Maple 2018.2 Integration Test Results
on the problems in "1 Algebraic functions/1.1 Binomial products/1.1.2 Quadratic"

Test results for the 277 problems in "1.1.2.2 (c x)^m (a+b x^2)^p.txt"

Problem 21: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(b x^2+a\right)^5}{x^{13}}\, dx$$

Optimal(type 1, 17 leaves, 1 step):

$$-\frac{\left(b x^2+a\right)^6}{12 a x^{12}}$$

Result(type 1, 57 leaves):

$$-\frac{b^5}{2 x^2}-\frac{5 a b^4}{4 x^4}-\frac{5 a^3 b^2}{4 x^8}-\frac{a^4 b}{2 x^{10}}-\frac{a^5}{12 x^{12}}-\frac{5 a^2 b^3}{3 x^6}$$

Problem 26: Result more than twice size of optimal antiderivative.

$$\int x \left(b x^2+a\right)^8 dx$$

Optimal(type 1, 14 leaves, 1 step):

$$\frac{\left(b x^2+a\right)^9}{18 b}$$

Result(type 1, 90 leaves):

$$\frac{1}{18} b^8 x^{18}+\frac{1}{2} a b^7 x^{16}+2 a^2 b^6 x^{14}+\frac{14}{3} a^3 b^5 x^{12}+7 a^4 b^4 x^{10}+7 a^5 b^3 x^8+\frac{14}{3} a^6 b^2 x^6+2 a^7 b x^4+\frac{1}{2} a^8 x^2$$

Problem 29: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(b x^2+a\right)^8}{x^{19}}\, dx$$

Optimal(type 1, 17 leaves, 1 step):

$$-\frac{\left(b x^2+a\right)^9}{18 a x^{18}}$$

Result(type 1, 90 leaves):

$$-\frac{b^8}{2 x^2}-\frac{2 a^6 b^2}{x^{14}}-\frac{2 a b^7}{x^4}-\frac{7 a^3 b^5}{x^8}-\frac{a^7 b}{2 x^{16}}-\frac{a^8}{18 x^{18}}-\frac{7 a^4 b^4}{x^{10}}-\frac{14 a^5 b^3}{3 x^{12}}-\frac{14 a^2 b^6}{3 x^6}$$

Problem 30: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x^2 + a)^8}{x^{21}}\, dx$$

Optimal(type 1, 36 leaves, 3 steps):

$$-\frac{(b x^2 + a)^9}{20 a x^{20}} + \frac{b (b x^2 + a)^9}{180 a^2 x^{18}}$$

Result(type 1, 90 leaves):

$$-\frac{4 a^5 b^3}{x^{14}} - \frac{b^8}{4 x^4} - \frac{7 a^2 b^6}{2 x^8} - \frac{7 a^6 b^2}{4 x^{16}} - \frac{4 a^7 b}{9 x^{18}} - \frac{28 a^3 b^5}{5 x^{10}} - \frac{35 a^4 b^4}{6 x^{12}} - \frac{4 a b^7}{3 x^6} - \frac{a^8}{20 x^{20}}$$

Problem 51: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{15}}{(b x^2 + a)^{10}}\, dx$$

Optimal(type 1, 35 leaves, 3 steps):

$$\frac{x^{16}}{18 a (b x^2 + a)^9} + \frac{x^{16}}{144 a^2 (b x^2 + a)^8}$$

Result(type 1, 132 leaves):

$$-\frac{21 a^2}{8 b^8 (b x^2 + a)^4} + \frac{7 a}{6 b^8 (b x^2 + a)^3} - \frac{7 a^6}{16 b^8 (b x^2 + a)^8} - \frac{1}{4 b^8 (b x^2 + a)^2} + \frac{3 a^5}{2 b^8 (b x^2 + a)^7} - \frac{35 a^4}{12 b^8 (b x^2 + a)^6} + \frac{7 a^3}{2 b^8 (b x^2 + a)^5} + \frac{a^7}{18 b^8 (b x^2 + a)^9}$$

Problem 90: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 11 leaves, 4 steps):

$$-\arctan\left(\sqrt{x}\right) + \operatorname{arctanh}\left(\sqrt{x}\right)$$

Result(type 3, 23 leaves):

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

Problem 91: Result more than twice size of optimal antiderivative.

$$\int x^m (b x^2 + a)^5\, dx$$

Optimal(type 3, 97 leaves, 2 steps):

$$\frac{a^5 x^{1+m}}{1+m}+\frac{5 a^4 b x^{3+m}}{3+m}+\frac{10 a^3 b^2 x^{5+m}}{5+m}+\frac{10 a^2 b^3 x^{7+m}}{7+m}+\frac{5 a b^4 x^{9+m}}{9+m}+\frac{b^5 x^{11+m}}{11+m}$$

Result(type 3, 431 leaves):

$$\frac{1}{(11+m)(9+m)(7+m)(5+m)(3+m)(1+m)}\big(x^{1+m}\big(b^5 m^5 x^{10}+25 b^5 m^4 x^{10}+5 a b^4 m^5 x^8+230 b^5 m^3 x^{10}+135 a b^4 m^4 x^8+950 b^5 m^2 x^{10}$$
$$+10 a^2 b^3 m^5 x^6+1310 a b^4 m^3 x^8+1689 b^5 m x^{10}+290 a^2 b^3 m^4 x^6+5610 a b^4 m^2 x^8+945 b^5 x^{10}+10 a^3 b^2 m^5 x^4+3020 a^2 b^3 m^3 x^6+10205 a b^4 m x^8$$
$$+310 a^3 b^2 m^4 x^4+13660 a^2 b^3 m^2 x^6+5775 a b^4 x^8+5 a^4 b m^5 x^2+3500 a^3 b^2 m^3 x^4+25770 a^2 b^3 m x^6+165 a^4 b m^4 x^2+17300 a^3 b^2 m^2 x^4+14850 a^2 b^3 x^6$$
$$+a^5 m^5+2030 a^4 b m^3 x^2+34890 a^3 b^2 m x^4+35 a^5 m^4+11310 a^4 b m^2 x^2+20790 a^3 b^2 x^4+470 a^5 m^3+26765 a^4 b m x^2+3010 a^5 m^2+17325 a^4 b x^2$$
$$+9129 a^5 m+10395 a^5\big)\big)$$

Problem 93: Unable to integrate problem.

$$\int \frac{x^m}{(b x^2+a)^2}\,dx$$

Optimal(type 5, 37 leaves, 1 step):

$$\frac{x^{1+m}\,\mathrm{hypergeom}\left(\left[2,\frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],-\frac{b x^2}{a}\right)}{a^2(1+m)}$$

Result(type 8, 15 leaves):

$$\int \frac{x^m}{(b x^2+a)^2}\,dx$$

Problem 94: Unable to integrate problem.

$$\int \frac{(c x)^{1+m}}{b x^2+a}\,dx$$

Optimal(type 5, 42 leaves, 1 step):

$$\frac{(c x)^{2+m}\,\mathrm{hypergeom}\left(\left[1,1+\frac{m}{2}\right],\left[2+\frac{m}{2}\right],-\frac{b x^2}{a}\right)}{a c(2+m)}$$

Result(type 8, 19 leaves):

$$\int \frac{(c x)^{1+m}}{b x^2+a}\,dx$$

Problem 95: Unable to integrate problem.

$$\int \frac{(c x)^m}{b x^2+a}\,dx$$

Optimal(type 5, 42 leaves, 1 step):

$$\frac{(c x)^{1+m} \operatorname{hypergeom}\left(\left[1, \frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],-\frac{b x^2}{a}\right)}{a c (1+m)}$$

Result(type 8, 17 leaves):

$$\int \frac{(c x)^m}{b x^2+a}\, dx$$

Problem 96: Unable to integrate problem.

$$\int \frac{(c x)^{-1+m}}{b x^2+a}\, dx$$

Optimal(type 5, 36 leaves, 1 step):

$$\frac{(c x)^m \operatorname{hypergeom}\left(\left[1, \frac{m}{2}\right],\left[1+\frac{m}{2}\right],-\frac{b x^2}{a}\right)}{a c m}$$

Result(type 8, 19 leaves):

$$\int \frac{(c x)^{-1+m}}{b x^2+a}\, dx$$

Problem 112: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x^2+a)^{9/2}}{x^{11}}\, dx$$

Optimal(type 3, 103 leaves, 8 steps):

$$-\frac{21 b^3 (b x^2+a)^{3/2}}{128 x^4}-\frac{21 b^2 (b x^2+a)^{5/2}}{160 x^6}-\frac{9 b (b x^2+a)^{7/2}}{80 x^8}-\frac{(b x^2+a)^{9/2}}{10 x^{10}}-\frac{63 b^5 \operatorname{arctanh}\left(\frac{\sqrt{b x^2+a}}{\sqrt{a}}\right)}{256 \sqrt{a}}-\frac{63 b^4 \sqrt{b x^2+a}}{256 x^2}$$

Result(type 3, 212 leaves):

$$-\frac{(b x^2+a)^{11/2}}{10 a x^{10}}-\frac{b (b x^2+a)^{11/2}}{80 a^2 x^8}-\frac{b^2 (b x^2+a)^{11/2}}{160 a^3 x^6}-\frac{b^3 (b x^2+a)^{11/2}}{128 a^4 x^4}-\frac{7 b^4 (b x^2+a)^{11/2}}{256 a^5 x^2}+\frac{7 b^5 (b x^2+a)^{9/2}}{256 a^5}+\frac{9 b^5 (b x^2+a)^{7/2}}{256 a^4}$$

$$+\frac{63 b^5 (b x^2+a)^{5/2}}{1280 a^3}+\frac{21 b^5 (b x^2+a)^{3/2}}{256 a^2}-\frac{63 b^5 \ln\left(\frac{2 a+2 \sqrt{a} \sqrt{b x^2+a}}{x}\right)}{256 \sqrt{a}}+\frac{63 b^5 \sqrt{b x^2+a}}{256 a}$$

Problem 163: Result more than twice size of optimal antiderivative.

$$\int \sqrt{c x}\,\sqrt{-2 a x^2+3 a}\,dx$$

Optimal(type 4, 77 leaves, 5 steps):

$$-\frac{6\,6^{1/4}\,a\,\mathrm{EllipticE}\left(\frac{\sqrt{3-x\sqrt{6}}\,\sqrt{6}}{6},\sqrt{2}\right)\sqrt{c x}\,\sqrt{-2 x^2+3}}{5\sqrt{x}\,\sqrt{-2 a x^2+3 a}}+\frac{2\,(c x)^{3/2}\sqrt{-2 a x^2+3 a}}{5 c}$$

Result(type 4, 228 leaves):

$$\frac{1}{10 x\,(2 x^2-3)}\Bigg(\sqrt{c x}\,\sqrt{-a\,(2 x^2-3)}\,\Bigg(2\sqrt{\left(-2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\,\sqrt{3}\,\sqrt{-x\sqrt{2}\,\sqrt{3}}\,\sqrt{\left(2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\,\sqrt{2}\,\mathrm{EllipticE}\left(\frac{1}{6}\left(\sqrt{3}\,\sqrt{2}\,\sqrt{\left(2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\right),\frac{\sqrt{2}}{2}\right)-\sqrt{\left(-2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\,\sqrt{3}\,\sqrt{-x\sqrt{2}\,\sqrt{3}}\,\mathrm{EllipticF}\left(\frac{\sqrt{3}\,\sqrt{2}\,\sqrt{\left(2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}}{6},\frac{\sqrt{2}}{2}\right)\sqrt{\left(2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\,\sqrt{2}+8 x^4-12 x^2\Bigg)\Bigg)$$

Problem 172: Result more than twice size of optimal antiderivative.

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

Optimal(type 4, 53 leaves, 4 steps):

$$-\frac{6^{1/4}\,\mathrm{EllipticE}\left(\frac{\sqrt{3-x\sqrt{6}}\,\sqrt{6}}{6},\sqrt{2}\right)\sqrt{c x}\,\sqrt{-2 x^2+3}}{\sqrt{x}\,\sqrt{-2 a x^2+3 a}}$$

Result(type 4, 164 leaves):

$$\frac{1}{12 a x\,(2 x^2-3)}\Bigg(\sqrt{c x}\,\sqrt{-a\,(2 x^2-3)}\,\sqrt{2}\,\sqrt{\left(2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\,\sqrt{\left(-2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\,\sqrt{3}\,\sqrt{-x\sqrt{2}\,\sqrt{3}}\,\Bigg(2\,\mathrm{EllipticE}\left(\frac{1}{6}\left(\sqrt{3}\,\sqrt{2}\,\sqrt{\left(2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}\right),\frac{\sqrt{2}}{2}\right)-\mathrm{EllipticF}\left(\frac{\sqrt{3}\,\sqrt{2}\,\sqrt{\left(2 x+\sqrt{2}\,\sqrt{3}\right)\sqrt{2}\,\sqrt{3}}}{6},\frac{\sqrt{2}}{2}\right)\Bigg)\Bigg)$$

Problem 173: Result more than twice size of optimal antiderivative.

$$\int \frac{(c x)^{5/2}}{(-2 a x^2+3 a)^{3/2}}\,dx$$

Optimal(type 4, 86 leaves, 5 steps):

$$\frac{c\,(c x)^{3/2}}{2 a\sqrt{-2 a x^2+3 a}}+\frac{3\,3^{1/4} c^2\,\mathrm{EllipticE}\left(\frac{\sqrt{3-x\sqrt{6}}\,\sqrt{6}}{6},\sqrt{2}\right)\sqrt{c x}\,\sqrt{-2 x^2+3}\;2^{1/4}}{4 a\sqrt{x}\,\sqrt{-2 a x^2+3 a}}$$

Result(type 4, 229 leaves):

$$-\frac{1}{16 x a^2\,(2 x^2-3)}\left(c^2\sqrt{c x}\,\sqrt{-a\,(2 x^2-3)}\left(2\sqrt{(-2 x+\sqrt{2}\sqrt{3})\sqrt{2}\sqrt{3}}\,\sqrt{3}\,\sqrt{-x\sqrt{2}\sqrt{3}}\,\sqrt{(2 x+\sqrt{2}\sqrt{3})\sqrt{2}\sqrt{3}}\,\sqrt{2}\,\mathrm{EllipticE}\left(\frac{1}{6}\left(\sqrt{3}\sqrt{2}\sqrt{(2 x+\sqrt{2}\sqrt{3})\sqrt{2}\sqrt{3}}\right),\frac{\sqrt{2}}{2}\right)-\sqrt{(-2 x+\sqrt{2}\sqrt{3})\sqrt{2}\sqrt{3}}\,\sqrt{3}\,\sqrt{-x\sqrt{2}\sqrt{3}}\,\mathrm{EllipticF}\left(\frac{\sqrt{3}\sqrt{2}\sqrt{(2 x+\sqrt{2}\sqrt{3})\sqrt{2}\sqrt{3}}}{6},\frac{\sqrt{2}}{2}\right)\sqrt{(2 x+\sqrt{2}\sqrt{3})\sqrt{2}\sqrt{3}}\,\sqrt{2}+8 x^2\right)\right)$$

Problem 174: Unable to integrate problem.

$$\int x^m\,(b x^2+a)^{3/2}\,dx$$

Optimal(type 5, 46 leaves, 2 steps):

$$\frac{x^{1+m}\,(b x^2+a)^{5/2}\,\mathrm{hypergeom}\left(\left[1,3+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],-\frac{b x^2}{a}\right)}{a\,(1+m)}$$

Result(type 8, 15 leaves):

$$\int x^m\,(b x^2+a)^{3/2}\,dx$$

Problem 175: Unable to integrate problem.

$$\int\frac{x^{2+m}}{\sqrt{b x^2+a}}\,dx$$

Optimal(type 5, 46 leaves, 2 steps):

$$\frac{x^{3+m}\,\mathrm{hypergeom}\left(\left[1,2+\frac{m}{2}\right],\left[\frac{5}{2}+\frac{m}{2}\right],-\frac{b x^2}{a}\right)\sqrt{b x^2+a}}{a\,(3+m)}$$

Result(type 8, 17 leaves):

$$\int\frac{x^{2+m}}{\sqrt{b x^2+a}}\,dx$$

Problem 176: Unable to integrate problem.

$$\int \frac{x^{1+m}}{\sqrt{b x^2+a}}\, dx$$

Optimal(type 5, 46 leaves, 2 steps):

$$\frac{x^{2+m} \operatorname{hypergeom}\left(\left[1, \frac{3}{2}+\frac{m}{2}\right], \left[2+\frac{m}{2}\right], -\frac{b x^2}{a}\right) \sqrt{b x^2+a}}{a\,(2+m)}$$

Result(type 8, 17 leaves):

$$\int \frac{x^{1+m}}{\sqrt{b x^2+a}}\, dx$$

Problem 177: Unable to integrate problem.

$$\int \left(\frac{a\,(2+m)\, x^{1+m}}{\sqrt{b x^2+a}} + \frac{b\,(3+m)\, x^{3+m}}{\sqrt{b x^2+a}} \right) dx$$

Optimal(type 3, 15 leaves, ? steps):

$$x^{2+m} \sqrt{b x^2+a}$$

Result(type 8, 41 leaves):

$$\int \left(\frac{a\,(2+m)\, x^{1+m}}{\sqrt{b x^2+a}} + \frac{b\,(3+m)\, x^{3+m}}{\sqrt{b x^2+a}} \right) dx$$

Problem 179: Unable to integrate problem.

$$\int \left(-\frac{b\, x^{1+m}}{\left(b x^2+a\right)^{3/2}} + \frac{m\, x^{-1+m}}{\sqrt{b x^2+a}} \right) dx$$

Optimal(type 3, 13 leaves, ? steps):

$$\frac{x^m}{\sqrt{b x^2+a}}$$

Result(type 8, 36 leaves):

$$\int \left(-\frac{b\, x^{1+m}}{\left(b x^2+a\right)^{3/2}} + \frac{m\, x^{-1+m}}{\sqrt{b x^2+a}} \right) dx$$

Problem 181: Unable to integrate problem.

$$\int \frac{\left(b x^2+a\right)^{1/3}}{x^3}\, dx$$

Optimal(type 3, 78 leaves, 6 steps):

$$-\frac{(b x^2+a)^{1/3}}{2 x^2}-\frac{b \ln(x)}{6 a^{2/3}}+\frac{b \ln\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{4 a^{2/3}}-\frac{b \arctan\left(\frac{\left(a^{1/3}+2 (b x^2+a)^{1/3}\right)\sqrt{3}}{3 a^{1/3}}\right)\sqrt{3}}{6 a^{2/3}}$$

Result(type 8, 55 leaves):

$$-\frac{(b x^2+a)^{1/3}}{2 x^2}+\frac{\left(\int \frac{b}{3 x \left((b x^2+a)^2\right)^{1/3}}\, dx\right)\left((b x^2+a)^2\right)^{1/3}}{(b x^2+a)^{2/3}}$$

Problem 182: Unable to integrate problem.

$$\int \frac{(b x^2+a)^{1/3}}{x^5}\, dx$$

Optimal(type 3, 102 leaves, 7 steps):

$$-\frac{(b x^2+a)^{1/3}}{4 x^4}-\frac{b (b x^2+a)^{1/3}}{12 a x^2}+\frac{b^2 \ln(x)}{18 a^{5/3}}-\frac{b^2 \ln\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{12 a^{5/3}}+\frac{b^2 \arctan\left(\frac{\left(a^{1/3}+2 (b x^2+a)^{1/3}\right)\sqrt{3}}{3 a^{1/3}}\right)\sqrt{3}}{18 a^{5/3}}$$

Result(type 8, 72 leaves):

$$-\frac{(b x^2+a)^{1/3} (b x^2+3 a)}{12 x^4 a}+\frac{\left(\int -\frac{b^2}{9 a x \left((b x^2+a)^2\right)^{1/3}}\, dx\right)\left((b x^2+a)^2\right)^{1/3}}{(b x^2+a)^{2/3}}$$

Problem 183: Unable to integrate problem.

$$\int x^2 (b x^2+a)^{1/3}\, dx$$

Optimal(type 4, 229 leaves, 4 steps):

$$\frac{6 a x (b x^2+a)^{1/3}}{55 b}+\frac{3 x^3 (b x^2+a)^{1/3}}{11}+\frac{1}{55 b^2 x \sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\Bigg(6\, 3^{3/4} a^2 \left(a^{1/3}-(b x^2+a)^{1/3}\right)$$

$$\mathrm{EllipticF}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)}, 2 I-I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\Bigg)$$

Result(type 8, 68 leaves):

$$\frac{3x(5bx^2+2a)(bx^2+a)^{1/3}}{55b}+\frac{\left(\int -\frac{6a^2}{55b\left((bx^2+a)^2\right)^{1/3}}\,dx\right)\left((bx^2+a)^2\right)^{1/3}}{(bx^2+a)^{2/3}}$$

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Problem 185: Unable to integrate problem.
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$$\int (bx^2+a)^{2/3}\,dx$$

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Optimal(type 4, 430 leaves, 5 steps):
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$$\frac{3x(bx^2+a)^{2/3}}{7}-\frac{12ax}{7\left(-(bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)}$$
$$-\frac{1}{7bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(bx^2+a)^{1/3}\right)}{\left(-(bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\left(4\,3^{3/4}a^{4/3}\left(a^{1/3}-(bx^2+a)^{1/3}\right)\operatorname{EllipticF}\left(\frac{-(bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})},2I\right.\right.$$
$$\left.\left.-I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(bx^2+a)^{1/3}+(bx^2+a)^{2/3}}{\left(-(bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\right)+\frac{1}{7bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(bx^2+a)^{1/3}\right)}{\left(-(bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\left(6\,3^{1/4}a^{4/3}\left(a^{1/3}\right.\right.$$
$$\left.\left.-(bx^2+a)^{1/3}\right)\operatorname{EllipticE}\left(\frac{-(bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})},2I-I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(bx^2+a)^{1/3}+(bx^2+a)^{2/3}}{\left(-(bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)\right)$$

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Result(type 8, 27 leaves):
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$$\frac{3x(bx^2+a)^{2/3}}{7}+\int\frac{4a}{7(bx^2+a)^{1/3}}\,dx$$

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Problem 187: Unable to integrate problem.
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$$\int\frac{(bx^2+a)^{4/3}}{x}\,dx$$

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Optimal(type 3, 84 leaves, 7 steps):
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$$\frac{3a(bx^2+a)^{1/3}}{2}+\frac{3(bx^2+a)^{4/3}}{8}-\frac{a^{4/3}\ln(x)}{2}+\frac{3a^{4/3}\ln\left(a^{1/3}-(bx^2+a)^{1/3}\right)}{4}-\frac{a^{4/3}\arctan\left(\frac{\left(a^{1/3}+2(bx^2+a)^{1/3}\right)\sqrt{3}}{3a^{1/3}}\right)\sqrt{3}}{2}$$

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Result(type 8, 15 leaves):
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$$\int \frac{(b x^2 + a)^{4/3}}{x}\, dx$$

Problem 188: Unable to integrate problem.

$$\int \frac{(b x^2 + a)^{4/3}}{x^3}\, dx$$

Optimal(type 3, 89 leaves, 7 steps):

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

Result(type 8, 66 leaves):

$$-\frac{a (b x^2 + a)^{1/3}}{2 x^2} + \frac{\left(\int \frac{b (3 b x^2 + 4 a)}{3 x \left((b x^2 + a)^2\right)^{1/3}}\, dx\right) \left((b x^2 + a)^2\right)^{1/3}}{(b x^2 + a)^{2/3}}$$

Problem 189: Unable to integrate problem.

$$\int \frac{(b x^2 + a)^{4/3}}{x^5}\, dx$$

Optimal(type 3, 99 leaves, 7 steps):

$$-\frac{b (b x^2 + a)^{1/3}}{3 x^2} - \frac{(b x^2 + a)^{4/3}}{4 x^4} - \frac{b^2 \ln(x)}{9 a^{2/3}} + \frac{b^2 \ln\left(a^{1/3} - (b x^2 + a)^{1/3}\right)}{6 a^{2/3}} - \frac{b^2 \arctan\left(\frac{\left(a^{1/3} + 2 (b x^2 + a)^{1/3}\right)\sqrt{3}}{3 a^{1/3}}\right)\sqrt{3}}{9 a^{2/3}}$$

Result(type 8, 67 leaves):

$$-\frac{(b x^2 + a)^{1/3} (7 b x^2 + 3 a)}{12 x^4} + \frac{\left(\int \frac{2 b^2}{9 x \left((b x^2 + a)^2\right)^{1/3}}\, dx\right) \left((b x^2 + a)^2\right)^{1/3}}{(b x^2 + a)^{2/3}}$$

Problem 190: Unable to integrate problem.

$$\int (b x^2 + a)^{4/3}\, dx$$

Optimal(type 4, 224 leaves, 4 steps):

$$\frac{24\,a\,x\,(b\,x^2+a)^{1/3}}{55}+\frac{3\,x\,(b\,x^2+a)^{4/3}}{11}-\frac{1}{55\,b\,x\,\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b\,x^2+a)^{1/3}\right)}{\left(-(b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\Bigg(16\,3^{3/4}\,a^2\left(a^{1/3}-(b\,x^2+a)^{1/3}\right)\mathrm{EllipticF}\left(\frac{-(b\,x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)},2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b\,x^2+a)^{1/3}+(b\,x^2+a)^{2/3}}{\left(-(b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\Bigg)$$

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Result(type 8, 62 leaves):
```

$$\frac{3\,x\,(5\,b\,x^2+13\,a)\,(b\,x^2+a)^{1/3}}{55}+\frac{\left(\int\frac{16\,a^2}{55\left((b\,x^2+a)^2\right)^{1/3}}\,\mathrm{d}x\right)\left((b\,x^2+a)^2\right)^{1/3}}{(b\,x^2+a)^{2/3}}$$

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Problem 191: Unable to integrate problem.
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$$\int\frac{(b\,x^2+a)^{4/3}}{x^4}\,\mathrm{d}x$$

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Optimal(type 4, 223 leaves, 4 steps):
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$$-\frac{8\,b\,(b\,x^2+a)^{1/3}}{9\,x}-\frac{(b\,x^2+a)^{4/3}}{3\,x^3}-\frac{1}{27\,x\,\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b\,x^2+a)^{1/3}\right)}{\left(-(b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\Bigg(16\,b\left(a^{1/3}-(b\,x^2+a)^{1/3}\right)\mathrm{EllipticF}\left(\frac{-(b\,x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)},2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b\,x^2+a)^{1/3}+(b\,x^2+a)^{2/3}}{\left(-(b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)3^{3/4}\Bigg)$$

```
Result(type 8, 64 leaves):
```

$$-\frac{(b\,x^2+a)^{1/3}\,(11\,b\,x^2+3\,a)}{9\,x^3}+\frac{\left(\int\frac{16\,b^2}{27\left((b\,x^2+a)^2\right)^{1/3}}\,\mathrm{d}x\right)\left((b\,x^2+a)^2\right)^{1/3}}{(b\,x^2+a)^{2/3}}$$

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Problem 194: Unable to integrate problem.
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$$\int\frac{1}{x^3\,(b\,x^2+a)^{1/3}}\,\mathrm{d}x$$

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Optimal(type 3, 81 leaves, 6 steps):
```

$$-\frac{(b x^2+a)^{2/3}}{2 a x^2}+\frac{b\ln(x)}{6 a^{4/3}}-\frac{b\ln\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{4 a^{4/3}}-\frac{b\arctan\left(\frac{\left(a^{1/3}+2(b x^2+a)^{1/3}\right)\sqrt{3}}{3 a^{1/3}}\right)\sqrt{3}}{6 a^{4/3}}$$

Result(type 8, 38 leaves):

$$-\frac{(b x^2+a)^{2/3}}{2 a x^2}+\int -\frac{b}{3 a x (b x^2+a)^{1/3}}\,dx$$

Problem 195: Unable to integrate problem.

$$\int \frac{x^4}{(b x^2+a)^{1/3}}\,dx$$

Optimal(type 4, 456 leaves, 6 steps):

$$-\frac{27 a x (b x^2+a)^{2/3}}{91 b^2}+\frac{3 x^3 (b x^2+a)^{2/3}}{13 b}-\frac{81 a^2 x}{91 b^2\left(-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)}$$

$$-\frac{1}{91 b^3 x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\left(27\, 3^{3/4} a^{7/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)\operatorname{EllipticF}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)}, 2 I\right.\right.$$

$$\left.\left.-I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\right)+\frac{1}{182 b^3 x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\left(81\, 3^{1/4} a^{7/3}\left(a^{1/3}\right.\right.$$

$$\left.\left.-(b x^2+a)^{1/3}\right)\operatorname{EllipticE}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)}, 2 I-I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)\right)$$

Result(type 8, 45 leaves):

$$-\frac{3 x(-7 b x^2+9 a)(b x^2+a)^{2/3}}{91 b^2}+\int \frac{27 a^2}{91 b^2 (b x^2+a)^{1/3}}\,dx$$

Problem 196: Unable to integrate problem.

$$\int \frac{1}{(b x^2+a)^{1/3}}\,dx$$

Optimal(type 4, 417 leaves, 4 steps):

$$-\frac{3 x}{-(b x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)}$$

$$-\frac{1}{b x \sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\left(3^{3/4} a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right) \mathrm{EllipticF}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2 I - I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\right)+\frac{1}{2 b x \sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\left(3\, 3^{1/4} a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right) \mathrm{EllipticE}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2 I - I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)\right)$$

Result(type 8, 11 leaves):

$$\int \frac{1}{(b x^2+a)^{1/3}}\, dx$$

Problem 198: Unable to integrate problem.

$$\int \frac{x^4}{(b x^2+a)^{2/3}}\, dx$$

Optimal(type 4, 232 leaves, 4 steps):

$$-\frac{27 a x (b x^2+a)^{1/3}}{55 b^2}+\frac{3 x^3 (b x^2+a)^{1/3}}{11 b}-\frac{1}{55 b^3 x \sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\left(27\, 3^{3/4} a^2\left(a^{1/3}-(b x^2+a)^{1/3}\right) \mathrm{EllipticF}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2 I - I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\right)$$

Result(type 8, 68 leaves):

$$-\frac{3 x (-5 b x^2+9 a) (b x^2+a)^{1/3}}{55 b^2}+\frac{\left(\int \frac{27 a^2}{55 b^2 \left((b x^2+a)^2\right)^{1/3}}\, dx\right)\left((b x^2+a)^2\right)^{1/3}}{(b x^2+a)^{2/3}}$$

Problem 199: Unable to integrate problem.

$$\int \frac{1}{x^2 (b x^2+a)^{2/3}}\, dx$$

Optimal(type 4, 213 leaves, 3 steps):

$$-\frac{(b x^2+a)^{1/3}}{a x}+\frac{1}{3 a x \sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\left(\left(a^{1/3}-(b x^2+a)^{1/3}\right) \text{EllipticF}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2 I - I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right) 3^{3/4}\right)$$

Result(type 8, 58 leaves):

$$-\frac{(b x^2+a)^{1/3}}{a x}+\frac{\left(\int -\frac{b}{3 a \left((b x^2+a)^2\right)^{1/3}}\, dx\right)\left((b x^2+a)^2\right)^{1/3}}{(b x^2+a)^{2/3}}$$

Problem 200: Unable to integrate problem.

$$\int \frac{1}{x^4 (b x^2+a)^{2/3}}\, dx$$

Optimal(type 4, 232 leaves, 4 steps):

$$-\frac{(b x^2+a)^{1/3}}{3 a x^3}+\frac{7 b (b x^2+a)^{1/3}}{9 a^2 x}-\frac{1}{27 a^2 x \sqrt{-\frac{a^{1/3}\left(a^{1/3}-(b x^2+a)^{1/3}\right)}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\left(7 b \left(a^{1/3}-(b x^2+a)^{1/3}\right) \text{EllipticF}\left(\frac{-(b x^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2 I - I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(b x^2+a)^{1/3}+(b x^2+a)^{2/3}}{\left(-(b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right) 3^{3/4}\right)$$

Result(type 8, 70 leaves):

$$-\frac{(b x^2+a)^{1/3}(-7 b x^2+3 a)}{9 a^2 x^3}+\frac{\left(\int \frac{7 b^2}{27 a^2 \left((b x^2+a)^2\right)^{1/3}}\, dx\right)\left((b x^2+a)^2\right)^{1/3}}{(b x^2+a)^{2/3}}$$

Problem 201: Unable to integrate problem.

$$\int \frac{1}{x (b x^2+a)^{4/3}}\, dx$$

Optimal(type 3, 75 leaves, 6 steps):

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

Result(type 8, 15 leaves):

$$\int \frac{1}{x \left(b x^{2}+a\right)^{4/3}}\, dx$$

Problem 202: Unable to integrate problem.

$$\int \frac{1}{x^{4} \left(b x^{2}+a\right)^{4/3}}\, dx$$

Optimal(type 4, 471 leaves, 7 steps):

$$\frac{3}{2 a x^{3} \left(b x^{2}+a\right)^{1/3}}-\frac{11 \left(b x^{2}+a\right)^{2/3}}{6 a^{2} x^{3}}+\frac{55 b \left(b x^{2}+a\right)^{2/3}}{18 a^{3} x}+\frac{55 b^{2} x}{18 a^{3} \left(-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1-\sqrt{3}\right)\right)}$$

$$+\frac{1}{54 a^{8/3} x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(b x^{2}+a\right)^{1/3}\right)}{\left(-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1-\sqrt{3}\right)\right)^{2}}}}\left(55 b \left(a^{1/3}-\left(b x^{2}+a\right)^{1/3}\right) \operatorname{EllipticF}\left(\frac{-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1+\sqrt{3}\right)}{-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1-\sqrt{3}\right)}, 2 I\right.\right.$$

$$\left.\left.- I \sqrt{3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(b x^{2}+a\right)^{1/3}+\left(b x^{2}+a\right)^{2/3}}{\left(-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1-\sqrt{3}\right)\right)^{2}}}\, 3^{3/4} \sqrt{2}\right)-\frac{1}{36 a^{8/3} x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(b x^{2}+a\right)^{1/3}\right)}{\left(-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1-\sqrt{3}\right)\right)^{2}}}}\left(55 b \left(a^{1/3}\right.\right.$$

$$\left.\left.-\left(b x^{2}+a\right)^{1/3}\right) \operatorname{EllipticE}\left(\frac{-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1+\sqrt{3}\right)}{-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1-\sqrt{3}\right)}, 2 I-I \sqrt{3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(b x^{2}+a\right)^{1/3}+\left(b x^{2}+a\right)^{2/3}}{\left(-\left(b x^{2}+a\right)^{1/3}+a^{1/3} \left(1-\sqrt{3}\right)\right)^{2}}} \left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right) 3^{1/4}\right)$$

