\left(10\sqrt{2}-13\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(10\sqrt{2}-13\right)}}\left(\left(13-10\sqrt{2}\right)x-3\sqrt{2}+7\right)}{\sqrt{2x^2-x+3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)),x]
```

```
[Out] Sqrt[(13 + 10*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(13 + 10*Sqrt[2])
)]*(7 + 3*Sqrt[2] + (13 + 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]] -
Sqrt[(-13 + 10*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-13 + 10*Sqrt[
2]))]*(7 - 3*Sqrt[2] + (13 - 10*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]]
```

Rubi in Sympy [A] time = 55.0243, size = 172, normalized size = 1.16

$$\frac{\sqrt{682}\left(22+22\sqrt{2}\right)\left(33\sqrt{2}+77\right)\operatorname{atan}\left(\frac{\sqrt{341}\left(x\left(143+110\sqrt{2}\right)+33\sqrt{2}+77\right)}{341\sqrt{13+10\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{165044\sqrt{13+10\sqrt{2}}}+\frac{\sqrt{682}\left(-33\sqrt{2}+77\right)\left(-22\sqrt{2}+22\right)\operatorname{atanh}\left(\frac{\sqrt{341}\left(x\left(-110\sqrt{2}+143\right)-33\sqrt{2}+77\right)}{341\sqrt{-13+10\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{165044\sqrt{-13+10\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(5*x**2+3*x+2)/(2*x**2-x+3)**(1/2),x)
```

```
[Out] sqrt(682)*(22 + 22*sqrt(2))*(33*sqrt(2) + 77)*atan(sqrt(341)*(x*(
143 + 110*sqrt(2)) + 33*sqrt(2) + 77)/(341*sqrt(13 + 10*sqrt(2))*
```

```
sqrt(2*x**2 - x + 3)))/(165044*sqrt(13 + 10*sqrt(2))) + sqrt(682)
*(-33*sqrt(2) + 77)*(-22*sqrt(2) + 22)*atanh(sqrt(341)*(x*(-110*s
qrt(2) + 143) - 33*sqrt(2) + 77)/(341*sqrt(-13 + 10*sqrt(2))*sqrt
(2*x**2 - x + 3)))/(165044*sqrt(-13 + 10*sqrt(2)))
```

Mathematica [C] time = 6.41329, size = 959, normalized size = 6.48

$$-\frac{5i\tan^{-1}\left(\frac{11\left(550x^4-2200x^3-62i\sqrt{31}x^2+1906x^2+31i\sqrt{31}x+1797x-93i\sqrt{31}+1\cdots\right.}{-1100\sqrt{31}x^4-550\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-110\sqrt{31}x^3+6820ix^3+1245\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^2-1078\sqrt{31}x^2-1364ix^2+725\sqrt{22\left(-13+i\sqrt{\cdots}\right.}\cdots}\right.}{\sqrt{\frac{341}{2}\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{5\tan^{-1}\left(\frac{31\left(100ix^2-50ix+11\sqrt{31}+7i\right)\left(2x^2-x+3\right)}{-1100i\sqrt{31}x^4+100i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-110i\sqrt{31}x^3+6820x^3+35i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^2-1078i\sqrt{31}x^2-1364x^2+25i\sqrt{682\left(13+i\sqrt{3\cdots}\right.}\cdots}\right.}{\sqrt{\frac{341}{2}\left(13+i\sqrt{31}\right)}}$$

$$+\frac{5i\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{\sqrt{682\left(13+i\sqrt{31}\right)}}-\frac{5\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{5\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+i\sqrt{682\left(-13+i\sqrt{31\cdots}\right.}\cdots\right.\right.}{\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{5i\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-63i\sqrt{22\left(13+i\sqrt{3\cdots}\right.}\cdots\right.\right.}{\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)),x]
```

```
[Out] ((-5*I)*ArcTan[(11*(1759 - (93*I)*Sqrt[31] + 1797*x + (31*I)*Sqrt
[31]*x + 1906*x^2 - (62*I)*Sqrt[31]*x^2 - 2200*x^3 + 550*x^4))/(3
069*I + 363*Sqrt[31] + (9207*I)*x - 1111*Sqrt[31]*x - (1364*I)*x^
2 - 1078*Sqrt[31]*x^2 + (6820*I)*x^3 - 110*Sqrt[31]*x^3 - 1100*Sq
rt[31]*x^4 + 630*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2]
+ 725*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + 1245*Sq
rt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - 550*Sqrt[22*(
-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[(341*(-13 + I*
Sqrt[31]))/2] - (5*ArcTan[(31*(7*I + 11*Sqrt[31] - (50*I)*x + (10
0*I)*x^2)*(3 - x + 2*x^2))/(3069 + (363*I)*Sqrt[31] + 9207*x - (1
111*I)*Sqrt[31]*x - 1364*x^2 - (1078*I)*Sqrt[31]*x^2 + 6820*x^3 -
 (110*I)*Sqrt[31]*x^3 - (1100*I)*Sqrt[31]*x^4 - (10*I)*Sqrt[682*(
13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (25*I)*Sqrt[682*(13 + I*S
qrt[31])]*x*Sqrt[3 - x + 2*x^2] + (35*I)*Sqrt[682*(13 + I*Sqrt[31
])]*x^2*Sqrt[3 - x + 2*x^2] + (100*I)*Sqrt[682*(13 + I*Sqrt[31])]
*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[(341*(13 + I*Sqrt[31]))/2] - (5*
Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2]
)/Sqrt[682*(-13 + I*Sqrt[31])] + ((5*I)*Log[(-3*I + Sqrt[31] - (1
0*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(13 + I*Sqrt[3
1])] + (5*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x
 - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-1
3 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sq
rt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31])] -
((5*I)*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x
- 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*
(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*S
qrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13 + I*Sqrt[31])]
```

Maple [B] time = 0.006, size = 684, normalized size = 4.6

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(5*x^2+3*x+2)/(2*x^2-x+3)^(1/2),x)
```

```
[Out] 1/21142*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x
)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(369*2^(1/2)*arcta
n(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*(-
23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*2^
(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^(1
/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-x)
^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2)-
1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*2^
(1/2))^(1/2)+520*arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)
*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/
2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368
*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2
)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(
8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1
/2)*(-775687+549362*2^(1/2))^(1/2)+465124*arctanh(31/2*(8*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^
2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-866822*a
rctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)
-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(
1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x
)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))^
2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-8866+682
0*2^(1/2))^(1/2)
```

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

$$\int \frac{1}{(5\,x^2+3\,x+2)\sqrt{2\,x^2-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)
```

Fricas [A] time = 0.330157, size = 1299, normalized size = 8.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] 1/422840*sqrt(341)*sqrt(31)*sqrt(5)*(200^(1/4)*sqrt(31)*(10*sqrt(
2) - 13)*log(-40*(sqrt(341)*200^(1/4)*sqrt(5)*sqrt(2*x^2 - x + 3)
*(sqrt(2)*(86551*x + 35845) - 122396*x - 50706)*sqrt((13*sqrt(2)
- 20)/(260*sqrt(2) - 369)) + 3464300*x^2 + 220*sqrt(2)*(28280*x^2
 - 9997*sqrt(2)*(2*x^2 - x + 3) - 14140*x + 42420) - 49985*sqrt(2
)*(49*x^2 - 151*x + 200) - 10675700*x + 14140000)/(9997*sqrt(2)*x
^2 - 14140*x^2)) - 200^(1/4)*sqrt(31)*(10*sqrt(2) - 13)*log(40*(s
qrt(341)*200^(1/4)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(86551*x
```

```
+ 35845) - 122396*x - 50706)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2)
- 369)) - 3464300*x^2 - 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*
x^2 - x + 3) - 14140*x + 42420) + 49985*sqrt(2)*(49*x^2 - 151*x +
 200) + 10675700*x - 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2)) +
124*200^(1/4)*arctan(155*(sqrt(341)*sqrt(5)*(10*sqrt(2)*(x - 6) -
 13*x + 78)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 11*200^
(1/4)*sqrt(2*x^2 - x + 3)*(7*sqrt(2) - 6))/(2*sqrt(341)*sqrt(31)*
sqrt(10)*sqrt(5)*(10*sqrt(2)*x - 13*x)*sqrt(-(sqrt(341)*200^(1/4)
*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(86551*x + 35845) - 122396*
x - 50706)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) + 3464300*
x^2 + 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3) - 141
40*x + 42420) - 49985*sqrt(2)*(49*x^2 - 151*x + 200) - 10675700*x
 + 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2))*sqrt((13*sqrt(2) - 2
0)/(260*sqrt(2) - 369)) + 5*sqrt(341)*sqrt(31)*sqrt(5)*(10*sqrt(2
)*(19*x - 22) - 247*x + 286)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2)
- 369)) - 1705*200^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqrt(2) -
2))) + 124*200^(1/4)*arctan(-155*(sqrt(341)*sqrt(5)*(10*sqrt(2)*(
x - 6) - 13*x + 78)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) -
 11*200^(1/4)*sqrt(2*x^2 - x + 3)*(7*sqrt(2) - 6))/(2*sqrt(341)*s
qrt(31)*sqrt(10)*sqrt(5)*(10*sqrt(2)*x - 13*x)*sqrt((sqrt(341)*20
0^(1/4)*sqrt(5)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(86551*x + 35845) -
122396*x - 50706)*sqrt((13*sqrt(2) - 20)/(260*sqrt(2) - 369)) - 3
464300*x^2 - 220*sqrt(2)*(28280*x^2 - 9997*sqrt(2)*(2*x^2 - x + 3
) - 14140*x + 42420) + 49985*sqrt(2)*(49*x^2 - 151*x + 200) + 106
75700*x - 14140000)/(9997*sqrt(2)*x^2 - 14140*x^2))*sqrt((13*sqrt
(2) - 20)/(260*sqrt(2) - 369)) + 5*sqrt(341)*sqrt(31)*sqrt(5)*(10
*sqrt(2)*(19*x - 22) - 247*x + 286)*sqrt((13*sqrt(2) - 20)/(260*s
qrt(2) - 369)) + 1705*200^(1/4)*sqrt(31)*sqrt(2*x^2 - x + 3)*(sqr
t(2) - 2))))/((10*sqrt(2) - 13)*sqrt((13*sqrt(2) - 20)/(260*sqrt(
2) - 369)))
```

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

$$\int \frac{1}{\sqrt{2x^2 - x + 3}\,(5x^2 + 3x + 2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(5*x**2+3*x+2)/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.84 $\int \frac{1}{\sqrt{3-x+2x^2}(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=188

$$\frac{\sqrt{2x^2-x+3}(65x+4)}{682(5x^2+3x+2)}+\frac{\sqrt{\frac{1}{682}\left(2343727+1678700\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(2343727+1678700\sqrt{2}\right)}}\left(\left(5751+3935\sqrt{2}\right)x+1816\sqrt{2}+2119\right)}{\sqrt{2x^2-x+3}}\right)}{1364}-\frac{\sqrt{\frac{1}{682}\left(1678700\sqrt{2}-2343727\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(1678700\sqrt{2}-2343727\right)}}\left(\left(5751-3935\sqrt{2}\right)x-1816\sqrt{2}+2119\right)}{\sqrt{2x^2-x+3}}\right)}{1364}$$

```
[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(682*(2 + 3*x + 5*x^2)) + (Sqrt[
(2343727 + 1678700*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(2343727 + 1
678700*Sqrt[2]))]*(2119 + 1816*Sqrt[2] + (5751 + 3935*Sqrt[2])*x)
)/Sqrt[3 - x + 2*x^2]])/1364 - (Sqrt[(-2343727 + 1678700*Sqrt[2])
/682]*ArcTanh[(Sqrt[11/(31*(-2343727 + 1678700*Sqrt[2]))]*(2119 -
 1816*Sqrt[2] + (5751 - 3935*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/1
364
```

Rubi [A] time = 0.884934, antiderivative size = 188, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{\sqrt{2x^2-x+3}(65x+4)}{682(5x^2+3x+2)}+\frac{\sqrt{\frac{1}{682}\left(2343727+1678700\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(2343727+1678700\sqrt{2}\right)}}\left(\left(5751+3935\sqrt{2}\right)x+1816\sqrt{2}+2119\right)}{\sqrt{2x^2-x+3}}\right)}{1364}-\frac{\sqrt{\frac{1}{682}\left(1678700\sqrt{2}-2343727\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(1678700\sqrt{2}-2343727\right)}}\left(\left(5751-3935\sqrt{2}\right)x-1816\sqrt{2}+2119\right)}{\sqrt{2x^2-x+3}}\right)}{1364}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2),x]
```


```
[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(682*(2 + 3*x + 5*x^2)) + (Sqrt[
(2343727 + 1678700*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(2343727 + 1
678700*Sqrt[2]))]*(2119 + 1816*Sqrt[2] + (5751 + 3935*Sqrt[2])*x)
)/Sqrt[3 - x + 2*x^2]])/1364 - (Sqrt[(-2343727 + 1678700*Sqrt[2])
/682]*ArcTanh[(Sqrt[11/(31*(-2343727 + 1678700*Sqrt[2]))]*(2119 -
 1816*Sqrt[2] + (5751 - 3935*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/1
364
```

Rubi in Sympy [A] time = 77.5236, size = 216, normalized size = 1.15

$$\frac{(715x+44)\sqrt{2x^2-x+3}}{7502\,(5x^2+3x+2)}+\frac{\sqrt{682}\left(\frac{256399}{2}+109868\sqrt{2}\right)\left(40172\sqrt{2}+64977\right)\operatorname{atan}\left(\frac{2\sqrt{341}\left(x\left(\frac{476135\sqrt{2}}{2}+\frac{695871}{2}\right)+\frac{256399}{2}+109868\sqrt{2}\right)}{3751\sqrt{2343727+1678700\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{6809880484\sqrt{2343727+1678700\sqrt{2}}}+\frac{\sqrt{682}\left(-109868\sqrt{2}+\frac{256399}{2}\right)\left(-40172\sqrt{2}+64977\right)\operatorname{atanh}\left(\frac{2\sqrt{341}\left(x\left(-\frac{476135\sqrt{2}}{2}+\frac{695871}{2}\right)-109868\sqrt{2}+\frac{256399}{2}\right)}{3751\sqrt{-2343727+1678700\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{6809880484\sqrt{-2343727+1678700\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(5*x**2+3*x+2)**2/(2*x**2-x+3)**(1/2),x)
```

```
[Out] (715*x + 44)*sqrt(2*x**2 - x + 3)/(7502*(5*x**2 + 3*x + 2)) + sqr
t(682)*(256399/2 + 109868*sqrt(2))*(40172*sqrt(2) + 64977)*atan(2
*sqrt(341)*(x*(476135*sqrt(2)/2 + 695871/2) + 256399/2 + 109868*s
qrt(2))/(3751*sqrt(2343727 + 1678700*sqrt(2))*sqrt(2*x**2 - x + 3
)))/(6809880484*sqrt(2343727 + 1678700*sqrt(2))) + sqrt(682)*(-10
9868*sqrt(2) + 256399/2)*(-40172*sqrt(2) + 64977)*atanh(2*sqrt(34
1)*(x*(-476135*sqrt(2)/2 + 695871/2) - 109868*sqrt(2) + 256399/2)
/(3751*sqrt(-2343727 + 1678700*sqrt(2))*sqrt(2*x**2 - x + 3)))/(6
809880484*sqrt(-2343727 + 1678700*sqrt(2)))
```

Mathematica [C] time = 6.44877, size = 1147, normalized size = 6.1

$$\frac{\sqrt{2x^2-x+3}(65x+4)}{682\,(5x^2+3x+2)}-\frac{5i\left(-787i+41\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(73964\sqrt{31}x^4+299597ix^4+291346\cdots\right.}{-31033201i\sqrt{31}x^4+44012188x^4+1342960i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-14709760i\sqrt{31}x^3+81775210x^3+470036i\sqrt{682\left(13+\cdots\right.}}\right.}{136\cdots}$$

$$-\frac{5i\left(787i+41\sqrt{31}\right)\tanh^{-1}\left(\frac{31033201\sqrt{31}x^4-44012188ix^4+7386280\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+14709760\sqrt{31}x^3-81775210ix^3-16719852\sqrt{22\left(-13+\cdots\right.}}{2292884\sqrt{31}x^4+155225093ix^4+9031726\sqrt{31}x\cdots}\right.}{136\cdots}$$

$$+\frac{5i\left(787i+41\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{2728\sqrt{682\left(-13+i\sqrt{31}\right)}}-\frac{5\left(-787i+41\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{2728\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$-\frac{5i\left(787i+41\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+i\cdots\right.\right.}{2728\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{5\left(-787i+41\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-6\cdots\right.\right.}{2728\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(682*(2 + 3*x + 5*x^2)) - (((5*I
)/1364)*(-787*I + 41*Sqrt[31])*ArcTan[(31*(802246*I + 546546*Sqrt
[31] - (3387270*I)*x + 310310*Sqrt[31]*x + (2284079*I)*x^2 + 3111
46*Sqrt[31]*x^2 - (3529208*I)*x^3 + 291346*Sqrt[31]*x^3 + (299597
*I)*x^4 + 73964*Sqrt[31]*x^4))/(20294274 + (5110826*I)*Sqrt[31] +
 148907198*x - (9626874*I)*Sqrt[31]*x + 27657146*x^2 - (35512659*
I)*Sqrt[31]*x^2 + 81775210*x^3 - (14709760*I)*Sqrt[31]*x^3 + 4401
2188*x^4 - (31033201*I)*Sqrt[31]*x^4 - (134296*I)*Sqrt[682*(13 +
I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (335740*I)*Sqrt[682*(13 + I*Sq
rt[31])]*x*Sqrt[3 - x + 2*x^2] + (470036*I)*Sqrt[682*(13 + I*Sqrt
[31])]*x^2*Sqrt[3 - x + 2*x^2] + (1342960*I)*Sqrt[682*(13 + I*Sqr
t[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13 + I*Sqrt[31])] -
(((5*I)/1364)*(787*I + 41*Sqrt[31])*ArcTanh[(-20294274*I - 511082
6*Sqrt[31] - (148907198*I)*x + 9626874*Sqrt[31]*x - (27657146*I)*
x^2 + 35512659*Sqrt[31]*x^2 - (81775210*I)*x^3 + 14709760*Sqrt[31
]*x^3 - (44012188*I)*x^4 + 31033201*Sqrt[31]*x^4 - 8460648*Sqrt[2
2*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 9736460*Sqrt[22*(-13
+ I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] - 16719852*Sqrt[22*(-13 + I*
Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + 7386280*Sqrt[22*(-13 + I*Sqr
t[31])]*x^3*Sqrt[3 - x + 2*x^2])/(243722374*I + 16942926*Sqrt[31]
 + (305106410*I)*x + 9619610*Sqrt[31]*x + (362298151*I)*x^2 + 964
5526*Sqrt[31]*x^2 - (298854392*I)*x^3 + 9031726*Sqrt[31]*x^3 + (1
55225093*I)*x^4 + 2292884*Sqrt[31]*x^4)])/Sqrt[682*(-13 + I*Sqrt[
31])] - (5*(-787*I + 41*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x
)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(2728*Sqrt[682*(13 + I*Sqrt[3
1])]) + (((5*I)/2728)*(787*I + 41*Sqrt[31])*Log[(-3*I + Sqrt[31]
- (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 + I*S
qrt[31])] - (((5*I)/2728)*(787*I + 41*Sqrt[31])*Log[(2 + 3*x + 5*
x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*
x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x
 + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x
^2])])/Sqrt[682*(-13 + I*Sqrt[31])] + (5*(-787*I + 41*Sqrt[31])*L
og[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqr
t[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*
Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])
]*x*Sqrt[3 - x + 2*x^2])])/(2728*Sqrt[682*(13 + I*Sqrt[31])])
```

Maple [B] time = 0.009, size = 5225, normalized size = 27.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(5*x^2+3*x+2)^2/(2*x^2-x+3)^(1/2),x)
```

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

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

$$\int \frac{1}{\left(5\,x^2+3\,x+2\right)^2\sqrt{2\,x^2-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3)), x)
```

Fricas [A] time = 0.362036, size = 1505, normalized size = 8.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] -1/2641240152695936*930248^(3/4)*sqrt(33574)*sqrt(31)*(4*930248^(
1/4)*sqrt(33574)*sqrt(31)*sqrt(2*x^2 - x + 3)*(2343727*sqrt(2)*(6
5*x + 4) - 218231000*x - 13429600)*sqrt((2343727*sqrt(2) - 335740
0)/(7868829029800*sqrt(2) - 11129123630529)) + 8422204*sqrt(16787
)*sqrt(2)*(5*x^2 + 3*x + 2)*arctan(520397*(930248^(1/4)*sqrt(3357
4)*(2343727*sqrt(2)*(x - 6) - 3357400*x + 20144400)*sqrt((2343727
*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529)) + 8
8*sqrt(16787)*sqrt(2*x^2 - x + 3)*(1816*sqrt(2) - 2119))/(2*93024
8^(1/4)*sqrt(33574)*sqrt(16787)*sqrt(31)*(2343727*sqrt(2)*x - 335
7400*x)*sqrt(-sqrt(2)*(930248^(1/4)*sqrt(33574)*sqrt(16787)*sqrt(
2*x^2 - x + 3)*(sqrt(2)*(189489825488457357396643*x + 78489272699
663150388575) - 267979098188120507785218*x - 11100055278879420700
8068)*sqrt((2343727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 1
1129123630529)) + 219371611293533385864425600*x^2 + 16787*sqrt(2)
*(363823499562131949620 0*x^2 - 525024341238593615 83*sqrt(2)*(49*x
^2 - 151*x + 200) - 1121170376201671926380 0*x + 14849938757638038
760000) - 775595358240759850546562 48*sqrt(2)*(2*x^2 - x + 3) - 10
968580564676669293221280 0*x + 32905741694030007879663840 0)/(52502
434123859361583*sqrt(2)*x^2 - 74249693788190193800*x^2))*sqrt((23
43727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529)
) + 16787*930248^(1/4)*sqrt(33574)*sqrt(31)*(2343727*sqrt(2)*(19*
x - 22) - 63790600*x + 73862800)*sqrt((2343727*sqrt(2) - 3357400)
/(7868829029800*sqrt(2) - 11129123630529)) - 45794936*sqrt(16787)
*sqrt(31)*sqrt(2*x^2 - x + 3)*(332*sqrt(2) - 537))) + 8422204*sqr
t(16787)*sqrt(2)*(5*x^2 + 3*x + 2)*arctan(-520397*(930248^(1/4)*s
qrt(33574)*(2343727*sqrt(2)*(x - 6) - 3357400*x + 20144400)*sqrt(
(2343727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 111291236305
29)) - 88*sqrt(16787)*sqrt(2*x^2 - x + 3)*(1816*sqrt(2) - 2119))/
(2*930248^(1/4)*sqrt(33574)*sqrt(16787)*sqrt(31)*(2343727*sqrt(2)
*x - 3357400*x)*sqrt(sqrt(2)*(930248^(1/4)*sqrt(33574)*sqrt(16787
)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(189489825488457357396643*x + 7848
9272699663150388575) - 267979098188120507785218*x - 1110005527887
94207008068)*sqrt((2343727*sqrt(2) - 3357400)/(7868829029800*sqrt
(2) - 11129123630529)) - 219371611293533385864425600*x^2 - 16787*
sqrt(2)*(3638234995621319496200*x^2 - 52502434123859361583*sqrt(2
)*(49*x^2 - 151*x + 200) - 11211703762016719263800*x + 1484993875
7638038760000) + 77559535824075985054656248*sqrt(2)*(2*x^2 - x +
3) + 109685805646766692932212800*x - 329057416940300078796638400)
/(52502434123859361583*sqrt(2)*x^2 - 74249693788190193800*x^2))*s
qrt((2343727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123
630529)) + 16787*930248^(1/4)*sqrt(33574)*sqrt(31)*(2343727*sqrt(
2)*(19*x - 22) - 63790600*x + 73862800)*sqrt((2343727*sqrt(2) - 3
357400)/(7868829029800*sqrt(2) - 11129123630529)) + 45794936*sqrt
(16787)*sqrt(31)*sqrt(2*x^2 - x + 3)*(332*sqrt(2) - 537))) - sqrt
(16787)*sqrt(31)*(16787000*x^2 - 2343727*sqrt(2)*(5*x^2 + 3*x + 2
) + 10072200*x + 6714800)*log(-41967500*sqrt(2)*(930248^(1/4)*sqr
t(33574)*sqrt(16787)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(18948982548845
7357396643*x + 78489272699663150388575) - 26797909818812050778521
8*x - 111000552788794207008068)*sqrt((2343727*sqrt(2) - 3357400)/
(7868829029800*sqrt(2) - 11129123630529)) + 219371611293533385864
425600*x^2 + 16787*sqrt(2)*(3638234995621319496200*x^2 - 52502434
123859361583*sqrt(2)*(49*x^2 - 151*x + 200) - 1121170376201671926
3800*x + 14849938757638038760000) - 77559535824075985054656248*sq
rt(2)*(2*x^2 - x + 3) - 109685805646766692932212800*x + 329057416
940300078796638400)/(52502434123859361583*sqrt(2)*x^2 - 742496937
88190193800*x^2)) + sqrt(16787)*sqrt(31)*(16787000*x^2 - 2343727*
sqrt(2)*(5*x^2 + 3*x + 2) + 10072200*x + 6714800)*log(41967500*sq
rt(2)*(930248^(1/4)*sqrt(33574)*sqrt(16787)*sqrt(2*x^2 - x + 3)*(
sqrt(2)*(189489825488457357396643*x + 78489272699663150388575) -
267979098188120507785218*x - 111000552788794207008068)*sqrt((2343
727*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529))
- 219371611293533385864425600*x^2 - 16787*sqrt(2)*(36382349956213
```

```
19496200*x^2 - 52502434123859361583*sqrt(2)*(49*x^2 - 151*x + 200
) - 1121170376201671926380 0*x + 14849938757638038760000) + 775595
35824075985054656248*sqrt(2)*(2*x^2 - x + 3) + 109685805646766692
932212800*x - 32905741694030007879663840 0)/(52502434123859361583*
sqrt(2)*x^2 - 74249693788190193800*x^2)))/((16787000*x^2 - 234372
7*sqrt(2)*(5*x^2 + 3*x + 2) + 10072200*x + 6714800)*sqrt((2343727
*sqrt(2) - 3357400)/(7868829029800*sqrt(2) - 11129123630529)))
```

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

$$\int \frac{1}{\sqrt{2x^2-x+3}\,(5x^2+3x+2)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(5*x**2+3*x+2)**2/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*sqrt(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.85 $\int \frac{1}{\sqrt{3-x+2x^2}(2+3x+5x^2)^3} dx$

Optimal. Leaf size=223

$$\frac{\sqrt{2x^2-x+3}(65x+4)}{1364\left(5x^2+3x+2\right)^2}+\frac{(86265x+26794)\sqrt{2x^2-x+3}}{1860496\left(5x^2+3x+2\right)}+\frac{25\sqrt{\frac{1}{682}\left(6414867847+4536374600\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(6414867847+4536374600\sqrt{2}\right)}}\left(\left(294669+208915\sqrt{2}\right)x+85754\sqrt{2}+123161\right)}{\sqrt{2x^2-x+3}}\right)}{3720992}-\frac{25\sqrt{\frac{1}{682}\left(4536374600\sqrt{2}-6414867847\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(4536374600\sqrt{2}-6414867847\right)}}\left(\left(294669-208915\sqrt{2}\right)x-85754\sqrt{2}+123161\right)}{\sqrt{2x^2-x+3}}\right)}{3720992}$$

```
[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(1364*(2 + 3*x + 5*x^2)^2) + ((2
6794 + 86265*x)*Sqrt[3 - x + 2*x^2])/(1860496*(2 + 3*x + 5*x^2))
+ (25*Sqrt[(6414867847 + 4536374600*Sqrt[2])/682]*ArcTan[(Sqrt[11
/(31*(6414867847 + 4536374600*Sqrt[2]))]*(123161 + 85754*Sqrt[2]
+ (294669 + 208915*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/3720992 - (
25*Sqrt[(-6414867847 + 4536374600*Sqrt[2])/682]*ArcTanh[(Sqrt[11/
(31*(-6414867847 + 4536374600*Sqrt[2]))]*(123161 - 85754*Sqrt[2]
+ (294669 - 208915*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/3720992
```

Rubi [A] time = 0.968858, antiderivative size = 223, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{\sqrt{2x^2-x+3}(65x+4)}{1364\left(5x^2+3x+2\right)^2}+\frac{(86265x+26794)\sqrt{2x^2-x+3}}{1860496\left(5x^2+3x+2\right)}+\frac{25\sqrt{\frac{1}{682}\left(6414867847+4536374600\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(6414867847+4536374600\sqrt{2}\right)}}\left(\left(294669+208915\sqrt{2}\right)x+85754\sqrt{2}+123161\right)}{\sqrt{2x^2-x+3}}\right)}{3720992}-\frac{25\sqrt{\frac{1}{682}\left(4536374600\sqrt{2}-6414867847\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(4536374600\sqrt{2}-6414867847\right)}}\left(\left(294669-208915\sqrt{2}\right)x-85754\sqrt{2}+123161\right)}{\sqrt{2x^2-x+3}}\right)}{3720992}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] ((4 + 65*x)*Sqrt[3 - x + 2*x^2])/(1364*(2 + 3*x + 5*x^2)^2) + ((2
6794 + 86265*x)*Sqrt[3 - x + 2*x^2])/(1860496*(2 + 3*x + 5*x^2))
+ (25*Sqrt[(6414867847 + 4536374600*Sqrt[2])/682]*ArcTan[(Sqrt[11
/(31*(6414867847 + 4536374600*Sqrt[2]))]*(123161 + 85754*Sqrt[2]
+ (294669 + 208915*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/3720992 - (
25*Sqrt[(-6414867847 + 4536374600*Sqrt[2])/682]*ArcTanh[(Sqrt[11/
(31*(-6414867847 + 4536374600*Sqrt[2]))]*(123161 - 85754*Sqrt[2]
+ (294669 - 208915*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/3720992
```

Rubi in Sympy [A] time = 104.21, size = 258, normalized size = 1.16

$$\frac{(715x+44)\sqrt{2x^2-x+3}}{15004\,(5x^2+3x+2)^2}+\frac{\left(\frac{10438065x}{2}+1621037\right)\sqrt{2x^2-x+3}}{112560008\,(5x^2+3x+2)}$$
$$+\frac{\sqrt{682}\left(\frac{868577325}{2}+310422475\sqrt{2}\right)\left(\frac{1426732175\sqrt{2}}{2}+\frac{4098182275}{4}\right)\operatorname{atan}\left(\frac{4\sqrt{341}\left(x\left(\frac{9805110975}{4}+\frac{6951646625\sqrt{2}}{4}\right)+\frac{1426732175\sqrt{2}}{2}+\frac{4098182275}{4}\right)}{1031525\sqrt{6414867847+4536374600\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{14049123932516200\sqrt{6414867847+4536374600\sqrt{2}}}$$
$$+\frac{\sqrt{682}\left(-\frac{1426732175\sqrt{2}}{2}+\frac{4098182275}{4}\right)\left(-310422475\sqrt{2}+\frac{868577325}{2}\right)\operatorname{atanh}\left(\frac{4\sqrt{341}\left(x\left(-\frac{6951646625\sqrt{2}}{4}+\frac{9805110975}{4}\right)-\frac{1426732175\sqrt{2}}{2}+\frac{4098182275}{4}\right)}{1031525\sqrt{-6414867847+4536374600\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{14049123932516200\sqrt{-6414867847+4536374600\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   rubi_integrate(1/(5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)
```

```
[Out] (715*x + 44)*sqrt(2*x**2 - x + 3)/(15004*(5*x**2 + 3*x + 2)**2) +
 (10438065*x/2 + 1621037)*sqrt(2*x**2 - x + 3)/(112560008*(5*x**2
 + 3*x + 2)) + sqrt(682)*(868577325/2 + 310422475*sqrt(2))*(14267
32175*sqrt(2)/2 + 4098182275/4)*atan(4*sqrt(341)*(x*(9805110975/4
 + 6951646625*sqrt(2)/4) + 1426732175*sqrt(2)/2 + 4098182275/4)/(
1031525*sqrt(6414867847 + 4536374600*sqrt(2))*sqrt(2*x**2 - x + 3
)))/(14049123932516200*sqrt(6414867847 + 4536374600*sqrt(2))) + s
qrt(682)*(-1426732175*sqrt(2)/2 + 4098182275/4)*(-310422475*sqrt(
2) + 868577325/2)*atanh(4*sqrt(341)*(x*(-6951646625*sqrt(2)/4 + 9
805110975/4) - 1426732175*sqrt(2)/2 + 4098182275/4)/(1031525*sqrt
(-6414867847 + 4536374600*sqrt(2))*sqrt(2*x**2 - x + 3)))/(140491
23932516200*sqrt(-6414867847 + 4536374600*sqrt(2)))
```

Mathematica [C] time = 6.46702, size = 1170, normalized size = 5.25

$$\sqrt{2x^2-x+3}\left(\frac{65x+4}{1364\,(5x^2+3x+2)^2}+\frac{86265x+26794}{1860496\,(5x^2+3x+2)}\right)$$

$$-\frac{125i\left(-41783i+1489\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(97553324\sqrt{31}x^4 \cdots\right.}{-72669503461i\sqrt{31}x^4+84861105868x^4+3629099680i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-29645645200i\sqrt{31}x^3+2372409 \cdots}\right.}{\cdots}$$

$$-\frac{125i\left(41783i+1489\sqrt{31}\right)\tanh^{-1}\left(\frac{72669503461\sqrt{31}x^4-84861105868ix^4+19960048240\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+29645645200\sqrt{31}x^3-237240959 \cdots}{3024153044\sqrt{31}x^4+343941 \cdots}\right.}{\cdots}$$

$$+\frac{125i\left(41783i+1489\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{7441984\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{125\left(-41783i+1489\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{7441984\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$-\frac{125i\left(41783i+1489\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+46 \cdots\right.\right.}{7441984\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{125\left(-41783i+1489\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041 \cdots\right.\right.}{7441984\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((4 + 65*x)/(1364*(2 + 3*x + 5*x^2)^2) + (267
94 + 86265*x)/(1860496*(2 + 3*x + 5*x^2))) - (((125*I)/3720992)*(
-41783*I + 1489*Sqrt[31])*ArcTan[(31*(1733669734*I + 1411781250*S
qrt[31] - (8257920150*I)*x + 438440750*Sqrt[31]*x + (8927431079*I
)*x^2 + 784505986*Sqrt[31]*x^2 - (8456927744*I)*x^3 + 557246338*S
qrt[31]*x^3 + (3245899757*I)*x^4 + 97553324*Sqrt[31]*x^4))/(74935
517250 + (14089391258*I)*Sqrt[31] + 394528763486*x - (31523713098
*I)*Sqrt[31]*x + 37412913890*x^2 - (81049798431*I)*Sqrt[31]*x^2 +
 237240959890*x^3 - (29645645200*I)*Sqrt[31]*x^3 + 84861105868*x^
4 - (72669503461*I)*Sqrt[31]*x^4 - (362909968*I)*Sqrt[682*(13 + I
*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (907274920*I)*Sqrt[682*(13 + I*
Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (1270184888*I)*Sqrt[682*(13 +
I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (3629099680*I)*Sqrt[682*(1
3 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13 + I*Sqrt
[31])] - (((125*I)/3720992)*(41783*I + 1489*Sqrt[31])*ArcTanh[(-7
4935517250*I - 14089391258*Sqrt[31] - (394528763486*I)*x + 315237
13098*Sqrt[31]*x - (37412913890*I)*x^2 + 81049798431*Sqrt[31]*x^2
 - (237240959890*I)*x^3 + 29645645200*Sqrt[31]*x^3 - (84861105868
*I)*x^4 + 72669503461*Sqrt[31]*x^4 - 22863327984*Sqrt[22*(-13 + I
*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - 26310972680*Sqrt[22*(-13 + I*Sq
rt[31])]*x*Sqrt[3 - x + 2*x^2] - 45182291016*Sqrt[22*(-13 + I*Sqr
t[31])]*x^2*Sqrt[3 - x + 2*x^2] + 19960048240*Sqrt[22*(-13 + I*Sq
rt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(672076174246*I + 43765218750*S
qrt[31] + (796731376970*I)*x + 13591663250*Sqrt[31]*x + (89363428
3351*I)*x^2 + 24319685566*Sqrt[31]*x^2 - (841081542656*I)*x^3 + 1
7274636478*Sqrt[31]*x^3 + (343941818333*I)*x^4 + 3024153044*Sqrt[
31]*x^4)])/Sqrt[682*(-13 + I*Sqrt[31])] - (125*(-41783*I + 1489*S
qrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10
```

```
*I)*x)^2])/(7441984*Sqrt[682*(13 + I*Sqrt[31])]) + (((125*I)/7441
984)*(41783*I + 1489*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2
*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 + I*Sqrt[31])] - (
((125*I)/7441984)*(41783*I + 1489*Sqrt[31])*Log[(2 + 3*x + 5*x^2)
*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2
+ 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2
*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])
])/Sqrt[682*(-13 + I*Sqrt[31])] + (125*(-41783*I + 1489*Sqrt[31])
*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*S
qrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 +
I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31
])]*x*Sqrt[3 - x + 2*x^2])])/(7441984*Sqrt[682*(13 + I*Sqrt[31])]
)
```

Maple [B] time = 0.037, size = 13040, normalized size = 58.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(5*x^2+3*x+2)^3/(2*x^2-x+3)^(1/2),x)
```

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

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

$$\int \frac{1}{(5x^2+3x+2)^3\sqrt{2x^2-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)), x)
```

Fricas [A] time = 0.37231, size = 1601, normalized size = 7.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] 1/2433873989840816267008*sqrt(22681873)*232562^(3/4)*sqrt(31)*(8*
sqrt(22681873)*232562^(1/4)*sqrt(31)*(3913303548690000*x^3 + 3563
458339538000*x^2 - 6414867847*sqrt(2)*(431325*x^3 + 392765*x^2 +
341572*x + 59044) + 3098997089742400*x + 535691403764800)*sqrt(2*
x^2 - x + 3)*sqrt((6414867847*sqrt(2) - 9072749200)/(582004871269
74972400*sqrt(2) - 82307918517524735409)) + 46113488900*sqrt(2268
1873)*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(31*(sq
rt(22681873)*232562^(1/4)*(6414867847*sqrt(2)*(x - 6) - 907274920
0*x + 54436495200)*sqrt((6414867847*sqrt(2) - 9072749200)/(582004
87126974972400*sqrt(2) - 82307918517524735409)) + 44*sqrt(2268187
3)*sqrt(2*x^2 - x + 3)*(85754*sqrt(2) - 123161))/(2*sqrt(22681873
)*232562^(1/4)*sqrt(31)*(6414867847*sqrt(2)*x - 9072749200*x)*sqr
t(-sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(19876203
112968156078556554677639977*x + 82329928978737020071375607715487
825) - 28109196010841858085694115449312780 2*x - 11643210215094454
```

```
0714189939062152152)*sqrt((6414867847*sqrt(2) - 9072749200)/(5820
0487126974972400*sqrt(2) - 82307918517524735409)) + 2628482505413
0298353406038323840 0*x^2 + sqrt(2)*(7317934248024912609755090215 1
600*x^2 - 10560328430724378104644985744 23*sqrt(2)*(49*x^2 - 151*x
 + 200) - 225511851316686082463881351528400*x + 29869119379693520
8561432253680000) - 929308901903745273208758745492 24*sqrt(2)*(2*x
^2 - x + 3) - 1314241252706514917670301916192 00*x + 394272375811 9
5447530109057485760 0)/(10560328430724378104644985744 23*sqrt(2)*x^
2 - 1493455968984676042807161268400*x^2))*sqrt((6414867847*sqrt(2
) - 9072749200)/(58200487126974972400*sqrt(2) - 82307918517524735
409)) + sqrt(22681873)*232562^(1/4)*sqrt(31)*(6414867847*sqrt(2)*
(19*x - 22) - 172382234800*x + 199600482400)*sqrt((6414867847*sqr
t(2) - 9072749200)/(58200487126974972400*sqrt(2) - 82307918517524
735409)) - 1364*sqrt(22681873)*sqrt(31)*sqrt(2*x^2 - x + 3)*(1865
8*sqrt(2) - 26103))) + 46113488900*sqrt(22681873)*sqrt(2)*(25*x^4
 + 30*x^3 + 29*x^2 + 12*x + 4)*arctan(-31*(sqrt(22681873)*232562^
(1/4)*(6414867847*sqrt(2)*(x - 6) - 9072749200*x + 54436495200)*s
qrt((6414867847*sqrt(2) - 9072749200)/(58200487126974972400*sqrt(
2) - 82307918517524735409)) - 44*sqrt(22681873)*sqrt(2*x^2 - x +
3)*(85754*sqrt(2) - 123161))/(2*sqrt(22681873)*232562^(1/4)*sqrt(
31)*(6414867847*sqrt(2)*x - 9072749200*x)*sqrt(sqrt(2)*(2*232562^
(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(198762031129681560785565546777
7639977*x + 82329928978737020071375607715487825) - 28109196010841
8580856941154493127802*x - 1164321021509445407141899390621521 52)*
sqrt((6414867847*sqrt(2) - 9072749200)/(58200487126974972400*sqrt
(2) - 82307918517524735409)) - 26284825054130298353406038323840 0*
x^2 - sqrt(2)*(7317934248024912609755090215160 0*x^2 - 10560328430
72437810464498574423*sqrt(2)*(49*x^2 - 151*x + 200) - 22551185131
6686082463881351528400*x + 29869119379693520856143225368000 0) + 9
29308901903745273208758745492 24*sqrt(2)*(2*x^2 - x + 3) + 1314241
25270651491767030191619200*x - 39427237581195447530109057485760 0)
/(10560328430724378104644985744 23*sqrt(2)*x^2 - 1493455968984676 0
42807161268400*x^2))*sqrt((6414867847*sqrt(2) - 9072749200)/(5820
0487126974972400*sqrt(2) - 82307918517524735409)) + sqrt(22681873
)*232562^(1/4)*sqrt(31)*(6414867847*sqrt(2)*(19*x - 22) - 1723822
34800*x + 199600482400)*sqrt((6414867847*sqrt(2) - 9072749200)/(5
8200487126974972400*sqrt(2) - 82307918517524735409)) + 1364*sqrt(
22681873)*sqrt(31)*sqrt(2*x^2 - x + 3)*(18658*sqrt(2) - 26103)))
 + 25*sqrt(22681873)*sqrt(31)*(226818730000*x^4 + 272182476000*x^3
 + 263109726800*x^2 - 6414867847*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^
2 + 12*x + 4) + 108872990400*x + 36290996800)*log(-80385525435645
1562500*sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(198
76203112968156078556554677763997 7*x + 823299289787370200713756077
15487825) - 281091960108418580856941154493127802*x - 116432102150
9445407141899390621521 52)*sqrt((6414867847*sqrt(2) - 9072749200)/
(58200487126974972400*sqrt(2) - 82307918517524735409)) + 26284825
0541302983534060383238400*x^2 + sqrt(2)*(731793424802491260975509
02151600*x^2 - 10560328430724378104644985744 23*sqrt(2)*(49*x^2 -
151*x + 200) - 225511851316686082463881351528400*x + 298691193796
93520856143225368000 0) - 929308901903745273208758745492 24*sqrt(2)
*(2*x^2 - x + 3) - 1314241252706514917670301916192 00*x + 39427237
58119544753010905748576 00)/(10560328430724378104644985744 23*sqrt(
2)*x^2 - 1493455968984676042807161268400*x^2)) - 25*sqrt(22681873
)*sqrt(31)*(226818730000*x^4 + 272182476000*x^3 + 263109726800*x^
2 - 6414867847*sqrt(2)*(25*x^4 + 30*x^3 + 29*x^2 + 12*x + 4) + 10
8872990400*x + 36290996800)*log(803855254356451562500*sqrt(2)*(2*
232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(1987620311296815607855
65546777639977*x + 82329928978737020071375607715487825) - 2810919
601084185808569411544931278 02*x - 116432102150944540714189939062 1
52152)*sqrt((6414867847*sqrt(2) - 9072749200)/(582004871269749724
00*sqrt(2) - 82307918517524735409)) - 2628482505413029835340603 83
238400*x^2 - sqrt(2)*(7317934248024912609755090215160 0*x^2 - 1056
03284307243781046449857442 3*sqrt(2)*(49*x^2 - 151*x + 200) - 2255
1185131668608246388135152840 0*x + 2986911937969352085614322536800
00) + 929308901903745273208758745492 24*sqrt(2)*(2*x^2 - x + 3) +
1314241252706514917670301916192 00*x - 394272375811954475301090574
857600)/(10560328430724378104644985744 23*sqrt(2)*x^2 - 1493455968
9846760428071612684 00*x^2)))/((226818730000*x^4 + 272182476000*x^
3 + 263109726800*x^2 - 6414867847*sqrt(2)*(25*x^4 + 30*x^3 + 29*x
^2 + 12*x + 4) + 108872990400*x + 36290996800)*sqrt((6414867847*s
qrt(2) - 9072749200)/(58200487126974972400*sqrt(2) - 823079185175
24735409)))
```

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

$$\int \frac{1}{\sqrt{2x^2 - x + 3}\,(5x^2 + 3x + 2)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(5*x**2+3*x+2)**3/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**3), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*sqrt(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.86 $\int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^{3/2}} dx$

Optimal. Leaf size=166

$$-\frac{111315\sqrt{2x^2-x+3}x^2}{2048}-\frac{8992487\sqrt{2x^2-x+3}x}{16384}-\frac{31009685\sqrt{2x^2-x+3}}{65536}-\frac{14641(79x+101)}{1472\sqrt{2x^2-x+3}}+\frac{625}{24}\sqrt{2x^2-x+3}x^5+\frac{10075}{96}\sqrt{2x^2-x+3}x^4+\frac{79425}{512}\sqrt{2x^2-x+3}x^3-\frac{310445587\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{131072\sqrt{2}}$$

```
[Out] (-14641*(101 + 79*x))/(1472*Sqrt[3 - x + 2*x^2]) - (31009685*Sqrt
[3 - x + 2*x^2])/65536 - (8992487*x*Sqrt[3 - x + 2*x^2])/16384 -
(111315*x^2*Sqrt[3 - x + 2*x^2])/2048 + (79425*x^3*Sqrt[3 - x + 2
*x^2])/512 + (10075*x^4*Sqrt[3 - x + 2*x^2])/96 + (625*x^5*Sqrt[3
 - x + 2*x^2])/24 - (310445587*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1310
72*Sqrt[2])
```

Rubi [A] time = 0.335245, antiderivative size = 166, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$-\frac{111315\sqrt{2x^2-x+3}x^2}{2048}-\frac{8992487\sqrt{2x^2-x+3}x}{16384}-\frac{31009685\sqrt{2x^2-x+3}}{65536}-\frac{14641(79x+101)}{1472\sqrt{2x^2-x+3}}+\frac{625}{24}\sqrt{2x^2-x+3}x^5+\frac{10075}{96}\sqrt{2x^2-x+3}x^4+\frac{79425}{512}\sqrt{2x^2-x+3}x^3-\frac{310445587\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{131072\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] (-14641*(101 + 79*x))/(1472*Sqrt[3 - x + 2*x^2]) - (31009685*Sqrt
[3 - x + 2*x^2])/65536 - (8992487*x*Sqrt[3 - x + 2*x^2])/16384 -
(111315*x^2*Sqrt[3 - x + 2*x^2])/2048 + (79425*x^3*Sqrt[3 - x + 2
*x^2])/512 + (10075*x^4*Sqrt[3 - x + 2*x^2])/96 + (625*x^5*Sqrt[3
 - x + 2*x^2])/24 - (310445587*ArcSinh[(1 - 4*x)/Sqrt[23]])/(1310
72*Sqrt[2])
```

Rubi in Sympy [A] time = 97.0207, size = 175, normalized size = 1.05

$$-\frac{2(-4x+1)\left(5x^2+3x+2\right)^4}{23\sqrt{2x^2-x+3}}-\frac{(11200x+9520)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^3}{12880}+\frac{(35770000x+99473500)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{7728000}-\frac{(56221252500x+33377245125)\left(-1874041750x^2+4439548750x+1495749500\right)\sqrt{2x^2-x+3}}{695164542912000000}-\frac{\left(40408556489155240312 50x+\frac{869038530973983267 1875}{2}\right)\sqrt{2x^2-x+3}}{5561316343296000000}+\frac{310445587\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{262144}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(3/2),x)
```

```
[Out] -2*(-4*x + 1)*(5*x**2 + 3*x + 2)**4/(23*sqrt(2*x**2 - x + 3)) - (
11200*x + 9520)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**3/12880
```

```
+ (35770000*x + 99473500)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)
**2/7728000 - (56221252500*x + 33377245125)*(-1874041750*x**2 + 4
439548750*x + 1495749500)*sqrt(2*x**2 - x + 3)/695164542912000000
 - (404085564891552403125 0*x + 869038530973983267187 5/2)*sqrt(2*x
**2 - x + 3)/5561316343296000000 + 310445587*sqrt(2)*atanh(sqrt(2
)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/262144
```

Mathematica [A] time = 0.0946359, size = 95, normalized size = 0.57

$$\sqrt{2x^2-x+3}\left(\frac{625x^5}{24}+\frac{10075x^4}{96}+\frac{79425x^3}{512}-\frac{111315x^2}{2048}-\frac{14641(79x+101)}{1472\left(2x^2-x+3\right)}-\frac{8992487x}{16384}-\frac{31009685}{65536}\right)+\frac{310445587\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{131072\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*(-31009685/65536 - (8992487*x)/16384 - (11131
5*x^2)/2048 + (79425*x^3)/512 + (10075*x^4)/96 + (625*x^5)/24 - (
14641*(101 + 79*x))/(1472*(3 - x + 2*x^2))) + (310445587*ArcSinh[
(-1 + 4*x)/Sqrt[23]])/(131072*Sqrt[2])
```

Maple [A] time = 0.036, size = 166, normalized size = 1.

$$\frac{4936178060\,x-1234044515}{12058624}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{1217267299}{524288}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{310445587\,x}{131072}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{310445587\,\sqrt{2}}{262144}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)-\frac{18367831\,x^2}{32768}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{4734827\,x^3}{8192}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{52235\,x^4}{1024}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{217675\,x^5}{768}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{8825\,x^6}{48}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{625\,x^7}{12}\frac{1}{\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^4/(2*x^2-x+3)^(3/2),x)
```

```
[Out] 1234044515/12058624*(4*x-1)/(2*x^2-x+3)^(1/2)-1217267299/524288/(
2*x^2-x+3)^(1/2)-310445587/131072*x/(2*x^2-x+3)^(1/2)+310445587/2
62144*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))-18367831/32768*x^2/(
2*x^2-x+3)^(1/2)-4734827/8192*x^3/(2*x^2-x+3)^(1/2)+52235/1024*x^
4/(2*x^2-x+3)^(1/2)+217675/768*x^5/(2*x^2-x+3)^(1/2)+8825/48*x^6/
(2*x^2-x+3)^(1/2)+625/12*x^7/(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.781994, size = 200, normalized size = 1.2

$$\frac{625\,x^7}{12\,\sqrt{2\,x^2-x+3}}+\frac{8825\,x^6}{48\,\sqrt{2\,x^2-x+3}}+\frac{217675\,x^5}{768\,\sqrt{2\,x^2-x+3}}+\frac{52235\,x^4}{1024\,\sqrt{2\,x^2-x+3}}-\frac{4734827\,x^3}{8192\,\sqrt{2\,x^2-x+3}}-\frac{18367831\,x^2}{32768\,\sqrt{2\,x^2-x+3}}+\frac{310445587}{262144}\,\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\frac{2953101993\,x}{1507328\,\sqrt{2\,x^2-x+3}}-\frac{3653899049}{1507328\,\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 625/12*x^7/sqrt(2*x^2 - x + 3) + 8825/48*x^6/sqrt(2*x^2 - x + 3)
+ 217675/768*x^5/sqrt(2*x^2 - x + 3) + 52235/1024*x^4/sqrt(2*x^2
- x + 3) - 4734827/8192*x^3/sqrt(2*x^2 - x + 3) - 18367831/32768*
x^2/sqrt(2*x^2 - x + 3) + 310445587/262144*sqrt(2)*arcsinh(1/23*s
qrt(23)*(4*x - 1)) - 2953101993/1507328*x/sqrt(2*x^2 - x + 3) - 3
653899049/1507328/sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.290256, size = 159, normalized size = 0.96

$$\frac{\sqrt{2}\left(4\sqrt{2}\left(235520000\,x^7 + 831385600\,x^6 + 1281670400\,x^5 + 230669760\,x^4 - 2613624504\,x^3 - 2534760678\,x^2 - 8859305979\,x\right.\right.}{36175872\,(2\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/36175872*sqrt(2)*(4*sqrt(2)*(235520000*x^7 + 831385600*x^6 + 12
81670400*x^5 + 230669760*x^4 - 2613624504*x^3 - 2534760678*x^2 -
8859305979*x - 10961697147)*sqrt(2*x^2 - x + 3) + 21420745503*(2*
x^2 - x + 3)*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x
 + 3)*(4*x - 1)))/(2*x^2 - x + 3)
```

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

$$\int \frac{\left(5x^2 + 3x + 2\right)^4}{\left(2x^2 - x + 3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(3/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**4/(2*x**2 - x + 3)**(3/2), x)
```

GIAC/XCAS [A] time = 0.273171, size = 111, normalized size = 0.67

$$-\frac{310445587}{262144}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2\,x^2 - x + 3}\right) + 1\right) + \frac{(46\,(4\,(40\,(20\,(16\,(100\,x + 353)x + 8707)x + 31341)x - 14204481)x - 55103493)x - 8859305979)x - 10961697147}{4521984\,\sqrt{2\,x^2 - x + 3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] -310445587/262144*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 -
 x + 3)) + 1) + 1/4521984*((46*(4*(40*(20*(16*(100*x + 353)*x + 8
707)*x + 31341)*x - 14204481)*x - 55103493)*x - 8859305979)*x - 1
0961697147)/sqrt(2*x^2 - x + 3)
```

3.87 $\int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^{3/2}}\,dx$

Optimal. Leaf size=124

$$\frac{1825}{64}\sqrt{2x^2-x+3}x^2+\frac{15565}{512}\sqrt{2x^2-x+3}x-\frac{181561\sqrt{2x^2-x+3}}{2048}-\frac{1331(17-45x)}{368\sqrt{2x^2-x+3}}+\frac{125}{16}\sqrt{2x^2-x+3}x^3+\frac{1168881\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4096\sqrt{2}}$$

```
[Out] (-1331*(17 - 45*x))/(368*Sqrt[3 - x + 2*x^2]) - (181561*Sqrt[3 -
x + 2*x^2])/2048 + (15565*x*Sqrt[3 - x + 2*x^2])/512 + (1825*x^2*
Sqrt[3 - x + 2*x^2])/64 + (125*x^3*Sqrt[3 - x + 2*x^2])/16 + (116
8881*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4096*Sqrt[2])
```

Rubi [A] time = 0.217738, antiderivative size = 124, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{1825}{64}\sqrt{2x^2-x+3}x^2+\frac{15565}{512}\sqrt{2x^2-x+3}x-\frac{181561\sqrt{2x^2-x+3}}{2048}-\frac{1331(17-45x)}{368\sqrt{2x^2-x+3}}+\frac{125}{16}\sqrt{2x^2-x+3}x^3+\frac{1168881\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4096\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] (-1331*(17 - 45*x))/(368*Sqrt[3 - x + 2*x^2]) - (181561*Sqrt[3 -
x + 2*x^2])/2048 + (15565*x*Sqrt[3 - x + 2*x^2])/512 + (1825*x^2*
Sqrt[3 - x + 2*x^2])/64 + (125*x^3*Sqrt[3 - x + 2*x^2])/16 + (116
8881*ArcSinh[(1 - 4*x)/Sqrt[23]])/(4096*Sqrt[2])
```

Rubi in Sympy [A] time = 72.1264, size = 144, normalized size = 1.16

$$-\frac{\left(-476859375x+\frac{7171882875}{4}\right)\sqrt{2x^2-x+3}}{13248000}-\frac{2(-4x+1)\left(5x^2+3x+2\right)^3}{23\sqrt{2x^2-x+3}}-\frac{(6000x+5100)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{6900}+\frac{(8527500x+24325875)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)}{1656000}-\frac{1168881\sqrt{2}\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{8192}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(3/2),x)
```

```
[Out] -(-476859375*x + 7171882875/4)*sqrt(2*x**2 - x + 3)/13248000 - 2*
(-4*x + 1)*(5*x**2 + 3*x + 2)**3/(23*sqrt(2*x**2 - x + 3)) - (600
0*x + 5100)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)**2/6900 + (85
27500*x + 24325875)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)/16560
00 - 1168881*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x +
 3)))/8192
```

Mathematica [A] time = 0.0972838, size = 65, normalized size = 0.52

$$\frac{\frac{4(736000x^5+2318400x^4+2624760x^3-5754186x^2+16138403x-15423965)}{\sqrt{2x^2-x+3}}-26884263\sqrt{2}\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{188416}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] ((4*(-15423965 + 16138403*x - 5754186*x^2 + 2624760*x^3 + 2318400
*x^4 + 736000*x^5))/Sqrt[3 - x + 2*x^2] - 26884263*Sqrt[2]*ArcSin
h[(-1 + 4*x)/Sqrt[23]])/188416
```

Maple [A] time = 0.01, size = 132, normalized size = 1.1

$$\frac{21570172\,x-5392543}{376832}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{5130399}{16384}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{1168881\,x}{4096}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{1168881\,\sqrt{2}}{8192}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)-\frac{125091\,x^2}{1024}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{14265\,x^3}{256}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{1575\,x^4}{32}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{125\,x^5}{8}\frac{1}{\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^3/(2*x^2-x+3)^(3/2),x)
```

```
[Out] 5392543/376832*(4*x-1)/(2*x^2-x+3)^(1/2)-5130399/16384/(2*x^2-x+3
)^(1/2)+1168881/4096*x/(2*x^2-x+3)^(1/2)-1168881/8192*2^(1/2)*arc
sinh(4/23*23^(1/2)*(x-1/4))-125091/1024*x^2/(2*x^2-x+3)^(1/2)+142
65/256*x^3/(2*x^2-x+3)^(1/2)+1575/32*x^4/(2*x^2-x+3)^(1/2)+125/8*
x^5/(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.780091, size = 154, normalized size = 1.24

$$\frac{125\,x^5}{8\,\sqrt{2\,x^2-x+3}}+\frac{1575\,x^4}{32\,\sqrt{2\,x^2-x+3}}+\frac{14265\,x^3}{256\,\sqrt{2\,x^2-x+3}}-\frac{125091\,x^2}{1024\,\sqrt{2\,x^2-x+3}}-\frac{1168881}{8192}\,\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)+\frac{16138403\,x}{47104\,\sqrt{2\,x^2-x+3}}-\frac{15423965}{47104\,\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 125/8*x^5/sqrt(2*x^2 - x + 3) + 1575/32*x^4/sqrt(2*x^2 - x + 3) +
 14265/256*x^3/sqrt(2*x^2 - x + 3) - 125091/1024*x^2/sqrt(2*x^2 -
 x + 3) - 1168881/8192*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) +
 16138403/47104*x/sqrt(2*x^2 - x + 3) - 15423965/47104/sqrt(2*x^2
 - x + 3)
```

Fricas [A] time = 0.285335, size = 146, normalized size = 1.18

$$\frac{\sqrt{2}\Big(4\,\sqrt{2}(736000\,x^5+2318400\,x^4+2624760\,x^3-5754186\,x^2+16138403\,x-15423965)\,\sqrt{2\,x^2-x+3}+26884263\,(2\,x^2-x}{376832\,(2\,x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/376832*sqrt(2)*(4*sqrt(2)*(736000*x^5 + 2318400*x^4 + 2624760*x
^3 - 5754186*x^2 + 16138403*x - 15423965)*sqrt(2*x^2 - x + 3) + 2
6884263*(2*x^2 - x + 3)*log(-sqrt(2)*(32*x^2 - 16*x + 25) + 8*sqr
t(2*x^2 - x + 3)*(4*x - 1)))/(2*x^2 - x + 3)
```

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

$$\int \frac{\left(5x^2+3x+2\right)^3}{(2x^2-x+3)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(3/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**3/(2*x**2 - x + 3)**(3/2), x)
```

GIAC/XCAS [A] time = 0.272944, size = 97, normalized size = 0.78

$$\frac{1168881}{8192}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)+\frac{(46(20(40(20x+63)x+2853)x-125091)x+16138403)x-15423965}{47104\sqrt{2x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] 1168881/8192*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x +
3)) + 1) + 1/47104*((46*(20*(40*(20*x + 63)*x + 2853)*x - 125091)
*x + 16138403)*x - 15423965)/sqrt(2*x^2 - x + 3)
```

3.88 $\int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^{3/2}}\,dx$

Optimal. Leaf size=82

$$\frac{121(19-7x)}{92\sqrt{2x^2-x+3}}+\frac{25}{8}x\sqrt{2x^2-x+3}+\frac{415}{32}\sqrt{2x^2-x+3}-\frac{223\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{2}}$$

```
[Out] (121*(19 - 7*x))/(92*Sqrt[3 - x + 2*x^2]) + (415*Sqrt[3 - x + 2*x
^2])/32 + (25*x*Sqrt[3 - x + 2*x^2])/8 - (223*ArcSinh[(1 - 4*x)/S
qrt[23]])/(64*Sqrt[2])
```

Rubi [A] time = 0.126512, antiderivative size = 82, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{121(19-7x)}{92\sqrt{2x^2-x+3}}+\frac{25}{8}x\sqrt{2x^2-x+3}+\frac{415}{32}\sqrt{2x^2-x+3}-\frac{223\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{64\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] (121*(19 - 7*x))/(92*Sqrt[3 - x + 2*x^2]) + (415*Sqrt[3 - x + 2*x
^2])/32 + (25*x*Sqrt[3 - x + 2*x^2])/8 - (223*ArcSinh[(1 - 4*x)/S
qrt[23]])/(64*Sqrt[2])
```

Rubi in Sympy [A] time = 46.3233, size = 112, normalized size = 1.37

$$-\frac{2(-4x+1)(5x^2+3x+2)^2}{23\sqrt{2x^2-x+3}}-\frac{(2400x+2040)\sqrt{2x^2-x+3}\,(5x^2+3x+2)}{2760}+\frac{(148200x+505470)\sqrt{2x^2-x+3}}{22080}+\frac{223\sqrt{2}\,\text{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{128}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(3/2),x)
```

```
[Out] -2*(-4*x + 1)*(5*x**2 + 3*x + 2)**2/(23*sqrt(2*x**2 - x + 3)) - (
2400*x + 2040)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)/2760 + (14
8200*x + 505470)*sqrt(2*x**2 - x + 3)/22080 + 223*sqrt(2)*atanh(s
qrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/128
```

Mathematica [A] time = 0.0787709, size = 55, normalized size = 0.67

$$\frac{4600x^3+16790x^2-9421x+47027}{736\sqrt{2x^2-x+3}}+\frac{223\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{64\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] (47027 - 9421*x + 16790*x^2 + 4600*x^3)/(736*Sqrt[3 - x + 2*x^2])
 + (223*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(64*Sqrt[2])
```

Maple [A] time = 0.009, size = 98, normalized size = 1.2

$$-\frac{54852\,x-13713}{5888}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{15761}{256}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{223\,x}{64}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{223\,\sqrt{2}}{128}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{365\,x^2}{16}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{25\,x^3}{4}\frac{1}{\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^2/(2*x^2-x+3)^(3/2),x)
```

```
[Out] -13713/5888*(4*x-1)/(2*x^2-x+3)^(1/2)+15761/256/(2*x^2-x+3)^(1/2)
-223/64*x/(2*x^2-x+3)^(1/2)+223/128*2^(1/2)*arcsinh(4/23*23^(1/2)
*(x-1/4))+365/16*x^2/(2*x^2-x+3)^(1/2)+25/4*x^3/(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.782227, size = 108, normalized size = 1.32

$$\frac{25\,x^3}{4\,\sqrt{2\,x^2-x+3}}+\frac{365\,x^2}{16\,\sqrt{2\,x^2-x+3}}+\frac{223}{128}\,\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\,\sqrt{23}(4\,x-1)\right)-\frac{9421\,x}{736\,\sqrt{2\,x^2-x+3}}+\frac{47027}{736\,\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 25/4*x^3/sqrt(2*x^2 - x + 3) + 365/16*x^2/sqrt(2*x^2 - x + 3) + 2
23/128*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 9421/736*x/sqrt
(2*x^2 - x + 3) + 47027/736/sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.279848, size = 132, normalized size = 1.61

$$\frac{\sqrt{2}\left(4\,\sqrt{2}\left(4600\,x^3+16790\,x^2-9421\,x+47027\right)\sqrt{2\,x^2-x+3}+5129\,\left(2\,x^2-x+3\right)\,\log\left(-\sqrt{2}\left(32\,x^2-16\,x+25\right)-8\,\sqrt{2\,x^2}\right.\right.}{5888\,(2\,x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/5888*sqrt(2)*(4*sqrt(2)*(4600*x^3 + 16790*x^2 - 9421*x + 47027)
*sqrt(2*x^2 - x + 3) + 5129*(2*x^2 - x + 3)*log(-sqrt(2)*(32*x^2
- 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(2*x^2 - x + 3)
```

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

$$\int \frac{\left(5x^2+3x+2\right)^2}{(2x^2-x+3)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(3/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**2/(2*x**2 - x + 3)**(3/2), x)
```

GIAC/XCAS [A] time = 0.271948, size = 84, normalized size = 1.02

$$-\frac{223}{128}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x-\sqrt{2x^2-x+3}\right)+1\right)+\frac{(230(20x+73)x-9421)x+47027}{736\sqrt{2x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] -223/128*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3))
+ 1) + 1/736*((230*(20*x + 73)*x - 9421)*x + 47027)/sqrt(2*x^2 -
x + 3)
```

3.89 $\int \frac{2+3x+5x^2}{(3-x+2x^2)^{3/2}}\,dx$

Optimal. Leaf size=45

$$-\frac{11(3x+5)}{23\sqrt{2x^2-x+3}}-\frac{5\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2\sqrt{2}}$$

```
[Out] (-11*(5 + 3*x))/(23*Sqrt[3 - x + 2*x^2]) - (5*ArcSinh[(1 - 4*x)/S
qrt[23]])/(2*Sqrt[2])
```

Rubi [A] time = 0.0544134, antiderivative size = 45, 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

$$-\frac{11(3x+5)}{23\sqrt{2x^2-x+3}}-\frac{5\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{2\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] (-11*(5 + 3*x))/(23*Sqrt[3 - x + 2*x^2]) - (5*ArcSinh[(1 - 4*x)/S
qrt[23]])/(2*Sqrt[2])
```

Rubi in Sympy [A] time = 9.59914, size = 51, normalized size = 1.13

$$-\frac{33x+55}{23\sqrt{2x^2-x+3}}+\frac{5\sqrt{2}\,\text{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(3/2),x)
```

```
[Out] -(33*x + 55)/(23*sqrt(2*x**2 - x + 3)) + 5*sqrt(2)*atanh(sqrt(2)*
(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/4
```

Mathematica [A] time = 0.0520673, size = 45, normalized size = 1.

$$\frac{5\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{2\sqrt{2}}-\frac{11(3x+5)}{23\sqrt{2x^2-x+3}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(3/2),x]
```

```
[Out] (-11*(5 + 3*x))/(23*Sqrt[3 - x + 2*x^2]) + (5*ArcSinh[(-1 + 4*x)/
Sqrt[23]])/(2*Sqrt[2])
```

Maple [A] time = 0.007, size = 64, normalized size = 1.4

$$\frac{196\,x-49}{184}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{17}{8}\frac{1}{\sqrt{2\,x^2-x+3}}-\frac{5\,x}{2}\frac{1}{\sqrt{2\,x^2-x+3}}+\frac{5\,\sqrt{2}}{4}\mathit{Arcsinh}\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)/(2*x^2-x+3)^(3/2),x)
```

```
[Out] 49/184*(4*x-1)/(2*x^2-x+3)^(1/2)-17/8/(2*x^2-x+3)^(1/2)-5/2*x/(2*
x^2-x+3)^(1/2)+5/4*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))
```

Maxima [A] time = 0.781412, size = 62, normalized size = 1.38

$$\frac{5}{4}\sqrt{2}\,\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{33\,x}{23\,\sqrt{2\,x^2-x+3}}-\frac{55}{23\,\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(3/2),x, algorithm="maxima")
```

```
[Out] 5/4*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) - 33/23*x/sqrt(2*x^2
 - x + 3) - 55/23/sqrt(2*x^2 - x + 3)
```

Fricas [A] time = 0.277572, size = 119, normalized size = 2.64

$$-\frac{\sqrt{2}\left(44\,\sqrt{2}\sqrt{2\,x^2-x+3}(3\,x+5)-115\,\left(2\,x^2-x+3\right)\log\left(-\sqrt{2}\left(32\,x^2-16\,x+25\right)-8\,\sqrt{2\,x^2-x+3}(4\,x-1)\right)\right)}{184\,(2\,x^2-x+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(3/2),x, algorithm="fricas")
```

```
[Out] -1/184*sqrt(2)*(44*sqrt(2)*sqrt(2*x^2 - x + 3)*(3*x + 5) - 115*(2
*x^2 - x + 3)*log(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 -
x + 3)*(4*x - 1)))/(2*x^2 - x + 3)
```

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

$$\int \frac{5x^2+3x+2}{(2x^2-x+3)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(3/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)/(2*x**2 - x + 3)**(3/2), x)
```

GIAC/XCAS [A] time = 0.272084, size = 72, normalized size = 1.6

$$-\frac{5}{4}\sqrt{2}\ln\left(-2\,\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^2-x+3}\right)+1\right)-\frac{11\,(3\,x+5)}{23\,\sqrt{2\,x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(3/2),x, algorithm="giac")
```

```
[Out] -5/4*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1)
 - 11/23*(3*x + 5)/sqrt(2*x^2 - x + 3)
```

3.90 $\int \frac{1}{(3-x+2x^2)^{3/2}(2+3x+5x^2)}\,dx$

Optimal. Leaf size=176

$$\frac{13-6x}{253\sqrt{2x^2-x+3}}+\frac{1}{22}\sqrt{\frac{1}{682}\left(247+500\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(247+500\sqrt{2}\right)}}\left(\left(69+65\sqrt{2}\right)x+4\sqrt{2}+61\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{22}\sqrt{\frac{1}{682}\left(500\sqrt{2}-247\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(500\sqrt{2}-247\right)}}\left(\left(69-65\sqrt{2}\right)x-4\sqrt{2}+61\right)}{\sqrt{2x^2-x+3}}\right)$$

```
[Out] (13 - 6*x)/(253*Sqrt[3 - x + 2*x^2]) + (Sqrt[(247 + 500*Sqrt[2])/
682]*ArcTan[(Sqrt[11/(31*(247 + 500*Sqrt[2]))]*(61 + 4*Sqrt[2] +
(69 + 65*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/22 - (Sqrt[(-247 + 50
0*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-247 + 500*Sqrt[2]))]*(61 -
 4*Sqrt[2] + (69 - 65*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/22
```

Rubi [A] time = 0.832572, antiderivative size = 176, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{13-6x}{253\sqrt{2x^2-x+3}}+\frac{1}{22}\sqrt{\frac{1}{682}\left(247+500\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(247+500\sqrt{2}\right)}}\left(\left(69+65\sqrt{2}\right)x+4\sqrt{2}+61\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{22}\sqrt{\frac{1}{682}\left(500\sqrt{2}-247\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(500\sqrt{2}-247\right)}}\left(\left(69-65\sqrt{2}\right)x-4\sqrt{2}+61\right)}{\sqrt{2x^2-x+3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (13 - 6*x)/(253*Sqrt[3 - x + 2*x^2]) + (Sqrt[(247 + 500*Sqrt[2])/
682]*ArcTan[(Sqrt[11/(31*(247 + 500*Sqrt[2]))]*(61 + 4*Sqrt[2] +
(69 + 65*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/22 - (Sqrt[(-247 + 50
0*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(-247 + 500*Sqrt[2]))]*(61 -
 4*Sqrt[2] + (69 - 65*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/22
```