Result(type 8, 66 leaves):

$$-\frac{\left(b x^{2}+a\right)^{2/3} \left(-14 b x^{2}+3 a\right)}{9 a^{3} x^{3}}+\int -\frac{b \left(14 b x^{2}-13 a\right)}{27 a^{3} \left(x^{2}+\frac{a}{b}\right) \left(b x^{2}+a\right)^{1/3}}\, dx$$

Problem 203: Unable to integrate problem.

$$\int (c x)^{1/3} \left(b x^{2}+a\right)^{1/3}\, dx$$

Optimal(type 3, 96 leaves, 4 steps):

$$\frac{(cx)^{4/3}(bx^2+a)^{1/3}}{2c}-\frac{a c^{1/3}\ln\left(b^{1/3}(cx)^{2/3}-c^{2/3}(bx^2+a)^{1/3}\right)}{4b^{2/3}}-\frac{a c^{1/3}\arctan\left(\frac{\left(1+\frac{2b^{1/3}(cx)^{2/3}}{c^{2/3}(bx^2+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{6b^{2/3}}$$

Result(type 8, 78 leaves):

$$\frac{x(bx^2+a)^{1/3}(cx)^{1/3}}{2}+\frac{\left(\int\frac{ax}{3\left(c^2x^2(bx^2+a)^2\right)^{1/3}}\,dx\right)(cx)^{1/3}\left(c^2x^2(bx^2+a)^2\right)^{1/3}}{x(bx^2+a)^{2/3}}$$

Problem 206: Unable to integrate problem.

$$\int(cx)^{7/3}(bx^2+a)^{4/3}\,dx$$

Optimal(type 3, 143 leaves, 6 steps):

$$\frac{a^2c(cx)^{4/3}(bx^2+a)^{1/3}}{27b}+\frac{a(cx)^{10/3}(bx^2+a)^{1/3}}{9c}+\frac{(cx)^{10/3}(bx^2+a)^{4/3}}{6c}+\frac{a^3c^{7/3}\ln\left(b^{1/3}(cx)^{2/3}-c^{2/3}(bx^2+a)^{1/3}\right)}{27b^{5/3}}$$
$$+\frac{2a^3c^{7/3}\arctan\left(\frac{\left(1+\frac{2b^{1/3}(cx)^{2/3}}{c^{2/3}(bx^2+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{81b^{5/3}}$$

Result(type 8, 113 leaves):

$$\frac{x(9b^2x^4+15abx^2+2a^2)(bx^2+a)^{1/3}c^2(cx)^{1/3}}{54b}+\frac{\left(\int-\frac{4a^3x}{81b\left(c^2x^2(bx^2+a)^2\right)^{1/3}}\,dx\right)c^2(cx)^{1/3}\left(c^2x^2(bx^2+a)^2\right)^{1/3}}{x(bx^2+a)^{2/3}}$$

Problem 207: Unable to integrate problem.

$$\int(cx)^{1/3}(bx^2+a)^{4/3}\,dx$$

Optimal(type 3, 120 leaves, 5 steps):

$$\frac{a(cx)^{4/3}(bx^2+a)^{1/3}}{3c}+\frac{(cx)^{4/3}(bx^2+a)^{4/3}}{4c}-\frac{a^2c^{1/3}\ln\left(b^{1/3}(cx)^{2/3}-c^{2/3}(bx^2+a)^{1/3}\right)}{6b^{2/3}}$$
$$-\frac{a^2c^{1/3}\arctan\left(\frac{\left(1+\frac{2b^{1/3}(cx)^{2/3}}{c^{2/3}(bx^2+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{9b^{2/3}}$$

Result(type 8, 90 leaves):

$$\frac{x\left(3 b x^2+7 a\right)\left(b x^2+a\right)^{1/3}(c x)^{1/3}}{12}+\frac{\left(\int \frac{2 a^2 x}{9\left(c^2 x^2\left(b x^2+a\right)^2\right)^{1/3}}\, dx\right)(c x)^{1/3}\left(c^2 x^2\left(b x^2+a\right)^2\right)^{1/3}}{x\left(b x^2+a\right)^{2/3}}$$

Problem 208: Unable to integrate problem.

$$\int \frac{\left(b x^2+a\right)^{4/3}}{(c x)^{11/3}}\, dx$$

Optimal(type 3, 114 leaves, 5 steps):

$$-\frac{3 b\left(b x^2+a\right)^{1/3}}{2 c^3(c x)^{2/3}}-\frac{3\left(b x^2+a\right)^{4/3}}{8 c(c x)^{8/3}}-\frac{3 b^{4/3} \ln\left(b^{1/3}(c x)^{2/3}-c^{2/3}\left(b x^2+a\right)^{1/3}\right)}{4 c^{11/3}}-\frac{b^{4/3} \arctan\left(\frac{\left(1+\frac{2 b^{1/3}(c x)^{2/3}}{c^{2/3}\left(b x^2+a\right)^{1/3}}\right) \sqrt{3}}{3}\right) \sqrt{3}}{2 c^{11/3}}$$

Result(type 8, 92 leaves):

$$-\frac{3\left(b x^2+a\right)^{1/3}\left(5 b x^2+a\right)}{8 x^2 c^3(c x)^{2/3}}+\frac{\left(\int \frac{b^2 x}{\left(c^2 x^2\left(b x^2+a\right)^2\right)^{1/3}}\, dx\right)\left(c^2 x^2\left(b x^2+a\right)^2\right)^{1/3}}{c^3(c x)^{2/3}\left(b x^2+a\right)^{2/3}}$$

Problem 210: Unable to integrate problem.

$$\int (c x)^{4/3}\left(b x^2+a\right)^{4/3}\, dx$$

Optimal(type 4, 469 leaves, 6 steps):

$$\frac{16 a^2 c(c x)^{1/3}\left(b x^2+a\right)^{1/3}}{135 b}+\frac{8 a(c x)^{7/3}\left(b x^2+a\right)^{1/3}}{45 c}+\frac{(c x)^{7/3}\left(b x^2+a\right)^{4/3}}{5 c}-\Bigg(8 a^2 c^{1/3}(c x)^{1/3}\left(b x^2+a\right)^{1/3}\Bigg(c^{2/3}$$

$$-\frac{b^{1/3}(c x)^{2/3}}{\left(b x^2+a\right)^{1/3}}\Bigg) \sqrt{\frac{\left(c^{2/3}-\frac{b^{1/3}(c x)^{2/3}\left(1-\sqrt{3}\right)}{\left(b x^2+a\right)^{1/3}}\right)^2}{\left(c^{2/3}-\frac{b^{1/3}(c x)^{2/3}\left(1+\sqrt{3}\right)}{\left(b x^2+a\right)^{1/3}}\right)^2}}\Bigg(c^{2/3}$$

$$-\frac{b^{1/3}(cx)^{2/3}\left(1+\sqrt{3}\right)}{\left(bx^2+a\right)^{1/3}}\Bigg)\ \mathrm{EllipticF}\left(\sqrt{1-\frac{\left(c^{2/3}-\frac{b^{1/3}(cx)^{2/3}\left(1-\sqrt{3}\right)}{\left(bx^2+a\right)^{1/3}}\right)^2}{\left(c^{2/3}-\frac{b^{1/3}(cx)^{2/3}\left(1+\sqrt{3}\right)}{\left(bx^2+a\right)^{1/3}}\right)^2}},\ \frac{\sqrt{6}}{4}\right.$$

$$\left.+\frac{\sqrt{2}}{4}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}(cx)^{4/3}}{\left(bx^2+a\right)^{2/3}}+\frac{b^{1/3}c^{2/3}(cx)^{2/3}}{\left(bx^2+a\right)^{1/3}}}{\left(c^{2/3}-\frac{b^{1/3}(cx)^{2/3}\left(1+\sqrt{3}\right)}{\left(bx^2+a\right)^{1/3}}\right)^2}}\ 3^{3/4}\Bigg)\Bigg/\Bigg(405\Bigg(c^{2/3}$$

$$-\frac{b^{1/3}(cx)^{2/3}\left(1-\sqrt{3}\right)}{\left(bx^2+a\right)^{1/3}}\Bigg)\,b\,\sqrt{-\frac{b^{1/3}(cx)^{2/3}\left(c^{2/3}-\frac{b^{1/3}(cx)^{2/3}}{\left(bx^2+a\right)^{1/3}}\right)}{\left(bx^2+a\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}(cx)^{2/3}\left(1+\sqrt{3}\right)}{\left(bx^2+a\right)^{1/3}}\right)^2}}\Bigg)$$

Result(type 8, 107 leaves):

$$\frac{\left(27b^2x^4+51abx^2+16a^2\right)\left(bx^2+a\right)^{1/3}c\,(cx)^{1/3}}{135b}+\frac{\left(\int -\frac{16a^3}{405b\left(c^2x^2\left(bx^2+a\right)^2\right)^{1/3}}\,dx\right)c\,(cx)^{1/3}\left(c^2x^2\left(bx^2+a\right)^2\right)^{1/3}}{x\left(bx^2+a\right)^{2/3}}$$

Problem 211: Unable to integrate problem.

$$\int (cx)^{2/3}\left(bx^2+a\right)^{4/3}\,dx$$

Optimal(type 5, 47 leaves, 2 steps):

$$\frac{3a\,(cx)^{5/3}\left(bx^2+a\right)^{1/3}\mathrm{hypergeom}\left(\left[-\frac{4}{3},\frac{5}{6}\right],\left[\frac{11}{6}\right],-\frac{bx^2}{a}\right)}{5c\left(1+\frac{bx^2}{a}\right)^{1/3}}$$

Result(type 8, 83 leaves):

$$\frac{3x^2\left(7bx^2+15a\right)\left(bx^2+a\right)^{1/3}c}{91\,(cx)^{1/3}}+\frac{\left(\int \frac{16a^2x}{91\left(cx\left(bx^2+a\right)^2\right)^{1/3}}\,dx\right)c\left(cx\left(bx^2+a\right)^2\right)^{1/3}}{\left(bx^2+a\right)^{2/3}(cx)^{1/3}}$$

Problem 212: Unable to integrate problem.

$$\int \frac{(c x)^{13/3}}{(b x^2+a)^{2/3}}\, dx$$

Optimal(type 3, 124 leaves, 5 steps):

$$-\frac{5 a c^3 (c x)^{4/3} (b x^2+a)^{1/3}}{12 b^2}+\frac{c (c x)^{10/3} (b x^2+a)^{1/3}}{4 b}-\frac{5 a^2 c^{13/3} \ln\left(b^{1/3} (c x)^{2/3}-c^{2/3} (b x^2+a)^{1/3}\right)}{12 b^{8/3}}$$
$$-\frac{5 a^2 c^{13/3} \arctan\left(\frac{\left(1+\frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} (b x^2+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{18 b^{8/3}}$$

Result(type 8, 102 leaves):

$$-\frac{x (-3 b x^2+5 a) (b x^2+a)^{1/3} c^4 (c x)^{1/3}}{12 b^2}+\frac{\left(\int \frac{5 a^2 x}{9 b^2 \left(c^2 x^2 (b x^2+a)^2\right)^{1/3}}\, dx\right) c^4 (c x)^{1/3} \left(c^2 x^2 (b x^2+a)^2\right)^{1/3}}{x (b x^2+a)^{2/3}}$$

Problem 215: Unable to integrate problem.

$$\int \frac{1}{(c x)^{8/3} (b x^2+a)^{2/3}}\, dx$$

Optimal(type 4, 427 leaves, 4 steps):

$$-\frac{3 (b x^2+a)^{1/3}}{5 a c (c x)^{5/3}}-\left(3\, 3^{3/4} b (c x)^{1/3} (b x^2+a)^{1/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{(b x^2+a)^{1/3}}\right) \sqrt{\frac{\left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3} (1-\sqrt{3})}{(b x^2+a)^{1/3}}\right)^2}{\left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3} (1+\sqrt{3})}{(b x^2+a)^{1/3}}\right)^2}} \left(c^{2/3}\right.\right.$$
$$\left.-\frac{b^{1/3} (c x)^{2/3} (1+\sqrt{3})}{(b x^2+a)^{1/3}}\right) \mathrm{EllipticF}\left(\sqrt{1-\frac{\left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3} (1-\sqrt{3})}{(b x^2+a)^{1/3}}\right)^2}{\left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3} (1+\sqrt{3})}{(b x^2+a)^{1/3}}\right)^2}}, \frac{\sqrt{6}}{4}\right.$$
$$\left.\left.+\frac{\sqrt{2}}{4}\right) \sqrt{\frac{c^{4/3}+\frac{b^{2/3} (c x)^{4/3}}{(b x^2+a)^{2/3}}+\frac{b^{1/3} c^{2/3} (c x)^{2/3}}{(b x^2+a)^{1/3}}}{\left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3} (1+\sqrt{3})}{(b x^2+a)^{1/3}}\right)^2}}\right) \Bigg/ \left(10 \left(c^{2/3}\right.\right.$$

$$-\frac{b^{1/3}(cx)^{2/3}\left(1-\sqrt{3}\right)}{(bx^2+a)^{1/3}}\Bigg)a^2c^{11/3}\sqrt{-\frac{b^{1/3}(cx)^{2/3}\left(c^{2/3}-\frac{b^{1/3}(cx)^{2/3}}{(bx^2+a)^{1/3}}\right)}{(bx^2+a)^{1/3}\left(c^{2/3}-\frac{b^{1/3}(cx)^{2/3}\left(1+\sqrt{3}\right)}{(bx^2+a)^{1/3}}\right)^2}}\Bigg)$$

Result(type 8, 88 leaves):

$$-\frac{3(bx^2+a)^{1/3}}{5axc^2(cx)^{2/3}}+\frac{\left(\int -\frac{3b}{5a\left(c^2x^2(bx^2+a)^2\right)^{1/3}}\,dx\right)\left(c^2x^2(bx^2+a)^2\right)^{1/3}}{c^2(cx)^{2/3}(bx^2+a)^{2/3}}$$

Problem 216: Unable to integrate problem.

$$\int x^4(bx^2+a)^{1/4}\,dx$$

Optimal(type 4, 126 leaves, 5 steps):

$$-\frac{4a^2x(bx^2+a)^{1/4}}{77b^2}+\frac{2ax^3(bx^2+a)^{1/4}}{77b}+\frac{2x^5(bx^2+a)^{1/4}}{11}$$

$$+\frac{8a^{7/2}\left(1+\frac{bx^2}{a}\right)^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{77\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)b^{5/2}(bx^2+a)^{3/4}}$$

Result(type 8, 79 leaves):

$$-\frac{2x\left(-7b^2x^4-abx^2+2a^2\right)(bx^2+a)^{1/4}}{77b^2}+\frac{\left(\int \frac{4a^3}{77b^2\left((bx^2+a)^3\right)^{1/4}}\,dx\right)\left((bx^2+a)^3\right)^{1/4}}{(bx^2+a)^{3/4}}$$

Problem 217: Unable to integrate problem.

$$\int \frac{(-bx^2+a)^{1/4}}{x^2}\,dx$$

Optimal(type 4, 93 leaves, 3 steps):

$$-\frac{(-b x^2+a)^{1/4}}{x}-\frac{\left(1-\frac{b x^2}{a}\right)^{3/4}\sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticF}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{a}\,\sqrt{b}}{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)(-b x^2+a)^{3/4}}$$

Result(type 8, 86 leaves):

$$-\frac{(-b x^2+a)^{1/4}\left((-b x^2+a)^3\right)^{1/4}}{x\left(-(b x^2-a)^3\right)^{1/4}}+\frac{\left(\int -\frac{b}{2\left(-(b x^2-a)^3\right)^{1/4}}\,dx\right)\left((-b x^2+a)^3\right)^{1/4}}{(-b x^2+a)^{3/4}}$$

Problem 218: Unable to integrate problem.

$$\int \frac{(b x^2+a)^{3/4}}{x^4}\,dx$$

Optimal(type 4, 126 leaves, 5 steps):

$$\frac{b^2 x}{2 a (b x^2+a)^{1/4}}-\frac{(b x^2+a)^{3/4}}{3 x^3}-\frac{b (b x^2+a)^{3/4}}{2 a x}-\frac{b^{3/2}\left(1+\frac{b x^2}{a}\right)^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{2\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)(b x^2+a)^{1/4}\sqrt{a}}$$

Result(type 8, 47 leaves):

$$-\frac{(b x^2+a)^{3/4}(3 b x^2+2 a)}{6 a x^3}+\int \frac{b^2}{4 a (b x^2+a)^{1/4}}\,dx$$

Problem 219: Unable to integrate problem.

$$\int x^4 (-b x^2+a)^{3/4}\,dx$$

Optimal(type 4, 131 leaves, 5 steps):

$$-\frac{4 a^2 x (-b x^2+a)^{3/4}}{65 b^2}-\frac{2 a x^3 (-b x^2+a)^{3/4}}{39 b}+\frac{2 x^5 (-b x^2+a)^{3/4}}{13}$$

$$+\frac{8 a^{7/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)}{65 \cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{5/2} \left(-b x^2+a\right)^{1/4}}$$

Result(type 8, 58 leaves):

$$-\frac{2 x \left(-15 b^2 x^4+5 a b x^2+6 a^2\right) \left(-b x^2+a\right)^{3/4}}{195 b^2}+\int \frac{4 a^3}{65 b^2 \left(-b x^2+a\right)^{1/4}}\, dx$$

Problem 220: Unable to integrate problem.

$$\int \frac{\left(-b x^2+a\right)^{3/4}}{x^2}\, dx$$

Optimal(type 4, 93 leaves, 3 steps):

$$-\frac{\left(-b x^2+a\right)^{3/4}}{x}-\frac{3 \left(1-\frac{b x^2}{a}\right)^{1/4} \sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{a}\, \sqrt{b}}{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) \left(-b x^2+a\right)^{1/4}}$$

Result(type 8, 31 leaves):

$$-\frac{\left(-b x^2+a\right)^{3/4}}{x}+\int -\frac{3 b}{2 \left(-b x^2+a\right)^{1/4}}\, dx$$

Problem 221: Unable to integrate problem.

$$\int \frac{x^2}{\left(b x^2+a\right)^{1/4}}\, dx$$

Optimal(type 4, 107 leaves, 4 steps):

$$-\frac{4 a x}{5 b \left(b x^2+a\right)^{1/4}}+\frac{2 x \left(b x^2+a\right)^{3/4}}{5 b}+\frac{4 a^{3/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)}{5 \cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{3/2} \left(b x^2+a\right)^{1/4}}$$

Result(type 8, 33 leaves):

$$\frac{2 x \left(b x^2+a\right)^{3/4}}{5 b}+\int -\frac{2 a}{5 b \left(b x^2+a\right)^{1/4}}\, dx$$

Problem 222: Unable to integrate problem.

$$\int \frac{x^2}{\left(-b x^2+a\right)^{1/4}}\, dx$$

Optimal(type 4, 94 leaves, 3 steps):

$$-\frac{2 x \left(-b x^2+a\right)^{3/4}}{5 b}+\frac{4 a^{3/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)}{5 \cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{3/2} \left(-b x^2+a\right)^{1/4}}$$

Result(type 8, 35 leaves):

$$-\frac{2 x \left(-b x^2+a\right)^{3/4}}{5 b}+\int \frac{2 a}{5 b \left(-b x^2+a\right)^{1/4}}\, dx$$

Problem 223: Unable to integrate problem.

$$\int \frac{1}{x^2 \left(-b x^2+a\right)^{1/4}}\, dx$$

Optimal(type 4, 96 leaves, 3 steps):

$$-\frac{\left(-b x^2+a\right)^{3/4}}{a x}-\frac{\left(1-\frac{b x^2}{a}\right)^{1/4}\sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticE}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}}{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)\left(-b x^2+a\right)^{1/4}\sqrt{a}}$$

Result(type 8, 37 leaves):

$$-\frac{\left(-b x^2+a\right)^{3/4}}{a x}+\int -\frac{b}{2 a\left(-b x^2+a\right)^{1/4}}\,dx$$

Problem 224: Unable to integrate problem.

$$\int \frac{x^4}{\left(b x^2+a\right)^{3/4}}\,dx$$

Optimal(type 4, 109 leaves, 4 steps):

$$-\frac{4 a x\left(b x^2+a\right)^{1/4}}{7 b^2}+\frac{2 x^3\left(b x^2+a\right)^{1/4}}{7 b}+\frac{8 a^{5/2}\left(1+\frac{b x^2}{a}\right)^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{7\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{5/2}\left(b x^2+a\right)^{3/4}}$$

Result(type 8, 68 leaves):

$$-\frac{2 x\left(-b x^2+2 a\right)\left(b x^2+a\right)^{1/4}}{7 b^2}+\frac{\left(\int \frac{4 a^2}{7 b^2\left(\left(b x^2+a\right)^3\right)^{1/4}}\,dx\right)\left(\left(b x^2+a\right)^3\right)^{1/4}}{\left(b x^2+a\right)^{3/4}}$$

Problem 225: Unable to integrate problem.

$$\int \frac{1}{x^2\left(b x^2+a\right)^{3/4}}\,dx$$

Optimal(type 4, 93 leaves, 3 steps):

$$-\frac{(b x^2+a)^{1/4}}{a x}-\frac{\left(1+\frac{b x^2}{a}\right)^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}}{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)(b x^2+a)^{3/4}\sqrt{a}}$$

Result(type 8, 58 leaves):

$$-\frac{(b x^2+a)^{1/4}}{a x}+\frac{\left(\int -\frac{b}{2 a\left((b x^2+a)^3\right)^{1/4}}\,\mathrm{d}x\right)\left((b x^2+a)^3\right)^{1/4}}{(b x^2+a)^{3/4}}$$

Problem 226: Unable to integrate problem.

$$\int \frac{1}{x^4 (b x^2+a)^{3/4}}\,\mathrm{d}x$$

Optimal(type 4, 111 leaves, 4 steps):

$$-\frac{(b x^2+a)^{1/4}}{3 a x^3}+\frac{5 b (b x^2+a)^{1/4}}{6 a^2 x}+\frac{5 b^{3/2}\left(1+\frac{b x^2}{a}\right)^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{6\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)a^{3/2}(b x^2+a)^{3/4}}$$

Result(type 8, 70 leaves):

$$-\frac{(b x^2+a)^{1/4}(-5 b x^2+2 a)}{6 a^2 x^3}+\frac{\left(\int \frac{5 b^2}{12 a^2\left((b x^2+a)^3\right)^{1/4}}\,\mathrm{d}x\right)\left((b x^2+a)^3\right)^{1/4}}{(b x^2+a)^{3/4}}$$

Problem 227: Unable to integrate problem.

$$\int \frac{x^4}{(-b x^2+a)^{3/4}}\,\mathrm{d}x$$

Optimal(type 4, 113 leaves, 4 steps):

$$-\frac{4 a x \left(-b x^{2}+a\right)^{1/4}}{7 b^{2}}-\frac{2 x^{3} \left(-b x^{2}+a\right)^{1/4}}{7 b}+\frac{8 a^{5/2} \left(1-\frac{b x^{2}}{a}\right)^{3/4} \sqrt{\cos\left(\frac{\arcsin\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^{2}}\ \mathrm{EllipticF}\left(\sin\left(\frac{\arcsin\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)}{7 \cos\left(\frac{\arcsin\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{5/2} \left(-b x^{2}+a\right)^{3/4}}$$

Result(type 8, 101 leaves):

$$-\frac{2 x \left(b x^{2}+2 a\right) \left(-b x^{2}+a\right)^{1/4} \left(\left(-b x^{2}+a\right)^{3}\right)^{1/4}}{7 b^{2} \left(-\left(b x^{2}-a\right)^{3}\right)^{1/4}}+\frac{\left(\int \frac{4 a^{2}}{7 b^{2} \left(-\left(b x^{2}-a\right)^{3}\right)^{1/4}}\, dx\right) \left(\left(-b x^{2}+a\right)^{3}\right)^{1/4}}{\left(-b x^{2}+a\right)^{3/4}}$$

Problem 228: Unable to integrate problem.

$$\int \frac{1}{x^{2} \left(-b x^{2}+a\right)^{3/4}}\, dx$$

Optimal(type 4, 95 leaves, 3 steps):

$$-\frac{\left(-b x^{2}+a\right)^{1/4}}{a x}+\frac{\left(1-\frac{b x^{2}}{a}\right)^{3/4} \sqrt{\cos\left(\frac{\arcsin\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^{2}}\ \mathrm{EllipticF}\left(\sin\left(\frac{\arcsin\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{b}}{\cos\left(\frac{\arcsin\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) \left(-b x^{2}+a\right)^{3/4} \sqrt{a}}$$

Result(type 8, 92 leaves):

$$-\frac{\left(-b x^{2}+a\right)^{1/4} \left(\left(-b x^{2}+a\right)^{3}\right)^{1/4}}{a x \left(-\left(b x^{2}-a\right)^{3}\right)^{1/4}}+\frac{\left(\int \frac{b}{2 a \left(-\left(b x^{2}-a\right)^{3}\right)^{1/4}}\, dx\right) \left(\left(-b x^{2}+a\right)^{3}\right)^{1/4}}{\left(-b x^{2}+a\right)^{3/4}}$$

Problem 229: Unable to integrate problem.

$$\int \frac{x^{6}}{\left(b x^{2}+a\right)^{5/4}}\, dx$$

Optimal(type 4, 129 leaves, 5 steps):

$$\frac{8 a^{2} x}{3 b^{3} \left(b x^{2}+a\right)^{1/4}}-\frac{4 a x^{3}}{9 b^{2} \left(b x^{2}+a\right)^{1/4}}+\frac{2 x^{5}}{9 b \left(b x^{2}+a\right)^{1/4}}$$

$$-\frac{16 a^{5/2}\left(1+\frac{b x^2}{a}\right)^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\operatorname{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{3\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{7/2}\left(b x^2+a\right)^{1/4}}$$

Result(type 8, 66 leaves):

$$-\frac{2 x\left(-b x^2+3 a\right)\left(b x^2+a\right)^{3/4}}{9 b^3}+\int \frac{a^2\left(5 b x^2+2 a\right)}{3 b^4\left(x^2+\frac{a}{b}\right)\left(b x^2+a\right)^{1/4}}\,dx$$

Problem 230: Unable to integrate problem.

$$\int \frac{1}{x^4\left(b x^2+a\right)^{5/4}}\,dx$$

Optimal(type 4, 111 leaves, 4 steps):

$$-\frac{1}{3 a x^3\left(b x^2+a\right)^{1/4}}+\frac{7 b}{6 a^2 x\left(b x^2+a\right)^{1/4}}+\frac{7 b^{3/2}\left(1+\frac{b x^2}{a}\right)^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\operatorname{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{2\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{5/2}\left(b x^2+a\right)^{1/4}}$$

Result(type 8, 66 leaves):

$$-\frac{\left(b x^2+a\right)^{3/4}\left(-9 b x^2+2 a\right)}{6 a^3 x^3}+\int -\frac{b\left(3 b x^2-a\right)}{4 a^3\left(x^2+\frac{a}{b}\right)\left(b x^2+a\right)^{1/4}}\,dx$$

Problem 231: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(3 x^2+2\right)^{1/4}}\,dx$$

Optimal(type 4, 61 leaves, 2 steps):

$$\frac{2x}{(3x^2+2)^{1/4}} - \frac{2\,2^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right), \sqrt{2}\right)\sqrt{3}}{3\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

Result(type 5, 17 leaves):

$$\frac{2^{3/4}\,x\,\mathrm{hypergeom}\left(\left[\frac{1}{4}, \frac{1}{2}\right], \left[\frac{3}{2}\right], -\frac{3x^2}{2}\right)}{2}$$

Problem 232: Result unnecessarily involves higher level functions.

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

Optimal(type 4, 75 leaves, 3 steps):

$$\frac{3x}{2\,(3x^2+2)^{1/4}} - \frac{(3x^2+2)^{3/4}}{2x} - \frac{2^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right), \sqrt{2}\right)\sqrt{3}}{2\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

Result(type 5, 32 leaves):

$$-\frac{(3x^2+2)^{3/4}}{2x} + \frac{3\,2^{3/4}\,x\,\mathrm{hypergeom}\left(\left[\frac{1}{4}, \frac{1}{2}\right], \left[\frac{3}{2}\right], -\frac{3x^2}{2}\right)}{8}$$

Problem 233: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^6\,(-3x^2+2)^{1/4}}\,dx$$

Optimal(type 4, 91 leaves, 4 steps):

$$-\frac{(-3x^2+2)^{3/4}}{10x^5}-\frac{7(-3x^2+2)^{3/4}}{40x^3}-\frac{63(-3x^2+2)^{3/4}}{160x}-\frac{63\sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\,\mathrm{EllipticE}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right),\sqrt{2}\right)\sqrt{3}\,2^{1/4}}{160\cos\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

Result(type 5, 49 leaves):

$$\frac{189x^6-42x^4-8x^2-32}{160x^5(-3x^2+2)^{1/4}}-\frac{189\,2^{3/4}\,x\,\mathrm{hypergeom}\left(\left[\frac{1}{4},\frac{1}{2}\right],\left[\frac{3}{2}\right],\frac{3x^2}{2}\right)}{640}$$

Problem 234: Result unnecessarily involves higher level functions.

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

Optimal(type 4, 75 leaves, 3 steps):

$$-\frac{8x(3x^2+2)^{1/4}}{63}+\frac{2x^3(3x^2+2)^{1/4}}{21}+\frac{16\,2^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\,\mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right),\sqrt{2}\right)\sqrt{3}}{189\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

Result(type 5, 37 leaves):

$$\frac{2x(3x^2-4)(3x^2+2)^{1/4}}{63}+\frac{8\,2^{1/4}\,x\,\mathrm{hypergeom}\left(\left[\frac{1}{2},\frac{3}{4}\right],\left[\frac{3}{2}\right],-\frac{3x^2}{2}\right)}{63}$$

Problem 235: Result unnecessarily involves higher level functions.

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

Optimal(type 4, 61 leaves, 2 steps):

$$\frac{2x\left(3x^2+2\right)^{1/4}}{9}-\frac{4\,2^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\ \mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right),\sqrt{2}\right)\sqrt{3}}{27\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

Result(type 5, 30 leaves):

$$\frac{2x\left(3x^2+2\right)^{1/4}}{9}-\frac{2\,2^{1/4}x\,\mathrm{hypergeom}\left(\left[\frac{1}{2},\frac{3}{4}\right],\left[\frac{3}{2}\right],-\frac{3x^2}{2}\right)}{9}$$

Problem 236: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\left(3x^2+2\right)^{3/4}}\,dx$$

Optimal(type 4, 63 leaves, 2 steps):

$$-\frac{\left(3x^2+2\right)^{1/4}}{2x}-\frac{2^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\ \mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right),\sqrt{2}\right)\sqrt{3}}{4\cos\left(\frac{\arctan\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

Result(type 5, 32 leaves):

$$-\frac{\left(3x^2+2\right)^{1/4}}{2x}-\frac{3\,2^{1/4}x\,\mathrm{hypergeom}\left(\left[\frac{1}{2},\frac{3}{4}\right],\left[\frac{3}{2}\right],-\frac{3x^2}{2}\right)}{8}$$

Problem 237: Result unnecessarily involves higher level functions.

$$\int\frac{x^6}{\left(3x^2-2\right)^{1/4}}\,dx$$

Optimal(type 4, 290 leaves, 7 steps):

$$\frac{32x\left(3x^2-2\right)^{3/4}}{1053}+\frac{40x^3\left(3x^2-2\right)^{3/4}}{1053}+\frac{2x^5\left(3x^2-2\right)^{3/4}}{39}+\frac{128x\left(3x^2-2\right)^{1/4}}{1053\left(\sqrt{2}+\sqrt{3x^2-2}\right)}$$

$$-\frac{1}{3159\cos\left(2\arctan\left(\frac{(3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)x}\Bigg(128\,2^{1/4}\sqrt{\cos\left(2\arctan\left(\frac{(3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)^2}\,\mathrm{EllipticE}\left(\sin\left(2\arctan\left(\frac{(3x^2-2)^{1/4}2^{3/4}}{2}\right)\right),\right.$$

$$\left.\frac{\sqrt{2}}{2}\right)\left(\sqrt{2}+\sqrt{3x^2-2}\right)\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{3x^2-2}\right)^2}}\,\sqrt{3}\Bigg)$$

$$+\frac{1}{3159\cos\left(2\arctan\left(\frac{(3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)x}\Bigg(64\,2^{1/4}\sqrt{\cos\left(2\arctan\left(\frac{(3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)^2}\,\mathrm{EllipticF}\left(\sin\left(2\arctan\left(\frac{(3x^2-2)^{1/4}2^{3/4}}{2}\right)\right),\right.$$

$$\left.\frac{\sqrt{2}}{2}\right)\left(\sqrt{2}+\sqrt{3x^2-2}\right)\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{3x^2-2}\right)^2}}\,\sqrt{3}\Bigg)$$

Result(type 5, 64 leaves):

$$\frac{2x\,(27x^4+20x^2+16)\,(3x^2-2)^{3/4}}{1053}+\frac{32\,2^{3/4}\left(-\mathrm{signum}\left(-1+\frac{3x^2}{2}\right)\right)^{1/4}x\,\mathrm{hypergeom}\left(\left[\frac{1}{4},\frac{1}{2}\right],\left[\frac{3}{2}\right],\frac{3x^2}{2}\right)}{1053\,\mathrm{signum}\left(-1+\frac{3x^2}{2}\right)^{1/4}}$$

Problem 238: Result unnecessarily involves higher level functions.