Rubi in Sympy [A] time = 79.3106, size = 207, normalized size = 1.18

$$\frac{-66x+143}{2783\sqrt{2x^2-x+3}}+\frac{\sqrt{682}\left(8349+22264\sqrt{2}\right)\left(5566\sqrt{2}+\frac{169763}{2}\right)\operatorname{atan}\left(\frac{2\sqrt{341}\left(x\left(\frac{192027}{2}+\frac{180895\sqrt{2}}{2}\right)+5566\sqrt{2}+\frac{169763}{2}\right)}{86273\sqrt{247+500\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{58103657678\sqrt{247+500\sqrt{2}}}+\frac{\sqrt{682}\left(-22264\sqrt{2}+8349\right)\left(-5566\sqrt{2}+\frac{169763}{2}\right)\operatorname{atanh}\left(\frac{2\sqrt{341}\left(x\left(-\frac{180895\sqrt{2}}{2}+\frac{192027}{2}\right)-5566\sqrt{2}+\frac{169763}{2}\right)}{86273\sqrt{-247+500\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{58103657678\sqrt{-247+500\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2),x)
```

```
[Out] (-66*x + 143)/(2783*sqrt(2*x**2 - x + 3)) + sqrt(682)*(8349 + 222
64*sqrt(2))*(5566*sqrt(2) + 169763/2)*atan(2*sqrt(341)*(x*(192027
/2 + 180895*sqrt(2)/2) + 5566*sqrt(2) + 169763/2)/(86273*sqrt(247
 + 500*sqrt(2))*sqrt(2*x**2 - x + 3)))/(58103657678*sqrt(247 + 50
0*sqrt(2))) + sqrt(682)*(-22264*sqrt(2) + 8349)*(-5566*sqrt(2) +
169763/2)*atanh(2*sqrt(341)*(x*(-180895*sqrt(2)/2 + 192027/2) - 5
566*sqrt(2) + 169763/2)/(86273*sqrt(-247 + 500*sqrt(2))*sqrt(2*x*
*2 - x + 3)))/(58103657678*sqrt(-247 + 500*sqrt(2)))
```

Mathematica [C] time = 6.39428, size = 1129, normalized size = 6.41

$$\frac{13-6x}{253\sqrt{2x^2-x+3}} - \frac{5\left(-13i+\sqrt{31}\right)\tan^{-1}\left(\frac{4439i\sqrt{31}x^4+17732x^4-2200i\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+5120i\sqrt{31}x^3-17050x^3+4980i\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^2+6405i\cdots}{1364\sqrt{31}x^4+24293ix^4-3410\sqrt{31}x^3-85640ix^3+4774\sqrt{31}\cdots}\right)}{22\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{5i\left(13i+\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(44\sqrt{31}x^4+797ix^4-110\sqrt{31}x^3-1160ix^3+154\sqrt{31}x^2+\cdots\right)}{4439i\sqrt{31}x^4-17732x^4+400i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+5120i\sqrt{31}x^3+17050x^3+140i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^2+6405i\sqrt{31}x^2\cdots}\right)}{22\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$+\frac{5\left(13i+\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{44\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$-\frac{5i\left(-13i+\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{44\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{5i\left(-13i+\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+i\sqrt{6\cdots}\right)\right)}{44\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{5\left(13i+\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-63i\sqrt{2\cdots}\right)\right)}{44\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (13 - 6*x)/(253*Sqrt[3 - x + 2*x^2]) - (5*(-13*I + Sqrt[31])*ArcT
an[(-14322 + (602*I)*Sqrt[31] - 7502*x - (4266*I)*Sqrt[31]*x + 21
142*x^2 + (6405*I)*Sqrt[31]*x^2 - 17050*x^3 + (5120*I)*Sqrt[31]*x
^3 + 17732*x^4 + (4439*I)*Sqrt[31]*x^4 + (2520*I)*Sqrt[22*(-13 +
I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (2900*I)*Sqrt[22*(-13 + I*Sqrt
[31])]*x*Sqrt[3 - x + 2*x^2] + (4980*I)*Sqrt[22*(-13 + I*Sqrt[31]
)]*x^2*Sqrt[3 - x + 2*x^2] - (2200*I)*Sqrt[22*(-13 + I*Sqrt[31])]
*x^3*Sqrt[3 - x + 2*x^2])/(82294*I + 2046*Sqrt[31] + (58298*I)*x
- 4774*Sqrt[31]*x + (88855*I)*x^2 + 4774*Sqrt[31]*x^2 - (85640*I)
*x^3 - 3410*Sqrt[31]*x^3 + (24293*I)*x^4 + 1364*Sqrt[31]*x^4)])/(
22*Sqrt[682*(-13 + I*Sqrt[31])]) + (((5*I)/22)*(13*I + Sqrt[31])*
ArcTan[(31*(-74*I + 66*Sqrt[31] + (42*I)*x - 154*Sqrt[31]*x + (12
95*I)*x^2 + 154*Sqrt[31]*x^2 - (1160*I)*x^3 - 110*Sqrt[31]*x^3 +
(797*I)*x^4 + 44*Sqrt[31]*x^4))/(14322 + (602*I)*Sqrt[31] + 7502*
```

```
x - (4266*I)*Sqrt[31]*x - 21142*x^2 + (6405*I)*Sqrt[31]*x^2 + 170
50*x^3 + (5120*I)*Sqrt[31]*x^3 - 17732*x^4 + (4439*I)*Sqrt[31]*x^
4 - (40*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (100
*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (140*I)*S
qrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (400*I)*Sqrt
[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13 +
 I*Sqrt[31])] - (((5*I)/44)*(-13*I + Sqrt[31])*Log[(-3*I + Sqrt[3
1] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 +
I*Sqrt[31])] + (5*(13*I + Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)
*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(44*Sqrt[682*(13 + I*Sqrt[3
1])]) + (((5*I)/44)*(-13*I + Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-14
2*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*
Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2]
 - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sq
rt[682*(-13 + I*Sqrt[31])] - (5*(13*I + Sqrt[31])*Log[(2 + 3*x +
5*x^2)*(-1858*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817
*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqr
t[3 - x + 2*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x
 + 2*x^2])])/(44*Sqrt[682*(13 + I*Sqrt[31])])
```

Maple [B] time = 0.037, size = 718, normalized size = 4.1

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^(3/2)/(5*x^2+3*x+2),x)
```

```
[Out] 1/465124*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+
x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(2197*2^(1/2)*arc
tan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2))*
(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(6485*
2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/(2^
(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)+1-
x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(1/2
)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+549362*
2^(1/2))^(1/2)+3070*arctan(1/11692487*(-775687+549362*2^(1/2))^(1
/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^
(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10
368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(
1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23
)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))
^(1/2)*(-775687+549362*2^(1/2))^(1/2)+1712502*arctanh(31/2*(8*(2^
(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1
-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-6617
446*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^
(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/
2))^(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2
)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/2)+1
-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(-886
6+6820*2^(1/2))^(1/2)-3/506*(4*x-1)/(2*x^2-x+3)^(1/2)+1/22/(2*x^2
-x+3)^(1/2)
```

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

$$\int \frac{1}{(5\,x^2 + 3\,x + 2)(2\,x^2 - x + 3)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)), x)
```

Fricas [A] time = 0.33274, size = 1463, normalized size = 8.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)),x, algorithm="fricas")
```

```
[Out] 1/213957040*sqrt(341)*sqrt(31)*sqrt(10)*(8*sqrt(341)*sqrt(31)*sqr
t(10)*sqrt(2*x^2 - x + 3)*(500*sqrt(2)*(6*x - 13) - 1482*x + 3211
)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 23*50^(1
/4)*sqrt(31)*(494*x^2 - 500*sqrt(2)*(2*x^2 - x + 3) - 247*x + 741
)*log(-25000*(sqrt(341)*50^(1/4)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sq
rt(2)*(24886429777*x + 2962665725) - 27849095502*x - 21923764052)
*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 167341615
000*x^2 + 220*sqrt(2)*(1366054000*x^2 - 385569223*sqrt(2)*(2*x^2
- x + 3) - 683027000*x + 2049081000) - 1927846115*sqrt(2)*(49*x^2
 - 151*x + 200) - 515685385000*x + 683027000000)/(385569223*sqrt(
2)*x^2 - 683027000*x^2)) - 23*50^(1/4)*sqrt(31)*(494*x^2 - 500*sq
rt(2)*(2*x^2 - x + 3) - 247*x + 741)*log(25000*(sqrt(341)*50^(1/4
)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(24886429777*x + 29626657
25) - 27849095502*x - 21923764052)*sqrt((247*sqrt(2) - 1000)/(247
000*sqrt(2) - 561009)) - 167341615000*x^2 - 220*sqrt(2)*(13660540
00*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 204908
1000) + 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) + 515685385000*
x - 683027000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2)) - 3393
88*50^(1/4)*(2*x^2 - x + 3)*arctan(31*(sqrt(341)*sqrt(10)*(500*sq
rt(2)*(x - 6) - 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*s
qrt(2) - 561009)) + 22*50^(1/4)*sqrt(2*x^2 - x + 3)*(61*sqrt(2) -
 8))/(sqrt(341)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693
*x + 5434)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) +
 4*sqrt(341)*sqrt(31)*(500*sqrt(2)*x - 247*x)*sqrt(-(sqrt(341)*50
^(1/4)*sqrt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(24886429777*x + 296
2665725) - 27849095502*x - 21923764052)*sqrt((247*sqrt(2) - 1000)
/(247000*sqrt(2) - 561009)) + 167341615000*x^2 + 220*sqrt(2)*(136
6054000*x^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2
049081000) - 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) - 51568538
5000*x + 683027000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2))*s
qrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) - 682*50^(1/4
)*sqrt(31)*sqrt(2*x^2 - x + 3)*(3*sqrt(2) - 16))) - 339388*50^(1/
4)*(2*x^2 - x + 3)*arctan(-31*(sqrt(341)*sqrt(10)*(500*sqrt(2)*(x
 - 6) - 247*x + 1482)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) -
 561009)) - 22*50^(1/4)*sqrt(2*x^2 - x + 3)*(61*sqrt(2) - 8))/(sq
rt(341)*sqrt(31)*sqrt(10)*(500*sqrt(2)*(19*x - 22) - 4693*x + 543
4)*sqrt((247*sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 4*sqrt(
341)*sqrt(31)*(500*sqrt(2)*x - 247*x)*sqrt((sqrt(341)*50^(1/4)*sq
rt(10)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(24886429777*x + 2962665725)
- 27849095502*x - 21923764052)*sqrt((247*sqrt(2) - 1000)/(247000*
sqrt(2) - 561009)) - 167341615000*x^2 - 220*sqrt(2)*(1366054000*x
^2 - 385569223*sqrt(2)*(2*x^2 - x + 3) - 683027000*x + 2049081000
) + 1927846115*sqrt(2)*(49*x^2 - 151*x + 200) + 515685385000*x -
683027000000)/(385569223*sqrt(2)*x^2 - 683027000*x^2))*sqrt((247*
sqrt(2) - 1000)/(247000*sqrt(2) - 561009)) + 682*50^(1/4)*sqrt(31
)*sqrt(2*x^2 - x + 3)*(3*sqrt(2) - 16))))/((494*x^2 - 500*sqrt(2)
*(2*x^2 - x + 3) - 247*x + 741)*sqrt((247*sqrt(2) - 1000)/(247000
*sqrt(2) - 561009)))
```

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

$$\int \frac{1}{\left(2x^2 - x + 3\right)^{\frac{3}{2}} \left(5x^2 + 3x + 2\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2),x)

[Out] Integral(1/((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)), x)
```

GIAC/XCAS [F(-2)]   time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(3/2)),x, algorithm="giac")

[Out] Exception raised: RuntimeError
```

3.91 $\int \frac{1}{(3-x+2x^2)^{3/2}(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=211

$$-\frac{6315-2306x}{345092\sqrt{2x^2-x+3}}+\frac{65x+4}{682\sqrt{2x^2-x+3}\,(5x^2+3x+2)}+\frac{\sqrt{\frac{1}{682}\left(129694447+103775000\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(129694447+103775000\sqrt{2}\right)}}\left(\left(45519+29065\sqrt{2}\right)x+16454\sqrt{2}+12611\right)}{\sqrt{2x^2-x+3}}\right)}{30008}-\frac{\sqrt{\frac{1}{682}\left(103775000\sqrt{2}-129694447\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(103775000\sqrt{2}-129694447\right)}}\left(\left(45519-29065\sqrt{2}\right)x-16454\sqrt{2}+12611\right)}{\sqrt{2x^2-x+3}}\right)}{30008}$$

```
[Out] -(6315 - 2306*x)/(345092*Sqrt[3 - x + 2*x^2]) + (4 + 65*x)/(682*S
qrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)) + (Sqrt[(129694447 + 103775
000*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(129694447 + 103775000*Sqrt
[2]))]*(12611 + 16454*Sqrt[2] + (45519 + 29065*Sqrt[2])*x))/Sqrt[
3 - x + 2*x^2]])/30008 - (Sqrt[(-129694447 + 103775000*Sqrt[2])/6
82]*ArcTanh[(Sqrt[11/(31*(-129694447 + 103775000*Sqrt[2]))]*(1261
1 - 16454*Sqrt[2] + (45519 - 29065*Sqrt[2])*x))/Sqrt[3 - x + 2*x^
2]])/30008
```

Rubi [A] time = 0.97548, antiderivative size = 211, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{6315-2306x}{345092\sqrt{2x^2-x+3}}+\frac{65x+4}{682\sqrt{2x^2-x+3}\,(5x^2+3x+2)}+\frac{\sqrt{\frac{1}{682}\left(129694447+103775000\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(129694447+103775000\sqrt{2}\right)}}\left(\left(45519+29065\sqrt{2}\right)x+16454\sqrt{2}+12611\right)}{\sqrt{2x^2-x+3}}\right)}{30008}-\frac{\sqrt{\frac{1}{682}\left(103775000\sqrt{2}-129694447\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(103775000\sqrt{2}-129694447\right)}}\left(\left(45519-29065\sqrt{2}\right)x-16454\sqrt{2}+12611\right)}{\sqrt{2x^2-x+3}}\right)}{30008}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2),x]
```


```
[Out] -(6315 - 2306*x)/(345092*Sqrt[3 - x + 2*x^2]) + (4 + 65*x)/(682*S
qrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)) + (Sqrt[(129694447 + 103775
000*Sqrt[2])/682]*ArcTan[(Sqrt[11/(31*(129694447 + 103775000*Sqrt
[2]))]*(12611 + 16454*Sqrt[2] + (45519 + 29065*Sqrt[2])*x))/Sqrt[
3 - x + 2*x^2]])/30008 - (Sqrt[(-129694447 + 103775000*Sqrt[2])/6
82]*ArcTanh[(Sqrt[11/(31*(-129694447 + 103775000*Sqrt[2]))]*(1261
1 - 16454*Sqrt[2] + (45519 - 29065*Sqrt[2])*x))/Sqrt[3 - x + 2*x^
2]])/30008
```

Rubi in Sympy [A] time = 99.9886, size = 248, normalized size = 1.18

$$-\frac{-139513x+\frac{764115}{2}}{20878066\sqrt{2x^2-x+3}}+\frac{715x+44}{7502\sqrt{2x^2-x+3}\,(5x^2+3x+2)}$$
$$+\frac{\sqrt{682}\left(\frac{386060543}{4}+\frac{251853151\sqrt{2}}{2}\right)\left(33031427\sqrt{2}+\frac{142442289}{2}\right)\operatorname{atan}\left(\frac{4\sqrt{341}\left(x\left(\frac{889766845\sqrt{2}}{4}+\frac{1393473147}{4}\right)+\frac{386060543}{4}+\frac{251853151\sqrt{2}}{2}\right)}{949003\sqrt{129694447+103775000\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{2397415019451958\sqrt{129694447+103775000\sqrt{2}}}$$
$$+\frac{\sqrt{682}\left(-\frac{251853151\sqrt{2}}{2}+\frac{386060543}{4}\right)\left(-33031427\sqrt{2}+\frac{142442289}{2}\right)\operatorname{atanh}\left(\frac{4\sqrt{341}\left(x\left(-\frac{889766845\sqrt{2}}{4}+\frac{1393473147}{4}\right)-\frac{251853151\sqrt{2}}{2}+\frac{386060543}{4}\right)}{949003\sqrt{-129694447+103775000\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{2397415019451958\sqrt{-129694447+103775000\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] -(-139513*x + 764115/2)/(20878066*sqrt(2*x**2 - x + 3)) + (715*x
+ 44)/(7502*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)) + sqrt(682)*
(386060543/4 + 251853151*sqrt(2)/2)*(33031427*sqrt(2) + 142442289
/2)*atan(4*sqrt(341)*(x*(889766845*sqrt(2)/4 + 1393473147/4) + 38
6060543/4 + 251853151*sqrt(2)/2)/(949003*sqrt(129694447 + 1037750
00*sqrt(2))*sqrt(2*x**2 - x + 3)))/(2397415019451958*sqrt(1296944
47 + 103775000*sqrt(2))) + sqrt(682)*(-251853151*sqrt(2)/2 + 3860
60543/4)*(-33031427*sqrt(2) + 142442289/2)*atanh(4*sqrt(341)*(x*(
-889766845*sqrt(2)/4 + 1393473147/4) - 251853151*sqrt(2)/2 + 3860
60543/4)/(949003*sqrt(-129694447 + 103775000*sqrt(2))*sqrt(2*x**2
 - x + 3)))/(2397415019451958*sqrt(-129694447 + 103775000*sqrt(2)
))
```

Mathematica [C] time = 6.45325, size = 1170, normalized size = 5.55

$$\sqrt{2x^2-x+3}\left(\frac{-14x-31}{5566\,(2x^2-x+3)}+\frac{345x-98}{15004\,(5x^2+3x+2)}\right)$$

$$-\frac{5i\left(-5813i+499\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(10956044\sqrt{31}x^4-104765803\right.}{-2241477661i\sqrt{31}x^4+3956537068x^4+83020000i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-1267524880i\sqrt{31}x^3+3951866050x^3+2905}\right.}{}$$

$$-\frac{5i\left(5813i+499\sqrt{31}\right)\tanh^{-1}\left(\frac{2241477661\sqrt{31}x^4-3956537068ix^4+456610000\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+1267524880\sqrt{31}x^3-3951866050ix^3-10335}{339637364\sqrt{31}x^4+13417689893ix^4+82}\right.}{}$$

$$+\frac{5i\left(5813i+499\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{60016\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{5\left(-5813i+499\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{60016\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$-\frac{5i\left(5813i+499\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+\right.\right.}{60016\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{5\left(-5813i+499\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-\right.\right.}{60016\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((-31 - 14*x)/(5566*(3 - x + 2*x^2)) + (-98 +
 345*x)/(15004*(2 + 3*x + 5*x^2))) - (((5*I)/30008)*(-5813*I + 49
9*Sqrt[31])*ArcTan[(31*(67211446*I + 35267826*Sqrt[31] - (2362701
18*I)*x + 36393566*Sqrt[31]*x - (2553985*I)*x^2 + 23896114*Sqrt[3
1]*x^2 - (282686240*I)*x^3 + 26621650*Sqrt[31]*x^3 - (104765803*I
)*x^4 + 10956044*Sqrt[31]*x^4))/(294638322 + (278507402*I)*Sqrt[3
1] + 8796989102*x - (311643066*I)*Sqrt[31]*x + 3166163858*x^2 - (
2655130695*I)*Sqrt[31]*x^2 + 3951866050*x^3 - (1267524880*I)*Sqrt
[31]*x^3 + 3956537068*x^4 - (2241477661*I)*Sqrt[31]*x^4 - (830200
0*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (20755000*
I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (29057000*
I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (8302000
0*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[
682*(13 + I*Sqrt[31])] - (((5*I)/30008)*(5813*I + 499*Sqrt[31])*A
rcTanh[(-294638322*I - 278507402*Sqrt[31] - (8796989102*I)*x + 31
1643066*Sqrt[31]*x - (3166163858*I)*x^2 + 2655130695*Sqrt[31]*x^2
 - (3951866050*I)*x^3 + 1267524880*Sqrt[31]*x^3 - (3956537068*I)*
x^4 + 2241477661*Sqrt[31]*x^4 - 523026000*Sqrt[22*(-13 + I*Sqrt[3
1])]*Sqrt[3 - x + 2*x^2] - 601895000*Sqrt[22*(-13 + I*Sqrt[31])]*
x*Sqrt[3 - x + 2*x^2] - 1033599000*Sqrt[22*(-13 + I*Sqrt[31])]*x^
2*Sqrt[3 - x + 2*x^2] + 456610000*Sqrt[22*(-13 + I*Sqrt[31])]*x^3
*Sqrt[3 - x + 2*x^2])/(14520445174*I + 1093302606*Sqrt[31] + (196
94353658*I)*x + 1128200546*Sqrt[31]*x + (26853123535*I)*x^2 + 740
779534*Sqrt[31]*x^2 - (16474806560*I)*x^3 + 825271150*Sqrt[31]*x^
3 + (13417689893*I)*x^4 + 339637364*Sqrt[31]*x^4)])/Sqrt[682*(-13
 + I*Sqrt[31])] - (5*(-5813*I + 499*Sqrt[31])*Log[(-3*I + Sqrt[31
] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(60016*Sqrt[682*(
13 + I*Sqrt[31])]) + (((5*I)/60016)*(5813*I + 499*Sqrt[31])*Log[(
```

```
-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqr
t[682*(-13 + I*Sqrt[31])] - (((5*I)/60016)*(5813*I + 499*Sqrt[31]
)*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sq
rt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sq
rt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]
*x*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31])] + (5*(-581
3*I + 499*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31]
+ (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (6
3*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt
[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(60016*Sqrt[682*(
13 + I*Sqrt[31])])
```

Maple [B] time = 0.096, size = 5942, normalized size = 28.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^(3/2)/(5*x^2+3*x+2)^2,x)

[Out] result too large to display
```

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

$$\int \frac{1}{\left(5\,x^2+3\,x+2\right)^2\left(2\,x^2-x+3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)),x, algorithm="maxima")

[Out] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)), x)
```

Fricas [A] time = 0.373024, size = 1588, normalized size = 7.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)),x, algorithm="fricas")

[Out] 1/413093216787056960*232562^(3/4)*sqrt(20755)*sqrt(31)*(8*232562^
(1/4)*sqrt(20755)*sqrt(31)*(2393051500000*x^3 - 5117560350000*x^2
 - 129694447*sqrt(2)*(11530*x^3 - 24657*x^2 + 18557*x - 10606) +
3851505350000*x - 2201275300000)*sqrt(2*x^2 - x + 3)*sqrt((129694
447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150832
635809)) - 35183643812*sqrt(20755)*sqrt(2)*(10*x^4 + x^3 + 16*x^2
 + 7*x + 6)*arctan(31*(232562^(1/4)*sqrt(20755)*(129694447*sqrt(2
)*(x - 6) - 207550000*x + 1245300000)*sqrt((129694447*sqrt(2) - 2
07550000)/(26918082474850000*sqrt(2) - 38359150832635809)) + 44*s
qrt(20755)*sqrt(2*x^2 - x + 3)*(16454*sqrt(2) - 12611))/(2*232562
^(1/4)*sqrt(20755)*sqrt(31)*(129694447*sqrt(2)*x - 207550000*x)*s
qrt(-sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(291845
314290690421779084003227*x + 120958472180713824696109941475) - 41
2803786471404246475193944702*x - 170886842109976597082974061752)*
sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) -
 38359150832635809)) + 263009003788356081939760000*x^2 + sqrt(2)
*(73224097645621863721865000*x^2 - 105618168722834083006526623*sq
```

```
rt(2)*(49*x^2 - 151*x + 200) - 22564977029569186575513500000*x + 2
98873867941313729477000000000) - 92943988476093993045743O824*sqrt(2
)*(2*x^2 - x + 3) - 131504501894178040969880000000*x + 394513505682
5341229096400000)/(105618168722834083006526623*sqrt(2)*x^2 - 14943
69339706568647385000000*x^2))*sqrt((129694447*sqrt(2) - 207550000)/
(26918082474850000*sqrt(2) - 38359150832635809)) + 232562^(1/4)*s
qrt(20755)*sqrt(31)*(129694447*sqrt(2)*(19*x - 22) - 3943450000*x
 + 4566100000)*sqrt((129694447*sqrt(2) - 207550000)/(269180824748
50000*sqrt(2) - 38359150832635809)) - 1364*sqrt(20755)*sqrt(31)*s
qrt(2*x^2 - x + 3)*(2158*sqrt(2) - 4653))) - 35183643812*sqrt(207
55)*sqrt(2)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)*arctan(-31*(232562^
(1/4)*sqrt(20755)*(129694447*sqrt(2)*(x - 6) - 207550000*x + 1245
300000)*sqrt((129694447*sqrt(2) - 207550000)/(26918082474850000*s
qrt(2) - 38359150832635809)) - 44*sqrt(20755)*sqrt(2*x^2 - x + 3)
*(16454*sqrt(2) - 12611))/(2*232562^(1/4)*sqrt(20755)*sqrt(31)*(1
29694447*sqrt(2)*x - 207550000*x)*sqrt(sqrt(2)*(2*232562^(1/4)*sq
rt(2*x^2 - x + 3)*(sqrt(2)*(291845314290690421779084003227*x + 12
0958472180713824696109941475) - 412803786471404246475193944702*x
- 170886842109976597082974061752)*sqrt((129694447*sqrt(2) - 20755
0000)/(26918082474850000*sqrt(2) - 38359150832635809)) - 26300900
3788356081939760000O*x^2 - sqrt(2)*(73224097645621863721865000O*x
^2 - 105618168722834083006526623*sqrt(2)*(49*x^2 - 151*x + 200) -
22564977029569186575513500000*x + 29887386794131372947700000000) +
92943988476093993045743O824*sqrt(2)*(2*x^2 - x + 3) + 13150450189
4178040969880000O*x - 394513505682534122909640000O)/(105618168722
83408300652623*sqrt(2)*x^2 - 149436933970656864738500000*x^2))*sqr
t((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38
359150832635809)) + 232562^(1/4)*sqrt(20755)*sqrt(31)*(129694447*
sqrt(2)*(19*x - 22) - 3943450000*x + 4566100000)*sqrt((129694447*
sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 383591508326358
09)) + 1364*sqrt(20755)*sqrt(31)*sqrt(2*x^2 - x + 3)*(2158*sqrt(2
) - 4653))) + 23*sqrt(20755)*sqrt(31)*(2075500000*x^4 + 207550000
*x^3 + 3320800000*x^2 - 129694447*sqrt(2)*(10*x^4 + x^3 + 16*x^2
+ 7*x + 6) + 1452850000*x + 1245300000)*log(-673078164062500*sqrt
(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(291845314290690
421779084003227*x + 120958472180713824696109941475) - 41280378647
1404246475193944702*x - 170886842109976597082974061752)*sqrt((129
694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38359150
832635809)) + 263009003788356081939760000O*x^2 + sqrt(2)*(7322409
764562186372186500000*x^2 - 105618168722834083006526623*sqrt(2)*(49
*x^2 - 151*x + 200) - 22564977029569186575513500000*x + 2988738679
4131372947700000000) - 92943988476093993045743O824*sqrt(2)*(2*x^2
- x + 3) - 131504501894178040969880000000*x + 39451350568253412290
96400000)/(105618168722834083006526623*sqrt(2)*x^2 - 14943693397065
686473850000*x^2)) - 23*sqrt(20755)*sqrt(31)*(2075500000*x^4 + 20
7550000*x^3 + 3320800000*x^2 - 129694447*sqrt(2)*(10*x^4 + x^3 +
16*x^2 + 7*x + 6) + 1452850000*x + 1245300000)*log(67307816406250
0*sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(291845314
290690421779084003227*x + 120958472180713824696109941475) - 41280
3786471404246475193944702*x - 170886842109976597082974061752)*sqr
t((129694447*sqrt(2) - 207550000)/(26918082474850000*sqrt(2) - 38
359150832635809)) - 263009003788356081939760000O*x^2 - sqrt(2)*(7
322409764562186372186500000*x^2 - 105618168722834083006526623*sqrt(
2)*(49*x^2 - 151*x + 200) - 22564977029569186575513500000*x + 2988
73867941313729477000000000) + 92943988476093993045743O824*sqrt(2)*(
2*x^2 - x + 3) + 131504501894178040969880000000*x - 394513505682534
1229096400000)/(105618168722834083006526623*sqrt(2)*x^2 - 14943693
397065686473850000*x^2)))/((2075500000*x^4 + 207550000*x^3 + 3320
800000*x^2 - 129694447*sqrt(2)*(10*x^4 + x^3 + 16*x^2 + 7*x + 6)
+ 1452850000*x + 1245300000)*sqrt((129694447*sqrt(2) - 207550000)
/(26918082474850000*sqrt(2) - 38359150832635809)))
```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{3}{2}} (5x^2 + 3x + 2)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] Integral(1/((2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)**2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(3/2)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.92 $\int \frac{1}{(3-x+2x^2)^{3/2}(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=246

$$-\frac{4353943-6508666x}{941410976\sqrt{2x^2-x+3}}+\frac{5(17315x+7318)}{1860496\sqrt{2x^2-x+3}\,(5x^2+3x+2)}+\frac{65x+4}{1364\sqrt{2x^2-x+3}\,(5x^2+3x+2)^2}+\frac{3\sqrt{\frac{1}{682}\left(13874275807943+9819738650000\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(13874275807943+9819738650000\sqrt{2}\right)}}\left(\left(13785797+9662095\sqrt{2}\right)x+4123702\sqrt{2}+5538393\right)}{\sqrt{2x^2-x+3}}\right)}{81861824}-\frac{3\sqrt{\frac{1}{682}\left(9819738650000\sqrt{2}-13874275807943\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(9819738650000\sqrt{2}-13874275807943\right)}}\left(\left(13785797-9662095\sqrt{2}\right)x-4123702\sqrt{2}+5538393\right)}{\sqrt{2x^2-x+3}}\right)}{81861824}$$

```
[Out] -(4353943 - 6508666*x)/(941410976*Sqrt[3 - x + 2*x^2]) + (4 + 65*
x)/(1364*Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2) + (5*(7318 + 17
315*x))/(1860496*Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)) + (3*Sqrt
[(13874275807943 + 9819738650000*Sqrt[2])/682]*ArcTan[(Sqrt[11/(3
1*(13874275807943 + 9819738650000*Sqrt[2]))]*(5538393 + 4123702*S
qrt[2] + (13785797 + 9662095*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/8
1861824 - (3*Sqrt[(-13874275807943 + 9819738650000*Sqrt[2])/682]*
ArcTanh[(Sqrt[11/(31*(-13874275807943 + 9819738650000*Sqrt[2]))]*
(5538393 - 4123702*Sqrt[2] + (13785797 - 9662095*Sqrt[2])*x))/Sqr
t[3 - x + 2*x^2]])/81861824
```

Rubi [A] time = 1.08326, antiderivative size = 246, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$-\frac{4353943-6508666x}{941410976\sqrt{2x^2-x+3}}+\frac{5(17315x+7318)}{1860496\sqrt{2x^2-x+3}\,(5x^2+3x+2)}+\frac{65x+4}{1364\sqrt{2x^2-x+3}\,(5x^2+3x+2)^2}+\frac{3\sqrt{\frac{1}{682}\left(13874275807943+9819738650000\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(13874275807943+9819738650000\sqrt{2}\right)}}\left(\left(13785797+9662095\sqrt{2}\right)x+4123702\sqrt{2}+5538393\right)}{\sqrt{2x^2-x+3}}\right)}{81861824}-\frac{3\sqrt{\frac{1}{682}\left(9819738650000\sqrt{2}-13874275807943\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(9819738650000\sqrt{2}-13874275807943\right)}}\left(\left(13785797-9662095\sqrt{2}\right)x-4123702\sqrt{2}+5538393\right)}{\sqrt{2x^2-x+3}}\right)}{81861824}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^3),x]
```


```
[Out] -(4353943 - 6508666*x)/(941410976*Sqrt[3 - x + 2*x^2]) + (4 + 65*
x)/(1364*Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)^2) + (5*(7318 + 17
315*x))/(1860496*Sqrt[3 - x + 2*x^2]*(2 + 3*x + 5*x^2)) + (3*Sqrt
[(13874275807943 + 9819738650000*Sqrt[2])/682]*ArcTan[(Sqrt[11/(3
1*(13874275807943 + 9819738650000*Sqrt[2]))]*(5538393 + 4123702*S
qrt[2] + (13785797 + 9662095*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/8
1861824 - (3*Sqrt[(-13874275807943 + 9819738650000*Sqrt[2])/682]*
ArcTanh[(Sqrt[11/(31*(-13874275807943 + 9819738650000*Sqrt[2]))]*
(5538393 - 4123702*Sqrt[2] + (13785797 - 9662095*Sqrt[2])*x))/Sqr
t[3 - x + 2*x^2]])/81861824
```

Rubi in Sympy [A] time = 130.217, size = 286, normalized size = 1.16

$$-\frac{-\frac{4331517223x}{2}+\frac{5795098133}{4}}{313254502264\sqrt{2x^2-x+3}}+\frac{715x+44}{15004\sqrt{2x^2-x+3}\,(5x^2+3x+2)^2}+\frac{\frac{10475575x}{2}+2213695}{112560008\sqrt{2x^2-x+3}\,(5x^2+3x+2)}$$
$$+\frac{\sqrt{682}\left(\frac{5595045221997}{8}+\frac{2082941673879\sqrt{2}}{4}\right)\left(\frac{428162326383\sqrt{2}}{2}+\frac{1255552000131}{4}\right)\operatorname{atan}\left(\frac{8\sqrt{341}\left(x\left(\frac{9760928569755\sqrt{2}}{8}+\frac{13926811917513}{8}\right)+\frac{5595045221997}{8}+\frac{20829416}{4}\right.}{31317099\sqrt{13874275807943+9819738650000\sqrt{2}}\sqrt{2x^2-x+}}\right.}{593518446705643434228\sqrt{13874275807943+9819738650000\sqrt{2}}}$$
$$+\frac{\sqrt{682}\left(-\frac{2082941673879\sqrt{2}}{4}+\frac{5595045221997}{8}\right)\left(-\frac{428162326383\sqrt{2}}{2}+\frac{1255552000131}{4}\right)\operatorname{atanh}\left(\frac{8\sqrt{341}\left(x\left(-\frac{9760928569755\sqrt{2}}{8}+\frac{13926811917513}{8}\right)-\frac{2082941673879\sqrt{}}{4}\right.}{31317099\sqrt{-13874275807943+9819738650000\sqrt{2}}\sqrt{}}\right.}{593518446705643434228\sqrt{-13874275807943+9819738650000\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**(3/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] -(-4331517223*x/2 + 5795098133/4)/(313254502264*sqrt(2*x**2 - x +
 3)) + (715*x + 44)/(15004*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2
)**2) + (10475575*x/2 + 2213695)/(112560008*sqrt(2*x**2 - x + 3)*
(5*x**2 + 3*x + 2)) + sqrt(682)*(5595045221997/8 + 2082941673879*
sqrt(2)/4)*(428162326383*sqrt(2)/2 + 1255552000131/4)*atan(8*sqrt
(341)*(x*(9760928569755*sqrt(2)/8 + 13926811917513/8) + 559504522
1997/8 + 2082941673879*sqrt(2)/4)/(31317099*sqrt(13874275807943 +
 9819738650000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(59351844670564343
4228*sqrt(13874275807943 + 9819738650000*sqrt(2))) + sqrt(682)*(-
2082941673879*sqrt(2)/4 + 5595045221997/8)*(-428162326383*sqrt(2)
/2 + 1255552000131/4)*atanh(8*sqrt(341)*(x*(-9760928569755*sqrt(2
)/8 + 13926811917513/8) - 2082941673879*sqrt(2)/4 + 5595045221997
/8)/(31317099*sqrt(-13874275807943 + 9819738650000*sqrt(2))*sqrt(
2*x**2 - x + 3)))/(593518446705643434228*sqrt(-13874275807943 + 9
819738650000*sqrt(2)))
```

Mathematica [C] time = 6.50056, size = 1191, normalized size = 4.84

result too large to display

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((-11 + 90*x)/(122452*(3 - x + 2*x^2)) + (-98
 + 345*x)/(30008*(2 + 3*x + 5*x^2)^2) + (231418 + 632255*x)/(4093
0912*(2 + 3*x + 5*x^2))) - (((15*I)/81861824)*(-1932419*I + 79037
*Sqrt[31])*ArcTan[(31*(4059546477574*I + 3106527877794*Sqrt[31] -
 (18544569435542*I)*x + 1227936189854*Sqrt[31]*x + (1750177402753
5*I)*x^2 + 1728828684066*Sqrt[31]*x^2 - (18989790004560*I)*x^3 +
1371533012850*Sqrt[31]*x^3 + (5399410180693*I)*x^4 + 274861284236
*Sqrt[31]*x^4))/(148573472722818 + (30402744893338*I)*Sqrt[31] +
862374952340638*x - (64577765937354*I)*Sqrt[31]*x + 1075734013616
02*x^2 - (186540875521455*I)*Sqrt[31]*x^2 + 503769328622450*x^3 -
 (71509340960720*I)*Sqrt[31]*x^3 + 208327267086092*x^4 - (1657142
45597909*I)*Sqrt[31]*x^4 - (785579092000*I)*Sqrt[682*(13 + I*Sqrt
[31])]*Sqrt[3 - x + 2*x^2] + (1963947730000*I)*Sqrt[682*(13 + I*S
qrt[31])]*x*Sqrt[3 - x + 2*x^2] + (2749526822000*I)*Sqrt[682*(13
+ I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] + (7855790920000*I)*Sqrt[6
82*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13 + I
*Sqrt[31])] - (((15*I)/81861824)*(1932419*I + 79037*Sqrt[31])*Arc
Tanh[(-148573472722818*I - 30402744893338*Sqrt[31] - (86237495234
0638*I)*x + 64577765937354*Sqrt[31]*x - (107573401361602*I)*x^2 +
 186540875521455*Sqrt[31]*x^2 - (503769328622450*I)*x^3 + 7150934
```

```
0960720*Sqrt[31]*x^3 - (208327267086092*I)*x^4 + 165714245597909*
Sqrt[31]*x^4 - 49491482796000*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3
- x + 2*x^2] - 56954484170000*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[
3 - x + 2*x^2] - 97804596954000*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*S
qrt[3 - x + 2*x^2] + 43206850060000*Sqrt[22*(-13 + I*Sqrt[31])]*x
^3*Sqrt[3 - x + 2*x^2])/(1445312243195206*I + 96302364211614*Sqrt
[31] + (1745394499581802*I)*x + 38066021885474*Sqrt[31]*x + (1990
937576846415*I)*x^2 + 53593689206046*Sqrt[31]*x^2 - (179947694953
8640*I)*x^3 + 42517523398350*Sqrt[31]*x^3 + (794952672098517*I)*x
^4 + 8520699811316*Sqrt[31]*x^4)])/Sqrt[682*(-13 + I*Sqrt[31])] -
 (15*(-1932419*I + 79037*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*
x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(163723648*Sqrt[682*(13 + I*
Sqrt[31])]) + (((15*I)/163723648)*(1932419*I + 79037*Sqrt[31])*Lo
g[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/
Sqrt[682*(-13 + I*Sqrt[31])] - (((15*I)/163723648)*(1932419*I + 7
9037*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469
*I)*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[68
2*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 +
 I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31]
)] + (15*(-1932419*I + 79037*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-18
58*I + 66*Sqrt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 4
4*Sqrt[31]*x^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2
*x^2] + (22*I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])]
)/(163723648*Sqrt[682*(13 + I*Sqrt[31])])
```

Maple [B] time = 0.195, size = 18844, normalized size = 76.6

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^(3/2)/(5*x^2+3*x+2)^3,x)
```

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

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

$$\int \frac{1}{\left(5\,x^2+3\,x+2\right)^3\left(2\,x^2-x+3\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2)), x)
```

Fricas [A] time = 0.384355, size = 1777, normalized size = 7.22

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(3/2)),x, algorithm="fricas")
```

```
[Out] 1/21326992321239789760592896O*sqrt(1963947730)*930248^(3/4)*sqrt(
31)*(4*sqrt(1963947730)*930248^(1/4)*sqrt(31)*(319566995400704500
0000*x^5 + 16970748269586065000000*x^4 + 54434302057645302000000*x^
3 + 34532720417889735000000*x^2 - 13874275807943*sqrt(2)*(16271665
```

```
0*x^5 + 86411405*x^4 + 277167774*x^3 + 175833195*x^2 + 161806828*
x + 22374044) + 3177801525491004400000*x + 4394145292472012000000)
*sqrt(2*x^2 - x + 3)*sqrt((13874275807943*sqrt(2) - 1963947730000
0)/(27248352478403570819390000*sqrt(2) - 385350063503480030421891
1249)) - 920746859815884*sqrt(981973865)*sqrt(2)*(50*x^6 + 35*x^5
 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*arctan(30441189815*(sqr
t(1963947730)*930248^(1/4)*(13874275807943*sqrt(2)*(x - 6) - 1963
9477300000*x + 117836863800000)*sqrt((13874275807943*sqrt(2) - 19
639477300000)/(27248352478403570819390000*sqrt(2) - 385350063503
480030421891249)) + 88*sqrt(981973865)*sqrt(2*x^2 - x + 3)*(41237
02*sqrt(2) - 5538393))/(2*sqrt(1963947730)*sqrt(981973865)*930248
^(1/4)*sqrt(31)*(13874275807943*sqrt(2)*x - 19639477300000*x)*sqr
t(-sqrt(2)*(sqrt(1963947730)*sqrt(981973865)*930248^(1/4)*sqrt(2*
x^2 - x + 3)*(sqrt(2)*(93660708863653806311559793916265862355660 7
71809*x + 387955358736679851686810987990084333337117 33825) - 1324
56244737321791480240892715274295689372505634*x - 5486517298998582
114287869511725742902194903 7984)*sqrt((13874275807943*sqrt(2) - 1
9639477300000)/(27248352478403570819390000*sqrt(2) - 38535006350
3480030421891249)) + 261472249845819278251849895764324226623992 63
44000000*x^2 + 981973865*sqrt(2)*(741325751857247553904456330347 2
09711900000*x^2 - 10697887063275688449737374476343556390807*sqrt(
2)*(49*x^2 - 151*x + 200) - 228449364347845674774638583433527890 8
100000*x + 30258193953357043016508421646824886200000000) - 9244440
046035328065821531707548941160495056227968 40*sqrt(2)*(2*x^2 - x +
 3) - 130736124922909639125924947882162113311996317 2000000*x + 39
220837476872891737777484364648633993598895160000 00)/(106978870632
75688449737374476343556390807*sqrt(2)*x^2 - 151290969766785215082
54210823412443100000*x^2))*sqrt((13874275807943*sqrt(2) - 1963947
7300000)/(27248352478403570819390000*sqrt(2) - 385350063503480 03
0421891249)) + 981973865*sqrt(1963947730)*930248^(1/4)*sqrt(31)*(
13874275807943*sqrt(2)*(19*x - 22) - 373150068700000*x + 43206850
0600000)*sqrt((13874275807943*sqrt(2) - 19639477300000)/(27248352
478403570819390000*sqrt(2) - 3853500635034800304218912 49)) - 267
8824703720*sqrt(981973865)*sqrt(31)*sqrt(2*x^2 - x + 3)*(847654*s
qrt(2) - 1242839))) - 920746859815884*sqrt(981973865)*sqrt(2)*(50
*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12)*arctan(-30
441189815*(sqrt(1963947730)*930248^(1/4)*(13874275807943*sqrt(2)*
(x - 6) - 19639477300000*x + 117836863800000)*sqrt((1387427580794
3*sqrt(2) - 19639477300000)/(27248352478403570819390000*sqrt(2)
- 385350063503480030421891249)) - 88*sqrt(981973865)*sqrt(2*x^2 -
 x + 3)*(4123702*sqrt(2) - 5538393))/(2*sqrt(1963947730)*sqrt(981
973865)*930248^(1/4)*sqrt(31)*(13874275807943*sqrt(2)*x - 1963947
7300000*x)*sqrt(sqrt(2)*(sqrt(1963947730)*sqrt(981973865)*930248^
(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(9366070886365380631155979391 6
265862355660771809*x + 38795535873667985168681098799008433333 7117
33825) - 13245624473732179148024089271527429568937250563 4*x - 548
6517298998582114287869511725742902194903 7984)*sqrt((1387427580794
3*sqrt(2) - 19639477300000)/(27248352478403570819390000*sqrt(2)
- 385350063503480030421891249)) - 2614722498458192782518498957643
24226623992634400000 0*x^2 - 981973865*sqrt(2)*(741325751857247553
90445633034720971190000 0*x^2 - 10697887063275688449737374476343 55
6390807*sqrt(2)*(49*x^2 - 151*x + 200) - 2284493643478456747746 38
583433527890810000 0*x + 302581939533570430165084216468248862000 00
00) + 924444004603532806582153170754894116049505622796840*sqrt(2)
*(2*x^2 - x + 3) + 13073612492290963912592494788216211331199631 72
000000*x - 39220837476872891737777484364648633993598895160000 00)/
(10697887063275688449737374476343556390807*sqrt(2)*x^2 - 15129096
97667852150825421082341244310000 0*x^2))*sqrt((13874275807943*sqrt
(2) - 19639477300000)/(27248352478403570819390000*sqrt(2) - 3853
500635034800304218912 49)) + 981973865*sqrt(1963947730)*930248^(1/
4)*sqrt(31)*(13874275807943*sqrt(2)*(19*x - 22) - 373150068700000
*x + 432068500600000)*sqrt((13874275807943*sqrt(2) - 196394773000
00)/(27248352478403570819390000*sqrt(2) - 38535006350348003042 18
91249)) + 2678824703720*sqrt(981973865)*sqrt(31)*sqrt(2*x^2 - x +
 3)*(847654*sqrt(2) - 1242839))) + 69*sqrt(981973865)*sqrt(31)*(9
81973865000000*x^6 + 687381705500000*x^5 + 2022866161900000*x^4 +
 1669355570500000*x^3 + 1630076615900000*x^2 - 13874275807943*sqr
t(2)*(50*x^6 + 35*x^5 + 103*x^4 + 85*x^3 + 83*x^2 + 32*x + 12) +
628463273600000*x + 235673727600000)*log(-13809007476562500*sqrt(
2)*(sqrt(1963947730)*sqrt(981973865)*930248^(1/4)*sqrt(2*x^2 - x
+ 3)*(sqrt(2)*(9366070886365380631155979391626586235566077180 9*x
+ 387955358736679851686810987990084333337117 33825) - 132456244737
```

```
3217914802408927152742956893725056348*x - 548651729899858211428786
```

3.93 $\int \frac{(2+3x+5x^2)^4}{(3-x+2x^2)^{5/2}}\,dx$

Optimal. Leaf size=147

$$\frac{38375}{384}\sqrt{2x^2-x+3}x^2+\frac{526075\sqrt{2x^2-x+3}x}{3072}-\frac{1308645\sqrt{2x^2-x+3}}{4096}+\frac{1331(116368x+7409)}{101568\sqrt{2x^2-x+3}}-\frac{14641(79x+101)}{4416\,(2x^2-x+3)^{3/2}}+\frac{625}{32}\sqrt{2x^2-x+3}x^3+\frac{16955197\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8192\sqrt{2}}$$

```
[Out] (-14641*(101 + 79*x))/(4416*(3 - x + 2*x^2)^(3/2)) + (1331*(7409
+ 116368*x))/(101568*Sqrt[3 - x + 2*x^2]) - (1308645*Sqrt[3 - x +
 2*x^2])/4096 + (526075*x*Sqrt[3 - x + 2*x^2])/3072 + (38375*x^2*
Sqrt[3 - x + 2*x^2])/384 + (625*x^3*Sqrt[3 - x + 2*x^2])/32 + (16
955197*ArcSinh[(1 - 4*x)/Sqrt[23]])/(8192*Sqrt[2])
```

Rubi [A] time = 0.278346, antiderivative size = 147, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{38375}{384}\sqrt{2x^2-x+3}x^2+\frac{526075\sqrt{2x^2-x+3}x}{3072}-\frac{1308645\sqrt{2x^2-x+3}}{4096}+\frac{1331(116368x+7409)}{101568\sqrt{2x^2-x+3}}-\frac{14641(79x+101)}{4416\,(2x^2-x+3)^{3/2}}+\frac{625}{32}\sqrt{2x^2-x+3}x^3+\frac{16955197\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{8192\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(5/2),x]
```

```
[Out] (-14641*(101 + 79*x))/(4416*(3 - x + 2*x^2)^(3/2)) + (1331*(7409
+ 116368*x))/(101568*Sqrt[3 - x + 2*x^2]) - (1308645*Sqrt[3 - x +
 2*x^2])/4096 + (526075*x*Sqrt[3 - x + 2*x^2])/3072 + (38375*x^2*
Sqrt[3 - x + 2*x^2])/384 + (625*x^3*Sqrt[3 - x + 2*x^2])/32 + (16
955197*ArcSinh[(1 - 4*x)/Sqrt[23]])/(8192*Sqrt[2])
```

Rubi in Sympy [A] time = 98.319, size = 180, normalized size = 1.22

$$-\frac{\left(-\frac{778938699375x}{2}+\frac{3520397050875}{8}\right)\sqrt{2x^2-x+3}}{914112000}-\frac{2(-4x+1)\left(5x^2+3x+2\right)^4}{69\left(2x^2-x+3\right)^{\frac{3}{2}}}+\frac{2(1576x+112)\left(5x^2+3x+2\right)^3}{1587\sqrt{2x^2-x+3}}-\frac{(2709000x+3441150)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)^2}{476100}+\frac{\left(1966983750x+\frac{21212629875}{2}\right)\sqrt{2x^2-x+3}\left(5x^2+3x+2\right)}{114264000}-\frac{16955197\sqrt{2}\,\text{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{16384}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(5/2),x)
```

```
[Out] -(-778938699375*x/2 + 3520397050875/8)*sqrt(2*x**2 - x + 3)/91411
2000 - 2*(-4*x + 1)*(5*x**2 + 3*x + 2)**4/(69*(2*x**2 - x + 3)**(
3/2)) + 2*(1576*x + 112)*(5*x**2 + 3*x + 2)**3/(1587*sqrt(2*x**2
- x + 3)) - (2709000*x + 3441150)*sqrt(2*x**2 - x + 3)*(5*x**2 +
3*x + 2)**2/476100 + (1966983750*x + 21212629875/2)*sqrt(2*x**2 -
 x + 3)*(5*x**2 + 3*x + 2)/114264000 - 16955197*sqrt(2)*atanh(sqr
t(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/16384
```

Mathematica [A] time = 0.15485, size = 75, normalized size = 0.51

$$\frac{507840000x^7 + 2090608000x^6 + 3504730800x^5 - 5076781260x^4 + 39848900984x^3 - 36481630395x^2 + 49883864262x - 189}{6500352\,(2x^2 - x + 3)^{3/2}}$$
$$-\frac{16955197\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{8192\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^4/(3 - x + 2*x^2)^(5/2),x]
```

```
[Out] (-18974698519 + 49883864262*x - 36481630395*x^2 + 39848900984*x^3
 - 5076781260*x^4 + 3504730800*x^5 + 2090608000*x^6 + 507840000*x
^7)/(6500352*(3 - x + 2*x^2)^(3/2)) - (16955197*ArcSinh[(-1 + 4*x
)/Sqrt[23]])/(8192*Sqrt[2])
```

Maple [A] time = 0.043, size = 214, normalized size = 1.5

$$\frac{16955197}{32768}\frac{1}{\sqrt{2x^2-x+3}} - \frac{2149616639}{524288}\left(2x^2-x+3\right)^{-\frac{3}{2}} - \frac{16955197\sqrt{2}}{16384}\mathit{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right) + \frac{20566450900x-5141612725}{36175872}\left(2x^2-x+3\right)^{-\frac{3}{2}} + \frac{3971704132x-992926033}{13000704}\frac{1}{\sqrt{2x^2-x+3}} + \frac{138025x^5}{256}\left(2x^2-x+3\right)^{-\frac{3}{2}} - \frac{799745x^4}{1024}\left(2x^2-x+3\right)^{-\frac{3}{2}} + \frac{16955197x^3}{12288}\left(2x^2-x+3\right)^{-\frac{3}{2}} - \frac{67488035x^2}{16384}\left(2x^2-x+3\right)^{-\frac{3}{2}} + \frac{55167267x}{131072}\left(2x^2-x+3\right)^{-\frac{3}{2}} + \frac{625x^7}{8}\left(2x^2-x+3\right)^{-\frac{3}{2}} + \frac{30875x^6}{96}\left(2x^2-x+3\right)^{-\frac{3}{2}} + \frac{16955197x}{8192}\frac{1}{\sqrt{2x^2-x+3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^4/(2*x^2-x+3)^(5/2),x)
```

```
[Out] 16955197/32768/(2*x^2-x+3)^(1/2)-2149616639/524288/(2*x^2-x+3)^(3
/2)-16955197/16384*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+5141612
725/36175872*(4*x-1)/(2*x^2-x+3)^(3/2)+992926033/13000704*(4*x-1)
/(2*x^2-x+3)^(1/2)+138025/256*x^5/(2*x^2-x+3)^(3/2)-799745/1024*x
^4/(2*x^2-x+3)^(3/2)+16955197/12288*x^3/(2*x^2-x+3)^(3/2)-6748803
5/16384*x^2/(2*x^2-x+3)^(3/2)+55167267/131072*x/(2*x^2-x+3)^(3/2)
+625/8*x^7/(2*x^2-x+3)^(3/2)+30875/96*x^6/(2*x^2-x+3)^(3/2)+16955
197/8192*x/(2*x^2-x+3)^(1/2)
```

Maxima [A] time = 0.79172, size = 342, normalized size = 2.33

$$\frac{625x^7}{8\left(2x^2-x+3\right)^{\frac{3}{2}}} + \frac{30875x^6}{96\left(2x^2-x+3\right)^{\frac{3}{2}}} + \frac{138025x^5}{256\left(2x^2-x+3\right)^{\frac{3}{2}}} - \frac{799745x^4}{1024\left(2x^2-x+3\right)^{\frac{3}{2}}} - \frac{16955197}{13000704}x\left(\frac{284x}{\sqrt{2x^2-x+3}} - \frac{3174x^2}{\left(2x^2-x+3\right)^{\frac{3}{2}}} - \frac{71}{\sqrt{2x^2-x+3}} + \frac{805x}{\left(2x^2-x+3\right)^{\frac{3}{2}}} - \frac{3243}{\left(2x^2-x+3\right)^{\frac{3}{2}}}\right) - \frac{16955197}{16384}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4x-1)\right) + \frac{1203818987}{6500352}\sqrt{2x^2-x+3} + \frac{3536205583x}{3250176\sqrt{2x^2-x+3}} - \frac{2638851x^2}{512\left(2x^2-x+3\right)^{\frac{3}{2}}} + \frac{257773037}{1083392\sqrt{2x^2-x+3}} + \frac{29484067x}{23552\left(2x^2-x+3\right)^{\frac{3}{2}}} - \frac{374445479}{70656\left(2x^2-x+3\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 625/8*x^7/(2*x^2 - x + 3)^(3/2) + 30875/96*x^6/(2*x^2 - x + 3)^(3
/2) + 138025/256*x^5/(2*x^2 - x + 3)^(3/2) - 799745/1024*x^4/(2*x
^2 - x + 3)^(3/2) - 16955197/13000704*x*(284*x/sqrt(2*x^2 - x + 3
) - 3174*x^2/(2*x^2 - x + 3)^(3/2) - 71/sqrt(2*x^2 - x + 3) + 805
*x/(2*x^2 - x + 3)^(3/2) - 3243/(2*x^2 - x + 3)^(3/2)) - 16955197
/16384*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*x - 1)) + 1203818987/6500
352*sqrt(2*x^2 - x + 3) + 3536205583/3250176*x/sqrt(2*x^2 - x + 3
) - 2638851/512*x^2/(2*x^2 - x + 3)^(3/2) + 257773037/1083392/sqr
t(2*x^2 - x + 3) + 29484067/23552*x/(2*x^2 - x + 3)^(3/2) - 37444
5479/70656/(2*x^2 - x + 3)^(3/2)
```

Fricas [A] time = 0.291338, size = 186, normalized size = 1.27

$$\frac{\sqrt{2}\Big(4\sqrt{2}\big(507840000\,x^7 + 2090608000\,x^6 + 3504730800\,x^5 - 5076781260\,x^4 + 39848900984\,x^3 - 36481630395\,x^2 + 4988386}{52002816\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/52002816*sqrt(2)*(4*sqrt(2)*(507840000*x^7 + 2090608000*x^6 + 3
504730800*x^5 - 5076781260*x^4 + 39848900984*x^3 - 36481630395*x^
2 + 49883864262*x - 18974698519)*sqrt(2*x^2 - x + 3) + 2690789763
9*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(-sqrt(2)*(32*x^2 - 16*x
+ 25) + 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(4*x^4 - 4*x^3 + 13*x^2
 - 6*x + 9)
```

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

$$\int \frac{\left(5x^2 + 3x + 2\right)^4}{\left(2x^2 - x + 3\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**4/(2*x**2-x+3)**(5/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**4/(2*x**2 - x + 3)**(5/2), x)
```

GIAC/XCAS [A] time = 0.27356, size = 109, normalized size = 0.74

$$\frac{16955197}{16384}\,\sqrt{2}\ln\left(-2\,\sqrt{2}\left(\sqrt{2}x - \sqrt{2\,x^2 - x + 3}\right) + 1\right) + \frac{((4\,(2645\,(20\,(40\,(60\,x + 247)x + 16563)x - 479847)x + 9962225246)x - 36481630395)x + 49883864262)x - 18974698519}{6500352\,(2\,x^2 - x + 3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^4/(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] 16955197/16384*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x
+ 3)) + 1) + 1/6500352*(((4*(2645*(20*(40*(60*x + 247)*x + 16563)
```

```
*x - 479847)*x + 9962225246)*x - 36481630395)*x + 49883864262)*x
- 18974698519)/(2*x^2 - x + 3)^(3/2)
```

3.94 $\int \frac{(2+3x+5x^2)^3}{(3-x+2x^2)^{5/2}}\, dx$

Optimal. Leaf size=105

$$\frac{121(10679-6744x)}{8464\sqrt{2x^2-x+3}}+\frac{125}{16}x\sqrt{2x^2-x+3}+\frac{3175}{64}\sqrt{2x^2-x+3}-\frac{1331(17-45x)}{1104\,(2x^2-x+3)^{3/2}}-\frac{7495\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{128\sqrt{2}}$$

```
[Out] (-1331*(17 - 45*x))/(1104*(3 - x + 2*x^2)^(3/2)) + (121*(10679 -
6744*x))/(8464*Sqrt[3 - x + 2*x^2]) + (3175*Sqrt[3 - x + 2*x^2])/
64 + (125*x*Sqrt[3 - x + 2*x^2])/16 - (7495*ArcSinh[(1 - 4*x)/Sqr
t[23]])/(128*Sqrt[2])
```

Rubi [A] time = 0.176466, antiderivative size = 105, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{121(10679-6744x)}{8464\sqrt{2x^2-x+3}}+\frac{125}{16}x\sqrt{2x^2-x+3}+\frac{3175}{64}\sqrt{2x^2-x+3}-\frac{1331(17-45x)}{1104\,(2x^2-x+3)^{3/2}}-\frac{7495\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{128\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(5/2),x]
```


```
[Out] (-1331*(17 - 45*x))/(1104*(3 - x + 2*x^2)^(3/2)) + (121*(10679 -
6744*x))/(8464*Sqrt[3 - x + 2*x^2]) + (3175*Sqrt[3 - x + 2*x^2])/
64 + (125*x*Sqrt[3 - x + 2*x^2])/16 - (7495*ArcSinh[(1 - 4*x)/Sqr
t[23]])/(128*Sqrt[2])
```

Rubi in Sympy [A] time = 72.9896, size = 144, normalized size = 1.37

$$-\frac{2\,(-1116x+26)\,(5x^2+3x+2)^2}{1587\sqrt{2x^2-x+3}}-\frac{2\,(-4x+1)\,(5x^2+3x+2)^3}{69\,(2x^2-x+3)^{\frac{3}{2}}}-\frac{(807600x+990060)\sqrt{2x^2-x+3}\,(5x^2+3x+2)}{190440}+\frac{(29748900x+165587715)\sqrt{2x^2-x+3}}{1523520}+\frac{7495\sqrt{2}\,\operatorname{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{256}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(5/2),x)
```

```
[Out] -2*(-1116*x + 26)*(5*x**2 + 3*x + 2)**2/(1587*sqrt(2*x**2 - x + 3
)) - 2*(-4*x + 1)*(5*x**2 + 3*x + 2)**3/(69*(2*x**2 - x + 3)**(3/
2)) - (807600*x + 990060)*sqrt(2*x**2 - x + 3)*(5*x**2 + 3*x + 2)
/190440 + (29748900*x + 165587715)*sqrt(2*x**2 - x + 3)/1523520 +
 7495*sqrt(2)*atanh(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/2
56
```

Mathematica [A] time = 0.11998, size = 65, normalized size = 0.62

$$\frac{3174000x^5+16980900x^4-29423976x^3+101546529x^2-62463282x+89784565}{101568\,(2x^2-x+3)^{3/2}}+\frac{7495\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{128\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^3/(3 - x + 2*x^2)^(5/2),x]
```

```
[Out] (89784565 - 62463282*x + 101546529*x^2 - 29423976*x^3 + 16980900*
x^4 + 3174000*x^5)/(101568*(3 - x + 2*x^2)^(3/2)) + (7495*ArcSinh
[(-1 + 4*x)/Sqrt[23]])/(128*Sqrt[2])
```

Maple [B] time = 0.01, size = 180, normalized size = 1.7

$$-\frac{56326844\,x-14081711}{565248}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{13564556\,x-3391139}{203136}\frac{1}{\sqrt{2\,x^{2}-x+3}}+\frac{20961031}{24576}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{281177\,x}{2048}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}+\frac{222809\,x^{2}}{256}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{7495\,x^{3}}{192}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{7495\,x}{128}\frac{1}{\sqrt{2\,x^{2}-x+3}}-\frac{7495}{512}\frac{1}{\sqrt{2\,x^{2}-x+3}}+\frac{7495\sqrt{2}}{256}\mathit{Arcsinh}\left(\frac{4\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)+\frac{2675\,x^{4}}{16}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}+\frac{125\,x^{5}}{4}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^3/(2*x^2-x+3)^(5/2),x)
```

```
[Out] -14081711/565248*(4*x-1)/(2*x^2-x+3)^(3/2)-3391139/203136*(4*x-1)
/(2*x^2-x+3)^(1/2)+20961031/24576/(2*x^2-x+3)^(3/2)-281177/2048*x
/(2*x^2-x+3)^(3/2)+222809/256*x^2/(2*x^2-x+3)^(3/2)-7495/192*x^3/
(2*x^2-x+3)^(3/2)-7495/128*x/(2*x^2-x+3)^(1/2)-7495/512/(2*x^2-x+
3)^(1/2)+7495/256*2^(1/2)*arcsinh(4/23*23^(1/2)*(x-1/4))+2675/16*
x^4/(2*x^2-x+3)^(3/2)+125/4*x^5/(2*x^2-x+3)^(3/2)
```

Maxima [A] time = 0.77999, size = 296, normalized size = 2.82

$$\frac{125\,x^{5}}{4\,(2\,x^{2}-x+3)^{\frac{3}{2}}}+\frac{2675\,x^{4}}{16\,(2\,x^{2}-x+3)^{\frac{3}{2}}}+\frac{7495}{203136}\,x\left(\frac{284\,x}{\sqrt{2\,x^{2}-x+3}}-\frac{3174\,x^{2}}{(2\,x^{2}-x+3)^{\frac{3}{2}}}-\frac{71}{\sqrt{2\,x^{2}-x+3}}+\frac{805\,x}{(2\,x^{2}-x+3)^{\frac{3}{2}}}-\frac{3243}{(2\,x^{2}-x+3)^{\frac{3}{2}}}\right)+\frac{7495}{256}\sqrt{2}\,\operatorname{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{532145}{101568}\sqrt{2\,x^{2}-x+3}-\frac{4515389\,x}{50784\sqrt{2\,x^{2}-x+3}}+\frac{7197\,x^{2}}{8\,(2\,x^{2}-x+3)^{\frac{3}{2}}}+\frac{396211}{50784\sqrt{2\,x^{2}-x+3}}-\frac{269783\,x}{1104\,(2\,x^{2}-x+3)^{\frac{3}{2}}}+\frac{1002137}{1104\,(2\,x^{2}-x+3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 125/4*x^5/(2*x^2 - x + 3)^(3/2) + 2675/16*x^4/(2*x^2 - x + 3)^(3/
2) + 7495/203136*x*(284*x/sqrt(2*x^2 - x + 3) - 3174*x^2/(2*x^2 -
 x + 3)^(3/2) - 71/sqrt(2*x^2 - x + 3) + 805*x/(2*x^2 - x + 3)^(3
/2) - 3243/(2*x^2 - x + 3)^(3/2)) + 7495/256*sqrt(2)*arcsinh(1/23
*sqrt(23)*(4*x - 1)) - 532145/101568*sqrt(2*x^2 - x + 3) - 451538
9/50784*x/sqrt(2*x^2 - x + 3) + 7197/8*x^2/(2*x^2 - x + 3)^(3/2)
+ 396211/50784/sqrt(2*x^2 - x + 3) - 269783/1104*x/(2*x^2 - x + 3
)^(3/2) + 1002137/1104/(2*x^2 - x + 3)^(3/2)
```

Fricas [A] time = 0.288325, size = 173, normalized size = 1.65

$$\frac{\sqrt{2}\left(4\,\sqrt{2}\left(3174000\,x^{5}+16980900\,x^{4}-29423976\,x^{3}+101546529\,x^{2}-62463282\,x+89784565\right)\sqrt{2\,x^{2}-x+3}+11894565\,\left(4\right.}{812544\,\left(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/812544*sqrt(2)*(4*sqrt(2)*(3174000*x^5 + 16980900*x^4 - 2942397
6*x^3 + 101546529*x^2 - 62463282*x + 89784565)*sqrt(2*x^2 - x + 3
) + 11894565*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*log(-sqrt(2)*(32*
x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1)))/(4*x^4 - 4*x
^3 + 13*x^2 - 6*x + 9)
```

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

$$\int \frac{\left(5x^{2}+3x+2\right)^{3}}{\left(2x^{2}-x+3\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**3/(2*x**2-x+3)**(5/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**3/(2*x**2 - x + 3)**(5/2), x)
```

GIAC/XCAS [A] time = 0.274439, size = 97, normalized size = 0.92

$$-\frac{7495}{256}\,\sqrt{2}\ln\left(-2\,\sqrt{2}\left(\sqrt{2}x-\sqrt{2\,x^{2}-x+3}\right)+1\right)+\frac{3\left(\left(4\left(13225\left(20\,x+107\right)x-2451998\right)x+33848843\right)x-20821094\right)x+89784565}{101568\left(2\,x^{2}-x+3\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)^3/(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] -7495/256*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3))
 + 1) + 1/101568*(3*((4*(13225*(20*x + 107)*x - 2451998)*x + 3384
8843)*x - 20821094)*x + 89784565)/(2*x^2 - x + 3)^(3/2)
```

3.95 $\int \frac{(2+3x+5x^2)^2}{(3-x+2x^2)^{5/2}}\,dx$

Optimal. Leaf size=68

$$\frac{121(19-7x)}{276(2x^2-x+3)^{3/2}}-\frac{11(2336x+7351)}{6348\sqrt{2x^2-x+3}}-\frac{25\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{2}}$$

```
[Out] (121*(19 - 7*x))/(276*(3 - x + 2*x^2)^(3/2)) - (11*(7351 + 2336*x
))/(6348*Sqrt[3 - x + 2*x^2]) - (25*ArcSinh[(1 - 4*x)/Sqrt[23]])/
(4*Sqrt[2])
```

Rubi [A] time = 0.101411, antiderivative size = 68, 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

$$\frac{121(19-7x)}{276(2x^2-x+3)^{3/2}}-\frac{11(2336x+7351)}{6348\sqrt{2x^2-x+3}}-\frac{25\sinh^{-1}\left(\frac{1-4x}{\sqrt{23}}\right)}{4\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(5/2),x]
```

```
[Out] (121*(19 - 7*x))/(276*(3 - x + 2*x^2)^(3/2)) - (11*(7351 + 2336*x
))/(6348*Sqrt[3 - x + 2*x^2]) - (25*ArcSinh[(1 - 4*x)/Sqrt[23]])/
(4*Sqrt[2])
```

Rubi in Sympy [A] time = 44.8875, size = 114, normalized size = 1.68

$$-\frac{2(-656x+164)(5x^2+3x+2)}{1587\sqrt{2x^2-x+3}}-\frac{2(-4x+1)(5x^2+3x+2)^2}{69(2x^2-x+3)^{\frac{3}{2}}}-\frac{(17720x+20122)\sqrt{2x^2-x+3}}{6348}+\frac{25\sqrt{2}\,\mathrm{atanh}\left(\frac{\sqrt{2}(4x-1)}{4\sqrt{2x^2-x+3}}\right)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(5/2),x)
```

```
[Out] -2*(-656*x + 164)*(5*x**2 + 3*x + 2)/(1587*sqrt(2*x**2 - x + 3))
- 2*(-4*x + 1)*(5*x**2 + 3*x + 2)**2/(69*(2*x**2 - x + 3)**(3/2))
 - (17720*x + 20122)*sqrt(2*x**2 - x + 3)/6348 + 25*sqrt(2)*atanh
(sqrt(2)*(4*x - 1)/(4*sqrt(2*x**2 - x + 3)))/8
```

Mathematica [A] time = 0.10361, size = 55, normalized size = 0.81

$$\frac{25\sinh^{-1}\left(\frac{4x-1}{\sqrt{23}}\right)}{4\sqrt{2}}-\frac{11\left(2336x^3+6183x^2+714x+8623\right)}{3174(2x^2-x+3)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)^2/(3 - x + 2*x^2)^(5/2),x]
```

```
[Out] (-11*(8623 + 714*x + 6183*x^2 + 2336*x^3))/(3174*(3 - x + 2*x^2)^
(3/2)) + (25*ArcSinh[(-1 + 4*x)/Sqrt[23]])/(4*Sqrt[2])
```

Maple [B] time = 0.009, size = 146, normalized size = 2.2

$$\frac{33972\,x-8493}{5888}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}+\frac{9068\,x-2267}{2116}\frac{1}{\sqrt{2\,x^{2}-x+3}}-\frac{15775}{768}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{319\,x}{64}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{145\,x^{2}}{8}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{25\,x^{3}}{6}\left(2\,x^{2}-x+3\right)^{-\frac{3}{2}}-\frac{25\,x}{4}\frac{1}{\sqrt{2\,x^{2}-x+3}}-\frac{25}{16}\frac{1}{\sqrt{2\,x^{2}-x+3}}+\frac{25\,\sqrt{2}}{8}Arcsinh\left(\frac{4\,\sqrt{23}}{23}\left(x-\frac{1}{4}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)^2/(2*x^2-x+3)^(5/2),x)
```

```
[Out] 8493/5888*(4*x-1)/(2*x^2-x+3)^(3/2)+2267/2116*(4*x-1)/(2*x^2-x+3)
^(1/2)-15775/768/(2*x^2-x+3)^(3/2)-319/64*x/(2*x^2-x+3)^(3/2)-145
/8*x^2/(2*x^2-x+3)^(3/2)-25/6*x^3/(2*x^2-x+3)^(3/2)-25/4*x/(2*x^2
-x+3)^(1/2)-25/16/(2*x^2-x+3)^(1/2)+25/8*2^(1/2)*arcsinh(4/23*23^
(1/2)*(x-1/4))
```

Maxima [A] time = 0.779493, size = 250, normalized size = 3.68

$$\frac{25}{6348}\,x\left(\frac{284\,x}{\sqrt{2\,x^{2}-x+3}}-\frac{3174\,x^{2}}{(2\,x^{2}-x+3)^{\frac{3}{2}}}-\frac{71}{\sqrt{2\,x^{2}-x+3}}+\frac{805\,x}{(2\,x^{2}-x+3)^{\frac{3}{2}}}-\frac{3243}{(2\,x^{2}-x+3)^{\frac{3}{2}}}\right)+\frac{25}{8}\sqrt{2}\,\mathrm{arsinh}\left(\frac{1}{23}\sqrt{23}(4\,x-1)\right)-\frac{1775}{3174}\sqrt{2\,x^{2}-x+3}+\frac{1017\,x}{529\,\sqrt{2\,x^{2}-x+3}}-\frac{15\,x^{2}}{(2\,x^{2}-x+3)^{\frac{3}{2}}}-\frac{6413}{3174\,\sqrt{2\,x^{2}-x+3}}-\frac{x}{138\,(2\,x^{2}-x+3)^{\frac{3}{2}}}-\frac{2593}{138\,(2\,x^{2}-x+3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 25/6348*x*(284*x/sqrt(2*x^2 - x + 3) - 3174*x^2/(2*x^2 - x + 3)^(
3/2) - 71/sqrt(2*x^2 - x + 3) + 805*x/(2*x^2 - x + 3)^(3/2) - 324
3/(2*x^2 - x + 3)^(3/2)) + 25/8*sqrt(2)*arcsinh(1/23*sqrt(23)*(4*
x - 1)) - 1775/3174*sqrt(2*x^2 - x + 3) + 1017/529*x/sqrt(2*x^2 -
 x + 3) - 15*x^2/(2*x^2 - x + 3)^(3/2) - 6413/3174/sqrt(2*x^2 - x
 + 3) - 1/138*x/(2*x^2 - x + 3)^(3/2) - 2593/138/(2*x^2 - x + 3)^
(3/2)
```