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

Optimal(type 4, 264 leaves, 5 steps):

$$-\frac{2x\,(-3x^2-2)^{3/4}}{15}-\frac{8x\,(-3x^2-2)^{1/4}}{15\left(\sqrt{2}+\sqrt{-3x^2-2}\right)}$$

$$-\frac{1}{45\cos\left(2\arctan\left(\frac{(-3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)x}\Bigg(8\,2^{1/4}\sqrt{\cos\left(2\arctan\left(\frac{(-3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)^2}\,\mathrm{EllipticE}\left(\sin\left(2\arctan\left(\frac{(-3x^2-2)^{1/4}2^{3/4}}{2}\right)\right),\right.$$

$$\left.\frac{\sqrt{2}}{2}\right)\left(\sqrt{2}+\sqrt{-3x^2-2}\right)\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-3x^2-2}\right)^2}}\,\sqrt{3}\Bigg)$$

$$+\frac{1}{45\cos\left(2\arctan\left(\frac{(-3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)x}\Bigg(4\,2^{1/4}\sqrt{\cos\left(2\arctan\left(\frac{(-3x^2-2)^{1/4}2^{3/4}}{2}\right)\right)^2}\,\mathrm{EllipticF}\left(\sin\left(2\arctan\left(\frac{(-3x^2-2)^{1/4}2^{3/4}}{2}\right)\right),\right.$$

$$\left.\frac{\sqrt{2}}{2}\right)\left(\sqrt{2}+\sqrt{-3x^2-2}\right)\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-3x^2-2}\right)^2}}\,\sqrt{3}\,\Bigg)$$

Result(type 5, 40 leaves):

$$\frac{2x\left(3x^2+2\right)}{15\left(-3x^2-2\right)^{1/4}}+\frac{2\left(-1\right)^{3/4}2^{3/4}x\,\mathrm{hypergeom}\left(\left[\frac{1}{4},\frac{1}{2}\right],\left[\frac{3}{2}\right],-\frac{3x^2}{2}\right)}{15}$$

Problem 239: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(3x^2-2\right)^{3/4}}\,dx$$

Optimal(type 4, 111 leaves, 2 steps):

$$\frac{\sqrt{\cos\left(2\arctan\left(\frac{\left(3x^2-2\right)^{1/4}2^{3/4}}{2}\right)\right)^2}\,\mathrm{EllipticF}\left(\sin\left(2\arctan\left(\frac{\left(3x^2-2\right)^{1/4}2^{3/4}}{2}\right)\right),\frac{\sqrt{2}}{2}\right)\left(\sqrt{2}+\sqrt{3x^2-2}\right)\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{3x^2-2}\right)^2}}\,2^{3/4}\sqrt{3}}{6\cos\left(2\arctan\left(\frac{\left(3x^2-2\right)^{1/4}2^{3/4}}{2}\right)\right)x}$$

Result(type 5, 39 leaves):

$$\frac{2^{1/4}\left(-\mathrm{signum}\left(-1+\frac{3x^2}{2}\right)\right)^{3/4}x\,\mathrm{hypergeom}\left(\left[\frac{1}{2},\frac{3}{4}\right],\left[\frac{3}{2}\right],\frac{3x^2}{2}\right)}{2\,\mathrm{signum}\left(-1+\frac{3x^2}{2}\right)^{3/4}}$$

Problem 240: Unable to integrate problem.

$$\int (cx)^{7/2}\left(bx^2+a\right)^{1/4}\,dx$$

Optimal(type 4, 149 leaves, 8 steps):

$$\frac{ac\,(cx)^{5/2}\left(bx^2+a\right)^{1/4}}{30b}+\frac{(cx)^{9/2}\left(bx^2+a\right)^{1/4}}{5c}$$

$$-\frac{a^{5/2}c^2\left(1+\frac{a}{bx^2}\right)^{3/4}(cx)^{3/2}\sqrt{\cos\left(\frac{\mathrm{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticF}\left(\sin\left(\frac{\mathrm{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{12\cos\left(\frac{\mathrm{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)b^{3/2}\left(bx^2+a\right)^{3/4}}-\frac{a^2c^3\left(bx^2+a\right)^{1/4}\sqrt{cx}}{12b^2}$$

Result(type 8, 111 leaves):

$$-\frac{\left(-12 b^{2} x^{4}-2 a b x^{2}+5 a^{2}\right)\left(b x^{2}+a\right)^{1/4} c^{3} \sqrt{c x}}{60 b^{2}}+\frac{\left(\int \frac{a^{3}}{24 b^{2}\left(c^{2} x^{2}\left(b x^{2}+a\right)^{3}\right)^{1/4}} d x\right) c^{3} \sqrt{c x}\left(c^{2} x^{2}\left(b x^{2}+a\right)^{3}\right)^{1/4}}{x\left(b x^{2}+a\right)^{3/4}}$$

Problem 241: Unable to integrate problem.

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

Optimal(type 4, 102 leaves, 6 steps):

$$-\frac{\left(1+\frac{a}{b x^{2}}\right)^{3/4}(c x)^{3/2} \sqrt{\cos \left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^{2}} \operatorname{EllipticF}\left(\sin \left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{a} \sqrt{b}}{\cos \left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) c^{2}\left(b x^{2}+a\right)^{3/4}}+\frac{\left(b x^{2}+a\right)^{1/4} \sqrt{c x}}{c}$$

Result(type 8, 73 leaves):

$$\frac{\left(b x^{2}+a\right)^{1/4} x}{\sqrt{c x}}+\frac{\left(\int \frac{a}{2\left(c^{2} x^{2}\left(b x^{2}+a\right)^{3}\right)^{1/4}} d x\right)\left(c^{2} x^{2}\left(b x^{2}+a\right)^{3}\right)^{1/4}}{\sqrt{c x}\left(b x^{2}+a\right)^{3/4}}$$

Problem 242: Unable to integrate problem.

$$\int \frac{\left(b x^{2}+a\right)^{1/4}}{(c x)^{13/2}} d x$$

Optimal(type 4, 151 leaves, 8 steps):

$$-\frac{2\left(b x^{2}+a\right)^{1/4}}{11 c(c x)^{11/2}}-\frac{2 b\left(b x^{2}+a\right)^{1/4}}{77 a c^{3}(c x)^{7/2}}+\frac{4 b^{2}\left(b x^{2}+a\right)^{1/4}}{77 a^{2} c^{5}(c x)^{3/2}}$$
$$-\frac{8 b^{7/2}\left(1+\frac{a}{b x^{2}}\right)^{3/4}(c x)^{3/2} \sqrt{\cos \left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^{2}} \operatorname{EllipticF}\left(\sin \left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)}{77 \cos \left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{5/2} c^{8}\left(b x^{2}+a\right)^{3/4}}$$

Result(type 8, 110 leaves):

$$-\frac{2\left(b x^{2}+a\right)^{1/4}\left(-2 b^{2} x^{4}+a b x^{2}+7 a^{2}\right)}{77 x^{5} a^{2} c^{6} \sqrt{c x}}+\frac{\left(\int \frac{4 b^{3}}{77 a^{2}\left(c^{2} x^{2}\left(b x^{2}+a\right)^{3}\right)^{1/4}} d x\right)\left(c^{2} x^{2}\left(b x^{2}+a\right)^{3}\right)^{1/4}}{c^{6} \sqrt{c x}\left(b x^{2}+a\right)^{3/4}}$$

Problem 243: Unable to integrate problem.

$$\int (c x)^{5/2}\left(-b x^{2}+a\right)^{1/4} d x$$

Optimal(type 3, 246 leaves, 13 steps):

$$-\frac{a c (c x)^{3/2}\left(-b x^{2}+a\right)^{1/4}}{16 b}+\frac{(c x)^{7/2}\left(-b x^{2}+a\right)^{1/4}}{4 c}+\frac{3 a^{2} c^{5/2} \arctan\left(-1+\frac{b^{1/4} \sqrt{2} \sqrt{c x}}{\left(-b x^{2}+a\right)^{1/4} \sqrt{c}}\right) \sqrt{2}}{64 b^{7/4}}$$
$$+\frac{3 a^{2} c^{5/2} \arctan\left(1+\frac{b^{1/4} \sqrt{2} \sqrt{c x}}{\left(-b x^{2}+a\right)^{1/4} \sqrt{c}}\right) \sqrt{2}}{64 b^{7/4}}+\frac{3 a^{2} c^{5/2} \ln\left(\sqrt{c}-\frac{b^{1/4} \sqrt{2} \sqrt{c x}}{\left(-b x^{2}+a\right)^{1/4}}+\frac{x \sqrt{b} \sqrt{c}}{\sqrt{-b x^{2}+a}}\right) \sqrt{2}}{128 b^{7/4}}$$
$$-\frac{3 a^{2} c^{5/2} \ln\left(\sqrt{c}+\frac{b^{1/4} \sqrt{2} \sqrt{c x}}{\left(-b x^{2}+a\right)^{1/4}}+\frac{x \sqrt{b} \sqrt{c}}{\sqrt{-b x^{2}+a}}\right) \sqrt{2}}{128 b^{7/4}}$$

Result(type 8, 162 leaves):

$$-\frac{x\left(-4 b x^{2}+a\right)\left(-b x^{2}+a\right)^{1/4} c^{2} \sqrt{c x}\left(\left(-b x^{2}+a\right)^{3}\right)^{1/4}}{16 b\left(-\left(b x^{2}-a\right)^{3}\right)^{1/4}}+\frac{\left(\int \frac{3 a^{2} x}{32 b\left(-c^{2} x^{2}\left(b x^{2}-a\right)^{3}\right)^{1/4}} d x\right) c^{2} \sqrt{c x}\left(\left(-b x^{2}+a\right)^{3}\right)^{1/4}\left(-c^{2} x^{2}\left(b x^{2}-a\right)^{3}\right)^{1/4}}{x\left(-b x^{2}+a\right)^{3/4}\left(-\left(b x^{2}-a\right)^{3}\right)^{1/4}}$$

Problem 245: Unable to integrate problem.

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

Optimal(type 3, 59 leaves, 5 steps):

$$\frac{\arctan\left(\frac{b^{1/4} \sqrt{c x}}{\left(b x^{2}+a\right)^{1/4} \sqrt{c}}\right)}{b^{1/4} \sqrt{c}}+\frac{\operatorname{arctanh}\left(\frac{b^{1/4} \sqrt{c x}}{\left(b x^{2}+a\right)^{1/4} \sqrt{c}}\right)}{b^{1/4} \sqrt{c}}$$

Result(type 8, 17 leaves):

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

Problem 247: Unable to integrate problem.

$$\int \frac{1}{(cx)^{3/2}\,(bx^2+a)^{1/4}}\, dx$$

Optimal(type 4, 103 leaves, 4 steps):

$$-\frac{2}{c\,(bx^2+a)^{1/4}\sqrt{cx}}+\frac{2\left(1+\frac{a}{bx^2}\right)^{1/4}\sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}\,\sqrt{cx}}{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)c^2\,(bx^2+a)^{1/4}\sqrt{a}}$$

Result(type 8, 82 leaves):

$$-\frac{2\,(bx^2+a)^{3/4}}{ac\sqrt{cx}}+\frac{\left(\int\frac{2bx}{a\,((bx^2+a)\,c^2x^2)^{1/4}}\,dx\right)((bx^2+a)\,c^2x^2)^{1/4}}{c\sqrt{cx}\,(bx^2+a)^{1/4}}$$

Problem 248: Unable to integrate problem.

$$\int \frac{(cx)^{3/2}}{(-bx^2+a)^{1/4}}\, dx$$

Optimal(type 3, 217 leaves, 12 steps):

$$\frac{a c^{3/2}\arctan\left(-1+\frac{b^{1/4}\sqrt{2}\,\sqrt{cx}}{(-bx^2+a)^{1/4}\sqrt{c}}\right)\sqrt{2}}{8b^{5/4}}+\frac{a c^{3/2}\arctan\left(1+\frac{b^{1/4}\sqrt{2}\,\sqrt{cx}}{(-bx^2+a)^{1/4}\sqrt{c}}\right)\sqrt{2}}{8b^{5/4}}-\frac{a c^{3/2}\ln\left(\sqrt{c}-\frac{b^{1/4}\sqrt{2}\,\sqrt{cx}}{(-bx^2+a)^{1/4}}+\frac{x\sqrt{b}\,\sqrt{c}}{\sqrt{-bx^2+a}}\right)\sqrt{2}}{16b^{5/4}}$$
$$+\frac{a c^{3/2}\ln\left(\sqrt{c}+\frac{b^{1/4}\sqrt{2}\,\sqrt{cx}}{(-bx^2+a)^{1/4}}+\frac{x\sqrt{b}\,\sqrt{c}}{\sqrt{-bx^2+a}}\right)\sqrt{2}}{16b^{5/4}}-\frac{c\,(-bx^2+a)^{3/4}\sqrt{cx}}{2b}$$

Result(type 8, 84 leaves):

$$-\frac{c\,(-bx^2+a)^{3/4}\sqrt{cx}}{2b}+\frac{\left(\int\frac{a}{4b\,(c^2x^2(-bx^2+a))^{1/4}}\,dx\right)c\sqrt{cx}\,(c^2x^2(-bx^2+a))^{1/4}}{x\,(-bx^2+a)^{1/4}}$$

Problem 250: Unable to integrate problem.

$$\int \frac{(cx)^{5/2}}{(-bx^2+a)^{1/4}}\, dx$$

Optimal(type 4, 131 leaves, 5 steps):

$$-\frac{c (c x)^{3/2} (-b x^2+a)^{3/4}}{3 b}-\frac{a c^3 (-b x^2+a)^{3/4}}{2 b^2 \sqrt{c x}}+\frac{a^{3/2} c^2 \left(1-\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\, \operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{c x}}{2 \cos\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{3/2} (-b x^2+a)^{1/4}}$$

Result(type 8, 90 leaves):

$$-\frac{x (-b x^2+a)^{3/4} c^2 \sqrt{c x}}{3 b}+\frac{\left(\int \frac{a x}{2 b (c^2 x^2 (-b x^2+a))^{1/4}}\, dx\right) c^2 \sqrt{c x}\, (c^2 x^2 (-b x^2+a))^{1/4}}{x (-b x^2+a)^{1/4}}$$

Problem 251: Unable to integrate problem.

$$\int \frac{1}{(c x)^{3/2} (-b x^2+a)^{1/4}}\, dx$$

Optimal(type 4, 85 leaves, 3 steps):

$$-\frac{2 \left(1-\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\, \operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{b}\, \sqrt{c x}}{\cos\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) c^2 (-b x^2+a)^{1/4} \sqrt{a}}$$

Result(type 8, 86 leaves):

$$-\frac{2 (-b x^2+a)^{3/4}}{a c \sqrt{c x}}+\frac{\left(\int -\frac{2 b x}{a (c^2 x^2 (-b x^2+a))^{1/4}}\, dx\right) (c^2 x^2 (-b x^2+a))^{1/4}}{c \sqrt{c x}\, (-b x^2+a)^{1/4}}$$

Problem 252: Unable to integrate problem.

$$\int \frac{1}{(c x)^{9/2} (-b x^2+a)^{3/4}}\, dx$$

Optimal(type 4, 133 leaves, 7 steps):

$$-\frac{2\left(-b x^2+a\right)^{1/4}}{7 a c (c x)^{7/2}}-\frac{4 b\left(-b x^2+a\right)^{1/4}}{7 a^2 c^3 (c x)^{3/2}}-\frac{8 b^{5/2}\left(1-\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \sqrt{\cos\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\, \operatorname{EllipticF}\left(\sin\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)}{7 \cos\left(\frac{\operatorname{arccsc}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{5/2} c^6 \left(-b x^2+a\right)^{3/4}}$$

Result(type 8, 160 leaves):

$$-\frac{2\left(-b x^2+a\right)^{1/4}\left(2 b x^2+a\right)\left(\left(-b x^2+a\right)^3\right)^{1/4}}{7 a^2 x^3 \sqrt{c x}\left(-\left(b x^2-a\right)^3\right)^{1/4} c^4}+\frac{\left(\int \frac{4 b^2}{7 a^2\left(-c^2 x^2\left(b x^2-a\right)^3\right)^{1/4}}\, dx\right)\left(\left(-b x^2+a\right)^3\right)^{1/4}\left(-c^2 x^2\left(b x^2-a\right)^3\right)^{1/4}}{\sqrt{c x}\left(-b x^2+a\right)^{3/4}\left(-\left(b x^2-a\right)^3\right)^{1/4} c^4}$$

Problem 255: Unable to integrate problem.

$$\int \frac{(c x)^{5/2}}{\left(b x^2+a\right)^{5/4}}\, dx$$

Optimal(type 4, 103 leaves, 4 steps):

$$\frac{c (c x)^{3/2}}{b\left(b x^2+a\right)^{1/4}}+\frac{3 c^2\left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\, \operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{a} \sqrt{c x}}{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{3/2}\left(b x^2+a\right)^{1/4}}$$

Result(type 8, 17 leaves):

$$\int \frac{(c x)^{5/2}}{\left(b x^2+a\right)^{5/4}}\, dx$$

Problem 256: Unable to integrate problem.

$$\int \frac{\sqrt{c x}}{\left(b x^2+a\right)^{5/4}}\, dx$$

Optimal(type 4, 80 leaves, 3 steps):

$$-\frac{2\left(1+\frac{a}{b x^2}\right)^{1/4}\sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{c x}}{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)\left(b x^2+a\right)^{1/4}\sqrt{a}\,\sqrt{b}}$$

Result(type 8, 17 leaves):

$$\int \frac{\sqrt{c x}}{\left(b x^2+a\right)^{5/4}}\, dx$$

Problem 257: Unable to integrate problem.

$$\int \frac{1}{(c x)^{3/2}\left(b x^2+a\right)^{5/4}}\, dx$$

Optimal(type 4, 106 leaves, 4 steps):

$$-\frac{2}{a c\left(b x^2+a\right)^{1/4}\sqrt{c x}}+\frac{4\left(1+\frac{a}{b x^2}\right)^{1/4}\sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}\,\sqrt{c x}}{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)a^{3/2}c^2\left(b x^2+a\right)^{1/4}}$$

Result(type 8, 99 leaves):

$$-\frac{2\left(b x^2+a\right)^{3/4}}{a^2 c\sqrt{c x}}+\frac{\left(\int \frac{x\left(2 b x^2+a\right)}{a^2\left(x^2+\frac{a}{b}\right)\left(\left(b x^2+a\right)c^2x^2\right)^{1/4}}\, dx\right)\left(\left(b x^2+a\right)c^2x^2\right)^{1/4}}{c\sqrt{c x}\left(b x^2+a\right)^{1/4}}$$

Problem 258: Unable to integrate problem.

$$\int \frac{1}{(c x)^{7/2}\left(b x^2+a\right)^{5/4}}\, dx$$

Optimal(type 4, 129 leaves, 5 steps):

$$-\frac{2}{5 a c (c x)^{5/2}\left(b x^2+a\right)^{1/4}}+\frac{12 b}{5 a^2 c^3\left(b x^2+a\right)^{1/4}\sqrt{c x}}$$

$$-\frac{24 b^{3/2} \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \text{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)\sqrt{c x}}{5\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{5/2} c^4 \left(b x^2+a\right)^{1/4}}$$

Result(type 8, 114 leaves):

$$-\frac{2\left(b x^2+a\right)^{3/4}\left(-7 b x^2+a\right)}{5 a^3 x^2 c^3 \sqrt{c x}}+\frac{\left(\int -\frac{b x\left(14 b x^2+9 a\right)}{5 a^3\left(x^2+\frac{a}{b}\right)\left(\left(b x^2+a\right) c^2 x^2\right)^{1/4}}\, dx\right)\left(\left(b x^2+a\right) c^2 x^2\right)^{1/4}}{c^3\sqrt{c x}\left(b x^2+a\right)^{1/4}}$$

Problem 259: Unable to integrate problem.

$$\int \frac{1}{(c x)^{11/2}\left(b x^2+a\right)^{5/4}}\, dx$$

Optimal(type 4, 154 leaves, 6 steps):

$$-\frac{2}{9 a c (c x)^{9/2}\left(b x^2+a\right)^{1/4}}+\frac{4 b}{9 a^2 c^3 (c x)^{5/2}\left(b x^2+a\right)^{1/4}}-\frac{8 b^2}{3 a^3 c^5\left(b x^2+a\right)^{1/4}\sqrt{c x}}$$
$$+\frac{16 b^{5/2} \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \text{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)\sqrt{c x}}{3\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{7/2} c^6 \left(b x^2+a\right)^{1/4}}$$

Result(type 8, 127 leaves):

$$-\frac{2\left(b x^2+a\right)^{3/4}\left(15 b^2 x^4-3 a b x^2+a^2\right)}{9 a^4 x^4 c^5 \sqrt{c x}}+\frac{\left(\int \frac{b^2 x\left(10 b x^2+7 a\right)}{3 a^4\left(x^2+\frac{a}{b}\right)\left(\left(b x^2+a\right) c^2 x^2\right)^{1/4}}\, dx\right)\left(\left(b x^2+a\right) c^2 x^2\right)^{1/4}}{c^5\sqrt{c x}\left(b x^2+a\right)^{1/4}}$$

Problem 260: Unable to integrate problem.

$$\int \frac{1}{(c x)^{3/4}\left(b x^2+a\right)^{1/4}}\, dx$$

Optimal(type 5, 46 leaves, 2 steps):

$$\frac{4\,(c x)^{1/4}\left(1+\frac{b x^2}{a}\right)^{1/4}\mathrm{hypergeom}\left(\left[\frac{1}{8},\frac{1}{4}\right],\left[\frac{9}{8}\right],-\frac{b x^2}{a}\right)}{c\,(b x^2+a)^{1/4}}$$

Result(type 8, 17 leaves):

$$\int \frac{1}{(c x)^{3/4}\,(b x^2+a)^{1/4}}\,dx$$

Problem 261: Unable to integrate problem.

$$\int \frac{(c x)^{5/4}}{(b x^2+a)^{7/4}}\,dx$$

Optimal(type 5, 49 leaves, 2 steps):

$$\frac{4\,(c x)^{9/4}\left(1+\frac{b x^2}{a}\right)^{3/4}\mathrm{hypergeom}\left(\left[\frac{9}{8},\frac{7}{4}\right],\left[\frac{17}{8}\right],-\frac{b x^2}{a}\right)}{9\,a\,c\,(b x^2+a)^{3/4}}$$

Result(type 8, 17 leaves):

$$\int \frac{(c x)^{5/4}}{(b x^2+a)^{7/4}}\,dx$$

Problem 262: Unable to integrate problem.

$$\int \frac{1}{(c x)^{3/4}\,(b x^2+a)^{7/4}}\,dx$$

Optimal(type 5, 49 leaves, 2 steps):

$$\frac{4\,(c x)^{1/4}\left(1+\frac{b x^2}{a}\right)^{3/4}\mathrm{hypergeom}\left(\left[\frac{1}{8},\frac{7}{4}\right],\left[\frac{9}{8}\right],-\frac{b x^2}{a}\right)}{a\,c\,(b x^2+a)^{3/4}}$$

Result(type 8, 17 leaves):

$$\int \frac{1}{(c x)^{3/4}\,(b x^2+a)^{7/4}}\,dx$$

Problem 263: Unable to integrate problem.

$$\int x^2\,(b x^2+a)^{1/6}\,dx$$

Optimal(type 4, 247 leaves, 5 steps):

$$\frac{3ax(bx^2+a)^{1/6}}{40b}+\frac{3x^3(bx^2+a)^{1/6}}{10}-\frac{1}{40b^2x\left(\frac{a}{bx^2+a}\right)^{1/3}\sqrt{\frac{-1+\left(\frac{a}{bx^2+a}\right)^{1/3}}{\left(1-\left(\frac{a}{bx^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}}\Bigg(3\,3^{3/4}a^2(bx^2+a)^{1/6}\Bigg(1-\left(\frac{a}{bx^2+a}\right)^{1/3}\Bigg)\mathrm{EllipticF}\left(\frac{1-\left(\frac{a}{bx^2+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{bx^2+a}\right)^{1/3}-\sqrt{3}},2\mathrm{I}-\mathrm{I}\sqrt{3}\right)\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\sqrt{\frac{1+\left(\frac{a}{bx^2+a}\right)^{1/3}+\left(\frac{a}{bx^2+a}\right)^{2/3}}{\left(1-\left(\frac{a}{bx^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}\Bigg)$$

```
Result(type 8, 66 leaves):
```

$$\frac{3x(4bx^2+a)(bx^2+a)^{1/6}}{40b}+\frac{\left(\int -\frac{3a^2}{40b\left((bx^2+a)^5\right)^{1/6}}\,dx\right)\left((bx^2+a)^5\right)^{1/6}}{(bx^2+a)^{5/6}}$$

```
Problem 264: Unable to integrate problem.
```

$$\int \frac{(bx^2+a)^{1/6}}{x^2}\,dx$$

```
Optimal(type 4, 225 leaves, 4 steps):
```

$$-\frac{(bx^2+a)^{1/6}}{x}+\frac{1}{3x\left(\frac{a}{bx^2+a}\right)^{1/3}\sqrt{\frac{-1+\left(\frac{a}{bx^2+a}\right)^{1/3}}{\left(1-\left(\frac{a}{bx^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}}\Bigg((bx^2+a)^{1/6}\Bigg(1-\left(\frac{a}{bx^2+a}\right)^{1/3}\Bigg)\mathrm{EllipticF}\left(\frac{1-\left(\frac{a}{bx^2+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{bx^2+a}\right)^{1/3}-\sqrt{3}},2\mathrm{I}-\mathrm{I}\sqrt{3}\right)\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\sqrt{\frac{1+\left(\frac{a}{bx^2+a}\right)^{1/3}+\left(\frac{a}{bx^2+a}\right)^{2/3}}{\left(1-\left(\frac{a}{bx^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}\,3^{3/4}\Bigg)$$

```
Result(type 8, 52 leaves):
```

$$-\frac{(b x^2+a)^{1/6}}{x}+\frac{\left(\int \frac{b}{3\left((b x^2+a)^5\right)^{1/6}}\,dx\right)\left((b x^2+a)^5\right)^{1/6}}{(b x^2+a)^{5/6}}$$

```
Problem 265: Unable to integrate problem.
```

$$\int \frac{(b x^2+a)^{1/6}}{x^4}\,dx$$

```
Optimal(type 4, 247 leaves, 5 steps):
```

$$-\frac{(b x^2+a)^{1/6}}{3 x^3}-\frac{b (b x^2+a)^{1/6}}{9 a x}-\frac{1}{27 a x \left(\frac{a}{b x^2+a}\right)^{1/3}\sqrt{\frac{-1+\left(\frac{a}{b x^2+a}\right)^{1/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}}\left(2 b (b x^2+a)^{1/6}\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}\right)\operatorname{EllipticF}\left(\frac{1-\left(\frac{a}{b x^2+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}}, 2 I-I\sqrt{3}\right)\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\sqrt{\frac{1+\left(\frac{a}{b x^2+a}\right)^{1/3}+\left(\frac{a}{b x^2+a}\right)^{2/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}\,3^{3/4}\right)$$

```
Result(type 8, 69 leaves):
```

$$-\frac{(b x^2+a)^{1/6}(b x^2+3 a)}{9 x^3 a}+\frac{\left(\int -\frac{2 b^2}{27 a\left((b x^2+a)^5\right)^{1/6}}\,dx\right)\left((b x^2+a)^5\right)^{1/6}}{(b x^2+a)^{5/6}}$$

```
Problem 266: Unable to integrate problem.
```

$$\int \frac{1}{x^6 (b x^2+a)^{1/6}}\,dx$$

```
Optimal(type 4, 553 leaves, 9 steps):
```

$$\frac{8 b^3 x}{27 a^3 (b x^2+a)^{1/6}}-\frac{(b x^2+a)^{5/6}}{5 a x^5}+\frac{2 b (b x^2+a)^{5/6}}{9 a^2 x^3}-\frac{8 b^2 (b x^2+a)^{5/6}}{27 a^3 x}+\frac{8 b^3 x}{27 a^2 \left(\frac{a}{b x^2+a}\right)^{2/3}(b x^2+a)^{7/6}\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)}$$

$$-\frac{8 b^{2}\left(1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}\right) \operatorname{EllipticF}\left(\frac{1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}}, 2 I-I \sqrt{3}\right) \sqrt{2} \sqrt{\frac{1+\left(\frac{a}{b x^{2}+a}\right)^{1/3}+\left(\frac{a}{b x^{2}+a}\right)^{2/3}}{\left(1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}\right)^{2}}}\, 3^{3/4}}{81 a^{2} x\left(\frac{a}{b x^{2}+a}\right)^{2/3}\left(b x^{2}+a\right)^{1/6} \sqrt{\frac{-1+\left(\frac{a}{b x^{2}+a}\right)^{1/3}}{\left(1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}\right)^{2}}}}$$

$$+\frac{1}{27 a^{2} x\left(\frac{a}{b x^{2}+a}\right)^{2/3}\left(b x^{2}+a\right)^{1/6} \sqrt{\frac{-1+\left(\frac{a}{b x^{2}+a}\right)^{1/3}}{\left(1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}\right)^{2}}}}\Bigg(4 b^{2}\Bigg(1$$

$$-\left(\frac{a}{b x^{2}+a}\right)^{1/3}\Bigg) \operatorname{EllipticE}\left(\frac{1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}}, 2 I-I \sqrt{3}\right) \sqrt{\frac{1+\left(\frac{a}{b x^{2}+a}\right)^{1/3}+\left(\frac{a}{b x^{2}+a}\right)^{2/3}}{\left(1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}\right)^{2}}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right) 3^{1/4}\Bigg)$$

Result(type 8, 58 leaves):

$$-\frac{\left(b x^{2}+a\right)^{5/6}\left(40 b^{2} x^{4}-30 a b x^{2}+27 a^{2}\right)}{135 a^{3} x^{5}}+\int \frac{16 b^{3}}{81 a^{3}\left(b x^{2}+a\right)^{1/6}} d x$$

Problem 267: Unable to integrate problem.

$$\int \frac{1}{\left(b x^{2}+a\right)^{5/6}} d x$$

Optimal(type 4, 212 leaves, 3 steps):

$$\frac{1}{b x\left(\frac{a}{b x^{2}+a}\right)^{1/3} \sqrt{\frac{-1+\left(\frac{a}{b x^{2}+a}\right)^{1/3}}{\left(1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}\right)^{2}}}}\Bigg(3^{3/4}\left(b x^{2}+a\right)^{1/6}\left(1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}\right) \operatorname{EllipticF}\Bigg(\frac{1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{b x^{2}+a}\right)^{1/3}-\sqrt{3}}, 2 I$$

$$-I\sqrt{3}\Bigg)\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\sqrt{\frac{1+\left(\frac{a}{b x^2+a}\right)^{1/3}+\left(\frac{a}{b x^2+a}\right)^{2/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}\Bigg)$$

Result(type 8, 11 leaves):

$$\int\frac{1}{(b x^2+a)^{5/6}}\,dx$$

Problem 268: Unable to integrate problem.

$$\int\frac{1}{x^2\,(b x^2+a)^{5/6}}\,dx$$

Optimal(type 4, 231 leaves, 4 steps):

$$-\frac{(b x^2+a)^{1/6}}{a x}-\frac{1}{3 a x\left(\frac{a}{b x^2+a}\right)^{1/3}\sqrt{\frac{-1+\left(\frac{a}{b x^2+a}\right)^{1/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}}\Bigg(2\,(b x^2+a)^{1/6}\Bigg(1$$

$$-\left(\frac{a}{b x^2+a}\right)^{1/3}\Bigg)\operatorname{EllipticF}\left(\frac{1-\left(\frac{a}{b x^2+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}},2I-I\sqrt{3}\right)\left(\frac{\sqrt{6}}{2}-\frac{\sqrt{2}}{2}\right)\sqrt{\frac{1+\left(\frac{a}{b x^2+a}\right)^{1/3}+\left(\frac{a}{b x^2+a}\right)^{2/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}\,3^{3/4}\Bigg)$$

Result(type 8, 58 leaves):

$$-\frac{(b x^2+a)^{1/6}}{a x}+\frac{\left(\int-\frac{2 b}{3 a\left((b x^2+a)^5\right)^{1/6}}\,dx\right)\left((b x^2+a)^5\right)^{1/6}}{(b x^2+a)^{5/6}}$$

Problem 269: Unable to integrate problem.

$$\int\frac{1}{x^4\,(b x^2+a)^{7/6}}\,dx$$

Optimal(type 4, 546 leaves, 9 steps):

$$\frac{3}{a x^3 (b x^2+a)^{1/6}} - \frac{40 b^2 x}{9 a^3 (b x^2+a)^{1/6}} - \frac{10 (b x^2+a)^{5/6}}{3 a^2 x^3} + \frac{40 b (b x^2+a)^{5/6}}{9 a^3 x} - \frac{40 b^2 x}{9 a^2 \left(\frac{a}{b x^2+a}\right)^{2/3} (b x^2+a)^{7/6} \left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)}$$

$$+ \frac{40 b \left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}\right) \mathrm{EllipticF}\left(\frac{1-\left(\frac{a}{b x^2+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}}, 2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right) \sqrt{2} \sqrt{\frac{1+\left(\frac{a}{b x^2+a}\right)^{1/3}+\left(\frac{a}{b x^2+a}\right)^{2/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}\, 3^{3/4}}{27 a^2 x \left(\frac{a}{b x^2+a}\right)^{2/3} (b x^2+a)^{1/6} \sqrt{\frac{-1+\left(\frac{a}{b x^2+a}\right)^{1/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}}$$

$$- \frac{1}{9 a^2 x \left(\frac{a}{b x^2+a}\right)^{2/3} (b x^2+a)^{1/6} \sqrt{\frac{-1+\left(\frac{a}{b x^2+a}\right)^{1/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}}} \left(20 b \left(1 - \left(\frac{a}{b x^2+a}\right)^{1/3}\right) \mathrm{EllipticE}\left(\frac{1-\left(\frac{a}{b x^2+a}\right)^{1/3}+\sqrt{3}}{1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}}, 2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right) \sqrt{\frac{1+\left(\frac{a}{b x^2+a}\right)^{1/3}+\left(\frac{a}{b x^2+a}\right)^{2/3}}{\left(1-\left(\frac{a}{b x^2+a}\right)^{1/3}-\sqrt{3}\right)^2}} \left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right) 3^{1/4}\right)$$

Result(type 8, 66 leaves):

$$-\frac{(b x^2+a)^{5/6} (-13 b x^2+3 a)}{9 a^3 x^3} + \int -\frac{b (26 b x^2 - a)}{27 a^3 \left(x^2+\frac{a}{b}\right) (b x^2+a)^{1/6}}\, dx$$

Problem 270: Unable to integrate problem.

$$\int x^6 (b x^2+a)^p\, dx$$

Optimal(type 5, 36 leaves, 2 steps):

$$\frac{x^7 (b x^2+a)^{1+p} \mathrm{hypergeom}\left(\left[1, \frac{9}{2}+p\right], \left[\frac{9}{2}\right], -\frac{b x^2}{a}\right)}{7 a}$$

Result(type 8, 15 leaves):

$$\int x^6 (b x^2 + a)^p \, dx$$

Problem 271: Unable to integrate problem.

$$\int x^{7/2} (b x^2 + a)^p \, dx$$

Optimal(type 5, 36 leaves, 2 steps):

$$\frac{2 x^{9/2} (b x^2 + a)^{1+p} \operatorname{hypergeom}\left(\left[1, \frac{13}{4} + p\right], \left[\frac{13}{4}\right], -\frac{b x^2}{a}\right)}{9 a}$$

Result(type 8, 15 leaves):

$$\int x^{7/2} (b x^2 + a)^p \, dx$$

Problem 272: Unable to integrate problem.

$$\int \sqrt{x} \, (b x^2 + a)^p \, dx$$

Optimal(type 5, 36 leaves, 2 steps):

$$\frac{2 x^{3/2} (b x^2 + a)^{1+p} \operatorname{hypergeom}\left(\left[1, \frac{7}{4} + p\right], \left[\frac{7}{4}\right], -\frac{b x^2}{a}\right)}{3 a}$$

Result(type 8, 15 leaves):

$$\int \sqrt{x} \, (b x^2 + a)^p \, dx$$

Problem 273: Unable to integrate problem.

$$\int \frac{(b x^2 + a)^p}{x^{7/2}} \, dx$$

Optimal(type 5, 36 leaves, 2 steps):

$$-\frac{2 (b x^2 + a)^{1+p} \operatorname{hypergeom}\left(\left[1, -\frac{1}{4} + p\right], \left[-\frac{1}{4}\right], -\frac{b x^2}{a}\right)}{5 a x^{5/2}}$$

Result(type 8, 15 leaves):

$$\int \frac{(b x^2 + a)^p}{x^{7/2}} \, dx$$

Problem 274: Unable to integrate problem.

$$\int (c x)^m (b x^2 + a)^p \, dx$$

Optimal(type 5, 64 leaves, 2 steps):

$$\frac{(c x)^{1+m} (b x^2 + a)^p \operatorname{hypergeom}\left(\left[-p, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a}\right)}{c (1+m) \left(1 + \frac{b x^2}{a}\right)^p}$$

Result(type 8, 17 leaves):

$$\int (c x)^m (b x^2 + a)^p \, dx$$

Problem 275: Unable to integrate problem.

$$\int x^{-8-2p} (b x^2 + a)^p \, dx$$

Optimal(type 5, 49 leaves, 2 steps):

$$-\frac{x^{-7-2p} (b x^2 + a)^{1+p} \operatorname{hypergeom}\left(\left[-\frac{5}{2}, 1\right], \left[-\frac{5}{2} - p\right], -\frac{b x^2}{a}\right)}{a (7 + 2p)}$$

Result(type 8, 19 leaves):

$$\int x^{-8-2p} (b x^2 + a)^p \, dx$$

Problem 277: Unable to integrate problem.

$$\int x^{-1-2p} (b x^2 + a)^p \, dx$$

Optimal(type 5, 45 leaves, 2 steps):

$$-\frac{(b x^2 + a)^{1+p} \operatorname{hypergeom}\left([1, 1], [1 - p], -\frac{b x^2}{a}\right)}{2 a p x^{2p}}$$

Result(type 8, 19 leaves):

$$\int x^{-1-2p} (b x^2 + a)^p \, dx$$

Test results for the 96 problems in "1.1.2.3 (a+b x^2)^p (c+d x^2)^q.txt"

Problem 8: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x^2 + a)^3}{(d x^2 + c)^2} \, dx$$

Optimal(type 3, 93 leaves, 4 steps):

$$-\frac{b^2(-3ad+2bc)x}{d^3}+\frac{b^3x^3}{3d^2}-\frac{(-ad+bc)^3x}{2cd^3(dx^2+c)}+\frac{(-ad+bc)^2(ad+5bc)\arctan\left(\frac{x\sqrt{d}}{\sqrt{c}}\right)}{2c^{3/2}d^{7/2}}$$

Result(type 3, 204 leaves):

$$\frac{b^3x^3}{3d^2}+\frac{3b^2ax}{d^2}-\frac{2b^3cx}{d^3}+\frac{xa^3}{2c(dx^2+c)}-\frac{3xa^2b}{2d(dx^2+c)}+\frac{3cxab^2}{2d^2(dx^2+c)}-\frac{c^2xb^3}{2d^3(dx^2+c)}+\frac{\arctan\left(\frac{xd}{\sqrt{cd}}\right)a^3}{2c\sqrt{cd}}+\frac{3\arctan\left(\frac{xd}{\sqrt{cd}}\right)a^2b}{2d\sqrt{cd}}-\frac{9c\arctan\left(\frac{xd}{\sqrt{cd}}\right)ab^2}{2d^2\sqrt{cd}}+\frac{5c^2\arctan\left(\frac{xd}{\sqrt{cd}}\right)b^3}{2d^3\sqrt{cd}}$$

Problem 9: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 116 leaves, 5 steps):

$$\frac{b^3x}{d^3}-\frac{(-ad+bc)^3x}{4cd^3(dx^2+c)^2}+\frac{3(-ad+bc)^2(ad+3bc)x}{8c^2d^3(dx^2+c)}-\frac{3(-ad+bc)\left(4b^2c^2+(ad+bc)^2\right)\arctan\left(\frac{x\sqrt{d}}{\sqrt{c}}\right)}{8c^{5/2}d^{7/2}}$$

Result(type 3, 265 leaves):

$$\frac{b^3x}{d^3}+\frac{3dx^3a^3}{8(dx^2+c)^2c^2}+\frac{3x^3a^2b}{8(dx^2+c)^2c}-\frac{15x^3ab^2}{8d(dx^2+c)^2}+\frac{9cx^3b^3}{8d^2(dx^2+c)^2}+\frac{5xa^3}{8(dx^2+c)^2c}-\frac{3xa^2b}{8d(dx^2+c)^2}-\frac{9cxab^2}{8d^2(dx^2+c)^2}+\frac{7c^2xb^3}{8d^3(dx^2+c)^2}+\frac{3\arctan\left(\frac{xd}{\sqrt{cd}}\right)a^3}{8c^2\sqrt{cd}}+\frac{3\arctan\left(\frac{xd}{\sqrt{cd}}\right)a^2b}{8dc\sqrt{cd}}+\frac{9\arctan\left(\frac{xd}{\sqrt{cd}}\right)ab^2}{8d^2\sqrt{cd}}-\frac{15c\arctan\left(\frac{xd}{\sqrt{cd}}\right)b^3}{8d^3\sqrt{cd}}$$

Problem 11: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 92 leaves, 4 steps):

$$\frac{d^2(-2ad+3bc)x}{b^3}+\frac{d^3x^3}{3b^2}+\frac{(-ad+bc)^3x}{2ab^3(bx^2+a)}+\frac{(-ad+bc)^2(5ad+bc)\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2a^{3/2}b^{7/2}}$$

Result(type 3, 204 leaves):

$$\frac{d^3 x^3}{3 b^2} - \frac{2 d^3 a x}{b^3} + \frac{3 d^2 c x}{b^2} - \frac{x a^2 d^3}{2 b^3 (b x^2 + a)} + \frac{3 x a c d^2}{2 b^2 (b x^2 + a)} - \frac{3 x c^2 d}{2 b (b x^2 + a)} + \frac{x c^3}{2 a (b x^2 + a)} + \frac{5 a^2 \arctan\left(\frac{b x}{\sqrt{a b}}\right) d^3}{2 b^3 \sqrt{a b}} - \frac{9 a \arctan\left(\frac{b x}{\sqrt{a b}}\right) c d^2}{2 b^2 \sqrt{a b}} + \frac{3 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^2 d}{2 b \sqrt{a b}} + \frac{\arctan\left(\frac{b x}{\sqrt{a b}}\right) c^3}{2 a \sqrt{a b}}$$

Problem 12: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x^2 + c)^5}{(b x^2 + a)^3} \, dx$$

Optimal(type 3, 178 leaves, 5 steps):

$$\frac{d^3 (6 a^2 d^2 - 15 a b c d + 10 b^2 c^2) x}{b^5} + \frac{d^4 (-3 a d + 5 b c) x^3}{3 b^4} + \frac{d^5 x^5}{5 b^3} + \frac{(-a d + b c)^5 x}{4 a b^5 (b x^2 + a)^2} + \frac{(-a d + b c)^4 (17 a d + 3 b c) x}{8 a^2 b^5 (b x^2 + a)} + \frac{(-a d + b c)^3 (63 a^2 d^2 + 14 a b c d + 3 b^2 c^2) \arctan\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{8 a^{5/2} b^{11/2}}$$

Result(type 3, 483 leaves):

$$\frac{d^5 x^5}{5 b^3} - \frac{d^5 x^3 a}{b^4} + \frac{5 d^4 x^3 c}{3 b^3} + \frac{6 d^5 a^2 x}{b^5} - \frac{15 d^4 a c x}{b^4} + \frac{10 d^3 c^2 x}{b^3} + \frac{17 a^3 x^3 d^5}{8 b^4 (b x^2 + a)^2} - \frac{65 a^2 x^3 c d^4}{8 b^3 (b x^2 + a)^2} + \frac{45 a x^3 c^2 d^3}{4 b^2 (b x^2 + a)^2} - \frac{25 x^3 c^3 d^2}{4 b (b x^2 + a)^2} + \frac{5 x^3 c^4 d}{8 (b x^2 + a)^2 a} + \frac{3 b x^3 c^5}{8 (b x^2 + a)^2 a^2} + \frac{15 a^4 x d^5}{8 b^5 (b x^2 + a)^2} - \frac{55 a^3 x c d^4}{8 b^4 (b x^2 + a)^2} + \frac{35 a^2 x c^2 d^3}{4 b^3 (b x^2 + a)^2} - \frac{15 a x c^3 d^2}{4 b^2 (b x^2 + a)^2} - \frac{5 x c^4 d}{8 b (b x^2 + a)^2} + \frac{5 x c^5}{8 (b x^2 + a)^2 a} - \frac{63 a^3 \arctan\left(\frac{b x}{\sqrt{a b}}\right) d^5}{8 b^5 \sqrt{a b}} + \frac{175 a^2 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c d^4}{8 b^4 \sqrt{a b}} - \frac{75 a \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^2 d^3}{4 b^3 \sqrt{a b}} + \frac{15 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^3 d^2}{4 b^2 \sqrt{a b}} + \frac{5 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^4 d}{8 b a \sqrt{a b}} + \frac{3 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^5}{8 a^2 \sqrt{a b}}$$

Problem 17: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{b x^2 + a}}{d x^2 + c} \, dx$$

Optimal(type 3, 66 leaves, 5 steps):

$$\frac{\operatorname{arctanh}\left(\frac{x\sqrt{b}}{\sqrt{b x^{2}+a}}\right)\sqrt{b}}{d}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{-a d+b c}}{\sqrt{c}\,\sqrt{b x^{2}+a}}\right)\sqrt{-a d+b c}}{d\sqrt{c}}$$

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Result(type 3, 931 leaves):
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$$\frac{\sqrt{\left(x-\frac{\sqrt{-c d}}{d}\right)^{2} b+\frac{2 b\sqrt{-c d}\left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{2\sqrt{-c d}}$$

$$+\frac{\sqrt{b}\,\ln\left(\frac{\frac{b\sqrt{-c d}}{d}+b\left(x-\frac{\sqrt{-c d}}{d}\right)}{\sqrt{b}}+\sqrt{\left(x-\frac{\sqrt{-c d}}{d}\right)^{2} b+\frac{2 b\sqrt{-c d}\left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}\right)}{2 d}$$

$$-\frac{\ln\left(\frac{\frac{2\,(a d-b c)}{d}+\frac{2 b\sqrt{-c d}\left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+2\sqrt{\frac{a d-b c}{d}}\sqrt{\left(x-\frac{\sqrt{-c d}}{d}\right)^{2} b+\frac{2 b\sqrt{-c d}\left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{x-\frac{\sqrt{-c d}}{d}}\right) a}{2\sqrt{-c d}\sqrt{\frac{a d-b c}{d}}}$$

$$+\frac{\ln\left(\frac{\frac{2\,(a d-b c)}{d}+\frac{2 b\sqrt{-c d}\left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+2\sqrt{\frac{a d-b c}{d}}\sqrt{\left(x-\frac{\sqrt{-c d}}{d}\right)^{2} b+\frac{2 b\sqrt{-c d}\left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{x-\frac{\sqrt{-c d}}{d}}\right) b c}{2\sqrt{-c d}\, d\sqrt{\frac{a d-b c}{d}}}$$

$$-\frac{\sqrt{\left(x+\frac{\sqrt{-c d}}{d}\right)^{2} b-\frac{2 b\sqrt{-c d}\left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{2\sqrt{-c d}}$$

$$+\frac{\sqrt{b}\,\ln\left(\frac{-\frac{b\sqrt{-c d}}{d}+b\left(x+\frac{\sqrt{-c d}}{d}\right)}{\sqrt{b}}+\sqrt{\left(x+\frac{\sqrt{-c d}}{d}\right)^{2} b-\frac{2 b\sqrt{-c d}\left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}\right)}{2 d}$$

$$+\frac{\ln\left(\frac{\frac{2(ad-bc)}{d}-\frac{2b\sqrt{-cd}\left(x+\frac{\sqrt{-cd}}{d}\right)}{d}+2\sqrt{\frac{ad-bc}{d}}\sqrt{\left(x+\frac{\sqrt{-cd}}{d}\right)^2 b-\frac{2b\sqrt{-cd}\left(x+\frac{\sqrt{-cd}}{d}\right)}{d}+\frac{ad-bc}{d}}}{x+\frac{\sqrt{-cd}}{d}}\right)a}{2\sqrt{-cd}\sqrt{\frac{ad-bc}{d}}}$$

$$-\frac{\ln\left(\frac{\frac{2(ad-bc)}{d}-\frac{2b\sqrt{-cd}\left(x+\frac{\sqrt{-cd}}{d}\right)}{d}+2\sqrt{\frac{ad-bc}{d}}\sqrt{\left(x+\frac{\sqrt{-cd}}{d}\right)^2 b-\frac{2b\sqrt{-cd}\left(x+\frac{\sqrt{-cd}}{d}\right)}{d}+\frac{ad-bc}{d}}}{x+\frac{\sqrt{-cd}}{d}}\right)bc}{2\sqrt{-cd}\,d\sqrt{\frac{ad-bc}{d}}}$$

Problem 19: Result more than twice size of optimal antiderivative.

$$\int \frac{(bx^2+a)^{3/2}}{(dx^2+c)^3}\,dx$$

Optimal(type 3, 93 leaves, 4 steps):

$$\frac{x(bx^2+a)^{3/2}}{4c(dx^2+c)^2}+\frac{3a^2\operatorname{arctanh}\left(\frac{x\sqrt{-ad+bc}}{\sqrt{c}\sqrt{bx^2+a}}\right)}{8c^{5/2}\sqrt{-ad+bc}}+\frac{3ax\sqrt{bx^2+a}}{8c^2(dx^2+c)}$$

Result(type ?, 9058 leaves): Display of huge result suppressed!

Problem 22: Result more than twice size of optimal antiderivative.

$$\int \frac{(bx^2+a)^{5/2}}{dx^2+c}\,dx$$

Optimal(type 3, 131 leaves, 7 steps):

$$\frac{bx(bx^2+a)^{3/2}}{4d}+\frac{(15a^2d^2-20abcd+8b^2c^2)\operatorname{arctanh}\left(\frac{x\sqrt{b}}{\sqrt{bx^2+a}}\right)\sqrt{b}}{8d^3}-\frac{(-ad+bc)^{5/2}\operatorname{arctanh}\left(\frac{x\sqrt{-ad+bc}}{\sqrt{c}\sqrt{bx^2+a}}\right)}{d^3\sqrt{c}}$$

$$-\frac{b(-7ad+4bc)x\sqrt{bx^2+a}}{8d^2}$$

Result(type ?, 3052 leaves): Display of huge result suppressed!

Problem 23: Humongous result has more than 20000 leaves.

$$\int \frac{(b x^2 + a)^{5/2}}{(d x^2 + c)^5}\, dx$$

Optimal(type 3, 221 leaves, 6 steps):

$$-\frac{d x (b x^2 + a)^{7/2}}{8 c (-a d + b c) (d x^2 + c)^4} + \frac{(-7 a d + 8 b c) x (b x^2 + a)^{5/2}}{48 c^2 (-a d + b c) (d x^2 + c)^3} + \frac{5 a (-7 a d + 8 b c) x (b x^2 + a)^{3/2}}{192 c^3 (-a d + b c) (d x^2 + c)^2} + \frac{5 a^3 (-7 a d + 8 b c) \operatorname{arctanh}\left(\frac{x \sqrt{-a d + b c}}{\sqrt{c} \sqrt{b x^2 + a}}\right)}{128 c^{9/2} (-a d + b c)^{3/2}} + \frac{5 a^2 (-7 a d + 8 b c) x \sqrt{b x^2 + a}}{128 c^4 (-a d + b c) (d x^2 + c)}$$

Result(type ?, 28624 leaves): Display of huge result suppressed!

Problem 24: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{b x^2 + a}\, (d x^2 + c)^3}\, dx$$

Optimal(type 3, 143 leaves, 5 steps):

$$\frac{(3 a^2 d^2 - 8 a b c d + 8 b^2 c^2) \operatorname{arctanh}\left(\frac{x \sqrt{-a d + b c}}{\sqrt{c} \sqrt{b x^2 + a}}\right)}{8 c^{5/2} (-a d + b c)^{5/2}} - \frac{d x \sqrt{b x^2 + a}}{4 c (-a d + b c) (d x^2 + c)^2} - \frac{3 d (-a d + 2 b c) x \sqrt{b x^2 + a}}{8 c^2 (-a d + b c)^2 (d x^2 + c)}$$

Result(type 3, 1814 leaves):

$$\frac{3 \sqrt{\left(x - \frac{\sqrt{-c d}}{d}\right)^2 b + \frac{2 b \sqrt{-c d} \left(x - \frac{\sqrt{-c d}}{d}\right)}{d} + \frac{a d - b c}{d}}}{16 c^2 (a d - b c) \left(x - \frac{\sqrt{-c d}}{d}\right)}$$

$$- \frac{3 b \sqrt{-c d} \ln\left(\frac{\frac{2 (a d - b c)}{d} + \frac{2 b \sqrt{-c d} \left(x - \frac{\sqrt{-c d}}{d}\right)}{d} + 2 \sqrt{\frac{a d - b c}{d}} \sqrt{\left(x - \frac{\sqrt{-c d}}{d}\right)^2 b + \frac{2 b \sqrt{-c d} \left(x - \frac{\sqrt{-c d}}{d}\right)}{d} + \frac{a d - b c}{d}}}{x - \frac{\sqrt{-c d}}{d}}\right)}{16 c^2 d (a d - b c) \sqrt{\frac{a d - b c}{d}}}$$

$$+\frac{3\sqrt{\left(x+\frac{\sqrt{-c\,d}}{d}\right)^{2}b-\frac{2\,b\sqrt{-c\,d}\left(x+\frac{\sqrt{-c\,d}}{d}\right)}{d}+\frac{a\,d-b\,c}{d}}}{16\,c^{2}\,(a\,d-b\,c)\left(x+\frac{\sqrt{-c\,d}}{d}\right)}$$

$$+\frac{3\,b\sqrt{-c\,d}\,\ln\left(\frac{\frac{2\,(a\,d-b\,c)}{d}-\frac{2\,b\sqrt{-c\,d}\left(x+\frac{\sqrt{-c\,d}}{d}\right)}{d}+2\sqrt{\frac{a\,d-b\,c}{d}}\sqrt{\left(x+\frac{\sqrt{-c\,d}}{d}\right)^{2}b-\frac{2\,b\sqrt{-c\,d}\left(x+\frac{\sqrt{-c\,d}}{d}\right)}{d}+\frac{a\,d-b\,c}{d}}}{x+\frac{\sqrt{-c\,d}}{d}}\right)}{16\,c^{2}\,d\,(a\,d-b\,c)\sqrt{\frac{a\,d-b\,c}{d}}}$$

$$-\frac{3\ln\left(\frac{\frac{2\,(a\,d-b\,c)}{d}+\frac{2\,b\sqrt{-c\,d}\left(x-\frac{\sqrt{-c\,d}}{d}\right)}{d}+2\sqrt{\frac{a\,d-b\,c}{d}}\sqrt{\left(x-\frac{\sqrt{-c\,d}}{d}\right)^{2}b+\frac{2\,b\sqrt{-c\,d}\left(x-\frac{\sqrt{-c\,d}}{d}\right)}{d}+\frac{a\,d-b\,c}{d}}}{x-\frac{\sqrt{-c\,d}}{d}}\right)}{16\sqrt{-c\,d}\,c^{2}\sqrt{\frac{a\,d-b\,c}{d}}}$$

$$+\frac{3\ln\left(\frac{\frac{2\,(a\,d-b\,c)}{d}-\frac{2\,b\sqrt{-c\,d}\left(x+\frac{\sqrt{-c\,d}}{d}\right)}{d}+2\sqrt{\frac{a\,d-b\,c}{d}}\sqrt{\left(x+\frac{\sqrt{-c\,d}}{d}\right)^{2}b-\frac{2\,b\sqrt{-c\,d}\left(x+\frac{\sqrt{-c\,d}}{d}\right)}{d}+\frac{a\,d-b\,c}{d}}}{x+\frac{\sqrt{-c\,d}}{d}}\right)}{16\sqrt{-c\,d}\,c^{2}\sqrt{\frac{a\,d-b\,c}{d}}}$$

$$+\frac{\sqrt{\left(x-\frac{\sqrt{-c\,d}}{d}\right)^{2}b+\frac{2\,b\sqrt{-c\,d}\left(x-\frac{\sqrt{-c\,d}}{d}\right)}{d}+\frac{a\,d-b\,c}{d}}}{16\sqrt{-c\,d}\,c\,(a\,d-b\,c)\left(x-\frac{\sqrt{-c\,d}}{d}\right)^{2}}-\frac{3\,b\sqrt{\left(x-\frac{\sqrt{-c\,d}}{d}\right)^{2}b+\frac{2\,b\sqrt{-c\,d}\left(x-\frac{\sqrt{-c\,d}}{d}\right)}{d}+\frac{a\,d-b\,c}{d}}}{16\,c\,(a\,d-b\,c)^{2}\left(x-\frac{\sqrt{-c\,d}}{d}\right)}$$

$$-\frac{3 b^2 \ln\left(\frac{\frac{2 (a d-b c)}{d}+\frac{2 b \sqrt{-c d} \left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+2 \sqrt{\frac{a d-b c}{d}} \sqrt{\left(x-\frac{\sqrt{-c d}}{d}\right)^2 b+\frac{2 b \sqrt{-c d} \left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{x-\frac{\sqrt{-c d}}{d}}\right)}{16 \sqrt{-c d} (a d-b c)^2 \sqrt{\frac{a d-b c}{d}}}$$

$$-\frac{b \ln\left(\frac{\frac{2 (a d-b c)}{d}+\frac{2 b \sqrt{-c d} \left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+2 \sqrt{\frac{a d-b c}{d}} \sqrt{\left(x-\frac{\sqrt{-c d}}{d}\right)^2 b+\frac{2 b \sqrt{-c d} \left(x-\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{x-\frac{\sqrt{-c d}}{d}}\right)}{16 \sqrt{-c d}\, c (a d-b c) \sqrt{\frac{a d-b c}{d}}}$$

$$-\frac{\sqrt{\left(x+\frac{\sqrt{-c d}}{d}\right)^2 b-\frac{2 b \sqrt{-c d} \left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{16 \sqrt{-c d}\, c (a d-b c) \left(x+\frac{\sqrt{-c d}}{d}\right)^2}-\frac{3 b \sqrt{\left(x+\frac{\sqrt{-c d}}{d}\right)^2 b-\frac{2 b \sqrt{-c d} \left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{16 c (a d-b c)^2 \left(x+\frac{\sqrt{-c d}}{d}\right)}$$

$$+\frac{3 b^2 \ln\left(\frac{\frac{2 (a d-b c)}{d}-\frac{2 b \sqrt{-c d} \left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+2 \sqrt{\frac{a d-b c}{d}} \sqrt{\left(x+\frac{\sqrt{-c d}}{d}\right)^2 b-\frac{2 b \sqrt{-c d} \left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{x+\frac{\sqrt{-c d}}{d}}\right)}{16 \sqrt{-c d} (a d-b c)^2 \sqrt{\frac{a d-b c}{d}}}$$

$$+\frac{b \ln\left(\frac{\frac{2 (a d-b c)}{d}-\frac{2 b \sqrt{-c d} \left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+2 \sqrt{\frac{a d-b c}{d}} \sqrt{\left(x+\frac{\sqrt{-c d}}{d}\right)^2 b-\frac{2 b \sqrt{-c d} \left(x+\frac{\sqrt{-c d}}{d}\right)}{d}+\frac{a d-b c}{d}}}{x+\frac{\sqrt{-c d}}{d}}\right)}{16 \sqrt{-c d}\, c (a d-b c) \sqrt{\frac{a d-b c}{d}}}$$

Problem 29: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(b x^2 + a)(d x^2 + c)^{3/2}}\, dx$$

Optimal(type 3, 67 leaves, 3 steps):

$$\frac{b \arctan\left(\frac{x\sqrt{-a d + b c}}{\sqrt{a}\,\sqrt{d x^2 + c}}\right)}{(-a d + b c)^{3/2}\sqrt{a}} - \frac{d x}{c\,(-a d + b c)\sqrt{d x^2 + c}}$$

Result(type 3, 627 leaves):

$$-\frac{b}{2\sqrt{-a b}\,(a d - b c)\sqrt{d\left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d\sqrt{-a b}\left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$
$$+ \frac{x d}{2(a d - b c)\, c\sqrt{d\left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d\sqrt{-a b}\left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$
$$+ \frac{b \ln\left(\frac{-\frac{2(a d - b c)}{b} + \frac{2 d\sqrt{-a b}\left(x - \frac{\sqrt{-a b}}{b}\right)}{b} + 2\sqrt{-\frac{a d - b c}{b}}\sqrt{d\left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d\sqrt{-a b}\left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}{x - \frac{\sqrt{-a b}}{b}}\right)}{2\sqrt{-a b}\,(a d - b c)\sqrt{-\frac{a d - b c}{b}}}$$
$$+ \frac{b}{2\sqrt{-a b}\,(a d - b c)\sqrt{d\left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d\sqrt{-a b}\left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$
$$+ \frac{x d}{2(a d - b c)\, c\sqrt{d\left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d\sqrt{-a b}\left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

$$-\frac{b\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{2\sqrt{-ab}\,(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

Problem 30: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 84 leaves, 3 steps):

$$\frac{(-2ad+bc)\arctan\left(\frac{x\sqrt{-ad+bc}}{\sqrt{a}\sqrt{dx^2+c}}\right)}{2a^{3/2}(-ad+bc)^{3/2}}+\frac{bx\sqrt{dx^2+c}}{2a(-ad+bc)\left(bx^2+a\right)}$$

Result(type 3, 822 leaves):

$$-\frac{\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{4a(ad-bc)\left(x-\frac{\sqrt{-ab}}{b}\right)}$$

$$+\frac{d\sqrt{-ab}\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)}{4ab(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{4a(ad-bc)\left(x+\frac{\sqrt{-ab}}{b}\right)}$$

$$-\frac{d\sqrt{-ab}\,\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{4ab(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)}{4a\sqrt{-ab}\sqrt{-\frac{ad-bc}{b}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{4a\sqrt{-ab}\sqrt{-\frac{ad-bc}{b}}}$$

Problem 31: Unable to integrate problem.

$$\int\frac{(-bx^2+a)^{2/3}}{(bx^2+3a)^2}\,dx$$

Optimal(type 4, 464 leaves, 6 steps):

$$\frac{x(-bx^2+a)^{2/3}}{6a(bx^2+3a)}-\frac{x}{6a\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)}$$

$$+\frac{1}{18a^{2/3}bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-bx^2+a)^{1/3}\right)}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\Bigg(\left(a^{1/3}-(-bx^2+a)^{1/3}\right)\text{EllipticF}\left(\frac{-(-bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})},2I\right.$$

$$-I\sqrt{3}\Bigg)\sqrt{\frac{a^{2/3}+a^{1/3}(-bx^2+a)^{1/3}+(-bx^2+a)^{2/3}}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\,3^{3/4}\sqrt{2}\Bigg)-\frac{1}{12a^{2/3}bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-bx^2+a)^{1/3}\right)}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\Bigg(\Big(a^{1/3}$$

$$-(-bx^2+a)^{1/3}\Big)\,\mathrm{EllipticE}\left(\frac{-(-bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})},2I-I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(-bx^2+a)^{1/3}+(-bx^2+a)^{2/3}}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\,\Bigg(\frac{\sqrt{6}}{2}$$

$$+\frac{\sqrt{2}}{2}\Bigg)3^{1/4}\Bigg)$$

Result(type 8, 24 leaves):

$$\int\frac{(-bx^2+a)^{2/3}}{(bx^2+3a)^2}\,dx$$

Problem 32: Unable to integrate problem.

$$\int(-bx^2+a)^{5/3}(bx^2+3a)^2\,dx$$

Optimal(type 4, 505 leaves, 8 steps):

$$\frac{28512a^3x(-bx^2+a)^{2/3}}{8645}+\frac{14256a^2x(-bx^2+a)^{5/3}}{6175}-\frac{306ax(-bx^2+a)^{8/3}}{475}-\frac{3x(-bx^2+a)^{8/3}(bx^2+3a)}{25}$$

$$-\frac{114048a^4x}{8645\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)}+\frac{1}{8645bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-bx^2+a)^{1/3}\right)}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\Bigg(38016\,3^{3/4}a^{13/3}\Big(a^{1/3}-($$

$$-bx^2+a)^{1/3}\Big)\,\mathrm{EllipticF}\left(\frac{-(-bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})},2I-I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(-bx^2+a)^{1/3}+(-bx^2+a)^{2/3}}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\Bigg)$$

$$-\frac{1}{8645bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-bx^2+a)^{1/3}\right)}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}}\Bigg(57024\,3^{1/4}a^{13/3}\Big(a^{1/3}-(-bx^2+a)^{1/}$$

$$^{3}\Big)\,\mathrm{EllipticE}\left(\frac{-(-bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})},2I-I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(-bx^2+a)^{1/3}+(-bx^2+a)^{2/3}}{\left(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)\Bigg)$$

Result(type 8, 63 leaves):

$$\frac{3x(-1729b^3x^6-11011ab^2x^4-6055a^2bx^2+66315a^3)(-bx^2+a)^{2/3}}{43225}+\int\frac{38016a^4}{8645(-bx^2+a)^{1/3}}\,dx$$

Problem 33: Unable to integrate problem.

$$\int (-b x^2 + a)^{5/3} (b x^2 + 3 a)\, dx$$

Optimal(type 4, 480 leaves, 7 steps):

$$\frac{1800 a^2 x (-b x^2 + a)^{2/3}}{1729} + \frac{180 a x (-b x^2 + a)^{5/3}}{247} - \frac{3 x (-b x^2 + a)^{8/3}}{19} - \frac{7200 a^3 x}{1729 \left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)}$$

$$+ \frac{1}{1729 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right)}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}}} \left(2400\, 3^{3/4} a^{10/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right) \text{EllipticF}\left(\frac{-(-b x^2 + a)^{1/3} + a^{1/3} (1 + \sqrt{3})}{-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})}, 2 I - I \sqrt{3}\right) \sqrt{2} \sqrt{\frac{a^{2/3} + a^{1/3} (-b x^2 + a)^{1/3} + (-b x^2 + a)^{2/3}}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}}\right)$$

$$- \frac{1}{1729 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right)}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}}} \left(3600\, 3^{1/4} a^{10/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right) \text{EllipticE}\left(\frac{-(-b x^2 + a)^{1/3} + a^{1/3} (1 + \sqrt{3})}{-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})}, 2 I - I \sqrt{3}\right) \sqrt{\frac{a^{2/3} + a^{1/3} (-b x^2 + a)^{1/3} + (-b x^2 + a)^{2/3}}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}} \left(\frac{\sqrt{6}}{2} + \frac{\sqrt{2}}{2}\right)\right)$$

Result(type 8, 52 leaves):

$$\frac{3 x (-91 b^2 x^4 - 238 a b x^2 + 929 a^2) (-b x^2 + a)^{2/3}}{1729} + \int \frac{2400 a^3}{1729 (-b x^2 + a)^{1/3}}\, dx$$

Problem 34: Unable to integrate problem.

$$\int \frac{(-b x^2 + a)^{5/3}}{b x^2 + 3 a}\, dx$$

Optimal(type 4, 583 leaves, 7 steps):

$$-\frac{3 x (-b x^2 + a)^{2/3}}{7} + \frac{96 a x}{7 \left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)} + \frac{4\, 2^{1/3} a^{7/6} \operatorname{arctanh}\left(\frac{x \sqrt{b}}{a^{1/6} \left(a^{1/3} + 2^{1/3} (-b x^2 + a)^{1/3}\right)}\right)}{\sqrt{b}}$$

$$- \frac{4\, 2^{1/3} a^{7/6} \operatorname{arctanh}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{3 \sqrt{b}} + \frac{4\, 2^{1/3} a^{7/6} \arctan\left(\frac{a^{1/6} \left(a^{1/3} - 2^{1/3} (-b x^2 + a)^{1/3}\right) \sqrt{3}}{x \sqrt{b}}\right) \sqrt{3}}{3 \sqrt{b}} + \frac{4\, 2^{1/3} a^{7/6} \arctan\left(\frac{\sqrt{3} \sqrt{a}}{x \sqrt{b}}\right) \sqrt{3}}{3 \sqrt{b}}$$

$$-\frac{1}{7\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-b\,x^2+a)^{1/3}\right)}{\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\left(32\,3^{3/4}\,a^{4/3}\left(a^{1/3}-(-b\,x^2+a)^{1/3}\right)\mathrm{EllipticF}\left(\frac{-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)},2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(-b\,x^2+a)^{1/3}+(-b\,x^2+a)^{2/3}}{\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\right)+\frac{1}{7\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-b\,x^2+a)^{1/3}\right)}{\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\left(48\,3^{1/4}\,a^{4/3}\left(a^{1/3}-(-b\,x^2+a)^{1/3}\right)\mathrm{EllipticE}\left(\frac{-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)},2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(-b\,x^2+a)^{1/3}+(-b\,x^2+a)^{2/3}}{\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)\right)$$

Result(type 8, 54 leaves):

$$-\frac{3\,x\,(-b\,x^2+a)^{2/3}}{7}+\int -\frac{16\,a\,(2\,b\,x^2-a)}{7\,b\left(x^2+\frac{3\,a}{b}\right)(-b\,x^2+a)^{1/3}}\,dx$$

Problem 35: Unable to integrate problem.