Fricas [A] time = 0.280794, size = 159, normalized size = 2.34

$$-\frac{\sqrt{2}\Big(44\,\sqrt{2}\big(2336\,x^{3}+6183\,x^{2}+714\,x+8623\big)\sqrt{2\,x^{2}-x+3}-39675\,\big(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9\big)\log\Big(-\sqrt{2}\big(32\,x^{2}-16\,x}{25392\,(4\,x^{4}-4\,x^{3}+13\,x^{2}-6\,x+9)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/25392*sqrt(2)*(44*sqrt(2)*(2336*x^3 + 6183*x^2 + 714*x + 8623)
*sqrt(2*x^2 - x + 3) - 39675*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*l
```

```
og(-sqrt(2)*(32*x^2 - 16*x + 25) - 8*sqrt(2*x^2 - x + 3)*(4*x - 1
)))/(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)
```

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

$$\int \frac{(5x^2 + 3x + 2)^2}{(2x^2 - x + 3)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)**2/(2*x**2-x+3)**(5/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)**2/(2*x**2 - x + 3)**(5/2), x)
```

GIAC/XCAS [A] time = 0.27351, size = 82, normalized size = 1.21

$$-\frac{25}{8}\sqrt{2}\ln\left(-2\sqrt{2}\left(\sqrt{2}x - \sqrt{2x^2 - x + 3}\right) + 1\right) - \frac{11\,(((2336\,x + 6183)x + 714)x + 8623)}{3174\,(2\,x^2 - x + 3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x^2 + 3*x + 2)^2/(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] -25/8*sqrt(2)*ln(-2*sqrt(2)*(sqrt(2)*x - sqrt(2*x^2 - x + 3)) + 1
) - 11/3174*(((2336*x + 6183)*x + 714)*x + 8623)/(2*x^2 - x + 3)^
(3/2)
```

3.96 $\int \frac{2+3x+5x^2}{(3-x+2x^2)^{5/2}}\,dx$

Optimal. Leaf size=47

$$-\frac{71(1-4x)}{529\sqrt{2x^2-x+3}}-\frac{11(3x+5)}{69\,(2x^2-x+3)^{3/2}}$$

```
[Out] (-11*(5 + 3*x))/(69*(3 - x + 2*x^2)^(3/2)) - (71*(1 - 4*x))/(529*
Sqrt[3 - x + 2*x^2])
```

Rubi [A] time = 0.0406135, antiderivative size = 47, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.12$

$$-\frac{71(1-4x)}{529\sqrt{2x^2-x+3}}-\frac{11(3x+5)}{69\,(2x^2-x+3)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(5/2),x]
```

```
[Out] (-11*(5 + 3*x))/(69*(3 - x + 2*x^2)^(3/2)) - (71*(1 - 4*x))/(529*
Sqrt[3 - x + 2*x^2])
```

Rubi in Sympy [A] time = 9.367, size = 37, normalized size = 0.79

$$-\frac{71\,(-8x+2)}{1058\sqrt{2x^2-x+3}}-\frac{33x+55}{69\,(2x^2-x+3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(5/2),x)
```

```
[Out] -71*(-8*x + 2)/(1058*sqrt(2*x**2 - x + 3)) - (33*x + 55)/(69*(2*x
**2 - x + 3)**(3/2))
```

Mathematica [A] time = 0.0287658, size = 33, normalized size = 0.7

$$\frac{2\left(852x^3-639x^2+1005x-952\right)}{1587\,(2x^2-x+3)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(2 + 3*x + 5*x^2)/(3 - x + 2*x^2)^(5/2),x]
```

```
[Out] (2*(-952 + 1005*x - 639*x^2 + 852*x^3))/(1587*(3 - x + 2*x^2)^(3/
2))
```

Maple [A] time = 0.005, size = 30, normalized size = 0.6

$$\frac{1704\,x^3-1278\,x^2+2010\,x-1904}{1587}\left(2\,x^2-x+3\right)^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((5*x^2+3*x+2)/(2*x^2-x+3)^(5/2),x)
```

```
[Out] 2/1587/(2*x^2-x+3)^(3/2)*(852*x^3-639*x^2+1005*x-952)
```

Maxima [A] time = 0.700173, size = 80, normalized size = 1.7

$$\frac{284\,x}{529\,\sqrt{2\,x^2-x+3}}-\frac{71}{529\,\sqrt{2\,x^2-x+3}}-\frac{11\,x}{23\,(2\,x^2-x+3)^{\frac{3}{2}}}-\frac{55}{69\,(2\,x^2-x+3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(5/2),x, algorithm="maxima")
```

```
[Out] 284/529*x/sqrt(2*x^2 - x + 3) - 71/529/sqrt(2*x^2 - x + 3) - 11/2
3*x/(2*x^2 - x + 3)^(3/2) - 55/69/(2*x^2 - x + 3)^(3/2)
```

Fricas [A] time = 0.274511, size = 69, normalized size = 1.47

$$\frac{2\,\left(852\,x^3-639\,x^2+1005\,x-952\right)\sqrt{2\,x^2-x+3}}{1587\,(4\,x^4-4\,x^3+13\,x^2-6\,x+9)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/1587*(852*x^3 - 639*x^2 + 1005*x - 952)*sqrt(2*x^2 - x + 3)/(4*
x^4 - 4*x^3 + 13*x^2 - 6*x + 9)
```

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

$$\int \frac{5x^2+3x+2}{(2x^2-x+3)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((5*x**2+3*x+2)/(2*x**2-x+3)**(5/2),x)
```

```
[Out] Integral((5*x**2 + 3*x + 2)/(2*x**2 - x + 3)**(5/2), x)
```

GIAC/XCAS [A] time = 0.270117, size = 39, normalized size = 0.83

$$\frac{2\,(3\,(71\,(4\,x-3)x+335)x-952)}{1587\,(2\,x^2-x+3)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((5*x^2 + 3*x + 2)/(2*x^2 - x + 3)^(5/2),x, algorithm="giac")
```

```
[Out] 2/1587*(3*(71*(4*x - 3)*x + 335)*x - 952)/(2*x^2 - x + 3)^(3/2)
```

3.97 $\int \frac{1}{(3-x+2x^2)^{5/2}(2+3x+5x^2)}\,dx$

Optimal. Leaf size=199

$$\frac{3603-658x}{128018\sqrt{2x^2-x+3}}+\frac{13-6x}{759\,(2x^2-x+3)^{3/2}}+\frac{1}{484}\sqrt{\frac{1}{682}\left(25000\sqrt{2}-15457\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(25000\sqrt{2}-15457\right)}}\left(\left(247+345\sqrt{2}\right)x-98\sqrt{2}+443\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{484}\sqrt{\frac{1}{682}\left(15457+25000\sqrt{2}\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(15457+25000\sqrt{2}\right)}}\left(\left(247-345\sqrt{2}\right)x+98\sqrt{2}+443\right)}{\sqrt{2x^2-x+3}}\right)$$

```
[Out] (13 - 6*x)/(759*(3 - x + 2*x^2)^(3/2)) + (3603 - 658*x)/(128018*S
qrt[3 - x + 2*x^2]) + (Sqrt[(-15457 + 25000*Sqrt[2])/682]*ArcTan[
(Sqrt[11/(31*(-15457 + 25000*Sqrt[2]))]*(443 - 98*Sqrt[2] + (247
+ 345*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/484 - (Sqrt[(15457 + 250
00*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(15457 + 25000*Sqrt[2]))]*(
443 + 98*Sqrt[2] + (247 - 345*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/
484
```

Rubi [A] time = 0.942163, antiderivative size = 199, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{3603-658x}{128018\sqrt{2x^2-x+3}}+\frac{13-6x}{759\,(2x^2-x+3)^{3/2}}+\frac{1}{484}\sqrt{\frac{1}{682}\left(25000\sqrt{2}-15457\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(25000\sqrt{2}-15457\right)}}\left(\left(247+345\sqrt{2}\right)x-98\sqrt{2}+443\right)}{\sqrt{2x^2-x+3}}\right)-\frac{1}{484}\sqrt{\frac{1}{682}\left(15457+25000\sqrt{2}\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(15457+25000\sqrt{2}\right)}}\left(\left(247-345\sqrt{2}\right)x+98\sqrt{2}+443\right)}{\sqrt{2x^2-x+3}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)),x]
```

```
[Out] (13 - 6*x)/(759*(3 - x + 2*x^2)^(3/2)) + (3603 - 658*x)/(128018*S
qrt[3 - x + 2*x^2]) + (Sqrt[(-15457 + 25000*Sqrt[2])/682]*ArcTan[
(Sqrt[11/(31*(-15457 + 25000*Sqrt[2]))]*(443 - 98*Sqrt[2] + (247
+ 345*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/484 - (Sqrt[(15457 + 250
00*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(15457 + 25000*Sqrt[2]))]*(
443 + 98*Sqrt[2] + (247 - 345*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/
484
```

Rubi in Sympy [A] time = 105.101, size = 238, normalized size = 1.2

$$\frac{-119427x+\frac{1307889}{2}}{23235267\sqrt{2x^2-x+3}}+\frac{-66x+143}{8349\left(2x^2-x+3\right)^{\frac{3}{2}}}-\frac{\sqrt{682}\left(-57032019\sqrt{2}+\frac{23235267}{2}\right)\left(-\frac{103502553\sqrt{2}}{2}+\frac{935747571}{4}\right)\operatorname{atan}\left(\frac{4\sqrt{341}\left(x\left(\frac{521737359}{4}+\frac{728742465\sqrt{2}}{4}\right)-\frac{103502553\sqrt{2}}{2}+\frac{935747571}{4}\right)}{65481207\sqrt{-15457+25000\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{184098272703399549\sqrt{-15457+25000\sqrt{2}}}-\frac{\sqrt{682}\left(\frac{23235267}{2}+57032019\sqrt{2}\right)\left(\frac{103502553\sqrt{2}}{2}+\frac{935747571}{4}\right)\operatorname{atanh}\left(\frac{4\sqrt{341}\left(x\left(-\frac{728742465\sqrt{2}}{4}+\frac{521737359}{4}\right)+\frac{103502553\sqrt{2}}{2}+\frac{935747571}{4}\right)}{65481207\sqrt{15457+25000\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{184098272703399549\sqrt{15457+25000\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2),x)
```

```
[Out] (-119427*x + 1307889/2)/(23235267*sqrt(2*x**2 - x + 3)) + (-66*x
+ 143)/(8349*(2*x**2 - x + 3)**(3/2)) - sqrt(682)*(-57032019*sqrt
(2) + 23235267/2)*(-103502553*sqrt(2)/2 + 935747571/4)*atan(4*sqr
t(341)*(x*(521737359/4 + 728742465*sqrt(2)/4) - 103502553*sqrt(2)
/2 + 935747571/4)/(65481207*sqrt(-15457 + 25000*sqrt(2))*sqrt(2*x
**2 - x + 3)))/(184098272703399549*sqrt(-15457 + 25000*sqrt(2)))
- sqrt(682)*(23235267/2 + 57032019*sqrt(2))*(103502553*sqrt(2)/2
+ 935747571/4)*atanh(4*sqrt(341)*(x*(-728742465*sqrt(2)/4 + 52173
7359/4) + 103502553*sqrt(2)/2 + 935747571/4)/(65481207*sqrt(15457
 + 25000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(184098272703399549*sqrt
(15457 + 25000*sqrt(2)))
```

Mathematica [C] time = 6.4295, size = 1176, normalized size = 5.91

$$\sqrt{2x^2-x+3}\left(\frac{3603-658x}{128018\left(2x^2-x+3\right)}+\frac{13-6x}{759\left(2x^2-x+3\right)^2}\right)$$

$$-\frac{5\left(-69i+13\sqrt{31}\right)\tan^{-1}\left(\frac{526291i\sqrt{31}x^4+1223508x^4-110000i\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+375280i\sqrt{31}x^3+187550x^3+249000i\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2\cdots}}{230516\sqrt{31}x^4+2998917ix^4-221650\sqrt{31}x^3-27766\cdots}\right)}{484\sqrt{682\left(-\cdots\right.}}$$

$$+\frac{5i\left(69i+13\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(7436\sqrt{31}x^4-17707ix^4-7150\sqrt{31}x^3-106560\cdots\right.}{526291i\sqrt{31}x^4-1223508x^4+20000i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+375280i\sqrt{31}x^3-187550x^3+7000i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x\cdots}\right)}{484\sqrt{682\left(13+\cdots\right.}}$$

$$+\frac{5\left(69i+13\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{968\sqrt{682\left(13+i\sqrt{31}\right)}}$$

$$-\frac{5i\left(-69i+13\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{968\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$+\frac{5i\left(-69i+13\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+i\cdots\right.\right.}{968\sqrt{682\left(-13+i\sqrt{31}\right)}}$$

$$-\frac{5\left(69i+13\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-63i\cdots\right.\right.}{968\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((13 - 6*x)/(759*(3 - x + 2*x^2)^2) + (3603 -
 658*x)/(128018*(3 - x + 2*x^2))) - (5*(-69*I + 13*Sqrt[31])*ArcT
an[(-374418 - (31062*I)*Sqrt[31] + 1323762*x - (72154*I)*Sqrt[31]
*x + 1185998*x^2 + (657545*I)*Sqrt[31]*x^2 + 187550*x^3 + (375280
*I)*Sqrt[31]*x^3 + 1223508*x^4 + (526291*I)*Sqrt[31]*x^4 + (12600
0*I)*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (145000*I)
*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (249000*I)*S
qrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2] - (110000*I)*S
qrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/(4112406*I +
18414*Sqrt[31] + (2234202*I)*x - 165726*Sqrt[31]*x + (6774415*I)*
x^2 + 411246*Sqrt[31]*x^2 - (2776640*I)*x^3 - 221650*Sqrt[31]*x^3
 + (2998917*I)*x^4 + 230516*Sqrt[31]*x^4)])/(484*Sqrt[682*(-13 +
I*Sqrt[31])]) + (((5*I)/484)*(69*I + 13*Sqrt[31])*ArcTan[(31*(-36
26*I + 594*Sqrt[31] + (24058*I)*x - 5346*Sqrt[31]*x - (10465*I)*x
^2 + 13266*Sqrt[31]*x^2 - (106560*I)*x^3 - 7150*Sqrt[31]*x^3 - (1
7707*I)*x^4 + 7436*Sqrt[31]*x^4))/(374418 - (31062*I)*Sqrt[31] -
1323762*x - (72154*I)*Sqrt[31]*x - 1185998*x^2 + (657545*I)*Sqrt[
31]*x^2 - 187550*x^3 + (375280*I)*Sqrt[31]*x^3 - 1223508*x^4 + (5
26291*I)*Sqrt[31]*x^4 - (2000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt
[3 - x + 2*x^2] + (5000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 -
 x + 2*x^2] + (7000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x
 + 2*x^2] + (20000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x
+ 2*x^2])])/Sqrt[682*(13 + I*Sqrt[31])] - (((5*I)/968)*(-69*I + 1
3*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] +
(10*I)*x)^2])/Sqrt[682*(-13 + I*Sqrt[31])] + (5*(69*I + 13*Sqrt[3
1])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x
)^2])/(968*Sqrt[682*(13 + I*Sqrt[31])]) + (((5*I)/968)*(-69*I + 1
3*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)
*x - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(
-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*
Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31])]
- (5*(69*I + 13*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqr
t[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^
2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I
)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(968*Sqrt[6
82*(13 + I*Sqrt[31])])
```

Maple [B] time = 0.04, size = 751, normalized size = 3.8

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^(5/2)/(5*x^2+3*x+2),x)
```

```
[Out] 1/10232728*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-
1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)*2^(1/2)*(10111*2^(1/2)*
arctan(1/11692487*(-775687+549362*2^(1/2))^(1/2)*(-23*(8+3*2^(1/2
))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+24*2^(1/2)-41))^(1/2)*(64
85*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+10368*(2^(1/2)-1+x)^2/
(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*(2^(1/2)-1+x)^4/(2^(1/2)
+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+23)*(8+3*2^(1/2))*(2^(
1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1/2))^(1/2)*(-775687+5493
62*2^(1/2))^(1/2)+13910*arctan(1/11692487*(-775687+549362*2^(1/2)
)^(1/2)*(-23*(8+3*2^(1/2))*(-23*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+2
4*2^(1/2)-41))^(1/2)*(6485*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^
2+10368*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+22379*2^(1/2)+32016)/(23*
(2^(1/2)-1+x)^4/(2^(1/2)+1-x)^4+82*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^
2+23)*(8+3*2^(1/2))*(2^(1/2)-1+x)/(2^(1/2)+1-x))*(-8866+6820*2^(1
/2))^(1/2)*(-775687+549362*2^(1/2))^(1/2)-993674*arctanh(31/2*(8*
(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^(1/2)-1+x)^2/(2^(1/2
)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2^(1/2))^(1/2))*2^(1/2)-4
```

```
2685698*arctanh(31/2*(8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)
*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))^(1/2)/(-8866+6820*2
^(1/2))^(1/2)))/((8*(2^(1/2)-1+x)^2/(2^(1/2)+1-x)^2+3*2^(1/2)*(2^
(1/2)-1+x)^2/(2^(1/2)+1-x)^2+8-3*2^(1/2))/(1+(2^(1/2)-1+x)/(2^(1/
2)+1-x))^2)^(1/2)/(1+(2^(1/2)-1+x)/(2^(1/2)+1-x))/(8+3*2^(1/2))/(
-8866+6820*2^(1/2))^(1/2)-1/506*(4*x-1)/(2*x^2-x+3)^(3/2)-329/256
036*(4*x-1)/(2*x^2-x+3)^(1/2)+1/66/(2*x^2-x+3)^(3/2)+13/484/(2*x^
2-x+3)^(1/2)
```

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

$$\int \frac{1}{(5x^2+3x+2)(2x^2-x+3)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)), x)
```

Fricas [A] time = 0.359485, size = 1601, normalized size = 8.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)),x, algorithm="fricas")
```

```
[Out] -1/110752294271520*232562^(3/4)*sqrt(31)*sqrt(5)*(8*232562^(1/4)*
sqrt(31)*sqrt(5)*(197400000*x^3 - 1179600000*x^2 + 15457*sqrt(2)*
(3948*x^3 - 23592*x^2 + 19767*x - 39005) + 988350000*x - 19502500
00)*sqrt(2*x^2 - x + 3)*sqrt((15457*sqrt(2) + 50000)/(772850000*s
qrt(2) + 1488918849)) - 1123856268*sqrt(5)*sqrt(2)*(4*x^4 - 4*x^3
 + 13*x^2 - 6*x + 9)*arctan(31*(232562^(1/4)*sqrt(5)*(15457*sqrt(
2)*(x - 6) + 50000*x - 300000)*sqrt((15457*sqrt(2) + 50000)/(7728
50000*sqrt(2) + 1488918849)) + 44*sqrt(5)*sqrt(2*x^2 - x + 3)*(98
*sqrt(2) + 443))/(2*232562^(1/4)*sqrt(31)*sqrt(5)*(15457*sqrt(2)*
x + 50000*x)*sqrt(sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sq
rt(2)*(37682974625135859*x - 88363116363919925) + 506801417387840
66*x - 126046090989055784)*sqrt((15457*sqrt(2) + 50000)/(77285000
0*sqrt(2) + 1488918849)) + 17307457613600000*x^2 + sqrt(2)*(48185
53540150000*x^2 + 61656718648993*sqrt(2)*(49*x^2 - 151*x + 200) -
 14849011929850000*x + 19667565470000000) + 5425791241111384*sqrt
(2)*(2*x^2 - x + 3) - 8653728806800000*x + 25961186420400000)/(61
656718648993*sqrt(2)*x^2 + 98337827350000*x^2))*sqrt((15457*sqrt(
2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 232562^(1/4)*sqrt
(31)*sqrt(5)*(15457*sqrt(2)*(19*x - 22) + 950000*x - 1100000)*sqr
t((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 136
4*sqrt(31)*sqrt(5)*sqrt(2*x^2 - x + 3)*(54*sqrt(2) + 11))) - 1123
856268*sqrt(5)*sqrt(2)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9)*arctan(
-31*(232562^(1/4)*sqrt(5)*(15457*sqrt(2)*(x - 6) + 50000*x - 3000
00)*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)
) - 44*sqrt(5)*sqrt(2*x^2 - x + 3)*(98*sqrt(2) + 443))/(2*232562^
(1/4)*sqrt(31)*sqrt(5)*(15457*sqrt(2)*x + 50000*x)*sqrt(-sqrt(2)*
(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(37682974625135859*x
 - 88363116363919925) + 50680141738784066*x - 126046090989055784)
*sqrt((15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) -
 17307457613600000*x^2 - sqrt(2)*(4818553540150000*x^2 + 61656718
648993*sqrt(2)*(49*x^2 - 151*x + 200) - 14849011929850000*x + 196
67565470000000) - 5425791241111384*sqrt(2)*(2*x^2 - x + 3) + 8653
728806800000*x - 25961186420400000)/(61656718648993*sqrt(2)*x^2 +
 98337827350000*x^2))*sqrt((15457*sqrt(2) + 50000)/(772850000*sqr
t(2) + 1488918849)) + 232562^(1/4)*sqrt(31)*sqrt(5)*(15457*sqrt(2
```

```
)*(19*x - 22) + 950000*x - 1100000)*sqrt((15457*sqrt(2) + 50000)/
(772850000*sqrt(2) + 1488918849)) - 1364*sqrt(31)*sqrt(5)*sqrt(2*
x^2 - x + 3)*(54*sqrt(2) + 11))) - 1587*sqrt(31)*sqrt(5)*(200000*
x^4 - 200000*x^3 + 650000*x^2 + 15457*sqrt(2)*(4*x^4 - 4*x^3 + 13
*x^2 - 6*x + 9) - 300000*x + 450000)*log(39062500*sqrt(2)*(2*2325
62^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(37682974625135859*x - 8836
3116363919925) + 50680141738784066*x - 126046090989055784)*sqrt((
15457*sqrt(2) + 50000)/(772850000*sqrt(2) + 1488918849)) + 173074
57613600000*x^2 + sqrt(2)*(4818553540150000*x^2 + 61656718648993*
sqrt(2)*(49*x^2 - 151*x + 200) - 14849011929850000*x + 1966756547
0000000) + 5425791241111384*sqrt(2)*(2*x^2 - x + 3) - 86537288068
00000*x + 25961186420400000)/(61656718648993*sqrt(2)*x^2 + 983378
27350000*x^2)) + 1587*sqrt(31)*sqrt(5)*(200000*x^4 - 200000*x^3 +
 650000*x^2 + 15457*sqrt(2)*(4*x^4 - 4*x^3 + 13*x^2 - 6*x + 9) -
300000*x + 450000)*log(-39062500*sqrt(2)*(2*232562^(1/4)*sqrt(2*x
^2 - x + 3)*(sqrt(2)*(37682974625135859*x - 88363116363919925) +
50680141738784066*x - 126046090989055784)*sqrt((15457*sqrt(2) + 5
0000)/(772850000*sqrt(2) + 1488918849)) - 17307457613600000*x^2 -
 sqrt(2)*(4818553540150000*x^2 + 61656718648993*sqrt(2)*(49*x^2 -
 151*x + 200) - 14849011929850000*x + 19667565470000000) - 542579
1241111384*sqrt(2)*(2*x^2 - x + 3) + 8653728806800000*x - 2596118
6420400000)/(61656718648993*sqrt(2)*x^2 + 98337827350000*x^2)))/(
(200000*x^4 - 200000*x^3 + 650000*x^2 + 15457*sqrt(2)*(4*x^4 - 4*
x^3 + 13*x^2 - 6*x + 9) - 300000*x + 450000)*sqrt((15457*sqrt(2)
+ 50000)/(772850000*sqrt(2) + 1488918849)))
```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2),x)
```

```
[Out] Integral(1/((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)*(2*x^2 - x + 3)^(5/2)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.98 $\int \frac{1}{(3-x+2x^2)^{5/2}(2+3x+5x^2)^2}\,dx$

Optimal. Leaf size=234

$$-\frac{15101-8654x}{1035276\left(2x^2-x+3\right)^{3/2}}-\frac{1352542x+3133427}{523849656\sqrt{2x^2-x+3}}+\frac{65x+4}{682\left(2x^2-x+3\right)^{3/2}\left(5x^2+3x+2\right)}+\frac{625\sqrt{\frac{1}{682}\left(30463+23600\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(30463+23600\sqrt{2}\right)}}\left(\left(687+445\sqrt{2}\right)x+242\sqrt{2}+203\right)}{\sqrt{2x^2-x+3}}\right)}{660176}-\frac{625\sqrt{\frac{1}{682}\left(23600\sqrt{2}-30463\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(23600\sqrt{2}-30463\right)}}\left(\left(687-445\sqrt{2}\right)x-242\sqrt{2}+203\right)}{\sqrt{2x^2-x+3}}\right)}{660176}$$

```
[Out] -(15101 - 8654*x)/(1035276*(3 - x + 2*x^2)^(3/2)) - (3133427 + 13
52542*x)/(523849656*Sqrt[3 - x + 2*x^2]) + (4 + 65*x)/(682*(3 - x
 + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)) + (625*Sqrt[(30463 + 23600*Sqr
t[2])/682]*ArcTan[(Sqrt[11/(31*(30463 + 23600*Sqrt[2]))]*(203 + 2
42*Sqrt[2] + (687 + 445*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/660176
 - (625*Sqrt[(-30463 + 23600*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(
-30463 + 23600*Sqrt[2]))]*(203 - 242*Sqrt[2] + (687 - 445*Sqrt[2]
)*x))/Sqrt[3 - x + 2*x^2]])/660176
```

Rubi [A] time = 1.0974, antiderivative size = 234, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$

$$-\frac{15101-8654x}{1035276\left(2x^2-x+3\right)^{3/2}}-\frac{1352542x+3133427}{523849656\sqrt{2x^2-x+3}}+\frac{65x+4}{682\left(2x^2-x+3\right)^{3/2}\left(5x^2+3x+2\right)}+\frac{625\sqrt{\frac{1}{682}\left(30463+23600\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(30463+23600\sqrt{2}\right)}}\left(\left(687+445\sqrt{2}\right)x+242\sqrt{2}+203\right)}{\sqrt{2x^2-x+3}}\right)}{660176}-\frac{625\sqrt{\frac{1}{682}\left(23600\sqrt{2}-30463\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(23600\sqrt{2}-30463\right)}}\left(\left(687-445\sqrt{2}\right)x-242\sqrt{2}+203\right)}{\sqrt{2x^2-x+3}}\right)}{660176}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^2),x]
```


```
[Out] -(15101 - 8654*x)/(1035276*(3 - x + 2*x^2)^(3/2)) - (3133427 + 13
52542*x)/(523849656*Sqrt[3 - x + 2*x^2]) + (4 + 65*x)/(682*(3 - x
 + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)) + (625*Sqrt[(30463 + 23600*Sqr
t[2])/682]*ArcTan[(Sqrt[11/(31*(30463 + 23600*Sqrt[2]))]*(203 + 2
42*Sqrt[2] + (687 + 445*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]])/660176
 - (625*Sqrt[(-30463 + 23600*Sqrt[2])/682]*ArcTanh[(Sqrt[11/(31*(
-30463 + 23600*Sqrt[2]))]*(203 - 242*Sqrt[2] + (687 - 445*Sqrt[2]
)*x))/Sqrt[3 - x + 2*x^2]])/660176
```

Rubi in Sympy [A] time = 130.288, size = 274, normalized size = 1.17

$$-\frac{-523567x+\frac{1827221}{2}}{62634198\,(2x^2-x+3)^{\frac{3}{2}}}+\frac{715x+44}{7502\,(2x^2-x+3)^{\frac{3}{2}}\,(5x^2+3x+2)}-\frac{\frac{900116701x}{2}+\frac{4170591337}{4}}{174310973034\sqrt{2x^2-x+3}}$$

$$+\frac{\sqrt{682}\left(\frac{2947974500625}{8}+\frac{1757167066875\sqrt{2}}{4}\right)\left(\frac{246874711875\sqrt{2}}{2}+\frac{1002020889375}{4}\right)\operatorname{atan}\left(\frac{8\sqrt{341}\left(x\left(\frac{6462308634375\sqrt{2}}{8}+\frac{9976642768125}{8}\right)+\frac{2947974500625}{8}+\ldots\right)}{450183298125\sqrt{30463+23600\sqrt{2}}\sqrt{2x^2-x+3}}\right)}{474754926875935549455625\sqrt{30463+23600\sqrt{2}}}$$

$$+\frac{\sqrt{682}\left(-\frac{1757167066875\sqrt{2}}{4}+\frac{2947974500625}{8}\right)\left(-\frac{246874711875\sqrt{2}}{2}+\frac{1002020889375}{4}\right)\operatorname{atanh}\left(\frac{8\sqrt{341}\left(x\left(-\frac{6462308634375\sqrt{2}}{8}+\frac{9976642768125}{8}\right)-\frac{1757167066875\sqrt{2}}{4}\ldots\right)}{450183298125\sqrt{-30463+23600\sqrt{2}}\sqrt{2x^2-x+\ldots}}\right)}{474754926875935549455625\sqrt{-30463+23600\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] -(-523567*x + 1827221/2)/(62634198*(2*x**2 - x + 3)**(3/2)) + (71
5*x + 44)/(7502*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)) - (90
0116701*x/2 + 4170591337/4)/(174310973034*sqrt(2*x**2 - x + 3)) +
 sqrt(682)*(2947974500625/8 + 1757167066875*sqrt(2)/4)*(246874711
875*sqrt(2)/2 + 1002020889375/4)*atan(8*sqrt(341)*(x*(64623086343
75*sqrt(2)/8 + 9976642768125/8) + 2947974500625/8 + 1757167066875
*sqrt(2)/4)/(450183298125*sqrt(30463 + 23600*sqrt(2))*sqrt(2*x**2
 - x + 3)))/(474754926875935549455625*sqrt(30463 + 23600*sqrt(2)
)) + sqrt(682)*(-1757167066875*sqrt(2)/4 + 2947974500625/8)*(-246
874711875*sqrt(2)/2 + 1002020889375/4)*atanh(8*sqrt(341)*(x*(-646
2308634375*sqrt(2)/8 + 9976642768125/8) - 1757167066875*sqrt(2)/4
 + 2947974500625/8)/(450183298125*sqrt(-30463 + 23600*sqrt(2))*sq
rt(2*x**2 - x + 3)))/(474754926875935549455625*sqrt(-30463 + 236
00*sqrt(2)))
```

Mathematica [C] time = 6.45436, size = 1191, normalized size = 5.09

$$\sqrt{2x^2-x+3}\left(\frac{-17230x-10769}{4224594\left(2x^2-x+3\right)}+\frac{1235x-1474}{330088\left(5x^2+3x+2\right)}+\frac{-14x-31}{16698\left(2x^2-x+3\right)^2}\right)$$
$$-\frac{3125i\left(-89i+7\sqrt{31}\right)\tan^{-1}\left(\frac{31\left(2156\sqrt{31}x^4-17827ix^4+5698\sqrt{31}x^3-6\right.}{-499069i\sqrt{31}x^4+849772x^4+18880i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3-274000i\sqrt{31}x^3+958210x^3+6608i\sqrt{682\left(13+i\sqrt{31}\right)}\sqrt{2x^2}}\right.}{660176\sqrt{682\left(1\right.}}$$
$$-\frac{3125i\left(89i+7\sqrt{31}\right)\tanh^{-1}\left(\frac{499069\sqrt{31}x^4-849772ix^4+103840\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x^3+274000\sqrt{31}x^3-958210ix^3-235056\sqrt{22\left(-13+i\sqrt{31}\right)}\sqrt{2x^2}}{66836\sqrt{31}x^4+2865437ix^4+176638\sqrt{31}x^3-38502}\right.}{660176\sqrt{682\left(\right.}}$$
$$+\frac{3125i\left(89i+7\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{1320352\sqrt{682\left(-13+i\sqrt{31}\right)}}$$
$$-\frac{3125\left(-89i+7\sqrt{31}\right)\log\left(\left(-10ix+\sqrt{31}-3i\right)^2\left(10ix+\sqrt{31}+3i\right)^2\right)}{1320352\sqrt{682\left(13+i\sqrt{31}\right)}}$$
$$-\frac{3125i\left(89i+7\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2+327ix^2-4i\sqrt{682\left(-13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+469ix+\right.\right.}{1320352\sqrt{682\left(-13+i\sqrt{31}\right)}}$$
$$+\frac{3125\left(-89i+7\sqrt{31}\right)\log\left(\left(5x^2+3x+2\right)\left(44\sqrt{31}x^2-817ix^2+22i\sqrt{22\left(13+i\sqrt{31}\right)}\sqrt{2x^2-x+3}x-22\sqrt{31}x+1041ix-\right.\right.}{1320352\sqrt{682\left(13+i\sqrt{31}\right)}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^2),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((-31 - 14*x)/(16698*(3 - x + 2*x^2)^2) + (-1
0769 - 17230*x)/(4224594*(3 - x + 2*x^2)) + (-1474 + 1235*x)/(330
088*(2 + 3*x + 5*x^2))) - (((3125*I)/660176)*(-89*I + 7*Sqrt[31])
*ArcTan[(31*(14518*I + 7986*Sqrt[31] - (52806*I)*x + 7502*Sqrt[31
]*x + (6503*I)*x^2 + 5170*Sqrt[31]*x^2 - (60944*I)*x^3 + 5698*Sqr
t[31]*x^3 - (17827*I)*x^4 + 2156*Sqrt[31]*x^4))/(112530 + (65642*
I)*Sqrt[31] + 2037134*x - (84762*I)*Sqrt[31]*x + 658130*x^2 - (58
7559*I)*Sqrt[31]*x^2 + 958210*x^3 - (274000*I)*Sqrt[31]*x^3 + 849
772*x^4 - (499069*I)*Sqrt[31]*x^4 - (1888*I)*Sqrt[682*(13 + I*Sqr
t[31])]*Sqrt[3 - x + 2*x^2] + (4720*I)*Sqrt[682*(13 + I*Sqrt[31])
]*x*Sqrt[3 - x + 2*x^2] + (6608*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^
2*Sqrt[3 - x + 2*x^2] + (18880*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3
*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(13 + I*Sqrt[31])] - (((3125*I)/
660176)*(89*I + 7*Sqrt[31])*ArcTanh[(-112530*I - 65642*Sqrt[31] -
 (2037134*I)*x + 84762*Sqrt[31]*x - (658130*I)*x^2 + 587559*Sqrt[
31]*x^2 - (958210*I)*x^3 + 274000*Sqrt[31]*x^3 - (849772*I)*x^4 +
 499069*Sqrt[31]*x^4 - 118944*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3
- x + 2*x^2] - 136880*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x +
2*x^2] - 235056*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^
2] + 103840*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt[3 - x + 2*x^2])/
(3325942*I + 247566*Sqrt[31] + (4450106*I)*x + 232562*Sqrt[31]*x
+ (5887207*I)*x^2 + 160270*Sqrt[31]*x^2 - (3850256*I)*x^3 + 17663
8*Sqrt[31]*x^3 + (2865437*I)*x^4 + 66836*Sqrt[31]*x^4)])/Sqrt[682
*(-13 + I*Sqrt[31])] - (3125*(-89*I + 7*Sqrt[31])*Log[(-3*I + Sqr
t[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/(1320352*Sqrt
[682*(13 + I*Sqrt[31])]) + (((3125*I)/1320352)*(89*I + 7*Sqrt[31]
)*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^
2])/Sqrt[682*(-13 + I*Sqrt[31])] - (((3125*I)/1320352)*(89*I + 7*
```

```
Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x
 - 22*Sqrt[31]*x + (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-1
3 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sq
rt[31])]*x*Sqrt[3 - x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31])] +
(3125*(-89*I + 7*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sq
rt[31] + (1041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x
^2 - (63*I)*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*
I)*Sqrt[22*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(1320352*S
qrt[682*(13 + I*Sqrt[31])])
```

Maple [B] time = 0.097, size = 5975, normalized size = 25.5

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^(5/2)/(5*x^2+3*x+2)^2,x)
```

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

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

$$\int \frac{1}{(5x^2+3x+2)^2(2x^2-x+3)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)), x)
```

Fricas [A] time = 0.365488, size = 1763, normalized size = 7.53

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)),x, algorithm="fricas")
```

```
[Out] -1/7130321307035874816*930248^(3/4)*sqrt(118)*sqrt(31)*(4*930248^
(1/4)*sqrt(118)*sqrt(31)*(638399824000*x^5 + 1542817526400*x^4 +
135911408800*x^3 + 3996489324800*x^2 - 30463*sqrt(2)*(13525420*x^
5 + 32686812*x^4 + 2879479*x^3 + 84671384*x^2 - 5712309*x + 31010
342) - 269620984800*x + 1463688142400)*sqrt(2*x^2 - x + 3)*sqrt((
30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 30120
8632500*sqrt(59)*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2
+ 15*x + 18)*arctan(1829*(930248^(1/4)*sqrt(118)*(30463*sqrt(2)*(
x - 6) - 47200*x + 283200)*sqrt((30463*sqrt(2) - 47200)/(14378536
00*sqrt(2) - 2041914369)) + 88*sqrt(59)*sqrt(2*x^2 - x + 3)*(242*
sqrt(2) - 203))/(2*930248^(1/4)*sqrt(118)*sqrt(59)*sqrt(31)*(3046
3*sqrt(2)*x - 47200*x)*sqrt(-sqrt(2)*(930248^(1/4)*sqrt(118)*sqrt
(59)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(54611342765659019*x + 22625446
139756875) - 77236788905415894*x - 31985896625902144)*sqrt((30463
*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 1910458980
737753600*x^2 + 59*sqrt(2)*(9015070305869600*x^2 - 13006952734284
7*sqrt(2)*(49*x^2 - 151*x + 200) - 27781135024210400*x + 36796205
330080000) - 67532098596406l624*sqrt(2)*(2*x^2 - x + 3) - 9552294
90368876800*x + 2865688471106630400)/(130069527342847*sqrt(2)*x^2
```

```
 - 183981026650400*x^2))*sqrt((30463*sqrt(2) - 47200)/(1437853600
*sqrt(2) - 2041914369)) + 59*930248^(1/4)*sqrt(118)*sqrt(31)*(304
63*sqrt(2)*(19*x - 22) - 896800*x + 1038400)*sqrt((30463*sqrt(2)
- 47200)/(1437853600*sqrt(2) - 2041914369)) - 160952*sqrt(59)*sqr
t(31)*sqrt(2*x^2 - x + 3)*(34*sqrt(2) - 69))) + 301208632500*sqrt
(59)*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)
*arctan(-1829*(930248^(1/4)*sqrt(118)*(30463*sqrt(2)*(x - 6) - 47
200*x + 283200)*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2)
- 2041914369)) - 88*sqrt(59)*sqrt(2*x^2 - x + 3)*(242*sqrt(2) - 2
03))/(2*930248^(1/4)*sqrt(118)*sqrt(59)*sqrt(31)*(30463*sqrt(2)*x
 - 47200*x)*sqrt(sqrt(2)*(930248^(1/4)*sqrt(118)*sqrt(59)*sqrt(2*
x^2 - x + 3)*(sqrt(2)*(54611342765659019*x + 22625446139756875) -
 77236788905415894*x - 31985896625902144)*sqrt((30463*sqrt(2) - 4
7200)/(1437853600*sqrt(2) - 2041914369)) - 1910458980737753600*x^
2 - 59*sqrt(2)*(9015070305869600*x^2 - 130069527342847*sqrt(2)*(4
9*x^2 - 151*x + 200) - 27781135024210400*x + 36796205330080000) +
 675320985964061624*sqrt(2)*(2*x^2 - x + 3) + 955229490368876800*
x - 2865688471106630400)/(130069527342847*sqrt(2)*x^2 - 183981026
650400*x^2))*sqrt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2
041914369)) + 59*930248^(1/4)*sqrt(118)*sqrt(31)*(30463*sqrt(2)*(
19*x - 22) - 896800*x + 1038400)*sqrt((30463*sqrt(2) - 47200)/(14
37853600*sqrt(2) - 2041914369)) + 160952*sqrt(59)*sqrt(31)*sqrt(2
*x^2 - x + 3)*(34*sqrt(2) - 69))) - 991875*sqrt(59)*sqrt(31)*(944
000*x^6 - 377600*x^5 + 2879200*x^4 + 47200*x^3 + 2501600*x^2 - 30
463*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)
+ 708000*x + 849600)*log(-57617187500*sqrt(2)*(930248^(1/4)*sqrt(
118)*sqrt(59)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(54611342765659019*x +
 22625446139756875) - 77236788905415894*x - 31985896625902144)*sq
rt((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) + 1
910458980737753600*x^2 + 59*sqrt(2)*(9015070305869600*x^2 - 13006
9527342847*sqrt(2)*(49*x^2 - 151*x + 200) - 27781135024210400*x +
 36796205330080000) - 675320985964061624*sqrt(2)*(2*x^2 - x + 3)
- 955229490368876800*x + 2865688471106630400)/(130069527342847*sq
rt(2)*x^2 - 183981026650400*x^2)) + 991875*sqrt(59)*sqrt(31)*(944
000*x^6 - 377600*x^5 + 2879200*x^4 + 47200*x^3 + 2501600*x^2 - 30
463*sqrt(2)*(20*x^6 - 8*x^5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18)
+ 708000*x + 849600)*log(57617187500*sqrt(2)*(930248^(1/4)*sqrt(1
18)*sqrt(59)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(54611342765659019*x +
22625446139756875) - 77236788905415894*x - 31985896625902144)*sqr
t((30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)) - 19
10458980737753600*x^2 - 59*sqrt(2)*(9015070305869600*x^2 - 130069
527342847*sqrt(2)*(49*x^2 - 151*x + 200) - 27781135024210400*x +
36796205330080000) + 675320985964061624*sqrt(2)*(2*x^2 - x + 3) +
 955229490368876800*x - 2865688471106630400)/(130069527342847*sqr
t(2)*x^2 - 183981026650400*x^2)))/((944000*x^6 - 377600*x^5 + 287
9200*x^4 + 47200*x^3 + 2501600*x^2 - 30463*sqrt(2)*(20*x^6 - 8*x^
5 + 61*x^4 + x^3 + 53*x^2 + 15*x + 18) + 708000*x + 849600)*sqrt(
(30463*sqrt(2) - 47200)/(1437853600*sqrt(2) - 2041914369)))
```

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

$$\int \frac{1}{(2x^2 - x + 3)^{\frac{5}{2}} (5x^2 + 3x + 2)^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**2,x)
```

```
[Out] Integral(1/((2*x**2 - x + 3)**(5/2)*(5*x**2 + 3*x + 2)**2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 3*x + 2)^2*(2*x^2 - x + 3)^(5/2)),x, algorithm="giac")

[Out] Exception raised: RuntimeError
```

3.99 $\int \frac{1}{(3-x+2x^2)^{5/2}(2+3x+5x^2)^3}\,dx$

Optimal. Leaf size=269

$$-\frac{1134826571-1504660754x}{476353953856\sqrt{2x^2-x+3}}+\frac{86885x+46386}{1860496\left(2x^2-x+3\right)^{3/2}\left(5x^2+3x+2\right)}-\frac{12280939-19536786x}{2824232928\left(2x^2-x+3\right)^{3/2}}+\frac{65x+4}{1364\left(2x^2-x+3\right)^{3/2}\left(5x^2+3x+2\right)^2}+\frac{35\sqrt{\frac{1}{682}\left(2243059557247+2011748500000\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(2243059557247+2011748500000\sqrt{2}\right)}}\left(\left(6290431+3861685\sqrt{2}\right)x+2428746\sqrt{2}+1432939\right)}{\sqrt{2x^2-x+3}}\right)}{1800960128}-\frac{35\sqrt{\frac{1}{682}\left(2011748500000\sqrt{2}-2243059557247\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(2011748500000\sqrt{2}-2243059557247\right)}}\left(\left(6290431-3861685\sqrt{2}\right)x-2428746\sqrt{2}+1432939\right)}{\sqrt{2x^2-x+3}}\right)}{1800960128}$$

```
[Out] -(12280939 - 19536786*x)/(2824232928*(3 - x + 2*x^2)^(3/2)) - (11
34826571 - 1504660754*x)/(476353953856*Sqrt[3 - x + 2*x^2]) + (4
+ 65*x)/(1364*(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2) + (46386
 + 86885*x)/(1860496*(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)) + (
35*Sqrt[(2243059557247 + 2011748500000*Sqrt[2])/682]*ArcTan[(Sqrt
[11/(31*(2243059557247 + 2011748500000*Sqrt[2]))]*(1432939 + 2428
746*Sqrt[2] + (6290431 + 3861685*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]
])/1800960128 - (35*Sqrt[(-2243059557247 + 2011748500000*Sqrt[2])
/682]*ArcTanh[(Sqrt[11/(31*(-2243059557247 + 2011748500000*Sqrt[2
]))]*(1432939 - 2428746*Sqrt[2] + (6290431 - 3861685*Sqrt[2])*x))
/Sqrt[3 - x + 2*x^2]])/1800960128
```

Rubi [A] time = 1.23242, antiderivative size = 269, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$-\frac{1134826571-1504660754x}{476353953856\sqrt{2x^2-x+3}}+\frac{86885x+46386}{1860496\left(2x^2-x+3\right)^{3/2}\left(5x^2+3x+2\right)}-\frac{12280939-19536786x}{2824232928\left(2x^2-x+3\right)^{3/2}}+\frac{65x+4}{1364\left(2x^2-x+3\right)^{3/2}\left(5x^2+3x+2\right)^2}+\frac{35\sqrt{\frac{1}{682}\left(2243059557247+2011748500000\sqrt{2}\right)}\tan^{-1}\left(\frac{\sqrt{\frac{11}{31\left(2243059557247+2011748500000\sqrt{2}\right)}}\left(\left(6290431+3861685\sqrt{2}\right)x+2428746\sqrt{2}+1432939\right)}{\sqrt{2x^2-x+3}}\right)}{1800960128}-\frac{35\sqrt{\frac{1}{682}\left(2011748500000\sqrt{2}-2243059557247\right)}\tanh^{-1}\left(\frac{\sqrt{\frac{11}{31\left(2011748500000\sqrt{2}-2243059557247\right)}}\left(\left(6290431-3861685\sqrt{2}\right)x-2428746\sqrt{2}+1432939\right)}{\sqrt{2x^2-x+3}}\right)}{1800960128}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3),x]
```


```
[Out] -(12280939 - 19536786*x)/(2824232928*(3 - x + 2*x^2)^(3/2)) - (11
34826571 - 1504660754*x)/(476353953856*Sqrt[3 - x + 2*x^2]) + (4
+ 65*x)/(1364*(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)^2) + (46386
 + 86885*x)/(1860496*(3 - x + 2*x^2)^(3/2)*(2 + 3*x + 5*x^2)) + (
35*Sqrt[(2243059557247 + 2011748500000*Sqrt[2])/682]*ArcTan[(Sqrt
[11/(31*(2243059557247 + 2011748500000*Sqrt[2]))]*(1432939 + 2428
746*Sqrt[2] + (6290431 + 3861685*Sqrt[2])*x))/Sqrt[3 - x + 2*x^2]
])/1800960128 - (35*Sqrt[(-2243059557247 + 2011748500000*Sqrt[2])
/682]*ArcTanh[(Sqrt[11/(31*(-2243059557247 + 2011748500000*Sqrt[2
]))]*(1432939 - 2428746*Sqrt[2] + (6290431 - 3861685*Sqrt[2])*x))
/Sqrt[3 - x + 2*x^2]])/1800960128
```

Rubi in Sympy [A] time = 152.126, size = 308, normalized size = 1.14

$$-\frac{-\frac{33044607148971x}{4}+\frac{49844987478033}{8}}{2615361839402136\sqrt{2x^2-x+3}}-\frac{-\frac{13001731083x}{2}+\frac{16345929809}{4}}{939763506792\left(2x^2-x+3\right)^{\frac{3}{2}}}+\frac{715x+44}{15004\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)^2}+\frac{\frac{10513085x}{2}+2806353}{112560008\left(2x^2-x+3\right)^{\frac{3}{2}}\left(5x^2+3x+2\right)}$$

$$+\frac{\sqrt{682}\left(\frac{12818467299989505}{16}+\frac{10863268143647535\sqrt{2}}{8}\right)\left(\frac{1177425894955695\sqrt{2}}{4}+\frac{6020347019301615}{8}\right)\operatorname{atan}\left(\frac{16\sqrt{341}\left(x\left(\frac{34545003587284575\sqrt{2}}{16}+\frac{56271539874579645}{16}\cdots\right.\right.}{277312911645\sqrt{2243059557247+2\cdots}}\right.}{21939526602367333910816280030\sqrt{2243059557247+2011748500000\sqrt{2}}}$$

$$+\frac{\sqrt{682}\left(-\frac{10863268143647535\sqrt{2}}{8}+\frac{12818467299989505}{16}\right)\left(-\frac{1177425894955695\sqrt{2}}{4}+\frac{6020347019301615}{8}\right)\operatorname{atanh}\left(\frac{16\sqrt{341}\left(x\left(-\frac{34545003587284575\sqrt{2}}{16}+\frac{56271539\cdots}{}\right.\right.}{277312911645\sqrt{-224305955\cdots}}\right.}{21939526602367333910816280030\sqrt{-2243059557247+2011748500000\sqrt{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(2*x**2-x+3)**(5/2)/(5*x**2+3*x+2)**3,x)
```

```
[Out] -(-33044607148971*x/4 + 49844987478033/8)/(2615361839402136*sqrt(
2*x**2 - x + 3)) - (-13001731083*x/2 + 16345929809/4)/(9397635067
92*(2*x**2 - x + 3)**(3/2)) + (715*x + 44)/(15004*(2*x**2 - x + 3
)**(3/2)*(5*x**2 + 3*x + 2)**2) + (10513085*x/2 + 2806353)/(11256
0008*(2*x**2 - x + 3)**(3/2)*(5*x**2 + 3*x + 2)) + sqrt(682)*(128
18467299989505/16 + 10863268143647535*sqrt(2)/8)*(117742589495569
5*sqrt(2)/4 + 6020347019301615/8)*atan(16*sqrt(341)*(x*(345450035
87284575*sqrt(2)/16 + 56271539874579645/16) + 12818467299989505/1
6 + 10863268143647535*sqrt(2)/8)/(277312911645*sqrt(2243059557247
 + 2011748500000*sqrt(2))*sqrt(2*x**2 - x + 3)))/(219395266023673
33910816280030*sqrt(2243059557247 + 2011748500000*sqrt(2))) + sqr
t(682)*(-10863268143647535*sqrt(2)/8 + 12818467299989505/16)*(-11
77425894955695*sqrt(2)/4 + 6020347019301615/8)*atanh(16*sqrt(341)
*(x*(-34545003587284575*sqrt(2)/16 + 56271539874579645/16) - 1086
3268143647535*sqrt(2)/8 + 12818467299989505/16)/(277312911645*sqr
t(-2243059557247 + 2011748500000*sqrt(2))*sqrt(2*x**2 - x + 3)))/
(21939526602367333910816280030*sqrt(-2243059557247 + 201174850000
0*sqrt(2)))
```

Mathematica [C] time = 6.48412, size = 1218, normalized size = 4.53

result too large to display

Antiderivative was successfully verified.

```
[In]  Integrate[1/((3 - x + 2*x^2)^(5/2)*(2 + 3*x + 5*x^2)^3),x]
```

```
[Out] Sqrt[3 - x + 2*x^2]*((-11 + 90*x)/(367356*(3 - x + 2*x^2)^2) + (-
39095 + 53754*x)/(61960712*(3 - x + 2*x^2)) + (-1474 + 1235*x)/(6
60176*(2 + 3*x + 5*x^2)^2) + (157362 + 468895*x)/(81861824*(2 + 3
*x + 5*x^2))) + (175*(772337*I + 81951*Sqrt[31])*ArcTan[(46553644
48878 + (4766043812202*I)*Sqrt[31] - 158699364373902*x - (2787485
821466*I)*Sqrt[31]*x - 74012991583058*x^2 - (54042219198695*I)*Sq
rt[31]*x^2 - 61598686386050*x^3 - (27260449836880*I)*Sqrt[31]*x^3
 - 86332728860268*x^4 - (44936737584061*I)*Sqrt[31]*x^4 + (101392
12440000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (11
668141300000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2]
 + (20037015060000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^2*Sqrt[3 - x
+ 2*x^2] - (8851693400000*I)*Sqrt[22*(-13 + I*Sqrt[31])]*x^3*Sqrt
[3 - x + 2*x^2])/(276508696366774*I + 21211104525006*Sqrt[31] + (
386113686180858*I)*x + 27073970836946*Sqrt[31]*x + (5722577808965
35*I)*x^2 + 16500157269134*Sqrt[31]*x^2 - (293982300056560*I)*x^3
```

```
 + 18182603589150*Sqrt[31]*x^3 + (303413457358093*I)*x^4 + 916057
8170964*Sqrt[31]*x^4)])/(1800960128*Sqrt[682*(-13 + I*Sqrt[31])])
 - (((175*I)/1800960128)*(-772337*I + 81951*Sqrt[31])*ArcTan[(31*
(1463582697846*I + 684229178226*Sqrt[31] - (4719782741318*I)*x +
873353897966*Sqrt[31]*x - (1716989286985*I)*x^2 + 532263137714*Sq
rt[31]*x^2 - (6299191456240*I)*x^3 + 586535599650*Sqrt[31]*x^3 -
(3427809818003*I)*x^4 + 295502521644*Sqrt[31]*x^4))/(-46553644488
78 + (4766043812202*I)*Sqrt[31] + 158699364373902*x - (2787485821
466*I)*Sqrt[31]*x + 74012991583058*x^2 - (54042219198695*I)*Sqrt[
31]*x^2 + 61598686386050*x^3 - (27260449836880*I)*Sqrt[31]*x^3 +
86332728860268*x^4 - (44936737584061*I)*Sqrt[31]*x^4 - (160939880
000*I)*Sqrt[682*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (4023497
00000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2] + (563
289580000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^2*Sqrt[3 - x + 2*x^2]
+ (1609398800000*I)*Sqrt[682*(13 + I*Sqrt[31])]*x^3*Sqrt[3 - x +
2*x^2])])/Sqrt[682*(13 + I*Sqrt[31])] - (175*(-772337*I + 81951*S
qrt[31])*Log[(-3*I + Sqrt[31] - (10*I)*x)^2*(3*I + Sqrt[31] + (10
*I)*x)^2])/(3601920256*Sqrt[682*(13 + I*Sqrt[31])]) + (((175*I)/3
601920256)*(772337*I + 81951*Sqrt[31])*Log[(-3*I + Sqrt[31] - (10
*I)*x)^2*(3*I + Sqrt[31] + (10*I)*x)^2])/Sqrt[682*(-13 + I*Sqrt[3
1])] - (((175*I)/3601920256)*(772337*I + 81951*Sqrt[31])*Log[(2 +
 3*x + 5*x^2)*(-142*I + 66*Sqrt[31] + (469*I)*x - 22*Sqrt[31]*x +
 (327*I)*x^2 + 44*Sqrt[31]*x^2 + I*Sqrt[682*(-13 + I*Sqrt[31])]*S
qrt[3 - x + 2*x^2] - (4*I)*Sqrt[682*(-13 + I*Sqrt[31])]*x*Sqrt[3
- x + 2*x^2])])/Sqrt[682*(-13 + I*Sqrt[31])] + (175*(-772337*I +
81951*Sqrt[31])*Log[(2 + 3*x + 5*x^2)*(-1858*I + 66*Sqrt[31] + (1
041*I)*x - 22*Sqrt[31]*x - (817*I)*x^2 + 44*Sqrt[31]*x^2 - (63*I)
*Sqrt[22*(13 + I*Sqrt[31])]*Sqrt[3 - x + 2*x^2] + (22*I)*Sqrt[22*
(13 + I*Sqrt[31])]*x*Sqrt[3 - x + 2*x^2])])/(3601920256*Sqrt[682*
(13 + I*Sqrt[31])])
```

Maple [B] time = 0.203, size = 18877, normalized size = 70.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(2*x^2-x+3)^(5/2)/(5*x^2+3*x+2)^3,x)
```

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

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

$$\int \frac{1}{\left(5\,x^2+3\,x+2\right)^3\left(2\,x^2-x+3\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2)), x)
```

Fricas [A] time = 0.39633, size = 1871, normalized size = 6.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((5*x^2 + 3*x + 2)^3*(2*x^2 - x + 3)^(5/2)),x, algorithm="fricas")
```

```
[Out] 1/33162338299227688590379929 6*sqrt(4023497)*232562^(3/4)*sqrt(31)
*(8*sqrt(4023497)*232562^(1/4)*sqrt(31)*(90809970446051070000000
*x^7 - 4922590246846056000000*x^6 + 238562683251220070700000*x^
5 + 70106061507073861700000*x^4 + 208909304299430614500000*x^3
+ 71880160599675522700000*x^2 - 2243059557247*sqrt(2)*(225699113
100*x^7 - 12234606480*x^6 + 592923725931*x^5 + 174241614961*x^4 +
 519223213785*x^3 + 178650961091*x^2 + 218659985088*x + 973933553
2) + 87977779402161273600000*x + 39186187294995404000000)*sqrt(2
*x^2 - x + 3)*sqrt((2243059557247*sqrt(2) - 4023497000000)/(90249
43399404632759000000*sqrt(2) - 13125580231861607670219009)) - 216
4988593398757980*sqrt(4023497)*sqrt(2)*(100*x^8 + 20*x^7 + 321*x^
6 + 172*x^5 + 390*x^4 + 236*x^3 + 241*x^2 + 84*x + 36)*arctan(31*
(sqrt(4023497)*232562^(1/4)*(2243059557247*sqrt(2)*(x - 6) - 4023
497000000*x + 24140982000000)*sqrt((2243059557247*sqrt(2) - 40234
97000000)/(9024943399404632759000000*sqrt(2) - 131255802318616076
70219009)) + 44*sqrt(4023497)*sqrt(2*x^2 - x + 3)*(2428746*sqrt(2
) - 1432939))/(2*sqrt(4023497)*232562^(1/4)*sqrt(31)*(22430595572
47*sqrt(2)*x - 4023497000000*x)*sqrt(-sqrt(2)*(2*232562^(1/4)*sqr
t(2*x^2 - x + 3)*(sqrt(2)*(246651077845086853143824617701320373 00
1093723*x + 1027612905935688432819032861390431959767872 75) - 3494
1236843865569642572790384036356897788099 8*x - 14388978725151800 98
619213315622771770243064 48)*sqrt((2243059557247*sqrt(2) - 4023497
000000)/(9024943399404632759000000*sqrt(2) - 1312558023186160767 0
219009)) + 1642039586483121129144007484476174400000 0*x^2 + sqrt(2
)*(457158748509505314363956629200753100000 0*x^2 - 657532908761638
14995277292515063108223*sqrt(2)*(49*x^2 - 151*x + 200) - 14087953
2703949596875423369406762690000 0*x + 186595407554900128311819032
32683800000000) - 5786289597102415719584401741325553523624*sqrt(2
)*(2*x^2 - x + 3) - 821019793241560564572003742238087200000 0*x +
246305937972468169371601122671426160000 00)/(657532908761638149952
77292515063108223*sqrt(2)*x^2 - 932977037774500641559095161634190
00000*x^2))*sqrt((2243059557247*sqrt(2) - 4023497000000)/(9024943
399404632759000000*sqrt(2) - 13125580231861607670219009)) + sqrt(
4023497)*232562^(1/4)*sqrt(31)*(2243059557247*sqrt(2)*(19*x - 22)
 - 76446443000000*x + 88516934000000)*sqrt((2243059557247*sqrt(2)
 - 4023497000000)/(9024943399404632759000000*sqrt(2) - 1312558023
1861607670219009)) - 1364*sqrt(4023497)*sqrt(31)*sqrt(2*x^2 - x +
 3)*(263242*sqrt(2) - 672997))) - 2164988593398757980*sqrt(402349
7)*sqrt(2)*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4 + 236*
x^3 + 241*x^2 + 84*x + 36)*arctan(-31*(sqrt(4023497)*232562^(1/4)
*(2243059557247*sqrt(2)*(x - 6) - 4023497000000*x + 2414098200000
0)*sqrt((2243059557247*sqrt(2) - 4023497000000)/(9024943399404632
759000000*sqrt(2) - 13125580231861607670219009)) - 44*sqrt(402349
7)*sqrt(2*x^2 - x + 3)*(2428746*sqrt(2) - 1432939))/(2*sqrt(40234
97)*232562^(1/4)*sqrt(31)*(2243059557247*sqrt(2)*x - 402349700000
0*x)*sqrt(sqrt(2)*(2*232562^(1/4)*sqrt(2*x^2 - x + 3)*(sqrt(2)*(2
466510778450868531438246177013203730010 93723*x + 1027612905935688
43281903286139043195976787275) - 349412368438655696425727903840 36
3568977880998*x - 14388978725151800986192133156227717702430 6448)*
sqrt((2243059557247*sqrt(2) - 4023497000000)/(9024943399404632759
000000*sqrt(2) - 13125580231861607670219009)) - 16420395864831211
29144007484476174400000 0*x^2 - sqrt(2)*(45715874850950531436395 66
292007531000000*x^2 - 65753290876163814995277292515063108223*sqrt
(2)*(49*x^2 - 151*x + 200) - 140879532703949596875423369406762690
00000*x + 18659540755490012831181903232683800000000) + 5786289597
102415719584401741325553523624*sqrt(2)*(2*x^2 - x + 3) + 82101979
32415605645720037422380872000000*x - 24630593797246816937160112 26
7142616000000)/(65753290876163814995277292515063108223*sqrt(2)*x^
2 - 93297703777450064155909516163419000000*x^2))*sqrt((2243059557
247*sqrt(2) - 4023497000000)/(9024943399404632759000000*sqrt(2) -
 13125580231861607670219009)) + sqrt(4023497)*232562^(1/4)*sqrt(3
1)*(2243059557247*sqrt(2)*(19*x - 22) - 76446443000000*x + 885169
34000000)*sqrt((2243059557247*sqrt(2) - 4023497000000)/(902494339
9404632759000000*sqrt(2) - 13125580231861607670219009)) + 1364*sq
rt(4023497)*sqrt(31)*sqrt(2*x^2 - x + 3)*(263242*sqrt(2) - 672997
))) + 55545*sqrt(4023497)*sqrt(31)*(402349700000000*x^8 + 8046994
0000000*x^7 + 1291542537000000*x^6 + 692041484000000*x^5 + 156916
3830000000*x^4 + 949545292000000*x^3 + 969662777000000*x^2 - 2243
059557247*sqrt(2)*(100*x^8 + 20*x^7 + 321*x^6 + 172*x^5 + 390*x^4
 + 236*x^3 + 241*x^2 + 84*x + 36) + 337973748000000*x + 144845892
000000)*log(-193661591147812744140625 00*sqrt(2)*(2*232562^(1/4)*s
qrt(2*x^2 - x + 3)*(sqrt(2)*(2466510778450868531438246177013203 73
```

```
001093723*x + 102761290593568843281903286139043195976787275) - 34
```

3.100 $\int \sqrt{a+bx+cx^2}\left(d+ex+fx^2\right)^2\,dx$

Optimal. Leaf size=436

$$-\frac{\left(b^2-4ac\right)\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(8c^2\left(2a^2f^2+12abef+5b^2\left(2df+e^2\right)\right)-56b^2cf(af+be)-32c^3\left(a\left(2df+e^2\right)+4b\ldots\right.\right.}{1024c^{11/2}}$$
$$+\frac{(b+2cx)\sqrt{a+bx+cx^2}\left(8c^2\left(2a^2f^2+12abef+5b^2\left(2df+e^2\right)\right)-56b^2cf(af+be)-32c^3\left(a\left(2df+e^2\right)+4bde\right)+21b^4f\ldots\right.}{512c^5}$$
$$+\frac{\left(a+bx+cx^2\right)^{3/2}\left(-8c^2\left(32aef+25b\left(2df+e^2\right)\right)+28bcf(7af+10be)-105b^3f^2+640c^3de\right)}{960c^4}$$
$$+\frac{x\left(a+bx+cx^2\right)^{3/2}\left(-4cf(5af+14be)+21b^2f^2+40c^2\left(2df+e^2\right)\right)}{160c^3}$$
$$+\frac{fx^2\left(a+bx+cx^2\right)^{3/2}(8ce-3bf)}{20c^2}+\frac{f^2x^3\left(a+bx+cx^2\right)^{3/2}}{6c}$$

```
[Out] ((128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*e + a*f) - 32*c^3*(4*b
*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f + 2*a^2*f^2 + 5*b^2*(
e^2 + 2*d*f)))*(b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(512*c^5) + ((6
40*c^3*d*e - 105*b^3*f^2 + 28*b*c*f*(10*b*e + 7*a*f) - 8*c^2*(32*
a*e*f + 25*b*(e^2 + 2*d*f)))*(a + b*x + c*x^2)^(3/2))/(960*c^4) +
 ((21*b^2*f^2 - 4*c*f*(14*b*e + 5*a*f) + 40*c^2*(e^2 + 2*d*f))*x*
(a + b*x + c*x^2)^(3/2))/(160*c^3) + (f*(8*c*e - 3*b*f)*x^2*(a +
b*x + c*x^2)^(3/2))/(20*c^2) + (f^2*x^3*(a + b*x + c*x^2)^(3/2))/
(6*c) - ((b^2 - 4*a*c)*(128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*
e + a*f) - 32*c^3*(4*b*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f
 + 2*a^2*f^2 + 5*b^2*(e^2 + 2*d*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[
c]*Sqrt[a + b*x + c*x^2])])/(1024*c^(11/2))
```

Rubi [A] time = 1.497, antiderivative size = 436, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$-\frac{\left(b^2-4ac\right)\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(8c^2\left(2a^2f^2+12abef+5b^2\left(2df+e^2\right)\right)-56b^2cf(af+be)-32c^3\left(a\left(2df+e^2\right)+4b\ldots\right.\right.}{1024c^{11/2}}$$
$$+\frac{(b+2cx)\sqrt{a+bx+cx^2}\left(8c^2\left(2a^2f^2+12abef+5b^2\left(2df+e^2\right)\right)-56b^2cf(af+be)-32c^3\left(a\left(2df+e^2\right)+4bde\right)+21b^4f\ldots\right.}{512c^5}$$
$$+\frac{\left(a+bx+cx^2\right)^{3/2}\left(-8c^2\left(32aef+25b\left(2df+e^2\right)\right)+28bcf(7af+10be)-105b^3f^2+640c^3de\right)}{960c^4}$$
$$+\frac{x\left(a+bx+cx^2\right)^{3/2}\left(-4cf(5af+14be)+21b^2f^2+40c^2\left(2df+e^2\right)\right)}{160c^3}$$
$$+\frac{fx^2\left(a+bx+cx^2\right)^{3/2}(8ce-3bf)}{20c^2}+\frac{f^2x^3\left(a+bx+cx^2\right)^{3/2}}{6c}$$

Antiderivative was successfully verified.

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

```
[Out] ((128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*e + a*f) - 32*c^3*(4*b
*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f + 2*a^2*f^2 + 5*b^2*(
e^2 + 2*d*f)))*(b + 2*c*x)*Sqrt[a + b*x + c*x^2])/(512*c^5) + ((6
40*c^3*d*e - 105*b^3*f^2 + 28*b*c*f*(10*b*e + 7*a*f) - 8*c^2*(32*
a*e*f + 25*b*(e^2 + 2*d*f)))*(a + b*x + c*x^2)^(3/2))/(960*c^4) +
 ((21*b^2*f^2 - 4*c*f*(14*b*e + 5*a*f) + 40*c^2*(e^2 + 2*d*f))*x*
(a + b*x + c*x^2)^(3/2))/(160*c^3) + (f*(8*c*e - 3*b*f)*x^2*(a +
b*x + c*x^2)^(3/2))/(20*c^2) + (f^2*x^3*(a + b*x + c*x^2)^(3/2))/
(6*c) - ((b^2 - 4*a*c)*(128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*
e + a*f) - 32*c^3*(4*b*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f
 + 2*a^2*f^2 + 5*b^2*(e^2 + 2*d*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[
c]*Sqrt[a + b*x + c*x^2])])/(1024*c^(11/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.19413, size = 456, normalized size = 1.05

$$2\sqrt{c}\sqrt{a+x(b+cx)}\left(16bc^2\left(113a^2f^2-2ac\left(f\left(130d+17fx^2\right)+65e^2+58efx\right)+4c^2\left(30d^2+10dx(2e+fx)+x^2\left(5e^2+6e\right.\right.\right.\right.$$

Antiderivative was successfully verified.