$$\int \frac{(-b\,x^2+a)^{5/3}}{(b\,x^2+3\,a)^2}\,dx$$

Optimal(type 4, 593 leaves, 7 steps):

$$\frac{2\,x\,(-b\,x^2+a)^{2/3}}{3\,(b\,x^2+3\,a)}-\frac{11\,x}{3\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)}-\frac{2^{1/3}\,a^{1/6}\,\mathrm{arctanh}\left(\frac{x\sqrt{b}}{a^{1/6}\left(a^{1/3}+2^{1/3}(-b\,x^2+a)^{1/3}\right)}\right)}{\sqrt{b}}+\frac{2^{1/3}\,a^{1/6}\,\mathrm{arctanh}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{3\sqrt{b}}-\frac{2^{1/3}\,a^{1/6}\arctan\left(\frac{a^{1/6}\left(a^{1/3}-2^{1/3}(-b\,x^2+a)^{1/3}\right)\sqrt{3}}{x\sqrt{b}}\right)\sqrt{3}}{3\sqrt{b}}-\frac{2^{1/3}\,a^{1/6}\arctan\left(\frac{\sqrt{3}\sqrt{a}}{x\sqrt{b}}\right)\sqrt{3}}{3\sqrt{b}}+\frac{1}{9\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-b\,x^2+a)^{1/3}\right)}{\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\left(11\,a^{1/3}\left(a^{1/3}-(-b\,x^2+a)^{1/3}\right)\mathrm{EllipticF}\left(\frac{-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)},2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(-b\,x^2+a)^{1/3}+(-b\,x^2+a)^{2/3}}{\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}\,3^{3/4}\right)-\frac{1}{6\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(-b\,x^2+a)^{1/3}\right)}{\left(-(-b\,x^2+a)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^2}}}\left(11\,a^{1/3}\left(a^{1/3}\right.\right.$$

$$-(-bx^2+a)^{1/3}) \operatorname{EllipticE}\left(\frac{-(-bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2I-I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(-bx^2+a)^{1/3}+(-bx^2+a)^{2/3}}{(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)3^{1/4}\Bigg)$$

Result(type 8, 24 leaves):

$$\int \frac{(-bx^2+a)^{5/3}}{(bx^2+3a)^2}\,dx$$

Problem 36: Unable to integrate problem.

$$\int \frac{(bx^2+3a)^4}{(-bx^2+a)^{1/3}}\,dx$$

Optimal(type 4, 527 leaves, 8 steps):

$$-\frac{1552608a^3x(-bx^2+a)^{2/3}}{43225}-\frac{36288a^2x(-bx^2+a)^{2/3}(bx^2+3a)}{6175}-\frac{18ax(-bx^2+a)^{2/3}(bx^2+3a)^2}{19}-\frac{3x(-bx^2+a)^{2/3}(bx^2+3a)^3}{25}$$
$$-\frac{3794688a^4x}{8645(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))}+\frac{1}{8645bx\sqrt{-\frac{a^{1/3}(a^{1/3}-(-bx^2+a)^{1/3})}{(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}}\Bigg(1264896\,3^{3/4}a^{13/3}(a^{1/3}-($$
$$-bx^2+a)^{1/3}) \operatorname{EllipticF}\left(\frac{-(-bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2I-I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(-bx^2+a)^{1/3}+(-bx^2+a)^{2/3}}{(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}\Bigg)$$
$$-\frac{1}{8645bx\sqrt{-\frac{a^{1/3}(a^{1/3}-(-bx^2+a)^{1/3})}{(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}}\Bigg(1897344\,3^{1/4}a^{13/3}(a^{1/3}-(-bx^2+a)^{1/}$$
$$^{3}) \operatorname{EllipticE}\left(\frac{-(-bx^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2I-I\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(-bx^2+a)^{1/3}+(-bx^2+a)^{2/3}}{(-(-bx^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)\Bigg)$$

Result(type 8, 63 leaves):

$$-\frac{3x(1729b^3x^6+29211ab^2x^4+213255a^2bx^2+941085a^3)(-bx^2+a)^{2/3}}{43225}+\int \frac{1264896a^4}{8645(-bx^2+a)^{1/3}}\,dx$$

Problem 37: Unable to integrate problem.

$$\int \frac{(b x^2 + 3 a)^2}{(-b x^2 + a)^{1/3}} \, dx$$

Optimal(type 4, 473 leaves, 6 steps):

$$-\frac{198 a x (-b x^2 + a)^{2/3}}{91} - \frac{3 x (-b x^2 + a)^{2/3} (b x^2 + 3 a)}{13} - \frac{3240 a^2 x}{91 \left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)}$$

$$+ \frac{1}{91 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right)}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}}} \left(1080\, 3^{3/4} a^{7/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right) \operatorname{EllipticF}\left(\frac{-(-b x^2 + a)^{1/3} + a^{1/3} (1 + \sqrt{3})}{-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})}, 2 I - I \sqrt{3}\right) \sqrt{2} \sqrt{\frac{a^{2/3} + a^{1/3} (-b x^2 + a)^{1/3} + (-b x^2 + a)^{2/3}}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}}\right)$$

$$- \frac{1}{91 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right)}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}}} \left(1620\, 3^{1/4} a^{7/3} \left(a^{1/3} - (-b x^2 + a)^{1/3}\right) \operatorname{EllipticE}\left(\frac{-(-b x^2 + a)^{1/3} + a^{1/3} (1 + \sqrt{3})}{-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})}, 2 I - I \sqrt{3}\right) \sqrt{\frac{a^{2/3} + a^{1/3} (-b x^2 + a)^{1/3} + (-b x^2 + a)^{2/3}}{\left(-(-b x^2 + a)^{1/3} + a^{1/3} (1 - \sqrt{3})\right)^2}} \left(\frac{\sqrt{6}}{2} + \frac{\sqrt{2}}{2}\right)\right)$$

Result(type 8, 41 leaves):

$$-\frac{3 x (7 b x^2 + 87 a) (-b x^2 + a)^{2/3}}{91} + \int \frac{1080 a^2}{91 (-b x^2 + a)^{1/3}} \, dx$$

Problem 38: Unable to integrate problem.

$$\int \frac{1}{(-b x^2 + a)^{1/3} (b x^2 + 3 a)} \, dx$$

Optimal(type 3, 136 leaves, 1 step):

$$\frac{\operatorname{arctanh}\left(\frac{x \sqrt{b}}{a^{1/6} \left(a^{1/3} + 2^{1/3} (-b x^2 + a)^{1/3}\right)}\right) 2^{1/3}}{4 a^{5/6} \sqrt{b}} - \frac{\operatorname{arctanh}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right) 2^{1/3}}{12 a^{5/6} \sqrt{b}} + \frac{\arctan\left(\frac{a^{1/6} \left(a^{1/3} - 2^{1/3} (-b x^2 + a)^{1/3}\right) \sqrt{3}}{x \sqrt{b}}\right) 2^{1/3} \sqrt{3}}{12 a^{5/6} \sqrt{b}}$$

$$+ \frac{\arctan\left(\frac{\sqrt{3} \sqrt{a}}{x \sqrt{b}}\right) 2^{1/3} \sqrt{3}}{12 a^{5/6} \sqrt{b}}$$

Result(type 8, 24 leaves):

$$\int \frac{1}{(-b x^2+a)^{1/3} (b x^2+3 a)}\,dx$$

Problem 39: Unable to integrate problem.

$$\int \frac{b x^2+3 a}{(-b x^2+a)^{4/3}}\,dx$$

Optimal(type 4, 447 leaves, 5 steps):

$$\frac{6 x}{(-b x^2+a)^{1/3}}+\frac{9 x}{-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}-\frac{1}{b x\sqrt{-\frac{a^{1/3}(a^{1/3}-(-b x^2+a)^{1/3})}{(-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}}\Big(3 a^{1/3}(a^{1/3}-(-b x^2+a)^{1/3}) \operatorname{EllipticF}\Big(\frac{-(-b x^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2 I-I\sqrt{3}\Big)\sqrt{2}\sqrt{\frac{a^{2/3}+a^{1/3}(-b x^2+a)^{1/3}+(-b x^2+a)^{2/3}}{(-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}\,3^{3/4}\Big)$$

$$+\frac{1}{2 b x\sqrt{-\frac{a^{1/3}(a^{1/3}-(-b x^2+a)^{1/3})}{(-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}}\Big(9 a^{1/3}(a^{1/3}-(-b x^2+a)^{1/3}) \operatorname{EllipticE}\Big(\frac{-(-b x^2+a)^{1/3}+a^{1/3}(1+\sqrt{3})}{-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3})}, 2 I-I\sqrt{3}\Big)\sqrt{\frac{a^{2/3}+a^{1/3}(-b x^2+a)^{1/3}+(-b x^2+a)^{2/3}}{(-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))^2}}\Big(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\Big) 3^{1/4}\Big)$$

Result(type 8, 22 leaves):

$$\int \frac{b x^2+3 a}{(-b x^2+a)^{4/3}}\,dx$$

Problem 40: Unable to integrate problem.

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

Optimal(type 4, 615 leaves, 8 steps):

$$\frac{x}{12 a^3 (-b x^2+a)^{1/3}}+\frac{x}{24 a^2 (-b x^2+a)^{1/3} (b x^2+3 a)}+\frac{x}{12 a^3 (-(-b x^2+a)^{1/3}+a^{1/3}(1-\sqrt{3}))}$$

$$+\frac{\operatorname{arctanh}\Big(\frac{x\sqrt{b}}{a^{1/6}(a^{1/3}+2^{1/3}(-b x^2+a)^{1/3})}\Big) 2^{1/3}}{32 a^{17/6}\sqrt{b}}-\frac{\operatorname{arctanh}\Big(\frac{x\sqrt{b}}{\sqrt{a}}\Big) 2^{1/3}}{96 a^{17/6}\sqrt{b}}+\frac{\arctan\Big(\frac{a^{1/6}(a^{1/3}-2^{1/3}(-b x^2+a)^{1/3})\sqrt{3}}{x\sqrt{b}}\Big) 2^{1/3}\sqrt{3}}{96 a^{17/6}\sqrt{b}}$$

$$+\frac{\arctan\left(\frac{\sqrt{3}\,\sqrt{a}}{x\sqrt{b}}\right)2^{1/3}\sqrt{3}}{96\,a^{17/6}\sqrt{b}}$$

$$-\frac{1}{36\,a^{8/3}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(-b\,x^{2}+a\right)^{1/3}\right)}{\left(-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^{2}}}}\left(\left(a^{1/3}-\left(-b\,x^{2}+a\right)^{1/3}\right)\mathrm{EllipticF}\left(\frac{-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)},2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(-b\,x^{2}+a\right)^{1/3}+\left(-b\,x^{2}+a\right)^{2/3}}{\left(-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^{2}}}\;3^{3/4}\sqrt{2}\right)+\frac{1}{24\,a^{8/3}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(-b\,x^{2}+a\right)^{1/3}\right)}{\left(-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^{2}}}}\left(\left(a^{1/3}-\left(-b\,x^{2}+a\right)^{1/3}\right)\mathrm{EllipticE}\left(\frac{-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1+\sqrt{3}\right)}{-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)},2\,\mathrm{I}-\mathrm{I}\sqrt{3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(-b\,x^{2}+a\right)^{1/3}+\left(-b\,x^{2}+a\right)^{2/3}}{\left(-\left(-b\,x^{2}+a\right)^{1/3}+a^{1/3}\left(1-\sqrt{3}\right)\right)^{2}}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)3^{1/4}\right)$$

Result(type 8, 24 leaves):

$$\int\frac{1}{\left(-b\,x^{2}+a\right)^{4/3}\left(b\,x^{2}+3\,a\right)^{2}}\,dx$$

Problem 41: Unable to integrate problem.

$$\int\frac{1}{\left(-b\,x^{2}+3\,a\right)\left(b\,x^{2}+a\right)^{1/3}}\,dx$$

Optimal(type 3, 134 leaves, 1 step):

$$\frac{\arctan\left(\frac{x\sqrt{b}}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(b\,x^{2}+a\right)^{1/3}\right)}\right)2^{1/3}}{4\,a^{5/6}\sqrt{b}}-\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)2^{1/3}}{12\,a^{5/6}\sqrt{b}}-\frac{\operatorname{arctanh}\left(\frac{a^{1/6}\left(a^{1/3}-2^{1/3}\left(b\,x^{2}+a\right)^{1/3}\right)\sqrt{3}}{x\sqrt{b}}\right)2^{1/3}\sqrt{3}}{12\,a^{5/6}\sqrt{b}}$$

$$-\frac{\operatorname{arctanh}\left(\frac{\sqrt{3}\,\sqrt{a}}{x\sqrt{b}}\right)2^{1/3}\sqrt{3}}{12\,a^{5/6}\sqrt{b}}$$

Result(type 8, 24 leaves):

$$\int\frac{1}{\left(-b\,x^{2}+3\,a\right)\left(b\,x^{2}+a\right)^{1/3}}\,dx$$

Problem 42: Unable to integrate problem.

$$\int \frac{1}{\left(-x^2+3\right)\left(x^2+1\right)^{1/3}}\,dx$$

Optimal(type 3, 77 leaves, 1 step):

$$-\frac{\arctan(x)\,2^{1/3}}{12}+\frac{\arctan\left(\frac{x}{1+2^{1/3}\left(x^2+1\right)^{1/3}}\right)2^{1/3}}{4}-\frac{\operatorname{arctanh}\left(\frac{\sqrt{3}}{x}\right)2^{1/3}\sqrt{3}}{12}-\frac{\operatorname{arctanh}\left(\frac{\left(1-2^{1/3}\left(x^2+1\right)^{1/3}\right)\sqrt{3}}{x}\right)2^{1/3}\sqrt{3}}{12}$$

Result(type 8, 19 leaves):

$$\int \frac{1}{\left(-x^2+3\right)\left(x^2+1\right)^{1/3}}\,dx$$

Problem 43: Unable to integrate problem.

$$\int \frac{3-x}{\left(-x^2+1\right)^{1/3}\left(x^2+3\right)}\,dx$$

Optimal(type 3, 70 leaves, 1 step):

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

Result(type 8, 24 leaves):

$$\int \frac{3-x}{\left(-x^2+1\right)^{1/3}\left(x^2+3\right)}\,dx$$

Problem 44: Unable to integrate problem.

$$\int \frac{1}{\left(b\,x^2-a\right)^{1/3}\left(-\frac{9\,a\,d}{b}+d\,x^2\right)}\,dx$$

Optimal(type 3, 105 leaves, 1 step):

$$-\frac{\operatorname{arctanh}\left(\frac{\left(a^{1/3}+\left(b\,x^2-a\right)^{1/3}\right)^2}{3\,a^{1/6}\,x\sqrt{b}}\right)\sqrt{b}}{12\,a^{5/6}\,d}+\frac{\operatorname{arctanh}\left(\frac{x\sqrt{b}}{3\sqrt{a}}\right)\sqrt{b}}{12\,a^{5/6}\,d}+\frac{\arctan\left(\frac{a^{1/6}\left(a^{1/3}+\left(b\,x^2-a\right)^{1/3}\right)\sqrt{3}}{x\sqrt{b}}\right)\sqrt{b}\,\sqrt{3}}{12\,a^{5/6}\,d}$$

Result(type 8, 29 leaves):

$$\int \frac{1}{\left(b\,x^2-a\right)^{1/3}\left(-\frac{9\,a\,d}{b}+d\,x^2\right)}\,dx$$

Problem 45: Unable to integrate problem.

$$\int \frac{1}{\left(b x^2-2\right)^{1/3}\left(-\frac{18 d}{b}+d x^2\right)}\, dx$$

Optimal(type 3, 101 leaves, 1 step):

$$-\frac{\operatorname{arctanh}\left(\frac{\left(2^{1/3}+\left(b x^2-2\right)^{1/3}\right)^2 2^{5/6}}{6 x \sqrt{b}}\right)\sqrt{b}\, 2^{1/6}}{24 d}+\frac{\operatorname{arctanh}\left(\frac{x\sqrt{b}\,\sqrt{2}}{6}\right)\sqrt{b}\, 2^{1/6}}{24 d}+\frac{\arctan\left(\frac{2^{1/6}\left(2^{1/3}+\left(b x^2-2\right)^{1/3}\right)\sqrt{3}}{x\sqrt{b}}\right)\sqrt{b}\, 2^{1/6}\sqrt{3}}{24 d}$$

Result(type 8, 26 leaves):

$$\int \frac{1}{\left(b x^2-2\right)^{1/3}\left(-\frac{18 d}{b}+d x^2\right)}\, dx$$

Problem 46: Unable to integrate problem.

$$\int \frac{1}{\left(3 x^2+2\right)^{1/3}\left(d x^2+6 d\right)}\, dx$$

Optimal(type 3, 90 leaves, 1 step):

$$-\frac{\operatorname{arctanh}\left(\frac{2^{1/6}\left(2^{1/3}-\left(3 x^2+2\right)^{1/3}\right)}{x}\right)2^{1/6}}{8 d}+\frac{\arctan\left(\frac{\left(2^{1/3}-\left(3 x^2+2\right)^{1/3}\right)^2 2^{5/6}\sqrt{3}}{18 x}\right)2^{1/6}\sqrt{3}}{24 d}+\frac{\arctan\left(\frac{x\sqrt{6}}{6}\right)2^{1/6}\sqrt{3}}{24 d}$$

Result(type 8, 23 leaves):

$$\int \frac{1}{\left(3 x^2+2\right)^{1/3}\left(d x^2+6 d\right)}\, dx$$

Problem 53: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(b x^2+a\right)^{5/2}\sqrt{d x^2+c}}\, dx$$

Optimal(type 4, 295 leaves, 4 steps):

$$-\frac{(-3 a d+b c)\sqrt{\frac{1}{1+\frac{d x^2}{c}}}\,\sqrt{1+\frac{d x^2}{c}}\,\operatorname{EllipticF}\left(\frac{x\sqrt{d}}{\sqrt{c}\,\sqrt{1+\frac{d x^2}{c}}},\sqrt{1-\frac{b c}{a d}}\right)\sqrt{c}\,\sqrt{d}\,\sqrt{b x^2+a}}{3 a^2(-a d+b c)^2\sqrt{\frac{c\left(b x^2+a\right)}{a\left(d x^2+c\right)}}\,\sqrt{d x^2+c}}+\frac{b x\sqrt{d x^2+c}}{3 a(-a d+b c)\left(b x^2+a\right)^{3/2}}$$

$$+\frac{2\left(-2 a d+b c\right)\sqrt{\frac{1}{1+\frac{b x^2}{a}}}\,\sqrt{1+\frac{b x^2}{a}}\,\mathrm{EllipticE}\left(\frac{x\sqrt{b}}{\sqrt{a}\,\sqrt{1+\frac{b x^2}{a}}},\sqrt{1-\frac{a d}{b c}}\right)\sqrt{b}\,\sqrt{d x^2+c}}{3 a^{3/2}\left(-a d+b c\right)^2\sqrt{b x^2+a}\,\sqrt{\frac{a\left(d x^2+c\right)}{c\left(b x^2+a\right)}}}$$

Result(type 4, 751 leaves):

$$\frac{1}{3\sqrt{d x^2+c}\,\left(a d-b c\right)^2\sqrt{-\frac{b}{a}}\,a^2\left(b x^2+a\right)^{3/2}}\Bigg(-4 x^5 a b^2 d^2\sqrt{-\frac{b}{a}}+2 x^5 b^3 c d\sqrt{-\frac{b}{a}}+3\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\right.$$
$$\left.\sqrt{\frac{a d}{b c}}\right)x^2 a^2 b d^2\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}-5\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\sqrt{\frac{a d}{b c}}\right)x^2 a b^2 c d\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}+2\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\right.$$
$$\left.\sqrt{\frac{a d}{b c}}\right)x^2 b^3 c^2\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}+4\,\mathrm{EllipticE}\left(x\sqrt{-\frac{b}{a}},\sqrt{\frac{a d}{b c}}\right)x^2 a b^2 c d\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}-2\,\mathrm{EllipticE}\left(x\sqrt{-\frac{b}{a}},\right.$$
$$\left.\sqrt{\frac{a d}{b c}}\right)x^2 b^3 c^2\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}-5 x^3 a^2 b d^2\sqrt{-\frac{b}{a}}-x^3 a b^2 c d\sqrt{-\frac{b}{a}}+2 x^3 b^3 c^2\sqrt{-\frac{b}{a}}+3\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\right.$$
$$\left.\sqrt{\frac{a d}{b c}}\right)a^3 d^2\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}-5\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\sqrt{\frac{a d}{b c}}\right)a^2 b c d\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}+2\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\right.$$
$$\left.\sqrt{\frac{a d}{b c}}\right)a b^2 c^2\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}+4\,\mathrm{EllipticE}\left(x\sqrt{-\frac{b}{a}},\sqrt{\frac{a d}{b c}}\right)a^2 b c d\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}-2\,\mathrm{EllipticE}\left(x\sqrt{-\frac{b}{a}},\right.$$
$$\left.\sqrt{\frac{a d}{b c}}\right)a b^2 c^2\sqrt{\frac{b x^2+a}{a}}\,\sqrt{\frac{d x^2+c}{c}}-5 x a^2 b c d\sqrt{-\frac{b}{a}}+3 x a b^2 c^2\sqrt{-\frac{b}{a}}\Bigg)$$

Problem 71: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{-b x^2-a}}{\sqrt{-d x^2+c}}\,dx$$

Optimal(type 4, 75 leaves, 3 steps):

$$\frac{\mathrm{EllipticE}\left(\frac{x\sqrt{d}}{\sqrt{c}},\sqrt{-\frac{b c}{a d}}\right)\sqrt{c}\,\sqrt{-b x^2-a}\,\sqrt{1-\frac{d x^2}{c}}}{\sqrt{d}\,\sqrt{1+\frac{b x^2}{a}}\,\sqrt{-d x^2+c}}$$

Result(type 4, 170 leaves):

$$\frac{1}{\left(b\,d\,x^4+a\,d\,x^2-b\,c\,x^2-a\,c\right)\sqrt{-\frac{b}{a}}\;d}\left(\left(-a\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\sqrt{-\frac{a\,d}{b\,c}}\right)d-b\,c\,\mathrm{EllipticF}\left(x\sqrt{-\frac{b}{a}},\sqrt{-\frac{a\,d}{b\,c}}\right)+b\,c\,\mathrm{EllipticE}\left(x\sqrt{-\frac{b}{a}},\sqrt{-\frac{a\,d}{b\,c}}\right)\right)\sqrt{-b\,x^2-a}\,\sqrt{-d\,x^2+c}\,\sqrt{\frac{b\,x^2+a}{a}}\,\sqrt{-\frac{d\,x^2-c}{c}}\right)$$

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Problem 72: Result more than twice size of optimal antiderivative.
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$$\int\frac{\sqrt{-b\,x^2+a}}{\sqrt{d\,x^2-c}}\,\mathrm{d}x$$

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Optimal(type 4, 74 leaves, 3 steps):
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$$\frac{\mathrm{EllipticE}\left(\frac{x\sqrt{d}}{\sqrt{c}},\sqrt{\frac{b\,c}{a\,d}}\right)\sqrt{c}\,\sqrt{-b\,x^2+a}\,\sqrt{1-\frac{d\,x^2}{c}}}{\sqrt{d}\,\sqrt{1-\frac{b\,x^2}{a}}\,\sqrt{d\,x^2-c}}$$

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Result(type 4, 165 leaves):
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$$\frac{\left(-a\,\mathrm{EllipticF}\left(\sqrt{\frac{b}{a}}\,x,\sqrt{\frac{a\,d}{b\,c}}\right)d+b\,c\,\mathrm{EllipticF}\left(\sqrt{\frac{b}{a}}\,x,\sqrt{\frac{a\,d}{b\,c}}\right)-b\,c\,\mathrm{EllipticE}\left(\sqrt{\frac{b}{a}}\,x,\sqrt{\frac{a\,d}{b\,c}}\right)\right)\sqrt{-b\,x^2+a}\,\sqrt{d\,x^2-c}\,\sqrt{-\frac{d\,x^2-c}{c}}\,\sqrt{-\frac{b\,x^2-a}{a}}}{\left(b\,d\,x^4-a\,d\,x^2-b\,c\,x^2+a\,c\right)\sqrt{\frac{b}{a}}\;d}$$

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Problem 74: Result more than twice size of optimal antiderivative.
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$$\int\frac{\sqrt{-d\,x^2+c}}{\sqrt{-b\,x^2+a}}\,\mathrm{d}x$$

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Optimal(type 4, 73 leaves, 3 steps):
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$$\frac{\mathrm{EllipticE}\left(\frac{x\sqrt{b}}{\sqrt{a}},\sqrt{\frac{a\,d}{b\,c}}\right)\sqrt{a}\,\sqrt{1-\frac{b\,x^2}{a}}\,\sqrt{-d\,x^2+c}}{\sqrt{b}\,\sqrt{-b\,x^2+a}\,\sqrt{1-\frac{d\,x^2}{c}}}$$

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Result(type 4, 163 leaves):
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$$\frac{\left(-a\, d\, \mathrm{EllipticF}\left(x\sqrt{\frac{d}{c}}, \sqrt{\frac{b\,c}{a\,d}}\right) + c\,\mathrm{EllipticF}\left(x\sqrt{\frac{d}{c}}, \sqrt{\frac{b\,c}{a\,d}}\right) b + a\,d\,\mathrm{EllipticE}\left(x\sqrt{\frac{d}{c}}, \sqrt{\frac{b\,c}{a\,d}}\right)\right)\sqrt{-b\,x^2+a}\,\sqrt{-d\,x^2+c}\,\sqrt{-\frac{d\,x^2-c}{c}}\,\sqrt{-\frac{b\,x^2-a}{a}}}{b\sqrt{\frac{d}{c}}\,\left(b\,d\,x^4-a\,d\,x^2-b\,c\,x^2+a\,c\right)}$$

Problem 75: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{d\,x^2-c}}{\sqrt{b\,x^2-a}}\, dx$$

Optimal(type 4, 75 leaves, 3 steps):

$$\frac{\mathrm{EllipticE}\left(\frac{x\sqrt{b}}{\sqrt{a}}, \sqrt{\frac{a\,d}{b\,c}}\right)\sqrt{a}\,\sqrt{1-\frac{b\,x^2}{a}}\,\sqrt{d\,x^2-c}}{\sqrt{b}\,\sqrt{b\,x^2-a}\,\sqrt{1-\frac{d\,x^2}{c}}}$$

Result(type 4, 166 leaves):

$$\frac{\sqrt{d\,x^2-c}\,\sqrt{b\,x^2-a}\,\sqrt{-\frac{d\,x^2-c}{c}}\,\sqrt{-\frac{b\,x^2-a}{a}}\left(a\,d\,\mathrm{EllipticF}\left(x\sqrt{\frac{d}{c}}, \sqrt{\frac{b\,c}{a\,d}}\right) - c\,\mathrm{EllipticF}\left(x\sqrt{\frac{d}{c}}, \sqrt{\frac{b\,c}{a\,d}}\right) b - a\,d\,\mathrm{EllipticE}\left(x\sqrt{\frac{d}{c}}, \sqrt{\frac{b\,c}{a\,d}}\right)\right)}{b\sqrt{\frac{d}{c}}\,\left(b\,d\,x^4-a\,d\,x^2-b\,c\,x^2+a\,c\right)}$$

Problem 80: Unable to integrate problem.

$$\int \frac{\sqrt{1+\frac{2\,c\,x^2}{b-\sqrt{-4\,a\,c+b^2}}}}{\sqrt{1+\frac{2\,c\,x^2}{b+\sqrt{-4\,a\,c+b^2}}}}\, dx$$

Optimal(type 4, 457 leaves, 4 steps):

$$\frac{x\sqrt{1+\frac{2\,c\,x^2}{b-\sqrt{-4\,a\,c+b^2}}}}{\sqrt{1+\frac{2\,c\,x^2}{b+\sqrt{-4\,a\,c+b^2}}}}$$

$$-\frac{1}{2\sqrt{c}\sqrt{\frac{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}}\left(\sqrt{\frac{1}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}\,\mathrm{EllipticE}\left(\frac{x\sqrt{2}\sqrt{c}}{\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}},\right.\right.$$

$$\left.\left.\sqrt{-\frac{2\sqrt{-4ac+b^2}}{b-\sqrt{-4ac+b^2}}}\right)\sqrt{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{2}\right)$$

$$+\frac{1}{2\sqrt{c}\sqrt{\frac{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}}\left(\sqrt{\frac{1}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}\,\mathrm{EllipticF}\left(\frac{x\sqrt{2}\sqrt{c}}{\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}},\right.\right.$$

$$\left.\left.\sqrt{-\frac{2\sqrt{-4ac+b^2}}{b-\sqrt{-4ac+b^2}}}\right)\sqrt{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{2}\right)$$

Result(type 8, 53 leaves):

$$\int\frac{\sqrt{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}}{\sqrt{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}\,dx$$

Problem 81: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{x^2-1}\sqrt{7+x^2-4\sqrt{3}}}\,dx$$

Optimal(type 4, 37 leaves, 2 steps):

$$\frac{\mathrm{EllipticF}\left(x, \mathrm{I}\sqrt{3}+2\,\mathrm{I}\right)\sqrt{-x^2+1}}{\sqrt{x^2-1}\left(2-\sqrt{3}\right)}$$

Result(type 4, 116 leaves):

$$\frac{-I\,\mathrm{EllipticF}\left(\frac{I x}{-2+\sqrt{3}}, 2I - I\sqrt{3}\right)\sqrt{-x^2+1}\,\sqrt{-\left(-x^2+4\sqrt{3}-7\right)\left(-4\sqrt{3}+7\right)}\,\left(-2+\sqrt{3}\right)\sqrt{x^2-1}\,\sqrt{7+x^2-4\sqrt{3}}}{\left(4\sqrt{3}-7\right)\left(-x^4+4\sqrt{3}\,x^2-6x^2-4\sqrt{3}+7\right)}$$

Problem 82: Unable to integrate problem.

$$\int \frac{1}{\left(-3x^2+a\right)^{1/4}\left(-3x^2+2a\right)}\,dx$$

Optimal(type 3, 90 leaves, 1 step):

$$\frac{\arctan\left(\frac{a^{3/4}\left(1-\frac{\sqrt{-3x^2+a}}{\sqrt{a}}\right)\sqrt{3}}{3x\left(-3x^2+a\right)^{1/4}}\right)\sqrt{3}}{6a^{3/4}}+\frac{\operatorname{arctanh}\left(\frac{a^{3/4}\left(1+\frac{\sqrt{-3x^2+a}}{\sqrt{a}}\right)\sqrt{3}}{3x\left(-3x^2+a\right)^{1/4}}\right)\sqrt{3}}{6a^{3/4}}$$

Result(type 8, 23 leaves):

$$\int \frac{1}{\left(-3x^2+a\right)^{1/4}\left(-3x^2+2a\right)}\,dx$$

Problem 83: Unable to integrate problem.

$$\int \frac{1}{\left(3x^2-2\right)\left(3x^2-1\right)^{1/4}}\,dx$$

Optimal(type 3, 43 leaves, 1 step):

$$-\frac{\arctan\left(\frac{x\sqrt{6}}{2\left(3x^2-1\right)^{1/4}}\right)\sqrt{6}}{12}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{6}}{2\left(3x^2-1\right)^{1/4}}\right)\sqrt{6}}{12}$$

Result(type 8, 21 leaves):

$$\int \frac{1}{\left(3x^2-2\right)\left(3x^2-1\right)^{1/4}}\,dx$$

Problem 84: Unable to integrate problem.

$$\int \frac{1}{\left(3x^2-2a\right)\left(3x^2-a\right)^{1/4}}\,dx$$

Optimal(type 3, 59 leaves, 1 step):

$$-\frac{\arctan\left(\frac{x\sqrt{6}}{2\,a^{1/4}\,(3x^2-a)^{1/4}}\right)\sqrt{6}}{12\,a^{3/4}}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{6}}{2\,a^{1/4}\,(3x^2-a)^{1/4}}\right)\sqrt{6}}{12\,a^{3/4}}$$

Result(type 8, 25 leaves):

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

Problem 85: Unable to integrate problem.

$$\int\frac{1}{(bx^2+a)^{5/4}\,(dx^2+c)}\,dx$$

Optimal(type 4, 216 leaves, 7 steps):

$$\frac{2\left(1+\frac{bx^2}{a}\right)^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\operatorname{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}}{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)(-ad+bc)\,(bx^2+a)^{1/4}\sqrt{a}}$$

$$+\frac{a^{1/4}\operatorname{EllipticPi}\left(\frac{(bx^2+a)^{1/4}}{a^{1/4}},-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{ad-bc}},I\right)\sqrt{d}\,\sqrt{-\frac{bx^2}{a}}}{(ad-bc)^{3/2}\,x}-\frac{a^{1/4}\operatorname{EllipticPi}\left(\frac{(bx^2+a)^{1/4}}{a^{1/4}},\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{ad-bc}},I\right)\sqrt{d}\,\sqrt{-\frac{bx^2}{a}}}{(ad-bc)^{3/2}\,x}$$

Result(type 8, 21 leaves):

$$\int\frac{1}{(bx^2+a)^{5/4}\,(dx^2+c)}\,dx$$

Problem 86: Unable to integrate problem.

$$\int\frac{1}{(bx^2+a)^{11/4}\,(dx^2+c)}\,dx$$

Optimal(type 4, 285 leaves, 10 steps):

$$\frac{2bx}{7a(-ad+bc)\,(bx^2+a)^{7/4}}+\frac{2b(-12ad+5bc)\,x}{21a^2(-ad+bc)^2\,(bx^2+a)^{3/4}}$$

$$+\frac{2\left(-12 a d+5 b c\right)\left(1+\frac{b x^{2}}{a}\right)^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^{2}}\ \mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}}{21\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)a^{3/2}\left(-a d+b c\right)^{2}\left(b x^{2}+a\right)^{3/4}}$$

$$+\frac{a^{1/4} d^{2}\,\mathrm{EllipticPi}\left(\frac{\left(b x^{2}+a\right)^{1/4}}{a^{1/4}},-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{a d-b c}},I\right)\sqrt{-\frac{b x^{2}}{a}}}{\left(-a d+b c\right)^{3} x}+\frac{a^{1/4} d^{2}\,\mathrm{EllipticPi}\left(\frac{\left(b x^{2}+a\right)^{1/4}}{a^{1/4}},\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{a d-b c}},I\right)\sqrt{-\frac{b x^{2}}{a}}}{\left(-a d+b c\right)^{3} x}$$

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Result(type 8, 21 leaves):
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$$\int\frac{1}{\left(b x^{2}+a\right)^{11/4}\left(d x^{2}+c\right)}\,dx$$

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Problem 87: Unable to integrate problem.
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$$\int\frac{\left(b x^{2}+a\right)^{5/4}}{\left(d x^{2}+c\right)^{2}}\,dx$$

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Optimal(type 4, 260 leaves, 9 steps):
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$$-\frac{\left(-a d+b c\right) x\left(b x^{2}+a\right)^{1/4}}{2 c d\left(d x^{2}+c\right)}+\frac{\left(a d+3 b c\right)\left(1+\frac{b x^{2}}{a}\right)^{3/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^{2}}\ \mathrm{EllipticF}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{a}\,\sqrt{b}}{2\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)c d^{2}\left(b x^{2}+a\right)^{3/4}}$$

$$-\frac{a^{1/4}\left(2 a d+3 b c\right)\mathrm{EllipticPi}\left(\frac{\left(b x^{2}+a\right)^{1/4}}{a^{1/4}},-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{a d-b c}},I\right)\sqrt{-\frac{b x^{2}}{a}}}{4 c d^{2} x}$$

$$-\frac{a^{1/4}\left(2 a d+3 b c\right)\mathrm{EllipticPi}\left(\frac{\left(b x^{2}+a\right)^{1/4}}{a^{1/4}},\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{a d-b c}},I\right)\sqrt{-\frac{b x^{2}}{a}}}{4 c d^{2} x}$$

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Result(type 8, 21 leaves):
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$$\int\frac{\left(b x^{2}+a\right)^{5/4}}{\left(d x^{2}+c\right)^{2}}\,dx$$

Problem 88: Unable to integrate problem.

$$\int \frac{(b x^2+a)^{3/4}}{(d x^2+c)^2}\, dx$$

Optimal(type 4, 278 leaves, 9 steps):

$$-\frac{b x}{2 c d (b x^2+a)^{1/4}}+\frac{x (b x^2+a)^{3/4}}{2 c (d x^2+c)}+\frac{\left(1+\frac{b x^2}{a}\right)^{1/4} \sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{a}\, \sqrt{b}}{2 \cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) c d (b x^2+a)^{1/4}}$$

$$+\frac{a^{1/4} (2 a d+b c)\, \mathrm{EllipticPi}\left(\frac{(b x^2+a)^{1/4}}{a^{1/4}}, -\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{a d-b c}}, \mathrm{I}\right) \sqrt{-\frac{b x^2}{a}}}{4 c d^{3/2} x \sqrt{a d-b c}}-\frac{a^{1/4} (2 a d+b c)\, \mathrm{EllipticPi}\left(\frac{(b x^2+a)^{1/4}}{a^{1/4}}, \frac{\sqrt{a}\,\sqrt{d}}{\sqrt{a d-b c}}, \mathrm{I}\right) \sqrt{-\frac{b x^2}{a}}}{4 c d^{3/2} x \sqrt{a d-b c}}$$

Result(type 8, 21 leaves):

$$\int \frac{(b x^2+a)^{3/4}}{(d x^2+c)^2}\, dx$$

Problem 89: Unable to integrate problem.

$$\int \frac{1}{(b x^2+a)^{1/4} (d x^2+c)^2}\, dx$$

Optimal(type 4, 305 leaves, 9 steps):

$$\frac{b x}{2 c (-a d+b c) (b x^2+a)^{1/4}}-\frac{d x (b x^2+a)^{3/4}}{2 c (-a d+b c) (d x^2+c)}$$

$$-\frac{\left(1+\frac{b x^2}{a}\right)^{1/4} \sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{a}\, \sqrt{b}}{2 \cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) c (-a d+b c) (b x^2+a)^{1/4}}$$

$$-\frac{a^{1/4} (-2 a d+3 b c)\, \mathrm{EllipticPi}\left(\frac{(b x^2+a)^{1/4}}{a^{1/4}}, -\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{a d-b c}}, \mathrm{I}\right) \sqrt{-\frac{b x^2}{a}}}{4 c (a d-b c)^{3/2} x \sqrt{d}}$$

$$+\frac{a^{1/4}(-2ad+3bc)\,\mathrm{EllipticPi}\left(\frac{(bx^2+a)^{1/4}}{a^{1/4}},\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{ad-bc}},I\right)\sqrt{-\frac{bx^2}{a}}}{4c(ad-bc)^{3/2}x\sqrt{d}}$$

Result(type 8, 21 leaves):

$$\int\frac{1}{(bx^2+a)^{1/4}(dx^2+c)^2}\,dx$$

Problem 90: Unable to integrate problem.

$$\int\frac{1}{(bx^2+a)^{5/4}(dx^2+c)^2}\,dx$$

Optimal(type 4, 287 leaves, 10 steps):

$$-\frac{dx}{2c(-ad+bc)(bx^2+a)^{1/4}(dx^2+c)}+\frac{(ad+4bc)\left(1+\frac{bx^2}{a}\right)^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}}{2\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)c(-ad+bc)^2(bx^2+a)^{1/4}\sqrt{a}}$$

$$-\frac{a^{1/4}(-2ad+7bc)\,\mathrm{EllipticPi}\left(\frac{(bx^2+a)^{1/4}}{a^{1/4}},-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{ad-bc}},I\right)\sqrt{d}\sqrt{-\frac{bx^2}{a}}}{4c(ad-bc)^{5/2}x}$$

$$+\frac{a^{1/4}(-2ad+7bc)\,\mathrm{EllipticPi}\left(\frac{(bx^2+a)^{1/4}}{a^{1/4}},\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{ad-bc}},I\right)\sqrt{d}\sqrt{-\frac{bx^2}{a}}}{4c(ad-bc)^{5/2}x}$$

Result(type 8, 21 leaves):

$$\int\frac{1}{(bx^2+a)^{5/4}(dx^2+c)^2}\,dx$$

Problem 91: Unable to integrate problem.

$$\int\frac{1}{(bx^2+a)^{9/4}(dx^2+c)^2}\,dx$$

Optimal(type 4, 340 leaves, 11 steps):

$$\frac{b(5ad+4bc)x}{10ac(-ad+bc)^2(bx^2+a)^{5/4}}-\frac{dx}{2c(-ad+bc)(bx^2+a)^{5/4}(dx^2+c)}$$

$$+\frac{\left(-5 a^2 d^2-52 a c b d+12 b^2 c^2\right)\left(1+\frac{b x^2}{a}\right)^{1/4}\sqrt{\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\ \mathrm{EllipticE}\left(\sin\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{b}}{10\cos\left(\frac{\arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{3/2} c\,(-a d+b c)^3\,(b x^2+a)^{1/4}}$$

$$-\frac{a^{1/4} d^{3/2}\,(-2 a d+11 b c)\ \mathrm{EllipticPi}\left(\frac{(b x^2+a)^{1/4}}{a^{1/4}},-\frac{\sqrt{a}\sqrt{d}}{\sqrt{a d-b c}},\mathrm{I}\right)\sqrt{-\frac{b x^2}{a}}}{4 c\,(a d-b c)^{7/2} x}$$

$$+\frac{a^{1/4} d^{3/2}\,(-2 a d+11 b c)\ \mathrm{EllipticPi}\left(\frac{(b x^2+a)^{1/4}}{a^{1/4}},\frac{\sqrt{a}\sqrt{d}}{\sqrt{a d-b c}},\mathrm{I}\right)\sqrt{-\frac{b x^2}{a}}}{4 c\,(a d-b c)^{7/2} x}$$

Result(type 8, 21 leaves):

$$\int\frac{1}{(b x^2+a)^{9/4}\,(d x^2+c)^2}\,dx$$

Problem 92: Unable to integrate problem.

$$\int (b x^2+a)^p\,(d x^2+c)^2\,dx$$

Optimal(type 5, 174 leaves, 4 steps):

$$-\frac{d\,(3 a d-b c\,(7+2 p))\,x\,(b x^2+a)^{1+p}}{b^2\,(2 p+3)\,(2 p+5)}+\frac{d x\,(b x^2+a)^{1+p}\,(d x^2+c)}{b\,(2 p+5)}$$

$$+\frac{\left(3 a^2 d^2-2 a b c d\,(2 p+5)+b^2 c^2\,(4 p^2+16 p+15)\right) x\,(b x^2+a)^p\ \mathrm{hypergeom}\left(\left[\frac{1}{2},-p\right],\left[\frac{3}{2}\right],-\frac{b x^2}{a}\right)}{b^2\,(2 p+3)\,(2 p+5)\left(1+\frac{b x^2}{a}\right)^p}$$

Result(type 8, 21 leaves):

$$\int (b x^2+a)^p\,(d x^2+c)^2\,dx$$

Problem 93: Unable to integrate problem.

$$\int (b x^2+a)^p\,dx$$

Optimal(type 5, 42 leaves, 2 steps):

$$\frac{x\left(b x^2+a\right)^p \operatorname{hypergeom}\left(\left[\frac{1}{2},-p\right],\left[\frac{3}{2}\right],-\frac{b x^2}{a}\right)}{\left(1+\frac{b x^2}{a}\right)^p}$$

Result(type 8, 11 leaves):

$$\int\left(b x^2+a\right)^p \mathrm{d}x$$

Problem 94: Unable to integrate problem.

$$\int \frac{\left(b x^2+a\right)^p}{\left(d x^2+c\right)^2} \mathrm{d}x$$

Optimal(type 6, 53 leaves, 2 steps):

$$\frac{x\left(b x^2+a\right)^p \mathit{AppellF1}\left(\frac{1}{2},-p,2,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right)}{c^2\left(1+\frac{b x^2}{a}\right)^p}$$

Result(type 8, 21 leaves):

$$\int \frac{\left(b x^2+a\right)^p}{\left(d x^2+c\right)^2} \mathrm{d}x$$

Problem 95: Unable to integrate problem.

$$\int \frac{\left(b x^2+a\right)^p}{\left(d x^2+c\right)^3} \mathrm{d}x$$

Optimal(type 6, 53 leaves, 2 steps):

$$\frac{x\left(b x^2+a\right)^p \mathit{AppellF1}\left(\frac{1}{2},-p,3,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right)}{c^3\left(1+\frac{b x^2}{a}\right)^p}$$

Result(type 8, 21 leaves):

$$\int \frac{\left(b x^2+a\right)^p}{\left(d x^2+c\right)^3} \mathrm{d}x$$

Test results for the 301 problems in "1.1.2.4 (e x)^m (a+b x^2)^p (c+d x^2)^q.txt"

Problem 11: Result more than twice size of optimal antiderivative.

$$\int x^3 \left(b x^2+a\right)^5 \left(B x^2+A\right) dx$$

Optimal(type 1, 61 leaves, 3 steps):

$$-\frac{a (A b-a B) \left(b x^2+a\right)^6}{12 b^3}+\frac{(A b-2 a B) \left(b x^2+a\right)^7}{14 b^3}+\frac{B \left(b x^2+a\right)^8}{16 b^3}$$

Result(type 1, 123 leaves):

$$\frac{b^5 B x^{16}}{16}+\frac{\left(b^5 A+5 a b^4 B\right) x^{14}}{14}+\frac{\left(5 a b^4 A+10 a^2 b^3 B\right) x^{12}}{12}+\frac{\left(10 a^2 b^3 A+10 a^3 b^2 B\right) x^{10}}{10}+\frac{\left(10 a^3 b^2 A+5 a^4 b B\right) x^8}{8}+\frac{\left(5 a^4 b A+a^5 B\right) x^6}{6}+\frac{a^5 A x^4}{4}$$

Problem 16: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(b x^2+a\right)^5 \left(B x^2+A\right)}{x^{15}} dx$$

Optimal(type 1, 44 leaves, 3 steps):

$$-\frac{A \left(b x^2+a\right)^6}{14 a x^{14}}+\frac{(A b-7 a B) \left(b x^2+a\right)^6}{84 a^2 x^{12}}$$

Result(type 1, 103 leaves):

$$-\frac{b^5 B}{2 x^2}-\frac{a^5 A}{14 x^{14}}-\frac{b^4 (A b+5 a B)}{4 x^4}-\frac{5 a^2 b^2 (A b+a B)}{4 x^8}-\frac{a^3 b (2 A b+a B)}{2 x^{10}}-\frac{a^4 (5 A b+a B)}{12 x^{12}}-\frac{5 a b^3 (A b+2 a B)}{6 x^6}$$

Problem 33: Result more than twice size of optimal antiderivative.

$$\int \frac{2 x^2+1}{x^5 \left(x^2+1\right)^3} dx$$

Optimal(type 1, 12 leaves, 2 steps):

$$-\frac{1}{4 x^4 \left(x^2+1\right)^2}$$

Result(type 1, 29 leaves):

$$-\frac{1}{4 \left(x^2+1\right)^2}-\frac{1}{2 \left(x^2+1\right)}-\frac{1}{4 x^4}+\frac{1}{2 x^2}$$

Problem 58: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2 \left(d x^2+c\right)^3}{b x^2+a} dx$$

Optimal(type 3, 105 leaves, 3 steps):

$$\frac{(-a d+b c)^3 x}{b^4}+\frac{d\left(a^2 d^2-3 a c b d+3 b^2 c^2\right) x^3}{3 b^3}+\frac{d^2(-a d+3 b c) x^5}{5 b^2}+\frac{d^3 x^7}{7 b}-\frac{(-a d+b c)^3 \arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)\sqrt{a}}{b^{9/2}}$$

Result(type 3, 217 leaves):

$$\frac{d^3 x^7}{7 b}-\frac{x^5 a d^3}{5 b^2}+\frac{3 x^5 c d^2}{5 b}+\frac{x^3 a^2 d^3}{3 b^3}-\frac{x^3 a c d^2}{b^2}+\frac{x^3 c^2 d}{b}-\frac{a^3 d^3 x}{b^4}+\frac{3 a^2 c d^2 x}{b^3}-\frac{3 a c^2 d x}{b^2}+\frac{c^3 x}{b}+\frac{a^4 \arctan\left(\frac{b x}{\sqrt{a b}}\right) d^3}{b^4\sqrt{a b}}$$
$$-\frac{3 a^3 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c d^2}{b^3\sqrt{a b}}+\frac{3 a^2 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^2 d}{b^2\sqrt{a b}}-\frac{a \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^3}{b\sqrt{a b}}$$

Problem 75: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3\left(d x^2+c\right)^3}{\left(b x^2+a\right)^2}\, dx$$

Optimal(type 3, 107 leaves, 3 steps):

$$\frac{3 d(-a d+b c)^2 x^2}{2 b^4}+\frac{d^2(-2 a d+3 b c) x^4}{4 b^3}+\frac{d^3 x^6}{6 b^2}+\frac{a(-a d+b c)^3}{2 b^5\left(b x^2+a\right)}+\frac{(-4 a d+b c)(-a d+b c)^2 \ln\left(b x^2+a\right)}{2 b^5}$$

Result(type 3, 228 leaves):

$$\frac{d^3 x^6}{6 b^2}-\frac{d^3 x^4 a}{2 b^3}+\frac{3 d^2 x^4 c}{4 b^2}+\frac{3 d^3 x^2 a^2}{2 b^4}-\frac{3 d^2 x^2 a c}{b^3}+\frac{3 d x^2 c^2}{2 b^2}-\frac{2 \ln\left(b x^2+a\right) a^3 d^3}{b^5}+\frac{9 \ln\left(b x^2+a\right) a^2 d^2 c}{2 b^4}-\frac{3 \ln\left(b x^2+a\right) a d c^2}{b^3}+\frac{\ln\left(b x^2+a\right) c^3}{2 b^2}$$
$$-\frac{a^4 d^3}{2 b^5\left(b x^2+a\right)}+\frac{3 a^3 d^2 c}{2 b^4\left(b x^2+a\right)}-\frac{3 a^2 d c^2}{2 b^3\left(b x^2+a\right)}+\frac{a c^3}{2 b^2\left(b x^2+a\right)}$$

Problem 77: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(d x^2+c\right)^3}{\left(b x^2+a\right)^2}\, dx$$

Optimal(type 3, 92 leaves, 4 steps):

$$\frac{d^2(-2 a d+3 b c) x}{b^3}+\frac{d^3 x^3}{3 b^2}+\frac{(-a d+b c)^3 x}{2 a b^3\left(b x^2+a\right)}+\frac{(-a d+b c)^2(5 a d+b c) \arctan\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2 a^{3/2} b^{7/2}}$$

Result(type 3, 204 leaves):

$$\frac{d^3 x^3}{3 b^2} - \frac{2 d^3 a x}{b^3} + \frac{3 d^2 c x}{b^2} - \frac{x a^2 d^3}{2 b^3 (b x^2 + a)} + \frac{3 x a c d^2}{2 b^2 (b x^2 + a)} - \frac{3 x c^2 d}{2 b (b x^2 + a)} + \frac{x c^3}{2 a (b x^2 + a)} + \frac{5 a^2 \arctan\left(\frac{b x}{\sqrt{a b}}\right) d^3}{2 b^3 \sqrt{a b}} - \frac{9 a \arctan\left(\frac{b x}{\sqrt{a b}}\right) c d^2}{2 b^2 \sqrt{a b}}$$
$$+ \frac{3 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c^2 d}{2 b \sqrt{a b}} + \frac{\arctan\left(\frac{b x}{\sqrt{a b}}\right) c^3}{2 a \sqrt{a b}}$$

Problem 83: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2}{(b x^2 + a)^2 (d x^2 + c)^3} \, dx$$

Optimal(type 3, 174 leaves, 6 steps):

$$-\frac{3 d x}{4 (-a d + b c)^2 (d x^2 + c)^2} - \frac{x}{2 (-a d + b c) (b x^2 + a) (d x^2 + c)^2} - \frac{d (a d + 11 b c) x}{8 c (-a d + b c)^3 (d x^2 + c)} + \frac{b^{3/2} (5 a d + b c) \arctan\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2 (-a d + b c)^4 \sqrt{a}}$$
$$- \frac{(-a^2 d^2 + 10 a c b d + 15 b^2 c^2) \arctan\left(\frac{x \sqrt{d}}{\sqrt{c}}\right) \sqrt{d}}{8 c^{3/2} (-a d + b c)^4}$$

Result(type 3, 390 leaves):

$$\frac{b^2 x a d}{2 (a d - b c)^4 (b x^2 + a)} - \frac{b^3 x c}{2 (a d - b c)^4 (b x^2 + a)} + \frac{5 b^2 \arctan\left(\frac{b x}{\sqrt{a b}}\right) a d}{2 (a d - b c)^4 \sqrt{a b}} + \frac{b^3 \arctan\left(\frac{b x}{\sqrt{a b}}\right) c}{2 (a d - b c)^4 \sqrt{a b}} + \frac{d^4 x^3 a^2}{8 (a d - b c)^4 (d x^2 + c)^2 c}$$
$$+ \frac{3 d^3 x^3 a b}{4 (a d - b c)^4 (d x^2 + c)^2} - \frac{7 d^2 x^3 b^2 c}{8 (a d - b c)^4 (d x^2 + c)^2} + \frac{5 d^2 a b c x}{4 (a d - b c)^4 (d x^2 + c)^2} - \frac{9 d b^2 c^2 x}{8 (a d - b c)^4 (d x^2 + c)^2} - \frac{d^3 a^2 x}{8 (a d - b c)^4 (d x^2 + c)^2}$$
$$+ \frac{d^3 \arctan\left(\frac{x d}{\sqrt{c d}}\right) a^2}{8 (a d - b c)^4 c \sqrt{c d}} - \frac{5 d^2 \arctan\left(\frac{x d}{\sqrt{c d}}\right) a b}{4 (a d - b c)^4 \sqrt{c d}} - \frac{15 d c \arctan\left(\frac{x d}{\sqrt{c d}}\right) b^2}{8 (a d - b c)^4 \sqrt{c d}}$$

Problem 85: Result more than twice size of optimal antiderivative.

$$\int x^m (b x^2 + a)^2 (d x^2 + c) \, dx$$

Optimal(type 3, 71 leaves, 2 steps):

$$\frac{a^2 c x^{1+m}}{1+m} + \frac{a (a d + 2 b c) x^{3+m}}{3+m} + \frac{b (2 a d + b c) x^{5+m}}{5+m} + \frac{b^2 d x^{7+m}}{7+m}$$

Result(type 3, 261 leaves):

$$\frac{1}{(7+m)(5+m)(3+m)(1+m)}\left(x^{1+m}\left(b^2 d m^3 x^6+9 b^2 d m^2 x^6+2 a b d m^3 x^4+b^2 c m^3 x^4+23 b^2 d m x^6+22 a b d m^2 x^4+11 b^2 c m^2 x^4+15 b^2 d x^6 + a^2 d m^3 x^2+2 a b c m^3 x^2+62 a b d m x^4+31 b^2 c m x^4+13 a^2 d m^2 x^2+26 a b c m^2 x^2+42 a b d x^4+21 b^2 c x^4+a^2 c m^3+47 a^2 d m x^2+94 a b c m x^2 + 15 a^2 c m^2+35 a^2 d x^2+70 a b c x^2+71 a^2 c m+105 a^2 c\right)\right)$$

Problem 86: Unable to integrate problem.

$$\int \frac{x^m (b x^2+a)^2}{(d x^2+c)^3}\, dx$$

Optimal(type 5, 163 leaves, 3 steps):

$$\frac{(-a d+b c)^2 x^{1+m}}{4 c d^2 (d x^2+c)^2}-\frac{(-a d+b c)(a d(3-m)+b c(5+m)) x^{1+m}}{8 c^2 d^2 (d x^2+c)} + \frac{\left(2 a b c d(-m^2+1)+a^2 d^2(m^2-4 m+3)+b^2 c^2(m^2+4 m+3)\right) x^{1+m} \text{hypergeom}\left(\left[1, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], -\frac{d x^2}{c}\right)}{8 c^3 d^2 (1+m)}$$

Result(type 8, 24 leaves):

$$\int \frac{x^m (b x^2+a)^2}{(d x^2+c)^3}\, dx$$

Problem 87: Unable to integrate problem.

$$\int \frac{x^m (d x^2+c)^2}{b x^2+a}\, dx$$

Optimal(type 5, 92 leaves, 3 steps):

$$\frac{d(-a d+2 b c) x^{1+m}}{b^2(1+m)}+\frac{d^2 x^{3+m}}{b(3+m)}+\frac{(-a d+b c)^2 x^{1+m} \text{hypergeom}\left(\left[1, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], -\frac{b x^2}{a}\right)}{a b^2(1+m)}$$

Result(type 8, 24 leaves):

$$\int \frac{x^m (d x^2+c)^2}{b x^2+a}\, dx$$

Problem 88: Unable to integrate problem.

$$\int \frac{x^m (d x^2+c)}{b x^2+a}\, dx$$

Optimal(type 5, 64 leaves, 2 steps):

$$\frac{d x^{1+m}}{b (1+m)} + \frac{(-a d + b c) x^{1+m} \mathrm{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a}\right)}{a b (1+m)}$$

Result(type 8, 22 leaves):

$$\int \frac{x^m (d x^2 + c)}{b x^2 + a}\, dx$$

Problem 89: Unable to integrate problem.

$$\int \frac{x^m}{(b x^2 + a)^2 (d x^2 + c)}\, dx$$

Optimal(type 5, 148 leaves, 5 steps):

$$\frac{b x^{1+m}}{2 a (-a d + b c) (b x^2 + a)} + \frac{b (b c (1-m) - a d (3-m)) x^{1+m} \mathrm{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a}\right)}{2 a^2 (-a d + b c)^2 (1+m)}$$
$$+ \frac{d^2 x^{1+m} \mathrm{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{d x^2}{c}\right)}{c (-a d + b c)^2 (1+m)}$$

Result(type 8, 24 leaves):

$$\int \frac{x^m}{(b x^2 + a)^2 (d x^2 + c)}\, dx$$

Problem 90: Unable to integrate problem.

$$\int \frac{x^m (d x^2 + c)^3}{(b x^2 + a)^2}\, dx$$

Optimal(type 5, 191 leaves, 4 steps):

$$-\frac{d (2 b^2 c^2 (1+m) - 3 a b c d (3+m) + a^2 d^2 (5+m)) x^{1+m}}{2 a b^3 (1+m)} - \frac{d^2 (b c (3+m) - a d (5+m)) x^{3+m}}{2 a b^2 (3+m)} + \frac{(-a d + b c) x^{1+m} (d x^2 + c)^2}{2 a b (b x^2 + a)}$$
$$+ \frac{(-a d + b c)^2 (a d (5+m) + b (-c m + c)) x^{1+m} \mathrm{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a}\right)}{2 a^2 b^3 (1+m)}$$

Result(type 8, 24 leaves):

$$\int \frac{x^m (d x^2 + c)^3}{(b x^2 + a)^2}\, dx$$

Problem 91: Unable to integrate problem.

$$\int \frac{x^m (d x^2 + c)}{(b x^2 + a)^2} \, dx$$

Optimal(type 5, 87 leaves, 2 steps):

$$\frac{(-a d + b c) x^{1+m}}{2 a b (b x^2 + a)} + \frac{(a d (1+m) + b(-c m + c)) x^{1+m} \mathrm{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a}\right)}{2 a^2 b (1+m)}$$

Result(type 8, 22 leaves):

$$\int \frac{x^m (d x^2 + c)}{(b x^2 + a)^2} \, dx$$

Problem 110: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{7/2} (b x^2 + a)^2}{d x^2 + c} \, dx$$

Optimal(type 3, 230 leaves, 14 steps):

$$\frac{2(-a d + b c)^2 x^{5/2}}{5 d^3} - \frac{2 b(-2 a d + b c) x^{9/2}}{9 d^2} + \frac{2 b^2 x^{13/2}}{13 d} - \frac{c^{5/4} (-a d + b c)^2 \arctan\left(1 - \frac{d^{1/4} \sqrt{2} \sqrt{x}}{c^{1/4}}\right) \sqrt{2}}{2 d^{17/4}}$$
$$+ \frac{c^{5/4} (-a d + b c)^2 \arctan\left(1 + \frac{d^{1/4} \sqrt{2} \sqrt{x}}{c^{1/4}}\right) \sqrt{2}}{2 d^{17/4}} - \frac{c^{5/4} (-a d + b c)^2 \ln\left(\sqrt{c} + x \sqrt{d} - c^{1/4} d^{1/4} \sqrt{2} \sqrt{x}\right) \sqrt{2}}{4 d^{17/4}}$$
$$+ \frac{c^{5/4} (-a d + b c)^2 \ln\left(\sqrt{c} + x \sqrt{d} + c^{1/4} d^{1/4} \sqrt{2} \sqrt{x}\right) \sqrt{2}}{4 d^{17/4}} - \frac{2 c (-a d + b c)^2 \sqrt{x}}{d^4}$$

Result(type 3, 544 leaves):

$$\frac{2 b^2 x^{13/2}}{13 d} + \frac{4 x^{9/2} a b}{9 d} - \frac{2 x^{9/2} b^2 c}{9 d^2} + \frac{2 x^{5/2} a^2}{5 d} - \frac{4 x^{5/2} a b c}{5 d^2} + \frac{2 x^{5/2} b^2 c^2}{5 d^3} - \frac{2 a^2 c \sqrt{x}}{d^2} + \frac{4 a b c^2 \sqrt{x}}{d^3} - \frac{2 b^2 c^3 \sqrt{x}}{d^4}$$
$$+ \frac{c \left(\frac{c}{d}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}} + 1\right) a^2}{2 d^2} - \frac{c^2 \left(\frac{c}{d}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}} + 1\right) a b}{d^3} + \frac{c^3 \left(\frac{c}{d}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}} + 1\right) b^2}{2 d^4}$$
$$+ \frac{c \left(\frac{c}{d}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}} - 1\right) a^2}{2 d^2} - \frac{c^2 \left(\frac{c}{d}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}} - 1\right) a b}{d^3} + \frac{c^3 \left(\frac{c}{d}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}} - 1\right) b^2}{2 d^4}$$

$$+\frac{c\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\ln\left(\frac{x+\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}{x-\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}\right)a^2}{4\,d^2}-\frac{c^2\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\ln\left(\frac{x+\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}{x-\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}\right)a\,b}{2\,d^3}$$

$$+\frac{c^3\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\ln\left(\frac{x+\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}{x-\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}\right)b^2}{4\,d^4}$$

Problem 111: Result more than twice size of optimal antiderivative.

$$\int\frac{x^{3/2}\left(b\,x^2+a\right)^2}{d\,x^2+c}\,dx$$

Optimal(type 3, 211 leaves, 13 steps):

$$-\frac{2\,b\,(-2\,a\,d+b\,c)\,x^{5/2}}{5\,d^2}+\frac{2\,b^2\,x^{9/2}}{9\,d}+\frac{c^{1/4}\,(-a\,d+b\,c)^2\arctan\left(1-\frac{d^{1/4}\sqrt{2}\,\sqrt{x}}{c^{1/4}}\right)\sqrt{2}}{2\,d^{13/4}}-\frac{c^{1/4}\,(-a\,d+b\,c)^2\arctan\left(1+\frac{d^{1/4}\sqrt{2}\,\sqrt{x}}{c^{1/4}}\right)\sqrt{2}}{2\,d^{13/4}}$$

$$+\frac{c^{1/4}\,(-a\,d+b\,c)^2\ln\left(\sqrt{c}+x\sqrt{d}-c^{1/4}\,d^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{4\,d^{13/4}}-\frac{c^{1/4}\,(-a\,d+b\,c)^2\ln\left(\sqrt{c}+x\sqrt{d}+c^{1/4}\,d^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{4\,d^{13/4}}$$

$$+\frac{2\,(-a\,d+b\,c)^2\sqrt{x}}{d^3}$$

Result(type 3, 494 leaves):

$$\frac{2\,b^2\,x^{9/2}}{9\,d}+\frac{4\,x^{5/2}\,a\,b}{5\,d}-\frac{2\,x^{5/2}\,b^2\,c}{5\,d^2}+\frac{2\,a^2\sqrt{x}}{d}-\frac{4\,a\,b\,c\sqrt{x}}{d^2}+\frac{2\,b^2\,c^2\sqrt{x}}{d^3}-\frac{\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}+1\right)a^2}{2\,d}$$

$$+\frac{\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}+1\right)a\,b\,c}{d^2}-\frac{\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}+1\right)b^2\,c^2}{2\,d^3}-\frac{\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}-1\right)a^2}{2\,d}$$

$$+\frac{\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}-1\right)a\,b\,c}{d^2}-\frac{\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}-1\right)b^2\,c^2}{2\,d^3}$$

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

$$-\frac{\left(\frac{c}{d}\right)^{1/4}\sqrt{2}\,\ln\left(\frac{x+\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}{x-\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}\right)b^2\,c^2}{4\,d^3}$$

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Problem 112: Result more than twice size of optimal antiderivative.
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$$\int\frac{\left(b\,x^2+a\right)^2}{x^{7/2}\left(d\,x^2+c\right)}\,dx$$

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Optimal(type 3, 194 leaves, 12 steps):
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$$-\frac{2\,a^2}{5\,c\,x^{5/2}}-\frac{\left(-a\,d+b\,c\right)^2\arctan\left(1-\frac{d^{1/4}\sqrt{2}\,\sqrt{x}}{c^{1/4}}\right)\sqrt{2}}{2\,c^{9/4}\,d^{3/4}}+\frac{\left(-a\,d+b\,c\right)^2\arctan\left(1+\frac{d^{1/4}\sqrt{2}\,\sqrt{x}}{c^{1/4}}\right)\sqrt{2}}{2\,c^{9/4}\,d^{3/4}}$$

$$+\frac{\left(-a\,d+b\,c\right)^2\ln\left(\sqrt{c}+x\sqrt{d}-c^{1/4}\,d^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{4\,c^{9/4}\,d^{3/4}}-\frac{\left(-a\,d+b\,c\right)^2\ln\left(\sqrt{c}+x\sqrt{d}+c^{1/4}\,d^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{4\,c^{9/4}\,d^{3/4}}-\frac{2\,a\left(-a\,d+2\,b\,c\right)}{c^2\sqrt{x}}$$

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Result(type 3, 451 leaves):
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$$\frac{d\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}+1\right)a^2}{2\,c^2\left(\frac{c}{d}\right)^{1/4}}-\frac{\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}+1\right)a\,b}{c\left(\frac{c}{d}\right)^{1/4}}+\frac{\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}+1\right)b^2}{2\,d\left(\frac{c}{d}\right)^{1/4}}+\frac{d\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{c}{d}\right)^{1/4}}-1\right)a^2}{2\,c^2\left(\frac{c}{d}\right)^{1/4}}$$

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

$$-\frac{\sqrt{2}\,\ln\left(\frac{x-\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}{x+\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}\right)a\,b}{2\,c\left(\frac{c}{d}\right)^{1/4}}+\frac{\sqrt{2}\,\ln\left(\frac{x-\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}{x+\left(\frac{c}{d}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{c}{d}}}\right)b^2}{4\,d\left(\frac{c}{d}\right)^{1/4}}-\frac{2\,a^2}{5\,c\,x^{5/2}}+\frac{2\,a^2\,d}{c^2\sqrt{x}}-\frac{4\,a\,b}{c\sqrt{x}}$$

Problem 120: Result more than twice size of optimal antiderivative.

$$\int\frac{(d\,x^2+c)^3}{(b\,x^2+a)\sqrt{x}}\,\mathrm{d}x$$

Optimal(type 3, 227 leaves, 12 steps):

$$\frac{2\,d^2\,(-a\,d+3\,b\,c)\,x^{5/2}}{5\,b^2}+\frac{2\,d^3\,x^{9/2}}{9\,b}-\frac{(-a\,d+b\,c)^3\arctan\left(1-\frac{b^{1/4}\sqrt{2}\,\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{2\,a^{3/4}\,b^{13/4}}+\frac{(-a\,d+b\,c)^3\arctan\left(1+\frac{b^{1/4}\sqrt{2}\,\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{2\,a^{3/4}\,b^{13/4}}$$
$$-\frac{(-a\,d+b\,c)^3\ln\left(\sqrt{a}+x\sqrt{b}-a^{1/4}\,b^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{4\,a^{3/4}\,b^{13/4}}+\frac{(-a\,d+b\,c)^3\ln\left(\sqrt{a}+x\sqrt{b}+a^{1/4}\,b^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{4\,a^{3/4}\,b^{13/4}}$$
$$+\frac{2\,d\,(a^2\,d^2-3\,a\,c\,b\,d+3\,b^2\,c^2)\sqrt{x}}{b^3}$$

Result(type 3, 649 leaves):

$$\frac{2\,d^3\,x^{9/2}}{9\,b}-\frac{2\,d^3\,x^{5/2}\,a}{5\,b^2}+\frac{6\,d^2\,x^{5/2}\,c}{5\,b}+\frac{2\,d^3\,a^2\sqrt{x}}{b^3}-\frac{6\,d^2\,a\,c\sqrt{x}}{b^2}+\frac{6\,d\,c^2\sqrt{x}}{b}-\frac{\left(\frac{a}{b}\right)^{1/4}a^2\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)d^3}{2\,b^3}$$
$$+\frac{3\left(\frac{a}{b}\right)^{1/4}a\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c\,d^2}{2\,b^2}-\frac{3\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c^2\,d}{2\,b}+\frac{\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c^3}{2\,a}$$
$$-\frac{\left(\frac{a}{b}\right)^{1/4}a^2\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)d^3}{2\,b^3}+\frac{3\left(\frac{a}{b}\right)^{1/4}a\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c\,d^2}{2\,b^2}-\frac{3\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c^2\,d}{2\,b}$$

$$+\frac{\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\arctan\left(\frac{\sqrt{2}\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c^3}{2a}-\frac{\left(\frac{a}{b}\right)^{1/4}a^2\sqrt{2}\ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right)d^3}{4b^3}$$

$$+\frac{3\left(\frac{a}{b}\right)^{1/4}a\sqrt{2}\ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right)c\,d^2}{4b^2}-\frac{3\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right)c^2d}{4b}$$

$$+\frac{\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right)c^3}{4a}$$

Problem 121: Result more than twice size of optimal antiderivative.