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

```
[Out] (2*Sqrt[c]*Sqrt[a + x*(b + c*x)]*(315*b^5*f^2 - 210*b^4*c*f*(4*e
+ f*x) - 16*b^2*c^2*(-2*a*f*(115*e + 28*f*x) + c*(120*d*e + 25*e^
2*x + 50*d*f*x + 28*e*f*x^2 + 9*f^2*x^3)) + 8*b^3*c*(-210*a*f^2 +
 c*(75*e^2 + 70*e*f*x + 3*f*(50*d + 7*f*x^2))) + 16*b*c^2*(113*a^
2*f^2 - 2*a*c*(65*e^2 + 58*e*f*x + f*(130*d + 17*f*x^2)) + 4*c^2*
(30*d^2 + 10*d*x*(2*e + f*x) + x^2*(5*e^2 + 6*e*f*x + 2*f^2*x^2))
) - 32*c^3*(a^2*f*(64*e + 15*f*x) - 2*a*c*(80*d*e + 15*e^2*x + 30
*d*f*x + 16*e*f*x^2 + 5*f^2*x^3) - 4*c^2*x*(30*d^2 + 10*d*x*(4*e
+ 3*f*x) + x^2*(15*e^2 + 24*e*f*x + 10*f^2*x^2)))) - 15*(b^2 - 4*
a*c)*(128*c^4*d^2 + 21*b^4*f^2 - 56*b^2*c*f*(b*e + a*f) - 32*c^3*
(4*b*d*e + a*(e^2 + 2*d*f)) + 8*c^2*(12*a*b*e*f + 2*a^2*f^2 + 5*b
^2*(e^2 + 2*d*f)))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)
]])/(15360*c^(11/2))
```

Maple [B] time = 0.027, size = 1429, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^2+b*x+a)^(1/2)*(f*x^2+e*x+d)^2,x)
```

```
[Out] 7/24*e*f*b^2/c^3*(c*x^2+b*x+a)^(3/2)+2/5*e*f*x^2*(c*x^2+b*x+a)^(3
/2)/c+3/8*e*f*b/c^2*a*(c*x^2+b*x+a)^(1/2)*x+1/6*f^2*x^3*(c*x^2+b*
x+a)^(3/2)/c+1/4*d^2/c*(c*x^2+b*x+a)^(1/2)*b+1/2*d^2/c^(1/2)*ln((
1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a-1/8*d^2/c^(3/2)*ln((1/2
*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*b^2+2/3*d*e*(c*x^2+b*x+a)^(3
/2)/c+1/4*x*(c*x^2+b*x+a)^(3/2)/c*e^2-5/24*b/c^2*(c*x^2+b*x+a)^(3
/2)*e^2+5/64*b^3/c^3*(c*x^2+b*x+a)^(1/2)*e^2-5/128*b^4/c^(7/2)*ln
((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2-1/8/c^(3/2)*a^2*ln(
(1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2-7/64*f^2*b^3/c^4*(c*
x^2+b*x+a)^(3/2)+21/512*f^2*b^5/c^5*(c*x^2+b*x+a)^(1/2)-21/1024*f
^2*b^6/c^(11/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+1/16*
f^2/c^(5/2)*a^3*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-5/16*
e*f*b^3/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a+3/1
6*e*f*b^2/c^3*a*(c*x^2+b*x+a)^(1/2)+3/8*e*f*b/c^(5/2)*a^2*ln((1/2
*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-1/8/c^2*a*(c*x^2+b*x+a)^(1/2
)*b*d*f-1/2*d*e*b/c*(c*x^2+b*x+a)^(1/2)*x-1/2*d*e*b/c^(3/2)*ln((1
/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a-7/20*e*f*b/c^2*x*(c*x^2+
```

```
b*x+a)^(3/2)-7/32*e*f*b^3/c^3*(c*x^2+b*x+a)^(1/2)*x-7/32*f^2*b^2/
c^3*a*(c*x^2+b*x+a)^(1/2)*x+5/16*b^2/c^2*(c*x^2+b*x+a)^(1/2)*x*d*
f+3/8*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a*d
*f-1/4/c*a*(c*x^2+b*x+a)^(1/2)*x*d*f-7/64*e*f*b^4/c^4*(c*x^2+b*x+
a)^(1/2)+7/128*e*f*b^5/c^(9/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+
a)^(1/2))-4/15*e*f/c^2*a*(c*x^2+b*x+a)^(3/2)+1/2*x*(c*x^2+b*x+a)^
(3/2)/c*d*f-5/12*b/c^2*(c*x^2+b*x+a)^(3/2)*d*f+5/32*b^2/c^2*(c*x^
2+b*x+a)^(1/2)*x*e^2+5/32*b^3/c^3*(c*x^2+b*x+a)^(1/2)*d*f+3/16*b^
2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a*e^2-5/64*
b^4/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*f-1/8/c
*a*(c*x^2+b*x+a)^(1/2)*x*e^2-1/16/c^2*a*(c*x^2+b*x+a)^(1/2)*b*e^2
-1/4/c^(3/2)*a^2*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*f-
1/4*d*e*b^2/c^2*(c*x^2+b*x+a)^(1/2)+1/8*d*e*b^3/c^(5/2)*ln((1/2*b
+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-7/64*f^2*b^3/c^4*a*(c*x^2+b*x+
a)^(1/2)-15/64*f^2*b^2/c^(7/2)*a^2*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+
b*x+a)^(1/2))+49/240*f^2*b/c^3*a*(c*x^2+b*x+a)^(3/2)-1/8*f^2/c^2*
a*x*(c*x^2+b*x+a)^(3/2)+1/16*f^2/c^2*a^2*(c*x^2+b*x+a)^(1/2)*x+1/
32*f^2/c^3*a^2*(c*x^2+b*x+a)^(1/2)*b-3/20*f^2*b/c^2*x^2*(c*x^2+b*
x+a)^(3/2)+21/160*f^2*b^2/c^3*x*(c*x^2+b*x+a)^(3/2)+21/256*f^2*b^
4/c^4*(c*x^2+b*x+a)^(1/2)*x+35/256*f^2*b^4/c^(9/2)*ln((1/2*b+c*x)
/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a+1/2*d^2*(c*x^2+b*x+a)^(1/2)*x
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.564142, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/30720*(4*(1280*c^5*f^2*x^5 + 1920*b*c^4*d^2 + 128*(24*c^5*e*f
+ b*c^4*f^2)*x^4 + 16*(120*c^5*e^2 - (9*b^2*c^3 - 20*a*c^4)*f^2 +
 24*(10*c^5*d + b*c^4*e)*f)*x^3 - 640*(3*b^2*c^3 - 8*a*c^4)*d*e +
 40*(15*b^3*c^2 - 52*a*b*c^3)*e^2 + (315*b^5 - 1680*a*b^3*c + 180
8*a^2*b*c^2)*f^2 + 8*(640*c^5*d*e + 40*b*c^4*e^2 + (21*b^3*c^2 -
68*a*b*c^3)*f^2 + 8*(10*b*c^4*d - (7*b^2*c^3 - 16*a*c^4)*e)*f)*x^
2 + 8*(10*(15*b^3*c^2 - 52*a*b*c^3)*d - (105*b^4*c - 460*a*b^2*c^
2 + 256*a^2*c^3)*e)*f + 2*(1920*c^5*d^2 + 640*b*c^4*d*e - 40*(5*b
^2*c^3 - 12*a*c^4)*e^2 - (105*b^4*c - 448*a*b^2*c^2 + 240*a^2*c^3
)*f^2 - 8*(10*(5*b^2*c^3 - 12*a*c^4)*d - (35*b^3*c^2 - 116*a*b*c^
3)*e)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) - 15*(128*(b^2*c^4 - 4*
a*c^5)*d^2 - 128*(b^3*c^3 - 4*a*b*c^4)*d*e + 8*(5*b^4*c^2 - 24*a*
b^2*c^3 + 16*a^2*c^4)*e^2 + (21*b^6 - 140*a*b^4*c + 240*a^2*b^2*c
^2 - 64*a^3*c^3)*f^2 + 8*(2*(5*b^4*c^2 - 24*a*b^2*c^3 + 16*a^2*c^
4)*d - (7*b^5*c - 40*a*b^3*c^2 + 48*a^2*b*c^3)*e)*f)*log(-4*(2*c^
2*x + b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4
*a*c)*sqrt(c)))/c^(11/2), 1/15360*(2*(1280*c^5*f^2*x^5 + 1920*b*c
^4*d^2 + 128*(24*c^5*e*f + b*c^4*f^2)*x^4 + 16*(120*c^5*e^2 - (9*
b^2*c^3 - 20*a*c^4)*f^2 + 24*(10*c^5*d + b*c^4*e)*f)*x^3 - 640*(3
*b^2*c^3 - 8*a*c^4)*d*e + 40*(15*b^3*c^2 - 52*a*b*c^3)*e^2 + (315
*b^5 - 1680*a*b^3*c + 1808*a^2*b*c^2)*f^2 + 8*(640*c^5*d*e + 40*b
*c^4*e^2 + (21*b^3*c^2 - 68*a*b*c^3)*f^2 + 8*(10*b*c^4*d - (7*b^2
*c^3 - 16*a*c^4)*e)*f)*x^2 + 8*(10*(15*b^3*c^2 - 52*a*b*c^3)*d -
```

```
(105*b^4*c - 460*a*b^2*c^2 + 256*a^2*c^3)*e)*f + 2*(1920*c^5*d^2
+ 640*b*c^4*d*e - 40*(5*b^2*c^3 - 12*a*c^4)*e^2 - (105*b^4*c - 44
8*a*b^2*c^2 + 240*a^2*c^3)*f^2 - 8*(10*(5*b^2*c^3 - 12*a*c^4)*d -
 (35*b^3*c^2 - 116*a*b*c^3)*e)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(-
c) - 15*(128*(b^2*c^4 - 4*a*c^5)*d^2 - 128*(b^3*c^3 - 4*a*b*c^4)*
d*e + 8*(5*b^4*c^2 - 24*a*b^2*c^3 + 16*a^2*c^4)*e^2 + (21*b^6 - 1
40*a*b^4*c + 240*a^2*b^2*c^2 - 64*a^3*c^3)*f^2 + 8*(2*(5*b^4*c^2
- 24*a*b^2*c^3 + 16*a^2*c^4)*d - (7*b^5*c - 40*a*b^3*c^2 + 48*a^2
*b*c^3)*e)*f)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x +
 a)*c)))/(sqrt(-c)*c^5)]
```

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

$$\int \sqrt{a + bx + cx^2} \left(d + ex + fx^2\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d)**2,x)
```

```
[Out] Integral(sqrt(a + b*x + c*x**2)*(d + e*x + f*x**2)**2, x)
```

GIAC/XCAS [A] time = 0.280034, size = 861, normalized size = 1.97

$$\frac{1}{7680}\sqrt{cx^2 + bx + a}\left(2\left(4\left(2\left(8\left(10\,f^2x + \frac{bc^4f^2 + 24\,c^5fe}{c^5}\right)x + \frac{240\,c^5df - 9\,b^2c^3f^2 + 20\,ac^4f^2 + 24\,bc^4fe + 120\,c^5e^2}{c^5}\right)x + \right.\right.\right.\right.$$
$$+ \frac{\left(128\,b^2c^4d^2 - 512\,ac^5d^2 + 80\,b^4c^2df - 384\,ab^2c^3df + 256\,a^2c^4df + 21\,b^6f^2 - 140\,ab^4cf^2 + 240\,a^2b^2c^2f^2 - 64\,a^3c^3f^2 - 1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7680*sqrt(c*x^2 + b*x + a)*(2*(4*(2*(8*(10*f^2*x + (b*c^4*f^2 +
 24*c^5*f*e)/c^5)*x + (240*c^5*d*f - 9*b^2*c^3*f^2 + 20*a*c^4*f^2
 + 24*b*c^4*f*e + 120*c^5*e^2)/c^5)*x + (80*b*c^4*d*f + 21*b^3*c^
2*f^2 - 68*a*b*c^3*f^2 + 640*c^5*d*e - 56*b^2*c^3*f*e + 128*a*c^4
*f*e + 40*b*c^4*e^2)/c^5)*x + (1920*c^5*d^2 - 400*b^2*c^3*d*f + 9
60*a*c^4*d*f - 105*b^4*c*f^2 + 448*a*b^2*c^2*f^2 - 240*a^2*c^3*f^
2 + 640*b*c^4*d*e + 280*b^3*c^2*f*e - 928*a*b*c^3*f*e - 200*b^2*c
^3*e^2 + 480*a*c^4*e^2)/c^5)*x + (1920*b*c^4*d^2 + 1200*b^3*c^2*d
*f - 4160*a*b*c^3*d*f + 315*b^5*f^2 - 1680*a*b^3*c*f^2 + 1808*a^2
*b*c^2*f^2 - 1920*b^2*c^3*d*e + 5120*a*c^4*d*e - 840*b^4*c*f*e +
3680*a*b^2*c^2*f*e - 2048*a^2*c^3*f*e + 600*b^3*c^2*e^2 - 2080*a*
b*c^3*e^2)/c^5) + 1/1024*(128*b^2*c^4*d^2 - 512*a*c^5*d^2 + 80*b^
4*c^2*d*f - 384*a*b^2*c^3*d*f + 256*a^2*c^4*d*f + 21*b^6*f^2 - 14
0*a*b^4*c*f^2 + 240*a^2*b^2*c^2*f^2 - 64*a^3*c^3*f^2 - 128*b^3*c^
3*d*e + 512*a*b*c^4*d*e - 56*b^5*c*f*e + 320*a*b^3*c^2*f*e - 384*
a^2*b*c^3*f*e + 40*b^4*c^2*e^2 - 192*a*b^2*c^3*e^2 + 128*a^2*c^4*
e^2)*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/
c^(11/2)
```

3.101 $\int \sqrt{a+bx+cx^2}\left(d+ex+fx^2\right)\,dx$

Optimal. Leaf size=175

$$-\frac{\left(b^2-4ac\right)\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-4c(af+2be)+5b^2f+16c^2d\right)}{128c^{7/2}}+\frac{(b+2cx)\sqrt{a+bx+cx^2}\left(-4acf+5b^2f-8bce+16c^2d\right)}{64c^3}+\frac{\left(a+bx+cx^2\right)^{3/2}(8ce-5bf)}{24c^2}+\frac{fx\left(a+bx+cx^2\right)^{3/2}}{4c}$$

```
[Out] ((16*c^2*d - 8*b*c*e + 5*b^2*f - 4*a*c*f)*(b + 2*c*x)*Sqrt[a + b*
x + c*x^2])/(64*c^3) + ((8*c*e - 5*b*f)*(a + b*x + c*x^2)^(3/2))/
(24*c^2) + (f*x*(a + b*x + c*x^2)^(3/2))/(4*c) - ((b^2 - 4*a*c)*(
16*c^2*d + 5*b^2*f - 4*c*(2*b*e + a*f))*ArcTanh[(b + 2*c*x)/(2*Sq
rt[c]*Sqrt[a + b*x + c*x^2]])])/(128*c^(7/2))
```

Rubi [A] time = 0.33784, antiderivative size = 175, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.2

$$-\frac{\left(b^2-4ac\right)\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-4c(af+2be)+5b^2f+16c^2d\right)}{128c^{7/2}}+\frac{(b+2cx)\sqrt{a+bx+cx^2}\left(-4acf+5b^2f-8bce+16c^2d\right)}{64c^3}+\frac{\left(a+bx+cx^2\right)^{3/2}(8ce-5bf)}{24c^2}+\frac{fx\left(a+bx+cx^2\right)^{3/2}}{4c}$$

Antiderivative was successfully verified.

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

```
[Out] ((16*c^2*d - 8*b*c*e + 5*b^2*f - 4*a*c*f)*(b + 2*c*x)*Sqrt[a + b*
x + c*x^2])/(64*c^3) + ((8*c*e - 5*b*f)*(a + b*x + c*x^2)^(3/2))/
(24*c^2) + (f*x*(a + b*x + c*x^2)^(3/2))/(4*c) - ((b^2 - 4*a*c)*(
16*c^2*d + 5*b^2*f - 4*c*(2*b*e + a*f))*ArcTanh[(b + 2*c*x)/(2*Sq
rt[c]*Sqrt[a + b*x + c*x^2]])])/(128*c^(7/2))
```

Rubi in Sympy [A] time = 20.4161, size = 160, normalized size = 0.91

$$-\frac{\left(a+bx+cx^2\right)^{\frac{3}{2}}\left(\frac{5bf}{2}-4ce-3cfx\right)}{12c^2}+\frac{(b+2cx)\sqrt{a+bx+cx^2}\left(-4acf+5b^2f-8bce+16c^2d\right)}{64c^3}-\frac{\left(-4ac+b^2\right)\left(-4acf+5b^2f-8bce+16c^2d\right)\operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{128c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d),x)
```

```
[Out] -(a + b*x + c*x**2)**(3/2)*(5*b*f/2 - 4*c*e - 3*c*f*x)/(12*c**2)
+ (b + 2*c*x)*sqrt(a + b*x + c*x**2)*(-4*a*c*f + 5*b**2*f - 8*b*c
*e + 16*c**2*d)/(64*c**3) - (-4*a*c + b**2)*(-4*a*c*f + 5*b**2*f
- 8*b*c*e + 16*c**2*d)*atanh((b + 2*c*x)/(2*sqrt(c)*sqrt(a + b*x
+ c*x**2)))/(128*c**(7/2))
```

Mathematica [A] time = 0.296497, size = 171, normalized size = 0.98

$$\frac{2\sqrt{c}\sqrt{a+x(b+cx)}\left(4bc\left(2c\left(6d+2ex+fx^2\right)-13af\right)+8c^2\left(a(8e+3fx)+2cx\left(6d+4ex+3fx^2\right)\right)+15b^3f-2b^2c(12e+\right.}{384c^{7/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (2*Sqrt[c]*Sqrt[a + x*(b + c*x)]*(15*b^3*f - 2*b^2*c*(12*e + 5*f*
x) + 4*b*c*(-13*a*f + 2*c*(6*d + 2*e*x + f*x^2)) + 8*c^2*(a*(8*e
+ 3*f*x) + 2*c*x*(6*d + 4*e*x + 3*f*x^2))) - 3*(b^2 - 4*a*c)*(16*
c^2*d + 5*b^2*f - 4*c*(2*b*e + a*f))*Log[b + 2*c*x + 2*Sqrt[c]*Sq
rt[a + x*(b + c*x)]])/(384*c^(7/2))
```

Maple [B] time = 0.009, size = 453, normalized size = 2.6

$$\begin{aligned}
&\frac{dx}{2}\sqrt{cx^2+bx+a}+\frac{bd}{4c}\sqrt{cx^2+bx+a}+\frac{ad}{2}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)\frac{1}{\sqrt{c}}\\
&-\frac{b^2d}{8}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{3}{2}}+\frac{e}{3c}\left(cx^2+bx+a\right)^{\frac{3}{2}}\\
&-\frac{bex}{4c}\sqrt{cx^2+bx+a}-\frac{b^2e}{8c^2}\sqrt{cx^2+bx+a}-\frac{abe}{4}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{3}{2}}\\
&+\frac{eb^3}{16}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{5}{2}}+\frac{fx}{4c}\left(cx^2+bx+a\right)^{\frac{3}{2}}\\
&-\frac{5bf}{24c^2}\left(cx^2+bx+a\right)^{\frac{3}{2}}+\frac{5b^2fx}{32c^2}\sqrt{cx^2+bx+a}+\frac{5b^3f}{64c^3}\sqrt{cx^2+bx+a}\\
&+\frac{3b^2fa}{16}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{5}{2}}\\
&-\frac{5fb^4}{128}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{7}{2}}-\frac{afx}{8c}\sqrt{cx^2+bx+a}\\
&-\frac{abf}{16c^2}\sqrt{cx^2+bx+a}-\frac{a^2f}{8}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{3}{2}}
\end{aligned}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^2+b*x+a)^(1/2)*(f*x^2+e*x+d),x)
```

```
[Out] 1/2*d*(c*x^2+b*x+a)^(1/2)*x+1/4*d/c*(c*x^2+b*x+a)^(1/2)*b+1/2*d/c
^(1/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a-1/8*d/c^(3/2
)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*b^2+1/3*e*(c*x^2+b*
x+a)^(3/2)/c-1/4*e*b/c*(c*x^2+b*x+a)^(1/2)*x-1/8*e*b^2/c^2*(c*x^2
+b*x+a)^(1/2)-1/4*e*b/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a
)^(1/2))*a+1/16*e*b^3/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a
)^(1/2))+1/4*f*x*(c*x^2+b*x+a)^(3/2)/c-5/24*f*b/c^2*(c*x^2+b*x+a)
^(3/2)+5/32*f*b^2/c^2*(c*x^2+b*x+a)^(1/2)*x+5/64*f*b^3/c^3*(c*x^2
+b*x+a)^(1/2)+3/16*f*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*
x+a)^(1/2))*a-5/128*f*b^4/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b
*x+a)^(1/2))-1/8*f/c*a*(c*x^2+b*x+a)^(1/2)*x-1/16*f/c^2*a*(c*x^2+
b*x+a)^(1/2)*b-1/8*f/c^(3/2)*a^2*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*
x+a)^(1/2))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.306603, size = 1, normalized size = 0.01

$$\left[\frac{4\left(48\,c^{3}fx^{3}+48\,bc^{2}d+8\left(8\,c^{3}e+bc^{2}f\right)x^{2}-8\left(3\,b^{2}c-8\,ac^{2}\right)e+\left(15\,b^{3}-52\,abc\right)f+2\left(48\,c^{3}d+8\,bc^{2}e-\left(5\,b^{2}c-12\,ac^{2}\right)\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/768*(4*(48*c^3*f*x^3 + 48*b*c^2*d + 8*(8*c^3*e + b*c^2*f)*x^2
- 8*(3*b^2*c - 8*a*c^2)*e + (15*b^3 - 52*a*b*c)*f + 2*(48*c^3*d +
 8*b*c^2*e - (5*b^2*c - 12*a*c^2)*f)*x)*sqrt(c*x^2 + b*x + a)*sqr
t(c) + 3*(16*(b^2*c^2 - 4*a*c^3)*d - 8*(b^3*c - 4*a*b*c^2)*e + (5
*b^4 - 24*a*b^2*c + 16*a^2*c^2)*f)*log(4*(2*c^2*x + b*c)*sqrt(c*x
^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/c^(
7/2), 1/384*(2*(48*c^3*f*x^3 + 48*b*c^2*d + 8*(8*c^3*e + b*c^2*f)
*x^2 - 8*(3*b^2*c - 8*a*c^2)*e + (15*b^3 - 52*a*b*c)*f + 2*(48*c^
3*d + 8*b*c^2*e - (5*b^2*c - 12*a*c^2)*f)*x)*sqrt(c*x^2 + b*x + a
)*sqrt(-c) - 3*(16*(b^2*c^2 - 4*a*c^3)*d - 8*(b^3*c - 4*a*b*c^2)*
e + (5*b^4 - 24*a*b^2*c + 16*a^2*c^2)*f)*arctan(1/2*(2*c*x + b)*s
qrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/(sqrt(-c)*c^3)]
```

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

$$\int\sqrt{a+bx+cx^{2}}\left(d+ex+fx^{2}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)**(1/2)*(f*x**2+e*x+d),x)
```

```
[Out] Integral(sqrt(a + b*x + c*x**2)*(d + e*x + f*x**2), x)
```

GIAC/XCAS [A] time = 0.27789, size = 286, normalized size = 1.63

$$\frac{1}{192}\sqrt{cx^{2}+bx+a}\left(2\left(4\left(6\,fx+\frac{bc^{2}f+8\,c^{3}e}{c^{3}}\right)x+\frac{48\,c^{3}d-5\,b^{2}cf+12\,ac^{2}f+8\,bc^{2}e}{c^{3}}\right)x+\frac{48\,bc^{2}d+15\,b^{3}f-52\,abcf-24}{c^{3}}\right.$$
$$+\frac{\left(16\,b^{2}c^{2}d-64\,ac^{3}d+5\,b^{4}f-24\,ab^{2}cf+16\,a^{2}c^{2}f-8\,b^{3}ce+32\,abc^{2}e\right)\ln\left(\left|-2\left(\sqrt{c}x-\sqrt{cx^{2}+bx+a}\right)\sqrt{c}-b\right|\right)}{128\,c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/192*sqrt(c*x^2 + b*x + a)*(2*(4*(6*f*x + (b*c^2*f + 8*c^3*e)/c^
3)*x + (48*c^3*d - 5*b^2*c*f + 12*a*c^2*f + 8*b*c^2*e)/c^3)*x + (
48*b*c^2*d + 15*b^3*f - 52*a*b*c*f - 24*b^2*c*e + 64*a*c^2*e)/c^3
) + 1/128*(16*b^2*c^2*d - 64*a*c^3*d + 5*b^4*f - 24*a*b^2*c*f + 1
```

```
6*a^2*c^2*f - 8*b^3*c*e + 32*a*b*c^2*e)*ln(abs(-2*(sqrt(c)*x - sq
rt(c*x^2 + b*x + a))*sqrt(c) - b))/c^(7/2)
```

3.102 $\int \frac{\sqrt{a+bx+cx^2}}{d+ex+fx^2}\,dx$

Optimal. Leaf size=431

$$-\frac{\sqrt{f\left(2af-b\left(e-\sqrt{e^2-4df}\right)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)}\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}f\sqrt{e^2-4df}}$$
$$+\frac{\sqrt{f\left(2af-b\left(\sqrt{e^2-4df}+e\right)\right)+c\left(e\sqrt{e^2-4df}-2df+e^2\right)}\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}f\sqrt{e^2-4df}}$$
$$+\frac{\sqrt{c}\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f}$$

```
[Out] (Sqrt[c]*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/
f - (Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e
 - Sqrt[e^2 - 4*d*f]))]*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]
) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2
- 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt
[a + b*x + c*x^2])])/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f]) + (Sqrt[c*(e^2
 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*
d*f]))]*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(
e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*
f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2
])])/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f])
```

Rubi [A] time = 2.37932, antiderivative size = 431, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$-\frac{\sqrt{f\left(2af-b\left(e-\sqrt{e^2-4df}\right)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)}\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}f\sqrt{e^2-4df}}$$
$$+\frac{\sqrt{f\left(2af-b\left(\sqrt{e^2-4df}+e\right)\right)+c\left(e\sqrt{e^2-4df}-2df+e^2\right)}\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}f\sqrt{e^2-4df}}$$
$$+\frac{\sqrt{c}\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f}$$

Antiderivative was successfully verified.

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

```
[Out] (Sqrt[c]*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/
f - (Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e
 - Sqrt[e^2 - 4*d*f]))]*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]
) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2
- 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt
[a + b*x + c*x^2])])/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f]) + (Sqrt[c*(e^2
 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*
d*f]))]*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(
e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*
f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2
])])/(Sqrt[2]*f*Sqrt[e^2 - 4*d*f])
```

Rubi in Sympy [A] time = 157.729, size = 420, normalized size = 0.97

$$\frac{\sqrt{c}\operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f}+\frac{\sqrt{2}\sqrt{2af^2-bef-bf\sqrt{-4df+e^2}-2cdf+ce^2+ce\sqrt{-4df+e^2}}\operatorname{atanh}\left(\frac{\sqrt{2}\left(4af-b\left(e+\sqrt{-4df+e^2}\right)+x\left(2bf-2c\left(e+\sqrt{-4df+e^2}\right)\right)\right)}{4\sqrt{a+bx+cx^2}\sqrt{2af^2-bef-2cdf+ce^2-(bf-ce)\sqrt{-4df+e^2}}}\right)}{2f\sqrt{-4df+e^2}}-\frac{\sqrt{2}\sqrt{2af^2-bef+bf\sqrt{-4df+e^2}-2cdf+ce^2-ce\sqrt{-4df+e^2}}\operatorname{atanh}\left(\frac{\sqrt{2}\left(4af-be+b\sqrt{-4df+e^2}+x\left(2bf-2ce+2c\sqrt{-4df+e^2}\right)\right)}{4\sqrt{a+bx+cx^2}\sqrt{2af^2-bef-2cdf+ce^2+(bf-ce)\sqrt{-4df+e^2}}}\right)}{2f\sqrt{-4df+e^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d),x)
```

```
[Out] sqrt(c)*atanh((b + 2*c*x)/(2*sqrt(c)*sqrt(a + b*x + c*x**2)))/f +
 sqrt(2)*sqrt(2*a*f**2 - b*e*f - b*f*sqrt(-4*d*f + e**2) - 2*c*d*
f + c*e**2 + c*e*sqrt(-4*d*f + e**2))*atanh(sqrt(2)*(4*a*f - b*(e
 + sqrt(-4*d*f + e**2)) + x*(2*b*f - 2*c*(e + sqrt(-4*d*f + e**2)
)))/(4*sqrt(a + b*x + c*x**2)*sqrt(2*a*f**2 - b*e*f - 2*c*d*f + c
*e**2 - (b*f - c*e)*sqrt(-4*d*f + e**2))))/(2*f*sqrt(-4*d*f + e**
2)) - sqrt(2)*sqrt(2*a*f**2 - b*e*f + b*f*sqrt(-4*d*f + e**2) - 2
*c*d*f + c*e**2 - c*e*sqrt(-4*d*f + e**2))*atanh(sqrt(2)*(4*a*f -
 b*e + b*sqrt(-4*d*f + e**2) + x*(2*b*f - 2*c*e + 2*c*sqrt(-4*d*f
 + e**2)))/(4*sqrt(a + b*x + c*x**2)*sqrt(2*a*f**2 - b*e*f - 2*c*
d*f + c*e**2 + (b*f - c*e)*sqrt(-4*d*f + e**2))))/(2*f*sqrt(-4*d*
f + e**2))
```

Mathematica [A] time = 5.2834, size = 699, normalized size = 1.62

$$\sqrt{2}\log\left(\sqrt{e^2-4df}-e-2fx\right)\sqrt{f\left(2af+b\sqrt{e^2-4df}+b(-e)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)}-\sqrt{2}\log\left(\sqrt{e^2-4df}+e\right.$$

Antiderivative was successfully verified.

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

```
[Out] (Sqrt[2]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 -
 2*d*f - e*Sqrt[e^2 - 4*d*f])]*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x
] - Sqrt[2]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f
 - b*(e + Sqrt[e^2 - 4*d*f]))]*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x]
 + 2*Sqrt[c]*Sqrt[e^2 - 4*d*f]*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a +
 x*(b + c*x)]] - Sqrt[2]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*
d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]*Log[4*a*f*Sqrt[e^2
 - 4*d*f] + 2*c*e^2*x - 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + b
*(e^2 - 4*d*f - e*Sqrt[e^2 - 4*d*f] + 2*f*Sqrt[e^2 - 4*d*f]*x) +
2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 -
 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]*Sqrt[a + x*(b +
 c*x)]] + Sqrt[2]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*
(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*Log[4*a*f*Sqrt[e^2 - 4*d*f]
- 2*c*e^2*x + 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*S
qrt[e^2 - 4*d*f]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(
2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*Sqrt[a + x*(b + c*x)] - b*(e^
2 + e*Sqrt[e^2 - 4*d*f] - 2*f*(2*d + Sqrt[e^2 - 4*d*f]*x))])/(2*f
*Sqrt[e^2 - 4*d*f])
```

Maple [B] time = 0.091, size = 6019, normalized size = 14.

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d),x)

[Out] result too large to display
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out
```

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

$$\int \frac{\sqrt{a + bx + cx^2}}{d + ex + fx^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d),x)

[Out] Integral(sqrt(a + b*x + c*x**2)/(d + e*x + f*x**2), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: TypeError
```

3.103 $\int \frac{\sqrt{a+bx+cx^2}}{(d+ex+fx^2)^2}\,dx$

Optimal. Leaf size=488

$$-\frac{\left(f(be-4af)-\left(e-\sqrt{e^2-4df}\right)(ce-bf)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\left(e^2-4df\right)^{3/2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}+\frac{\left(f(be-4af)-\left(\sqrt{e^2-4df}+e\right)(ce-bf)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\left(e^2-4df\right)^{3/2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}-\frac{(e+2fx)\sqrt{a+bx+cx^2}}{\left(e^2-4df\right)\left(d+ex+fx^2\right)}$$

```
[Out] -(((e + 2*f*x)*Sqrt[a + b*x + c*x^2])/((e^2 - 4*d*f)*(d + e*x + f
*x^2))) - ((f*(b*e - 4*a*f) - (c*e - b*f)*(e - Sqrt[e^2 - 4*d*f])
)*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sq
rt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*
a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(
Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^
2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + ((f*(b*e - 4*a*f) - (c*e -
b*f)*(e + Sqrt[e^2 - 4*d*f]))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 -
4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[
c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]
]*Sqrt[a + b*x + c*x^2])])/(Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^
2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

Rubi [A] time = 7.22224, antiderivative size = 488, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148

$$-\frac{\left(f(be-4af)-\left(e-\sqrt{e^2-4df}\right)(ce-bf)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\left(e^2-4df\right)^{3/2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}+\frac{\left(f(be-4af)-\left(\sqrt{e^2-4df}+e\right)(ce-bf)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\left(e^2-4df\right)^{3/2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}-\frac{(e+2fx)\sqrt{a+bx+cx^2}}{\left(e^2-4df\right)\left(d+ex+fx^2\right)}$$

Warning: Unable to verify antiderivative.

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


```
[Out] -(((e + 2*f*x)*Sqrt[a + b*x + c*x^2])/((e^2 - 4*d*f)*(d + e*x + f
*x^2))) - ((f*(b*e - 4*a*f) - (c*e - b*f)*(e - Sqrt[e^2 - 4*d*f])
)*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sq
rt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*
a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(
Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^
2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + ((f*(b*e - 4*a*f) - (c*e -
b*f)*(e + Sqrt[e^2 - 4*d*f]))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 -
4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[
c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]
]*Sqrt[a + b*x + c*x^2])])/(Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^
2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2,x)
```

```
[Out] Timed out
```

Mathematica [A] time = 3.04353, size = 798, normalized size = 1.64

$$-\frac{\sqrt{a+x(b+cx)}(e+2fx)}{(e^2-4df)(d+x(e+fx))}$$
$$+\frac{\left(ce\left(\sqrt{e^2-4df}-e\right)-f\left(4af+b\left(\sqrt{e^2-4df}-2e\right)\right)\right)\log\left(-e-2fx+\sqrt{e^2-4df}\right)}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2-\sqrt{e^2-4df}e-2df\right)+f\left(2af+b\left(\sqrt{e^2-4df}-e\right)\right)}}$$
$$+\frac{\left(ce\left(e+\sqrt{e^2-4df}\right)+f\left(4af-b\left(2e+\sqrt{e^2-4df}\right)\right)\right)\log\left(e+2fx+\sqrt{e^2-4df}\right)}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2+\sqrt{e^2-4df}e-2df\right)+f\left(2af-b\left(e+\sqrt{e^2-4df}\right)\right)}}$$
$$-\frac{\left(ce\left(e+\sqrt{e^2-4df}\right)+f\left(4af-b\left(2e+\sqrt{e^2-4df}\right)\right)\right)\log\left(-4af+2cex+2c\sqrt{e^2-4df}x+b\left(e-2fx+\sqrt{e^2-4df}\right)-\right.}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2+\sqrt{e^2-4df}e-2df\right)+f\left(2af-\right.}}$$
$$-\frac{\left(ce\left(\sqrt{e^2-4df}-e\right)-f\left(4af+b\left(\sqrt{e^2-4df}-2e\right)\right)\right)\log\left(b\left(-e+2fx+\sqrt{e^2-4df}\right)+2\left(2af-cex+c\sqrt{e^2-4df}x\right.\right.}{\sqrt{2}(e^2-4df)^{3/2}\sqrt{c\left(e^2-\sqrt{e^2-4df}e-2df\right)+f\left(2af\right.}}$$

Antiderivative was successfully verified.

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

```
[Out] -(((e + 2*f*x)*Sqrt[a + x*(b + c*x)])/((e^2 - 4*d*f)*(d + x*(e +
f*x)))) + ((c*e*(-e + Sqrt[e^2 - 4*d*f]) - f*(4*a*f + b*(-2*e + S
qrt[e^2 - 4*d*f])))*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x])/(Sqrt[2]
*(e^2 - 4*d*f)^(3/2)*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) +
 f*(2*a*f + b*(-e + Sqrt[e^2 - 4*d*f]))]) + ((c*e*(e + Sqrt[e^2 -
 4*d*f]) + f*(4*a*f - b*(2*e + Sqrt[e^2 - 4*d*f])))*Log[e + Sqrt[
e^2 - 4*d*f] + 2*f*x])/(Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*(e^2 -
 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*
f]))]) - ((c*e*(e + Sqrt[e^2 - 4*d*f]) + f*(4*a*f - b*(2*e + Sqrt
[e^2 - 4*d*f])))*Log[-4*a*f + 2*c*e*x + 2*c*Sqrt[e^2 - 4*d*f]*x +
 b*(e + Sqrt[e^2 - 4*d*f] - 2*f*x) - 2*Sqrt[2]*Sqrt[c*(e^2 - 2*d*
f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]
*Sqrt[a + x*(b + c*x)]])/(Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c*(e^2
 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*
d*f]))]) - ((c*e*(-e + Sqrt[e^2 - 4*d*f]) - f*(4*a*f + b*(-2*e +
Sqrt[e^2 - 4*d*f])))*Log[b*(-e + Sqrt[e^2 - 4*d*f] + 2*f*x) + 2*(
2*a*f - c*e*x + c*Sqrt[e^2 - 4*d*f]*x + Sqrt[2]*Sqrt[f*(-(b*e) +
2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*
f])]*Sqrt[a + x*(b + c*x)])])/(Sqrt[2]*(e^2 - 4*d*f)^(3/2)*Sqrt[c
*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f + b*(-e + Sqrt[e^
2 - 4*d*f]))])
```

Maple [B] time = 0.059, size = 22287, normalized size = 45.7

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d)^2,x)
```

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

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

$$\int \frac{\sqrt{cx^2 + bx + a}}{(fx^2 + ex + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(sqrt(c*x^2 + b*x + a)/(f*x^2 + e*x + d)^2, x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.798802, size = 4, normalized size = 0.01

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] sage0*x
```

3.104 $\int \left(a+bx+cx^2\right)^{3/2} \left(d+ex+fx^2\right)^2 \, dx$

Optimal. Leaf size=564

$$\frac{\left(b^2-4ac\right)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) \left(16c^2 \left(3a^2f^2+24abef+14b^2\left(2df+e^2\right)\right)-72b^2cf(3af+4be)-128c^3\left(a\left(2df+e^2\right)\right.\right.}{32768c^{13/2}}$$
$$-\frac{\left(b^2-4ac\right)(b+2cx)\sqrt{a+bx+cx^2}\left(16c^2\left(3a^2f^2+24abef+14b^2\left(2df+e^2\right)\right)-72b^2cf(3af+4be)-128c^3\left(a\left(2df+e^2\right)\right.\right.}{16384c^6}$$
$$+\frac{(b+2cx)\left(a+bx+cx^2\right)^{3/2}\left(16c^2\left(3a^2f^2+24abef+14b^2\left(2df+e^2\right)\right)-72b^2cf(3af+4be)-128c^3\left(a\left(2df+e^2\right)+6bde\right.\right.}{6144c^5}$$
$$+\frac{\left(a+bx+cx^2\right)^{5/2}\left(-32c^2\left(48aef+49b\left(2df+e^2\right)\right)+36bcf(31af+56be)-693b^3f^2+5376c^3de\right)}{13440c^4}$$
$$+\frac{x\left(a+bx+cx^2\right)^{5/2}\left(-12cf(7af+24be)+99b^2f^2+224c^2\left(2df+e^2\right)\right)}{1344c^3}$$
$$+\frac{fx^2\left(a+bx+cx^2\right)^{5/2}(32ce-11bf)}{112c^2}+\frac{f^2x^3\left(a+bx+cx^2\right)^{5/2}}{8c}$$

```
[Out] -((b^2 - 4*a*c)*(768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b*e + 3
*a*f) - 128*c^3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*b*e*f
+ 3*a^2*f^2 + 14*b^2*(e^2 + 2*d*f)))*(b + 2*c*x)*Sqrt[a + b*x + c
*x^2])/(16384*c^6) + ((768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b
*e + 3*a*f) - 128*c^3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*
b*e*f + 3*a^2*f^2 + 14*b^2*(e^2 + 2*d*f)))*(b + 2*c*x)*(a + b*x +
 c*x^2)^(3/2))/(6144*c^5) + ((5376*c^3*d*e - 693*b^3*f^2 + 36*b*c
*f*(56*b*e + 31*a*f) - 32*c^2*(48*a*e*f + 49*b*(e^2 + 2*d*f)))*(a
 + b*x + c*x^2)^(5/2))/(13440*c^4) + ((99*b^2*f^2 - 12*c*f*(24*b*
e + 7*a*f) + 224*c^2*(e^2 + 2*d*f))*x*(a + b*x + c*x^2)^(5/2))/(1
344*c^3) + (f*(32*c*e - 11*b*f)*x^2*(a + b*x + c*x^2)^(5/2))/(112
*c^2) + (f^2*x^3*(a + b*x + c*x^2)^(5/2))/(8*c) + ((b^2 - 4*a*c)^
2*(768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b*e + 3*a*f) - 128*c^
3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*b*e*f + 3*a^2*f^2 +
14*b^2*(e^2 + 2*d*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*
x + c*x^2])])/(32768*c^(13/2))
```

Rubi [A] time = 2.0149, antiderivative size = 564, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{\left(b^2-4ac\right)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right) \left(16c^2 \left(3a^2f^2+24abef+14b^2\left(2df+e^2\right)\right)-72b^2cf(3af+4be)-128c^3\left(a\left(2df+e^2\right)\right.\right.}{32768c^{13/2}}$$
$$-\frac{\left(b^2-4ac\right)(b+2cx)\sqrt{a+bx+cx^2}\left(16c^2\left(3a^2f^2+24abef+14b^2\left(2df+e^2\right)\right)-72b^2cf(3af+4be)-128c^3\left(a\left(2df+e^2\right)\right.\right.}{16384c^6}$$
$$+\frac{(b+2cx)\left(a+bx+cx^2\right)^{3/2}\left(16c^2\left(3a^2f^2+24abef+14b^2\left(2df+e^2\right)\right)-72b^2cf(3af+4be)-128c^3\left(a\left(2df+e^2\right)+6bde\right.\right.}{6144c^5}$$
$$+\frac{\left(a+bx+cx^2\right)^{5/2}\left(-32c^2\left(48aef+49b\left(2df+e^2\right)\right)+36bcf(31af+56be)-693b^3f^2+5376c^3de\right)}{13440c^4}$$
$$+\frac{x\left(a+bx+cx^2\right)^{5/2}\left(-12cf(7af+24be)+99b^2f^2+224c^2\left(2df+e^2\right)\right)}{1344c^3}$$
$$+\frac{fx^2\left(a+bx+cx^2\right)^{5/2}(32ce-11bf)}{112c^2}+\frac{f^2x^3\left(a+bx+cx^2\right)^{5/2}}{8c}$$

Antiderivative was successfully verified.

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

```
[Out] -((b^2 - 4*a*c)*(768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b*e + 3
*a*f) - 128*c^3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*b*e*f
+ 3*a^2*f^2 + 14*b^2*(e^2 + 2*d*f)))*(b + 2*c*x)*Sqrt[a + b*x + c
*x^2])/(16384*c^6) + ((768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b
```

```
*e + 3*a*f) - 128*c^3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*
b*e*f + 3*a^2*f^2 + 14*b^2*(e^2 + 2*d*f)))*(b + 2*c*x)*(a + b*x +
 c*x^2)^(3/2))/(6144*c^5) + ((5376*c^3*d*e - 693*b^3*f^2 + 36*b*c
*f*(56*b*e + 31*a*f) - 32*c^2*(48*a*e*f + 49*b*(e^2 + 2*d*f)))*(a
 + b*x + c*x^2)^(5/2))/(13440*c^4) + ((99*b^2*f^2 - 12*c*f*(24*b*
e + 7*a*f) + 224*c^2*(e^2 + 2*d*f))*x*(a + b*x + c*x^2)^(5/2))/(1
344*c^3) + (f*(32*c*e - 11*b*f)*x^2*(a + b*x + c*x^2)^(5/2))/(112
*c^2) + (f^2*x^3*(a + b*x + c*x^2)^(5/2))/(8*c) + ((b^2 - 4*a*c)^
2*(768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b*e + 3*a*f) - 128*c^
3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*b*e*f + 3*a^2*f^2 +
14*b^2*(e^2 + 2*d*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*
x + c*x^2])])/(32768*c^(13/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out
```

Mathematica [A] time = 3.71328, size = 766, normalized size = 1.36

$$105\left(b^2-4ac\right)^2\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)\left(16c^2\left(3a^2f^2+24abef+14b^2\left(2df+e^2\right)\right)-72b^2cf(3af+4be)-128c$$

Antiderivative was successfully verified.

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

[Out] (-2*Sqrt[c]*Sqrt[a + x*(b + c*x)]*(10395*b^7*f^2 - 630*b^6*c*f*(4
8*e + 11*f*x) + 84*b^5*c*(-1095*a*f^2 + c*(280*e^2 + 560*d*f + 24
0*e*f*x + 66*f^2*x^2)) - 8*b^4*c^2*(560*c*d*(18*e + 7*f*x) - 63*a
*f*(480*e + 107*f*x) + 2*c*x*(980*e^2 + 1008*e*f*x + 297*f^2*x^2)
) + 16*b^3*c^2*(15309*a^2*f^2 - 4*a*c*(2660*e^2 + 5320*d*f + 2184
*e*f*x + 585*f^2*x^2) + 8*c^2*(630*d^2 + 28*d*x*(15*e + 7*f*x) +
x^2*(98*e^2 + 108*e*f*x + 33*f^2*x^2))) - 96*b^2*c^3*(a^2*f*(5488
*e + 1181*f*x) + 8*c^2*x*(70*d^2 + 28*d*x*(2*e + f*x) + x^2*(14*e
^2 + 16*e*f*x + 5*f^2*x^2)) - 4*a*c*(56*d*(25*e + 9*f*x) + x*(252
*e^2 + 248*e*f*x + 71*f^2*x^2))) - 64*b*c^3*(2757*a^3*f^2 - 6*a^2
*c*(756*e^2 + 584*e*f*x + f*(1512*d + 151*f*x^2)) + 24*a*c^2*(350
*d^2 + 28*d*x*(7*e + 3*f*x) + x^2*(42*e^2 + 44*e*f*x + 13*f^2*x^2
)) + 16*c^3*x^2*(630*d^2 + 28*d*x*(33*e + 26*f*x) + x^2*(364*e^2
+ 600*e*f*x + 255*f^2*x^2))) - 128*c^4*(-3*a^3*f*(512*e + 105*f*x
) + 16*c^3*x^3*(210*d^2 + 56*d*x*(6*e + 5*f*x) + 5*x^2*(28*e^2 +
48*e*f*x + 21*f^2*x^2)) + 6*a^2*c*(56*d*(16*e + 5*f*x) + x*(140*e
^2 + 128*e*f*x + 35*f^2*x^2)) + 8*a*c^2*x*(1050*d^2 + 28*d*x*(48*
e + 35*f*x) + x^2*(490*e^2 + 768*e*f*x + 315*f^2*x^2)))) + 105*(b
^2 - 4*a*c)^2*(768*c^4*d^2 + 99*b^4*f^2 - 72*b^2*c*f*(4*b*e + 3*a
*f) - 128*c^3*(6*b*d*e + a*(e^2 + 2*d*f)) + 16*c^2*(24*a*b*e*f +
3*a^2*f^2 + 14*b^2*(e^2 + 2*d*f)))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt
[a + x*(b + c*x)]])/(3440640*c^(13/2))
```

Maple [B] time = 0.031, size = 2458, normalized size = 4.4

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/16*e*f*b/c^2*a^2*(c*x^2+b*x+a)^(1/2)*x-3/16*e*f*b^3/c^3*(c*x^2+
b*x+a)^(1/2)*x*a+1/8*e*f*b/c^2*a*(c*x^2+b*x+a)^(3/2)*x+1/4*b^2/c^
2*(c*x^2+b*x+a)^(1/2)*x*a*d*f-3/8*d*e*b/c*(c*x^2+b*x+a)^(1/2)*x*a
+1/8*f^2*x^3*(c*x^2+b*x+a)^(5/2)/c-15/64*e*f*b^3/c^(7/2)*ln((1/2*
b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2+21/256*e*f*b^5/c^(9/2)*ln
((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a-3/14*e*f*b/c^2*x*(c*x
^2+b*x+a)^(5/2)-3/32*e*f*b^3/c^3*(c*x^2+b*x+a)^(3/2)*x+9/256*e*f*
b^5/c^4*(c*x^2+b*x+a)^(1/2)*x-3/32*e*f*b^4/c^4*(c*x^2+b*x+a)^(1/2
)*a+1/16*e*f*b^2/c^3*a*(c*x^2+b*x+a)^(3/2)+3/32*e*f*b^2/c^3*a^2*(
c*x^2+b*x+a)^(1/2)-9/128*f^2*b^2/c^3*a*(c*x^2+b*x+a)^(3/2)*x-57/5
12*f^2*b^2/c^3*a^2*(c*x^2+b*x+a)^(1/2)*x+153/2048*f^2*b^4/c^4*(c*
x^2+b*x+a)^(1/2)*x*a+7/48*b^2/c^2*(c*x^2+b*x+a)^(3/2)*x*d*f+1/8*b
^2/c^2*(c*x^2+b*x+a)^(1/2)*x*a*e^2-7/128*b^4/c^3*(c*x^2+b*x+a)^(1
/2)*x*d*f+1/8*b^3/c^3*(c*x^2+b*x+a)^(1/2)*a*d*f+9/32*b^2/c^(5/2)*
ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2*d*f-15/128*b^4/c^
(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a*d*f-1/12/c*a*
(c*x^2+b*x+a)^(3/2)*x*d*f-1/24/c^2*a*(c*x^2+b*x+a)^(3/2)*b*d*f-1/
8/c*a^2*(c*x^2+b*x+a)^(1/2)*x*d*f-1/16/c^2*a^2*(c*x^2+b*x+a)^(1/2
)*b*d*f-1/4*d*e*b/c*(c*x^2+b*x+a)^(3/2)*x+3/32*d*e*b^3/c^2*(c*x^2
+b*x+a)^(1/2)*x-3/16*d*e*b^2/c^2*(c*x^2+b*x+a)^(1/2)*a-3/8*d*e*b/
c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2+3/16*d*e*
b^3/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a+3/16*e*
f*b/c^(5/2)*a^3*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+3/8*d
^2/c^(1/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2+2/5*d*
e*(c*x^2+b*x+a)^(5/2)/c+1/6*x*(c*x^2+b*x+a)^(5/2)/c*e^2-7/60*b/c^
2*(c*x^2+b*x+a)^(5/2)*e^2+7/192*b^3/c^3*(c*x^2+b*x+a)^(3/2)*e^2-7
/512*b^5/c^4*(c*x^2+b*x+a)^(1/2)*e^2+7/1024*b^6/c^(9/2)*ln((1/2*b
+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2-1/16/c^(3/2)*a^3*ln((1/2*b
+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2-99/16384*f^2*b^7/c^6*(c*x^
2+b*x+a)^(1/2)+99/32768*f^2*b^8/c^(13/2)*ln((1/2*b+c*x)/c^(1/2)+(
c*x^2+b*x+a)^(1/2))+3/128*f^2/c^(5/2)*a^4*ln((1/2*b+c*x)/c^(1/2)+
(c*x^2+b*x+a)^(1/2))-33/640*f^2*b^3/c^4*(c*x^2+b*x+a)^(5/2)+33/20
48*f^2*b^5/c^5*(c*x^2+b*x+a)^(3/2)+3/128*d^2/c^(5/2)*ln((1/2*b+c*
x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*b^4+1/8*d^2/c*(c*x^2+b*x+a)^(3/2)
*b+3/8*d^2*(c*x^2+b*x+a)^(1/2)*x*a-3/64*d^2/c^2*(c*x^2+b*x+a)^(1/
2)*b^3-15/128*f^2*b^2/c^(7/2)*a^3*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b
*x+a)^(1/2))+33/448*f^2*b^2/c^3*x*(c*x^2+b*x+a)^(5/2)+33/1024*f^2
*b^4/c^4*(c*x^2+b*x+a)^(3/2)*x+105/1024*f^2*b^4/c^(9/2)*ln((1/2*b
+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2-63/2048*f^2*b^6/c^(11/2)*l
n((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a+3/128*f^2/c^2*a^3*(c
*x^2+b*x+a)^(1/2)*x+3/256*f^2/c^3*a^3*(c*x^2+b*x+a)^(1/2)*b-1/16*
f^2/c^2*a*x*(c*x^2+b*x+a)^(5/2)+1/64*f^2/c^2*a^2*(c*x^2+b*x+a)^(3
/2)*x+1/128*f^2/c^3*a^2*(c*x^2+b*x+a)^(3/2)*b-99/8192*f^2*b^6/c^5
*(c*x^2+b*x+a)^(1/2)*x+153/4096*f^2*b^5/c^5*(c*x^2+b*x+a)^(1/2)*a
-9/256*f^2*b^3/c^4*a*(c*x^2+b*x+a)^(3/2)-57/1024*f^2*b^3/c^4*a^2*
(c*x^2+b*x+a)^(1/2)+93/1120*f^2*b/c^3*a*(c*x^2+b*x+a)^(5/2)-7/30*
b/c^2*(c*x^2+b*x+a)^(5/2)*d*f+7/96*b^2/c^2*(c*x^2+b*x+a)^(3/2)*x*
e^2-11/112*f^2*b/c^2*x^2*(c*x^2+b*x+a)^(5/2)-1/48/c^2*a*(c*x^2+b*
x+a)^(3/2)*b*e^2-1/16/c*a^2*(c*x^2+b*x+a)^(1/2)*x*e^2-1/32/c^2*a^
2*(c*x^2+b*x+a)^(1/2)*b*e^2-1/8/c^(3/2)*a^3*ln((1/2*b+c*x)/c^(1/2
)+(c*x^2+b*x+a)^(1/2))*d*f+1/3*x*(c*x^2+b*x+a)^(5/2)/c*d*f-15/256
*b^4/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a*e^2+7/
512*b^6/c^(9/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*f-1
/24/c*a*(c*x^2+b*x+a)^(3/2)*x*e^2+7/96*b^3/c^3*(c*x^2+b*x+a)^(3/2
)*d*f-7/256*b^4/c^3*(c*x^2+b*x+a)^(1/2)*x*e^2+1/16*b^3/c^3*(c*x^2
+b*x+a)^(1/2)*a*e^2-7/256*b^5/c^4*(c*x^2+b*x+a)^(1/2)*d*f+9/64*b^
2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2*e^2+3/6
4*d*e*b^4/c^3*(c*x^2+b*x+a)^(1/2)-3/128*d*e*b^5/c^(7/2)*ln((1/2*b
+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-1/8*d*e*b^2/c^2*(c*x^2+b*x+a)^
(3/2)+3/20*e*f*b^2/c^3*(c*x^2+b*x+a)^(5/2)-3/64*e*f*b^4/c^4*(c*x^
2+b*x+a)^(3/2)+9/512*e*f*b^6/c^5*(c*x^2+b*x+a)^(1/2)+3/16*d^2/c*(
c*x^2+b*x+a)^(1/2)*b*a+2/7*e*f*x^2*(c*x^2+b*x+a)^(5/2)/c-9/1024*e
*f*b^7/c^(11/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-4/35*
e*f/c^2*a*(c*x^2+b*x+a)^(5/2)+1/4*d^2*(c*x^2+b*x+a)^(3/2)*x-3/32*
d^2/c*(c*x^2+b*x+a)^(1/2)*x*b^2-3/16*d^2/c^(3/2)*ln((1/2*b+c*x)/c
^(1/2)+(c*x^2+b*x+a)^(1/2))*b^2*a
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.15616, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/6881280*(4*(215040*c^7*f^2*x^7 + 15360*(32*c^7*e*f + 17*b*c^6*
f^2)*x^6 + 1280*(224*c^7*e^2 + 3*(b^2*c^5 + 84*a*c^6)*f^2 + 32*(1
4*c^7*d + 15*b*c^6*e)*f)*x^5 + 128*(5376*c^7*d*e + 2912*b*c^6*e^2
 - 3*(11*b^3*c^4 - 52*a*b*c^5)*f^2 + 32*(182*b*c^6*d + 3*(b^2*c^5
 + 64*a*c^6)*e)*f)*x^4 + 16*(26880*c^7*d^2 + 59136*b*c^6*d*e + 22
4*(3*b^2*c^5 + 140*a*c^6)*e^2 + 3*(99*b^4*c^3 - 568*a*b^2*c^4 + 5
60*a^2*c^5)*f^2 + 32*(14*(3*b^2*c^5 + 140*a*c^6)*d - 3*(9*b^3*c^4
 - 44*a*b*c^5)*e)*f)*x^3 - 26880*(3*b^3*c^4 - 20*a*b*c^5)*d^2 + 5
376*(15*b^4*c^3 - 100*a*b^2*c^4 + 128*a^2*c^5)*d*e - 224*(105*b^5
*c^2 - 760*a*b^3*c^3 + 1296*a^2*b*c^4)*e^2 - 3*(3465*b^7 - 30660*
a*b^5*c + 81648*a^2*b^3*c^2 - 58816*a^3*b*c^3)*f^2 + 8*(80640*b*c
^6*d^2 + 5376*(b^2*c^5 + 32*a*c^6)*d*e - 224*(7*b^3*c^4 - 36*a*b*
c^5)*e^2 - 3*(231*b^5*c^2 - 1560*a*b^3*c^3 + 2416*a^2*b*c^4)*f^2
- 32*(14*(7*b^3*c^4 - 36*a*b*c^5)*d - 3*(21*b^4*c^3 - 124*a*b^2*c
^4 + 128*a^2*c^5)*e)*f)*x^2 - 32*(14*(105*b^5*c^2 - 760*a*b^3*c^3
 + 1296*a^2*b*c^4)*d - 3*(315*b^6*c - 2520*a*b^4*c^2 + 5488*a^2*b
^2*c^3 - 2048*a^3*c^4)*e)*f + 2*(26880*(b^2*c^5 + 20*a*c^6)*d^2 -
 5376*(5*b^3*c^4 - 28*a*b*c^5)*d*e + 224*(35*b^4*c^3 - 216*a*b^2*
c^4 + 240*a^2*c^5)*e^2 + 3*(1155*b^6*c - 8988*a*b^4*c^2 + 18896*a
^2*b^2*c^3 - 6720*a^3*c^4)*f^2 + 32*(14*(35*b^4*c^3 - 216*a*b^2*c
^4 + 240*a^2*c^5)*d - 3*(105*b^5*c^2 - 728*a*b^3*c^3 + 1168*a^2*b
*c^4)*e)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) + 105*(768*(b^4*c^4
- 8*a*b^2*c^5 + 16*a^2*c^6)*d^2 - 768*(b^5*c^3 - 8*a*b^3*c^4 + 16
*a^2*b*c^5)*d*e + 32*(7*b^6*c^2 - 60*a*b^4*c^3 + 144*a^2*b^2*c^4
- 64*a^3*c^5)*e^2 + 3*(33*b^8 - 336*a*b^6*c + 1120*a^2*b^4*c^2 -
1280*a^3*b^2*c^3 + 256*a^4*c^4)*f^2 + 32*(2*(7*b^6*c^2 - 60*a*b^4
*c^3 + 144*a^2*b^2*c^4 - 64*a^3*c^5)*d - 3*(3*b^7*c - 28*a*b^5*c^
2 + 80*a^2*b^3*c^3 - 64*a^3*b*c^4)*e)*f)*log(-4*(2*c^2*x + b*c)*s
qrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c
)))/c^(13/2), 1/3440640*(2*(215040*c^7*f^2*x^7 + 15360*(32*c^7*e*
f + 17*b*c^6*f^2)*x^6 + 1280*(224*c^7*e^2 + 3*(b^2*c^5 + 84*a*c^6
)*f^2 + 32*(14*c^7*d + 15*b*c^6*e)*f)*x^5 + 128*(5376*c^7*d*e + 2
912*b*c^6*e^2 - 3*(11*b^3*c^4 - 52*a*b*c^5)*f^2 + 32*(182*b*c^6*d
 + 3*(b^2*c^5 + 64*a*c^6)*e)*f)*x^4 + 16*(26880*c^7*d^2 + 59136*b
*c^6*d*e + 224*(3*b^2*c^5 + 140*a*c^6)*e^2 + 3*(99*b^4*c^3 - 568*
a*b^2*c^4 + 560*a^2*c^5)*f^2 + 32*(14*(3*b^2*c^5 + 140*a*c^6)*d -
 3*(9*b^3*c^4 - 44*a*b*c^5)*e)*f)*x^3 - 26880*(3*b^3*c^4 - 20*a*b
*c^5)*d^2 + 5376*(15*b^4*c^3 - 100*a*b^2*c^4 + 128*a^2*c^5)*d*e -
 224*(105*b^5*c^2 - 760*a*b^3*c^3 + 1296*a^2*b*c^4)*e^2 - 3*(3465
*b^7 - 30660*a*b^5*c + 81648*a^2*b^3*c^2 - 58816*a^3*b*c^3)*f^2 +
 8*(80640*b*c^6*d^2 + 5376*(b^2*c^5 + 32*a*c^6)*d*e - 224*(7*b^3*
c^4 - 36*a*b*c^5)*e^2 - 3*(231*b^5*c^2 - 1560*a*b^3*c^3 + 2416*a^
2*b*c^4)*f^2 - 32*(14*(7*b^3*c^4 - 36*a*b*c^5)*d - 3*(21*b^4*c^3
- 124*a*b^2*c^4 + 128*a^2*c^5)*e)*f)*x^2 - 32*(14*(105*b^5*c^2 -
760*a*b^3*c^3 + 1296*a^2*b*c^4)*d - 3*(315*b^6*c - 2520*a*b^4*c^2
 + 5488*a^2*b^2*c^3 - 2048*a^3*c^4)*e)*f + 2*(26880*(b^2*c^5 + 20
```

```
*a*c^6)*d^2 - 5376*(5*b^3*c^4 - 28*a*b*c^5)*d*e + 224*(35*b^4*c^3
 - 216*a*b^2*c^4 + 240*a^2*c^5)*e^2 + 3*(1155*b^6*c - 8988*a*b^4*
c^2 + 18896*a^2*b^2*c^3 - 6720*a^3*c^4)*f^2 + 32*(14*(35*b^4*c^3
- 216*a*b^2*c^4 + 240*a^2*c^5)*d - 3*(105*b^5*c^2 - 728*a*b^3*c^3
 + 1168*a^2*b*c^4)*e)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(-c) + 105*
(768*(b^4*c^4 - 8*a*b^2*c^5 + 16*a^2*c^6)*d^2 - 768*(b^5*c^3 - 8*
a*b^3*c^4 + 16*a^2*b*c^5)*d*e + 32*(7*b^6*c^2 - 60*a*b^4*c^3 + 14
4*a^2*b^2*c^4 - 64*a^3*c^5)*e^2 + 3*(33*b^8 - 336*a*b^6*c + 1120*
a^2*b^4*c^2 - 1280*a^3*b^2*c^3 + 256*a^4*c^4)*f^2 + 32*(2*(7*b^6*
c^2 - 60*a*b^4*c^3 + 144*a^2*b^2*c^4 - 64*a^3*c^5)*d - 3*(3*b^7*c
 - 28*a*b^5*c^2 + 80*a^2*b^3*c^3 - 64*a^3*b*c^4)*e)*f)*arctan(1/2
*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/(sqrt(-c)*c^6)]
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((a + b*x + c*x**2)**(3/2)*(d + e*x + f*x**2)**2, x)
```

GIAC/XCAS [A] time = 0.283909, size = 1, normalized size = 0.

$$Done$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Done
```

3.105 $\int \left(a+bx+cx^2\right)^{3/2} \left(d+ex+fx^2\right)\, dx$

Optimal. Leaf size=236

$$\frac{\left(b^2-4ac\right)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-4c(af+3be)+7b^2f+24c^2d\right)}{1024c^{9/2}} - \frac{\left(b^2-4ac\right)(b+2cx)\sqrt{a+bx+cx^2}\left(-4c(af+3be)+7b^2f+24c^2d\right)}{512c^4} + \frac{(b+2cx)\left(a+bx+cx^2\right)^{3/2}\left(-4acf+7b^2f-12bce+24c^2d\right)}{192c^3} + \frac{\left(a+bx+cx^2\right)^{5/2}(12ce-7bf)}{60c^2} + \frac{fx\left(a+bx+cx^2\right)^{5/2}}{6c}$$

```
[Out] -((b^2 - 4*a*c)*(24*c^2*d + 7*b^2*f - 4*c*(3*b*e + a*f))*(b + 2*c
*x)*Sqrt[a + b*x + c*x^2])/(512*c^4) + ((24*c^2*d - 12*b*c*e + 7*
b^2*f - 4*a*c*f)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2))/(192*c^3) +
 ((12*c*e - 7*b*f)*(a + b*x + c*x^2)^(5/2))/(60*c^2) + (f*x*(a +
b*x + c*x^2)^(5/2))/(6*c) + ((b^2 - 4*a*c)^2*(24*c^2*d + 7*b^2*f
- 4*c*(3*b*e + a*f))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x
+ c*x^2])])/(1024*c^(9/2))
```

Rubi [A] time = 0.497392, antiderivative size = 236, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.2$

$$\frac{\left(b^2-4ac\right)^2 \tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-4c(af+3be)+7b^2f+24c^2d\right)}{1024c^{9/2}} - \frac{\left(b^2-4ac\right)(b+2cx)\sqrt{a+bx+cx^2}\left(-4c(af+3be)+7b^2f+24c^2d\right)}{512c^4} + \frac{(b+2cx)\left(a+bx+cx^2\right)^{3/2}\left(-4acf+7b^2f-12bce+24c^2d\right)}{192c^3} + \frac{\left(a+bx+cx^2\right)^{5/2}(12ce-7bf)}{60c^2} + \frac{fx\left(a+bx+cx^2\right)^{5/2}}{6c}$$

Antiderivative was successfully verified.

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

```
[Out] -((b^2 - 4*a*c)*(24*c^2*d + 7*b^2*f - 4*c*(3*b*e + a*f))*(b + 2*c
*x)*Sqrt[a + b*x + c*x^2])/(512*c^4) + ((24*c^2*d - 12*b*c*e + 7*
b^2*f - 4*a*c*f)*(b + 2*c*x)*(a + b*x + c*x^2)^(3/2))/(192*c^3) +
 ((12*c*e - 7*b*f)*(a + b*x + c*x^2)^(5/2))/(60*c^2) + (f*x*(a +
b*x + c*x^2)^(5/2))/(6*c) + ((b^2 - 4*a*c)^2*(24*c^2*d + 7*b^2*f
- 4*c*(3*b*e + a*f))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x
+ c*x^2])])/(1024*c^(9/2))
```

Rubi in Sympy [A] time = 30.602, size = 223, normalized size = 0.94

$$-\frac{\left(a+bx+cx^2\right)^{\frac{5}{2}}\left(\frac{7bf}{2}-6ce-5cfx\right)}{30c^2} + \frac{(b+2cx)\left(a+bx+cx^2\right)^{\frac{3}{2}}\left(-4acf+7b^2f-12bce+24c^2d\right)}{192c^3} - \frac{(b+2cx)\left(-4ac+b^2\right)\sqrt{a+bx+cx^2}\left(-4acf+7b^2f-12bce+24c^2d\right)}{512c^4} + \frac{\left(-4ac+b^2\right)^2\left(-4acf+7b^2f-12bce+24c^2d\right)\operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{1024c^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(a + b*x + c*x**2)**(5/2)*(7*b*f/2 - 6*c*e - 5*c*f*x)/(30*c**2)
+ (b + 2*c*x)*(a + b*x + c*x**2)**(3/2)*(-4*a*c*f + 7*b**2*f - 12
*b*c*e + 24*c**2*d)/(192*c**3) - (b + 2*c*x)*(-4*a*c + b**2)*sqrt
(a + b*x + c*x**2)*(-4*a*c*f + 7*b**2*f - 12*b*c*e + 24*c**2*d)/(
512*c**4) + (-4*a*c + b**2)**2*(-4*a*c*f + 7*b**2*f - 12*b*c*e +
24*c**2*d)*atanh((b + 2*c*x)/(2*sqrt(c)*sqrt(a + b*x + c*x**2)))/
(1024*c**(9/2))
```

Mathematica [A] time = 0.657957, size = 290, normalized size = 1.23

$$\frac{15\left(b^2-4ac\right)^2\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)\left(-4c(af+3be)+7b^2f+24c^2d\right)-2\sqrt{c}\sqrt{a+x(b+cx)}\left(-16bc^2\left(-81a^2f\right.\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*Sqrt[c]*Sqrt[a + x*(b + c*x)]*(105*b^5*f - 10*b^4*c*(18*e + 7
*f*x) + 8*b^3*c*(45*c*d - 95*a*f + c*x*(15*e + 7*f*x)) + 48*b^2*c
^2*(a*(25*e + 9*f*x) - c*x*(5*d + x*(2*e + f*x))) - 16*b*c^2*(-81
*a^2*f + 6*a*c*(25*d + x*(7*e + 3*f*x)) + 4*c^2*x^2*(45*d + x*(33
*e + 26*f*x))) - 32*c^3*(3*a^2*(16*e + 5*f*x) + 4*c^2*x^3*(15*d +
 2*x*(6*e + 5*f*x)) + 2*a*c*x*(75*d + x*(48*e + 35*f*x)))) + 15*(
b^2 - 4*a*c)^2*(24*c^2*d + 7*b^2*f - 4*c*(3*b*e + a*f))*Log[b + 2
*c*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)]])/(15360*c^(9/2))
```

Maple [B] time = 0.011, size = 862, normalized size = 3.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -3/16*e*b/c*(c*x^2+b*x+a)^(1/2)*x*a+1/8*f*b^2/c^2*(c*x^2+b*x+a)^(
1/2)*x*a-15/256*f*b^4/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a
)^(1/2))*a-1/24*f/c*a*(c*x^2+b*x+a)^(3/2)*x-1/8*e*b/c*(c*x^2+b*x+
a)^(3/2)*x+3/64*e*b^3/c^2*(c*x^2+b*x+a)^(1/2)*x-3/32*e*b^2/c^2*(c
*x^2+b*x+a)^(1/2)*a-3/16*e*b/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^
2+b*x+a)^(1/2))*a^2+3/32*e*b^3/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*
x^2+b*x+a)^(1/2))*a-3/32*d/c*(c*x^2+b*x+a)^(1/2)*x*b^2+3/16*d/c*(
c*x^2+b*x+a)^(1/2)*b*a-3/16*d/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x
^2+b*x+a)^(1/2))*b^2*a-1/32*f/c^2*a^2*(c*x^2+b*x+a)^(1/2)*b+7/96*
f*b^2/c^2*(c*x^2+b*x+a)^(3/2)*x-7/256*f*b^4/c^3*(c*x^2+b*x+a)^(1/
2)*x+1/16*f*b^3/c^3*(c*x^2+b*x+a)^(1/2)*a+9/64*f*b^2/c^(5/2)*ln((
1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2-1/16*f/c*a^2*(c*x^2+b
*x+a)^(1/2)*x+1/5*e*(c*x^2+b*x+a)^(5/2)/c+1/4*d*(c*x^2+b*x+a)^(3/
2)*x+1/6*f*x*(c*x^2+b*x+a)^(5/2)/c+3/8*d*(c*x^2+b*x+a)^(1/2)*x*a-
3/64*d/c^2*(c*x^2+b*x+a)^(1/2)*b^3+3/8*d/c^(1/2)*ln((1/2*b+c*x)/c
^(1/2)+(c*x^2+b*x+a)^(1/2))*a^2+3/128*d/c^(5/2)*ln((1/2*b+c*x)/c^
(1/2)+(c*x^2+b*x+a)^(1/2))*b^4+7/192*f*b^3/c^3*(c*x^2+b*x+a)^(3/2
)-7/512*f*b^5/c^4*(c*x^2+b*x+a)^(1/2)+7/1024*f*b^6/c^(9/2)*ln((1/
2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-1/16*e*b^2/c^2*(c*x^2+b*x+a
)^(3/2)+3/128*e*b^4/c^3*(c*x^2+b*x+a)^(1/2)-3/256*e*b^5/c^(7/2)*l
n((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+1/8*d/c*(c*x^2+b*x+a)^
(3/2)*b-1/16*f/c^(3/2)*a^3*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(
1/2))-7/60*f*b/c^2*(c*x^2+b*x+a)^(5/2)-1/48*f/c^2*a*(c*x^2+b*x+a)
```

```
^(3/2)*b
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.373982, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] [1/30720*(4*(1280*c^5*f*x^5 + 128*(12*c^5*e + 13*b*c^4*f)*x^4 + 1
6*(120*c^5*d + 132*b*c^4*e + (3*b^2*c^3 + 140*a*c^4)*f)*x^3 + 8*(
360*b*c^4*d + 12*(b^2*c^3 + 32*a*c^4)*e - (7*b^3*c^2 - 36*a*b*c^3
)*f)*x^2 - 120*(3*b^3*c^2 - 20*a*b*c^3)*d + 12*(15*b^4*c - 100*a*
b^2*c^2 + 128*a^2*c^3)*e - (105*b^5 - 760*a*b^3*c + 1296*a^2*b*c^
2)*f + 2*(120*(b^2*c^3 + 20*a*c^4)*d - 12*(5*b^3*c^2 - 28*a*b*c^3
)*e + (35*b^4*c - 216*a*b^2*c^2 + 240*a^2*c^3)*f)*x)*sqrt(c*x^2 +
 b*x + a)*sqrt(c) - 15*(24*(b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4)*d
 - 12*(b^5*c - 8*a*b^3*c^2 + 16*a^2*b*c^3)*e + (7*b^6 - 60*a*b^4*
c + 144*a^2*b^2*c^2 - 64*a^3*c^3)*f)*log(4*(2*c^2*x + b*c)*sqrt(c
*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/c
^(9/2), 1/15360*(2*(1280*c^5*f*x^5 + 128*(12*c^5*e + 13*b*c^4*f)*
x^4 + 16*(120*c^5*d + 132*b*c^4*e + (3*b^2*c^3 + 140*a*c^4)*f)*x^
3 + 8*(360*b*c^4*d + 12*(b^2*c^3 + 32*a*c^4)*e - (7*b^3*c^2 - 36*
a*b*c^3)*f)*x^2 - 120*(3*b^3*c^2 - 20*a*b*c^3)*d + 12*(15*b^4*c -
 100*a*b^2*c^2 + 128*a^2*c^3)*e - (105*b^5 - 760*a*b^3*c + 1296*a
^2*b*c^2)*f + 2*(120*(b^2*c^3 + 20*a*c^4)*d - 12*(5*b^3*c^2 - 28*
a*b*c^3)*e + (35*b^4*c - 216*a*b^2*c^2 + 240*a^2*c^3)*f)*x)*sqrt(
c*x^2 + b*x + a)*sqrt(-c) + 15*(24*(b^4*c^2 - 8*a*b^2*c^3 + 16*a^
2*c^4)*d - 12*(b^5*c - 8*a*b^3*c^2 + 16*a^2*b*c^3)*e + (7*b^6 - 6
0*a*b^4*c + 144*a^2*b^2*c^2 - 64*a^3*c^3)*f)*arctan(1/2*(2*c*x +
b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/(sqrt(-c)*c^4)]
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Integral((a + b*x + c*x**2)**(3/2)*(d + e*x + f*x**2), x)
```

GIAC/XCAS [A] time = 0.27966, size = 563, normalized size = 2.39

$$\frac{1}{7680}\sqrt{cx^2+bx+a}\left(2\left(4\left(2\left(8\left(10\,cfx+\frac{13\,bc^5f+12\,c^6e}{c^5}\right)x+\frac{120\,c^6d+3\,b^2c^4f+140\,ac^5f+132\,bc^5e}{c^5}\right)x+\frac{360\,bc^5d-7\right.$$

$$-\frac{\left(24\,b^4c^2d-192\,ab^2c^3d+384\,a^2c^4d+7\,b^6f-60\,ab^4cf+144\,a^2b^2c^2f-64\,a^3c^3f-12\,b^5ce+96\,ab^3c^2e-192\,a^2bc^3e\right)\ln\left(\right.}{1024\,c^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7680*sqrt(c*x^2 + b*x + a)*(2*(4*(2*(8*(10*c*f*x + (13*b*c^5*f
+ 12*c^6*e)/c^5)*x + (120*c^6*d + 3*b^2*c^4*f + 140*a*c^5*f + 132
*b*c^5*e)/c^5)*x + (360*b*c^5*d - 7*b^3*c^3*f + 36*a*b*c^4*f + 12
*b^2*c^4*e + 384*a*c^5*e)/c^5)*x + (120*b^2*c^4*d + 2400*a*c^5*d
+ 35*b^4*c^2*f - 216*a*b^2*c^3*f + 240*a^2*c^4*f - 60*b^3*c^3*e +
 336*a*b*c^4*e)/c^5)*x - (360*b^3*c^3*d - 2400*a*b*c^4*d + 105*b^
5*c*f - 760*a*b^3*c^2*f + 1296*a^2*b*c^3*f - 180*b^4*c^2*e + 1200
*a*b^2*c^3*e - 1536*a^2*c^4*e)/c^5) - 1/1024*(24*b^4*c^2*d - 192*
a*b^2*c^3*d + 384*a^2*c^4*d + 7*b^6*f - 60*a*b^4*c*f + 144*a^2*b^
2*c^2*f - 64*a^3*c^3*f - 12*b^5*c*e + 96*a*b^3*c^2*e - 192*a^2*b*
c^3*e)*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b)
)/c^(9/2)
```

3.106 $\int \frac{\left(a+bx+cx^2\right)^{3/2}}{d+ex+fx^2}\,dx$

Optimal. Leaf size=679

$$\frac{\left(\left(e-\sqrt{e^2-4df}\right)(ce-bf)\left(f(be-2af)-c\left(e^2-2df\right)\right)-2f\left(-f^2\left(b^2d-a^2f\right)+2cdf(be-af)+c^2(-d)\left(e^2-df\right)\right)\right)\,\mathrm{t}}{\sqrt{2}f^3\sqrt{e^2-4df}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$

$$-\frac{\left(\left(\sqrt{e^2-4df}+e\right)(ce-bf)\left(f(be-2af)-c\left(e^2-2df\right)\right)-2f\left(-f^2\left(b^2d-a^2f\right)+2cdf(be-af)+c^2(-d)\left(e^2-df\right)\right)\right)}{\sqrt{2}f^3\sqrt{e^2-4df}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+c}}$$

$$+\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-12cf(be-af)+3b^2f^2+8c^2\left(e^2-df\right)\right)}{8\sqrt{c}f^3}-\frac{\sqrt{a+bx+cx^2}(-5bf+4ce-2cfx)}{4f^2}$$

```
[Out] -((4*c*e - 5*b*f - 2*c*f*x)*Sqrt[a + b*x + c*x^2])/(4*f^2) + ((3*
b^2*f^2 - 12*c*f*(b*e - a*f) + 8*c^2*(e^2 - d*f))*ArcTanh[(b + 2*
c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*Sqrt[c]*f^3) + (((c*e
 - b*f)*(e - Sqrt[e^2 - 4*d*f])*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f
)) - 2*f*(2*c*d*f*(b*e - a*f) - f^2*(b^2*d - a^2*f) - c^2*d*(e^2
- d*f)))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*
(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e
*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^
2])])/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f
 + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) - (((c*e - b*f)*(e +
 Sqrt[e^2 - 4*d*f])*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f)) - 2*f*(2*
c*d*f*(b*e - a*f) - f^2*(b^2*d - a^2*f) - c^2*d*(e^2 - d*f)))*Arc
Tanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^
2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2
 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(Sqrt[
2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 +
 (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

Rubi [A] time = 18.25, antiderivative size = 678, normalized size of antiderivative = 1., number of steps used = 9, number of rules used = 6, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222

$$\frac{\left(\left(e-\sqrt{e^2-4df}\right)(ce-bf)\left(f(be-2af)-c\left(e^2-2df\right)\right)-2f\left(-f^2\left(b^2d-a^2f\right)+2cdf(be-af)+c^2(-d)\left(e^2-df\right)\right)\right)\,\mathrm{t}}{\sqrt{2}f^3\sqrt{e^2-4df}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$

$$+\frac{\left(-2f^3\left(b^2d-a^2f\right)-\left(\sqrt{e^2-4df}+e\right)(ce-bf)\left(f(be-2af)-c\left(e^2-2df\right)\right)+4cdf^2(be-af)-2c^2df\left(e^2-df\right)\right)\,\mathrm{tan}}{\sqrt{2}f^3\sqrt{e^2-4df}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$

$$+\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-12cf(be-af)+3b^2f^2+8c^2\left(e^2-df\right)\right)}{8\sqrt{c}f^3}-\frac{\sqrt{a+bx+cx^2}(-5bf+4ce-2cfx)}{4f^2}$$

Warning: Unable to verify antiderivative.

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


```
[Out] -((4*c*e - 5*b*f - 2*c*f*x)*Sqrt[a + b*x + c*x^2])/(4*f^2) + ((3*
b^2*f^2 - 12*c*f*(b*e - a*f) + 8*c^2*(e^2 - d*f))*ArcTanh[(b + 2*
c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*Sqrt[c]*f^3) + (((c*e
 - b*f)*(e - Sqrt[e^2 - 4*d*f])*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f
)) - 2*f*(2*c*d*f*(b*e - a*f) - f^2*(b^2*d - a^2*f) - c^2*d*(e^2
- d*f)))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*
(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e
```

```
*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^
2])])/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f
 + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) + ((4*c*d*f^2*(b*e -
 a*f) - 2*f^3*(b^2*d - a^2*f) - 2*c^2*d*f*(e^2 - d*f) - (c*e - b*
f)*(e + Sqrt[e^2 - 4*d*f])*(f*(b*e - 2*a*f) - c*(e^2 - 2*d*f)))*A
rcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[
e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f
^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(Sqr
t[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2
 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Mathematica [B] time = 6.26447, size = 1934, normalized size = 2.85

$$-\frac{\left(-c^2e^4+2bcfe^3+c^2\sqrt{e^2-4df}e^3-b^2f^2e^2-2acf^2e^2+4c^2dfe^2-2bcf\sqrt{e^2-4df}e^2+2abf^3e-6bcdf^2e+b^2f^2\sqrt{e^2-\cdots\right.}{\sqrt{2}f^3\sqrt{e^2-4df}\sqrt{c\cdots}}$$

$$-\frac{\left(c^2e^4-2bcfe^3+c^2\sqrt{e^2-4df}e^3+b^2f^2e^2+2acf^2e^2-4c^2dfe^2-2bcf\sqrt{e^2-4df}e^2-2abf^3e+6bcdf^2e+b^2f^2\sqrt{e^2-4\cdots\right.}{\sqrt{2}f^3\sqrt{e^2-4df}\sqrt{ce\cdots}}$$

$$+\frac{\left(8e^2c^2-8dfc^2+12af^2c-12befc+3b^2f^2\right)\log\left(b+2cx+2\sqrt{c}\sqrt{cx^2+bx+a}\right)(a+x(b+cx))^{3/2}}{8\sqrt{c}f^3\left(cx^2+bx+a\right)^{3/2}}$$

$$+\frac{\left(c^2e^4-2bcfe^3+c^2\sqrt{e^2-4df}e^3+b^2f^2e^2+2acf^2e^2-4c^2dfe^2-2bcf\sqrt{e^2-4df}e^2-2abf^3e+6bcdf^2e+b^2f^2\sqrt{e^2-4\cdots\right.}{\cdots}$$

$$+\frac{\left(-c^2e^4+2bcfe^3+c^2\sqrt{e^2-4df}e^3-b^2f^2e^2-2acf^2e^2+4c^2dfe^2-2bcf\sqrt{e^2-4df}e^2+2abf^3e-6bcdf^2e+b^2f^2\sqrt{e^2-\cdots\right.}{\cdots}$$

$$+\frac{\left(\frac{5bf-4ce}{4f^2}+\frac{cx}{2f}\right)(a+x(b+cx))^{3/2}}{cx^2+bx+a}$$

Warning: Unable to verify antiderivative.

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

```
[Out] (((-4*c*e + 5*b*f)/(4*f^2) + (c*x)/(2*f))*(a + x*(b + c*x))^(3/2)
)/(a + b*x + c*x^2) - ((-(c^2*e^4) + 4*c^2*d*e^2*f + 2*b*c*e^3*f
- 2*c^2*d^2*f^2 - 6*b*c*d*e*f^2 - b^2*e^2*f^2 - 2*a*c*e^2*f^2 + 2
*b^2*d*f^3 + 4*a*c*d*f^3 + 2*a*b*e*f^3 - 2*a^2*f^4 + c^2*e^3*Sqrt
[e^2 - 4*d*f] - 2*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[
e^2 - 4*d*f] + 2*b*c*d*f^2*Sqrt[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2
 - 4*d*f] + 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 -
4*d*f])*(a + x*(b + c*x))^(3/2)*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*
x])/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f +
 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f]]*(a + b*
x + c*x^2)^(3/2)) - ((c^2*e^4 - 4*c^2*d*e^2*f - 2*b*c*e^3*f + 2*c
^2*d^2*f^2 + 6*b*c*d*e*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 - 2*b^2*
```

```
d*f^3 - 4*a*c*d*f^3 - 2*a*b*e*f^3 + 2*a^2*f^4 + c^2*e^3*Sqrt[e^2
- 4*d*f] - 2*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[e^2 -
 4*d*f] + 2*b*c*d*f^2*Sqrt[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2 - 4*
d*f] + 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 - 4*d*f
])*(a + x*(b + c*x))^(3/2)*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x])/(S
qrt[2]*f^3*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f
^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f]]*(a + b*x + c*
x^2)^(3/2)) + ((8*c^2*e^2 - 8*c^2*d*f - 12*b*c*e*f + 3*b^2*f^2 +
12*a*c*f^2)*(a + x*(b + c*x))^(3/2)*Log[b + 2*c*x + 2*Sqrt[c]*Sqr
t[a + b*x + c*x^2]])/(8*Sqrt[c]*f^3*(a + b*x + c*x^2)^(3/2)) + ((
c^2*e^4 - 4*c^2*d*e^2*f - 2*b*c*e^3*f + 2*c^2*d^2*f^2 + 6*b*c*d*e
*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 - 2*b^2*d*f^3 - 4*a*c*d*f^3 -
2*a*b*e*f^3 + 2*a^2*f^4 + c^2*e^3*Sqrt[e^2 - 4*d*f] - 2*c^2*d*e*f
*Sqrt[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[e^2 - 4*d*f] + 2*b*c*d*f^2*
Sqrt[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*c*e*f^2*Sqr
t[e^2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^(
3/2)*Log[-(b*e^2) + 4*b*d*f - b*e*Sqrt[e^2 - 4*d*f] + 4*a*f*Sqrt[
e^2 - 4*d*f] - 2*c*e^2*x + 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x
+ 2*b*f*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[c*
e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqr
t[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2]])/(Sqrt[2]*f^3*Sqrt[e^2 - 4
*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d
*f] - b*f*Sqrt[e^2 - 4*d*f]]*(a + b*x + c*x^2)^(3/2)) + ((-(c^2*e
^4) + 4*c^2*d*e^2*f + 2*b*c*e^3*f - 2*c^2*d^2*f^2 - 6*b*c*d*e*f^2
 - b^2*e^2*f^2 - 2*a*c*e^2*f^2 + 2*b^2*d*f^3 + 4*a*c*d*f^3 + 2*a*
b*e*f^3 - 2*a^2*f^4 + c^2*e^3*Sqrt[e^2 - 4*d*f] - 2*c^2*d*e*f*Sqr
t[e^2 - 4*d*f] - 2*b*c*e^2*f*Sqrt[e^2 - 4*d*f] + 2*b*c*d*f^2*Sqrt
[e^2 - 4*d*f] + b^2*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*c*e*f^2*Sqrt[e^
2 - 4*d*f] - 2*a*b*f^3*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^(3/2)
*Log[b*e^2 - 4*b*d*f - b*e*Sqrt[e^2 - 4*d*f] + 4*a*f*Sqrt[e^2 - 4
*d*f] + 2*c*e^2*x - 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x + 2*b*f
*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2
*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 -
 4*d*f]]*Sqrt[a + b*x + c*x^2]])/(Sqrt[2]*f^3*Sqrt[e^2 - 4*d*f]*S
qrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b
*f*Sqrt[e^2 - 4*d*f]]*(a + b*x + c*x^2)^(3/2))
```

Maple [B] time = 0.045, size = 22523, normalized size = 33.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.107 $\int \frac{(a+bx+cx^2)^{3/2}}{(d+ex+fx^2)^2}\,dx$

Optimal. Leaf size=704

$$-\frac{\left(\left(e-\sqrt{e^2-4df}\right)(ce-bf)\left(f(be-2af)+2c\left(e^2-5df\right)\right)-2f\left(f\left(-be(3af+cd)+4af(af+cd)+2b^2df\right)+2c^2d\left(e^2\right.\right.\right.}{2\sqrt{2}f^2\left(e^2-4df\right)^{3/2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2c}}$$
$$+\frac{\left(\left(\sqrt{e^2-4df}+e\right)(ce-bf)\left(f(be-2af)+2c\left(e^2-5df\right)\right)-2f\left(f\left(-be(3af+cd)+4af(af+cd)+2b^2df\right)+2c^2d\left(e^2\right.\right.\right.}{2\sqrt{2}f^2\left(e^2-4df\right)^{3/2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2c}}$$
$$+\frac{c^{3/2}\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f^2}-\frac{\sqrt{a+bx+cx^2}(-2bf+ce-2cfx)}{f\left(e^2-4df\right)}-\frac{(e+2fx)\left(a+bx+cx^2\right)^{3/2}}{\left(e^2-4df\right)\left(d+ex+fx^2\right)}$$

```
[Out] -(((c*e - 2*b*f - 2*c*f*x)*Sqrt[a + b*x + c*x^2])/(f*(e^2 - 4*d*f
))) - ((e + 2*f*x)*(a + b*x + c*x^2)^(3/2))/((e^2 - 4*d*f)*(d + e
*x + f*x^2)) + (c^(3/2)*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b
*x + c*x^2])])/f^2 - (((c*e - b*f)*(f*(b*e - 2*a*f) + 2*c*(e^2 -
5*d*f))*(e - Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*
(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*ArcTanh[(4*
a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*
f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e
- b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*Sqrt[2]*f^2
*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*
e - b*f)*Sqrt[e^2 - 4*d*f]]) + (((c*e - b*f)*(f*(b*e - 2*a*f) + 2
*c*(e^2 - 5*d*f))*(e + Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4
*d*f) + f*(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*A
rcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[
e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f
^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*S
qrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a
*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

Rubi [A] time = 22.4085, antiderivative size = 704, normalized size of antiderivative = 1., number of steps used = 10, number of rules used = 7, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.259

$$-\frac{\left(\left(e-\sqrt{e^2-4df}\right)(ce-bf)\left(f(be-2af)+2c\left(e^2-5df\right)\right)-2f\left(f\left(-be(3af+cd)+4af(af+cd)+2b^2df\right)+2c^2d\left(e^2\right.\right.\right.}{2\sqrt{2}f^2\left(e^2-4df\right)^{3/2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2c}}$$
$$+\frac{\left(\left(\sqrt{e^2-4df}+e\right)(ce-bf)\left(f(be-2af)+2c\left(e^2-5df\right)\right)-2f\left(f\left(-be(3af+cd)+4af(af+cd)+2b^2df\right)+2c^2d\left(e^2\right.\right.\right.}{2\sqrt{2}f^2\left(e^2-4df\right)^{3/2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2c}}$$
$$+\frac{c^{3/2}\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{f^2}-\frac{\sqrt{a+bx+cx^2}(-2bf+ce-2cfx)}{f\left(e^2-4df\right)}-\frac{(e+2fx)\left(a+bx+cx^2\right)^{3/2}}{\left(e^2-4df\right)\left(d+ex+fx^2\right)}$$

Warning: Unable to verify antiderivative.

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

```
[Out] -(((c*e - 2*b*f - 2*c*f*x)*Sqrt[a + b*x + c*x^2])/(f*(e^2 - 4*d*f
))) - ((e + 2*f*x)*(a + b*x + c*x^2)^(3/2))/((e^2 - 4*d*f)*(d + e
*x + f*x^2)) + (c^(3/2)*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b
*x + c*x^2])])/f^2 - (((c*e - b*f)*(f*(b*e - 2*a*f) + 2*c*(e^2 -
5*d*f))*(e - Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*
(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*ArcTanh[(4*
```

```
a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*
f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e
- b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*Sqrt[2]*f^2
*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*
e - b*f)*Sqrt[e^2 - 4*d*f]]) + (((c*e - b*f)*(f*(b*e - 2*a*f) + 2
*c*(e^2 - 5*d*f))*(e + Sqrt[e^2 - 4*d*f]) - 2*f*(2*c^2*d*(e^2 - 4
*d*f) + f*(2*b^2*d*f + 4*a*f*(c*d + a*f) - b*e*(c*d + 3*a*f))))*A
rcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[
e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f
^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*S
qrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a
*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Mathematica [B] time = 6.46468, size = 1844, normalized size = 2.62

$$-\frac{\left(-2c^2e^4+bcfe^3+2c^2\sqrt{e^2-4df}e^3+b^2f^2e^2+2acf^2e^2+14c^2dfe^2-bcf\sqrt{e^2-4df}e^2-8abf^3e-12bcdf^2e-b^2f^2\sqrt{e^2\right.}{2\sqrt{2}f^2\left(e^2-4df\right)^3}$$

$$-\frac{\left(2c^2e^4-bcfe^3+2c^2\sqrt{e^2-4df}e^3-b^2f^2e^2-2acf^2e^2-14c^2dfe^2-bcf\sqrt{e^2-4df}e^2+8abf^3e+12bcdf^2e-b^2f^2\sqrt{e^2\right.}{2\sqrt{2}f^2\left(e^2-4df\right)^{3/}}$$

$$+\frac{c^{3/2}\log\left(b+2cx+2\sqrt{c}\sqrt{cx^2+bx+a}\right)\left(a+x(b+cx)\right)^{3/2}}{f^2\left(cx^2+bx+a\right)^{3/2}}$$

$$+\frac{\left(2c^2e^4-bcfe^3+2c^2\sqrt{e^2-4df}e^3-b^2f^2e^2-2acf^2e^2-14c^2dfe^2-bcf\sqrt{e^2-4df}e^2+8abf^3e+12bcdf^2e-b^2f^2\sqrt{e^2\right.}{}$$

$$+\frac{\left(-2c^2e^4+bcfe^3+2c^2\sqrt{e^2-4df}e^3+b^2f^2e^2+2acf^2e^2+14c^2dfe^2-bcf\sqrt{e^2-4df}e^2-8abf^3e-12bcdf^2e-b^2f^2\sqrt{e^2\right.}{}$$

$$+\frac{\left(cxe^2+cde+afe-bfxe-2bdf+2af^2x-2cdfx\right)\left(a+x(b+cx)\right)^{3/2}}{f\left(4df-e^2\right)\left(cx^2+bx+a\right)\left(fx^2+ex+d\right)}$$

Warning: Unable to verify antiderivative.

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

```
[Out] ((c*d*e - 2*b*d*f + a*e*f + c*e^2*x - 2*c*d*f*x - b*e*f*x + 2*a*f
^2*x)*(a + x*(b + c*x))^(3/2))/(f*(-e^2 + 4*d*f)*(a + b*x + c*x^2
)*(d + e*x + f*x^2)) - ((-2*c^2*e^4 + 14*c^2*d*e^2*f + b*c*e^3*f
- 16*c^2*d^2*f^2 - 12*b*c*d*e*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 +
 4*b^2*d*f^3 + 8*a*c*d*f^3 - 8*a*b*e*f^3 + 8*a^2*f^4 + 2*c^2*e^3*
Sqrt[e^2 - 4*d*f] - 10*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - b*c*e^2*f*Sq
rt[e^2 - 4*d*f] + 10*b*c*d*f^2*Sqrt[e^2 - 4*d*f] - b^2*e*f^2*Sqrt
[e^2 - 4*d*f] - 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*b*f^3*Sqrt[e^
2 - 4*d*f])*(a + x*(b + c*x))^(3/2)*Log[-e + Sqrt[e^2 - 4*d*f] -
2*f*x])/(2*Sqrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f -
```

```
 b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f]]
*(a + b*x + c*x^2)^(3/2)) - ((2*c^2*e^4 - 14*c^2*d*e^2*f - b*c*e^
3*f + 16*c^2*d^2*f^2 + 12*b*c*d*e*f^2 - b^2*e^2*f^2 - 2*a*c*e^2*f
^2 - 4*b^2*d*f^3 - 8*a*c*d*f^3 + 8*a*b*e*f^3 - 8*a^2*f^4 + 2*c^2*
e^3*Sqrt[e^2 - 4*d*f] - 10*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - b*c*e^2*
f*Sqrt[e^2 - 4*d*f] + 10*b*c*d*f^2*Sqrt[e^2 - 4*d*f] - b^2*e*f^2*
Sqrt[e^2 - 4*d*f] - 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*b*f^3*Sqr
t[e^2 - 4*d*f])*(a + x*(b + c*x))^(3/2)*Log[e + Sqrt[e^2 - 4*d*f]
 + 2*f*x])/(2*Sqrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*
f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*
f]]*(a + b*x + c*x^2)^(3/2)) + (c^(3/2)*(a + x*(b + c*x))^(3/2)*L
og[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + b*x + c*x^2]])/(f^2*(a + b*x +
c*x^2)^(3/2)) + ((2*c^2*e^4 - 14*c^2*d*e^2*f - b*c*e^3*f + 16*c^2
*d^2*f^2 + 12*b*c*d*e*f^2 - b^2*e^2*f^2 - 2*a*c*e^2*f^2 - 4*b^2*d
*f^3 - 8*a*c*d*f^3 + 8*a*b*e*f^3 - 8*a^2*f^4 + 2*c^2*e^3*Sqrt[e^2
 - 4*d*f] - 10*c^2*d*e*f*Sqrt[e^2 - 4*d*f] - b*c*e^2*f*Sqrt[e^2 -
 4*d*f] + 10*b*c*d*f^2*Sqrt[e^2 - 4*d*f] - b^2*e*f^2*Sqrt[e^2 - 4
*d*f] - 2*a*c*e*f^2*Sqrt[e^2 - 4*d*f] + 2*a*b*f^3*Sqrt[e^2 - 4*d*
f])*(a + x*(b + c*x))^(3/2)*Log[b*e - 4*a*f + b*Sqrt[e^2 - 4*d*f]
 + 2*c*e*x - 2*b*f*x + 2*c*Sqrt[e^2 - 4*d*f]*x - 2*Sqrt[2]*Sqrt[c
*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sq
rt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2]])/(2*Sqrt[2]*f^2*(e^2 - 4*
d*f)^(3/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2
- 4*d*f] - b*f*Sqrt[e^2 - 4*d*f]]*(a + b*x + c*x^2)^(3/2)) + ((-2
*c^2*e^4 + 14*c^2*d*e^2*f + b*c*e^3*f - 16*c^2*d^2*f^2 - 12*b*c*d
*e*f^2 + b^2*e^2*f^2 + 2*a*c*e^2*f^2 + 4*b^2*d*f^3 + 8*a*c*d*f^3
- 8*a*b*e*f^3 + 8*a^2*f^4 + 2*c^2*e^3*Sqrt[e^2 - 4*d*f] - 10*c^2*
d*e*f*Sqrt[e^2 - 4*d*f] - b*c*e^2*f*Sqrt[e^2 - 4*d*f] + 10*b*c*d*
f^2*Sqrt[e^2 - 4*d*f] - b^2*e*f^2*Sqrt[e^2 - 4*d*f] - 2*a*c*e*f^2
*Sqrt[e^2 - 4*d*f] + 2*a*b*f^3*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x
))^(3/2)*Log[-(b*e) + 4*a*f + b*Sqrt[e^2 - 4*d*f] - 2*c*e*x + 2*b
*f*x + 2*c*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f -
 b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f]]
*Sqrt[a + b*x + c*x^2]])/(2*Sqrt[2]*f^2*(e^2 - 4*d*f)^(3/2)*Sqrt[
c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*S
qrt[e^2 - 4*d*f]]*(a + b*x + c*x^2)^(3/2))
```

Maple [B] time = 0.069, size = 72576, normalized size = 103.1

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.108 $\int \frac{\left(a+bx+cx^2\right)^{3/2}}{\left(d+ex+fx^2\right)^3}\,dx$

Optimal. Leaf size=671

$$-\frac{3\left(2\left(e-\sqrt{e^2-4df}\right)(ce-bf)(2af-be+2cd)-f\left(4be(3af+cd)-4a\left(4af^2+ce^2\right)+b^2\left(-\left(4df+e^2\right)\right)\right)\right)\tanh^{-1}\left(\frac{\cdots}{2\sqrt{\cdots}}\right)}{4\sqrt{2}\left(e^2-4df\right)^{5/2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$
$$+\frac{3\left(2\left(\sqrt{e^2-4df}+e\right)(ce-bf)(2af-be+2cd)-f\left(4be(3af+cd)-4a\left(4af^2+ce^2\right)+b^2\left(-\left(4df+e^2\right)\right)\right)\right)\tanh^{-1}\left(\frac{\cdots}{2\sqrt{\cdots}}\right)}{4\sqrt{2}\left(e^2-4df\right)^{5/2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$
$$+\frac{3\sqrt{a+bx+cx^2}\left(2x\left(4af^2-2bef+ce^2\right)+4aef-b\left(4df+e^2\right)+4cde\right)}{4\left(e^2-4df\right)^2\left(d+ex+fx^2\right)}-\frac{(e+2fx)\left(a+bx+cx^2\right)^{3/2}}{2\left(e^2-4df\right)\left(d+ex+fx^2\right)^2}$$

```
[Out] -((e + 2*f*x)*(a + b*x + c*x^2)^(3/2))/(2*(e^2 - 4*d*f)*(d + e*x
+ f*x^2)^2) + (3*(4*c*d*e + 4*a*e*f - b*(e^2 + 4*d*f) + 2*(c*e^2
- 2*b*e*f + 4*a*f^2)*x)*Sqrt[a + b*x + c*x^2])/(4*(e^2 - 4*d*f)^2
*(d + e*x + f*x^2)) - (3*(2*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e
- Sqrt[e^2 - 4*d*f]) - f*(4*b*e*(c*d + 3*a*f) - b^2*(e^2 + 4*d*f)
 - 4*a*(c*e^2 + 4*a*f^2)))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d
*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e
^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*S
qrt[a + b*x + c*x^2])])/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2
 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]) +
(3*(2*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + Sqrt[e^2 - 4*d*f]) -
 f*(4*b*e*(c*d + 3*a*f) - b^2*(e^2 + 4*d*f) - 4*a*(c*e^2 + 4*a*f^
2)))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e +
 Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f +
 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])]
)/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2
*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

Rubi [A] time = 17.6291, antiderivative size = 669, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{3\left(-2\left(e-\sqrt{e^2-4df}\right)(ce-bf)(2af-be+2cd)+4bef(3af+cd)-4af\left(4af^2+ce^2\right)+b^2(-f)\left(4df+e^2\right)\right)\tanh^{-1}\left(\frac{\cdots}{2\sqrt{\cdots}}\right)}{4\sqrt{2}\left(e^2-4df\right)^{5/2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$
$$-\frac{3\left(-2\left(\sqrt{e^2-4df}+e\right)(ce-bf)(2af-be+2cd)+4bef(3af+cd)-4af\left(4af^2+ce^2\right)+b^2(-f)\left(4df+e^2\right)\right)\tanh^{-1}\left(\frac{\cdots}{2\sqrt{\cdots}}\right)}{4\sqrt{2}\left(e^2-4df\right)^{5/2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$
$$+\frac{3\sqrt{a+bx+cx^2}\left(2x\left(4af^2-2bef+ce^2\right)+4aef-b\left(4df+e^2\right)+4cde\right)}{4\left(e^2-4df\right)^2\left(d+ex+fx^2\right)}-\frac{(e+2fx)\left(a+bx+cx^2\right)^{3/2}}{2\left(e^2-4df\right)\left(d+ex+fx^2\right)^2}$$

Warning: Unable to verify antiderivative.

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

```
[Out] -((e + 2*f*x)*(a + b*x + c*x^2)^(3/2))/(2*(e^2 - 4*d*f)*(d + e*x
+ f*x^2)^2) + (3*(4*c*d*e + 4*a*e*f - b*(e^2 + 4*d*f) + 2*(c*e^2
- 2*b*e*f + 4*a*f^2)*x)*Sqrt[a + b*x + c*x^2])/(4*(e^2 - 4*d*f)^2
*(d + e*x + f*x^2)) + (3*(4*b*e*f*(c*d + 3*a*f) - b^2*f*(e^2 + 4*
d*f) - 4*a*f*(c*e^2 + 4*a*f^2) - 2*(2*c*d - b*e + 2*a*f)*(c*e - b
*f)*(e - Sqrt[e^2 - 4*d*f]))*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4
*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c
*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]
```

```
*Sqrt[a + b*x + c*x^2])])/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e
^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
- (3*(4*b*e*f*(c*d + 3*a*f) - b^2*f*(e^2 + 4*d*f) - 4*a*f*(c*e^2
+ 4*a*f^2) - 2*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + Sqrt[e^2 -
4*d*f]))*ArcTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*
(e + Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e
*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^
2])])/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f
 + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]])
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Mathematica [B] time = 6.66612, size = 1621, normalized size = 2.42

$$\frac{\left(\frac{cxe^2+cde+afe-bfxe-2bdf+2af^2x-2cdfx}{2f(4df-e^2)(fx^2+ex+d)^2}+\frac{2ce^3-7bfe^2+2cfxe^2+12af^2e+4cdfe-12bf^2xe+4bdf^2+24af^3x+16cdf^2x}{4f(4df-e^2)^2(fx^2+ex+d)}\right)(a+x(b+cx))^{3/2}}{cx^2+bx+a}$$

$$+\frac{3\left(-2bce^3+4c^2de^2+3b^2fe^2+8acfe^2+2bc\sqrt{e^2-4df}e^2-16abf^2e-8bcdfe-4c^2d\sqrt{e^2-4df}e-2b^2f\sqrt{e^2-4df}e-4\right.}{4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe-c\sqrt{e^2-4df}e}}$$

$$+\frac{3\left(2bce^3-4c^2de^2-3b^2fe^2-8acfe^2+2bc\sqrt{e^2-4df}e^2+16abf^2e+8bcdfe-4c^2d\sqrt{e^2-4df}e-2b^2f\sqrt{e^2-4df}e-4a\right.}{4\sqrt{2}(e^2-4df)^{5/2}\sqrt{ce^2-bfe+c\sqrt{e^2-4df}e+}}$$

$$-\frac{3\left(2bce^3-4c^2de^2-3b^2fe^2-8acfe^2+2bc\sqrt{e^2-4df}e^2+16abf^2e+8bcdfe-4c^2d\sqrt{e^2-4df}e-2b^2f\sqrt{e^2-4df}e-4\right.}{}$$

$$-\frac{3\left(-2bce^3+4c^2de^2+3b^2fe^2+8acfe^2+2bc\sqrt{e^2-4df}e^2-16abf^2e-8bcdfe-4c^2d\sqrt{e^2-4df}e-2b^2f\sqrt{e^2-4df}e-\right.}{}$$

Warning: Unable to verify antiderivative.

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

```
[Out] ((a + x*(b + c*x))^(3/2)*((c*d*e - 2*b*d*f + a*e*f + c*e^2*x - 2*
c*d*f*x - b*e*f*x + 2*a*f^2*x)/(2*f*(-e^2 + 4*d*f)*(d + e*x + f*x
^2)^2) + (2*c*e^3 + 4*c*d*e*f - 7*b*e^2*f + 4*b*d*f^2 + 12*a*e*f^
2 + 2*c*e^2*f*x + 16*c*d*f^2*x - 12*b*e*f^2*x + 24*a*f^3*x)/(4*f*
(-e^2 + 4*d*f)^2*(d + e*x + f*x^2))))/(a + b*x + c*x^2) + (3*(4*c
^2*d*e^2 - 2*b*c*e^3 - 8*b*c*d*e*f + 3*b^2*e^2*f + 8*a*c*e^2*f +
4*b^2*d*f^2 - 16*a*b*e*f^2 + 16*a^2*f^3 - 4*c^2*d*e*Sqrt[e^2 - 4*
d*f] + 2*b*c*e^2*Sqrt[e^2 - 4*d*f] + 4*b*c*d*f*Sqrt[e^2 - 4*d*f]
- 2*b^2*e*f*Sqrt[e^2 - 4*d*f] - 4*a*c*e*f*Sqrt[e^2 - 4*d*f] + 4*a
*b*f^2*Sqrt[e^2 - 4*d*f])*(a + x*(b + c*x))^(3/2)*Log[-e + Sqrt[e
^2 - 4*d*f] - 2*f*x])/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2 -
 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2
 - 4*d*f]]*(a + b*x + c*x^2)^(3/2)) + (3*(-4*c^2*d*e^2 + 2*b*c*e^
3 + 8*b*c*d*e*f - 3*b^2*e^2*f - 8*a*c*e^2*f - 4*b^2*d*f^2 + 16*a*
b*e*f^2 - 16*a^2*f^3 - 4*c^2*d*e*Sqrt[e^2 - 4*d*f] + 2*b*c*e^2*Sq
rt[e^2 - 4*d*f] + 4*b*c*d*f*Sqrt[e^2 - 4*d*f] - 2*b^2*e*f*Sqrt[e^
```

```
2 - 4*d*f] - 4*a*c*e*f*Sqrt[e^2 - 4*d*f] + 4*a*b*f^2*Sqrt[e^2 - 4
*d*f])*(a + x*(b + c*x))^(3/2)*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x]
)/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2
*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f]]*(a + b*x
+ c*x^2)^(3/2)) - (3*(-4*c^2*d*e^2 + 2*b*c*e^3 + 8*b*c*d*e*f - 3*
b^2*e^2*f - 8*a*c*e^2*f - 4*b^2*d*f^2 + 16*a*b*e*f^2 - 16*a^2*f^3
 - 4*c^2*d*e*Sqrt[e^2 - 4*d*f] + 2*b*c*e^2*Sqrt[e^2 - 4*d*f] + 4*
b*c*d*f*Sqrt[e^2 - 4*d*f] - 2*b^2*e*f*Sqrt[e^2 - 4*d*f] - 4*a*c*e
*f*Sqrt[e^2 - 4*d*f] + 4*a*b*f^2*Sqrt[e^2 - 4*d*f])*(a + x*(b + c
*x))^(3/2)*Log[b*e - 4*a*f + b*Sqrt[e^2 - 4*d*f] + 2*c*e*x - 2*b*
f*x + 2*c*Sqrt[e^2 - 4*d*f]*x - 2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f -
b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f]]*
Sqrt[a + b*x + c*x^2]])/(4*Sqrt[2]*(e^2 - 4*d*f)^(5/2)*Sqrt[c*e^2
 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e
^2 - 4*d*f]]*(a + b*x + c*x^2)^(3/2)) - (3*(4*c^2*d*e^2 - 2*b*c*e
^3 - 8*b*c*d*e*f + 3*b^2*e^2*f + 8*a*c*e^2*f + 4*b^2*d*f^2 - 16*a
*b*e*f^2 + 16*a^2*f^3 - 4*c^2*d*e*Sqrt[e^2 - 4*d*f] + 2*b*c*e^2*S
qrt[e^2 - 4*d*f] + 4*b*c*d*f*Sqrt[e^2 - 4*d*f] - 2*b^2*e*f*Sqrt[e
^2 - 4*d*f] - 4*a*c*e*f*Sqrt[e^2 - 4*d*f] + 4*a*b*f^2*Sqrt[e^2 -
4*d*f])*(a + x*(b + c*x))^(3/2)*Log[-(b*e) + 4*a*f + b*Sqrt[e^2 -
 4*d*f] - 2*c*e*x + 2*b*f*x + 2*c*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]
*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] +
 b*f*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2]])/(4*Sqrt[2]*(e^2 -
 4*d*f)^(5/2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e
^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f]]*(a + b*x + c*x^2)^(3/2))
```

Maple [B] time = 0.121, size = 178044, normalized size = 265.3

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{(cx^2 + bx + a)^{\frac{3}{2}}}{(fx^2 + ex + d)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.742556, size = 4, normalized size = 0.01

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] sage0*x
```

3.109 $\int \frac{(d+ex+fx^2)^3}{\sqrt{a+bx+cx^2}}\,dx$

Optimal. Leaf size=717

$$\frac{x\sqrt{a+bx+cx^2}\,(24c^2f(50a^2f^2+322abef+175b^2(df+e^2))-252b^2cf^2(14af+15be)-160c^3(27af(df+e^2)+10b(6 \ldots}{3840c^5}$$
$$+\frac{\sqrt{a+bx+cx^2}\,(96c^3(128a^2ef^2+275abf(df+e^2)+50b^2(6def+e^3))-504bc^2f(22a^2f^2+70abef+25b^2(df+e^2)) \ldots}{7680c^6}$$
$$+\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)(384c^4(3a^2f(df+e^2)+2abe(6df+e^2)+3b^2d(df+e^2))+840b^2c^2f(2a^2f^2+4abef+b^2(df \ldots}{}$$
$$-\frac{x^2\sqrt{a+bx+cx^2}\,(24c^2f(32aef+35b(df+e^2))-36bcf^2(13af+21be)+231b^3f^3-320c^3(6def+e^3))}{960c^4}$$
$$+\frac{fx^3\sqrt{a+bx+cx^2}\,(-4cf(25af+81be)+99b^2f^2+360c^2(df+e^2))}{480c^3}$$
$$+\frac{f^2x^4\sqrt{a+bx+cx^2}(36ce-11bf)}{60c^2}+\frac{f^3x^5\sqrt{a+bx+cx^2}}{6c}$$

```
[Out] ((23040*c^5*d^2*e - 3465*b^5*f^3 + 420*b^3*c*f^2*(27*b*e + 34*a*f
) - 504*b*c^2*f*(70*a*b*e*f + 22*a^2*f^2 + 25*b^2*(e^2 + d*f)) -
640*c^4*(27*b*d*(e^2 + d*f) + 8*a*e*(e^2 + 6*d*f)) + 96*c^3*(128*
a^2*e*f^2 + 275*a*b*f*(e^2 + d*f) + 50*b^2*(e^3 + 6*d*e*f)))*Sqrt
[a + b*x + c*x^2])/(7680*c^6) + ((1155*b^4*f^3 - 252*b^2*c*f^2*(1
5*b*e + 14*a*f) + 5760*c^4*d*(e^2 + d*f) + 24*c^2*f*(322*a*b*e*f
+ 50*a^2*f^2 + 175*b^2*(e^2 + d*f)) - 160*c^3*(27*a*f*(e^2 + d*f)
 + 10*b*(e^3 + 6*d*e*f)))*x*Sqrt[a + b*x + c*x^2])/(3840*c^5) - (
(231*b^3*f^3 - 36*b*c*f^2*(21*b*e + 13*a*f) - 320*c^3*(e^3 + 6*d*
e*f) + 24*c^2*f*(32*a*e*f + 35*b*(e^2 + d*f)))*x^2*Sqrt[a + b*x +
 c*x^2])/(960*c^4) + (f*(99*b^2*f^2 - 4*c*f*(81*b*e + 25*a*f) + 3
60*c^2*(e^2 + d*f))*x^3*Sqrt[a + b*x + c*x^2])/(480*c^3) + (f^2*(
36*c*e - 11*b*f)*x^4*Sqrt[a + b*x + c*x^2])/(60*c^2) + (f^3*x^5*S
qrt[a + b*x + c*x^2])/(6*c) + ((1024*c^6*d^3 + 231*b^6*f^3 - 252*
b^4*c*f^2*(3*b*e + 5*a*f) - 1536*c^5*d*(b*d*e + a*(e^2 + d*f)) +
840*b^2*c^2*f*(4*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + d*f)) + 384*c^4
*(3*b^2*d*(e^2 + d*f) + 3*a^2*f*(e^2 + d*f) + 2*a*b*e*(e^2 + 6*d*
f)) - 320*c^3*(9*a^2*b*e*f^2 + a^3*f^3 + 9*a*b^2*f*(e^2 + d*f) +
b^3*(e^3 + 6*d*e*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x
 + c*x^2])])/(1024*c^(13/2))
```

Rubi [A] time = 6.35417, antiderivative size = 717, normalized size of antiderivative = 1., number of steps used = 8, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{x\sqrt{a+bx+cx^2}\,(24c^2f(50a^2f^2+322abef+175b^2(df+e^2))-252b^2cf^2(14af+15be)-160c^3(27af(df+e^2)+10b(6 \ldots}{3840c^5}$$
$$+\frac{\sqrt{a+bx+cx^2}\,(96c^3(128a^2ef^2+275abf(df+e^2)+50b^2(6def+e^3))-504bc^2f(22a^2f^2+70abef+25b^2(df+e^2)) \ldots}{7680c^6}$$
$$+\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)(384c^4(3a^2f(df+e^2)+2abe(6df+e^2)+3b^2d(df+e^2))+840b^2c^2f(2a^2f^2+4abef+b^2(df \ldots}{}$$
$$-\frac{x^2\sqrt{a+bx+cx^2}\,(24c^2f(32aef+35b(df+e^2))-36bcf^2(13af+21be)+231b^3f^3-320c^3(6def+e^3))}{960c^4}$$
$$+\frac{fx^3\sqrt{a+bx+cx^2}\,(-4cf(25af+81be)+99b^2f^2+360c^2(df+e^2))}{480c^3}$$
$$+\frac{f^2x^4\sqrt{a+bx+cx^2}(36ce-11bf)}{60c^2}+\frac{f^3x^5\sqrt{a+bx+cx^2}}{6c}$$

Antiderivative was successfully verified.

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

```
[Out] ((23040*c^5*d^2*e - 3465*b^5*f^3 + 420*b^3*c*f^2*(27*b*e + 34*a*f
) - 504*b*c^2*f*(70*a*b*e*f + 22*a^2*f^2 + 25*b^2*(e^2 + d*f)) -
640*c^4*(27*b*d*(e^2 + d*f) + 8*a*e*(e^2 + 6*d*f)) + 96*c^3*(128*
a^2*e*f^2 + 275*a*b*f*(e^2 + d*f) + 50*b^2*(e^3 + 6*d*e*f)))*Sqrt
[a + b*x + c*x^2])/(7680*c^6) + ((1155*b^4*f^3 - 252*b^2*c*f^2*(1
5*b*e + 14*a*f) + 5760*c^4*d*(e^2 + d*f) + 24*c^2*f*(322*a*b*e*f
+ 50*a^2*f^2 + 175*b^2*(e^2 + d*f)) - 160*c^3*(27*a*f*(e^2 + d*f)
 + 10*b*(e^3 + 6*d*e*f)))*x*Sqrt[a + b*x + c*x^2])/(3840*c^5) - (
(231*b^3*f^3 - 36*b*c*f^2*(21*b*e + 13*a*f) - 320*c^3*(e^3 + 6*d*
e*f) + 24*c^2*f*(32*a*e*f + 35*b*(e^2 + d*f)))*x^2*Sqrt[a + b*x +
 c*x^2])/(960*c^4) + (f*(99*b^2*f^2 - 4*c*f*(81*b*e + 25*a*f) + 3
60*c^2*(e^2 + d*f))*x^3*Sqrt[a + b*x + c*x^2])/(480*c^3) + (f^2*(
36*c*e - 11*b*f)*x^4*Sqrt[a + b*x + c*x^2])/(60*c^2) + (f^3*x^5*S
qrt[a + b*x + c*x^2])/(6*c) + ((1024*c^6*d^3 + 231*b^6*f^3 - 252*
b^4*c*f^2*(3*b*e + 5*a*f) - 1536*c^5*d*(b*d*e + a*(e^2 + d*f)) +
840*b^2*c^2*f*(4*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 + d*f)) + 384*c^4
*(3*b^2*d*(e^2 + d*f) + 3*a^2*f*(e^2 + d*f) + 2*a*b*e*(e^2 + 6*d*
f)) - 320*c^3*(9*a^2*b*e*f^2 + a^3*f^3 + 9*a*b^2*f*(e^2 + d*f) +
b^3*(e^3 + 6*d*e*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x
 + c*x^2])])/(1024*c^(13/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 1.26095, size = 615, normalized size = 0.86

$$2\sqrt{c}\sqrt{a+x(b+cx)}\left(48c^3\left(2a^2f^2(128e+25fx)+2abf\left(f\left(275d+39fx^2\right)+275e^2+161efx\right)+b^2\left(6ef\left(100d+21fx^2\right)+\right.\right.\right.$$

Antiderivative was successfully verified.

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

```
[Out] (2*Sqrt[c]*Sqrt[a + x*(b + c*x)]*(-3465*b^5*f^3 + 210*b^3*c*f^2*(
54*b*e + 68*a*f + 11*b*f*x) - 168*b*c^2*f*(66*a^2*f^2 + 42*a*b*f*
(5*e + f*x) + b^2*(75*e^2 + 75*d*f + 45*e*f*x + 11*f^2*x^2)) + 12
8*c^5*(90*d^2*(2*e + f*x) + 15*d*x*(6*e^2 + 8*e*f*x + 3*f^2*x^2)
+ x^2*(20*e^3 + 45*e^2*f*x + 36*e*f^2*x^2 + 10*f^3*x^3)) + 48*c^3
*(2*a^2*f^2*(128*e + 25*f*x) + b^2*(100*e^3 + 175*e^2*f*x + 6*e*f
*(100*d + 21*f*x^2) + f^2*x*(175*d + 33*f*x^2)) + 2*a*b*f*(275*e^
2 + 161*e*f*x + f*(275*d + 39*f*x^2))) - 64*c^4*(a*(80*e^3 + 135*
e^2*f*x + 96*e*f*(5*d + f*x^2) + 5*f^2*x*(27*d + 5*f*x^2)) + b*(2
70*d^2*f + 15*d*(18*e^2 + 20*e*f*x + 7*f^2*x^2) + x*(50*e^3 + 105
*e^2*f*x + 81*e*f^2*x^2 + 22*f^3*x^3)))) + 15*(1024*c^6*d^3 + 231
*b^6*f^3 - 252*b^4*c*f^2*(3*b*e + 5*a*f) - 1536*c^5*d*(b*d*e + a*
(e^2 + d*f)) + 840*b^2*c^2*f*(4*a*b*e*f + 2*a^2*f^2 + b^2*(e^2 +
d*f)) + 384*c^4*(3*b^2*d*(e^2 + d*f) + 3*a^2*f*(e^2 + d*f) + 2*a*
b*e*(e^2 + 6*d*f)) - 320*c^3*(9*a^2*b*e*f^2 + a^3*f^3 + 9*a*b^2*f
*(e^2 + d*f) + b^3*(e^3 + 6*d*e*f)))*Log[b + 2*c*x + 2*Sqrt[c]*Sq
rt[a + x*(b + c*x)]])/(15360*c^(13/2))
```

Maple [B] time = 0.033, size = 1930, normalized size = 2.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((f*x^2+e*x+d)^3/(c*x^2+b*x+a)^(1/2),x)
```

```
[Out] 9/2*b/c^(5/2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*e*f
+161/80*e*f^2*b/c^3*a*x*(c*x^2+b*x+a)^(1/2)-5/2*b/c^2*x*(c*x^2+b*
x+a)^(1/2)*d*e*f-147/32*e*f^2*b^2/c^4*a*(c*x^2+b*x+a)^(1/2)-9/8/c
^2*a*x*(c*x^2+b*x+a)^(1/2)*e^2*f+55/16*b/c^3*a*(c*x^2+b*x+a)^(1/2
)*d*f^2+55/16*b/c^3*a*(c*x^2+b*x+a)^(1/2)*e^2*f-9/8/c^2*a*x*(c*x^
2+b*x+a)^(1/2)*d*f^2-4/c^2*a*(c*x^2+b*x+a)^(1/2)*d*e*f-7/8*b/c^2*
x^2*(c*x^2+b*x+a)^(1/2)*d*f^2-7/8*b/c^2*x^2*(c*x^2+b*x+a)^(1/2)*e
^2*f+35/32*b^2/c^3*x*(c*x^2+b*x+a)^(1/2)*d*f^2+35/32*b^2/c^3*x*(c
*x^2+b*x+a)^(1/2)*e^2*f-45/16*b^2/c^(7/2)*a*ln((1/2*b+c*x)/c^(1/2
)+(c*x^2+b*x+a)^(1/2))*d*f^2-45/16*b^2/c^(7/2)*a*ln((1/2*b+c*x)/c
^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2*f-147/160*f^3*b^2/c^4*a*x*(c*x^2+
b*x+a)^(1/2)+39/80*f^3*b/c^3*a*x^2*(c*x^2+b*x+a)^(1/2)+2*x^2/c*(c
*x^2+b*x+a)^(1/2)*d*e*f+15/4*b^2/c^3*(c*x^2+b*x+a)^(1/2)*d*e*f-15
/8*b^3/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*e*f-
45/16*e*f^2*b/c^(7/2)*a^2*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1
/2))-4/5*e*f^2/c^2*a*x^2*(c*x^2+b*x+a)^(1/2)-27/40*e*f^2*b/c^2*x^
3*(c*x^2+b*x+a)^(1/2)+63/80*e*f^2*b^2/c^3*x^2*(c*x^2+b*x+a)^(1/2)
-63/64*e*f^2*b^3/c^4*x*(c*x^2+b*x+a)^(1/2)+105/32*e*f^2*b^3/c^(9/
2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+1/3*x^2/c*(c*x^2
+b*x+a)^(1/2)*e^3-231/512*f^3*b^5/c^6*(c*x^2+b*x+a)^(1/2)+231/102
4*f^3*b^6/c^(13/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-5/
16*f^3/c^(7/2)*a^3*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+3*
d^2*e/c*(c*x^2+b*x+a)^(1/2)+5/8*b^2/c^3*(c*x^2+b*x+a)^(1/2)*e^3-5
/16*b^3/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^3-2
/3/c^2*a*(c*x^2+b*x+a)^(1/2)*e^3+3/4*x^3/c*(c*x^2+b*x+a)^(1/2)*d*
f^2+1/6*f^3*x^5*(c*x^2+b*x+a)^(1/2)/c+d^3*ln((1/2*b+c*x)/c^(1/2)+
(c*x^2+b*x+a)^(1/2))/c^(1/2)+9/8/c^(5/2)*a^2*ln((1/2*b+c*x)/c^(1/
2)+(c*x^2+b*x+a)^(1/2))*d*f^2+9/8/c^(5/2)*a^2*ln((1/2*b+c*x)/c^(1
/2)+(c*x^2+b*x+a)^(1/2))*e^2*f+3/4*x^3/c*(c*x^2+b*x+a)^(1/2)*e^2*
f+9/8*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*f*d
^2+9/8*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^
2*d-3/2*a/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*f*d
^2-3/2*a/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2*
d-105/64*b^3/c^4*(c*x^2+b*x+a)^(1/2)*d*f^2-105/64*b^3/c^4*(c*x^2+
b*x+a)^(1/2)*e^2*f+105/128*b^4/c^(9/2)*ln((1/2*b+c*x)/c^(1/2)+(c*
x^2+b*x+a)^(1/2))*d*f^2+105/128*b^4/c^(9/2)*ln((1/2*b+c*x)/c^(1/2
)+(c*x^2+b*x+a)^(1/2))*e^2*f-9/4*b/c^2*(c*x^2+b*x+a)^(1/2)*f*d^2-
9/4*b/c^2*(c*x^2+b*x+a)^(1/2)*e^2*d+3/2*x/c*(c*x^2+b*x+a)^(1/2)*f
*d^2+3/2*x/c*(c*x^2+b*x+a)^(1/2)*e^2*d+8/5*e*f^2/c^3*a^2*(c*x^2+b
*x+a)^(1/2)-3/2*d^2*e*b/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x
+a)^(1/2))+77/256*f^3*b^4/c^5*x*(c*x^2+b*x+a)^(1/2)-315/256*f^3*b
^4/c^(11/2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+119/64*
f^3*b^3/c^5*a*(c*x^2+b*x+a)^(1/2)+105/64*f^3*b^2/c^(9/2)*a^2*ln((
1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+3/5*e*f^2*x^4/c*(c*x^2+b*
x+a)^(1/2)+189/128*e*f^2*b^4/c^5*(c*x^2+b*x+a)^(1/2)-189/256*e*f^
2*b^5/c^(11/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+33/160
*f^3*b^2/c^3*x^3*(c*x^2+b*x+a)^(1/2)-77/320*f^3*b^3/c^4*x^2*(c*x^
2+b*x+a)^(1/2)+5/16*f^3/c^3*a^2*x*(c*x^2+b*x+a)^(1/2)-5/12*b/c^2*
x*(c*x^2+b*x+a)^(1/2)*e^3+3/4*b/c^(5/2)*a*ln((1/2*b+c*x)/c^(1/2)+
(c*x^2+b*x+a)^(1/2))*e^3-11/60*f^3*b/c^2*x^4*(c*x^2+b*x+a)^(1/2)-
231/160*f^3*b/c^4*a^2*(c*x^2+b*x+a)^(1/2)-5/24*f^3/c^2*a*x^3*(c*x
^2+b*x+a)^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.45333, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/30720*(4*(1280*c^5*f^3*x^5 + 23040*c^5*d^2*e - 17280*b*c^4*d*e
^2 + 128*(36*c^5*e*f^2 - 11*b*c^4*f^3)*x^4 + 320*(15*b^2*c^3 - 16
*a*c^4)*e^3 - 21*(165*b^5 - 680*a*b^3*c + 528*a^2*b*c^2)*f^3 + 16
*(360*c^5*e^2*f + (99*b^2*c^3 - 100*a*c^4)*f^3 + 36*(10*c^5*d - 9
*b*c^4*e)*f^2)*x^3 - 12*(50*(21*b^3*c^2 - 44*a*b*c^3)*d - (945*b^
4*c - 2940*a*b^2*c^2 + 1024*a^2*c^3)*e)*f^2 + 8*(320*c^5*e^3 - 3*
(77*b^3*c^2 - 156*a*b*c^3)*f^3 - 12*(70*b*c^4*d - (63*b^2*c^3 - 6
4*a*c^4)*e)*f^2 + 120*(16*c^5*d*e - 7*b*c^4*e^2)*f)*x^2 - 120*(14
4*b*c^4*d^2 - 16*(15*b^2*c^3 - 16*a*c^4)*d*e + 5*(21*b^3*c^2 - 44
*a*b*c^3)*e^2)*f + 2*(5760*c^5*d*e^2 - 1600*b*c^4*e^3 + 3*(385*b^
4*c - 1176*a*b^2*c^2 + 400*a^2*c^3)*f^3 + 12*(10*(35*b^2*c^3 - 36
*a*c^4)*d - 7*(45*b^3*c^2 - 92*a*b*c^3)*e)*f^2 + 120*(48*c^5*d^2
- 80*b*c^4*d*e + (35*b^2*c^3 - 36*a*c^4)*e^2)*f)*x)*sqrt(c*x^2 +
b*x + a)*sqrt(c) - 15*(1024*c^6*d^3 - 1536*b*c^5*d^2*e + 384*(3*b
^2*c^4 - 4*a*c^5)*d*e^2 - 64*(5*b^3*c^3 - 12*a*b*c^4)*e^3 + (231*
b^6 - 1260*a*b^4*c + 1680*a^2*b^2*c^2 - 320*a^3*c^3)*f^3 + 12*(2*
(35*b^4*c^2 - 120*a*b^2*c^3 + 48*a^2*c^4)*d - (63*b^5*c - 280*a*b
^3*c^2 + 240*a^2*b*c^3)*e)*f^2 + 24*(16*(3*b^2*c^4 - 4*a*c^5)*d^2
 - 16*(5*b^3*c^3 - 12*a*b*c^4)*d*e + (35*b^4*c^2 - 120*a*b^2*c^3
+ 48*a^2*c^4)*e^2)*f)*log(4*(2*c^2*x + b*c)*sqrt(c*x^2 + b*x + a)
 - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/c^(13/2), 1/1536
0*(2*(1280*c^5*f^3*x^5 + 23040*c^5*d^2*e - 17280*b*c^4*d*e^2 + 12
8*(36*c^5*e*f^2 - 11*b*c^4*f^3)*x^4 + 320*(15*b^2*c^3 - 16*a*c^4)
*e^3 - 21*(165*b^5 - 680*a*b^3*c + 528*a^2*b*c^2)*f^3 + 16*(360*c
^5*e^2*f + (99*b^2*c^3 - 100*a*c^4)*f^3 + 36*(10*c^5*d - 9*b*c^4*
e)*f^2)*x^3 - 12*(50*(21*b^3*c^2 - 44*a*b*c^3)*d - (945*b^4*c - 2
940*a*b^2*c^2 + 1024*a^2*c^3)*e)*f^2 + 8*(320*c^5*e^3 - 3*(77*b^3
*c^2 - 156*a*b*c^3)*f^3 - 12*(70*b*c^4*d - (63*b^2*c^3 - 64*a*c^4
)*e)*f^2 + 120*(16*c^5*d*e - 7*b*c^4*e^2)*f)*x^2 - 120*(144*b*c^4
*d^2 - 16*(15*b^2*c^3 - 16*a*c^4)*d*e + 5*(21*b^3*c^2 - 44*a*b*c^
3)*e^2)*f + 2*(5760*c^5*d*e^2 - 1600*b*c^4*e^3 + 3*(385*b^4*c - 1
176*a*b^2*c^2 + 400*a^2*c^3)*f^3 + 12*(10*(35*b^2*c^3 - 36*a*c^4)
*d - 7*(45*b^3*c^2 - 92*a*b*c^3)*e)*f^2 + 120*(48*c^5*d^2 - 80*b*
c^4*d*e + (35*b^2*c^3 - 36*a*c^4)*e^2)*f)*x)*sqrt(c*x^2 + b*x + a
)*sqrt(-c) + 15*(1024*c^6*d^3 - 1536*b*c^5*d^2*e + 384*(3*b^2*c^4
 - 4*a*c^5)*d*e^2 - 64*(5*b^3*c^3 - 12*a*b*c^4)*e^3 + (231*b^6 -
1260*a*b^4*c + 1680*a^2*b^2*c^2 - 320*a^3*c^3)*f^3 + 12*(2*(35*b^
4*c^2 - 120*a*b^2*c^3 + 48*a^2*c^4)*d - (63*b^5*c - 280*a*b^3*c^2
 + 240*a^2*b*c^3)*e)*f^2 + 24*(16*(3*b^2*c^4 - 4*a*c^5)*d^2 - 16*
(5*b^3*c^3 - 12*a*b*c^4)*d*e + (35*b^4*c^2 - 120*a*b^2*c^3 + 48*a
^2*c^4)*e^2)*f)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x
 + a)*c)))/(sqrt(-c)*c^6)]
```

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

$$\int \frac{(d + ex + fx^2)^3}{\sqrt{a + bx + cx^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Integral((d + e*x + f*x**2)**3/sqrt(a + b*x + c*x**2), x)
```

GIAC/XCAS [A] time = 0.29312, size = 1112, normalized size = 1.55

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/7680*sqrt(c*x^2 + b*x + a)*(2*(4*(2*(8*(10*f^3*x/c - (11*b*c^4*
f^3 - 36*c^5*f^2*e)/c^6)*x + (360*c^5*d*f^2 + 99*b^2*c^3*f^3 - 10
0*a*c^4*f^3 - 324*b*c^4*f^2*e + 360*c^5*f*e^2)/c^6)*x - (840*b*c^
4*d*f^2 + 231*b^3*c^2*f^3 - 468*a*b*c^3*f^3 - 1920*c^5*d*f*e - 75
6*b^2*c^3*f^2*e + 768*a*c^4*f^2*e + 840*b*c^4*f*e^2 - 320*c^5*e^3
)/c^6)*x + (5760*c^5*d^2*f + 4200*b^2*c^3*d*f^2 - 4320*a*c^4*d*f^
2 + 1155*b^4*c*f^3 - 3528*a*b^2*c^2*f^3 + 1200*a^2*c^3*f^3 - 9600
*b*c^4*d*f*e - 3780*b^3*c^2*f^2*e + 7728*a*b*c^3*f^2*e + 5760*c^5
*d*e^2 + 4200*b^2*c^3*f*e^2 - 4320*a*c^4*f*e^2 - 1600*b*c^4*e^3)/
c^6)*x - (17280*b*c^4*d^2*f + 12600*b^3*c^2*d*f^2 - 26400*a*b*c^3
*d*f^2 + 3465*b^5*f^3 - 14280*a*b^3*c*f^3 + 11088*a^2*b*c^2*f^3 -
 23040*c^5*d^2*e - 28800*b^2*c^3*d*f*e + 30720*a*c^4*d*f*e - 1134
0*b^4*c*f^2*e + 35280*a*b^2*c^2*f^2*e - 12288*a^2*c^3*f^2*e + 172
80*b*c^4*d*e^2 + 12600*b^3*c^2*f*e^2 - 26400*a*b*c^3*f*e^2 - 4800
*b^2*c^3*e^3 + 5120*a*c^4*e^3)/c^6) - 1/1024*(1024*c^6*d^3 + 1152
*b^2*c^4*d^2*f - 1536*a*c^5*d^2*f + 840*b^4*c^2*d*f^2 - 2880*a*b^
2*c^3*d*f^2 + 1152*a^2*c^4*d*f^2 + 231*b^6*f^3 - 1260*a*b^4*c*f^3
 + 1680*a^2*b^2*c^2*f^3 - 320*a^3*c^3*f^3 - 1536*b*c^5*d^2*e - 19
20*b^3*c^3*d*f*e + 4608*a*b*c^4*d*f*e - 756*b^5*c*f^2*e + 3360*a*
b^3*c^2*f^2*e - 2880*a^2*b*c^3*f^2*e + 1152*b^2*c^4*d*e^2 - 1536*
a*c^5*d*e^2 + 840*b^4*c^2*f*e^2 - 2880*a*b^2*c^3*f*e^2 + 1152*a^2
*c^4*f*e^2 - 320*b^3*c^3*e^3 + 768*a*b*c^4*e^3)*ln(abs(-2*(sqrt(c
)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/c^(13/2)
```

3.110 $\int \frac{(d+ex+fx^2)^2}{\sqrt{a+bx+cx^2}}\,dx$

Optimal. Leaf size=316

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(48c^2\left(a^2f^2+4abef+b^2\left(2df+e^2\right)\right)-40b^2cf(3af+2be)-64c^3\left(a\left(2df+e^2\right)+2bde\right)+35b^4f^2}{128c^{9/2}}$$
$$+\frac{\sqrt{a+bx+cx^2}\left(-16c^2\left(16aef+9b\left(2df+e^2\right)\right)+20bcf(11af+12be)-105b^3f^2+384c^3de\right)}{192c^4}$$
$$+\frac{x\sqrt{a+bx+cx^2}\left(-4cf(9af+20be)+35b^2f^2+48c^2\left(2df+e^2\right)\right)}{96c^3}$$
$$+\frac{fx^2\sqrt{a+bx+cx^2}(16ce-7bf)}{24c^2}+\frac{f^2x^3\sqrt{a+bx+cx^2}}{4c}$$

```
[Out] ((384*c^3*d*e - 105*b^3*f^2 + 20*b*c*f*(12*b*e + 11*a*f) - 16*c^2
*(16*a*e*f + 9*b*(e^2 + 2*d*f)))*Sqrt[a + b*x + c*x^2])/(192*c^4)
 + ((35*b^2*f^2 - 4*c*f*(20*b*e + 9*a*f) + 48*c^2*(e^2 + 2*d*f))*
x*Sqrt[a + b*x + c*x^2])/(96*c^3) + (f*(16*c*e - 7*b*f)*x^2*Sqrt[
a + b*x + c*x^2])/(24*c^2) + (f^2*x^3*Sqrt[a + b*x + c*x^2])/(4*c
) + ((128*c^4*d^2 + 35*b^4*f^2 - 40*b^2*c*f*(2*b*e + 3*a*f) - 64*
c^3*(2*b*d*e + a*(e^2 + 2*d*f)) + 48*c^2*(4*a*b*e*f + a^2*f^2 + b
^2*(e^2 + 2*d*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x +
c*x^2])])/(128*c^(9/2))
```

Rubi [A] time = 1.1901, antiderivative size = 316, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(48c^2\left(a^2f^2+4abef+b^2\left(2df+e^2\right)\right)-40b^2cf(3af+2be)-64c^3\left(a\left(2df+e^2\right)+2bde\right)+35b^4f^2}{128c^{9/2}}$$
$$+\frac{\sqrt{a+bx+cx^2}\left(-16c^2\left(16aef+9b\left(2df+e^2\right)\right)+20bcf(11af+12be)-105b^3f^2+384c^3de\right)}{192c^4}$$
$$+\frac{x\sqrt{a+bx+cx^2}\left(-4cf(9af+20be)+35b^2f^2+48c^2\left(2df+e^2\right)\right)}{96c^3}$$
$$+\frac{fx^2\sqrt{a+bx+cx^2}(16ce-7bf)}{24c^2}+\frac{f^2x^3\sqrt{a+bx+cx^2}}{4c}$$

Antiderivative was successfully verified.

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

```
[Out] ((384*c^3*d*e - 105*b^3*f^2 + 20*b*c*f*(12*b*e + 11*a*f) - 16*c^2
*(16*a*e*f + 9*b*(e^2 + 2*d*f)))*Sqrt[a + b*x + c*x^2])/(192*c^4)
 + ((35*b^2*f^2 - 4*c*f*(20*b*e + 9*a*f) + 48*c^2*(e^2 + 2*d*f))*
x*Sqrt[a + b*x + c*x^2])/(96*c^3) + (f*(16*c*e - 7*b*f)*x^2*Sqrt[
a + b*x + c*x^2])/(24*c^2) + (f^2*x^3*Sqrt[a + b*x + c*x^2])/(4*c
) + ((128*c^4*d^2 + 35*b^4*f^2 - 40*b^2*c*f*(2*b*e + 3*a*f) - 64*
c^3*(2*b*d*e + a*(e^2 + 2*d*f)) + 48*c^2*(4*a*b*e*f + a^2*f^2 + b
^2*(e^2 + 2*d*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x +
c*x^2])])/(128*c^(9/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(1/2),x)
```

[Out] Timed out

Mathematica [A] time = 0.442964, size = 251, normalized size = 0.79

$$\frac{3\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)\left(48c^2\left(a^2f^2+4abef+b^2\left(2df+e^2\right)\right)-40b^2cf(3af+2be)-64c^3\left(a\left(2df+e^2\right)+2b\right.\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] (2*Sqrt[c]*Sqrt[a + x*(b + c*x)]*(-105*b^3*f^2 + 10*b*c*f*(24*b*e
 + 22*a*f + 7*b*f*x) + 16*c^3*(12*d*(2*e + f*x) + x*(6*e^2 + 8*e*
f*x + 3*f^2*x^2)) - 8*c^2*(a*f*(32*e + 9*f*x) + b*(18*e^2 + 36*d*
f + 20*e*f*x + 7*f^2*x^2))) + 3*(128*c^4*d^2 + 35*b^4*f^2 - 40*b^
2*c*f*(2*b*e + 3*a*f) - 64*c^3*(2*b*d*e + a*(e^2 + 2*d*f)) + 48*c
^2*(4*a*b*e*f + a^2*f^2 + b^2*(e^2 + 2*d*f)))*Log[b + 2*c*x + 2*S
qrt[c]*Sqrt[a + x*(b + c*x)]])/(384*c^(9/2))
```

Maple [B] time = 0.019, size = 706, normalized size = 2.2

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x^2+e*x+d)^2/(c*x^2+b*x+a)^(1/2),x)
```

```
[Out] -4/3*e*f/c^2*a*(c*x^2+b*x+a)^(1/2)+2/3*e*f*x^2/c*(c*x^2+b*x+a)^(1
/2)+x/c*(c*x^2+b*x+a)^(1/2)*d*f-3/2*b/c^2*(c*x^2+b*x+a)^(1/2)*d*f
+3/4*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*f-
a/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*f-d*e*b/c
^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-7/24*f^2*b/c^2
*x^2*(c*x^2+b*x+a)^(1/2)+35/96*f^2*b^2/c^3*x*(c*x^2+b*x+a)^(1/2)-
15/16*f^2*b^2/c^(7/2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2
))+55/48*f^2*b/c^3*a*(c*x^2+b*x+a)^(1/2)-3/8*f^2/c^2*a*x*(c*x^2+b
*x+a)^(1/2)-5/8*e*f*b^3/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x
+a)^(1/2))+5/4*e*f*b^2/c^3*(c*x^2+b*x+a)^(1/2)+35/128*f^2*b^4/c^(
9/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+3/8*f^2/c^(5/2)*
a^2*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+2*d*e/c*(c*x^2+b*
x+a)^(1/2)+1/2*x/c*(c*x^2+b*x+a)^(1/2)*e^2-3/4*b/c^2*(c*x^2+b*x+a
)^(1/2)*e^2+3/8*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^
(1/2))*e^2-1/2*a/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/
2))*e^2-35/64*f^2*b^3/c^4*(c*x^2+b*x+a)^(1/2)-5/6*e*f*b/c^2*x*(c*
x^2+b*x+a)^(1/2)+3/2*e*f*b/c^(5/2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^
2+b*x+a)^(1/2))+1/4*f^2*x^3*(c*x^2+b*x+a)^(1/2)/c+d^2*ln((1/2*b+c
*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))/c^(1/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.845185, size = 1, normalized size = 0.

$$\left[\frac{4\left(48\,c^{3}f^{2}x^{3}+384\,c^{3}de-144\,bc^{2}e^{2}-5\left(21\,b^{3}-44\,abc\right)f^{2}+8\left(16\,c^{3}ef-7\,bc^{2}f^{2}\right)x^{2}-16\left(18\,bc^{2}d-\left(15\,b^{2}c-16\,ac^{2}\right)e\right)\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/768*(4*(48*c^3*f^2*x^3 + 384*c^3*d*e - 144*b*c^2*e^2 - 5*(21*b
^3 - 44*a*b*c)*f^2 + 8*(16*c^3*e*f - 7*b*c^2*f^2)*x^2 - 16*(18*b*
c^2*d - (15*b^2*c - 16*a*c^2)*e)*f + 2*(48*c^3*e^2 + (35*b^2*c -
36*a*c^2)*f^2 + 16*(6*c^3*d - 5*b*c^2*e)*f)*x)*sqrt(c*x^2 + b*x +
 a)*sqrt(c) + 3*(128*c^4*d^2 - 128*b*c^3*d*e + 16*(3*b^2*c^2 - 4*
a*c^3)*e^2 + (35*b^4 - 120*a*b^2*c + 48*a^2*c^2)*f^2 + 16*(2*(3*b
^2*c^2 - 4*a*c^3)*d - (5*b^3*c - 12*a*b*c^2)*e)*f)*log(-4*(2*c^2*
x + b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a
*c)*sqrt(c)))/c^(9/2), 1/384*(2*(48*c^3*f^2*x^3 + 384*c^3*d*e - 1
44*b*c^2*e^2 - 5*(21*b^3 - 44*a*b*c)*f^2 + 8*(16*c^3*e*f - 7*b*c^
2*f^2)*x^2 - 16*(18*b*c^2*d - (15*b^2*c - 16*a*c^2)*e)*f + 2*(48*
c^3*e^2 + (35*b^2*c - 36*a*c^2)*f^2 + 16*(6*c^3*d - 5*b*c^2*e)*f)
*x)*sqrt(c*x^2 + b*x + a)*sqrt(-c) + 3*(128*c^4*d^2 - 128*b*c^3*d
*e + 16*(3*b^2*c^2 - 4*a*c^3)*e^2 + (35*b^4 - 120*a*b^2*c + 48*a^
2*c^2)*f^2 + 16*(2*(3*b^2*c^2 - 4*a*c^3)*d - (5*b^3*c - 12*a*b*c^
2)*e)*f)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c
)))/(sqrt(-c)*c^4)]
```

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

$$\int\frac{\left(d+ex+fx^{2}\right)^{2}}{\sqrt{a+bx+cx^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Integral((d + e*x + f*x**2)**2/sqrt(a + b*x + c*x**2), x)
```

GIAC/XCAS [A] time = 0.285053, size = 410, normalized size = 1.3

$$\frac{1}{192}\sqrt{cx^{2}+bx+a}\left(2\left(4\left(\frac{6\,f^{2}x}{c}-\frac{7\,bc^{2}f^{2}-16\,c^{3}fe}{c^{4}}\right)x+\frac{96\,c^{3}df+35\,b^{2}cf^{2}-36\,ac^{2}f^{2}-80\,bc^{2}fe+48\,c^{3}e^{2}}{c^{4}}\right)x-\frac{288\,bc^{2}}{}\right.$$
$$-\frac{\left(128\,c^{4}d^{2}+96\,b^{2}c^{2}df-128\,ac^{3}df+35\,b^{4}f^{2}-120\,ab^{2}cf^{2}+48\,a^{2}c^{2}f^{2}-128\,bc^{3}de-80\,b^{3}cfe+192\,abc^{2}fe+48\,b^{2}c^{2}e^{2}\right.}{128\,c^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/192*sqrt(c*x^2 + b*x + a)*(2*(4*(6*f^2*x/c - (7*b*c^2*f^2 - 16*
c^3*f*e)/c^4)*x + (96*c^3*d*f + 35*b^2*c*f^2 - 36*a*c^2*f^2 - 80*
b*c^2*f*e + 48*c^3*e^2)/c^4)*x - (288*b*c^2*d*f + 105*b^3*f^2 - 2
20*a*b*c*f^2 - 384*c^3*d*e - 240*b^2*c*f*e + 256*a*c^2*f*e + 144*
b*c^2*e^2)/c^4) - 1/128*(128*c^4*d^2 + 96*b^2*c^2*d*f - 128*a*c^3
*d*f + 35*b^4*f^2 - 120*a*b^2*c*f^2 + 48*a^2*c^2*f^2 - 128*b*c^3*
```

```
d*e - 80*b^3*c*f*e + 192*a*b*c^2*f*e + 48*b^2*c^2*e^2 - 64*a*c^3*
e^2)*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/
c^(9/2)
```

3.111 $\int \frac{d+ex+fx^2}{\sqrt{a+bx+cx^2}}\,dx$

Optimal. Leaf size=116

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-4c(af+be)+3b^2f+8c^2d\right)}{8c^{5/2}}+\frac{\sqrt{a+bx+cx^2}(4ce-3bf)}{4c^2}+\frac{fx\sqrt{a+bx+cx^2}}{2c}$$

```
[Out] ((4*c*e - 3*b*f)*Sqrt[a + b*x + c*x^2])/(4*c^2) + (f*x*Sqrt[a + b
*x + c*x^2])/(2*c) + ((8*c^2*d + 3*b^2*f - 4*c*(b*e + a*f))*ArcTa
nh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*c^(5/2))
```

Rubi [A] time = 0.214815, antiderivative size = 116, normalized size of antiderivative = 1., number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.16$

$$\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-4c(af+be)+3b^2f+8c^2d\right)}{8c^{5/2}}+\frac{\sqrt{a+bx+cx^2}(4ce-3bf)}{4c^2}+\frac{fx\sqrt{a+bx+cx^2}}{2c}$$

Antiderivative was successfully verified.