$$\int\frac{(d x^2+c)^3}{x^{7/2}(b x^2+a)}\,dx$$

Optimal(type 3, 206 leaves, 12 steps):

$$-\frac{2c^3}{5a x^{5/2}}+\frac{2d^3x^{3/2}}{3b}-\frac{(-a d+b c)^3\arctan\left(1-\frac{b^{1/4}\sqrt{2}\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{2a^{9/4}b^{7/4}}+\frac{(-a d+b c)^3\arctan\left(1+\frac{b^{1/4}\sqrt{2}\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{2a^{9/4}b^{7/4}}$$

$$+\frac{(-a d+b c)^3\ln\left(\sqrt{a}+x\sqrt{b}-a^{1/4}b^{1/4}\sqrt{2}\sqrt{x}\right)\sqrt{2}}{4a^{9/4}b^{7/4}}-\frac{(-a d+b c)^3\ln\left(\sqrt{a}+x\sqrt{b}+a^{1/4}b^{1/4}\sqrt{2}\sqrt{x}\right)\sqrt{2}}{4a^{9/4}b^{7/4}}+\frac{2c^2(-3a d+b c)}{a^2\sqrt{x}}$$

Result(type 3, 615 leaves):

$$\frac{2d^3x^{3/2}}{3b}-\frac{2c^3}{5a x^{5/2}}-\frac{6c^2d}{a\sqrt{x}}+\frac{2c^3b}{a^2\sqrt{x}}-\frac{a\sqrt{2}\ln\left(\frac{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right)d^3}{4b^2\left(\frac{a}{b}\right)^{1/4}}+\frac{3\sqrt{2}\ln\left(\frac{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right)c\,d^2}{4b\left(\frac{a}{b}\right)^{1/4}}$$

$$-\frac{3\sqrt{2}\,\ln\left(\frac{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{a}{b}}}{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{a}{b}}}\right)c^2 d}{4\,a\left(\frac{a}{b}\right)^{1/4}}+\frac{b\sqrt{2}\,\ln\left(\frac{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{a}{b}}}{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{a}{b}}}\right)c^3}{4\,a^2\left(\frac{a}{b}\right)^{1/4}}-\frac{a\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)d^3}{2\,b^2\left(\frac{a}{b}\right)^{1/4}}$$

$$+\frac{3\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c\,d^2}{2\,b\left(\frac{a}{b}\right)^{1/4}}-\frac{3\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c^2 d}{2\,a\left(\frac{a}{b}\right)^{1/4}}+\frac{b\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c^3}{2\,a^2\left(\frac{a}{b}\right)^{1/4}}-\frac{a\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)d^3}{2\,b^2\left(\frac{a}{b}\right)^{1/4}}$$

$$+\frac{3\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c\,d^2}{2\,b\left(\frac{a}{b}\right)^{1/4}}-\frac{3\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c^2 d}{2\,a\left(\frac{a}{b}\right)^{1/4}}+\frac{b\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c^3}{2\,a^2\left(\frac{a}{b}\right)^{1/4}}$$

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Problem 122: Result more than twice size of optimal antiderivative.
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$$\int \frac{x^{7/2}\left(d x^2+c\right)^3}{\left(b x^2+a\right)^2}\,\mathrm{d}x$$

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Optimal(type 3, 317 leaves, 13 steps):
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$$\frac{d\left(17 a^2 d^2-39 a c b d+27 b^2 c^2\right)x^{5/2}}{10\,b^4}+\frac{d^2\left(-17 a d+39 b c\right)x^{9/2}}{18\,b^3}+\frac{17\,d^3 x^{13/2}}{26\,b^2}-\frac{x^{5/2}\left(d x^2+c\right)^3}{2\,b\left(b x^2+a\right)}$$

$$+\frac{a^{1/4}\left(-17 a d+5 b c\right)\left(-a d+b c\right)^2\arctan\left(1-\frac{b^{1/4}\sqrt{2}\,\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{8\,b^{21/4}}-\frac{a^{1/4}\left(-17 a d+5 b c\right)\left(-a d+b c\right)^2\arctan\left(1+\frac{b^{1/4}\sqrt{2}\,\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{8\,b^{21/4}}$$

$$+\frac{a^{1/4}\left(-17 a d+5 b c\right)\left(-a d+b c\right)^2\ln\left(\sqrt{a}+x\sqrt{b}-a^{1/4}b^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{16\,b^{21/4}}$$

$$-\frac{a^{1/4}\left(-17 a d+5 b c\right)\left(-a d+b c\right)^2\ln\left(\sqrt{a}+x\sqrt{b}+a^{1/4}b^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{16\,b^{21/4}}+\frac{\left(-17 a d+5 b c\right)\left(-a d+b c\right)^2\sqrt{x}}{2\,b^5}$$

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Result(type 3, 803 leaves):
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$$-\frac{4\,x^{9/2}\,a\,d^3}{9\,b^3}+\frac{2\,x^{9/2}\,c\,d^2}{3\,b^2}+\frac{6\,x^{5/2}\,a^2 d^3}{5\,b^4}+\frac{6\,x^{5/2}\,c^2 d}{5\,b^2}-\frac{8\,a^3 d^3\sqrt{x}}{b^5}-\frac{39\,a^2\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c\,d^2}{8\,b^4}$$

$$+\frac{27 a \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2}\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right) c^2 d}{8 b^3}-\frac{39 a^2 \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2}\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right) c d^2}{8 b^4}$$

$$+\frac{27 a \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2}\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right) c^2 d}{8 b^3}-\frac{39 a^2 \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right) c d^2}{16 b^4}$$

$$+\frac{27 a \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right) c^2 d}{16 b^3}+\frac{2 d^3 x^{13/2}}{13 b^2}+\frac{2 c^3 \sqrt{x}}{b^2}-\frac{12 a c^2 d \sqrt{x}}{b^3}-\frac{a^4 \sqrt{x}\, d^3}{2 b^5 \left(b x^2+a\right)}+\frac{a \sqrt{x}\, c^3}{2 b^2 \left(b x^2+a\right)}$$

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

$$-\frac{5 \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right) c^3}{16 b^2}-\frac{12 x^{5/2} a c d^2}{5 b^3}+\frac{18 a^2 c d^2 \sqrt{x}}{b^4}+\frac{3 a^3 \sqrt{x}\, c d^2}{2 b^4 \left(b x^2+a\right)}-\frac{3 a^2 \sqrt{x}\, c^2 d}{2 b^3 \left(b x^2+a\right)}$$

$$+\frac{17 a^3 \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2}\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right) d^3}{8 b^5}+\frac{17 a^3 \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \arctan\left(\frac{\sqrt{2}\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right) d^3}{8 b^5}$$

$$+\frac{17 a^3 \left(\frac{a}{b}\right)^{1/4} \sqrt{2} \ln\left(\frac{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\sqrt{2}+\sqrt{\frac{a}{b}}}\right) d^3}{16 b^5}$$

Problem 123: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{5/2} (d x^2 + c)^3}{(b x^2 + a)^2} \, dx$$

Optimal(type 3, 286 leaves, 13 steps):

$$\frac{d (5 a^2 d^2 - 11 a c b d + 7 b^2 c^2) x^{3/2}}{2 b^4} + \frac{3 d^2 (-5 a d + 11 b c) x^{7/2}}{14 b^3} + \frac{15 d^3 x^{11/2}}{22 b^2} - \frac{x^{3/2} (d x^2 + c)^3}{2 b (b x^2 + a)}$$
$$- \frac{3 (-5 a d + b c) (-a d + b c)^2 \arctan\left(1 - \frac{b^{1/4} \sqrt{2} \sqrt{x}}{a^{1/4}}\right) \sqrt{2}}{8 a^{1/4} b^{19/4}} + \frac{3 (-5 a d + b c) (-a d + b c)^2 \arctan\left(1 + \frac{b^{1/4} \sqrt{2} \sqrt{x}}{a^{1/4}}\right) \sqrt{2}}{8 a^{1/4} b^{19/4}}$$
$$+ \frac{3 (-5 a d + b c) (-a d + b c)^2 \ln\left(\sqrt{a} + x \sqrt{b} - a^{1/4} b^{1/4} \sqrt{2} \sqrt{x}\right) \sqrt{2}}{16 a^{1/4} b^{19/4}} - \frac{3 (-5 a d + b c) (-a d + b c)^2 \ln\left(\sqrt{a} + x \sqrt{b} + a^{1/4} b^{1/4} \sqrt{2} \sqrt{x}\right) \sqrt{2}}{16 a^{1/4} b^{19/4}}$$

Result(type 3, 747 leaves):

$$\frac{2 d^3 x^{11/2}}{11 b^2} - \frac{4 d^3 x^{7/2} a}{7 b^3} + \frac{6 d^2 c x^{7/2}}{7 b^2} + \frac{2 d^3 x^{3/2} a^2}{b^4} - \frac{4 d^2 x^{3/2} a c}{b^3} + \frac{2 d x^{3/2} c^2}{b^2} + \frac{x^{3/2} a^3 d^3}{2 b^4 (b x^2 + a)} - \frac{3 x^{3/2} a^2 c d^2}{2 b^3 (b x^2 + a)} + \frac{3 x^{3/2} a c^2 d}{2 b^2 (b x^2 + a)}$$
$$- \frac{x^{3/2} c^3}{2 b (b x^2 + a)} - \frac{15 \sqrt{2} \ln\left(\frac{x - \left(\frac{a}{b}\right)^{1/4} \sqrt{x} \sqrt{2} + \sqrt{\frac{a}{b}}}{x + \left(\frac{a}{b}\right)^{1/4} \sqrt{x} \sqrt{2} + \sqrt{\frac{a}{b}}}\right) a^3 d^3}{16 b^5 \left(\frac{a}{b}\right)^{1/4}} - \frac{15 \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}} + 1\right) a^3 d^3}{8 b^5 \left(\frac{a}{b}\right)^{1/4}} - \frac{15 \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}} - 1\right) a^3 d^3}{8 b^5 \left(\frac{a}{b}\right)^{1/4}}$$
$$+ \frac{33 \sqrt{2} \ln\left(\frac{x - \left(\frac{a}{b}\right)^{1/4} \sqrt{x} \sqrt{2} + \sqrt{\frac{a}{b}}}{x + \left(\frac{a}{b}\right)^{1/4} \sqrt{x} \sqrt{2} + \sqrt{\frac{a}{b}}}\right) a^2 c d^2}{16 b^4 \left(\frac{a}{b}\right)^{1/4}} + \frac{33 \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}} + 1\right) a^2 c d^2}{8 b^4 \left(\frac{a}{b}\right)^{1/4}} + \frac{33 \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}} - 1\right) a^2 c d^2}{8 b^4 \left(\frac{a}{b}\right)^{1/4}}$$
$$- \frac{21 \sqrt{2} \ln\left(\frac{x - \left(\frac{a}{b}\right)^{1/4} \sqrt{x} \sqrt{2} + \sqrt{\frac{a}{b}}}{x + \left(\frac{a}{b}\right)^{1/4} \sqrt{x} \sqrt{2} + \sqrt{\frac{a}{b}}}\right) a c^2 d}{16 b^3 \left(\frac{a}{b}\right)^{1/4}} - \frac{21 \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}} + 1\right) a c^2 d}{8 b^3 \left(\frac{a}{b}\right)^{1/4}} - \frac{21 \sqrt{2} \arctan\left(\frac{\sqrt{2} \sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}} - 1\right) a c^2 d}{8 b^3 \left(\frac{a}{b}\right)^{1/4}}$$

$$+\frac{3\sqrt{2}\,\ln\left(\frac{x-\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{a}{b}}}{x+\left(\frac{a}{b}\right)^{1/4}\sqrt{x}\,\sqrt{2}+\sqrt{\frac{a}{b}}}\right)c^3}{16\,b^2\left(\frac{a}{b}\right)^{1/4}}+\frac{3\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c^3}{8\,b^2\left(\frac{a}{b}\right)^{1/4}}+\frac{3\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c^3}{8\,b^2\left(\frac{a}{b}\right)^{1/4}}$$

Problem 124: Result more than twice size of optimal antiderivative.

$$\int\frac{(d\,x^2+c)^3}{x^{9/2}\,(b\,x^2+a)^2}\,dx$$

Optimal(type 3, 292 leaves, 13 steps):

$$-\frac{c^2\,(-7\,a\,d+11\,b\,c)}{14\,a^2\,b\,x^{7/2}}+\frac{c\left(6\,a^2\,d^2-21\,a\,c\,b\,d+11\,b^2\,c^2\right)}{6\,a^3\,b\,x^{3/2}}+\frac{(-a\,d+b\,c)\,\left(d\,x^2+c\right)^2}{2\,a\,b\,x^{7/2}\,(b\,x^2+a)}-\frac{(-a\,d+b\,c)^2\,(a\,d+11\,b\,c)\,\arctan\left(1-\frac{b^{1/4}\sqrt{2}\,\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{8\,a^{15/4}\,b^{5/4}}$$
$$+\frac{(-a\,d+b\,c)^2\,(a\,d+11\,b\,c)\,\arctan\left(1+\frac{b^{1/4}\sqrt{2}\,\sqrt{x}}{a^{1/4}}\right)\sqrt{2}}{8\,a^{15/4}\,b^{5/4}}-\frac{(-a\,d+b\,c)^2\,(a\,d+11\,b\,c)\,\ln\left(\sqrt{a}+x\sqrt{b}-a^{1/4}\,b^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{16\,a^{15/4}\,b^{5/4}}$$
$$+\frac{(-a\,d+b\,c)^2\,(a\,d+11\,b\,c)\,\ln\left(\sqrt{a}+x\sqrt{b}+a^{1/4}\,b^{1/4}\sqrt{2}\,\sqrt{x}\right)\sqrt{2}}{16\,a^{15/4}\,b^{5/4}}$$

Result(type 3, 705 leaves):

$$-\frac{2\,c^3}{7\,a^2\,x^{7/2}}-\frac{2\,c^2\,d}{a^2\,x^{3/2}}+\frac{4\,c^3\,b}{3\,a^3\,x^{3/2}}-\frac{\sqrt{x}\,d^3}{2\,b\,(b\,x^2+a)}+\frac{3\sqrt{x}\,c\,d^2}{2\,a\,(b\,x^2+a)}-\frac{3\,b\sqrt{x}\,c^2\,d}{2\,a^2\,(b\,x^2+a)}+\frac{b^2\sqrt{x}\,c^3}{2\,a^3\,(b\,x^2+a)}+\frac{\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)d^3}{8\,a\,b}$$
$$+\frac{9\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c\,d^2}{8\,a^2}-\frac{21\,b\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c^2\,d}{8\,a^3}+\frac{11\,b^2\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}+1\right)c^3}{8\,a^4}$$
$$+\frac{\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)d^3}{8\,a\,b}+\frac{9\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c\,d^2}{8\,a^2}-\frac{21\,b\left(\frac{a}{b}\right)^{1/4}\sqrt{2}\,\arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}}-1\right)c^2\,d}{8\,a^3}$$

$$+\frac{11 b^2 \left(\frac{a}{b}\right)^{1/4} \sqrt{2}\, \arctan\left(\frac{\sqrt{2}\,\sqrt{x}}{\left(\frac{a}{b}\right)^{1/4}} - 1\right) c^3}{8 a^4} + \frac{\left(\frac{a}{b}\right)^{1/4} \sqrt{2}\, \ln\left(\frac{x + \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}{x - \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}\right) d^3}{16 a b}$$

$$+\frac{9 \left(\frac{a}{b}\right)^{1/4} \sqrt{2}\, \ln\left(\frac{x + \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}{x - \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}\right) c d^2}{16 a^2} - \frac{21 b \left(\frac{a}{b}\right)^{1/4} \sqrt{2}\, \ln\left(\frac{x + \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}{x - \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}\right) c^2 d}{16 a^3}$$

$$+\frac{11 b^2 \left(\frac{a}{b}\right)^{1/4} \sqrt{2}\, \ln\left(\frac{x + \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}{x - \left(\frac{a}{b}\right)^{1/4} \sqrt{x}\,\sqrt{2} + \sqrt{\frac{a}{b}}}\right) c^3}{16 a^4}$$

Problem 160: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x^2 + a)^2 \sqrt{d x^2 + c}}{x^7}\, dx$$

Optimal(type 3, 129 leaves, 6 steps):

$$-\frac{a^2 (d x^2 + c)^{3/2}}{6 c x^6} - \frac{a(-a d + 4 b c)(d x^2 + c)^{3/2}}{8 c^2 x^4} - \frac{d (a^2 d^2 - 4 a c b d + 8 b^2 c^2) \operatorname{arctanh}\left(\frac{\sqrt{d x^2 + c}}{\sqrt{c}}\right)}{16 c^{5/2}} - \frac{(a^2 d^2 - 4 a c b d + 8 b^2 c^2) \sqrt{d x^2 + c}}{16 c^2 x^2}$$

Result(type 3, 280 leaves):

$$-\frac{a^2 (d x^2 + c)^{3/2}}{6 c x^6} + \frac{a^2 d (d x^2 + c)^{3/2}}{8 c^2 x^4} - \frac{a^2 d^2 (d x^2 + c)^{3/2}}{16 c^3 x^2} - \frac{a^2 d^3 \ln\left(\frac{2 c + 2 \sqrt{c}\,\sqrt{d x^2 + c}}{x}\right)}{16 c^{5/2}} + \frac{a^2 d^3 \sqrt{d x^2 + c}}{16 c^3} - \frac{b^2 (d x^2 + c)^{3/2}}{2 c x^2}$$

$$-\frac{b^2 d \ln\left(\frac{2 c + 2 \sqrt{c}\,\sqrt{d x^2 + c}}{x}\right)}{2 \sqrt{c}} + \frac{b^2 d \sqrt{d x^2 + c}}{2 c} - \frac{a b (d x^2 + c)^{3/2}}{2 c x^4} + \frac{a b d (d x^2 + c)^{3/2}}{4 c^2 x^2} + \frac{a b d^2 \ln\left(\frac{2 c + 2 \sqrt{c}\,\sqrt{d x^2 + c}}{x}\right)}{4 c^{3/2}}$$

$$-\frac{a b d^2 \sqrt{d x^2 + c}}{4 c^2}$$

Problem 170: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x^2+a)^2 (d x^2+c)^{3/2}}{x^7}\, dx$$

Optimal(type 3, 163 leaves, 7 steps):

$$-\frac{\left(24 b^2 c^2+a d(-a d+12 b c)\right)(d x^2+c)^{3/2}}{48 c^2 x^2}-\frac{a^2 (d x^2+c)^{5/2}}{6 c x^6}-\frac{a(-a d+12 b c)(d x^2+c)^{5/2}}{24 c^2 x^4}$$
$$-\frac{d\left(24 b^2 c^2+a d(-a d+12 b c)\right)\operatorname{arctanh}\left(\frac{\sqrt{d x^2+c}}{\sqrt{c}}\right)}{16 c^{3/2}}+\frac{d\left(24 b^2 c^2+a d(-a d+12 b c)\right)\sqrt{d x^2+c}}{16 c^2}$$

Result(type 3, 334 leaves):

$$-\frac{a^2 (d x^2+c)^{5/2}}{6 c x^6}+\frac{a^2 d (d x^2+c)^{5/2}}{24 c^2 x^4}+\frac{a^2 d^2 (d x^2+c)^{5/2}}{48 c^3 x^2}-\frac{a^2 d^3 (d x^2+c)^{3/2}}{48 c^3}+\frac{a^2 d^3 \ln\left(\frac{2 c+2\sqrt{c}\sqrt{d x^2+c}}{x}\right)}{16 c^{3/2}}-\frac{a^2 d^3 \sqrt{d x^2+c}}{16 c^2}$$
$$-\frac{b^2 (d x^2+c)^{5/2}}{2 c x^2}+\frac{b^2 d (d x^2+c)^{3/2}}{2 c}-\frac{3 b^2 d \sqrt{c}\ln\left(\frac{2 c+2\sqrt{c}\sqrt{d x^2+c}}{x}\right)}{2}+\frac{3 b^2 d \sqrt{d x^2+c}}{2}-\frac{a b (d x^2+c)^{5/2}}{2 c x^4}-\frac{a b d (d x^2+c)^{5/2}}{4 c^2 x^2}$$
$$+\frac{a b d^2 (d x^2+c)^{3/2}}{4 c^2}-\frac{3 a b d^2 \ln\left(\frac{2 c+2\sqrt{c}\sqrt{d x^2+c}}{x}\right)}{4\sqrt{c}}+\frac{3 a b d^2 \sqrt{d x^2+c}}{4 c}$$

Problem 184: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{d x^2+c}}{b x^2+a}\, dx$$

Optimal(type 3, 65 leaves, 5 steps):

$$\frac{\operatorname{arctanh}\left(\frac{x\sqrt{d}}{\sqrt{d x^2+c}}\right)\sqrt{d}}{b}+\frac{\arctan\left(\frac{x\sqrt{-a d+b c}}{\sqrt{a}\sqrt{d x^2+c}}\right)\sqrt{-a d+b c}}{b\sqrt{a}}$$

Result(type 3, 947 leaves):

$$\frac{\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^2+\frac{2 d\sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{2\sqrt{-a b}}$$

$$+\frac{\sqrt{d}\,\ln\left(\frac{\frac{d\sqrt{-a b}}{b}+\left(x-\frac{\sqrt{-a b}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}\right)}{2 b}$$

$$+\frac{\ln\left(\frac{-\frac{2(a d-b c)}{b}+\frac{2 d\sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}+2\sqrt{-\frac{a d-b c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x-\frac{\sqrt{-a b}}{b}}\right)a d}{2\sqrt{-a b}\,b\sqrt{-\frac{a d-b c}{b}}}$$

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

$$-\frac{\sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d\sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{2\sqrt{-a b}}$$

$$+\frac{\sqrt{d}\,\ln\left(\frac{-\frac{d\sqrt{-a b}}{b}+\left(x+\frac{\sqrt{-a b}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d\sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}\right)}{2 b}$$

$$-\frac{\ln\left(\frac{-\frac{2(a d-b c)}{b}-\frac{2 d\sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}+2\sqrt{-\frac{a d-b c}{b}}\sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d\sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x+\frac{\sqrt{-a b}}{b}}\right)a d}{2\sqrt{-a b}\,b\sqrt{-\frac{a d-b c}{b}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)c}{2\sqrt{-ab}\sqrt{-\frac{ad-bc}{b}}}$$

Problem 185: Result more than twice size of optimal antiderivative.

$$\int\frac{x^3\left(dx^2+c\right)^{3/2}}{bx^2+a}\,dx$$

Optimal(type 3, 95 leaves, 6 steps):

$$-\frac{a\left(dx^2+c\right)^{3/2}}{3b^2}+\frac{\left(dx^2+c\right)^{5/2}}{5bd}+\frac{a(-ad+bc)^{3/2}\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{dx^2+c}}{\sqrt{-ad+bc}}\right)}{b^{7/2}}-\frac{a(-ad+bc)\sqrt{dx^2+c}}{b^3}$$

Result(type 3, 1896 leaves):

$$\frac{\left(dx^2+c\right)^{5/2}}{5bd}-\frac{a\left(d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}\right)^{3/2}}{6b^2}$$

$$-\frac{ad\sqrt{-ab}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}\,x}{4b^3}$$

$$-\frac{3a\sqrt{d}\sqrt{-ab}\ln\left(\frac{\frac{d\sqrt{-ab}}{b}+\left(x-\frac{\sqrt{-ab}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}\right)c}{4b^3}$$

$$+\frac{a^2\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}\,d}{2b^3}-\frac{a\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}\,c}{2b^2}$$

$$+\frac{a^2 d^{3/2}\sqrt{-ab}\,\ln\left(\frac{\frac{d\sqrt{-ab}}{b}+\left(x-\frac{\sqrt{-ab}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}\right)}{2b^4}$$

$$+\frac{a^3\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)d^2}{2b^4\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{a^2\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)dc}{b^3\sqrt{-\frac{ad-bc}{b}}}$$

$$+\frac{a\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)c^2}{2b^2\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{a\left(d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}\right)^{3/2}}{6b^2}$$

$$+\frac{ad\sqrt{-ab}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}\;x}{4b^3}$$

$$+\frac{3\,a\sqrt{d}\,\sqrt{-a\,b}\,\ln\left(\frac{-\frac{d\sqrt{-a\,b}}{b}+\left(x+\frac{\sqrt{-a\,b}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\right)c}{4\,b^3}$$

$$+\frac{a^2\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\;d}{2\,b^3}-\frac{a\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\;c}{2\,b^2}$$

$$-\frac{a^2\,d^{3/2}\sqrt{-a\,b}\,\ln\left(\frac{-\frac{d\sqrt{-a\,b}}{b}+\left(x+\frac{\sqrt{-a\,b}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\right)}{2\,b^4}$$

$$+\frac{a^3\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x+\frac{\sqrt{-a\,b}}{b}}\right)d^2}{2\,b^4\sqrt{-\frac{a\,d-b\,c}{b}}}$$

$$-\frac{a^2\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x+\frac{\sqrt{-a\,b}}{b}}\right)d\,c}{b^3\sqrt{-\frac{a\,d-b\,c}{b}}}$$

$$+\frac{a\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x+\frac{\sqrt{-a\,b}}{b}}\right)c^2}{2\,b^2\sqrt{-\frac{a\,d-b\,c}{b}}}$$

Problem 186: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x^2 + c)^{3/2}}{x^2 (b x^2 + a)} \, dx$$

Optimal(type 3, 84 leaves, 6 steps):

$$-\frac{(-a d + b c)^{3/2} \arctan\left(\frac{x \sqrt{-a d + b c}}{\sqrt{a} \sqrt{d x^2 + c}}\right)}{a^{3/2} b} + \frac{d^{3/2} \operatorname{arctanh}\left(\frac{x \sqrt{d}}{\sqrt{d x^2 + c}}\right)}{b} - \frac{c \sqrt{d x^2 + c}}{a x}$$

Result(type 3, 1955 leaves):

$$-\frac{(d x^2 + c)^{5/2}}{a c x} + \frac{d x (d x^2 + c)^{3/2}}{a c} + \frac{3 d x \sqrt{d x^2 + c}}{2 a} + \frac{3 \sqrt{d}\, c \ln\left(x \sqrt{d} + \sqrt{d x^2 + c}\right)}{2 a}$$

$$-\frac{b \left(d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}\right)^{3/2}}{6 a \sqrt{-a b}} - \frac{d \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}\; x}{4 a}$$

$$-\frac{3 \sqrt{d} \ln\left(\frac{\frac{d \sqrt{-a b}}{b} + \left(x - \frac{\sqrt{-a b}}{b}\right) d}{\sqrt{d}} + \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}\right) c}{4 a}$$

$$+\frac{\sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}\; d}{2 \sqrt{-a b}} - \frac{b \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}\; c}{2 a \sqrt{-a b}}$$

$$+\frac{d^{3/2} \ln\left(\frac{\frac{d \sqrt{-a b}}{b} + \left(x - \frac{\sqrt{-a b}}{b}\right) d}{\sqrt{d}} + \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}\right)}{2 b}$$

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

$$
-\frac{\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}+\frac{2\,d\sqrt{-a\,b}\,\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\,\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x-\frac{\sqrt{-a\,b}}{b}}\right)d\,c}{\sqrt{-a\,b}\,\sqrt{-\frac{a\,d-b\,c}{b}}}
$$

$$
+\frac{b\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}+\frac{2\,d\sqrt{-a\,b}\,\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\,\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x-\frac{\sqrt{-a\,b}}{b}}\right)c^{2}}{2\,a\sqrt{-a\,b}\,\sqrt{-\frac{a\,d-b\,c}{b}}}
$$

$$
+\frac{b\left(d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}\right)^{3/2}}{6\,a\sqrt{-a\,b}}-\frac{d\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\;x}{4\,a}
$$

$$
-\frac{3\sqrt{d}\,\ln\left(\frac{-\frac{d\sqrt{-a\,b}}{b}+\left(x+\frac{\sqrt{-a\,b}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\right)c}{4\,a}
$$

$$
-\frac{\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\;d}{2\sqrt{-a\,b}}+\frac{b\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\;c}{2\,a\sqrt{-a\,b}}
$$

$$
+\frac{d^{3/2}\ln\left(\frac{-\frac{d\sqrt{-a\,b}}{b}+\left(x+\frac{\sqrt{-a\,b}}{b}\right)d}{\sqrt{d}}+\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\right)}{2\,b}
$$

$$-\frac{a\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)d^2}{2b\sqrt{-ab}\sqrt{-\frac{ad-bc}{b}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)dc}{\sqrt{-ab}\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{b\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)c^2}{2a\sqrt{-ab}\sqrt{-\frac{ad-bc}{b}}}$$

Problem 187: Result more than twice size of optimal antiderivative.

$$\int \frac{(dx^2+c)^{3/2}}{x^4(bx^2+a)}\,dx$$

Optimal(type 3, 84 leaves, 5 steps):

$$\frac{(-ad+bc)^{3/2}\arctan\left(\frac{x\sqrt{-ad+bc}}{\sqrt{a}\sqrt{dx^2+c}}\right)}{a^{5/2}}-\frac{c\sqrt{dx^2+c}}{3ax^3}+\frac{(-4ad+3bc)\sqrt{dx^2+c}}{3a^2x}$$

Result(type ?, 2088 leaves): Display of huge result suppressed!

Problem 188: Result more than twice size of optimal antiderivative.

$$\int \frac{x^4(dx^2+c)^{5/2}}{bx^2+a}\,dx$$

Optimal(type 3, 257 leaves, 9 steps):

$$\frac{d x^5 (d x^2+c)^{3/2}}{8 b}+\frac{a^{3/2} (-a d+b c)^{5/2} \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a}\, \sqrt{d x^2+c}}\right)}{b^5}$$

$$-\frac{(-128 a^4 d^4+320 a^3 b c d^3-240 a^2 b^2 c^2 d^2+40 a b^3 c^3 d+5 b^4 c^4) \operatorname{arctanh}\left(\frac{x \sqrt{d}}{\sqrt{d x^2+c}}\right)}{128 b^5 d^{3/2}}$$

$$+\frac{(-64 a^3 d^3+144 a^2 b c d^2-88 a b^2 c^2 d+5 b^3 c^3) x \sqrt{d x^2+c}}{128 b^4 d}+\frac{(48 a^2 d^2-104 a c b d+59 b^2 c^2) x^3 \sqrt{d x^2+c}}{192 b^3}+\frac{d (-8 a d+11 b c) x^5 \sqrt{d x^2+c}}{48 b^2}$$

Result(type ?, 3372 leaves): Display of huge result suppressed!

Problem 189: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3 (d x^2+c)^{5/2}}{b x^2+a}\, dx$$

Optimal(type 3, 120 leaves, 7 steps):

$$-\frac{a (-a d+b c) (d x^2+c)^{3/2}}{3 b^3}-\frac{a (d x^2+c)^{5/2}}{5 b^2}+\frac{(d x^2+c)^{7/2}}{7 b d}+\frac{a (-a d+b c)^{5/2} \operatorname{arctanh}\left(\frac{\sqrt{b}\, \sqrt{d x^2+c}}{\sqrt{-a d+b c}}\right)}{b^{9/2}}-\frac{a (-a d+b c)^2 \sqrt{d x^2+c}}{b^4}$$

Result(type ?, 3126 leaves): Display of huge result suppressed!

Problem 190: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x^2+c)^{5/2}}{b x^2+a}\, dx$$

Optimal(type 3, 130 leaves, 7 steps):

$$\frac{d x (d x^2+c)^{3/2}}{4 b}+\frac{(-a d+b c)^{5/2} \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a}\, \sqrt{d x^2+c}}\right)}{b^3 \sqrt{a}}+\frac{(8 a^2 d^2-20 a c b d+15 b^2 c^2) \operatorname{arctanh}\left(\frac{x \sqrt{d}}{\sqrt{d x^2+c}}\right) \sqrt{d}}{8 b^3}$$

$$+\frac{d (-4 a d+7 b c) x \sqrt{d x^2+c}}{8 b^2}$$

Result(type ?, 3100 leaves): Display of huge result suppressed!

Problem 191: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x^2+c)^{5/2}}{x^2 (b x^2+a)}\, dx$$

Optimal(type 3, 121 leaves, 7 steps):

$$-\frac{c\left(d x^{2}+c\right)^{3/2}}{a x}-\frac{(-a d+b c)^{5/2}\arctan\left(\frac{x\sqrt{-a d+b c}}{\sqrt{a}\,\sqrt{d x^{2}+c}}\right)}{a^{3/2} b^{2}}+\frac{d^{3/2}(-2 a d+5 b c)\,\operatorname{arctanh}\left(\frac{x\sqrt{d}}{\sqrt{d x^{2}+c}}\right)}{2 b^{2}}+\frac{d(a d+2 b c)\,x\sqrt{d x^{2}+c}}{2 a b}$$

Result(type ?, 3190 leaves): Display of huge result suppressed!

Problem 192: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(d x^{2}+c\right)^{5/2}}{x^{4}\left(b x^{2}+a\right)}\,\mathrm{d}x$$

Optimal(type 3, 108 leaves, 7 steps):

$$-\frac{c\left(d x^{2}+c\right)^{3/2}}{3 a x^{3}}+\frac{(-a d+b c)^{5/2}\arctan\left(\frac{x\sqrt{-a d+b c}}{\sqrt{a}\,\sqrt{d x^{2}+c}}\right)}{a^{5/2} b}+\frac{d^{5/2}\,\operatorname{arctanh}\left(\frac{x\sqrt{d}}{\sqrt{d x^{2}+c}}\right)}{b}+\frac{c(-2 a d+b c)\sqrt{d x^{2}+c}}{a^{2} x}$$

Result(type ?, 3345 leaves): Display of huge result suppressed!