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

```
[Out] ((4*c*e - 3*b*f)*Sqrt[a + b*x + c*x^2])/(4*c^2) + (f*x*Sqrt[a + b
*x + c*x^2])/(2*c) + ((8*c^2*d + 3*b^2*f - 4*c*(b*e + a*f))*ArcTa
nh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*c^(5/2))
```

Rubi in Sympy [A] time = 15.7553, size = 97, normalized size = 0.84

$$-\frac{\sqrt{a+bx+cx^2}\left(\frac{3bf}{2}-2ce-cfx\right)}{2c^2}+\frac{\left(-4acf+3b^2f-4bce+8c^2d\right)\operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{8c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] -sqrt(a + b*x + c*x**2)*(3*b*f/2 - 2*c*e - c*f*x)/(2*c**2) + (-4*
a*c*f + 3*b**2*f - 4*b*c*e + 8*c**2*d)*atanh((b + 2*c*x)/(2*sqrt(
c)*sqrt(a + b*x + c*x**2)))/(8*c**(5/2))
```

Mathematica [A] time = 0.147425, size = 95, normalized size = 0.82

$$\frac{\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)\left(-4c(af+be)+3b^2f+8c^2d\right)+2\sqrt{c}\sqrt{a+x(b+cx)}(-3bf+4ce+2cfx)}{8c^{5/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (2*Sqrt[c]*(4*c*e - 3*b*f + 2*c*f*x)*Sqrt[a + x*(b + c*x)] + (8*c
^2*d + 3*b^2*f - 4*c*(b*e + a*f))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[
a + x*(b + c*x)]])/(8*c^(5/2))
```

Maple [A] time = 0.009, size = 185, normalized size = 1.6

$$d\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)\frac{1}{\sqrt{c}}+\frac{e}{c}\sqrt{cx^2+bx+a}-\frac{be}{2}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{3}{2}}+\frac{fx}{2c}\sqrt{cx^2+bx+a}-\frac{3bf}{4c^2}\sqrt{cx^2+bx+a}+\frac{3b^2f}{8}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{5}{2}}-\frac{fa}{2}\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int((f*x^2+e*x+d)/(c*x^2+b*x+a)^(1/2),x)
```

```
[Out] d*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))/c^(1/2)+e/c*(c*x^2+
b*x+a)^(1/2)-1/2*e*b/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)
^(1/2))+1/2*f*x*(c*x^2+b*x+a)^(1/2)/c-3/4*f*b/c^2*(c*x^2+b*x+a)^(
1/2)+3/8*f*b^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2)
)-1/2*f*a/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.571157, size = 1, normalized size = 0.01

$$\left[\frac{4\left(2cfx+4ce-3bf\right)\sqrt{cx^2+bx+a}\sqrt{c}-\left(8c^2d-4bce+\left(3b^2-4ac\right)f\right)\log\left(4\left(2c^2x+bc\right)\sqrt{cx^2+bx+a}-\left(8c^2x^2+8b\right.\right.}{16c^{\frac{5}{2}}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [1/16*(4*(2*c*f*x + 4*c*e - 3*b*f)*sqrt(c*x^2 + b*x + a)*sqrt(c)
- (8*c^2*d - 4*b*c*e + (3*b^2 - 4*a*c)*f)*log(4*(2*c^2*x + b*c)*s
qrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c
)))/c^(5/2), 1/8*(2*(2*c*f*x + 4*c*e - 3*b*f)*sqrt(c*x^2 + b*x +
a)*sqrt(-c) + (8*c^2*d - 4*b*c*e + (3*b^2 - 4*a*c)*f)*arctan(1/2*
(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/(sqrt(-c)*c^2)]
```

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

$$\int\frac{d+ex+fx^2}{\sqrt{a+bx+cx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(1/2),x)
```

```
[Out] Integral((d + e*x + f*x**2)/sqrt(a + b*x + c*x**2), x)
```

GIAC/XCAS [A] time = 0.282181, size = 132, normalized size = 1.14

$$\frac{1}{4}\sqrt{cx^2+bx+a}\left(\frac{2fx}{c}-\frac{3bf-4ce}{c^2}\right)-\frac{\left(8c^2d+3b^2f-4acf-4bce\right)\ln\left(\left|-2\left(\sqrt{c}x-\sqrt{cx^2+bx+a}\right)\sqrt{c}-b\right|\right)}{8c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*sqrt(c*x^2 + b*x + a)*(2*f*x/c - (3*b*f - 4*c*e)/c^2) - 1/8*(
8*c^2*d + 3*b^2*f - 4*a*c*f - 4*b*c*e)*ln(abs(-2*(sqrt(c)*x - sqr
t(c*x^2 + b*x + a))*sqrt(c) - b))/c^(5/2)
```

3.112 $\int \frac{1}{\sqrt{a+bx+cx^2}(d+ex+fx^2)}\,dx$

Optimal. Leaf size=374

$$\frac{\sqrt{2}f\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}-\frac{\sqrt{2}f\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$

```
[Out] -((Sqrt[2]*f*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f
- c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f -
 b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x +
c*x^2])])/(Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f
^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]])) + (Sqrt[2]*f*ArcTanh[(4*a*f
 - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f])
)*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b
*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(Sqrt[e^2 - 4*d*f
]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 -
 4*d*f]])
```

Rubi [A] time = 1.3687, antiderivative size = 374, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 3, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111

$$\frac{\sqrt{2}f\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}-\frac{\sqrt{2}f\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{e^2-4df}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)),x]
```

```
[Out] -((Sqrt[2]*f*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f
- c*(e - Sqrt[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f -
 b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x +
c*x^2])])/(Sqrt[e^2 - 4*d*f]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f
^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]])) + (Sqrt[2]*f*ArcTanh[(4*a*f
 - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f])
)*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b
*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(Sqrt[e^2 - 4*d*f
]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2 -
 4*d*f]])
```

Rubi in Sympy [A] time = 103.052, size = 357, normalized size = 0.95

$$-\frac{\sqrt{2}f\operatorname{atanh}\left(\frac{\sqrt{2}\left(4af-be+b\sqrt{-4df+e^2}+x\left(2bf-2ce+2c\sqrt{-4df+e^2}\right)\right)}{4\sqrt{a+bx+cx^2}\sqrt{2af^2-bef-2cdf+ce^2+(bf-ce)\sqrt{-4df+e^2}}}\right)}{\sqrt{-4df+e^2}\sqrt{2af^2-bef-2cdf+ce^2+(bf-ce)\sqrt{-4df+e^2}}}+\frac{\sqrt{2}f\operatorname{atanh}\left(\frac{\sqrt{2}\left(4af-b\left(e+\sqrt{-4df+e^2}\right)+x\left(2bf-2c\left(e+\sqrt{-4df+e^2}\right)\right)\right)}{4\sqrt{a+bx+cx^2}\sqrt{2af^2-bef-2cdf+ce^2-(bf-ce)\sqrt{-4df+e^2}}}\right)}{\sqrt{-4df+e^2}\sqrt{2af^2-bef-2cdf+ce^2-(bf-ce)\sqrt{-4df+e^2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d),x)
```

```
[Out] -sqrt(2)*f*atanh(sqrt(2)*(4*a*f - b*e + b*sqrt(-4*d*f + e**2) + x
*(2*b*f - 2*c*e + 2*c*sqrt(-4*d*f + e**2)))/(4*sqrt(a + b*x + c*x
**2)*sqrt(2*a*f**2 - b*e*f - 2*c*d*f + c*e**2 + (b*f - c*e)*sqrt(
-4*d*f + e**2))))/(sqrt(-4*d*f + e**2)*sqrt(2*a*f**2 - b*e*f - 2*
c*d*f + c*e**2 + (b*f - c*e)*sqrt(-4*d*f + e**2))) + sqrt(2)*f*at
anh(sqrt(2)*(4*a*f - b*(e + sqrt(-4*d*f + e**2)) + x*(2*b*f - 2*c
*(e + sqrt(-4*d*f + e**2))))/(4*sqrt(a + b*x + c*x**2)*sqrt(2*a*f
**2 - b*e*f - 2*c*d*f + c*e**2 - (b*f - c*e)*sqrt(-4*d*f + e**2))
))/(sqrt(-4*d*f + e**2)*sqrt(2*a*f**2 - b*e*f - 2*c*d*f + c*e**2
- (b*f - c*e)*sqrt(-4*d*f + e**2)))
```

Mathematica [A] time = 5.14594, size = 633, normalized size = 1.69

$$\sqrt{2}f\left(\frac{\log\left(\sqrt{e^2-4df}-e-2fx\right)}{\sqrt{f\left(2af+b\sqrt{e^2-4df}+b(-e)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)}}-\frac{\log\left(\sqrt{e^2-4df}+e+2fx\right)}{\sqrt{f\left(2af-b\left(\sqrt{e^2-4df}+e\right)\right)+c\left(e\sqrt{e^2-4df}-2df+e^2\right)}}-\frac{\log\left(2\sqrt{2}\sqrt{e^2-4df}\sqrt{a+x(b+cx)}\sqrt{\cdots}\right.}{\cdots}\right.$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)),x]
```

```
[Out] (Sqrt[2]*f*(Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x]/Sqrt[f*(-(b*e) +
2*a*f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*
f])] - Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x]/Sqrt[c*(e^2 - 2*d*f + e
*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))] - Lo
g[4*a*f*Sqrt[e^2 - 4*d*f] + 2*c*e^2*x - 8*c*d*f*x - 2*c*e*Sqrt[e^
2 - 4*d*f]*x + b*(e^2 - 4*d*f - e*Sqrt[e^2 - 4*d*f] + 2*f*Sqrt[e^
2 - 4*d*f]*x) + 2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[f*(-(b*e) + 2*a*
f + b*Sqrt[e^2 - 4*d*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]
*Sqrt[a + x*(b + c*x)]]/Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d
*f]) + c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])] + Log[4*a*f*Sqrt[e^
2 - 4*d*f] - 2*c*e^2*x + 8*c*d*f*x - 2*c*e*Sqrt[e^2 - 4*d*f]*x +
2*Sqrt[2]*Sqrt[e^2 - 4*d*f]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*
d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))]*Sqrt[a + x*(b + c*
x)] - b*(e^2 + e*Sqrt[e^2 - 4*d*f] - 2*f*(2*d + Sqrt[e^2 - 4*d*f]
*x))]/Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(
e + Sqrt[e^2 - 4*d*f]))]))/Sqrt[e^2 - 4*d*f]
```

Maple [B] time = 0.037, size = 761, normalized size = 2.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d),x)
```

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)),x, algorithm="maxima")
```

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

Fricas [A] time = 6.72084, size = 15237, normalized size = 40.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)),x, algorithm="fricas")
```

```
[Out] 1/4*sqrt(2)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f + (c^2*d^2*e^
2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*
(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^
2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^
4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d
*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(
a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c +
 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)
*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^
3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*
b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^
3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*
a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/(c^2*d^2*e
^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4
*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b
^2 - 6*a*c)*d*e^2)*f))*log((2*(b^2*d - a*b*e)*f^2 + sqrt(2)*(c^2*
d*e^3 - 4*a*b*d*f^3 + (4*b*c*d^2 + 4*a*c*d*e + a*b*e^2)*f^2 - (4*
c^2*d^2*e + b*c*d*e^2 + a*c*e^3)*f - (c^3*d^3*e^3 - b*c^2*d^2*e^4
 + a*c^2*d*e^5 + 4*(2*a^2*b*d^2 - a^3*d*e)*f^4 + (2*a^2*b*d*e^2 +
 a^3*e^3 + 8*(b^3 - 2*a*b*c)*d^3 - 4*(3*a*b^2 - a^2*c)*d^2*e)*f^3
 + (8*b*c^2*d^4 - a^2*b*e^4 - 4*(3*b^2*c - a*c^2)*d^3*e - 2*(b^3
- 10*a*b*c)*d^2*e^2 + (3*a*b^2 - 5*a^2*c)*d*e^3)*f^2 - (4*c^3*d^4
```

```
*e - 2*b*c^2*d^3*e^2 + 4*a*b*c*d*e^4 - a^2*c*e^5 - (3*b^2*c - 5*a
*c^2)*d^2*e^3)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e
^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^
5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2
*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*
a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*
e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e
 - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c
)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d
^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b
*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))*sqrt(c*x^2 +
b*x + a)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f + (c^2*d^2*e^2 -
 b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^
2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 -
 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e
^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^
5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2
*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*
a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*
e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e
 - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c
)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d
^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b
*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/(c^2*d^2*e^2
- b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b
^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2
- 6*a*c)*d*e^2)*f)) - 2*(b*c*d*e - a*c*e^2)*f + ((4*b*c*d - b^2*e
)*f^2 - (4*c^2*d*e - b*c*e^2)*f)*x - (8*a^3*d*f^4 - 2*(4*a^2*b*d*
e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c)*d^2)*f^3 + 2*(4*a*c^2*d^3 - 4*a
*b*c*d^2*e + a^2*b*e^3 - (a*b^2 - 6*a^2*c)*d*e^2)*f^2 - 2*(a*c^2*
d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^4)*f + (4*a^2*b*d*f^4 - (4*a*b^2*
d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b*c)*d^2)*f^3 + (4*b*c^2*d^3 - 4*b
^2*c*d^2*e + a*b^2*e^3 - (b^3 - 6*a*b*c)*d*e^2)*f^2 - (b*c^2*d^2*
e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f)*x)*sqrt((c^2*e^2 - 2*b*c*e*f +
b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c
^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e
 + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b
^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^
2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3
*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2
*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*
c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e
^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)
*f)))/x) - 1/4*sqrt(2)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f +
(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a
^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*
b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f
^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^
6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^
4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 -
4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2
 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c -
a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b
^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d
^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 +
(b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))
/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e +
a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a
*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f))*log((2*(b^2*d - a*b*e)*f^2 - sq
rt(2)*(c^2*d*e^3 - 4*a*b*d*f^3 + (4*b*c*d^2 + 4*a*c*d*e + a*b*e^2
)*f^2 - (4*c^2*d^2*e + b*c*d*e^2 + a*c*e^3)*f - (c^3*d^3*e^3 - b*
c^2*d^2*e^4 + a*c^2*d*e^5 + 4*(2*a^2*b*d^2 - a^3*d*e)*f^4 + (2*a^
2*b*d*e^2 + a^3*e^3 + 8*(b^3 - 2*a*b*c)*d^3 - 4*(3*a*b^2 - a^2*c)
*d^2*e)*f^3 + (8*b*c^2*d^4 - a^2*b*e^4 - 4*(3*b^2*c - a*c^2)*d^3*
e - 2*(b^3 - 10*a*b*c)*d^2*e^2 + (3*a*b^2 - 5*a^2*c)*d*e^3)*f^2 -
 (4*c^3*d^4*e - 2*b*c^2*d^3*e^2 + 4*a*b*c*d*e^4 - a^2*c*e^5 - (3*
b^2*c - 5*a*c^2)*d^2*e^3)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)
/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 -
 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e
^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a
*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 +
6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b
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*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3
- 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5
- 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^
3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))*sq
rt(c*x^2 + b*x + a)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b*e)*f + (c^
2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2*
e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*e
^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)
/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 -
 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e
^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a
*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 +
6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b
*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3
- 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5
- 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^
3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/(c
^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b*d*e + a^2
*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^2*e + a*b*
e^3 - (b^2 - 6*a*c)*d*e^2)*f)) - 2*(b*c*d*e - a*c*e^2)*f + ((4*b*
c*d - b^2*e)*f^2 - (4*c^2*d*e - b*c*e^2)*f)*x - (8*a^3*d*f^4 - 2*
(4*a^2*b*d*e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c)*d^2)*f^3 + 2*(4*a*c^
2*d^3 - 4*a*b*c*d^2*e + a^2*b*e^3 - (a*b^2 - 6*a^2*c)*d*e^2)*f^2
- 2*(a*c^2*d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^4)*f + (4*a^2*b*d*f^4
- (4*a*b^2*d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b*c)*d^2)*f^3 + (4*b*c^
2*d^3 - 4*b^2*c*d^2*e + a*b^2*e^3 - (b^3 - 6*a*b*c)*d*e^2)*f^2 -
(b*c^2*d^2*e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f)*x)*sqrt((c^2*e^2 - 2
*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*
e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (
8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b
*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*
d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d
^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*
d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*
f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a
*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*
c^2)*d*e^4)*f)))/x) + 1/4*sqrt(2)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d
+ b*e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*
a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c
*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*
e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 +
 a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3
*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3
+ 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e
 + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 -
8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e
^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 -
 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)
*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*
d*e^4)*f)))/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4
*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*
c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f))*log((2*(b^2*d - a*b*
e)*f^2 + sqrt(2)*(c^2*d*e^3 - 4*a*b*d*f^3 + (4*b*c*d^2 + 4*a*c*d*
e + a*b*e^2)*f^2 - (4*c^2*d^2*e + b*c*d*e^2 + a*c*e^3)*f + (c^3*d
^3*e^3 - b*c^2*d^2*e^4 + a*c^2*d*e^5 + 4*(2*a^2*b*d^2 - a^3*d*e)*
f^4 + (2*a^2*b*d*e^2 + a^3*e^3 + 8*(b^3 - 2*a*b*c)*d^3 - 4*(3*a*b
^2 - a^2*c)*d^2*e)*f^3 + (8*b*c^2*d^4 - a^2*b*e^4 - 4*(3*b^2*c -
a*c^2)*d^3*e - 2*(b^3 - 10*a*b*c)*d^2*e^2 + (3*a*b^2 - 5*a^2*c)*d
*e^3)*f^2 - (4*c^3*d^4*e - 2*b*c^2*d^3*e^2 + 4*a*b*c*d*e^4 - a^2*
c*e^5 - (3*b^2*c - 5*a*c^2)*d^2*e^3)*f)*sqrt((c^2*e^2 - 2*b*c*e*f
 + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^
2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*
d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2
*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e +
(a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(
b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2
+ 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*
(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^
3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e
^4)*f)))*sqrt(c*x^2 + b*x + a)*sqrt((c*e^2 + 2*a*f^2 - (2*c*d + b
*e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*b
*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d^
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2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2 - 2*b*c*e*f
 + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2*d*e^5 + a^
2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4 + (8*a^3*b*
d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2
*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*c)*d^2*e +
(a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(
b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^2)*d^2*e^2
+ 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*
(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 + 6*a*c^3)*d^
3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a^2*c^2)*d*e
^4)*f)))/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f^3 + (4*a*
b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3 - 4*b*c*d
^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)) - 2*(b*c*d*e - a*c*e^2)
*f + ((4*b*c*d - b^2*e)*f^2 - (4*c^2*d*e - b*c*e^2)*f)*x + (8*a^3
*d*f^4 - 2*(4*a^2*b*d*e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c)*d^2)*f^3
+ 2*(4*a*c^2*d^3 - 4*a*b*c*d^2*e + a^2*b*e^3 - (a*b^2 - 6*a^2*c)*
d*e^2)*f^2 - 2*(a*c^2*d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^4)*f + (4*a
^2*b*d*f^4 - (4*a*b^2*d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b*c)*d^2)*f^
3 + (4*b*c^2*d^3 - 4*b^2*c*d^2*e + a*b^2*e^3 - (b^3 - 6*a*b*c)*d*
e^2)*f^2 - (b*c^2*d^2*e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f)*x)*sqrt((
c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2
*a*b*c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*
d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4
 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3
- a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 -
 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 2
2*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a
^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^
2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2
*c - 2*a^2*c^2)*d*e^4)*f)))/x) - 1/4*sqrt(2)*sqrt((c*e^2 + 2*a*f^
2 - (2*c*d + b*e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*
d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*
d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e
^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*
c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e
^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*
(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2
*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*
c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2
*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)
*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2
 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c -
2*a^2*c^2)*d*e^4)*f)))/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2
*d*f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2
*d^3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f))*log((2*(b
^2*d - a*b*e)*f^2 - sqrt(2)*(c^2*d*e^3 - 4*a*b*d*f^3 + (4*b*c*d^2
 + 4*a*c*d*e + a*b*e^2)*f^2 - (4*c^2*d^2*e + b*c*d*e^2 + a*c*e^3)
*f + (c^3*d^3*e^3 - b*c^2*d^2*e^4 + a*c^2*d*e^5 + 4*(2*a^2*b*d^2
- a^3*d*e)*f^4 + (2*a^2*b*d*e^2 + a^3*e^3 + 8*(b^3 - 2*a*b*c)*d^3
 - 4*(3*a*b^2 - a^2*c)*d^2*e)*f^3 + (8*b*c^2*d^4 - a^2*b*e^4 - 4*
(3*b^2*c - a*c^2)*d^3*e - 2*(b^3 - 10*a*b*c)*d^2*e^2 + (3*a*b^2 -
 5*a^2*c)*d*e^3)*f^2 - (4*c^3*d^4*e - 2*b*c^2*d^3*e^2 + 4*a*b*c*d
*e^4 - a^2*c*e^5 - (3*b^2*c - 5*a*c^2)*d^2*e^3)*f)*sqrt((c^2*e^2
- 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2
*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4
+ (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^
3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*
c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3
)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^
2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^
4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 +
6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a
^2*c^2)*d*e^4)*f)))*sqrt(c*x^2 + b*x + a)*sqrt((c*e^2 + 2*a*f^2 -
 (2*c*d + b*e)*f - (c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*f
^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^3
 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)*sqrt((c^2*e^2
- 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*d^3*e^3 - 2*a*b*c^2
*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2 + 2*a*c^3)*d^2*e^4
+ (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*c)*d^2)*f^4 - 2*(a^
3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3 - 4*(a*b^3 - a^2*b*
c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8*(b^2*c^2 - 2*a*c^3
)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*a*b^2*c + 22*a^2*c^
```

```
2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^2*b^2 + 2*a^3*c)*e^
4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*c*e^5 + (b^2*c^2 +
6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3 - 2*(a*b^2*c - 2*a
^2*c^2)*d*e^4)*f)))/(c^2*d^2*e^2 - b*c*d*e^3 + a*c*e^4 - 4*a^2*d*
f^3 + (4*a*b*d*e + a^2*e^2 - 4*(b^2 - 2*a*c)*d^2)*f^2 - (4*c^2*d^
3 - 4*b*c*d^2*e + a*b*e^3 - (b^2 - 6*a*c)*d*e^2)*f)) - 2*(b*c*d*e
 - a*c*e^2)*f + ((4*b*c*d - b^2*e)*f^2 - (4*c^2*d*e - b*c*e^2)*f)
*x + (8*a^3*d*f^4 - 2*(4*a^2*b*d*e + a^3*e^2 - 4*(a*b^2 - 2*a^2*c
)*d^2)*f^3 + 2*(4*a*c^2*d^3 - 4*a*b*c*d^2*e + a^2*b*e^3 - (a*b^2
- 6*a^2*c)*d*e^2)*f^2 - 2*(a*c^2*d^2*e^2 - a*b*c*d*e^3 + a^2*c*e^
4)*f + (4*a^2*b*d*f^4 - (4*a*b^2*d*e + a^2*b*e^2 - 4*(b^3 - 2*a*b
*c)*d^2)*f^3 + (4*b*c^2*d^3 - 4*b^2*c*d^2*e + a*b^2*e^3 - (b^3 -
6*a*b*c)*d*e^2)*f^2 - (b*c^2*d^2*e^2 - b^2*c*d*e^3 + a*b*c*e^4)*f
)*x)*sqrt((c^2*e^2 - 2*b*c*e*f + b^2*f^2)/(c^4*d^4*e^2 - 2*b*c^3*
d^3*e^3 - 2*a*b*c^2*d*e^5 + a^2*c^2*e^6 - 4*a^4*d*f^5 + (b^2*c^2
+ 2*a*c^3)*d^2*e^4 + (8*a^3*b*d*e + a^4*e^2 - 8*(a^2*b^2 - 2*a^3*
c)*d^2)*f^4 - 2*(a^3*b*e^3 + 2*(b^4 - 4*a*b^2*c + 6*a^2*c^2)*d^3
- 4*(a*b^3 - a^2*b*c)*d^2*e + (a^2*b^2 + 6*a^3*c)*d*e^2)*f^3 - (8
*(b^2*c^2 - 2*a*c^3)*d^4 - 8*(b^3*c - a*b*c^2)*d^3*e - (b^4 - 20*
a*b^2*c + 22*a^2*c^2)*d^2*e^2 + 2*(a*b^3 - 5*a^2*b*c)*d*e^3 - (a^
2*b^2 + 2*a^3*c)*e^4)*f^2 - 2*(2*c^4*d^5 - 4*b*c^3*d^4*e + a^2*b*
c*e^5 + (b^2*c^2 + 6*a*c^3)*d^3*e^2 + (b^3*c - 5*a*b*c^2)*d^2*e^3
 - 2*(a*b^2*c - 2*a^2*c^2)*d*e^4)*f)))/x)
```

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

$$\int \frac{1}{\sqrt{a + bx + cx^2}\,(d + ex + fx^2)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d),x)
```

```
[Out] Integral(1/(sqrt(a + b*x + c*x**2)*(d + e*x + f*x**2)), x)
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)),x, algorithm="giac")
```

```
[Out] Exception raised: RuntimeError
```

3.113 $\int \frac{1}{\sqrt{a+bx+cx^2}(d+ex+fx^2)^2}\,dx$

Optimal. Leaf size=789

$$\frac{\left(f\left(e-\sqrt{e^2-4df}\right)(ce-bf)(2af-be+2cd)-2f\left(f\left(-4a^2f^2+3abef+b^2\left(e^2-6df\right)\right)-c\left(4af\left(e^2-3df\right)+b\left(e^3-\right.\right.\right.\right.}{2\sqrt{2}\left(e^2-4df\right)^{3/2}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{2af^2-\sqrt{e^2-4}}}$$

$$-\frac{\left(f\left(\sqrt{e^2-4df}+e\right)(ce-bf)(2af-be+2cd)-2f\left(f\left(-4a^2f^2+3abef+b^2\left(e^2-6df\right)\right)-c\left(4af\left(e^2-3df\right)+b\left(e^3-\right.\right.\right.\right.}{2\sqrt{2}\left(e^2-4df\right)^{3/2}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{2af^2+\sqrt{e^2-}}}$$

$$+\frac{\sqrt{a+bx+cx^2}\left(fx\left(f(be-2af)-c\left(e^2-2df\right)\right)+f\left(-aef-2bdf+be^2\right)-c\left(e^3-3def\right)\right)}{\left(e^2-4df\right)\left(d+ex+fx^2\right)\left((cd-af)^2-(bd-ae)(ce-bf)\right)}$$

```
[Out] ((f*(b*e^2 - 2*b*d*f - a*e*f) - c*(e^3 - 3*d*e*f) + f*(f*(b*e - 2
*a*f) - c*(e^2 - 2*d*f))*x)*Sqrt[a + b*x + c*x^2])/((e^2 - 4*d*f)
*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*(d + e*x + f*x^2)) + (
(f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e - Sqrt[e^2 - 4*d*f]) - 2*
f*(2*c^2*d*(e^2 - 4*d*f) + f*(3*a*b*e*f - 4*a^2*f^2 + b^2*(e^2 -
6*d*f)) - c*(4*a*f*(e^2 - 3*d*f) + b*(e^3 - 5*d*e*f))))*ArcTanh[(
4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*
d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*
e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*Sqrt[2]*(
e^2 - 4*d*f)^(3/2)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt
[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f
]]) - ((f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + Sqrt[e^2 - 4*d*f
]) - 2*f*(2*c^2*d*(e^2 - 4*d*f) + f*(3*a*b*e*f - 4*a^2*f^2 + b^2*
(e^2 - 6*d*f)) - c*(4*a*f*(e^2 - 3*d*f) + b*(e^3 - 5*d*e*f))))*Ar
cTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e
^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^
2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*Sq
rt[2]*(e^2 - 4*d*f)^(3/2)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f
))*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2
- 4*d*f]])
```

Rubi [A] time = 16.7037, antiderivative size = 787, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.148$

$$\frac{\left(f\left(e-\sqrt{e^2-4df}\right)(ce-bf)(2af-be+2cd)-2f\left(-4a^2f^3+3abef^2-4acf\left(e^2-3df\right)+b^2f\left(e^2-6df\right)-bc\left(e^3-5d\right.\right.\right.}{2\sqrt{2}\left(e^2-4df\right)^{3/2}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{2af^2-\sqrt{e^2-4d}}}$$

$$-\frac{\left(f\left(\sqrt{e^2-4df}+e\right)(ce-bf)(2af-be+2cd)-2f\left(-4a^2f^3+3abef^2-4acf\left(e^2-3df\right)+b^2f\left(e^2-6df\right)-bc\left(e^3-5\right.\right.\right.}{2\sqrt{2}\left(e^2-4df\right)^{3/2}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{2af^2+\sqrt{e^2-4}}}$$

$$+\frac{\sqrt{a+bx+cx^2}\left(fx\left(f(be-2af)-c\left(e^2-2df\right)\right)+f\left(-aef-2bdf+be^2\right)-c\left(e^3-3def\right)\right)}{\left(e^2-4df\right)\left(d+ex+fx^2\right)\left((cd-af)^2-(bd-ae)(ce-bf)\right)}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)^2),x]
```

```
[Out] ((f*(b*e^2 - 2*b*d*f - a*e*f) - c*(e^3 - 3*d*e*f) + f*(f*(b*e - 2
*a*f) - c*(e^2 - 2*d*f))*x)*Sqrt[a + b*x + c*x^2])/((e^2 - 4*d*f)
*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*(d + e*x + f*x^2)) + (
(f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e - Sqrt[e^2 - 4*d*f]) - 2*
f*(3*a*b*e*f^2 - 4*a^2*f^3 + b^2*f*(e^2 - 6*d*f) + 2*c^2*d*(e^2 -
 4*d*f) - 4*a*c*f*(e^2 - 3*d*f) - b*c*(e^3 - 5*d*e*f)))*ArcTanh[(
```

```
4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqrt[e^2 - 4*
d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*
e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*Sqrt[2]*(
e^2 - 4*d*f)^(3/2)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt
[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f
]]) - ((f*(2*c*d - b*e + 2*a*f)*(c*e - b*f)*(e + Sqrt[e^2 - 4*d*f
]) - 2*f*(3*a*b*e*f^2 - 4*a^2*f^3 + b^2*f*(e^2 - 6*d*f) + 2*c^2*d
*(e^2 - 4*d*f) - 4*a*c*f*(e^2 - 3*d*f) - b*c*(e^3 - 5*d*e*f)))*Ar
cTanh[(4*a*f - b*(e + Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e
^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^
2 + (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(2*Sq
rt[2]*(e^2 - 4*d*f)^(3/2)*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f
))*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[e^2
- 4*d*f]])
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2,x)

[Out] Timed out
```

Mathematica [B] time = 6.67129, size = 1836, normalized size = 2.33

$$\frac{\left(-ce^3+bfe^2-cfxe^2-af^2e+3cdfe+bf^2xe-2bdf^2-2af^3x+2cdf^2x\right)\left(cx^2+bx+a\right)}{\left(e^2-4df\right)\left(dfb^2-cdeb-aefb+c^2d^2+ace^2+a^2f^2-2acdf\right)\left(fx^2+ex+d\right)\sqrt{a+x(b+cx)}} - \frac{f\left(bce^3-2c^2de^2-b^2fe^2+10acfe^2+bc\sqrt{e^2-4df}e^2-8abf^2e-12bcdfe-2c^2d\sqrt{e^2-4df}e-b^2f\sqrt{e^2-4df}e-2acf \cdots\right.}{2\sqrt{2}\left(e^2-4df\right)^{3/2}\left(dfb^2-cdeb-aefb+c^2d^2+ace^2+a^2f^2-\cdots\right.} - \frac{f\left(-bce^3+2c^2de^2+b^2fe^2-10acfe^2+bc\sqrt{e^2-4df}e^2+8abf^2e+12bcdfe-2c^2d\sqrt{e^2-4df}e-b^2f\sqrt{e^2-4df}e-2ac \cdots\right.}{2\sqrt{2}\left(e^2-4df\right)^{3/2}\left(dfb^2-cdeb-aefb+c^2d^2+ace^2+a^2f^2-\cdots\right.} + \frac{f\left(-bce^3+2c^2de^2+b^2fe^2-10acfe^2+bc\sqrt{e^2-4df}e^2+8abf^2e+12bcdfe-2c^2d\sqrt{e^2-4df}e-b^2f\sqrt{e^2-4df}e-2ac \cdots\right.}{2\sqrt{2}\left(e \cdots\right.} + \frac{f\left(bce^3-2c^2de^2-b^2fe^2+10acfe^2+bc\sqrt{e^2-4df}e^2-8abf^2e-12bcdfe-2c^2d\sqrt{e^2-4df}e-b^2f\sqrt{e^2-4df}e-2acf \cdots\right.}{2\sqrt{2}\left(e \cdots\right.}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*(d + e*x + f*x^2)^2),x]

[Out] ((-(c*e^3) + 3*c*d*e*f + b*e^2*f - 2*b*d*f^2 - a*e*f^2 - c*e^2*f*
x + 2*c*d*f^2*x + b*e*f^2*x - 2*a*f^3*x)*(a + b*x + c*x^2))/((e^2
 - 4*d*f)*(c^2*d^2 - b*c*d*e + a*c*e^2 + b^2*d*f - 2*a*c*d*f - a*
b*e*f + a^2*f^2)*(d + e*x + f*x^2)*Sqrt[a + x*(b + c*x)]) - (f*(-
2*c^2*d*e^2 + b*c*e^3 + 16*c^2*d^2*f - 12*b*c*d*e*f - b^2*e^2*f +
 10*a*c*e^2*f + 12*b^2*d*f^2 - 24*a*c*d*f^2 - 8*a*b*e*f^2 + 8*a^2
*f^3 - 2*c^2*d*e*Sqrt[e^2 - 4*d*f] + b*c*e^2*Sqrt[e^2 - 4*d*f] +
2*b*c*d*f*Sqrt[e^2 - 4*d*f] - b^2*e*f*Sqrt[e^2 - 4*d*f] - 2*a*c*e
*f*Sqrt[e^2 - 4*d*f] + 2*a*b*f^2*Sqrt[e^2 - 4*d*f])*Sqrt[a + b*x
+ c*x^2]*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x])/(2*Sqrt[2]*(e^2 - 4
*d*f)^(3/2)*(c^2*d^2 - b*c*d*e + a*c*e^2 + b^2*d*f - 2*a*c*d*f -
```

```
a*b*e*f + a^2*f^2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*S
qrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f]]*Sqrt[a + x*(b + c*x)])
- (f*(2*c^2*d*e^2 - b*c*e^3 - 16*c^2*d^2*f + 12*b*c*d*e*f + b^2*e
^2*f - 10*a*c*e^2*f - 12*b^2*d*f^2 + 24*a*c*d*f^2 + 8*a*b*e*f^2 -
 8*a^2*f^3 - 2*c^2*d*e*Sqrt[e^2 - 4*d*f] + b*c*e^2*Sqrt[e^2 - 4*d
*f] + 2*b*c*d*f*Sqrt[e^2 - 4*d*f] - b^2*e*f*Sqrt[e^2 - 4*d*f] - 2
*a*c*e*f*Sqrt[e^2 - 4*d*f] + 2*a*b*f^2*Sqrt[e^2 - 4*d*f])*Sqrt[a
+ b*x + c*x^2]*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x])/(2*Sqrt[2]*(e^
2 - 4*d*f)^(3/2)*(c^2*d^2 - b*c*d*e + a*c*e^2 + b^2*d*f - 2*a*c*d
*f - a*b*e*f + a^2*f^2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 +
c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 - 4*d*f]]*Sqrt[a + x*(b + c*
x)]) + (f*(2*c^2*d*e^2 - b*c*e^3 - 16*c^2*d^2*f + 12*b*c*d*e*f +
b^2*e^2*f - 10*a*c*e^2*f - 12*b^2*d*f^2 + 24*a*c*d*f^2 + 8*a*b*e*
f^2 - 8*a^2*f^3 - 2*c^2*d*e*Sqrt[e^2 - 4*d*f] + b*c*e^2*Sqrt[e^2
- 4*d*f] + 2*b*c*d*f*Sqrt[e^2 - 4*d*f] - b^2*e*f*Sqrt[e^2 - 4*d*f
] - 2*a*c*e*f*Sqrt[e^2 - 4*d*f] + 2*a*b*f^2*Sqrt[e^2 - 4*d*f])*Sq
rt[a + b*x + c*x^2]*Log[b*e - 4*a*f + b*Sqrt[e^2 - 4*d*f] + 2*c*e
*x - 2*b*f*x + 2*c*Sqrt[e^2 - 4*d*f]*x - 2*Sqrt[2]*Sqrt[c*e^2 - 2
*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d*f] - b*f*Sqrt[e^2 -
 4*d*f]]*Sqrt[a + b*x + c*x^2]])/(2*Sqrt[2]*(e^2 - 4*d*f)^(3/2)*(
c^2*d^2 - b*c*d*e + a*c*e^2 + b^2*d*f - 2*a*c*d*f - a*b*e*f + a^2
*f^2)*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + c*e*Sqrt[e^2 - 4*d
*f] - b*f*Sqrt[e^2 - 4*d*f]]*Sqrt[a + x*(b + c*x)]) + (f*(-2*c^2*
d*e^2 + b*c*e^3 + 16*c^2*d^2*f - 12*b*c*d*e*f - b^2*e^2*f + 10*a*
c*e^2*f + 12*b^2*d*f^2 - 24*a*c*d*f^2 - 8*a*b*e*f^2 + 8*a^2*f^3 -
 2*c^2*d*e*Sqrt[e^2 - 4*d*f] + b*c*e^2*Sqrt[e^2 - 4*d*f] + 2*b*c*
d*f*Sqrt[e^2 - 4*d*f] - b^2*e*f*Sqrt[e^2 - 4*d*f] - 2*a*c*e*f*Sqr
t[e^2 - 4*d*f] + 2*a*b*f^2*Sqrt[e^2 - 4*d*f])*Sqrt[a + b*x + c*x^
2]*Log[-(b*e) + 4*a*f + b*Sqrt[e^2 - 4*d*f] - 2*c*e*x + 2*b*f*x +
 2*c*Sqrt[e^2 - 4*d*f]*x + 2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f
 + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt[e^2 - 4*d*f]]*Sqrt[
a + b*x + c*x^2]])/(2*Sqrt[2]*(e^2 - 4*d*f)^(3/2)*(c^2*d^2 - b*c*
d*e + a*c*e^2 + b^2*d*f - 2*a*c*d*f - a*b*e*f + a^2*f^2)*Sqrt[c*e
^2 - 2*c*d*f - b*e*f + 2*a*f^2 - c*e*Sqrt[e^2 - 4*d*f] + b*f*Sqrt
[e^2 - 4*d*f]]*Sqrt[a + x*(b + c*x)])
```

Maple [B] time = 0.044, size = 3858, normalized size = 4.9

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d)^2,x)
```

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

```
))/f)^2*c+4*(c*(-4*d*f+e^2)^(1/2)+b*f-c*e)/f*(x-1/2*(-e+(-4*d*f+e
^2)^(1/2))/f)+2*((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c*e+2*
a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2))/(x-1/2*(-e+(-4*d*f+e^2)^(1
/2))/f))*b+1/(4*d*f-e^2)*f/((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(
1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)*2^(1/2)/(((-4*d*f+e^2)^(1/2
)*b*f-(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1
/2)*ln((((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*
e*f-2*c*d*f+e^2*c)/f^2+(c*(-4*d*f+e^2)^(1/2)+b*f-c*e)/f*(x-1/2*(-
e+(-4*d*f+e^2)^(1/2))/f)+1/2*2^(1/2)*(((-4*d*f+e^2)^(1/2)*b*f-(-4
*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*(4*(x
-1/2*(-e+(-4*d*f+e^2)^(1/2))/f)^2*c+4*(c*(-4*d*f+e^2)^(1/2)+b*f-c
*e)/f*(x-1/2*(-e+(-4*d*f+e^2)^(1/2))/f)+2*((-4*d*f+e^2)^(1/2)*b*f
-(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2))/
(x-1/2*(-e+(-4*d*f+e^2)^(1/2))/f))*c*e+2/(4*d*f-e^2)/(-(-4*d*f+e^
2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)*
f^2/(x+1/2*e/f+1/2*(-4*d*f+e^2)^(1/2)/f)*((x+1/2*(e+(-4*d*f+e^2)^
(1/2))/f)^2*c+1/f*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(x+1/2*(e+(-4*d
*f+e^2)^(1/2))/f)+1/2*(-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)
*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)+1/(4*d*f-e^2)*f/(-(-
4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f
+e^2*c)*2^(1/2)/((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+
2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*ln(((-(-4*d*f+e^2)^(1/2)*
b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2+1/f*(
-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+1
/2*2^(1/2)*((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f
^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*(4*(x+1/2*(e+(-4*d*f+e^2)^(1/2
))/f)^2*c+4/f*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(x+1/2*(e+(-4*d*f+e
^2)^(1/2))/f)+2*(-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2
*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2))/(x+1/2*(e+(-4*d*f+e^2)^(1
/2))/f))*c*(-4*d*f+e^2)^(1/2)-1/(4*d*f-e^2)*f^2/(-(-4*d*f+e^2)^(1
/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)*2^(1/
2)/((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f
-2*c*d*f+e^2*c)/f^2)^(1/2)*ln(((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e
^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2+1/f*(-c*(-4*d*f+e^
2)^(1/2)+b*f-c*e)*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+1/2*2^(1/2)*((
-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*
d*f+e^2*c)/f^2)^(1/2)*(4*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)^2*c+4/f
*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)
+2*(-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-
2*c*d*f+e^2*c)/f^2)^(1/2))/(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f))*b+1/
(4*d*f-e^2)*f/(-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a
*f^2-b*e*f-2*c*d*f+e^2*c)*2^(1/2)/((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d
*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*ln(((-(
-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*
f+e^2*c)/f^2+1/f*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(x+1/2*(e+(-4*d*
f+e^2)^(1/2))/f)+1/2*2^(1/2)*((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^
2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*(4*(x+1/2*(e
+(-4*d*f+e^2)^(1/2))/f)^2*c+4/f*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(
x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+2*(-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*
f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2))/(x+1/2*
(e+(-4*d*f+e^2)^(1/2))/f))*c*e-2*f/(4*d*f-e^2)/(-4*d*f+e^2)^(1/2)
*2^(1/2)/(((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-
b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*ln((((-4*d*f+e^2)^(1/2)*b*f-(-4*d
*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2+(c*(-4*d*f+e^2
)^(1/2)+b*f-c*e)/f*(x-1/2*(-e+(-4*d*f+e^2)^(1/2))/f)+1/2*2^(1/2)*
(((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c
*d*f+e^2*c)/f^2)^(1/2)*(4*(x-1/2*(-e+(-4*d*f+e^2)^(1/2))/f)^2*c+4
*(c*(-4*d*f+e^2)^(1/2)+b*f-c*e)/f*(x-1/2*(-e+(-4*d*f+e^2)^(1/2))/
f)+2*((-4*d*f+e^2)^(1/2)*b*f-(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f
-2*c*d*f+e^2*c)/f^2)^(1/2))/(x-1/2*(-e+(-4*d*f+e^2)^(1/2))/f))+2*
f/(4*d*f-e^2)/(-4*d*f+e^2)^(1/2)*2^(1/2)/((-(-4*d*f+e^2)^(1/2)*b*
f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*
ln(((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f
-2*c*d*f+e^2*c)/f^2+1/f*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(x+1/2*(e
+(-4*d*f+e^2)^(1/2))/f)+1/2*2^(1/2)*((-(-4*d*f+e^2)^(1/2)*b*f+(-4
*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*(4*(x
+1/2*(e+(-4*d*f+e^2)^(1/2))/f)^2*c+4/f*(-c*(-4*d*f+e^2)^(1/2)+b*f
-c*e)*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+2*(-(-4*d*f+e^2)^(1/2)*b*f
+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2))/
(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f))
```

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}(fx^2 + ex + d)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2), x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2),x, algorithm="fricas")
```

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**2,x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.738498, size = 4, normalized size = 0.01

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*(f*x^2 + e*x + d)^2),x, algorithm="giac")
```

```
[Out] sage0*x
```

3.114 $\int \frac{(d+ex+fx^2)^3}{(a+bx+cx^2)^{3/2}} \, dx$

Optimal. Leaf size=649

$$\frac{3\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(80c^2f\left(a^2f^2+6abef+3b^2\left(df+e^2\right)\right)-280b^2cf^2(af+be)-64c^3\left(3af\left(df+e^2\right)+b\left(6def+e\right.\right.\right.}{128c^{11/2}}$$
$$+\frac{2\left(-x\left(-2acf+b^2f-bce+2c^2d\right)\left(a^2c^2f^2-4ab^2cf^2+7abc^2ef-2ac^3df-3ac^3e^2+b^4f^2-2b^3cef+b^2c^2df+b^2c^2e^2\right.\right.}{}$$
$$-\frac{\sqrt{a+bx+cx^2}\left(16c^2f\left(20aef+21b\left(df+e^2\right)\right)-4bcf^2(73af+114be)+187b^3f^3-64c^3\left(6def+e^3\right)\right)}{64c^5}$$
$$+\frac{fx\sqrt{a+bx+cx^2}\left(-4cf(7af+22be)+41b^2f^2+48c^2\left(df+e^2\right)\right)}{32c^4}$$
$$+\frac{f^2x^2\sqrt{a+bx+cx^2}(8ce-5bf)}{8c^3}+\frac{f^3x^3\sqrt{a+bx+cx^2}}{4c^2}$$

```
[Out] (2*(3*a*b^4*c*e*f^2 - a*b^5*f^3 + a*b^3*c*f*(5*a*f^2 - 3*c*(e^2 +
 d*f)) - b*c^2*(c^3*d^3 + 5*a^3*f^3 + 3*a*c^2*d*(e^2 + d*f) - 9*a
^2*c*f*(e^2 + d*f)) - a*b^2*c^2*e*(12*a*f^2 - c*(e^2 + 6*d*f)) +
2*a*c^3*e*(3*c^2*d^2 + 3*a^2*f^2 - a*c*(e^2 + 6*d*f)) - (2*c^2*d
- b*c*e + b^2*f - 2*a*c*f)*(c^4*d^2 - b*c^3*d*e + b^2*c^2*e^2 - 3
*a*c^3*e^2 + b^2*c^2*d*f - 2*a*c^3*d*f - 2*b^3*c*e*f + 7*a*b*c^2*
e*f + b^4*f^2 - 4*a*b^2*c*f^2 + a^2*c^2*f^2)*x))/(c^5*(b^2 - 4*a*
c)*Sqrt[a + b*x + c*x^2]) - ((187*b^3*f^3 - 4*b*c*f^2*(114*b*e +
73*a*f) - 64*c^3*(e^3 + 6*d*e*f) + 16*c^2*f*(20*a*e*f + 21*b*(e^2
 + d*f)))*Sqrt[a + b*x + c*x^2])/(64*c^5) + (f*(41*b^2*f^2 - 4*c*
f*(22*b*e + 7*a*f) + 48*c^2*(e^2 + d*f))*x*Sqrt[a + b*x + c*x^2])
/(32*c^4) + (f^2*(8*c*e - 5*b*f)*x^2*Sqrt[a + b*x + c*x^2])/(8*c^
3) + (f^3*x^3*Sqrt[a + b*x + c*x^2])/(4*c^2) + (3*(105*b^4*f^3 -
280*b^2*c*f^2*(b*e + a*f) + 128*c^4*d*(e^2 + d*f) + 80*c^2*f*(6*a
*b*e*f + a^2*f^2 + 3*b^2*(e^2 + d*f)) - 64*c^3*(3*a*f*(e^2 + d*f)
 + b*(e^3 + 6*d*e*f)))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*
x + c*x^2])])/(128*c^(11/2))
```

Rubi [A] time = 4.14001, antiderivative size = 649, normalized size of antiderivative = 1., number of steps used = 7, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{3\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(80c^2f\left(a^2f^2+6abef+3b^2\left(df+e^2\right)\right)-280b^2cf^2(af+be)-64c^3\left(3af\left(df+e^2\right)+b\left(6def+e\right.\right.\right.}{128c^{11/2}}$$
$$+\frac{2\left(-x\left(-c(2af+be)+b^2f+2c^2d\right)\left(c^2\left(a^2f^2+7abef+b^2\left(df+e^2\right)\right)-2b^2cf(2af+be)-c^3\left(2adf+3ae^2+bde\right)+b^4f\right.\right.}{}$$
$$-\frac{\sqrt{a+bx+cx^2}\left(16c^2f\left(20aef+21b\left(df+e^2\right)\right)-4bcf^2(73af+114be)+187b^3f^3-64c^3\left(6def+e^3\right)\right)}{64c^5}$$
$$+\frac{fx\sqrt{a+bx+cx^2}\left(-4cf(7af+22be)+41b^2f^2+48c^2\left(df+e^2\right)\right)}{32c^4}$$
$$+\frac{f^2x^2\sqrt{a+bx+cx^2}(8ce-5bf)}{8c^3}+\frac{f^3x^3\sqrt{a+bx+cx^2}}{4c^2}$$

Antiderivative was successfully verified.

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

```
[Out] (2*(3*a*b^4*c*e*f^2 - a*b^5*f^3 + a*b^3*c*f*(5*a*f^2 - 3*c*(e^2 +
 d*f)) - b*c^2*(c^3*d^3 + 5*a^3*f^3 + 3*a*c^2*d*(e^2 + d*f) - 9*a
^2*c*f*(e^2 + d*f)) - a*b^2*c^2*e*(12*a*f^2 - c*(e^2 + 6*d*f)) +
2*a*c^3*e*(3*c^2*d^2 + 3*a^2*f^2 - a*c*(e^2 + 6*d*f)) - (2*c^2*d
+ b^2*f - c*(b*e + 2*a*f))*(c^4*d^2 + b^4*f^2 - 2*b^2*c*f*(b*e +
2*a*f) - c^3*(b*d*e + 3*a*e^2 + 2*a*d*f) + c^2*(7*a*b*e*f + a^2*f
^2 + b^2*(e^2 + d*f)))*x))/(c^5*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^
2]) - ((187*b^3*f^3 - 4*b*c*f^2*(114*b*e + 73*a*f) - 64*c^3*(e^3
```

```
+ 6*d*e*f) + 16*c^2*f*(20*a*e*f + 21*b*(e^2 + d*f)))*Sqrt[a + b*x
 + c*x^2])/(64*c^5) + (f*(41*b^2*f^2 - 4*c*f*(22*b*e + 7*a*f) + 4
8*c^2*(e^2 + d*f))*x*Sqrt[a + b*x + c*x^2])/(32*c^4) + (f^2*(8*c*
e - 5*b*f)*x^2*Sqrt[a + b*x + c*x^2])/(8*c^3) + (f^3*x^3*Sqrt[a +
 b*x + c*x^2])/(4*c^2) + (3*(105*b^4*f^3 - 280*b^2*c*f^2*(b*e + a
*f) + 128*c^4*d*(e^2 + d*f) + 80*c^2*f*(6*a*b*e*f + a^2*f^2 + 3*b
^2*(e^2 + d*f)) - 64*c^3*(3*a*f*(e^2 + d*f) + b*(e^3 + 6*d*e*f)))
*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(128*c^(
11/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Mathematica [A] time = 4.23258, size = 745, normalized size = 1.15

$$\frac{3\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)\left(80c^2f\left(a^2f^2+6abef+3b^2\left(df+e^2\right)\right)-280b^2cf^2(af+be)-64c^3\left(3af\left(df+e^2\right)+\right.}{128c^{11/2}}$$
$$+\frac{-8b^3c\left(210a^2f^3+acf\left(f\left(77fx^2-90d\right)-90e^2-530efx\right)-c^2x\left(2ef\left(7fx^2-72d\right)+3f^2x\left(10d+fx^2\right)-24e^3+30e^2f\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] (315*b^6*f^3*x + 105*b^5*f^2*(3*a*f + c*x*(-8*e + f*x)) - 2*b^4*c
*f*(105*a*f*(4*e + 9*f*x) + c*x*(-360*e^2 - 360*d*f + 140*e*f*x +
 21*f^2*x^2)) - 8*b^3*c*(210*a^2*f^3 - c^2*x*(-24*e^3 + 30*e^2*f*
x + 3*f^2*x*(10*d + f*x^2) + 2*e*f*(-72*d + 7*f*x^2)) + a*c*f*(-9
0*e^2 - 530*e*f*x + f*(-90*d + 77*f*x^2))) - 16*b^2*c^2*(-(a^2*f^
2*(230*e + 169*f*x)) + a*c*(12*e^3 + 186*e^2*f*x + 2*e*f*(36*d -
43*f*x^2) + f^2*x*(186*d - 13*f*x^2)) + c^2*x*(-24*d^2*f + 6*d*(-
4*e^2 + 4*e*f*x + f^2*x^2) + x*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 +
 f^3*x^3))) + 32*c^3*(8*c^3*d^3*x - a^3*f^2*(64*e + 15*f*x) + a^2
*c*(16*e^3 + 36*e^2*f*x + f^2*x*(36*d - 5*f*x^2) - 32*e*f*(-3*d +
 f*x^2)) + 2*a*c^2*(-12*d^2*(e + f*x) + 6*d*x*(-2*e^2 + 4*e*f*x +
 f^2*x^2) + x^2*(4*e^3 + 6*e^2*f*x + 4*e*f^2*x^2 + f^3*x^3))) + 1
6*b*c^2*(113*a^3*f^3 + 8*c^3*d^2*(d - 3*e*x) + a^2*c*f*(-156*e^2
- 244*e*f*x + f*(-156*d + 49*f*x^2)) + 2*a*c^2*(12*d^2*f + 6*d*(2
*e^2 + 20*e*f*x - 5*f^2*x^2) - x*(-20*e^3 + 30*e^2*f*x + 14*e*f^2
*x^2 + 3*f^3*x^3))))/(64*c^5*(-b^2 + 4*a*c)*Sqrt[a + x*(b + c*x)]
) + (3*(105*b^4*f^3 - 280*b^2*c*f^2*(b*e + a*f) + 128*c^4*d*(e^2
+ d*f) + 80*c^2*f*(6*a*b*e*f + a^2*f^2 + 3*b^2*(e^2 + d*f)) - 64*
c^3*(3*a*f*(e^2 + d*f) + b*(e^3 + 6*d*e*f)))*Log[b + 2*c*x + 2*Sq
rt[c]*Sqrt[a + x*(b + c*x)]])/(128*c^(11/2))
```

Maple [B] time = 0.037, size = 2827, normalized size = 4.4

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -105/32*e*f^2*b^6/c^5/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)+115/8*e*f^2
*b^2/c^4*a/(c*x^2+b*x+a)^(1/2)+45/4*e*f^2*b/c^(7/2)*a*ln((1/2*b+c
*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))-4*e*f^2/c^2*a*x^2/(c*x^2+b*x+a)^
(1/2)-7/4*e*f^2*b/c^2*x^3/(c*x^2+b*x+a)^(1/2)+35/8*e*f^2*b^2/c^3*
x^2/(c*x^2+b*x+a)^(1/2)+105/16*e*f^2*b^3/c^4*x/(c*x^2+b*x+a)^(1/2
)+3/2*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*f*d^2+3/2*b^3/c^2/(
4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*e^2*d-45/8*b^2/c^3*x/(c*x^2+b*x+a)
^(1/2)*d*f^2-45/8*b^2/c^3*x/(c*x^2+b*x+a)^(1/2)*e^2*f+45/16*b^5/c
^4/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*d*f^2+45/16*b^5/c^4/(4*a*c-b^2
)/(c*x^2+b*x+a)^(1/2)*e^2*f-39/4*b/c^3*a/(c*x^2+b*x+a)^(1/2)*d*f^
2-39/4*b/c^3*a/(c*x^2+b*x+a)^(1/2)*e^2*f+9/2/c^2*a*x/(c*x^2+b*x+a
)^(1/2)*d*f^2+9/2/c^2*a*x/(c*x^2+b*x+a)^(1/2)*e^2*f-15/4*b/c^2*x^
2/(c*x^2+b*x+a)^(1/2)*d*f^2-15/4*b/c^2*x^2/(c*x^2+b*x+a)^(1/2)*e^
2*f+2/c^2*a*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*e^3+12/c^2*a/(c*x
^2+b*x+a)^(1/2)*d*e*f+6*x^2/c/(c*x^2+b*x+a)^(1/2)*d*e*f-9/2*b^2/c
^3/(c*x^2+b*x+a)^(1/2)*d*e*f-3/2*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+a
)^(1/2)*x*e^3-9*b/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1
/2))*d*e*f+113/16*f^3*b^3/c^4*a^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)
+315/128*f^3*b^6/c^5/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-6*d^2*e*b/
(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-3*d^2*e*b^2/c/(4*a*c-b^2)/(c*x^
2+b*x+a)^(1/2)+12/c^2*a*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*d*e*f
+24/c*a*b/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*d*e*f+3/c^(3/2)*ln((1
/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2*d+x^2/c/(c*x^2+b*x+a)^
(1/2)*e^3-3/4*b^2/c^3/(c*x^2+b*x+a)^(1/2)*e^3-3/2*b/c^(5/2)*ln((1
/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^3+2/c^2*a/(c*x^2+b*x+a)^
(1/2)*e^3+315/256*f^3*b^5/c^6/(c*x^2+b*x+a)^(1/2)+1/4*f^3*x^5/c/(
c*x^2+b*x+a)^(1/2)+15/8*f^3/c^(7/2)*a^2*ln((1/2*b+c*x)/c^(1/2)+(c
*x^2+b*x+a)^(1/2))+315/128*f^3*b^4/c^(11/2)*ln((1/2*b+c*x)/c^(1/2
)+(c*x^2+b*x+a)^(1/2))+2*d^3*(2*c*x+b)/(4*a*c-b^2)/(c*x^2+b*x+a)^
(1/2)-3*d^2*e/c/(c*x^2+b*x+a)^(1/2)+3/c^(3/2)*ln((1/2*b+c*x)/c^(1
/2)+(c*x^2+b*x+a)^(1/2))*f*d^2-39/2*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+
b*x+a)^(1/2)*x*e^2*f+115/4*e*f^2*b^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x
+a)^(1/2)*x-16*e*f^2/c^2*a^2*b/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-
39/2*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*d*f^2-9*b^3/c^2/
(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*d*e*f+3*b^2/c/(4*a*c-b^2)/(c*x^
2+b*x+a)^(1/2)*x*f*d^2+3*b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*
e^2*d+9*b/c^2*x/(c*x^2+b*x+a)^(1/2)*d*e*f-9/2*b^4/c^3/(4*a*c-b^2)
/(c*x^2+b*x+a)^(1/2)*d*e*f+4/c*a*b/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2
)*x*e^3+45/8*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*d*f^2+45/8
*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*e^2*f+113/8*f^3*b^2/c^
3*a^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-105/8*f^3*b^4/c^4*a/(4*a*
c-b^2)/(c*x^2+b*x+a)^(1/2)*x+115/8*e*f^2*b^4/c^4*a/(4*a*c-b^2)/(c
*x^2+b*x+a)^(1/2)-45/4*e*f^2*b/c^3*a*x/(c*x^2+b*x+a)^(1/2)-8*e*f^
2/c^3*a^2*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)-105/16*e*f^2*b^5/c^
4/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-39/4*b^3/c^3*a/(4*a*c-b^2)/(c
*x^2+b*x+a)^(1/2)*d*f^2-39/4*b^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x+a)^
(1/2)*e^2*f+45/8*b^2/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)
^(1/2))*d*f^2+105/16*f^3*b^2/c^4*a*x/(c*x^2+b*x+a)^(1/2)+49/16*f^
3*b/c^3*a*x^2/(c*x^2+b*x+a)^(1/2)+315/256*f^3*b^7/c^6/(4*a*c-b^2)
/(c*x^2+b*x+a)^(1/2)-3/8*f^3*b/c^2*x^4/(c*x^2+b*x+a)^(1/2)+e*f^2*
x^4/c/(c*x^2+b*x+a)^(1/2)-105/32*e*f^2*b^4/c^5/(c*x^2+b*x+a)^(1/2
)-105/16*e*f^2*b^3/c^(9/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(
1/2))-8*e*f^2/c^3*a^2/(c*x^2+b*x+a)^(1/2)-3*x/c/(c*x^2+b*x+a)^(1/
2)*f*d^2-3*x/c/(c*x^2+b*x+a)^(1/2)*e^2*d+3/2*b/c^2/(c*x^2+b*x+a)^
(1/2)*f*d^2+3/2*b/c^2/(c*x^2+b*x+a)^(1/2)*e^2*d-9/2/c^(5/2)*a*ln(
(1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*f^2-9/2/c^(5/2)*a*ln((
1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2*f-3/4*b^4/c^3/(4*a*c-
b^2)/(c*x^2+b*x+a)^(1/2)*e^3+21/32*f^3*b^2/c^3*x^3/(c*x^2+b*x+a)^
(1/2)-105/16*f^3*b^2/c^(9/2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+
a)^(1/2))-5/8*f^3/c^2*a*x^3/(c*x^2+b*x+a)^(1/2)-15/8*f^3/c^3*a^2*
x/(c*x^2+b*x+a)^(1/2)-105/16*f^3*b^3/c^5*a/(c*x^2+b*x+a)^(1/2)+11
3/16*f^3*b/c^4*a^2/(c*x^2+b*x+a)^(1/2)-105/64*f^3*b^3/c^4*x^2/(c*
x^2+b*x+a)^(1/2)-315/128*f^3*b^4/c^5*x/(c*x^2+b*x+a)^(1/2)+45/16*
b^3/c^4/(c*x^2+b*x+a)^(1/2)*e^2*f-105/16*f^3*b^5/c^5*a/(4*a*c-b^2
)/(c*x^2+b*x+a)^(1/2)+45/8*b^2/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*
x^2+b*x+a)^(1/2))*e^2*f+3/2*x^3/c/(c*x^2+b*x+a)^(1/2)*e^2*f+45/16
*b^3/c^4/(c*x^2+b*x+a)^(1/2)*d*f^2+3/2*x^3/c/(c*x^2+b*x+a)^(1/2)*
d*f^2+3/2*b/c^2*x/(c*x^2+b*x+a)^(1/2)*e^3
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 1.43661, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [-1/256*(4*(128*b*c^5*d^3 - 768*a*c^5*d^2*e + 384*a*b*c^4*d*e^2 -
 16*(b^2*c^4 - 4*a*c^5)*f^3*x^5 - 8*(8*(b^2*c^4 - 4*a*c^5)*e*f^2
- 3*(b^3*c^3 - 4*a*b*c^4)*f^3)*x^4 - 64*(3*a*b^2*c^3 - 8*a^2*c^4)
*e^3 + (315*a*b^5 - 1680*a^2*b^3*c + 1808*a^3*b*c^2)*f^3 - 2*(48*
(b^2*c^4 - 4*a*c^5)*e^2*f + (21*b^4*c^2 - 104*a*b^2*c^3 + 80*a^2*
c^4)*f^3 + 8*(6*(b^2*c^4 - 4*a*c^5)*d - 7*(b^3*c^3 - 4*a*b*c^4)*e
)*f^2)*x^3 + 8*(6*(15*a*b^3*c^2 - 52*a^2*b*c^3)*d - (105*a*b^4*c
- 460*a^2*b^2*c^2 + 256*a^3*c^3)*e)*f^2 - (64*(b^2*c^4 - 4*a*c^5)
*e^3 - 7*(15*b^5*c - 88*a*b^3*c^2 + 112*a^2*b*c^3)*f^3 - 8*(30*(b
^3*c^3 - 4*a*b*c^4)*d - (35*b^4*c^2 - 172*a*b^2*c^3 + 128*a^2*c^4
)*e)*f^2 + 48*(8*(b^2*c^4 - 4*a*c^5)*d*e - 5*(b^3*c^3 - 4*a*b*c^4
)*e^2)*f)*x^2 + 48*(8*a*b*c^4*d^2 - 8*(3*a*b^2*c^3 - 8*a^2*c^4)*d
*e + (15*a*b^3*c^2 - 52*a^2*b*c^3)*e^2)*f + (256*c^6*d^3 - 384*b*
c^5*d^2*e + 384*(b^2*c^4 - 2*a*c^5)*d*e^2 - 64*(3*b^3*c^3 - 10*a*
b*c^4)*e^3 + (315*b^6 - 1890*a*b^4*c + 2704*a^2*b^2*c^2 - 480*a^3
*c^3)*f^3 + 8*(6*(15*b^4*c^2 - 62*a*b^2*c^3 + 24*a^2*c^4)*d - (10
5*b^5*c - 530*a*b^3*c^2 + 488*a^2*b*c^3)*e)*f^2 + 48*(8*(b^2*c^4
- 2*a*c^5)*d^2 - 8*(3*b^3*c^3 - 10*a*b*c^4)*d*e + (15*b^4*c^2 - 6
2*a*b^2*c^3 + 24*a^2*c^4)*e^2)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c
) - 3*(128*(a*b^2*c^4 - 4*a^2*c^5)*d*e^2 - 64*(a*b^3*c^3 - 4*a^2*
b*c^4)*e^3 + 5*(21*a*b^6 - 140*a^2*b^4*c + 240*a^3*b^2*c^2 - 64*a
^4*c^3)*f^3 + 8*(6*(5*a*b^4*c^2 - 24*a^2*b^2*c^3 + 16*a^3*c^4)*d
- 5*(7*a*b^5*c - 40*a^2*b^3*c^2 + 48*a^3*b*c^3)*e)*f^2 + (128*(b^
2*c^5 - 4*a*c^6)*d*e^2 - 64*(b^3*c^4 - 4*a*b*c^5)*e^3 + 5*(21*b^6
*c - 140*a*b^4*c^2 + 240*a^2*b^2*c^3 - 64*a^3*c^4)*f^3 + 8*(6*(5*
b^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c^5)*d - 5*(7*b^5*c^2 - 40*a*b^3*
c^3 + 48*a^2*b*c^4)*e)*f^2 + 16*(8*(b^2*c^5 - 4*a*c^6)*d^2 - 24*(
b^3*c^4 - 4*a*b*c^5)*d*e + 3*(5*b^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c
^5)*e^2)*f)*x^2 + 16*(8*(a*b^2*c^4 - 4*a^2*c^5)*d^2 - 24*(a*b^3*c
^3 - 4*a^2*b*c^4)*d*e + 3*(5*a*b^4*c^2 - 24*a^2*b^2*c^3 + 16*a^3*
c^4)*e^2)*f + (128*(b^3*c^4 - 4*a*b*c^5)*d*e^2 - 64*(b^4*c^3 - 4*
a*b^2*c^4)*e^3 + 5*(21*b^7 - 140*a*b^5*c + 240*a^2*b^3*c^2 - 64*a
^3*b*c^3)*f^3 + 8*(6*(5*b^5*c^2 - 24*a*b^3*c^3 + 16*a^2*b*c^4)*d
- 5*(7*b^6*c - 40*a*b^4*c^2 + 48*a^2*b^2*c^3)*e)*f^2 + 16*(8*(b^3
*c^4 - 4*a*b*c^5)*d^2 - 24*(b^4*c^3 - 4*a*b^2*c^4)*d*e + 3*(5*b^5
*c^2 - 24*a*b^3*c^3 + 16*a^2*b*c^4)*e^2)*f)*x)*log(-4*(2*c^2*x +
b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*
sqrt(c)))/((a*b^2*c^5 - 4*a^2*c^6 + (b^2*c^6 - 4*a*c^7)*x^2 + (b^
3*c^5 - 4*a*b*c^6)*x)*sqrt(c)), -1/128*(2*(128*b*c^5*d^3 - 768*a*
c^5*d^2*e + 384*a*b*c^4*d*e^2 - 16*(b^2*c^4 - 4*a*c^5)*f^3*x^5 -
8*(8*(b^2*c^4 - 4*a*c^5)*e*f^2 - 3*(b^3*c^3 - 4*a*b*c^4)*f^3)*x^4
 - 64*(3*a*b^2*c^3 - 8*a^2*c^4)*e^3 + (315*a*b^5 - 1680*a^2*b^3*c
 + 1808*a^3*b*c^2)*f^3 - 2*(48*(b^2*c^4 - 4*a*c^5)*e^2*f + (21*b^
4*c^2 - 104*a*b^2*c^3 + 80*a^2*c^4)*f^3 + 8*(6*(b^2*c^4 - 4*a*c^5
)*d - 7*(b^3*c^3 - 4*a*b*c^4)*e)*f^2)*x^3 + 8*(6*(15*a*b^3*c^2 -
52*a^2*b*c^3)*d - (105*a*b^4*c - 460*a^2*b^2*c^2 + 256*a^3*c^3)*e
```

```
)*f^2 - (64*(b^2*c^4 - 4*a*c^5)*e^3 - 7*(15*b^5*c - 88*a*b^3*c^2
+ 112*a^2*b*c^3)*f^3 - 8*(30*(b^3*c^3 - 4*a*b*c^4)*d - (35*b^4*c^
2 - 172*a*b^2*c^3 + 128*a^2*c^4)*e)*f^2 + 48*(8*(b^2*c^4 - 4*a*c^
5)*d*e - 5*(b^3*c^3 - 4*a*b*c^4)*e^2)*f)*x^2 + 48*(8*a*b*c^4*d^2
- 8*(3*a*b^2*c^3 - 8*a^2*c^4)*d*e + (15*a*b^3*c^2 - 52*a^2*b*c^3)
*e^2)*f + (256*c^6*d^3 - 384*b*c^5*d^2*e + 384*(b^2*c^4 - 2*a*c^5
)*d*e^2 - 64*(3*b^3*c^3 - 10*a*b*c^4)*e^3 + (315*b^6 - 1890*a*b^4
*c + 2704*a^2*b^2*c^2 - 480*a^3*c^3)*f^3 + 8*(6*(15*b^4*c^2 - 62*
a*b^2*c^3 + 24*a^2*c^4)*d - (105*b^5*c - 530*a*b^3*c^2 + 488*a^2*
b*c^3)*e)*f^2 + 48*(8*(b^2*c^4 - 2*a*c^5)*d^2 - 8*(3*b^3*c^3 - 10
*a*b*c^4)*d*e + (15*b^4*c^2 - 62*a*b^2*c^3 + 24*a^2*c^4)*e^2)*f)*
x)*sqrt(c*x^2 + b*x + a)*sqrt(-c) - 3*(128*(a*b^2*c^4 - 4*a^2*c^5
)*d*e^2 - 64*(a*b^3*c^3 - 4*a^2*b*c^4)*e^3 + 5*(21*a*b^6 - 140*a^
2*b^4*c + 240*a^3*b^2*c^2 - 64*a^4*c^3)*f^3 + 8*(6*(5*a*b^4*c^2 -
 24*a^2*b^2*c^3 + 16*a^3*c^4)*d - 5*(7*a*b^5*c - 40*a^2*b^3*c^2 +
 48*a^3*b*c^3)*e)*f^2 + (128*(b^2*c^5 - 4*a*c^6)*d*e^2 - 64*(b^3*
c^4 - 4*a*b*c^5)*e^3 + 5*(21*b^6*c - 140*a*b^4*c^2 + 240*a^2*b^2*
c^3 - 64*a^3*c^4)*f^3 + 8*(6*(5*b^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c
^5)*d - 5*(7*b^5*c^2 - 40*a*b^3*c^3 + 48*a^2*b*c^4)*e)*f^2 + 16*(
8*(b^2*c^5 - 4*a*c^6)*d^2 - 24*(b^3*c^4 - 4*a*b*c^5)*d*e + 3*(5*b
^4*c^3 - 24*a*b^2*c^4 + 16*a^2*c^5)*e^2)*f)*x^2 + 16*(8*(a*b^2*c^
4 - 4*a^2*c^5)*d^2 - 24*(a*b^3*c^3 - 4*a^2*b*c^4)*d*e + 3*(5*a*b^
4*c^2 - 24*a^2*b^2*c^3 + 16*a^3*c^4)*e^2)*f + (128*(b^3*c^4 - 4*a
*b*c^5)*d*e^2 - 64*(b^4*c^3 - 4*a*b^2*c^4)*e^3 + 5*(21*b^7 - 140*
a*b^5*c + 240*a^2*b^3*c^2 - 64*a^3*b*c^3)*f^3 + 8*(6*(5*b^5*c^2 -
 24*a*b^3*c^3 + 16*a^2*b*c^4)*d - 5*(7*b^6*c - 40*a*b^4*c^2 + 48*
a^2*b^2*c^3)*e)*f^2 + 16*(8*(b^3*c^4 - 4*a*b*c^5)*d^2 - 24*(b^4*c
^3 - 4*a*b^2*c^4)*d*e + 3*(5*b^5*c^2 - 24*a*b^3*c^3 + 16*a^2*b*c^
4)*e^2)*f)*x)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x +
 a)*c)))/((a*b^2*c^5 - 4*a^2*c^6 + (b^2*c^6 - 4*a*c^7)*x^2 + (b^3
*c^5 - 4*a*b*c^6)*x)*sqrt(-c))]
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Timed out
```

GIAC/XCAS [A] time = 0.287321, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Done
```

3.115 $\int \frac{(d+ex+fx^2)^2}{(a+bx+cx^2)^{3/2}}\,dx$

Optimal. Leaf size=309

$$\frac{2\left(-x\left(c^2\left(2a^2f^2+6abef+b^2\left(2df+e^2\right)\right)-2b^2cf(2af+be)-2c^3\left(a\left(2df+e^2\right)+bde\right)+b^4f^2+2c^4d^2\right)-bc\left(-3a^2f^2+\right.\right.}{c^3\left(b^2-4ac\right)\sqrt{a+bx+cx^2}}$$
$$+\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-12cf(af+2be)+15b^2f^2+8c^2\left(2df+e^2\right)\right)}{8c^{7/2}}$$
$$+\frac{f\sqrt{a+bx+cx^2}(8ce-7bf)}{4c^3}+\frac{f^2x\sqrt{a+bx+cx^2}}{2c^2}$$

```
[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*
d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b
^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a
*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x))/(c^3*(b^2 - 4*a*c)*S
qrt[a + b*x + c*x^2]) + (f*(8*c*e - 7*b*f)*Sqrt[a + b*x + c*x^2])
/(4*c^3) + (f^2*x*Sqrt[a + b*x + c*x^2])/(2*c^2) + ((15*b^2*f^2 -
 12*c*f*(2*b*e + a*f) + 8*c^2*(e^2 + 2*d*f))*ArcTanh[(b + 2*c*x)/
(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*c^(7/2))
```

Rubi [A] time = 0.870405, antiderivative size = 309, normalized size of antiderivative = 1., number of steps used = 5, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.185

$$\frac{2\left(-x\left(c^2\left(2a^2f^2+6abef+b^2\left(2df+e^2\right)\right)-2b^2cf(2af+be)-2c^3\left(a\left(2df+e^2\right)+bde\right)+b^4f^2+2c^4d^2\right)-bc\left(-3a^2f^2+\right.\right.}{c^3\left(b^2-4ac\right)\sqrt{a+bx+cx^2}}$$
$$+\frac{\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)\left(-12cf(af+2be)+15b^2f^2+8c^2\left(2df+e^2\right)\right)}{8c^{7/2}}$$
$$+\frac{f\sqrt{a+bx+cx^2}(8ce-7bf)}{4c^3}+\frac{f^2x\sqrt{a+bx+cx^2}}{2c^2}$$

Antiderivative was successfully verified.

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

```
[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*
d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b
^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a
*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x))/(c^3*(b^2 - 4*a*c)*S
qrt[a + b*x + c*x^2]) + (f*(8*c*e - 7*b*f)*Sqrt[a + b*x + c*x^2])
/(4*c^3) + (f^2*x*Sqrt[a + b*x + c*x^2])/(2*c^2) + ((15*b^2*f^2 -
 12*c*f*(2*b*e + a*f) + 8*c^2*(e^2 + 2*d*f))*ArcTanh[(b + 2*c*x)/
(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*c^(7/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

Mathematica [A] time = 0.644548, size = 288, normalized size = 0.93

$$\frac{4bc\left(-13a^2f^2+ac\left(4df+2e^2+20efx-5f^2x^2\right)+2c^2d(d-2ex)\right)+8c^2\left(a^2f(8e+3fx)+ac\left(x\left(-2e^2+4efx+f^2x^2\right)-4\right.\right.}{4c^3\left(4ac-b^2\right)}$$

$$+\frac{\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)\left(-12cf(af+2be)+15b^2f^2+8c^2\left(2df+e^2\right)\right)}{8c^{7/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (15*b^4*f^2*x + b^3*f*(15*a*f + c*x*(-24*e + 5*f*x)) + 4*b*c*(-13
*a^2*f^2 + 2*c^2*d*(d - 2*e*x) + a*c*(2*e^2 + 4*d*f + 20*e*f*x -
5*f^2*x^2)) - 2*b^2*c*(a*f*(12*e + 31*f*x) + c*x*(-4*e^2 - 8*d*f
+ 4*e*f*x + f^2*x^2)) + 8*c^2*(2*c^2*d^2*x + a^2*f*(8*e + 3*f*x)
+ a*c*(-4*d*(e + f*x) + x*(-2*e^2 + 4*e*f*x + f^2*x^2))))/(4*c^3*
(-b^2 + 4*a*c)*Sqrt[a + x*(b + c*x)]) + ((15*b^2*f^2 - 12*c*f*(2*
b*e + a*f) + 8*c^2*(e^2 + 2*d*f))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[
a + x*(b + c*x)]])/(8*c^(7/2))
```

Maple [B] time = 0.019, size = 1011, normalized size = 3.3

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 3/2*f^2/c^2*a*x/(c*x^2+b*x+a)^(1/2)-13/4*f^2*b/c^3*a/(c*x^2+b*x+a
)^(1/2)+15/16*f^2*b^5/c^4/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)+1/2*b^3
/c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*e^2-5/4*f^2*b/c^2*x^2/(c*x^2
+b*x+a)^(1/2)-15/8*f^2*b^2/c^3*x/(c*x^2+b*x+a)^(1/2)-3*e*f*b/c^(5
/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))+4*e*f/c^2*a/(c*x^
2+b*x+a)^(1/2)-2*x/c/(c*x^2+b*x+a)^(1/2)*d*f+b/c^2/(c*x^2+b*x+a)^
(1/2)*d*f+8*e*f/c*a*b/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-3/2*e*f*b
^2/c^3/(c*x^2+b*x+a)^(1/2)+2*e*f*x^2/c/(c*x^2+b*x+a)^(1/2)-13/2*f
^2*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x+2*b^2/c/(4*a*c-b^2
)/(c*x^2+b*x+a)^(1/2)*x*d*f-3*e*f*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+
a)^(1/2)*x+4*e*f/c^2*a*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)-3/2*e*
f*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)+3*e*f*b/c^2*x/(c*x^2+b*
x+a)^(1/2)+b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*e^2+b^3/c^2/(4
*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*d*f-2*d*e*b^2/c/(4*a*c-b^2)/(c*x^2+
b*x+a)^(1/2)-4*d*e*b/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-13/4*f^2*b
^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)+2*d^2*(2*c*x+b)/(4*a*c-b
^2)/(c*x^2+b*x+a)^(1/2)+2/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b
*x+a)^(1/2))*d*f+15/8*f^2*b^2/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x
^2+b*x+a)^(1/2))-3/2*f^2/c^(5/2)*a*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+
b*x+a)^(1/2))+1/2*f^2*x^3/c/(c*x^2+b*x+a)^(1/2)+15/16*f^2*b^3/c^4
/(c*x^2+b*x+a)^(1/2)-2*d*e/c/(c*x^2+b*x+a)^(1/2)-x/c/(c*x^2+b*x+a
)^(1/2)*e^2+1/2*b/c^2/(c*x^2+b*x+a)^(1/2)*e^2+15/8*f^2*b^4/c^3/(4
*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x+1/c^(3/2)*ln((1/2*b+c*x)/c^(1/2)+
(c*x^2+b*x+a)^(1/2))*e^2
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.953681, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [-1/16*(4*(8*b*c^3*d^2 - 32*a*c^3*d*e + 8*a*b*c^2*e^2 - 2*(b^2*c^
2 - 4*a*c^3)*f^2*x^3 + (15*a*b^3 - 52*a^2*b*c)*f^2 - (8*(b^2*c^2
- 4*a*c^3)*e*f - 5*(b^3*c - 4*a*b*c^2)*f^2)*x^2 + 8*(2*a*b*c^2*d
- (3*a*b^2*c - 8*a^2*c^2)*e)*f + (16*c^4*d^2 - 16*b*c^3*d*e + 8*(
b^2*c^2 - 2*a*c^3)*e^2 + (15*b^4 - 62*a*b^2*c + 24*a^2*c^2)*f^2 +
 8*(2*(b^2*c^2 - 2*a*c^3)*d - (3*b^3*c - 10*a*b*c^2)*e)*f)*x)*sqr
t(c*x^2 + b*x + a)*sqrt(c) + (8*(a*b^2*c^2 - 4*a^2*c^3)*e^2 + 3*(
5*a*b^4 - 24*a^2*b^2*c + 16*a^3*c^2)*f^2 + (8*(b^2*c^3 - 4*a*c^4)
*e^2 + 3*(5*b^4*c - 24*a*b^2*c^2 + 16*a^2*c^3)*f^2 + 8*(2*(b^2*c^
3 - 4*a*c^4)*d - 3*(b^3*c^2 - 4*a*b*c^3)*e)*f)*x^2 + 8*(2*(a*b^2*
c^2 - 4*a^2*c^3)*d - 3*(a*b^3*c - 4*a^2*b*c^2)*e)*f + (8*(b^3*c^2
 - 4*a*b*c^3)*e^2 + 3*(5*b^5 - 24*a*b^3*c + 16*a^2*b*c^2)*f^2 + 8
*(2*(b^3*c^2 - 4*a*b*c^3)*d - 3*(b^4*c - 4*a*b^2*c^2)*e)*f)*x)*lo
g(4*(2*c^2*x + b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x
+ b^2 + 4*a*c)*sqrt(c)))/((a*b^2*c^3 - 4*a^2*c^4 + (b^2*c^4 - 4*a
*c^5)*x^2 + (b^3*c^3 - 4*a*b*c^4)*x)*sqrt(c)), -1/8*(2*(8*b*c^3*d
^2 - 32*a*c^3*d*e + 8*a*b*c^2*e^2 - 2*(b^2*c^2 - 4*a*c^3)*f^2*x^3
 + (15*a*b^3 - 52*a^2*b*c)*f^2 - (8*(b^2*c^2 - 4*a*c^3)*e*f - 5*(
b^3*c - 4*a*b*c^2)*f^2)*x^2 + 8*(2*a*b*c^2*d - (3*a*b^2*c - 8*a^2
*c^2)*e)*f + (16*c^4*d^2 - 16*b*c^3*d*e + 8*(b^2*c^2 - 2*a*c^3)*e
^2 + (15*b^4 - 62*a*b^2*c + 24*a^2*c^2)*f^2 + 8*(2*(b^2*c^2 - 2*a
*c^3)*d - (3*b^3*c - 10*a*b*c^2)*e)*f)*x)*sqrt(c*x^2 + b*x + a)*s
qrt(-c) - (8*(a*b^2*c^2 - 4*a^2*c^3)*e^2 + 3*(5*a*b^4 - 24*a^2*b^
2*c + 16*a^3*c^2)*f^2 + (8*(b^2*c^3 - 4*a*c^4)*e^2 + 3*(5*b^4*c -
 24*a*b^2*c^2 + 16*a^2*c^3)*f^2 + 8*(2*(b^2*c^3 - 4*a*c^4)*d - 3*
(b^3*c^2 - 4*a*b*c^3)*e)*f)*x^2 + 8*(2*(a*b^2*c^2 - 4*a^2*c^3)*d
- 3*(a*b^3*c - 4*a^2*b*c^2)*e)*f + (8*(b^3*c^2 - 4*a*b*c^3)*e^2 +
 3*(5*b^5 - 24*a*b^3*c + 16*a^2*b*c^2)*f^2 + 8*(2*(b^3*c^2 - 4*a*
b*c^3)*d - 3*(b^4*c - 4*a*b^2*c^2)*e)*f)*x)*arctan(1/2*(2*c*x + b
)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/((a*b^2*c^3 - 4*a^2*c^4 +
(b^2*c^4 - 4*a*c^5)*x^2 + (b^3*c^3 - 4*a*b*c^4)*x)*sqrt(-c))]
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((d + e*x + f*x**2)**2/(a + b*x + c*x**2)**(3/2), x)
```

GIAC/XCAS [A] time = 0.287578, size = 549, normalized size = 1.78

$$\frac{\left(\left(\frac{2\left(b^2c^2f^2-4\,ac^3f^2\right)x}{b^2c^3-4\,ac^4} - \frac{5\,b^3cf^2-20\,abc^2f^2-8\,b^2c^2fe+32\,ac^3fe}{b^2c^3-4\,ac^4}\right)x - \frac{16\,c^4d^2+16\,b^2c^2df-32\,ac^3df+15\,b^4f^2-62\,ab^2cf^2+24\,a^2c^2f^2-16\,bc^3de-24\,b^3cfe}{b^2c^3-4\,ac^4}}{4\sqrt{cx^2+bx+a}}$$

$$-\frac{\left(16\,c^2df + 15\,b^2f^2 - 12\,acf^2 - 24\,bcfe + 8\,c^2e^2\right)\ln\left(\left|-2\left(\sqrt{c}x - \sqrt{cx^2+bx+a}\right)\sqrt{c} - b\right|\right)}{8\,c^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/4*(((2*(b^2*c^2*f^2 - 4*a*c^3*f^2)*x/(b^2*c^3 - 4*a*c^4) - (5*b
^3*c*f^2 - 20*a*b*c^2*f^2 - 8*b^2*c^2*f*e + 32*a*c^3*f*e)/(b^2*c^
3 - 4*a*c^4))*x - (16*c^4*d^2 + 16*b^2*c^2*d*f - 32*a*c^3*d*f + 1
5*b^4*f^2 - 62*a*b^2*c*f^2 + 24*a^2*c^2*f^2 - 16*b*c^3*d*e - 24*b
^3*c*f*e + 80*a*b*c^2*f*e + 8*b^2*c^2*e^2 - 16*a*c^3*e^2)/(b^2*c^
3 - 4*a*c^4))*x - (8*b*c^3*d^2 + 16*a*b*c^2*d*f + 15*a*b^3*f^2 -
52*a^2*b*c*f^2 - 32*a*c^3*d*e - 24*a*b^2*c*f*e + 64*a^2*c^2*f*e +
 8*a*b*c^2*e^2)/(b^2*c^3 - 4*a*c^4))/sqrt(c*x^2 + b*x + a) - 1/8*
(16*c^2*d*f + 15*b^2*f^2 - 12*a*c*f^2 - 24*b*c*f*e + 8*c^2*e^2)*l
n(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/c^(7/2
)
```

3.116 $\int \frac{d+ex+fx^2}{(a+bx+cx^2)^{3/2}}\,dx$

Optimal. Leaf size=111

$$\frac{2\left(c\left(2ae-b\left(\frac{af}{c}+d\right)\right)-x\left(-2acf+b^2f-bce+2c^2d\right)\right)}{c\left(b^2-4ac\right)\sqrt{a+bx+cx^2}}+\frac{f\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{3/2}}$$

```
[Out] (2*(c*(2*a*e - b*(d + (a*f)/c)) - (2*c^2*d - b*c*e + b^2*f - 2*a*
c*f)*x))/(c*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) + (f*ArcTanh[(b
+ 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/c^(3/2)
```

Rubi [A] time = 0.165008, antiderivative size = 111, 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

$$\frac{2\left(-x\left(-2acf+b^2f-bce+2c^2d\right)-b(af+cd)+2ace\right)}{c\left(b^2-4ac\right)\sqrt{a+bx+cx^2}}+\frac{f\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{3/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (2*(2*a*c*e - b*(c*d + a*f) - (2*c^2*d - b*c*e + b^2*f - 2*a*c*f)
*x))/(c*(b^2 - 4*a*c)*Sqrt[a + b*x + c*x^2]) + (f*ArcTanh[(b + 2*
c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/c^(3/2)
```

Rubi in Sympy [A] time = 15.4816, size = 105, normalized size = 0.95

$$-\frac{2\left(abf-2ace+bcd+x\left(-2acf+b^2f-bce+2c^2d\right)\right)}{c\left(-4ac+b^2\right)\sqrt{a+bx+cx^2}}+\frac{f\operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*(a*b*f - 2*a*c*e + b*c*d + x*(-2*a*c*f + b**2*f - b*c*e + 2*c*
*2*d))/(c*(-4*a*c + b**2)*sqrt(a + b*x + c*x**2)) + f*atanh((b +
2*c*x)/(2*sqrt(c)*sqrt(a + b*x + c*x**2)))/c**(3/2)
```

Mathematica [A] time = 0.323699, size = 113, normalized size = 1.02

$$\frac{\frac{2\sqrt{c}\left(abf-2ac(e+fx)+b^2fx+bc(d-ex)+2c^2dx\right)}{\sqrt{a+x(b+cx)}}-f\left(b^2-4ac\right)\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)}{c^{3/2}\left(4ac-b^2\right)}$$

Antiderivative was successfully verified.

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

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

Maple [B] time = 0.008, size = 249, normalized size = 2.2

$$2\frac{d(2cx+b)}{(4ac-b^2)\sqrt{cx^2+bx+a}}-\frac{e}{c}\frac{1}{\sqrt{cx^2+bx+a}}-2\frac{bex}{(4ac-b^2)\sqrt{cx^2+bx+a}}$$
$$-\frac{b^2e}{c(4ac-b^2)}\frac{1}{\sqrt{cx^2+bx+a}}-\frac{fx}{c}\frac{1}{\sqrt{cx^2+bx+a}}+\frac{bf}{2c^2}\frac{1}{\sqrt{cx^2+bx+a}}+\frac{b^2fx}{c(4ac-b^2)}\frac{1}{\sqrt{cx^2+bx+a}}$$
$$+\frac{b^3f}{2c^2(4ac-b^2)}\frac{1}{\sqrt{cx^2+bx+a}}+f\ln\left(1\left(\frac{b}{2}+cx\right)\frac{1}{\sqrt{c}}+\sqrt{cx^2+bx+a}\right)c^{-\frac{3}{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

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

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

Fricas [A] time = 0.575819, size = 1, normalized size = 0.01

$$\left[-\frac{4\left(bcd-2ace+abf+\left(2c^2d-bce+\left(b^2-2ac\right)f\right)x\right)\sqrt{cx^2+bx+a}\sqrt{c}-\left(\left(b^2c-4ac^2\right)fx^2+\left(b^3-4abc\right)fx+\left(ab^2-\right.\right.}{2(ab^2c-4a^2c^2+(b^2c^2-4ac^3)x^2+(b^3c-4abc}\right.$$

$$-\frac{2\left(bcd-2ace+abf+\left(2c^2d-bce+\left(b^2-2ac\right)f\right)x\right)\sqrt{cx^2+bx+a}\sqrt{-c}-\left(\left(b^2c-4ac^2\right)fx^2+\left(b^3-4abc\right)fx+\left(ab^2-\right.\right.}{(ab^2c-4a^2c^2+(b^2c^2-4ac^3)x^2+(b^3c-4abc^2)x)\sqrt{-c}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] [-1/2*(4*(b*c*d - 2*a*c*e + a*b*f + (2*c^2*d - b*c*e + (b^2 - 2*a
*c)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) - ((b^2*c - 4*a*c^2)*f*x^
2 + (b^3 - 4*a*b*c)*f*x + (a*b^2 - 4*a^2*c)*f)*log(-4*(2*c^2*x +
b*c)*sqrt(c*x^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*
sqrt(c)))/((a*b^2*c - 4*a^2*c^2 + (b^2*c^2 - 4*a*c^3)*x^2 + (b^3*
c - 4*a*b*c^2)*x)*sqrt(c)), -(2*(b*c*d - 2*a*c*e + a*b*f + (2*c^2
*d - b*c*e + (b^2 - 2*a*c)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(-c) -
 ((b^2*c - 4*a*c^2)*f*x^2 + (b^3 - 4*a*b*c)*f*x + (a*b^2 - 4*a^2*
c)*f)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))
/((a*b^2*c - 4*a^2*c^2 + (b^2*c^2 - 4*a*c^3)*x^2 + (b^3*c - 4*a*b
*c^2)*x)*sqrt(-c))]
```

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

$$\int \frac{d + ex + fx^2}{(a + bx + cx^2)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Integral((d + e*x + f*x**2)/(a + b*x + c*x**2)**(3/2), x)
```

GIAC/XCAS [A] time = 0.284782, size = 165, normalized size = 1.49

$$-\frac{2\left(\frac{(2\,c^2d+b^2f-2\,acf-bce)\,x}{b^2c-4\,ac^2}+\frac{bcd+abf-2\,ace}{b^2c-4\,ac^2}\right)}{\sqrt{cx^2+bx+a}}-\frac{f\ln\left(\left|-2\left(\sqrt{c}x-\sqrt{cx^2+bx+a}\right)\sqrt{c}-b\right|\right)}{c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*((2*c^2*d + b^2*f - 2*a*c*f - b*c*e)*x/(b^2*c - 4*a*c^2) + (b*
c*d + a*b*f - 2*a*c*e)/(b^2*c - 4*a*c^2))/sqrt(c*x^2 + b*x + a) -
 f*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/c^
(3/2)
```

3.117 $\int \frac{1}{(a+bx+cx^2)^{3/2}(d+ex+fx^2)}\,dx$

Optimal. Leaf size=666

$$\frac{2\left(-cx\left(-2acf+b^2f-bce+2c^2d\right)-bc(cd-3af)-2ac^2e+b^3(-f)+b^2ce\right)}{(b^2-4ac)\sqrt{a+bx+cx^2}\left((cd-af)^2-(bd-ae)(ce-bf)\right)}-\frac{f\left(f\left(2af-b\left(\sqrt{e^2-4df}+e\right)\right)+c\left(e\sqrt{e^2-4df}-2df+e^2\right)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\sqrt{e^2-4df}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{f\left(2af-b\left(e-\sqrt{e^2-4df}\right)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)}}+\frac{f\left(f\left(2af-b\left(e-\sqrt{e^2-4df}\right)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\sqrt{e^2-4df}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{f\left(2af-b\left(\sqrt{e^2-4df}+e\right)\right)+c\left(e\sqrt{e^2-4df}-2df+e^2\right)}}$$

```
[Out] (2*(b^2*c*e - 2*a*c^2*e - b^3*f - b*c*(c*d - 3*a*f) - c*(2*c^2*d
- b*c*e + b^2*f - 2*a*c*f)*x))/((b^2 - 4*a*c)*((c*d - a*f)^2 - (b
*d - a*e)*(c*e - b*f))*Sqrt[a + b*x + c*x^2]) - (f*(c*(e^2 - 2*d*
f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f])))
*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqr
t[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a
*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(S
qrt[2]*Sqrt[e^2 - 4*d*f]*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f)
)*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e -
Sqrt[e^2 - 4*d*f]))]) + (f*(c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])
 + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f])))*ArcTanh[(4*a*f - b*(e +
 Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*S
qrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[
e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(Sqrt[2]*Sqrt[e^2 - 4*d*f]
*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*(e^2 - 2*d*f +
e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))])
```

Rubi [A] time = 4.63117, antiderivative size = 666, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 4, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.148

$$\frac{2\left(-cx\left(-2acf+b^2f-bce+2c^2d\right)-bc(cd-3af)-2ac^2e+b^3(-f)+b^2ce\right)}{(b^2-4ac)\sqrt{a+bx+cx^2}\left((cd-af)^2-(bd-ae)(ce-bf)\right)}-\frac{f\left(f\left(2af-b\left(\sqrt{e^2-4df}+e\right)\right)+c\left(e\sqrt{e^2-4df}-2df+e^2\right)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(e-\sqrt{e^2-4df}\right)\right)-b\left(e-\sqrt{e^2-4df}\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2-\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\sqrt{e^2-4df}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{f\left(2af-b\left(e-\sqrt{e^2-4df}\right)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)}}+\frac{f\left(f\left(2af-b\left(e-\sqrt{e^2-4df}\right)\right)+c\left(-e\sqrt{e^2-4df}-2df+e^2\right)\right)\tanh^{-1}\left(\frac{4af+2x\left(bf-c\left(\sqrt{e^2-4df}+e\right)\right)-b\left(\sqrt{e^2-4df}+e\right)}{2\sqrt{2}\sqrt{a+bx+cx^2}\sqrt{2af^2+\sqrt{e^2-4df}(ce-bf)-bef-2cdf+ce^2}}\right)}{\sqrt{2}\sqrt{e^2-4df}\left((cd-af)^2-(bd-ae)(ce-bf)\right)\sqrt{f\left(2af-b\left(\sqrt{e^2-4df}+e\right)\right)+c\left(e\sqrt{e^2-4df}-2df+e^2\right)}}$$

Antiderivative was successfully verified.

```
[In]  Int[1/((a + b*x + c*x^2)^(3/2)*(d + e*x + f*x^2)),x]
```

```
[Out] (2*(b^2*c*e - 2*a*c^2*e - b^3*f - b*c*(c*d - 3*a*f) - c*(2*c^2*d
- b*c*e + b^2*f - 2*a*c*f)*x))/((b^2 - 4*a*c)*((c*d - a*f)^2 - (b
*d - a*e)*(c*e - b*f))*Sqrt[a + b*x + c*x^2]) - (f*(c*(e^2 - 2*d*
f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f])))
*ArcTanh[(4*a*f - b*(e - Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e - Sqr
t[e^2 - 4*d*f]))*x)/(2*Sqrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a
*f^2 - (c*e - b*f)*Sqrt[e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(S
```

```
qrt[2]*Sqrt[e^2 - 4*d*f]*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f)
)*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e -
Sqrt[e^2 - 4*d*f]))]) + (f*(c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])
 + f*(2*a*f - b*(e - Sqrt[e^2 - 4*d*f])))*ArcTanh[(4*a*f - b*(e +
 Sqrt[e^2 - 4*d*f]) + 2*(b*f - c*(e + Sqrt[e^2 - 4*d*f]))*x)/(2*S
qrt[2]*Sqrt[c*e^2 - 2*c*d*f - b*e*f + 2*a*f^2 + (c*e - b*f)*Sqrt[
e^2 - 4*d*f]]*Sqrt[a + b*x + c*x^2])])/(Sqrt[2]*Sqrt[e^2 - 4*d*f]
*((c*d - a*f)^2 - (b*d - a*e)*(c*e - b*f))*Sqrt[c*(e^2 - 2*d*f +
e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f]))])
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 4.55702, size = 906, normalized size = 1.36

$$-\frac{4\left(f b^3+c(f x-e) b^2+c(c(d-e x)-3 a f) b+2 c^2(c d x+a(e-f x))\right)}{\left(b^2-4 a c\right) \sqrt{a+x(b+c x)}}+\frac{\sqrt{2} f\left(c\left(e^2+\sqrt{e^2-4 d f}\, e-2 d f\right)+f\left(2 a f-b\left(e+\sqrt{e^2-4 d f}\right)\right)\right) \log\left(-e-2 f x+\sqrt{e^2-4 d f}\right)}{\sqrt{e^2-4 d f} \sqrt{c\left(e^2-\sqrt{e^2-4 d f}\, e-2 d f\right)+f\left(2 a f+b\left(\sqrt{e^2-4 d f}-e\right)\right)}}+\frac{\sqrt{2} f\left(c\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/((a + b*x + c*x^2)^(3/2)*(d + e*x + f*x^2)),x]
```

```
[Out] ((-4*(b^3*f + b^2*c*(-e + f*x) + b*c*(-3*a*f + c*(d - e*x)) + 2*c
^2*(c*d*x + a*(e - f*x))))/((b^2 - 4*a*c)*Sqrt[a + x*(b + c*x)])
+ (Sqrt[2]*f*(c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f -
b*(e + Sqrt[e^2 - 4*d*f])))*Log[-e + Sqrt[e^2 - 4*d*f] - 2*f*x])/
(Sqrt[e^2 - 4*d*f]*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f
*(2*a*f + b*(-e + Sqrt[e^2 - 4*d*f]))]) + (Sqrt[2]*f*(c*(-e^2 + 2
*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(-2*a*f + b*(e - Sqrt[e^2 - 4*d*f
])))*Log[e + Sqrt[e^2 - 4*d*f] + 2*f*x])/(Sqrt[e^2 - 4*d*f]*Sqrt[
c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^
2 - 4*d*f]))]) + (Sqrt[2]*f*(c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]
) + f*(2*a*f + b*(-e + Sqrt[e^2 - 4*d*f])))*Log[-4*a*f + 2*c*e*x
+ 2*c*Sqrt[e^2 - 4*d*f]*x + b*(e + Sqrt[e^2 - 4*d*f] - 2*f*x) - 2
*Sqrt[2]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f -
b*(e + Sqrt[e^2 - 4*d*f]))]*Sqrt[a + x*(b + c*x)]])/(Sqrt[e^2 - 4
*d*f]*Sqrt[c*(e^2 - 2*d*f + e*Sqrt[e^2 - 4*d*f]) + f*(2*a*f - b*(
e + Sqrt[e^2 - 4*d*f]))]) - (Sqrt[2]*f*(c*(e^2 - 2*d*f + e*Sqrt[e
^2 - 4*d*f]) + f*(2*a*f - b*(e + Sqrt[e^2 - 4*d*f])))*Log[b*(-e +
 Sqrt[e^2 - 4*d*f] + 2*f*x) + 2*(2*a*f - c*e*x + c*Sqrt[e^2 - 4*d
*f]*x + Sqrt[2]*Sqrt[f*(-(b*e) + 2*a*f + b*Sqrt[e^2 - 4*d*f]) + c
*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f])]*Sqrt[a + x*(b + c*x)])])/(S
qrt[e^2 - 4*d*f]*Sqrt[c*(e^2 - 2*d*f - e*Sqrt[e^2 - 4*d*f]) + f*(
2*a*f + b*(-e + Sqrt[e^2 - 4*d*f]))]))/(2*(c^2*d^2 - b*c*d*e + f*
(b^2*d - a*b*e + a^2*f) + a*c*(e^2 - 2*d*f)))
```

Maple [B] time = 0.039, size = 3889, normalized size = 5.8

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]   int(1/(c*x^2+b*x+a)^(3/2)/(f*x^2+e*x+d),x)
```

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

```
(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/(4*
a*c-b^2)/((x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)^2*c+1/f*(-c*(-4*d*f+e^
2)^(1/2)+b*f-c*e)*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+1/2*(-(-4*d*f+
e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c
)/f^2)^(1/2)*b*c+2/(-4*d*f+e^2)^(1/2)*f^2/(-(-4*d*f+e^2)^(1/2)*b*
f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/(4*a*c-b^2)
/((x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)^2*c+1/f*(-c*(-4*d*f+e^2)^(1/2)
+b*f-c*e)*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+1/2*(-(-4*d*f+e^2)^(1/
2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(
1/2)*b^2-2/(-4*d*f+e^2)^(1/2)*f/(-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+
e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/(4*a*c-b^2)/((x+1/2*(
e+(-4*d*f+e^2)^(1/2))/f)^2*c+1/f*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*
(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+1/2*(-(-4*d*f+e^2)^(1/2)*b*f+(-4
*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*b*c*e
+2/(-4*d*f+e^2)^(1/2)/(-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)
*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)*f^2*2^(1/2)/((-(-4*d*f+e^2)^(1/
2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(
1/2)*ln(((-(-4*d*f+e^2)^(1/2)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-
b*e*f-2*c*d*f+e^2*c)/f^2+1/f*(-c*(-4*d*f+e^2)^(1/2)+b*f-c*e)*(x+1
/2*(e+(-4*d*f+e^2)^(1/2))/f)+1/2*2^(1/2)*((-(-4*d*f+e^2)^(1/2)*b*
f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1/2)*
(4*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)^2*c+4/f*(-c*(-4*d*f+e^2)^(1/2
)+b*f-c*e)*(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f)+2*(-(-4*d*f+e^2)^(1/2
)*b*f+(-4*d*f+e^2)^(1/2)*c*e+2*a*f^2-b*e*f-2*c*d*f+e^2*c)/f^2)^(1
/2))/(x+1/2*(e+(-4*d*f+e^2)^(1/2))/f))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d)),x, algorithm="maxima")
```

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

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d)),x, algorithm="fricas")
```

```
[Out] Timed out
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(c*x**2+b*x+a)**(3/2)/(f*x**2+e*x+d),x)
```

```
[Out] Timed out
```

GIAC/XCAS [F(-2)] time = 0., size = 0, normalized size = 0.

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/((c*x^2 + b*x + a)^(3/2)*(f*x^2 + e*x + d)),x, algorithm="giac")

[Out] Exception raised: RuntimeError
```

3.118 $\int \frac{(d+ex+fx^2)^3}{(a+bx+cx^2)^{5/2}}\,dx$

Optimal. Leaf size=891

$$\frac{x\sqrt{cx^2+bx+a}\,f^3}{2c^3}+\frac{(12ce-11bf)\sqrt{cx^2+bx+a}\,f^2}{4c^4}+\frac{\left(24\left(e^2+df\right)c^2-20f(3be+af)c+35b^2f^2\right)\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{cx^2+bx+a}}\right)f}{8c^{9/2}}$$

$$-\frac{2\left(-f^3b^7+3cef^2b^6+3cf\left(6af^2-c\left(e^2+df\right)\right)b^5-c^2e\left(42af^2-c\left(e^2+6df\right)\right)b^4-3c^2\left(29a^2f^3-10ac\left(e^2+df\right)f+c\right.\right.}{}$$

$$+\frac{2\left(-af^3b^5+3acef^2b^4+acf\left(5af^2-3c\left(e^2+df\right)\right)b^3-ac^2e\left(12af^2-c\left(e^2+6df\right)\right)b^2-c^2\left(c^3d^3+3ac^2\left(e^2+df\right)d+5\right.\right.}{}$$

```
[Out] (2*(3*a*b^4*c*e*f^2 - a*b^5*f^3 + a*b^3*c*f*(5*a*f^2 - 3*c*(e^2 +
 d*f)) - b*c^2*(c^3*d^3 + 5*a^3*f^3 + 3*a*c^2*d*(e^2 + d*f) - 9*a
^2*c*f*(e^2 + d*f)) - a*b^2*c^2*e*(12*a*f^2 - c*(e^2 + 6*d*f)) +
2*a*c^3*e*(3*c^2*d^2 + 3*a^2*f^2 - a*c*(e^2 + 6*d*f)) - (2*c^2*d
- b*c*e + b^2*f - 2*a*c*f)*(c^4*d^2 - b*c^3*d*e + b^2*c^2*e^2 - 3
*a*c^3*e^2 + b^2*c^2*d*f - 2*a*c^3*d*f - 2*b^3*c*e*f + 7*a*b*c^2*
e*f + b^4*f^2 - 4*a*b^2*c*f^2 + a^2*c^2*f^2)*x))/(3*c^5*(b^2 - 4*
a*c)*(a + b*x + c*x^2)^(3/2)) - (2*(3*b^6*c*e*f^2 - b^7*f^3 + 3*b
^5*c*f*(6*a*f^2 - c*(e^2 + d*f)) - 3*b^3*c^2*(29*a^2*f^3 + c^2*d*
(e^2 + d*f) - 10*a*c*f*(e^2 + d*f)) - 4*b*c^3*(2*c^3*d^3 - 29*a^3
*f^3 + 3*a*c^2*d*(e^2 + d*f) + 24*a^2*c*f*(e^2 + d*f)) - 24*a^2*c
^4*e*(6*a*f^2 - c*(e^2 + 6*d*f)) - b^4*c^2*e*(42*a*f^2 - c*(e^2 +
 6*d*f)) + 6*b^2*c^3*e*(2*c^2*d^2 + 28*a^2*f^2 - a*c*(e^2 + 6*d*f
)) - c*(16*c^6*d^3 - 10*b^6*f^3 + 3*b^4*c*f^2*(7*b*e + 26*a*f) -
24*c^5*d*(b*d*e - a*(e^2 + d*f)) - 6*b^2*c^2*f*(25*a*b*e*f + 27*a
^2*f^2 + 2*b^2*(e^2 + d*f)) + 6*c^4*(b^2*d*(e^2 + d*f) - 16*a^2*f
*(e^2 + d*f) - 2*a*b*e*(e^2 + 6*d*f)) + c^3*(240*a^2*b*e*f^2 + 56
*a^3*f^3 + 84*a*b^2*f*(e^2 + d*f) + b^3*(e^3 + 6*d*e*f)))*x))/(3*
c^5*(b^2 - 4*a*c)^2*Sqrt[a + b*x + c*x^2]) + (f^2*(12*c*e - 11*b*
f)*Sqrt[a + b*x + c*x^2])/(4*c^4) + (f^3*x*Sqrt[a + b*x + c*x^2])
/(2*c^3) + (f*(35*b^2*f^2 - 20*c*f*(3*b*e + a*f) + 24*c^2*(e^2 +
d*f))*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*
c^(9/2))
```

Rubi [A] time = 5.04396, antiderivative size = 891, normalized size of antiderivative = 1., number of steps used = 6, number of rules used = 5, integrand size = 27, $\frac{\text{number of rules}}{\text{integrand size}} = 0.185$

$$\frac{x\sqrt{cx^2+bx+a}\,f^3}{2c^3}+\frac{(12ce-11bf)\sqrt{cx^2+bx+a}\,f^2}{4c^4}+\frac{\left(24\left(e^2+df\right)c^2-20f(3be+af)c+35b^2f^2\right)\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{cx^2+bx+a}}\right)f}{8c^{9/2}}$$

$$-\frac{2\left(-f^3b^7+3cef^2b^6+3cf\left(6af^2-c\left(e^2+df\right)\right)b^5-c^2e\left(42af^2-c\left(e^2+6df\right)\right)b^4-3c^2\left(29a^2f^3-10ac\left(e^2+df\right)f+c\right.\right.}{}$$

$$+\frac{2\left(-af^3b^5+3acef^2b^4+acf\left(5af^2-3c\left(e^2+df\right)\right)b^3-ac^2e\left(12af^2-c\left(e^2+6df\right)\right)b^2-c^2\left(c^3d^3+3ac^2\left(e^2+df\right)d+5\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In]  Int[(d + e*x + f*x^2)^3/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (2*(3*a*b^4*c*e*f^2 - a*b^5*f^3 + a*b^3*c*f*(5*a*f^2 - 3*c*(e^2 +
 d*f)) - b*c^2*(c^3*d^3 + 5*a^3*f^3 + 3*a*c^2*d*(e^2 + d*f) - 9*a
^2*c*f*(e^2 + d*f)) - a*b^2*c^2*e*(12*a*f^2 - c*(e^2 + 6*d*f)) +
2*a*c^3*e*(3*c^2*d^2 + 3*a^2*f^2 - a*c*(e^2 + 6*d*f)) - (2*c^2*d
+ b^2*f - c*(b*e + 2*a*f))*(c^4*d^2 + b^4*f^2 - 2*b^2*c*f*(b*e +
2*a*f) - c^3*(b*d*e + 3*a*e^2 + 2*a*d*f) + c^2*(7*a*b*e*f + a^2*f
```

```
^2 + b^2*(e^2 + d*f)))*x))/(3*c^5*(b^2 - 4*a*c)*(a + b*x + c*x^2)
^(3/2)) - (2*(3*b^6*c*e*f^2 - b^7*f^3 + 3*b^5*c*f*(6*a*f^2 - c*(e
^2 + d*f)) - 3*b^3*c^2*(29*a^2*f^3 + c^2*d*(e^2 + d*f) - 10*a*c*f
*(e^2 + d*f)) - 4*b*c^3*(2*c^3*d^3 - 29*a^3*f^3 + 3*a*c^2*d*(e^2
+ d*f) + 24*a^2*c*f*(e^2 + d*f)) - 24*a^2*c^4*e*(6*a*f^2 - c*(e^2
 + 6*d*f)) - b^4*c^2*e*(42*a*f^2 - c*(e^2 + 6*d*f)) + 6*b^2*c^3*e
*(2*c^2*d^2 + 28*a^2*f^2 - a*c*(e^2 + 6*d*f)) - c*(16*c^6*d^3 - 1
0*b^6*f^3 + 3*b^4*c*f^2*(7*b*e + 26*a*f) - 24*c^5*d*(b*d*e - a*(e
^2 + d*f)) - 6*b^2*c^2*f*(25*a*b*e*f + 27*a^2*f^2 + 2*b^2*(e^2 +
d*f)) + 6*c^4*(b^2*d*(e^2 + d*f) - 16*a^2*f*(e^2 + d*f) - 2*a*b*e
*(e^2 + 6*d*f)) + c^3*(240*a^2*b*e*f^2 + 56*a^3*f^3 + 84*a*b^2*f*
(e^2 + d*f) + b^3*(e^3 + 6*d*e*f)))*x))/(3*c^5*(b^2 - 4*a*c)^2*Sq
rt[a + b*x + c*x^2]) + (f^2*(12*c*e - 11*b*f)*Sqrt[a + b*x + c*x^
2])/(4*c^4) + (f^3*x*Sqrt[a + b*x + c*x^2])/(2*c^3) + (f*(35*b^2*
f^2 - 20*c*f*(3*b*e + a*f) + 24*c^2*(e^2 + d*f))*ArcTanh[(b + 2*c
*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/(8*c^(9/2))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 4.8857, size = 872, normalized size = 0.98

$$\frac{-105f^3x^2b^7 - 10f^2x(21af + 2cx(7fx - 9e))b^6 - 3f\left(35a^2f^2 - 10acx(12e + 23fx)f + c^2x^2\left(24e^2 - 80fxe + 7f^2x^2 + 24df\right.\right.}{}$$

$$+\frac{f\left(24\left(e^2 + df\right)c^2 - 20f(3be + af)c + 35b^2f^2\right)\log\left(b + 2cx + 2\sqrt{c}\sqrt{a + x(b + cx)}\right)}{8c^{9/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d + e*x + f*x^2)^3/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (-105*b^7*f^3*x^2 - 10*b^6*f^2*x*(21*a*f + 2*c*x*(-9*e + 7*f*x))
+ 6*b^4*c*f*(5*a^2*f*(6*e + 53*f*x) - 6*a*c*x*(4*e^2 + 4*d*f + 30
*e*f*x - 31*f^2*x^2) + c^2*x^3*(-16*e^2 - 16*d*f + 6*e*f*x + f^2*
x^2)) - 3*b^5*f*(35*a^2*f^2 - 10*a*c*f*x*(12*e + 23*f*x) + c^2*x^
2*(24*e^2 + 24*d*f - 80*e*f*x + 7*f^2*x^2)) - 48*b*c^2*(27*a^4*f^
3 - 4*c^4*d^2*x^2*(d - e*x) + a^2*c^2*(-4*d^2*f + 4*e^3*x - 64*e*
f^2*x^3 + 7*f^3*x^4 - 4*d*e*(e - 6*f*x)) - 2*a*c^3*(d^3 - e^3*x^3
 + 3*d*e*x^2*(e - 2*f*x) + 3*d^2*x*(-e + f*x)) - 2*a^3*c*f*(5*e^2
 + 39*e*f*x + f*(5*d - 14*f*x^2))) - 8*b^3*c*(-95*a^3*f^3 + c^3*(
d^3 - e^3*x^3 + 9*d^2*x*(e - f*x) - 3*d*e*x^2*(3*e + 2*f*x)) - 3*
a*c^2*f*x^2*(18*e^2 - 74*e*f*x + f*(18*d + 7*f*x^2)) + 3*a^2*c*f*
(3*e^2 + 105*e*f*x + f*(3*d + 29*f*x^2))) + 32*c^3*(4*c^4*d^3*x^3
 + 3*a^4*f^2*(16*e + 5*f*x) + 6*a*c^3*d*x*(d^2 + e^2*x^2 + d*f*x^
2) - 2*a^3*c*(2*e^3 + 9*e^2*f*x + f^2*x*(9*d - 10*f*x^2) + 12*e*f
*(d - 3*f*x^2)) - 3*a^2*c^2*(2*d^2*e + 4*d*f*x^2*(3*e + 2*f*x) +
x^2*(2*e^3 + 8*e^2*f*x - 6*e*f^2*x^2 - f^3*x^3))) - 48*b^2*c^2*(a
^3*f^2*(25*e + 63*f*x) - c^3*d*x*(d^2 + e^2*x^2 + d*x*(-6*e + f*x
)) + a^2*c*f*x*(-21*e^2 - 12*e*f*x + 7*f*(-3*d + 7*f*x^2)) + a*c^
2*(d^2*(e - 6*f*x) - 2*d*x*(3*e^2 - 3*e*f*x + 7*f^2*x^2) + x^2*(e
^3 - 14*e^2*f*x + 6*e*f^2*x^2 + f^3*x^3))))/(12*c^4*(b^2 - 4*a*c)
^2*(a + x*(b + c*x))^(3/2)) + (f*(35*b^2*f^2 - 20*c*f*(3*b*e + a*
f) + 24*c^2*(e^2 + d*f))*Log[b + 2*c*x + 2*Sqrt[c]*Sqrt[a + x*(b
+ c*x)]])/(8*c^(9/2))
```

Maple [B] time = 0.045, size = 4635, normalized size = 5.2

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x^2+e*x+d)^3/(c*x^2+b*x+a)^(5/2),x)
```

```
[Out] 2/3*b^3/c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*e^3-1/2*b^2/c^2*a/(
4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*e^3-4*b^2/c*a/(4*a*c-b^2)^2/(c*x^2
+b*x+a)^(1/2)*e^3-4/c^2*a/(c*x^2+b*x+a)^(3/2)*d*e*f-d^2*e*b^2/c/(
4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)-2*d^2*e*b/(4*a*c-b^2)/(c*x^2+b*x+a
)^(3/2)*x+1/4*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*f*d^2+1/4*b
^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*e^2*d+4*b^2/(4*a*c-b^2)^2/
(c*x^2+b*x+a)^(1/2)*x*f*d^2-x^2/c/(c*x^2+b*x+a)^(3/2)*e^3+1/24*b^
2/c^3/(c*x^2+b*x+a)^(3/2)*e^3-2/3/c^2*a/(c*x^2+b*x+a)^(3/2)*e^3+3
/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*d*f^2+3/c^(5
/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a)^(1/2))*e^2*f+35/16*f^3*b
^3/c^5/(c*x^2+b*x+a)^(1/2)+35/8*f^3*b^2/c^(9/2)*ln((1/2*b+c*x)/c^
(1/2)+(c*x^2+b*x+a)^(1/2))-5/2*f^3/c^(7/2)*a*ln((1/2*b+c*x)/c^(1/
2)+(c*x^2+b*x+a)^(1/2))+1/2*f^3*x^5/c/(c*x^2+b*x+a)^(3/2)-35/384*
f^3*b^5/c^6/(c*x^2+b*x+a)^(3/2)+2/3*d^3/(4*a*c-b^2)/(c*x^2+b*x+a)
^(3/2)*b-d^2*e/c/(c*x^2+b*x+a)^(3/2)-6*b/c*a/(4*a*c-b^2)/(c*x^2+b
*x+a)^(3/2)*x*d*e*f+12*b^2/c*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*
x*e^2*f+12*b^2/c*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*d*f^2+3/2*
b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*e^2*f+3/2*b^2/c^2*a/(
4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*d*f^2+12*e*f^2/c^2*a^2*b/(4*a*c-
b^2)/(c*x^2+b*x+a)^(3/2)*x+96*e*f^2/c*a^2*b/(4*a*c-b^2)^2/(c*x^2+
b*x+a)^(1/2)*x-38*e*f^2*b^3/c^2*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/
2)*x-19/4*e*f^2*b^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x-48*b*
a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*d*e*f+1/2*b^3/c^2/(4*a*c-b^
2)/(c*x^2+b*x+a)^(3/2)*x*d*e*f+4*b^3/c/(4*a*c-b^2)^2/(c*x^2+b*x+a
)^(1/2)*x*d*e*f-3*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*d*e*f
-15/4*e*f^2*b^4/c^4/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)+12*e*f^2/c^2*
a*x^2/(c*x^2+b*x+a)^(3/2)+5/2*e*f^2*b/c^2*x^3/(c*x^2+b*x+a)^(3/2)
+1/c*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*b*e^2*d+16*c*a/(4*a*c-b^2)
^2/(c*x^2+b*x+a)^(1/2)*x*f*d^2+16*c*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)
^(1/2)*x*e^2*d+1/2*b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*f*d^2+
1/2*b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*e^2*d+1/c*a/(4*a*c-b^
2)/(c*x^2+b*x+a)^(3/2)*b*f*d^2-15/2*e*f^2*b^3/c^3/(4*a*c-b^2)/(c*
x^2+b*x+a)^(1/2)*x+3*e*f^2/c^3*a*b*x/(c*x^2+b*x+a)^(3/2)+6*e*f^2/
c^3*a^2*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)+48*e*f^2/c^2*a^2*b^2/
(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)+5/16*e*f^2*b^5/c^4/(4*a*c-b^2)/
(c*x^2+b*x+a)^(3/2)*x+5/2*e*f^2*b^5/c^3/(4*a*c-b^2)^2/(c*x^2+b*x+
a)^(1/2)*x-19/8*e*f^2*b^4/c^4*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)+3
/4*b^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*d*f^2+3/4*b^3/c^3*a/
(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*e^2*f+6*b^3/c^2*a/(4*a*c-b^2)^2/(
c*x^2+b*x+a)^(1/2)*d*f^2+6*b^3/c^2*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^
(1/2)*e^2*f+3/c^2*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*d*f^2+3/c
^2*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x*e^2*f-1/8*b^4/c^3/(4*a*c
-b^2)/(c*x^2+b*x+a)^(3/2)*x*e^2*f-b^4/c^2/(4*a*c-b^2)^2/(c*x^2+b*
x+a)^(1/2)*x*d*f^2-b^4/c^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*e^
2*f-1/8*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*d*f^2+23*f^3*b^
4/c^3*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x+23/8*f^3*b^4/c^4*a/(4
*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x-5/2*f^3/c^3*a*b^2/(4*a*c-b^2)/(c*
x^2+b*x+a)^(1/2)*x-33/4*f^3*b^2/c^3*a^2/(4*a*c-b^2)/(c*x^2+b*x+a)
^(3/2)*x-66*f^3*b^2/c^2*a^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x-1
6*d^2*e*b*c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x-b/c*a/(4*a*c-b^2)
/(c*x^2+b*x+a)^(3/2)*x*e^3-3/2*b/c^2*x/(c*x^2+b*x+a)^(3/2)*d*e*f+
1/4*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*d*e*f+2*b^4/c^2/(4*a*
c-b^2)^2/(c*x^2+b*x+a)^(1/2)*d*e*f-19*e*f^2*b^4/c^3*a/(4*a*c-b^2)
^2/(c*x^2+b*x+a)^(1/2)+4*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*
e^2*d+2*b^3/c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*f*d^2+2*b^3/c/(4*
a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*e^2*d+2*a/(4*a*c-b^2)/(c*x^2+b*x+a
)^(3/2)*x*f*d^2+2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*e^2*d+8*a/(
4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*b*f*d^2+8*a/(4*a*c-b^2)^2/(c*x^2
+b*x+a)^(1/2)*b*e^2*d+16/3*d^3*c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2
)*b-1/4*b/c^2*x/(c*x^2+b*x+a)^(3/2)*e^3+3/2/c^3*b/(c*x^2+b*x+a)^(
```

```
1/2)*e^2*f-x^3/c/(c*x^2+b*x+a)^(3/2)*d*f^2-x^3/c/(c*x^2+b*x+a)^(3
/2)*e^2*f-5/4*f^3/c^4*a*b/(c*x^2+b*x+a)^(1/2)-11/2*f^3*b/c^4*a^2/
(c*x^2+b*x+a)^(3/2)-35/24*f^3*b^2/c^3*x^3/(c*x^2+b*x+a)^(3/2)-35/
8*f^3*b^2/c^4*x/(c*x^2+b*x+a)^(1/2)+35/16*f^3*b^5/c^5/(4*a*c-b^2)
/(c*x^2+b*x+a)^(1/2)-7/4*f^3*b/c^2*x^4/(c*x^2+b*x+a)^(3/2)+35/16*
f^3*b^3/c^4*x^2/(c*x^2+b*x+a)^(3/2)+35/64*f^3*b^4/c^5*x/(c*x^2+b*
x+a)^(3/2)+5/6*f^3/c^2*a*x^3/(c*x^2+b*x+a)^(3/2)+5/2*f^3/c^3*a*x/
(c*x^2+b*x+a)^(1/2)-8*d^2*e*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)
-35/384*f^3*b^7/c^6/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)-35/48*f^3*b^7
/c^5/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)+173/96*f^3*b^3/c^5*a/(c*x^
2+b*x+a)^(3/2)+1/24*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*e^3+1
/3*b^4/c^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*e^3+4/3*d^3/(4*a*c-b
^2)/(c*x^2+b*x+a)^(3/2)*c*x+32/3*d^3*c^2/(4*a*c-b^2)^2/(c*x^2+b*x
+a)^(1/2)*x-3/2*x/c/(c*x^2+b*x+a)^(3/2)*f*d^2+1/4*b/c^2/(c*x^2+b*
x+a)^(3/2)*e^2*d+3*e*f^2*x^4/c/(c*x^2+b*x+a)^(3/2)+8*e*f^2/c^3*a^
2/(c*x^2+b*x+a)^(3/2)-15/2*e*f^2*b/c^(7/2)*ln((1/2*b+c*x)/c^(1/2)
+(c*x^2+b*x+a)^(1/2))+5/32*e*f^2*b^4/c^5/(c*x^2+b*x+a)^(3/2)-15/4
*e*f^2*b^2/c^4/(c*x^2+b*x+a)^(1/2)-1/16*b^3/c^4/(c*x^2+b*x+a)^(3/
2)*d*f^2-1/16*b^3/c^4/(c*x^2+b*x+a)^(3/2)*e^2*f-3/c^2*x/(c*x^2+b*
x+a)^(1/2)*d*f^2-3/c^2*x/(c*x^2+b*x+a)^(1/2)*e^2*f+3/2/c^3*b/(c*x
^2+b*x+a)^(1/2)*d*f^2+1/4*b/c^2/(c*x^2+b*x+a)^(3/2)*f*d^2-24*b^2/
c*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*d*e*f+5/4*e*f^2*b^6/c^4/(4*
a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)-3/2*x/c/(c*x^2+b*x+a)^(3/2)*e^2*d-
33/8*f^3*b^3/c^4*a^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)-33*f^3*b^3/c
^3*a^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)-5/4*f^3/c^4*a*b^3/(4*a*c
-b^2)/(c*x^2+b*x+a)^(1/2)-6*x^2/c/(c*x^2+b*x+a)^(3/2)*d*e*f-8*b*a
/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*e^3+1/4*b^2/c^3/(c*x^2+b*x+a
)^(3/2)*d*e*f+1/12*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*e^3-
3*e*f^2*b^2/c^4*a/(c*x^2+b*x+a)^(3/2)+15/2*e*f^2*b/c^3*x/(c*x^2+b
*x+a)^(1/2)-15/4*e*f^2*b^2/c^3*x^2/(c*x^2+b*x+a)^(3/2)-15/16*e*f^
2*b^3/c^4*x/(c*x^2+b*x+a)^(3/2)+5/32*e*f^2*b^6/c^5/(4*a*c-b^2)/(c
*x^2+b*x+a)^(3/2)+3/2/c^3*b^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*d*f
^2-1/16*b^5/c^4/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*d*f^2-1/16*b^5/c^
4/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*e^2*f-1/2*b^5/c^3/(4*a*c-b^2)^2
/(c*x^2+b*x+a)^(1/2)*d*f^2-1/2*b^5/c^3/(4*a*c-b^2)^2/(c*x^2+b*x+a
)^(1/2)*e^2*f+3/8*b^2/c^3*x/(c*x^2+b*x+a)^(3/2)*e^2*f+3/2*b/c^2*x
^2/(c*x^2+b*x+a)^(3/2)*e^2*f+3/8*b^2/c^3*x/(c*x^2+b*x+a)^(3/2)*d*
f^2+3/2*b/c^2*x^2/(c*x^2+b*x+a)^(3/2)*d*f^2+3/2/c^3*b^3/(4*a*c-b^
2)/(c*x^2+b*x+a)^(1/2)*e^2*f+b/c^3*a/(c*x^2+b*x+a)^(3/2)*d*f^2+b/
c^3*a/(c*x^2+b*x+a)^(3/2)*e^2*f+23/2*f^3*b^5/c^4*a/(4*a*c-b^2)^2/
(c*x^2+b*x+a)^(1/2)+35/8*f^3*b^4/c^4/(4*a*c-b^2)/(c*x^2+b*x+a)^(1
/2)*x-33/4*f^3*b/c^3*a*x^2/(c*x^2+b*x+a)^(3/2)-35/192*f^3*b^6/c^5
/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x-35/24*f^3*b^6/c^4/(4*a*c-b^2)^
2/(c*x^2+b*x+a)^(1/2)*x+23/16*f^3*b^5/c^5*a/(4*a*c-b^2)/(c*x^2+b*
x+a)^(3/2)-33/16*f^3*b^2/c^4*a*x/(c*x^2+b*x+a)^(3/2)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x^2 + e*x + d)^3/(c*x^2 + b*x + a)^(5/2),x, algorithm="maxima")
```

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

Fricas [A] time = 1.43224, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x^2 + e*x + d)^3/(c*x^2 + b*x + a)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/48*(4*(192*a^2*b*c^4*d*e^2 - 128*a^3*c^4*e^3 + 6*(b^4*c^3 - 8*
a*b^2*c^4 + 16*a^2*c^5)*f^3*x^5 + 3*(12*(b^4*c^3 - 8*a*b^2*c^4 +
16*a^2*c^5)*e*f^2 - 7*(b^5*c^2 - 8*a*b^3*c^3 + 16*a^2*b*c^4)*f^3)
*x^4 - 8*(b^3*c^4 - 12*a*b*c^5)*d^3 - 48*(a*b^2*c^4 + 4*a^2*c^5)*
d^2*e - (105*a^2*b^5 - 760*a^3*b^3*c + 1296*a^4*b*c^2)*f^3 + 4*(3
2*c^7*d^3 - 48*b*c^6*d^2*e + 12*(b^2*c^5 + 4*a*c^6)*d*e^2 + 2*(b^
3*c^4 - 12*a*b*c^5)*e^3 - (35*b^6*c - 279*a*b^4*c^2 + 588*a^2*b^2
*c^3 - 160*a^3*c^4)*f^3 - 12*(2*(b^4*c^3 - 7*a*b^2*c^4 + 8*a^2*c^
5)*d - (5*b^5*c^2 - 37*a*b^3*c^3 + 64*a^2*b*c^4)*e)*f^2 + 12*((b^
2*c^5 + 4*a*c^6)*d^2 + (b^3*c^4 - 12*a*b*c^5)*d*e - 2*(b^4*c^3 -
7*a*b^2*c^4 + 8*a^2*c^5)*e^2)*f)*x^3 - 12*(2*(3*a^2*b^3*c^2 - 20*
a^3*b*c^3)*d - (15*a^2*b^4*c - 100*a^3*b^2*c^2 + 128*a^4*c^3)*e)*
f^2 + 3*(64*b*c^6*d^3 - 96*b^2*c^5*d^2*e + 24*(b^3*c^4 + 4*a*b*c^
5)*d*e^2 - 16*(a*b^2*c^4 + 4*a^2*c^5)*e^3 - (35*b^7 - 230*a*b^5*c
 + 232*a^2*b^3*c^2 + 448*a^3*b*c^3)*f^3 - 12*(2*(b^5*c^2 - 6*a*b^
3*c^3)*d - (5*b^6*c - 30*a*b^4*c^2 + 16*a^2*b^2*c^3 + 64*a^3*c^4)
*e)*f^2 + 24*((b^3*c^4 + 4*a*b*c^5)*d^2 - 4*(a*b^2*c^4 + 4*a^2*c^
5)*d*e - (b^5*c^2 - 6*a*b^3*c^3)*e^2)*f)*x^2 + 24*(8*a^2*b*c^4*d^
2 - 32*a^3*c^4*d*e - (3*a^2*b^3*c^2 - 20*a^3*b*c^3)*e^2)*f + 6*(4
8*a*b^2*c^4*d*e^2 - 32*a^2*b*c^4*e^3 + 8*(b^2*c^5 + 4*a*c^6)*d^3
- 12*(b^3*c^4 + 4*a*b*c^5)*d^2*e - (35*a*b^6 - 265*a^2*b^4*c + 50
4*a^3*b^2*c^2 - 80*a^4*c^3)*f^3 - 12*(2*(a*b^4*c^2 - 7*a^2*b^2*c^
3 + 4*a^3*c^4)*d - (5*a*b^5*c - 35*a^2*b^3*c^2 + 52*a^3*b*c^3)*e)
*f^2 + 24*(2*a*b^2*c^4*d^2 - 8*a^2*b*c^4*d*e - (a*b^4*c^2 - 7*a^2
*b^2*c^3 + 4*a^3*c^4)*e^2)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) -
3*((24*(b^4*c^4 - 8*a*b^2*c^5 + 16*a^2*c^6)*e^2*f + 5*(7*b^6*c^2
- 60*a*b^4*c^3 + 144*a^2*b^2*c^4 - 64*a^3*c^5)*f^3 + 12*(2*(b^4*c
^4 - 8*a*b^2*c^5 + 16*a^2*c^6)*d - 5*(b^5*c^3 - 8*a*b^3*c^4 + 16*
a^2*b*c^5)*e)*f^2)*x^4 + 24*(a^2*b^4*c^2 - 8*a^3*b^2*c^3 + 16*a^4
*c^4)*e^2*f + 5*(7*a^2*b^6 - 60*a^3*b^4*c + 144*a^4*b^2*c^2 - 64*
a^5*c^3)*f^3 + 2*(24*(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)*e^2*f
 + 5*(7*b^7*c - 60*a*b^5*c^2 + 144*a^2*b^3*c^3 - 64*a^3*b*c^4)*f^
3 + 12*(2*(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)*d - 5*(b^6*c^2 -
 8*a*b^4*c^3 + 16*a^2*b^2*c^4)*e)*f^2)*x^3 + 12*(2*(a^2*b^4*c^2 -
 8*a^3*b^2*c^3 + 16*a^4*c^4)*d - 5*(a^2*b^5*c - 8*a^3*b^3*c^2 + 1
6*a^4*b*c^3)*e)*f^2 + (24*(b^6*c^2 - 6*a*b^4*c^3 + 32*a^3*c^5)*e^
2*f + 5*(7*b^8 - 46*a*b^6*c + 24*a^2*b^4*c^2 + 224*a^3*b^2*c^3 -
128*a^4*c^4)*f^3 + 12*(2*(b^6*c^2 - 6*a*b^4*c^3 + 32*a^3*c^5)*d -
 5*(b^7*c - 6*a*b^5*c^2 + 32*a^3*b*c^4)*e)*f^2)*x^2 + 2*(24*(a*b^
5*c^2 - 8*a^2*b^3*c^3 + 16*a^3*b*c^4)*e^2*f + 5*(7*a*b^7 - 60*a^2
*b^5*c + 144*a^3*b^3*c^2 - 64*a^4*b*c^3)*f^3 + 12*(2*(a*b^5*c^2 -
 8*a^2*b^3*c^3 + 16*a^3*b*c^4)*d - 5*(a*b^6*c - 8*a^2*b^4*c^2 + 1
6*a^3*b^2*c^3)*e)*f^2)*x)*log(4*(2*c^2*x + b*c)*sqrt(c*x^2 + b*x
+ a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/((a^2*b^4*c^
4 - 8*a^3*b^2*c^5 + 16*a^4*c^6 + (b^4*c^6 - 8*a*b^2*c^7 + 16*a^2*
c^8)*x^4 + 2*(b^5*c^5 - 8*a*b^3*c^6 + 16*a^2*b*c^7)*x^3 + (b^6*c^
4 - 6*a*b^4*c^5 + 32*a^3*c^7)*x^2 + 2*(a*b^5*c^4 - 8*a^2*b^3*c^5
+ 16*a^3*b*c^6)*x)*sqrt(c)), 1/24*(2*(192*a^2*b*c^4*d*e^2 - 128*a
^3*c^4*e^3 + 6*(b^4*c^3 - 8*a*b^2*c^4 + 16*a^2*c^5)*f^3*x^5 + 3*(
12*(b^4*c^3 - 8*a*b^2*c^4 + 16*a^2*c^5)*e*f^2 - 7*(b^5*c^2 - 8*a*
b^3*c^3 + 16*a^2*b*c^4)*f^3)*x^4 - 8*(b^3*c^4 - 12*a*b*c^5)*d^3 -
 48*(a*b^2*c^4 + 4*a^2*c^5)*d^2*e - (105*a^2*b^5 - 760*a^3*b^3*c
+ 1296*a^4*b*c^2)*f^3 + 4*(32*c^7*d^3 - 48*b*c^6*d^2*e + 12*(b^2*
c^5 + 4*a*c^6)*d*e^2 + 2*(b^3*c^4 - 12*a*b*c^5)*e^3 - (35*b^6*c -
 279*a*b^4*c^2 + 588*a^2*b^2*c^3 - 160*a^3*c^4)*f^3 - 12*(2*(b^4*
c^3 - 7*a*b^2*c^4 + 8*a^2*c^5)*d - (5*b^5*c^2 - 37*a*b^3*c^3 + 64
*a^2*b*c^4)*e)*f^2 + 12*((b^2*c^5 + 4*a*c^6)*d^2 + (b^3*c^4 - 12*
a*b*c^5)*d*e - 2*(b^4*c^3 - 7*a*b^2*c^4 + 8*a^2*c^5)*e^2)*f)*x^3
- 12*(2*(3*a^2*b^3*c^2 - 20*a^3*b*c^3)*d - (15*a^2*b^4*c - 100*a^
3*b^2*c^2 + 128*a^4*c^3)*e)*f^2 + 3*(64*b*c^6*d^3 - 96*b^2*c^5*d^
2*e + 24*(b^3*c^4 + 4*a*b*c^5)*d*e^2 - 16*(a*b^2*c^4 + 4*a^2*c^5)
*e^3 - (35*b^7 - 230*a*b^5*c + 232*a^2*b^3*c^2 + 448*a^3*b*c^3)*f
^3 - 12*(2*(b^5*c^2 - 6*a*b^3*c^3)*d - (5*b^6*c - 30*a*b^4*c^2 +
16*a^2*b^2*c^3 + 64*a^3*c^4)*e)*f^2 + 24*((b^3*c^4 + 4*a*b*c^5)*d
^2 - 4*(a*b^2*c^4 + 4*a^2*c^5)*d*e - (b^5*c^2 - 6*a*b^3*c^3)*e^2)
*f)*x^2 + 24*(8*a^2*b*c^4*d^2 - 32*a^3*c^4*d*e - (3*a^2*b^3*c^2 -
 20*a^3*b*c^3)*e^2)*f + 6*(48*a*b^2*c^4*d*e^2 - 32*a^2*b*c^4*e^3
+ 8*(b^2*c^5 + 4*a*c^6)*d^3 - 12*(b^3*c^4 + 4*a*b*c^5)*d^2*e - (3
5*a*b^6 - 265*a^2*b^4*c + 504*a^3*b^2*c^2 - 80*a^4*c^3)*f^3 - 12*
(2*(a*b^4*c^2 - 7*a^2*b^2*c^3 + 4*a^3*c^4)*d - (5*a*b^5*c - 35*a^
2*b^3*c^2 + 52*a^3*b*c^3)*e)*f^2 + 24*(2*a*b^2*c^4*d^2 - 8*a^2*b*
c^4*d*e - (a*b^4*c^2 - 7*a^2*b^2*c^3 + 4*a^3*c^4)*e^2)*f)*x)*sqrt
```

```
(c*x^2 + b*x + a)*sqrt(-c) + 3*((24*(b^4*c^4 - 8*a*b^2*c^5 + 16*a
^2*c^6)*e^2*f + 5*(7*b^6*c^2 - 60*a*b^4*c^3 + 144*a^2*b^2*c^4 - 6
4*a^3*c^5)*f^3 + 12*(2*(b^4*c^4 - 8*a*b^2*c^5 + 16*a^2*c^6)*d - 5
*(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)*e)*f^2)*x^4 + 24*(a^2*b^4
*c^2 - 8*a^3*b^2*c^3 + 16*a^4*c^4)*e^2*f + 5*(7*a^2*b^6 - 60*a^3*
b^4*c + 144*a^4*b^2*c^2 - 64*a^5*c^3)*f^3 + 2*(24*(b^5*c^3 - 8*a*
b^3*c^4 + 16*a^2*b*c^5)*e^2*f + 5*(7*b^7*c - 60*a*b^5*c^2 + 144*a
^2*b^3*c^3 - 64*a^3*b*c^4)*f^3 + 12*(2*(b^5*c^3 - 8*a*b^3*c^4 + 1
6*a^2*b*c^5)*d - 5*(b^6*c^2 - 8*a*b^4*c^3 + 16*a^2*b^2*c^4)*e)*f^
2)*x^3 + 12*(2*(a^2*b^4*c^2 - 8*a^3*b^2*c^3 + 16*a^4*c^4)*d - 5*(
a^2*b^5*c - 8*a^3*b^3*c^2 + 16*a^4*b*c^3)*e)*f^2 + (24*(b^6*c^2 -
 6*a*b^4*c^3 + 32*a^3*c^5)*e^2*f + 5*(7*b^8 - 46*a*b^6*c + 24*a^2
*b^4*c^2 + 224*a^3*b^2*c^3 - 128*a^4*c^4)*f^3 + 12*(2*(b^6*c^2 -
6*a*b^4*c^3 + 32*a^3*c^5)*d - 5*(b^7*c - 6*a*b^5*c^2 + 32*a^3*b*c
^4)*e)*f^2)*x^2 + 2*(24*(a*b^5*c^2 - 8*a^2*b^3*c^3 + 16*a^3*b*c^4
)*e^2*f + 5*(7*a*b^7 - 60*a^2*b^5*c + 144*a^3*b^3*c^2 - 64*a^4*b*
c^3)*f^3 + 12*(2*(a*b^5*c^2 - 8*a^2*b^3*c^3 + 16*a^3*b*c^4)*d - 5
*(a*b^6*c - 8*a^2*b^4*c^2 + 16*a^3*b^2*c^3)*e)*f^2)*x)*arctan(1/2
*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c)))/((a^2*b^4*c^4 -
 8*a^3*b^2*c^5 + 16*a^4*c^6 + (b^4*c^6 - 8*a*b^2*c^7 + 16*a^2*c^8
)*x^4 + 2*(b^5*c^5 - 8*a*b^3*c^6 + 16*a^2*b*c^7)*x^3 + (b^6*c^4 -
 6*a*b^4*c^5 + 32*a^3*c^7)*x^2 + 2*(a*b^5*c^4 - 8*a^2*b^3*c^5 + 1
6*a^3*b*c^6)*x)*sqrt(-c))]
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x**2+e*x+d)**3/(c*x**2+b*x+a)**(5/2),x)

[Out] Timed out
```

GIAC/XCAS [A] time = 0.287527, size = 1, normalized size = 0.

Done

Verification of antiderivative is not currently implemented for this CAS.

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

[Out] Done
```

3.119 $\int \frac{\left(d+ex+fx^2\right)^2}{\left(a+bx+cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=444

$$\frac{2\left(-x\left(c^2\left(2a^2f^2+6abef+b^2\left(2df+e^2\right)\right)-2b^2cf(2af+be)-2c^3\left(a\left(2df+e^2\right)+bde\right)+b^4f^2+2c^4d^2\right)-bc\left(-3a^2f^2+\cdots\right.\right.}{3c^3\left(b^2-4ac\right)\left(a+bx+cx^2\right)^{3/2}}-\frac{2\left(-2cx\left(-c^2\left(16a^2f^2+12abef+b^2\left(-\left(2df+e^2\right)\right)\right)\right)+b^2cf(14af+be)-c^3\left(8bde-4a\left(2df+e^2\right)\right)-2b^4f^2+8c^4d^2\right)-\cdots}{3c^3\left(b^2-4ac\cdots\right.}+\frac{f^2\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{5/2}}$$

```
[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*
d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b
^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a
*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x))/(3*c^3*(b^2 - 4*a*c)
*(a + b*x + c*x^2)^(3/2)) - (2*(2*b^4*c*e*f + 48*a^2*c^3*e*f - b^
5*f^2 + 4*b^2*c^2*e*(2*c*d - 3*a*f) + b^3*c*(10*a*f^2 - c*(e^2 +
2*d*f)) - 4*b*c^2*(2*c^2*d^2 + 8*a^2*f^2 + a*c*(e^2 + 2*d*f)) - 2
*c*(8*c^4*d^2 - 2*b^4*f^2 + b^2*c*f*(b*e + 14*a*f) - c^3*(8*b*d*e
 - 4*a*(e^2 + 2*d*f)) - c^2*(12*a*b*e*f + 16*a^2*f^2 - b^2*(e^2 +
 2*d*f)))*x))/(3*c^3*(b^2 - 4*a*c)^2*Sqrt[a + b*x + c*x^2]) + (f^
2*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/c^(5/2)
```

Rubi [A] time = 0.988045, antiderivative size = 444, 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

$$\frac{2\left(-x\left(c^2\left(2a^2f^2+6abef+b^2\left(2df+e^2\right)\right)-2b^2cf(2af+be)-2c^3\left(a\left(2df+e^2\right)+bde\right)+b^4f^2+2c^4d^2\right)-bc\left(-3a^2f^2+\cdots\right.\right.}{3c^3\left(b^2-4ac\right)\left(a+bx+cx^2\right)^{3/2}}-\frac{2\left(-2cx\left(-c^2\left(16a^2f^2+12abef+b^2\left(-\left(2df+e^2\right)\right)\right)\right)+b^2cf(14af+be)-c^3\left(8bde-4a\left(2df+e^2\right)\right)-2b^4f^2+8c^4d^2\right)-\cdots}{3c^3\left(b^2-4ac\cdots\right.}+\frac{f^2\tanh^{-1}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d + e*x + f*x^2)^2/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (2*(2*a*b^2*c*e*f - a*b^3*f^2 + 4*a*c^2*e*(c*d - a*f) - b*c*(c^2*
d^2 - 3*a^2*f^2 + a*c*(e^2 + 2*d*f)) - (2*c^4*d^2 + b^4*f^2 - 2*b
^2*c*f*(b*e + 2*a*f) - 2*c^3*(b*d*e + a*(e^2 + 2*d*f)) + c^2*(6*a
*b*e*f + 2*a^2*f^2 + b^2*(e^2 + 2*d*f)))*x))/(3*c^3*(b^2 - 4*a*c)
*(a + b*x + c*x^2)^(3/2)) - (2*(2*b^4*c*e*f + 48*a^2*c^3*e*f - b^
5*f^2 + 4*b^2*c^2*e*(2*c*d - 3*a*f) + b^3*c*(10*a*f^2 - c*(e^2 +
2*d*f)) - 4*b*c^2*(2*c^2*d^2 + 8*a^2*f^2 + a*c*(e^2 + 2*d*f)) - 2
*c*(8*c^4*d^2 - 2*b^4*f^2 + b^2*c*f*(b*e + 14*a*f) - c^3*(8*b*d*e
 - 4*a*(e^2 + 2*d*f)) - c^2*(12*a*b*e*f + 16*a^2*f^2 - b^2*(e^2 +
 2*d*f)))*x))/(3*c^3*(b^2 - 4*a*c)^2*Sqrt[a + b*x + c*x^2]) + (f^
2*ArcTanh[(b + 2*c*x)/(2*Sqrt[c]*Sqrt[a + b*x + c*x^2])])/c^(5/2)
```

Rubi in Sympy [A] time = 151.808, size = 282, normalized size = 0.64

$$-\frac{2(b+2cx)\left(d+ex+fx^2\right)^2}{3\left(-4ac+b^2\right)\left(a+bx+cx^2\right)^{\frac{3}{2}}}-\frac{4\left(2be+4bfx-4cd+4cfx^2\right)\left(abf-2ace+bcd+x\left(-2acf+b^2f-bce+2c^2d\right)\right)}{3c\left(-4ac+b^2\right)^2\sqrt{a+bx+cx^2}}-\frac{2f\sqrt{a+bx+cx^2}\left(-20abcf+32ac^2e+3b^3f-4b^2ce-8bc^2d-2cx\left(-12acf+5b^2f-4bce+8c^2d\right)\right)}{3c^2\left(-4ac+b^2\right)^2}+\frac{f^2\operatorname{atanh}\left(\frac{b+2cx}{2\sqrt{c}\sqrt{a+bx+cx^2}}\right)}{c^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] -2*(b + 2*c*x)*(d + e*x + f*x**2)**2/(3*(-4*a*c + b**2)*(a + b*x
+ c*x**2)**(3/2)) - 4*(2*b*e + 4*b*f*x - 4*c*d + 4*c*f*x**2)*(a*b
*f - 2*a*c*e + b*c*d + x*(-2*a*c*f + b**2*f - b*c*e + 2*c**2*d))/
(3*c*(-4*a*c + b**2)**2*sqrt(a + b*x + c*x**2)) - 2*f*sqrt(a + b*
x + c*x**2)*(-20*a*b*c*f + 32*a*c**2*e + 3*b**3*f - 4*b**2*c*e -
8*b*c**2*d - 2*c*x*(-12*a*c*f + 5*b**2*f - 4*b*c*e + 8*c**2*d))/(
3*c**2*(-4*a*c + b**2)**2) + f**2*atanh((b + 2*c*x)/(2*sqrt(c)*sq
rt(a + b*x + c*x**2)))/c**(5/2)
```

Mathematica [A] time = 1.91218, size = 387, normalized size = 0.87

$$\frac{2\left(b^3\left(-3a^2f^2+18acf^2x^2+c^2\left(-d^2+6dx(fx-e)+ex^2(3e+2fx)\right)\right)+2b^2c\left(21a^2f^2x-2ac\left(d(e-6fx)+x\left(-3e^2+3ef\right.\right.\right.\right.}{}$$

$$+\frac{f^2\log\left(2\sqrt{c}\sqrt{a+x(b+cx)}+b+2cx\right)}{c^{5/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d + e*x + f*x^2)^2/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (2*(-3*b^5*f^2*x^2 - 2*b^4*f^2*x*(3*a + 2*c*x^2) + 4*b*c*(5*a^3*f
^2 + 2*c^3*d*x^2*(3*d - 2*e*x) + 2*a^2*c*(e^2 + 2*d*f - 6*e*f*x)
+ 3*a*c^2*(d - e*x)*(d + x*(-e + 2*f*x))) + b^3*(-3*a^2*f^2 + 18*
a*c*f^2*x^2 + c^2*(-d^2 + 6*d*x*(-e + f*x) + e*x^2*(3*e + 2*f*x))
) + 8*c^2*(2*c^3*d^2*x^3 - a^3*f*(4*e + 3*f*x) + a*c^2*x*(3*d^2 +
 e^2*x^2 + 2*d*f*x^2) - 2*a^2*c*(d*e + f*x^2*(3*e + 2*f*x))) + 2*
b^2*c*(21*a^2*f^2*x + c^2*x*(3*d^2 + e^2*x^2 + 2*d*x*(-6*e + f*x)
) - 2*a*c*(d*(e - 6*f*x) + x*(-3*e^2 + 3*e*f*x - 7*f^2*x^2)))))/(
3*c^2*(b^2 - 4*a*c)^2*(a + x*(b + c*x))^(3/2)) + (f^2*Log[b + 2*c
*x + 2*Sqrt[c]*Sqrt[a + x*(b + c*x)]])/c^(5/2)
```

Maple [B] time = 0.02, size = 1786, normalized size = 4.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x^2+e*x+d)^2/(c*x^2+b*x+a)^(5/2),x)
```

```
[Out] 4/3*d^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*c*x+32/3*d^2*c^2/(4*a*c-b
^2)^2/(c*x^2+b*x+a)^(1/2)*x-2*e*f*b/c*a/(4*a*c-b^2)/(c*x^2+b*x+a)
```

```
^(3/2)*x+1/2*f^2*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x-32/3
*d*e*b*c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x+4*f^2*b^2/c*a/(4*a*c
-b^2)^2/(c*x^2+b*x+a)^(1/2)*x+1/6*e*f*b^3/c^2/(4*a*c-b^2)/(c*x^2+
b*x+a)^(3/2)*x+4/3*e*f*b^3/c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x-
e*f*b^2/c^2*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)-16*e*f*b*a/(4*a*c-b
^2)^2/(c*x^2+b*x+a)^(1/2)*x-8*e*f*b^2/c*a/(4*a*c-b^2)^2/(c*x^2+b*
x+a)^(1/2)+1/3*b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*d*f+2/3/c*
a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*b*d*f+32/3*c*a/(4*a*c-b^2)^2/(c
*x^2+b*x+a)^(1/2)*x*d*f+1/4*f^2*b^3/c^3*a/(4*a*c-b^2)/(c*x^2+b*x+
a)^(3/2)+2*f^2*b^3/c^2*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)-1/3*f^
2*b^4/c^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x+1/6*b^3/c^2/(4*a*c-
b^2)/(c*x^2+b*x+a)^(3/2)*d*f+8/3*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^
(1/2)*x*d*f+f^2/c^2*b^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)*x-1/24*f^
2*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x+16/3*a/(4*a*c-b^2)^2/
(c*x^2+b*x+a)^(1/2)*b*d*f+1/6*b^2/c/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/
2)*x*e^2+4/3*b^3/c/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*d*f+4/3*a/(4
*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x*d*f+1/3/c*a/(4*a*c-b^2)/(c*x^2+b*
x+a)^(3/2)*b*e^2+16/3*c*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*e^2
-4/3*d*e*b/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*x-2/3*d*e*b^2/c/(4*a*c
-b^2)/(c*x^2+b*x+a)^(3/2)+1/12*e*f*b^4/c^3/(4*a*c-b^2)/(c*x^2+b*x
+a)^(3/2)+2/3*e*f*b^4/c^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)-1/2*e
*f*b/c^2*x/(c*x^2+b*x+a)^(3/2)+2/3*d^2/(4*a*c-b^2)/(c*x^2+b*x+a)^
(3/2)*b-1/3*f^2*x^3/c/(c*x^2+b*x+a)^(3/2)-1/48*f^2*b^3/c^4/(c*x^2
+b*x+a)^(3/2)-f^2/c^2*x/(c*x^2+b*x+a)^(1/2)+1/2*f^2/c^3*b/(c*x^2+
b*x+a)^(1/2)-2/3*d*e/c/(c*x^2+b*x+a)^(3/2)-1/2*x/c/(c*x^2+b*x+a)^
(3/2)*e^2+1/12*b/c^2/(c*x^2+b*x+a)^(3/2)*e^2+1/6*b/c^2/(c*x^2+b*x
+a)^(3/2)*d*f+1/12*b^3/c^2/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)*e^2+4/
3*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*x*e^2+2/3*b^3/c/(4*a*c-b^
2)^2/(c*x^2+b*x+a)^(1/2)*e^2+2/3*a/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2
)*x*e^2+8/3*a/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)*b*e^2-4/3*e*f/c^2
*a/(c*x^2+b*x+a)^(3/2)-16/3*d*e*b^2/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(
1/2)-x/c/(c*x^2+b*x+a)^(3/2)*d*f+1/8*f^2*b^2/c^3*x/(c*x^2+b*x+a)^
(3/2)-1/48*f^2*b^5/c^4/(4*a*c-b^2)/(c*x^2+b*x+a)^(3/2)-1/6*f^2*b^
5/c^3/(4*a*c-b^2)^2/(c*x^2+b*x+a)^(1/2)+1/3*f^2*b/c^3*a/(c*x^2+b*
x+a)^(3/2)+1/2*f^2/c^3*b^3/(4*a*c-b^2)/(c*x^2+b*x+a)^(1/2)-2*e*f*
x^2/c/(c*x^2+b*x+a)^(3/2)+1/12*e*f*b^2/c^3/(c*x^2+b*x+a)^(3/2)+1/
2*f^2*b/c^2*x^2/(c*x^2+b*x+a)^(3/2)+16/3*d^2*c/(4*a*c-b^2)^2/(c*x
^2+b*x+a)^(1/2)*b+f^2/c^(5/2)*ln((1/2*b+c*x)/c^(1/2)+(c*x^2+b*x+a
)^(1/2))
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x^2 + e*x + d)^2/(c*x^2 + b*x + a)^(5/2),x, algorithm="maxima")

[Out] Exception raised: ValueError
```

Fricas [A] time = 0.835388, size = 1, normalized size = 0.

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x^2 + e*x + d)^2/(c*x^2 + b*x + a)^(5/2),x, algorithm="fricas")

[Out] [1/6*(4*(8*a^2*b*c^2*e^2 + 2*(8*c^5*d^2 - 8*b*c^4*d*e + (b^2*c^3
+ 4*a*c^4)*e^2 - 2*(b^4*c - 7*a*b^2*c^2 + 8*a^2*c^3)*f^2 + (2*(b^
2*c^3 + 4*a*c^4)*d + (b^3*c^2 - 12*a*b*c^3)*e)*f)*x^3 - (b^3*c^2
- 12*a*b*c^3)*d^2 - 4*(a*b^2*c^2 + 4*a^2*c^3)*d*e - (3*a^2*b^3 -
20*a^3*b*c)*f^2 + 3*(8*b*c^4*d^2 - 8*b^2*c^3*d*e + (b^3*c^2 + 4*a
```

```
*b*c^3)*e^2 - (b^5 - 6*a*b^3*c)*f^2 + 2*((b^3*c^2 + 4*a*b*c^3)*d
- 2*(a*b^2*c^2 + 4*a^2*c^3)*e)*f)*x^2 + 16*(a^2*b*c^2*d - 2*a^3*c
^2*e)*f + 6*(2*a*b^2*c^2*e^2 + (b^2*c^3 + 4*a*c^4)*d^2 - (b^3*c^2
 + 4*a*b*c^3)*d*e - (a*b^4 - 7*a^2*b^2*c + 4*a^3*c^2)*f^2 + 4*(a*
b^2*c^2*d - 2*a^2*b*c^2*e)*f)*x)*sqrt(c*x^2 + b*x + a)*sqrt(c) +
3*((b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4)*f^2*x^4 + 2*(b^5*c - 8*a*
b^3*c^2 + 16*a^2*b*c^3)*f^2*x^3 + (b^6 - 6*a*b^4*c + 32*a^3*c^3)*
f^2*x^2 + 2*(a*b^5 - 8*a^2*b^3*c + 16*a^3*b*c^2)*f^2*x + (a^2*b^4
 - 8*a^3*b^2*c + 16*a^4*c^2)*f^2)*log(-4*(2*c^2*x + b*c)*sqrt(c*x
^2 + b*x + a) - (8*c^2*x^2 + 8*b*c*x + b^2 + 4*a*c)*sqrt(c)))/((a
^2*b^4*c^2 - 8*a^3*b^2*c^3 + 16*a^4*c^4 + (b^4*c^4 - 8*a*b^2*c^5
+ 16*a^2*c^6)*x^4 + 2*(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)*x^3
+ (b^6*c^2 - 6*a*b^4*c^3 + 32*a^3*c^5)*x^2 + 2*(a*b^5*c^2 - 8*a^2
*b^3*c^3 + 16*a^3*b*c^4)*x)*sqrt(c)), 1/3*(2*(8*a^2*b*c^2*e^2 + 2
*(8*c^5*d^2 - 8*b*c^4*d*e + (b^2*c^3 + 4*a*c^4)*e^2 - 2*(b^4*c -
7*a*b^2*c^2 + 8*a^2*c^3)*f^2 + (2*(b^2*c^3 + 4*a*c^4)*d + (b^3*c^
2 - 12*a*b*c^3)*e)*f)*x^3 - (b^3*c^2 - 12*a*b*c^3)*d^2 - 4*(a*b^2
*c^2 + 4*a^2*c^3)*d*e - (3*a^2*b^3 - 20*a^3*b*c)*f^2 + 3*(8*b*c^4
*d^2 - 8*b^2*c^3*d*e + (b^3*c^2 + 4*a*b*c^3)*e^2 - (b^5 - 6*a*b^3
*c)*f^2 + 2*((b^3*c^2 + 4*a*b*c^3)*d - 2*(a*b^2*c^2 + 4*a^2*c^3)*
e)*f)*x^2 + 16*(a^2*b*c^2*d - 2*a^3*c^2*e)*f + 6*(2*a*b^2*c^2*e^2
 + (b^2*c^3 + 4*a*c^4)*d^2 - (b^3*c^2 + 4*a*b*c^3)*d*e - (a*b^4 -
 7*a^2*b^2*c + 4*a^3*c^2)*f^2 + 4*(a*b^2*c^2*d - 2*a^2*b*c^2*e)*f
)*x)*sqrt(c*x^2 + b*x + a)*sqrt(-c) + 3*((b^4*c^2 - 8*a*b^2*c^3 +
 16*a^2*c^4)*f^2*x^4 + 2*(b^5*c - 8*a*b^3*c^2 + 16*a^2*b*c^3)*f^2
*x^3 + (b^6 - 6*a*b^4*c + 32*a^3*c^3)*f^2*x^2 + 2*(a*b^5 - 8*a^2*
b^3*c + 16*a^3*b*c^2)*f^2*x + (a^2*b^4 - 8*a^3*b^2*c + 16*a^4*c^2
)*f^2)*arctan(1/2*(2*c*x + b)*sqrt(-c)/(sqrt(c*x^2 + b*x + a)*c))
)/((a^2*b^4*c^2 - 8*a^3*b^2*c^3 + 16*a^4*c^4 + (b^4*c^4 - 8*a*b^2
*c^5 + 16*a^2*c^6)*x^4 + 2*(b^5*c^3 - 8*a*b^3*c^4 + 16*a^2*b*c^5)
*x^3 + (b^6*c^2 - 6*a*b^4*c^3 + 32*a^3*c^5)*x^2 + 2*(a*b^5*c^2 -
8*a^2*b^3*c^3 + 16*a^3*b*c^4)*x)*sqrt(-c))]
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x**2+e*x+d)**2/(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.29001, size = 792, normalized size = 1.78

$$-\frac{f^2\ln\left(\left|-2\left(\sqrt{c}x-\sqrt{cx^2+bx+a}\right)\sqrt{c}-b\right|\right)}{c^{\frac{5}{2}}}+\frac{2\left(\left(\left(\frac{2\left(8c^5d^2+2b^2c^3df+8ac^4df-2b^4cf^2+14ab^2c^2f^2-16a^2c^3f^2-8bc^4de+b^3c^2fe-12abc^3fe+b^2c^3e^2+4ac^4e^2\right)x}{b^4c^2-8ab^2c^3+16a^2c^4}+\frac{3\left(8bc^4d^2+2b^3c^2df+8abc^3df-b^5\right.}{}\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x^2 + e*x + d)^2/(c*x^2 + b*x + a)^(5/2),x, algorithm="giac")
```

```
[Out] -f^2*ln(abs(-2*(sqrt(c)*x - sqrt(c*x^2 + b*x + a))*sqrt(c) - b))/
c^(5/2) + 2/3*(((2*(8*c^5*d^2 + 2*b^2*c^3*d*f + 8*a*c^4*d*f - 2*b
^4*c*f^2 + 14*a*b^2*c^2*f^2 - 16*a^2*c^3*f^2 - 8*b*c^4*d*e + b^3*
c^2*f*e - 12*a*b*c^3*f*e + b^2*c^3*e^2 + 4*a*c^4*e^2)*x/(b^4*c^2
- 8*a*b^2*c^3 + 16*a^2*c^4) + 3*(8*b*c^4*d^2 + 2*b^3*c^2*d*f + 8*
a*b*c^3*d*f - b^5*f^2 + 6*a*b^3*c*f^2 - 8*b^2*c^3*d*e - 4*a*b^2*c
```

```
^2*f*e - 16*a^2*c^3*f*e + b^3*c^2*e^2 + 4*a*b*c^3*e^2)/(b^4*c^2 -
 8*a*b^2*c^3 + 16*a^2*c^4))*x + 6*(b^2*c^3*d^2 + 4*a*c^4*d^2 + 4*
a*b^2*c^2*d*f - a*b^4*f^2 + 7*a^2*b^2*c*f^2 - 4*a^3*c^2*f^2 - b^3
*c^2*d*e - 4*a*b*c^3*d*e - 8*a^2*b*c^2*f*e + 2*a*b^2*c^2*e^2)/(b^
4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4))*x - (b^3*c^2*d^2 - 12*a*b*c^3*
d^2 - 16*a^2*b*c^2*d*f + 3*a^2*b^3*f^2 - 20*a^3*b*c*f^2 + 4*a*b^2
*c^2*d*e + 16*a^2*c^3*d*e + 32*a^3*c^2*f*e - 8*a^2*b*c^2*e^2)/(b^
4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4))/(c*x^2 + b*x + a)^(3/2)
```

3.120 $\int \frac{d+ex+fx^2}{(a+bx+cx^2)^{5/2}}\,dx$

Optimal. Leaf size=131

$$\frac{2\left(c\left(2ae-b\left(\frac{af}{c}+d\right)\right)-x\left(-2acf+b^2f-bce+2c^2d\right)\right)}{3c\left(b^2-4ac\right)\left(a+bx+cx^2\right)^{3/2}}+\frac{2(b+2cx)\left(4af+\frac{b^2f}{c}-4be+8cd\right)}{3\left(b^2-4ac\right)^2\sqrt{a+bx+cx^2}}$$

```
[Out] (2*(c*(2*a*e - b*(d + (a*f)/c)) - (2*c^2*d - b*c*e + b^2*f - 2*a*
c*f)*x))/(3*c*(b^2 - 4*a*c)*(a + b*x + c*x^2)^(3/2)) + (2*(8*c*d
- 4*b*e + 4*a*f + (b^2*f)/c)*(b + 2*c*x))/(3*(b^2 - 4*a*c)^2*Sqrt
[a + b*x + c*x^2])
```

Rubi [A] time = 0.18387, antiderivative size = 131, 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

$$\frac{2\left(-x\left(-2acf+b^2f-bce+2c^2d\right)-b(af+cd)+2ace\right)}{3c\left(b^2-4ac\right)\left(a+bx+cx^2\right)^{3/2}}+\frac{2(b+2cx)\left(4af+\frac{b^2f}{c}-4be+8cd\right)}{3\left(b^2-4ac\right)^2\sqrt{a+bx+cx^2}}$$

Antiderivative was successfully verified.

```
[In]  Int[(d + e*x + f*x^2)/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (2*(2*a*c*e - b*(c*d + a*f) - (2*c^2*d - b*c*e + b^2*f - 2*a*c*f)
*x))/(3*c*(b^2 - 4*a*c)*(a + b*x + c*x^2)^(3/2)) + (2*(8*c*d - 4*
b*e + 4*a*f + (b^2*f)/c)*(b + 2*c*x))/(3*(b^2 - 4*a*c)^2*Sqrt[a +
 b*x + c*x^2])
```

Rubi in Sympy [A] time = 20.9142, size = 131, normalized size = 1.

$$-\frac{(2b+4cx)\left(4c\left(be-2cd\right)-f\left(4ac+b^2\right)\right)}{3c\left(-4ac+b^2\right)^2\sqrt{a+bx+cx^2}}-\frac{2\left(abf-2ace+bcd+x\left(-2acf+b^2f-bce+2c^2d\right)\right)}{3c\left(-4ac+b^2\right)\left(a+bx+cx^2\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] -(2*b + 4*c*x)*(4*c*(b*e - 2*c*d) - f*(4*a*c + b**2))/(3*c*(-4*a*
c + b**2)**2*sqrt(a + b*x + c*x**2)) - 2*(a*b*f - 2*a*c*e + b*c*d
 + x*(-2*a*c*f + b**2*f - b*c*e + 2*c**2*d))/(3*c*(-4*a*c + b**2)
*(a + b*x + c*x**2)**(3/2))
```

Mathematica [A] time = 0.253904, size = 147, normalized size = 1.12

$$\frac{8b\left(2a^2f+3ac\left(d-ex+fx^2\right)-2c^2x^2(ex-3d)\right)+16c\left(-a^2e+acx\left(3d+fx^2\right)+2c^2dx^3\right)-4b^2\left(a(e-6fx)-cx\left(3d-6e\right.\right.}{3\left(b^2-4ac\right)^2\left(a+x(b+cx)\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In]  Integrate[(d + e*x + f*x^2)/(a + b*x + c*x^2)^(5/2),x]
```

```
[Out] (-2*b^3*(d + 3*x*(e - f*x)) + 16*c*(-(a^2*e) + 2*c^2*d*x^3 + a*c*
x*(3*d + f*x^2)) - 4*b^2*(a*(e - 6*f*x) - c*x*(3*d - 6*e*x + f*x^
```

```
2)) + 8*b*(2*a^2*f - 2*c^2*x^2*(-3*d + e*x) + 3*a*c*(d - e*x + f*
x^2)))/(3*(b^2 - 4*a*c)^2*(a + x*(b + c*x))^(3/2))
```

Maple [A] time = 0.009, size = 185, normalized size = 1.4

$$\frac{16\,ac^2fx^3+4\,b^2cfx^3-16\,bc^2ex^3+32\,c^3dx^3+24\,abcfx^2+6\,b^3fx^2-24\,b^2cex^2+48\,bc^2dx^2+24\,ab^2fx-24\,abcex+48\,a\cdots}{48\,a^2c^2-24\,ab^2c+3\,b^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int((f*x^2+e*x+d)/(c*x^2+b*x+a)^(5/2),x)
```

```
[Out] 2/3/(c*x^2+b*x+a)^(3/2)*(8*a*c^2*f*x^3+2*b^2*c*f*x^3-8*b*c^2*e*x^
3+16*c^3*d*x^3+12*a*b*c*f*x^2+3*b^3*f*x^2-12*b^2*c*e*x^2+24*b*c^2
*d*x^2+12*a*b^2*f*x-12*a*b*c*e*x+24*a*c^2*d*x-3*b^3*e*x+6*b^2*c*d
*x+8*a^2*b*f-8*a^2*c*e-2*a*b^2*e+12*a*b*c*d-b^3*d)/(16*a^2*c^2-8*
a*b^2*c+b^4)
```

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

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x^2 + e*x + d)/(c*x^2 + b*x + a)^(5/2),x, algorithm="maxima")
```

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

Fricas [A] time = 0.662674, size = 386, normalized size = 2.95

$$\frac{2\left(8\,a^2bf+2\left(8\,c^3d-4\,bc^2e+\left(b^2c+4\,ac^2\right)f\right)x^3+3\left(8\,bc^2d-4\,b^2ce+\left(b^3+4\,abc\right)f\right)x^2-\left(b^3-12\,abc\right)d-2\left(ab^2+4\,a^2c\cdots\right.\right.}{3\left(a^2b^4-8\,a^3b^2c+16\,a^4c^2+\left(b^4c^2-8\,ab^2c^3+16\,a^2c^4\right)x^4+2\left(b^5c-8\,ab^3c^2+16\,a^2bc^3\right)x^3+\left(b^6-6\,ab^4\cdots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x^2 + e*x + d)/(c*x^2 + b*x + a)^(5/2),x, algorithm="fricas")
```

```
[Out] 2/3*(8*a^2*b*f + 2*(8*c^3*d - 4*b*c^2*e + (b^2*c + 4*a*c^2)*f)*x^
3 + 3*(8*b*c^2*d - 4*b^2*c*e + (b^3 + 4*a*b*c)*f)*x^2 - (b^3 - 12
*a*b*c)*d - 2*(a*b^2 + 4*a^2*c)*e + 3*(4*a*b^2*f + 2*(b^2*c + 4*a
*c^2)*d - (b^3 + 4*a*b*c)*e)*x)*sqrt(c*x^2 + b*x + a)/(a^2*b^4 -
8*a^3*b^2*c + 16*a^4*c^2 + (b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4)*x
^4 + 2*(b^5*c - 8*a*b^3*c^2 + 16*a^2*b*c^3)*x^3 + (b^6 - 6*a*b^4*
c + 32*a^3*c^3)*x^2 + 2*(a*b^5 - 8*a^2*b^3*c + 16*a^3*b*c^2)*x)
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x**2+e*x+d)/(c*x**2+b*x+a)**(5/2),x)
```

```
[Out] Timed out
```

GIAC/XCAS [A] time = 0.2771, size = 356, normalized size = 2.72

$$\frac{\left(\left(\frac{2\,(8\,c^3d+b^2cf+4\,ac^2f-4\,bc^2e)\,x}{b^4c^2-8\,ab^2c^3+16\,a^2c^4}+\frac{3\,(8\,bc^2d+b^3f+4\,abcf-4\,b^2ce)}{b^4c^2-8\,ab^2c^3+16\,a^2c^4}\right)x+\frac{3\,(2\,b^2cd+8\,ac^2d+4\,ab^2f-b^3e-4\,abce)}{b^4c^2-8\,ab^2c^3+16\,a^2c^4}\right)x-\frac{b^3d-12\,abcd-8\,a^2bf+2\,ab^2e+}{b^4c^2-8\,ab^2c^3+16\,a^2c^4}}{3\,(cx^2+bx+a)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate((f*x^2 + e*x + d)/(c*x^2 + b*x + a)^(5/2),x, algorithm="giac")
```

```
[Out] 1/3*(((2*(8*c^3*d + b^2*c*f + 4*a*c^2*f - 4*b*c^2*e)*x/(b^4*c^2 -
 8*a*b^2*c^3 + 16*a^2*c^4) + 3*(8*b*c^2*d + b^3*f + 4*a*b*c*f - 4
*b^2*c*e)/(b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4))*x + 3*(2*b^2*c*d
+ 8*a*c^2*d + 4*a*b^2*f - b^3*e - 4*a*b*c*e)/(b^4*c^2 - 8*a*b^2*c
^3 + 16*a^2*c^4))*x - (b^3*d - 12*a*b*c*d - 8*a^2*b*f + 2*a*b^2*e
 + 8*a^2*c*e)/(b^4*c^2 - 8*a*b^2*c^3 + 16*a^2*c^4))/(c*x^2 + b*x
+ a)^(3/2)
```

3.121 $\int \frac{1}{\sqrt{-7+2x+5x^2}(8+12x+5x^2)}\,dx$

Optimal. Leaf size=51

$$\frac{1}{10}\tan^{-1}\left(\frac{5(x+2)}{2\sqrt{5x^2+2x-7}}\right)+\frac{1}{5}\tanh^{-1}\left(\frac{5(x+1)}{\sqrt{5x^2+2x-7}}\right)$$

```
[Out] ArcTan[(5*(2 + x))/(2*Sqrt[-7 + 2*x + 5*x^2])]/10 + ArcTanh[(5*(1
 + x))/Sqrt[-7 + 2*x + 5*x^2]]/5
```

Rubi [A] time = 0.16469, antiderivative size = 51, 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

$$\frac{1}{10}\tan^{-1}\left(\frac{5(x+2)}{2\sqrt{5x^2+2x-7}}\right)+\frac{1}{5}\tanh^{-1}\left(\frac{5(x+1)}{\sqrt{5x^2+2x-7}}\right)$$

Antiderivative was successfully verified.

```
[In]  Int[1/(Sqrt[-7 + 2*x + 5*x^2]*(8 + 12*x + 5*x^2)),x]
```

```
[Out] ArcTan[(5*(2 + x))/(2*Sqrt[-7 + 2*x + 5*x^2])]/10 + ArcTanh[(5*(1
 + x))/Sqrt[-7 + 2*x + 5*x^2]]/5
```

Rubi in Sympy [A] time = 50.3907, size = 48, normalized size = 0.94

$$\frac{\operatorname{atan}\left(\frac{100x+200}{40\sqrt{5x^2+2x-7}}\right)}{10}-\frac{\operatorname{atanh}\left(\frac{-400x-400}{80\sqrt{5x^2+2x-7}}\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(5*x**2+12*x+8)/(5*x**2+2*x-7)**(1/2),x)
```

```
[Out] atan((100*x + 200)/(40*sqrt(5*x**2 + 2*x - 7)))/10 - atanh((-400*
x - 400)/(80*sqrt(5*x**2 + 2*x - 7)))/5
```

Mathematica [C] time = 0.0507797, size = 193, normalized size = 3.78

$$-\left(\frac{1}{20}-\frac{i}{40}\right)\log\left(15x^2-5\sqrt{5x^2+2x-7}x-5\sqrt{5x^2+2x-7}+26x+9\right)$$
$$+\left(\frac{1}{20}+\frac{i}{40}\right)\log\left(15x^2+5\sqrt{5x^2+2x-7}x+5\sqrt{5x^2+2x-7}+26x+9\right)$$
$$+\left(\frac{1}{20}+\frac{i}{10}\right)\tan^{-1}\left(\frac{5(x+2)}{2\sqrt{5x^2+2x-7}}\right)-\left(\frac{1}{20}-\frac{i}{10}\right)\tan^{-1}\left(\frac{2\sqrt{5x^2+2x-7}}{5(x+2)}\right)$$
$$-\frac{1}{20}i\log(((1+2i)x+(2+2i))((2+i)x+(2+2i)))$$

Antiderivative was successfully verified.

```
[In]  Integrate[1/(Sqrt[-7 + 2*x + 5*x^2]*(8 + 12*x + 5*x^2)),x]
```

```
[Out] (1/20 + I/10)*ArcTan[(5*(2 + x))/(2*Sqrt[-7 + 2*x + 5*x^2])] - (1
/20 - I/10)*ArcTan[(2*Sqrt[-7 + 2*x + 5*x^2])/(5*(2 + x))] - (I/2
```

```
0)*Log[((2 + 2*I) + (1 + 2*I)*x)*((2 + 2*I) + (2 + I)*x)] - (1/20
 - I/40)*Log[9 + 26*x + 15*x^2 - 5*Sqrt[-7 + 2*x + 5*x^2] - 5*x*S
qrt[-7 + 2*x + 5*x^2]] + (1/20 + I/40)*Log[9 + 26*x + 15*x^2 + 5*
Sqrt[-7 + 2*x + 5*x^2] + 5*x*Sqrt[-7 + 2*x + 5*x^2]]
```

Maple [B] time = 0.028, size = 144, normalized size = 2.8

$$-\frac{1}{10}\sqrt{-4\frac{(2+x)^2}{(-1-x)^2}+9}\left(2\,Artanh\left(1/5\sqrt{-4\frac{(2+x)^2}{(-1-x)^2}+9}\right)+\arctan\left(\frac{10+5x}{-2-2x}\sqrt{-4\frac{(2+x)^2}{(-1-x)^2}+9}\left(4\frac{(2+x)^2}{(-1-x)^2}-9\right)^{-1}\right)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(5*x^2+12*x+8)/(5*x^2+2*x-7)^(1/2),x)
```

```
[Out] -1/10*(-4*(2+x)^2/(-1-x)^2+9)^(1/2)*(2*arctanh(1/5*(-4*(2+x)^2/(-
1-x)^2+9)^(1/2))+arctan(5/2*(-4*(2+x)^2/(-1-x)^2+9)^(1/2)/(4*(2+x
)^2/(-1-x)^2-9)*(2+x)/(-1-x)))/(-(4*(2+x)^2/(-1-x)^2-9)/(1+(2+x)/
(-1-x))^2)^(1/2)/(1+(2+x)/(-1-x))
```

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

$$\int \frac{1}{(5x^2+12x+8)\sqrt{5x^2+2x-7}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)),x, algorithm="maxima")
```

```
[Out] integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)), x)
```

Fricas [A] time = 0.283099, size = 207, normalized size = 4.06

$$\frac{1}{20}\arctan\left(\frac{17x+5\sqrt{5x^2+2x-7}+25}{x+5\sqrt{5x^2+2x-7}-7}\right)-\frac{1}{20}\arctan\left(\frac{17x-5\sqrt{5x^2+2x-7}+25}{x-5\sqrt{5x^2+2x-7}-7}\right)$$
$$+\frac{1}{20}\log\left(\frac{15x^2+5\sqrt{5x^2+2x-7}(x+1)+26x+9}{x^2}\right)$$
$$-\frac{1}{20}\log\left(\frac{15x^2-5\sqrt{5x^2+2x-7}(x+1)+26x+9}{x^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)),x, algorithm="fricas")
```

```
[Out] 1/20*arctan((17*x + 5*sqrt(5*x^2 + 2*x - 7) + 25)/(x + 5*sqrt(5*x
^2 + 2*x - 7) - 7)) - 1/20*arctan((17*x - 5*sqrt(5*x^2 + 2*x - 7)
 + 25)/(x - 5*sqrt(5*x^2 + 2*x - 7) - 7)) + 1/20*log((15*x^2 + 5*
sqrt(5*x^2 + 2*x - 7)*(x + 1) + 26*x + 9)/x^2) - 1/20*log((15*x^2
 - 5*sqrt(5*x^2 + 2*x - 7)*(x + 1) + 26*x + 9)/x^2)
```

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

$$\int \frac{1}{\sqrt{(x-1)(5x+7)}\,(5x^2+12x+8)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(5*x**2+12*x+8)/(5*x**2+2*x-7)**(1/2),x)

[Out] Integral(1/(sqrt((x - 1)*(5*x + 7))*(5*x**2 + 12*x + 8)), x)
```

GIAC/XCAS [A] time = 0.28094, size = 277, normalized size = 5.43

$$-\frac{1}{10}\arctan\left(-\frac{5\sqrt{5}x+6\sqrt{5}-5\sqrt{5x^2+2x-7}+5}{2\left(\sqrt{5}+5\right)}\right)-\frac{1}{10}\arctan\left(\frac{5\sqrt{5}x+6\sqrt{5}-5\sqrt{5x^2+2x-7}-5}{2\left(\sqrt{5}-5\right)}\right)+\frac{1}{10}\ln\left(5\left(\sqrt{5}x-\sqrt{5x^2+2x-7}\right)^2+2\left(\sqrt{5}x-\sqrt{5x^2+2x-7}\right)\left(6\sqrt{5}+5\right)+20\sqrt{5}+65\right)-\frac{1}{10}\ln\left(5\left(\sqrt{5}x-\sqrt{5x^2+2x-7}\right)^2+2\left(\sqrt{5}x-\sqrt{5x^2+2x-7}\right)\left(6\sqrt{5}-5\right)-20\sqrt{5}+65\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/((5*x^2 + 12*x + 8)*sqrt(5*x^2 + 2*x - 7)),x, algorithm="giac")

[Out] -1/10*arctan(-1/2*(5*sqrt(5)*x + 6*sqrt(5) - 5*sqrt(5*x^2 + 2*x -
 7) + 5)/(sqrt(5) + 5)) - 1/10*arctan(1/2*(5*sqrt(5)*x + 6*sqrt(5
) - 5*sqrt(5*x^2 + 2*x - 7) - 5)/(sqrt(5) - 5)) + 1/10*ln(5*(sqrt
(5)*x - sqrt(5*x^2 + 2*x - 7))^2 + 2*(sqrt(5)*x - sqrt(5*x^2 + 2*
x - 7))*(6*sqrt(5) + 5) + 20*sqrt(5) + 65) - 1/10*ln(5*(sqrt(5)*x
 - sqrt(5*x^2 + 2*x - 7))^2 + 2*(sqrt(5)*x - sqrt(5*x^2 + 2*x - 7
))*(6*sqrt(5) - 5) - 20*sqrt(5) + 65)
```

3.122 $\int \frac{1}{\sqrt{a+bx+cx^2}\sqrt{d+ex+fx^2}}\,dx$

Optimal. Leaf size=1432

result too large to display

```
[Out] -(((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 -
 4*a*c]*e - 2*a*f))^(1/4)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^(3/2)*S
qrt[2*a + (b + Sqrt[b^2 - 4*a*c])*x]*Sqrt[((4*a*c - (b + Sqrt[b^2
 - 4*a*c])^2)^2*(d + e*x + f*x^2))/(((b + Sqrt[b^2 - 4*a*c])^2*d
- 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c]
 + 2*c*x)^2)]*(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt
[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sq
rt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 -
4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))*Sqrt[(1 - ((
b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b + Sqrt[b^2
 - 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d
 + Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))
 + ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sqrt[b^2 - 4*
a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 -
 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt
[b^2 - 4*a*c] + 2*c*x)^2))/(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2
*a*c*f - Sqrt[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*
a*c])*x))/(Sqrt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d
+ Sqrt[b^2 - 4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))
^2]*EllipticF[2*ArcTan[((2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt
[b^2 - 4*a*c]*(c*e - b*f))^(1/4)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c
])*x])/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[
b^2 - 4*a*c]*e - 2*a*f))^(1/4)*Sqrt[b + Sqrt[b^2 - 4*a*c] + 2*c*x
])], (2 + ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f))/(Sqrt[b
^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*
c]*e - 2*a*f)]*Sqrt[2*c^2*d + b*(b + Sqrt[b^2 - 4*a*c])*f - c*(b*
e + Sqrt[b^2 - 4*a*c]*e + 2*a*f)]))/4])/((4*a*c - (b + Sqrt[b^2 -
 4*a*c])^2)*(2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt[b^2 - 4*a*c
]*(c*e - b*f))^(1/4)*Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]*
Sqrt[1 - ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b
 + Sqrt[b^2 - 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e)
 - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c
] + 2*c*x)) + ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sq
rt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b +
 Sqrt[b^2 - 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f
)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)]))
```

Rubi [A] time = 13.0442, antiderivative size = 1432, normalized size of antiderivative = 1., number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.103

$$-\frac{\sqrt[4]{db^2+\left(\sqrt{b^2-4ac}d-ae\right)b-a\left(2cd+\sqrt{b^2-4ac}e-2af\right)}\left(b+2cx+\sqrt{b^2-4ac}\right)^{3/2}\sqrt{2a+\left(b+\sqrt{b^2-4ac}\right)x}\sqrt{\frac{\cdots}{\left(4fa^2-\cdots\right.}}\cdots}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]),x]
```

```
[Out] -(((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 -
 4*a*c]*e - 2*a*f))^(1/4)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^(3/2)*S
qrt[2*a + (b + Sqrt[b^2 - 4*a*c])*x]*Sqrt[((4*a*c - (b + Sqrt[b^2
 - 4*a*c])^2)^2*(d + e*x + f*x^2))/(((b + Sqrt[b^2 - 4*a*c])^2*d
- 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt[b^2 - 4*a*c]
```

```
 + 2*c*x)^2)]*(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt
[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*a*c])*x))/(Sq
rt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 -
4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))*Sqrt[(1 - ((
b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b + Sqrt[b^2
 - 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d
 + Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c] + 2*c*x))
 + ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sqrt[b^2 - 4*
a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b + Sqrt[b^2 -
 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f)*(b + Sqrt
[b^2 - 4*a*c] + 2*c*x)^2))/(1 + (Sqrt[2*c^2*d - b*c*e + b^2*f - 2
*a*c*f - Sqrt[b^2 - 4*a*c]*(c*e - b*f)]*(2*a + (b + Sqrt[b^2 - 4*
a*c])*x))/(Sqrt[b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d
+ Sqrt[b^2 - 4*a*c]*e - 2*a*f)]*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)))
^2]*EllipticF[2*ArcTan[((2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt
[b^2 - 4*a*c]*(c*e - b*f))^(1/4)*Sqrt[2*a + (b + Sqrt[b^2 - 4*a*c
])*x])/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[
b^2 - 4*a*c]*e - 2*a*f))^(1/4)*Sqrt[b + Sqrt[b^2 - 4*a*c] + 2*c*x
])], (2 + ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f))/(Sqrt[b
^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e) - a*(2*c*d + Sqrt[b^2 - 4*a*
c]*e - 2*a*f)]*Sqrt[2*c^2*d + b*(b + Sqrt[b^2 - 4*a*c])*f - c*(b*
e + Sqrt[b^2 - 4*a*c]*e + 2*a*f)]))/4])/((4*a*c - (b + Sqrt[b^2 -
 4*a*c])^2)*(2*c^2*d - b*c*e + b^2*f - 2*a*c*f - Sqrt[b^2 - 4*a*c
]*(c*e - b*f))^(1/4)*Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]*
Sqrt[1 - ((b + Sqrt[b^2 - 4*a*c])*(2*c*d - b*e + 2*a*f)*(2*a + (b
 + Sqrt[b^2 - 4*a*c])*x))/((b^2*d + b*(Sqrt[b^2 - 4*a*c]*d - a*e)
 - a*(2*c*d + Sqrt[b^2 - 4*a*c]*e - 2*a*f))*(b + Sqrt[b^2 - 4*a*c
] + 2*c*x)) + ((4*c^2*d - 2*c*(b + Sqrt[b^2 - 4*a*c])*e + (b + Sq
rt[b^2 - 4*a*c])^2*f)*(2*a + (b + Sqrt[b^2 - 4*a*c])*x)^2)/(((b +
 Sqrt[b^2 - 4*a*c])^2*d - 2*a*(b + Sqrt[b^2 - 4*a*c])*e + 4*a^2*f
)*(b + Sqrt[b^2 - 4*a*c] + 2*c*x)^2)]))
```

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

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] Timed out
```

Mathematica [A] time = 5.02743, size = 670, normalized size = 0.47

$$-\frac{\left(\sqrt{b^2-4ac}-b-2cx\right)\left(-\sqrt{e^2-4df}+e+2fx\right)\sqrt{-\frac{c\sqrt{b^2-4ac}\left(\sqrt{e^2-4df}+e+2fx\right)}{\left(\sqrt{b^2-4ac}-b-2cx\right)\left(f\left(\sqrt{b^2-4ac}+b\right)-c\left(\sqrt{e^2-4df}+e\right)\right)}}\sqrt{-\frac{c\left(\sqrt{b^2-4ac}\sqrt{e^2-4df}-e\left(\right.\right.}{\left(\sqrt{\right.}}}}{\sqrt{a+x(b+cx)}\sqrt{d+x(e+fx)}\left(f\left(\sqrt{b^2-4ac}-\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[a + b*x + c*x^2]*Sqrt[d + e*x + f*x^2]),x]
```

```
[Out] -(((-b + Sqrt[b^2 - 4*a*c] - 2*c*x)*(e - Sqrt[e^2 - 4*d*f] + 2*f*
x)*Sqrt[-((c*Sqrt[b^2 - 4*a*c]*(e + Sqrt[e^2 - 4*d*f] + 2*f*x))/(
((b + Sqrt[b^2 - 4*a*c])*f - c*(e + Sqrt[e^2 - 4*d*f]))*(-b + Sqr
t[b^2 - 4*a*c] - 2*c*x)))]*Sqrt[-((c*(4*a*f + Sqrt[b^2 - 4*a*c]*S
qrt[e^2 - 4*d*f] - 2*Sqrt[b^2 - 4*a*c]*f*x + 2*c*Sqrt[e^2 - 4*d*f
]*x - e*(Sqrt[b^2 - 4*a*c] + 2*c*x) + b*(-e + Sqrt[e^2 - 4*d*f] +
 2*f*x)))/(((b + Sqrt[b^2 - 4*a*c])*f + c*(-e + Sqrt[e^2 - 4*d*f]
))*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x)))]*EllipticF[ArcSin[Sqrt[(((-
```

```
b + Sqrt[b^2 - 4*a*c])*f + c*(e - Sqrt[e^2 - 4*d*f]))*(b + Sqrt[b
^2 - 4*a*c] + 2*c*x))/(((b + Sqrt[b^2 - 4*a*c])*f + c*(-e + Sqrt[
e^2 - 4*d*f]))*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x))]], (2*c*d - b*e
+ 2*a*f - Sqrt[b^2 - 4*a*c]*Sqrt[e^2 - 4*d*f])/(2*c*d - b*e + 2*a
*f + Sqrt[b^2 - 4*a*c]*Sqrt[e^2 - 4*d*f])])/(((-b + Sqrt[b^2 - 4*
a*c])*f + c*(e - Sqrt[e^2 - 4*d*f]))*Sqrt[(c*Sqrt[b^2 - 4*a*c]*(-
e + Sqrt[e^2 - 4*d*f] - 2*f*x))/(((b + Sqrt[b^2 - 4*a*c])*f + c*(
-e + Sqrt[e^2 - 4*d*f]))*(-b + Sqrt[b^2 - 4*a*c] - 2*c*x))]*Sqrt[
a + x*(b + c*x)]*Sqrt[d + x*(e + f*x)]))
```

Maple [A] time = 0.331, size = 928, normalized size = 0.7

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(c*x^2+b*x+a)^(1/2)/(f*x^2+e*x+d)^(1/2),x)
```

```
[Out] 8*(2*b*f^2*x^2-2*c*e*f*x^2+2*x^2*c*f*(-4*d*f+e^2)^(1/2)+2*(-4*a*c
+b^2)^(1/2)*f^2*x^2+2*b*e*f*x+2*x*b*f*(-4*d*f+e^2)^(1/2)-8*c*x*f*
d+2*(-4*a*c+b^2)^(1/2)*e*f*x+2*x*f*(-4*d*f+e^2)^(1/2)*(-4*a*c+b^2
)^(1/2)-2*b*d*f+b*e^2+b*e*(-4*d*f+e^2)^(1/2)-2*c*d*e-2*c*d*(-4*d*
f+e^2)^(1/2)-2*(-4*a*c+b^2)^(1/2)*d*f+(-4*a*c+b^2)^(1/2)*e^2+e*(-
4*d*f+e^2)^(1/2)*(-4*a*c+b^2)^(1/2))*EllipticF(((c*(-4*d*f+e^2)^(
1/2)-f*(-4*a*c+b^2)^(1/2)-b*f+c*e)*(-2*f*x+(-4*d*f+e^2)^(1/2)-e)/
(c*(-4*d*f+e^2)^(1/2)+f*(-4*a*c+b^2)^(1/2)+b*f-c*e)/(2*f*x+(-4*d*
f+e^2)^(1/2)+e))^(1/2),((c*(-4*d*f+e^2)^(1/2)+f*(-4*a*c+b^2)^(1/2
)-b*f+c*e)*(c*(-4*d*f+e^2)^(1/2)+f*(-4*a*c+b^2)^(1/2)+b*f-c*e)/(c
*(-4*d*f+e^2)^(1/2)-f*(-4*a*c+b^2)^(1/2)+b*f-c*e)/(c*(-4*d*f+e^2)
^(1/2)-f*(-4*a*c+b^2)^(1/2)-b*f+c*e))^(1/2))*((-4*d*f+e^2)^(1/2)*
(b+2*c*x+(-4*a*c+b^2)^(1/2))*f/(c*(-4*d*f+e^2)^(1/2)+f*(-4*a*c+b^
2)^(1/2)+b*f-c*e)/(2*f*x+(-4*d*f+e^2)^(1/2)+e))^(1/2)*(-(-4*d*f+e
^2)^(1/2)*(-2*c*x+(-4*a*c+b^2)^(1/2)-b)*f/(c*(-4*d*f+e^2)^(1/2)-f
*(-4*a*c+b^2)^(1/2)+b*f-c*e)/(2*f*x+(-4*d*f+e^2)^(1/2)+e))^(1/2)*
((c*(-4*d*f+e^2)^(1/2)-f*(-4*a*c+b^2)^(1/2)-b*f+c*e)*(-2*f*x+(-4*
d*f+e^2)^(1/2)-e)/(c*(-4*d*f+e^2)^(1/2)+f*(-4*a*c+b^2)^(1/2)+b*f-
c*e)/(2*f*x+(-4*d*f+e^2)^(1/2)+e))^(1/2)*(c*x^2+b*x+a)^(1/2)*(f*x
^2+e*x+d)^(1/2)/(1/c/f*(-2*f*x+(-4*d*f+e^2)^(1/2)-e)*(2*f*x+(-4*d
*f+e^2)^(1/2)+e)*(-2*c*x+(-4*a*c+b^2)^(1/2)-b)*(b+2*c*x+(-4*a*c+b
^2)^(1/2)))^(1/2)/(-4*d*f+e^2)^(1/2)/(-c*(-4*d*f+e^2)^(1/2)+f*(-4
*a*c+b^2)^(1/2)+b*f-c*e)/(c*f*x^4+b*f*x^3+c*e*x^3+a*f*x^2+b*e*x^2
+c*d*x^2+a*e*x+b*d*x+a*d)^(1/2)
```

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

$$\int \frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + ex + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)), x)
```

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

$$\text{integral}\left(\frac{1}{\sqrt{cx^2 + bx + a}\sqrt{fx^2 + ex + d}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)), x)
```

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

$$\int \frac{1}{\sqrt{a+bx+cx^2}\sqrt{d+ex+fx^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(c*x**2+b*x+a)**(1/2)/(f*x**2+e*x+d)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(a + b*x + c*x**2)*sqrt(d + e*x + f*x**2)), x)
```

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

$$\int \frac{1}{\sqrt{cx^2+bx+a}\sqrt{fx^2+ex+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(c*x^2 + b*x + a)*sqrt(f*x^2 + e*x + d)), x)
```

3.123 $\int \frac{1}{\sqrt{3-x+2x^2}\sqrt{2+3x+5x^2}}\,dx$

Optimal. Leaf size=710

$$\frac{\sqrt{\frac{23}{11}}\left(-4x-i\sqrt{23}+1\right)\sqrt{4x+i\sqrt{23}-1}\sqrt{6-\left(1-i\sqrt{23}\right)x}\sqrt{\frac{\left(-\sqrt{23}+11i\right)(5x^2+3x+2)}{\left(\sqrt{23}+7i\right)\left(-4x-i\sqrt{23}+1\right)^2}}\left(1-\frac{\sqrt{-\frac{-\sqrt{23}+3i}{\sqrt{23}+7i}}\left(6-\left(1-i\sqrt{23}\right)x\right)}{-4x-i\sqrt{23}+1}\right)\sqrt{-\frac{11\left(-\sqrt{23}+3i\cdots}{\left(\sqrt{23}+7i\right)\cdots}}}{\left(23+i\sqrt{23}\right)\sqrt[4]{-\frac{-\sqrt{23}+3i}{\sqrt{23}+7i}}\sqrt{2x^2-x+3}\sqrt{5x^2+3x+2}\sqrt{-\frac{11(-\cdots}{(\sqrt{\cdots}}}}$$

```
[Out] (Sqrt[23/11]*(1 - I*Sqrt[23] - 4*x)*Sqrt[-1 + I*Sqrt[23] + 4*x]*S
qrt[6 - (1 - I*Sqrt[23])*x]*Sqrt[((11*I - Sqrt[23])*(2 + 3*x + 5*
x^2))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)]*(1 - (Sqrt[-((
3*I - Sqrt[23])/(7*I + Sqrt[23]))]*(6 - (1 - I*Sqrt[23])*x))/(1 -
 I*Sqrt[23] - 4*x))*Sqrt[(11 - (41*(I + Sqrt[23])*(6 - (1 - I*Sqr
t[23])*x))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)) - (11*(3*I -
 Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((7*I + Sqrt[23])*(1 - I*S
qrt[23] - 4*x)^2))/(1 - (Sqrt[-((3*I - Sqrt[23])/(7*I + Sqrt[23])
)]*(6 - (1 - I*Sqrt[23])*x))/(1 - I*Sqrt[23] - 4*x))^2]*EllipticF
[2*ArcTan[((-((3*I - Sqrt[23])/(7*I + Sqrt[23])))^(1/4)*Sqrt[6 -
(1 - I*Sqrt[23])*x])/Sqrt[-1 + I*Sqrt[23] + 4*x]], (66*I - 22*Sqr
t[23] + 41*Sqrt[(-23*(3*I - Sqrt[23]))/(7*I + Sqrt[23])] + (41*I)
*Sqrt[-((3*I - Sqrt[23])/(7*I + Sqrt[23]))])/(44*(3*I - Sqrt[23])
)])/((23 + I*Sqrt[23])*(-((3*I - Sqrt[23])/(7*I + Sqrt[23])))^(1/
4)*Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2]*Sqrt[11 - (41*(I + S
qrt[23])*(6 - (1 - I*Sqrt[23])*x))/((7*I + Sqrt[23])*(1 - I*Sqrt[
23] - 4*x)) - (11*(3*I - Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((
7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)])
```

Rubi [A] time = 1.626, antiderivative size = 652, normalized size of antiderivative = 0.92, number of steps used = 3, number of rules used = 3, integrand size = 29, $\frac{\text{number of rules}}{\text{integrand size}} = 0.103$

$$\frac{\sqrt{\frac{23}{11}}\left(-4x-i\sqrt{23}+1\right)\sqrt{4x+i\sqrt{23}-1}\sqrt{6-\left(1-i\sqrt{23}\right)x}\sqrt{\frac{\left(-\sqrt{23}+11i\right)(5x^2+3x+2)}{\left(\sqrt{23}+7i\right)\left(-4x-i\sqrt{23}+1\right)^2}}\left(1-\frac{\sqrt{-\frac{-\sqrt{23}+3i}{\sqrt{23}+7i}}\left(6-\left(1-i\sqrt{23}\right)x\right)}{-4x-i\sqrt{23}+1}\right)\sqrt{-\frac{11\left(-\sqrt{23}+3i\cdots}{\left(\sqrt{23}+7i\right)\cdots}}}{\left(23+i\sqrt{23}\right)\sqrt[4]{-\frac{-\sqrt{23}+3i}{\sqrt{23}+7i}}\sqrt{2x^2-x+3}\sqrt{5x^2+3x+2}\sqrt{-\frac{11\left(-\sqrt{23}+3i\right)\left(\cdots\right.}{\left(\sqrt{23}+7i\right)\left(-\cdots\right.}}}$$

Warning: Unable to verify antiderivative.

```
[In]  Int[1/(Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2]),x]
```

```
[Out] (Sqrt[23/11]*(1 - I*Sqrt[23] - 4*x)*Sqrt[-1 + I*Sqrt[23] + 4*x]*S
qrt[6 - (1 - I*Sqrt[23])*x]*Sqrt[((11*I - Sqrt[23])*(2 + 3*x + 5*
x^2))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)^2)]*(1 - (Sqrt[-((
3*I - Sqrt[23])/(7*I + Sqrt[23]))]*(6 - (1 - I*Sqrt[23])*x))/(1 -
 I*Sqrt[23] - 4*x))*Sqrt[(11 - (41*(I + Sqrt[23])*(6 - (1 - I*Sqr
t[23])*x))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)) - (11*(3*I -
 Sqrt[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((7*I + Sqrt[23])*(1 - I*S
qrt[23] - 4*x)^2))/(1 - (Sqrt[-((3*I - Sqrt[23])/(7*I + Sqrt[23])
)]*(6 - (1 - I*Sqrt[23])*x))/(1 - I*Sqrt[23] - 4*x))^2]*EllipticF
[2*ArcTan[((-((3*I - Sqrt[23])/(7*I + Sqrt[23])))^(1/4)*Sqrt[6 -
(1 - I*Sqrt[23])*x])/Sqrt[-1 + I*Sqrt[23] + 4*x]], (44 - (41*(I +
 Sqrt[23]))/Sqrt[11 + I*Sqrt[23]])/88])/((23 + I*Sqrt[23])*(-((3*
I - Sqrt[23])/(7*I + Sqrt[23])))^(1/4)*Sqrt[3 - x + 2*x^2]*Sqrt[2
 + 3*x + 5*x^2]*Sqrt[11 - (41*(I + Sqrt[23])*(6 - (1 - I*Sqrt[23]
)*x))/((7*I + Sqrt[23])*(1 - I*Sqrt[23] - 4*x)) - (11*(3*I - Sqrt
```

```
[23])*(6 - (1 - I*Sqrt[23])*x)^2)/((7*I + Sqrt[23])*(1 - I*Sqrt[2
3] - 4*x)^2)])
```

Rubi in Sympy [A] time = 85.4387, size = 462, normalized size = 0.65

$$\frac{\sqrt{10}\sqrt{\frac{1+\frac{\left(-\frac{287}{220}-\frac{41\sqrt{31}i}{220}\right)\left(10x+3+\sqrt{31}i\right)}{x\left(3+\sqrt{31}i\right)+4}+\frac{\left(\frac{9}{100}+\frac{7\sqrt{31}i}{100}\right)\left(10x+3+\sqrt{31}i\right)^2}{\left(x\left(3+\sqrt{31}i\right)+4\right)^2}}{\left(1+\frac{\sqrt{9+7\sqrt{31}i}\left(10x+3+\sqrt{31}i\right)}{10\left(x\left(3+\sqrt{31}i\right)+4\right)}\right)^2}}\sqrt{\frac{\left(\frac{31}{11}-\frac{31\sqrt{31}i}{11}\right)(2x^2-x+3)}{\left(x\left(3+\sqrt{31}i\right)+4\right)^2}}\left(1+\frac{\sqrt{9+7\sqrt{31}i}\left(10x+3+\sqrt{31}i\right)}{10\left(x\left(3+\sqrt{31}i\right)+4\right)}\right)\left(x\left(3+\sqrt{31}i\right)+4\right)^{\frac{3}{2}}\sqrt{10\cdots}}{2\sqrt[4]{9+7\sqrt{31}i}\left(31-3\sqrt{31}i\right)\sqrt{1+\frac{\left(-\frac{287}{220}-\frac{41\sqrt{31}i}{220}\right)\left(10x+3+\sqrt{31}i\right)}{x\left(3+\sqrt{31}i\right)+4}+\frac{\left(\frac{9}{100}+\frac{7\sqrt{31}i}{100}\right)\left(10x\cdots\right)}{\left(x\left(3+\sqrt{31}i\cdots\right)\right)}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  rubi_integrate(1/(5*x**2+3*x+2)**(1/2)/(2*x**2-x+3)**(1/2),x)
```

```
[Out] sqrt(10)*sqrt((1 + (-287/220 - 41*sqrt(31)*I/220)*(10*x + 3 + sqr
t(31)*I)/(x*(3 + sqrt(31)*I) + 4) + (9/100 + 7*sqrt(31)*I/100)*(1
0*x + 3 + sqrt(31)*I)**2/(x*(3 + sqrt(31)*I) + 4)**2)/(1 + sqrt(9
 + 7*sqrt(31)*I)*(10*x + 3 + sqrt(31)*I)/(10*(x*(3 + sqrt(31)*I)
+ 4)))**2)*sqrt((31/11 - 31*sqrt(31)*I/11)*(2*x**2 - x + 3)/(x*(3
 + sqrt(31)*I) + 4)**2)*(1 + sqrt(9 + 7*sqrt(31)*I)*(10*x + 3 + s
qrt(31)*I)/(10*(x*(3 + sqrt(31)*I) + 4)))*(x*(3 + sqrt(31)*I) + 4
)**(3/2)*sqrt(10*x + 3 + sqrt(31)*I)*elliptic_f(2*atan(sqrt(10)*(
9 + 7*sqrt(31)*I)**(1/4)*sqrt(10*x + 3 + sqrt(31)*I)/(10*sqrt(x*(
3 + sqrt(31)*I) + 4))), 1/2 + (287/3520 - 41*sqrt(31)*I/3520)*sqr
t(9 + 7*sqrt(31)*I))/(2*(9 + 7*sqrt(31)*I)**(1/4)*(31 - 3*sqrt(31
)*I)*sqrt(1 + (-287/220 - 41*sqrt(31)*I/220)*(10*x + 3 + sqrt(31)
*I)/(x*(3 + sqrt(31)*I) + 4) + (9/100 + 7*sqrt(31)*I/100)*(10*x +
 3 + sqrt(31)*I)**2/(x*(3 + sqrt(31)*I) + 4)**2)*sqrt(2*x**2 - x
+ 3)*sqrt(5*x**2 + 3*x + 2))
```

Mathematica [A] time = 1.12868, size = 390, normalized size = 0.55

$$\frac{\left(-4x+i\sqrt{23}+1\right)\left(10ix+\sqrt{31}+3i\right)\sqrt{\frac{20ix-2\sqrt{31}+6i}{\left(11i+5\sqrt{23}-2\sqrt{31}\right)\left(4ix+\sqrt{23}-i\right)}}\sqrt{\frac{\left(-22-10i\sqrt{23}+4i\sqrt{31}\right)x-\sqrt{713}-i\sqrt{31}-3i\sqrt{23}+63}{\left(11i+5\sqrt{23}+2\sqrt{31}\right)\left(4ix+\sqrt{23}-i\right)}}F\left(\sin^{-1}\left(\sqrt{2}\sqrt{-\cdots}\right.\right.}{\left(-11i+5\sqrt{23}-2\sqrt{31}\right)\sqrt{\frac{10ix+\sqrt{31}+3i}{\left(11i+5\sqrt{23}+2\sqrt{31}\right)\left(4ix+\sqrt{23}-i\right)}}\sqrt{2x^2-x+3}\sqrt{5x^2\cdots}}$$

Warning: Unable to verify antiderivative.

```
[In]  Integrate[1/(Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2]),x]
```

```
[Out] ((1 + I*Sqrt[23] - 4*x)*(3*I + Sqrt[31] + (10*I)*x)*Sqrt[(6*I - 2
*Sqrt[31] + (20*I)*x)/((11*I + 5*Sqrt[23] - 2*Sqrt[31])*(-I + Sqr
t[23] + (4*I)*x))]*Sqrt[(63 - (3*I)*Sqrt[23] - I*Sqrt[31] - Sqrt[
713] + (-22 - (10*I)*Sqrt[23] + (4*I)*Sqrt[31])*x)/((11*I + 5*Sqr
t[23] + 2*Sqrt[31])*(-I + Sqrt[23] + (4*I)*x))]*EllipticF[ArcSin[
Sqrt[2]*Sqrt[-((-63 + (3*I)*Sqrt[23] + I*Sqrt[31] + Sqrt[713] + 2
*(11 + (5*I)*Sqrt[23] - (2*I)*Sqrt[31])*x)/((11*I + 5*Sqrt[23] +
2*Sqrt[31])*(-I + Sqrt[23] + (4*I)*x)))]], (1197 + 41*Sqrt[713])/
484])/((-11*I + 5*Sqrt[23] - 2*Sqrt[31])*Sqrt[(3*I + Sqrt[31] + (
10*I)*x)/((11*I + 5*Sqrt[23] + 2*Sqrt[31])*(-I + Sqrt[23] + (4*I)
*x))]*Sqrt[3 - x + 2*x^2]*Sqrt[2 + 3*x + 5*x^2])
```

Maple [A] time = 0.776, size = 420, normalized size = 0.6

$$\frac{\frac{4i}{23}\left(2i\sqrt{31}+5i\sqrt{23}-11\right)\left(i\sqrt{23}-4x+1\right)^{2}\sqrt{23}\sqrt{10}}{2i\sqrt{31}-5i\sqrt{23}-11}\sqrt{5x^{2}+3x+2}\sqrt{2x^{2}-x+3}\sqrt{-\frac{\left(2i\sqrt{31}-5i\sqrt{23}-11\right)\left(-1+4x+\right.}{\left(2i\sqrt{31}+5i\sqrt{23}-11\right)\left(i\sqrt{23}-4x\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  int(1/(5*x^2+3*x+2)^(1/2)/(2*x^2-x+3)^(1/2),x)
```

```
[Out] 4/23*I*(5*x^2+3*x+2)^(1/2)*(2*x^2-x+3)^(1/2)*(2*I*31^(1/2)+5*I*23
^(1/2)-11)*(-(2*I*31^(1/2)-5*I*23^(1/2)-11)*(-1+4*x+I*23^(1/2))/(
2*I*31^(1/2)+5*I*23^(1/2)-11)/(I*23^(1/2)-4*x+1))^(1/2)*(I*23^(1/
2)-4*x+1)^2*(I*23^(1/2)*(I*31^(1/2)+10*x+3)/(2*I*31^(1/2)-5*I*23^
(1/2)+11)/(I*23^(1/2)-4*x+1))^(1/2)*(I*23^(1/2)*(I*31^(1/2)-10*x-
3)/(2*I*31^(1/2)+5*I*23^(1/2)-11)/(I*23^(1/2)-4*x+1))^(1/2)*23^(1
/2)*10^(1/2)*EllipticF((-(2*I*31^(1/2)-5*I*23^(1/2)-11)*(-1+4*x+I
*23^(1/2))/(2*I*31^(1/2)+5*I*23^(1/2)-11)/(I*23^(1/2)-4*x+1))^(1/
2),((2*I*31^(1/2)+5*I*23^(1/2)+11)*(2*I*31^(1/2)+5*I*23^(1/2)-11)
/(2*I*31^(1/2)-5*I*23^(1/2)+11)/(2*I*31^(1/2)-5*I*23^(1/2)-11))^(
1/2))/(10*x^4+x^3+16*x^2+7*x+6)^(1/2)/(2*I*31^(1/2)-5*I*23^(1/2)-
11)/((-1+4*x+I*23^(1/2))*(I*23^(1/2)-4*x+1)*(I*31^(1/2)+10*x+3)*(
I*31^(1/2)-10*x-3))^(1/2)
```

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

$$\int \frac{1}{\sqrt{5x^{2}+3x+2}\sqrt{2x^{2}-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)
```

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

$$\mathrm{integral}\left(\frac{1}{\sqrt{5x^{2}+3x+2}\sqrt{2x^{2}-x+3}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="fricas")
```

```
[Out] integral(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)
```

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

$$\int \frac{1}{\sqrt{2x^{2}-x+3}\sqrt{5x^{2}+3x+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In]  integrate(1/(5*x**2+3*x+2)**(1/2)/(2*x**2-x+3)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(2*x**2 - x + 3)*sqrt(5*x**2 + 3*x + 2)), x)
```

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

$$\int \frac{1}{\sqrt{5x^2+3x+2}\sqrt{2x^2-x+3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(5*x^2 + 3*x + 2)*sqrt(2*x^2 - x + 3)), x)
```

4 Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Mathematica/Rubi followed by one for Maple. The following are links to the source code.

The following are the listing of the above functions.

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)
(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)

(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*        GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)

GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]

(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)
```

```
ExpnType[expn_] :=
  If[AtomQ[expn], 1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]
```

```
ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]

SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]
HypergeometricFunctionQ[func_] := MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
AppellFunctionQ[func_] := MemberQ[{AppellF1},func]
```

```
# File: GradeAntiderivative.mpl Original version thanks to Albert Rich emailed on 03/21/2017
#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);
  #This check below actually is not needed, since I only call this grading only for
  #passed integrals. i.e. I check for "F" before calling this.

  if not type(result,freeof('int')) then
     return "F";
  end if;

  if ExpnType_result<=ExpnType_optimal then
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
         if leaf_count_result<=2*leaf_count_optimal then
            return "A";
         else
            return "B";
         end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      return "C";
  end if
end proc:
```

```
# is_contains_complex(result) takes expressions and returns true if it contains "I"
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
      1 else
    max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
        1 else
      max(2,ExpnType(op(1,expn))) end if else
    max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' or op(0,expn)='integrate' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:
```

```
ElementaryFunctionQ := proc(func)
  member(func,[exp,log,ln, sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[erf,erfc,erfi,FresnelS,FresnelC,Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:
AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
    op(2,u) else
  apply(op(0,u),op(2..nops(u),u))
  end if
end proc:
#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```