Problem 193: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{5}}{\left(b x^{2}+a\right)\sqrt{d x^{2}+c}}\,\mathrm{d}x$$

Optimal(type 3, 84 leaves, 5 steps):

$$\frac{\left(d x^{2}+c\right)^{3/2}}{3 b d^{2}}-\frac{a^{2}\,\operatorname{arctanh}\left(\frac{\sqrt{b}\,\sqrt{d x^{2}+c}}{\sqrt{-a d+b c}}\right)}{b^{5/2}\sqrt{-a d+b c}}-\frac{(a d+b c)\sqrt{d x^{2}+c}}{d^{2} b^{2}}$$

Result(type 3, 361 leaves):

$$\frac{x^{2}\sqrt{d x^{2}+c}}{3 b d}-\frac{2 c\sqrt{d x^{2}+c}}{3 b d^{2}}-\frac{a\sqrt{d x^{2}+c}}{b^{2} d}$$

$$-\frac{a^{2}\ln\left(\frac{-\frac{2(a d-b c)}{b}+\frac{2 d\sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}+2\sqrt{-\frac{a d-b c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x-\frac{\sqrt{-a b}}{b}}\right)}{2 b^{3}\sqrt{-\frac{a d-b c}{b}}}$$

$$-\frac{a^2 \ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{2b^3\sqrt{-\frac{ad-bc}{b}}}$$

Problem 194: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^3\left(bx^2+a\right)\sqrt{dx^2+c}}\,dx$$

Optimal(type 3, 93 leaves, 7 steps):

$$\frac{(ad+2bc)\operatorname{arctanh}\left(\frac{\sqrt{dx^2+c}}{\sqrt{c}}\right)}{2a^2c^{3/2}}-\frac{b^{3/2}\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{dx^2+c}}{\sqrt{-ad+bc}}\right)}{a^2\sqrt{-ad+bc}}-\frac{\sqrt{dx^2+c}}{2acx^2}$$

Result(type 3, 384 leaves):

$$-\frac{\sqrt{dx^2+c}}{2acx^2}+\frac{d\ln\left(\frac{2c+2\sqrt{c}\sqrt{dx^2+c}}{x}\right)}{2ac^{3/2}}+\frac{b\ln\left(\frac{2c+2\sqrt{c}\sqrt{dx^2+c}}{x}\right)}{a^2\sqrt{c}}$$

$$-\frac{b\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)}{2a^2\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{b\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{2a^2\sqrt{-\frac{ad-bc}{b}}}$$

Problem 195: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2}{(b x^2 + a)\sqrt{d x^2 + c}}\, dx$$

Optimal(type 3, 66 leaves, 5 steps):

$$\frac{\operatorname{arctanh}\left(\frac{x\sqrt{d}}{\sqrt{d x^2 + c}}\right)}{b\sqrt{d}} - \frac{\arctan\left(\frac{x\sqrt{-a d + b c}}{\sqrt{a}\sqrt{d x^2 + c}}\right)\sqrt{a}}{b\sqrt{-a d + b c}}$$

Result(type 3, 336 leaves):

$$\frac{\ln\left(x\sqrt{d} + \sqrt{d x^2 + c}\right)}{b\sqrt{d}}$$
$$+ \frac{a\ln\left(\frac{-\frac{2(a d - b c)}{b} + \frac{2 d\sqrt{-a b}\left(x - \frac{\sqrt{-a b}}{b}\right)}{b} + 2\sqrt{-\frac{a d - b c}{b}}\sqrt{d\left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d\sqrt{-a b}\left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}{x - \frac{\sqrt{-a b}}{b}}\right)}{2\sqrt{-a b}\, b\sqrt{-\frac{a d - b c}{b}}}$$
$$- \frac{a\ln\left(\frac{-\frac{2(a d - b c)}{b} - \frac{2 d\sqrt{-a b}\left(x + \frac{\sqrt{-a b}}{b}\right)}{b} + 2\sqrt{-\frac{a d - b c}{b}}\sqrt{d\left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d\sqrt{-a b}\left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}{x + \frac{\sqrt{-a b}}{b}}\right)}{2\sqrt{-a b}\, b\sqrt{-\frac{a d - b c}{b}}}$$

Problem 196: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 62 leaves, 4 steps):

$$-\frac{b\arctan\left(\frac{x\sqrt{-a d + b c}}{\sqrt{a}\sqrt{d x^2 + c}}\right)}{a^{3/2}\sqrt{-a d + b c}} - \frac{\sqrt{d x^2 + c}}{a c x}$$

Result(type 3, 333 leaves):

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

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

Problem 197: Result more than twice size of optimal antiderivative.

$$\int \frac{x}{\left(b x^2+a\right)\left(d x^2+c\right)^{3/2}}\, dx$$

Optimal(type 3, 60 leaves, 4 steps):

$$-\frac{\operatorname{arctanh}\left(\frac{\sqrt{b}\, \sqrt{d x^2+c}}{\sqrt{-a d+b c}}\right) \sqrt{b}}{(-a d+b c)^{3/2}}+\frac{1}{(-a d+b c) \sqrt{d x^2+c}}$$

Result(type 3, 617 leaves):

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

$$+\frac{\sqrt{-a b}\, x d}{2 b (a d-b c) c \sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^2+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)}{2(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{1}{2(ad-bc)\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}$$

$$-\frac{\sqrt{-ab}\,xd}{2b(ad-bc)c\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{2(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

Problem 198: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{x^4(bx^2+a)(dx^2+c)^{3/2}}\,dx$$

Optimal(type 3, 156 leaves, 6 steps):

$$\frac{b^3\arctan\left(\frac{x\sqrt{-ad+bc}}{\sqrt{a}\sqrt{dx^2+c}}\right)}{a^{5/2}(-ad+bc)^{3/2}}-\frac{d}{c(-ad+bc)x^3\sqrt{dx^2+c}}-\frac{(-4ad+bc)\sqrt{dx^2+c}}{3ac^2(-ad+bc)x^3}+\frac{(-4ad+3bc)(2ad+bc)\sqrt{dx^2+c}}{3a^2c^3(-ad+bc)x}$$

Result(type 3, 761 leaves):

$$-\frac{1}{3acx^3\sqrt{dx^2+c}}+\frac{4d}{3ac^2x\sqrt{dx^2+c}}+\frac{8d^2x}{3ac^3\sqrt{dx^2+c}}+\frac{b}{a^2cx\sqrt{dx^2+c}}+\frac{2bdx}{a^2c^2\sqrt{dx^2+c}}$$

$$- \frac{b^{3}}{2 a^{2} \sqrt{-a b}\, (a d - b c) \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^{2} + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

$$+ \frac{b^{2} x d}{2 a^{2} (a d - b c)\, c \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^{2} + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

$$+ \frac{b^{3} \ln\left(\frac{-\frac{2 (a d - b c)}{b} + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} + 2 \sqrt{-\frac{a d - b c}{b}} \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^{2} + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}{x - \frac{\sqrt{-a b}}{b}}\right)}{2 a^{2} \sqrt{-a b}\, (a d - b c) \sqrt{-\frac{a d - b c}{b}}}$$

$$+ \frac{b^{3}}{2 a^{2} \sqrt{-a b}\, (a d - b c) \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^{2} - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

$$+ \frac{b^{2} x d}{2 a^{2} (a d - b c)\, c \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^{2} - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

$$- \frac{b^{3} \ln\left(\frac{-\frac{2 (a d - b c)}{b} - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} + 2 \sqrt{-\frac{a d - b c}{b}} \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^{2} - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}{x + \frac{\sqrt{-a b}}{b}}\right)}{2 a^{2} \sqrt{-a b}\, (a d - b c) \sqrt{-\frac{a d - b c}{b}}}$$

Problem 199: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{2}}{(b x^{2} + a) (d x^{2} + c)^{5/2}}\, dx$$

Optimal(type 3, 97 leaves, 5 steps):

$$\frac{x}{3\left(-a d+b c\right)\left(d x^{2}+c\right)^{3/2}}-\frac{b \arctan\left(\frac{x\sqrt{-a d+b c}}{\sqrt{a}\,\sqrt{d x^{2}+c}}\right)\sqrt{a}}{\left(-a d+b c\right)^{5/2}}+\frac{\left(a d+2 b c\right) x}{3 c\left(-a d+b c\right)^{2}\sqrt{d x^{2}+c}}$$

Result(type 3, 1133 leaves):

$$\frac{x}{3 b c\left(d x^{2}+c\right)^{3/2}}+\frac{2 x}{3 b c^{2}\sqrt{d x^{2}+c}}+\frac{a}{6\sqrt{-a b}\,\left(a d-b c\right)\left(d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\,\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}$$

$$-\frac{a d x}{6 b\left(a d-b c\right) c\left(d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\,\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}$$

$$-\frac{a d x}{3 b\left(a d-b c\right) c^{2}\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\,\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$-\frac{a b}{2\sqrt{-a b}\,\left(a d-b c\right)^{2}\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\,\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$+\frac{a x d}{2\left(a d-b c\right)^{2} c\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\,\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$+\frac{a b\ln\left(\frac{-\frac{2\left(a d-b c\right)}{b}+\frac{2 d\sqrt{-a b}\,\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}+2\sqrt{-\frac{a d-b c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d\sqrt{-a b}\,\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x-\frac{\sqrt{-a b}}{b}}\right)}{2\sqrt{-a b}\,\left(a d-b c\right)^{2}\sqrt{-\frac{a d-b c}{b}}}$$

$$-\frac{a}{6\sqrt{-a b}\,\left(a d-b c\right)\left(d\left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d\sqrt{-a b}\,\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}$$

$$-\frac{a d x}{6 b (a d-b c) c \left(d \left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\,\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}-\frac{a d x}{3 b (a d-b c) c^{2} \sqrt{d \left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\,\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}+\frac{a b}{2 \sqrt{-a b}\,(a d-b c)^{2} \sqrt{d \left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\,\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}+\frac{a x d}{2 (a d-b c)^{2} c \sqrt{d \left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\,\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}-\frac{a b \ln\left(\frac{-\frac{2 (a d-b c)}{b}-\frac{2 d \sqrt{-a b}\,\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}+2 \sqrt{-\frac{a d-b c}{b}}\,\sqrt{d \left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\,\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x+\frac{\sqrt{-a b}}{b}}\right)}{2 \sqrt{-a b}\,(a d-b c)^{2} \sqrt{-\frac{a d-b c}{b}}}$$

Problem 200: Result more than twice size of optimal antiderivative.

$$\int \frac{x}{(b x^{2}+a) (d x^{2}+c)^{5/2}}\, dx$$

Optimal(type 3, 82 leaves, 5 steps):

$$\frac{1}{3 (-a d+b c) (d x^{2}+c)^{3/2}}-\frac{b^{3/2} \operatorname{arctanh}\left(\frac{\sqrt{b}\,\sqrt{d x^{2}+c}}{\sqrt{-a d+b c}}\right)}{(-a d+b c)^{5/2}}+\frac{b}{(-a d+b c)^{2} \sqrt{d x^{2}+c}}$$

Result(type 3, 1085 leaves):

$$
-\frac{1}{6\,(a\,d-b\,c)\left(d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}\right)^{3/2}}
$$

$$
+\frac{d\sqrt{-a\,b}\;x}{6\,b\,(a\,d-b\,c)\,c\left(d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}\right)^{3/2}}
$$

$$
+\frac{d\sqrt{-a\,b}\;x}{3\,b\,(a\,d-b\,c)\,c^{2}\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$
+\frac{b}{2\,(a\,d-b\,c)^{2}\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$
-\frac{\sqrt{-a\,b}\;x\,d}{2\,(a\,d-b\,c)^{2}\,c\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$
-\frac{b\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x-\frac{\sqrt{-a\,b}}{b}}\right)}{2\,(a\,d-b\,c)^{2}\sqrt{-\frac{a\,d-b\,c}{b}}}
$$

$$
-\frac{1}{6\,(a\,d-b\,c)\left(d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}\right)^{3/2}}
$$

$$
-\frac{d\sqrt{-a\,b}\;x}{6\,b\,(a\,d-b\,c)\,c\left(d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}\right)^{3/2}}
$$

$$- \frac{d\sqrt{-a b}\, x}{3 b (a d - b c) c^2 \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

$$+ \frac{b}{2 (a d - b c)^2 \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

$$+ \frac{\sqrt{-a b}\, x d}{2 (a d - b c)^2 c \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}$$

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

Problem 201: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^4 (b x^2 + a) (d x^2 + c)^{5/2}}\, dx$$

Optimal(type 3, 221 leaves, 7 steps):

$$- \frac{d}{3 c (-a d + b c) x^3 (d x^2 + c)^{3/2}} + \frac{b^4 \arctan\left(\frac{x \sqrt{-a d + b c}}{\sqrt{a} \sqrt{d x^2 + c}}\right)}{a^{5/2} (-a d + b c)^{5/2}} - \frac{d (-2 a d + 3 b c)}{c^2 (-a d + b c)^2 x^3 \sqrt{d x^2 + c}} - \frac{(8 a^2 d^2 - 12 a c b d + b^2 c^2) \sqrt{d x^2 + c}}{3 a c^3 (-a d + b c)^2 x^3}$$

$$+ \frac{(-2 a d + b c) (-8 a^2 d^2 + 8 a c b d + 3 b^2 c^2) \sqrt{d x^2 + c}}{3 a^2 c^4 (-a d + b c)^2 x}$$

Result(type 3, 1284 leaves):

$$- \frac{1}{3 a c x^3 (d x^2 + c)^{3/2}} + \frac{2 d}{a c^2 x (d x^2 + c)^{3/2}} + \frac{8 d^2 x}{3 a c^3 (d x^2 + c)^{3/2}} + \frac{16 d^2 x}{3 a c^4 \sqrt{d x^2 + c}} + \frac{b}{a^2 c x (d x^2 + c)^{3/2}} + \frac{4 b d x}{3 a^2 c^2 (d x^2 + c)^{3/2}}$$

$$
+ \frac{8 b d x}{3 a^{2} c^{3} \sqrt{d x^{2}+c}} - \frac{b^{3}}{6 a^{2} \sqrt{-a b}\,(a d-b c) \left(d \left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}
$$

$$
+ \frac{b^{2} d x}{6 a^{2}(a d-b c)\, c \left(d \left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}
$$

$$
+ \frac{b^{2} d x}{3 a^{2}(a d-b c)\, c^{2} \sqrt{d \left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}
$$

$$
+ \frac{b^{4}}{2 a^{2} \sqrt{-a b}\,(a d-b c)^{2} \sqrt{d \left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}
$$

$$
- \frac{b^{3} x d}{2 a^{2}(a d-b c)^{2}\, c \sqrt{d \left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}
$$

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

$$
+ \frac{b^{3}}{6 a^{2} \sqrt{-a b}\,(a d-b c) \left(d \left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}
$$

$$
+ \frac{b^{2} d x}{6 a^{2}(a d-b c)\, c \left(d \left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}\right)^{3/2}}
$$

$$+\frac{b^2 d x}{3 a^2 (a d-b c) c^2 \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$-\frac{b^4}{2 a^2 \sqrt{-a b}\,(a d-b c)^2 \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$-\frac{b^3 x d}{2 a^2 (a d-b c)^2 c \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

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

Problem 202: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{d x^2+c}}{x^2 \left(b x^2+a\right)^2}\, dx$$

Optimal(type 3, 93 leaves, 5 steps):

$$-\frac{(-2 a d+3 b c) \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a}\,\sqrt{d x^2+c}}\right)}{2 a^{5/2} \sqrt{-a d+b c}}-\frac{3 \sqrt{d x^2+c}}{2 a^2 x}+\frac{\sqrt{d x^2+c}}{2 a x \left(b x^2+a\right)}$$

Result(type ?, 2617 leaves): Display of huge result suppressed!

Problem 203: Result more than twice size of optimal antiderivative.

$$\int \frac{x^4 \left(d x^2+c\right)^{3/2}}{\left(b x^2+a\right)^2}\, dx$$

Optimal(type 3, 165 leaves, 8 steps):

$$-\frac{x^3 (d x^2+c)^{3/2}}{2 b (b x^2+a)}+\frac{3 (8 a^2 d^2-8 a c b d+b^2 c^2) \operatorname{arctanh}\left(\frac{x \sqrt{d}}{\sqrt{d x^2+c}}\right)}{8 b^4 \sqrt{d}}-\frac{3 (-2 a d+b c) \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a} \sqrt{d x^2+c}}\right) \sqrt{a} \sqrt{-a d+b c}}{2 b^4}$$
$$+\frac{3 (-4 a d+3 b c) x \sqrt{d x^2+c}}{8 b^3}+\frac{3 d x^3 \sqrt{d x^2+c}}{4 b^2}$$

Result(type ?, 4794 leaves): Display of huge result suppressed!

Problem 204: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2 (d x^2+c)^{3/2}}{(b x^2+a)^2} \, dx$$

Optimal(type 3, 123 leaves, 7 steps):

$$-\frac{x (d x^2+c)^{3/2}}{2 b (b x^2+a)}+\frac{(-4 a d+3 b c) \operatorname{arctanh}\left(\frac{x \sqrt{d}}{\sqrt{d x^2+c}}\right) \sqrt{d}}{2 b^3}+\frac{(-4 a d+b c) \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a} \sqrt{d x^2+c}}\right) \sqrt{-a d+b c}}{2 b^3 \sqrt{a}}+\frac{d x \sqrt{d x^2+c}}{b^2}$$

Result(type ?, 4684 leaves): Display of huge result suppressed!

Problem 205: Result more than twice size of optimal antiderivative.

$$\int \frac{x (d x^2+c)^{3/2}}{(b x^2+a)^2} \, dx$$

Optimal(type 3, 79 leaves, 5 steps):

$$-\frac{(d x^2+c)^{3/2}}{2 b (b x^2+a)}-\frac{3 d \operatorname{arctanh}\left(\frac{\sqrt{b} \sqrt{d x^2+c}}{\sqrt{-a d+b c}}\right) \sqrt{-a d+b c}}{2 b^{5/2}}+\frac{3 d \sqrt{d x^2+c}}{2 b^2}$$

Result(type ?, 2820 leaves): Display of huge result suppressed!

Problem 206: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x^2+c)^{5/2}}{x^2 (b x^2+a)^2} \, dx$$

Optimal(type 3, 142 leaves, 7 steps):

$$\frac{(-a d+b c) (d x^2+c)^{3/2}}{2 a b x (b x^2+a)}-\frac{(-a d+b c)^{3/2} (2 a d+3 b c) \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a} \sqrt{d x^2+c}}\right)}{2 a^{5/2} b^2}+\frac{d^{5/2} \operatorname{arctanh}\left(\frac{x \sqrt{d}}{\sqrt{d x^2+c}}\right)}{b^2}-\frac{c (-a d+3 b c) \sqrt{d x^2+c}}{2 a^2 x b}$$

Result(type ?, 7528 leaves): Display of huge result suppressed!

Problem 207: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x^2+c)^{5/2}}{x^3 (b x^2+a)^2}\, dx$$

Optimal(type 3, 152 leaves, 8 steps):

$$-\frac{c (d x^2+c)^{3/2}}{2 a x^2 (b x^2+a)}+\frac{c^{3/2} (-5 a d+4 b c) \operatorname{arctanh}\left(\frac{\sqrt{d x^2+c}}{\sqrt{c}}\right)}{2 a^3}-\frac{(-a d+b c)^{3/2} (a d+4 b c) \operatorname{arctanh}\left(\frac{\sqrt{b}\,\sqrt{d x^2+c}}{\sqrt{-a d+b c}}\right)}{2 a^3 b^{3/2}}$$
$$-\frac{(-a d+b c) (-a d+2 b c) \sqrt{d x^2+c}}{2 a^2 b (b x^2+a)}$$

Result(type ?, 7589 leaves): Display of huge result suppressed!

Problem 208: Result more than twice size of optimal antiderivative.

$$\int \frac{x^4}{(b x^2+a)^2 \sqrt{d x^2+c}}\, dx$$

Optimal(type 3, 110 leaves, 6 steps):

$$-\frac{(-2 a d+3 b c) \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a}\,\sqrt{d x^2+c}}\right) \sqrt{a}}{2 b^2 (-a d+b c)^{3/2}}+\frac{\operatorname{arctanh}\left(\frac{x \sqrt{d}}{\sqrt{d x^2+c}}\right)}{b^2 \sqrt{d}}+\frac{a x \sqrt{d x^2+c}}{2 b (-a d+b c) (b x^2+a)}$$

Result(type 3, 845 leaves):

$$\frac{\ln\left(x \sqrt{d}+\sqrt{d x^2+c}\right)}{b^2 \sqrt{d}}-\frac{a \sqrt{d \left(x-\frac{\sqrt{-a b}}{b}\right)^2+\frac{2 d \sqrt{-a b} \left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{4 b^2 (a d-b c) \left(x-\frac{\sqrt{-a b}}{b}\right)}$$
$$+\frac{a d \sqrt{-a b}\, \ln\left(\frac{-\frac{2 (a d-b c)}{b}+\frac{2 d \sqrt{-a b} \left(x-\frac{\sqrt{-a b}}{b}\right)}{b}+2 \sqrt{-\frac{a d-b c}{b}} \sqrt{d \left(x-\frac{\sqrt{-a b}}{b}\right)^2+\frac{2 d \sqrt{-a b} \left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x-\frac{\sqrt{-a b}}{b}}\right)}{4 b^3 (a d-b c) \sqrt{-\frac{a d-b c}{b}}}$$

$$-\frac{a\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{4b^2(ad-bc)\left(x+\frac{\sqrt{-ab}}{b}\right)}$$

$$-\frac{ad\sqrt{-ab}\,\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{4b^3(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

$$+\frac{3a\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)}{4\sqrt{-ab}\,b^2\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{3a\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{4\sqrt{-ab}\,b^2\sqrt{-\frac{ad-bc}{b}}}$$

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Problem 209: Result more than twice size of optimal antiderivative.
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$$\int\frac{x^2}{(bx^2+a)^2\sqrt{dx^2+c}}\,dx$$

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Optimal(type 3, 73 leaves, 4 steps):
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$$\frac{c\arctan\left(\frac{x\sqrt{-ad+bc}}{\sqrt{a}\,\sqrt{dx^2+c}}\right)}{2(-ad+bc)^{3/2}\sqrt{a}}-\frac{x\sqrt{dx^2+c}}{2(-ad+bc)(bx^2+a)}$$

Result(type 3, 816 leaves):

$$\frac{\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{4 b\,(a d-b c)\left(x-\frac{\sqrt{-a b}}{b}\right)}$$

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

$$+\frac{\sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^{2}-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{4 b\,(a d-b c)\left(x+\frac{\sqrt{-a b}}{b}\right)}$$

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

$$-\frac{\ln\left(\frac{-\frac{2\,(a d-b c)}{b}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}+2 \sqrt{-\frac{a d-b c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^{2}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x-\frac{\sqrt{-a b}}{b}}\right)}{4 \sqrt{-a b}\; b \sqrt{-\frac{a d-b c}{b}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{4\sqrt{-ab}\,b\sqrt{-\frac{ad-bc}{b}}}$$

Problem 210: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x\left(bx^2+a\right)^2\sqrt{dx^2+c}}\,dx$$

Optimal(type 3, 108 leaves, 7 steps):

$$\frac{(-3ad+2bc)\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{dx^2+c}}{\sqrt{-ad+bc}}\right)\sqrt{b}}{2a^2(-ad+bc)^{3/2}}-\frac{\operatorname{arctanh}\left(\frac{\sqrt{dx^2+c}}{\sqrt{c}}\right)}{a^2\sqrt{c}}+\frac{b\sqrt{dx^2+c}}{2a(-ad+bc)\left(bx^2+a\right)}$$

Result(type 3, 837 leaves):

$$-\frac{\ln\left(\frac{2c+2\sqrt{c}\sqrt{dx^2+c}}{x}\right)}{a^2\sqrt{c}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)}{2a^2\sqrt{-\frac{ad-bc}{b}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{2a^2\sqrt{-\frac{ad-bc}{b}}}$$

$$-\frac{b\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{4a\sqrt{-ab}\,(ad-bc)\left(x-\frac{\sqrt{-ab}}{b}\right)}$$

$$+\frac{d\ln\left(\frac{-\frac{2(ad-bc)}{b}+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x-\frac{\sqrt{-ab}}{b}\right)^2+\frac{2d\sqrt{-ab}\left(x-\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x-\frac{\sqrt{-ab}}{b}}\right)}{4a(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

$$+\frac{b\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{4a\sqrt{-ab}\,(ad-bc)\left(x+\frac{\sqrt{-ab}}{b}\right)}$$

$$+\frac{d\ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{4a(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

Problem 211: Result more than twice size of optimal antiderivative.

$$\int\frac{x^3}{(bx^2+a)^2(dx^2+c)^{3/2}}\,dx$$

Optimal(type 3, 114 leaves, 5 steps):

$$-\frac{(ad+2bc)\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{dx^2+c}}{\sqrt{-ad+bc}}\right)}{2(-ad+bc)^{5/2}\sqrt{b}}+\frac{ad+2bc}{2b(-ad+bc)^2\sqrt{dx^2+c}}+\frac{a}{2b(-ad+bc)(bx^2+a)\sqrt{dx^2+c}}$$

Result(type 3, 1455 leaves):

$$
-\frac{1}{2\,b\,(a\,d-b\,c)\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$
+\frac{\sqrt{-a\,b}\;x\,d}{b^{2}\,(a\,d-b\,c)\,c\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$
+\frac{\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x-\frac{\sqrt{-a\,b}}{b}}\right)}{2\,(a\,d-b\,c)\,b\sqrt{-\frac{a\,d-b\,c}{b}}}
$$

$$
-\frac{1}{2\,b\,(a\,d-b\,c)\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$
-\frac{\sqrt{-a\,b}\;x\,d}{b^{2}\,(a\,d-b\,c)\,c\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$
+\frac{\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^{2}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x+\frac{\sqrt{-a\,b}}{b}}\right)}{2\,(a\,d-b\,c)\,b\sqrt{-\frac{a\,d-b\,c}{b}}}
$$

$$
+\frac{\sqrt{-a\,b}}{4\,b^{2}\,(a\,d-b\,c)\left(x-\frac{\sqrt{-a\,b}}{b}\right)\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^{2}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}
$$

$$+\frac{3\,a\,d}{4\,b\,(a\,d-b\,c)^2\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^2+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$-\frac{3\sqrt{-a\,b}\,d^2\,a\,x}{4\,b^2\,(a\,d-b\,c)^2\,c\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^2+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$-\frac{3\,a\,d\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^2+\frac{2\,d\sqrt{-a\,b}\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x-\frac{\sqrt{-a\,b}}{b}}\right)}{4\,b\,(a\,d-b\,c)^2\sqrt{-\frac{a\,d-b\,c}{b}}}$$

$$-\frac{\sqrt{-a\,b}}{4\,b^2\,(a\,d-b\,c)\left(x+\frac{\sqrt{-a\,b}}{b}\right)\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$+\frac{3\,a\,d}{4\,b\,(a\,d-b\,c)^2\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$+\frac{3\sqrt{-a\,b}\,d^2\,a\,x}{4\,b^2\,(a\,d-b\,c)^2\,c\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$-\frac{3\,a\,d\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\sqrt{-\frac{a\,d-b\,c}{b}}\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\sqrt{-a\,b}\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x+\frac{\sqrt{-a\,b}}{b}}\right)}{4\,b\,(a\,d-b\,c)^2\sqrt{-\frac{a\,d-b\,c}{b}}}$$

Problem 212: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x\left(b x^2+a\right)^2\left(d x^2+c\right)^{3/2}}\, dx$$

Optimal(type 3, 144 leaves, 8 steps):

$$-\frac{\operatorname{arctanh}\left(\frac{\sqrt{d x^2+c}}{\sqrt{c}}\right)}{a^2 c^{3/2}}+\frac{b^{3/2}\left(-5 a d+2 b c\right) \operatorname{arctanh}\left(\frac{\sqrt{b}\,\sqrt{d x^2+c}}{\sqrt{-a d+b c}}\right)}{2 a^2\left(-a d+b c\right)^{5/2}}+\frac{d\left(2 a d+b c\right)}{2 a c\left(-a d+b c\right)^2 \sqrt{d x^2+c}}+\frac{b}{2 a\left(-a d+b c\right)\left(b x^2+a\right) \sqrt{d x^2+c}}$$

Result(type 3, 1671 leaves):

$$\frac{1}{a^2 c \sqrt{d x^2+c}}-\frac{\ln\left(\frac{2 c+2 \sqrt{c}\,\sqrt{d x^2+c}}{x}\right)}{a^2 c^{3/2}}+\frac{b}{2 a^2\left(a d-b c\right) \sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^2+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$-\frac{\sqrt{-a b}\, x d}{2 a^2\left(a d-b c\right) c \sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^2+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$-\frac{b \ln\left(\frac{-\frac{2\left(a d-b c\right)}{b}+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}+2 \sqrt{-\frac{a d-b c}{b}}\,\sqrt{d\left(x-\frac{\sqrt{-a b}}{b}\right)^2+\frac{2 d \sqrt{-a b}\left(x-\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x-\frac{\sqrt{-a b}}{b}}\right)}{2 a^2\left(a d-b c\right) \sqrt{-\frac{a d-b c}{b}}}$$

$$+\frac{b}{2 a^2\left(a d-b c\right) \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$+\frac{\sqrt{-a b}\, x d}{2 a^2\left(a d-b c\right) c \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

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

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

$$+ \frac{3 d b}{4 a (a d - b c)^2 \sqrt{d \left(x - \frac{\sqrt{-a b}}{b} \right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b} \right)}{b} - \frac{a d - b c}{b}}}$$

$$+ \frac{3 d^2 b x}{4 \sqrt{-a b} (a d - b c)^2 c \sqrt{d \left(x - \frac{\sqrt{-a b}}{b} \right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b} \right)}{b} - \frac{a d - b c}{b}}}$$

$$- \frac{3 d b \ln\left(\frac{-\frac{2 (a d - b c)}{b} + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b} \right)}{b} + 2 \sqrt{-\frac{a d - b c}{b}} \sqrt{d \left(x - \frac{\sqrt{-a b}}{b} \right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b} \right)}{b} - \frac{a d - b c}{b}}}{x - \frac{\sqrt{-a b}}{b}} \right)}{4 a (a d - b c)^2 \sqrt{-\frac{a d - b c}{b}}}$$

$$- \frac{b x d}{2 a \sqrt{-a b} (a d - b c) c \sqrt{d \left(x - \frac{\sqrt{-a b}}{b} \right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b} \right)}{b} - \frac{a d - b c}{b}}}$$

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

$$+\frac{3 d b}{4 a (a d-b c)^2 \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$-\frac{3 d^2 b x}{4 \sqrt{-a b}\,(a d-b c)^2 c \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

$$-\frac{3 d b \ln\left(\frac{-\frac{2 (a d-b c)}{b}-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}+2 \sqrt{-\frac{a d-b c}{b}} \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}{x+\frac{\sqrt{-a b}}{b}}\right)}{4 a (a d-b c)^2 \sqrt{-\frac{a d-b c}{b}}}$$

$$+\frac{b x d}{2 a \sqrt{-a b}\,(a d-b c) c \sqrt{d\left(x+\frac{\sqrt{-a b}}{b}\right)^2-\frac{2 d \sqrt{-a b}\left(x+\frac{\sqrt{-a b}}{b}\right)}{b}-\frac{a d-b c}{b}}}$$

Problem 213: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^4 \left(b x^2+a\right)^2 \left(d x^2+c\right)^{3/2}}\, dx$$

Optimal(type 3, 249 leaves, 7 steps):

$$\frac{b^3 (-8 a d+5 b c) \arctan\left(\frac{x \sqrt{-a d+b c}}{\sqrt{a} \sqrt{d x^2+c}}\right)}{2 a^{7/2} (-a d+b c)^{5/2}}+\frac{d (2 a d+b c)}{2 a c (-a d+b c)^2 x^3 \sqrt{d x^2+c}}+\frac{b}{2 a (-a d+b c) x^3 \left(b x^2+a\right) \sqrt{d x^2+c}}$$

$$-\frac{\left(8 a^2 d^2-4 a c b d+5 b^2 c^2\right) \sqrt{d x^2+c}}{6 a^2 c^2 (-a d+b c)^2 x^3}+\frac{\left(16 a^3 d^3-8 a^2 b c d^2-14 a b^2 c^2 d+15 b^3 c^3\right) \sqrt{d x^2+c}}{6 a^3 c^3 (-a d+b c)^2 x}$$

Result(type 3, 1607 leaves):

$$-\frac{1}{3 a^2 c x^3 \sqrt{d x^2+c}}+\frac{4 d}{3 a^2 c^2 x \sqrt{d x^2+c}}+\frac{8 d^2 x}{3 a^2 c^3 \sqrt{d x^2+c}}+\frac{2 b}{a^3 c x \sqrt{d x^2+c}}+\frac{4 b d x}{a^3 c^2 \sqrt{d x^2+c}}$$

$$
- \frac{b^2}{4 a^3 (a d - b c) \left(x - \frac{\sqrt{-a b}}{b}\right) \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}
$$

$$
+ \frac{3 b^2 d \sqrt{-a b}}{4 a^3 (a d - b c)^2 \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}
$$

$$
+ \frac{3 b^2 d^2 x}{4 a^2 (a d - b c)^2 c \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}
$$

$$
- \frac{1}{4 a^3 (a d - b c)^2 \sqrt{-\frac{a d - b c}{b}}} \left(3 b^2 d \sqrt{-a b} \ln\left(\frac{1}{x - \frac{\sqrt{-a b}}{b}} \left(-\frac{2 (a d - b c)}{b} + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} \right.\right.\right.
$$

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

$$
+ \frac{3 b^2 x d}{4 a^3 (a d - b c) c \sqrt{d \left(x - \frac{\sqrt{-a b}}{b}\right)^2 + \frac{2 d \sqrt{-a b} \left(x - \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}
$$

$$
- \frac{b^2}{4 a^3 (a d - b c) \left(x + \frac{\sqrt{-a b}}{b}\right) \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}
$$

$$
- \frac{3 b^2 d \sqrt{-a b}}{4 a^3 (a d - b c)^2 \sqrt{d \left(x + \frac{\sqrt{-a b}}{b}\right)^2 - \frac{2 d \sqrt{-a b} \left(x + \frac{\sqrt{-a b}}{b}\right)}{b} - \frac{a d - b c}{b}}}
$$

$$+\frac{3\,b^2\,d^2\,x}{4\,a^2\,(a\,d-b\,c)^2\,c\,\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\,\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$+\frac{1}{4\,a^3\,(a\,d-b\,c)^2\,\sqrt{-\frac{a\,d-b\,c}{b}}}\left(3\,b^2\,d\,\sqrt{-a\,b}\,\ln\left(\frac{1}{x+\frac{\sqrt{-a\,b}}{b}}\left(-\frac{2\,(a\,d-b\,c)}{b}-\frac{2\,d\,\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}\right.\right.\right.$$

$$\left.\left.\left.+2\,\sqrt{-\frac{a\,d-b\,c}{b}}\,\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\,\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}\right)\right)\right)$$

$$+\frac{3\,b^2\,x\,d}{4\,a^3\,(a\,d-b\,c)\,c\,\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\,\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$-\frac{5\,b^3}{4\,a^3\,\sqrt{-a\,b}\,(a\,d-b\,c)\,\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^2+\frac{2\,d\,\sqrt{-a\,b}\,\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$+\frac{5\,b^3\,\ln\left(\frac{-\frac{2\,(a\,d-b\,c)}{b}+\frac{2\,d\,\sqrt{-a\,b}\,\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}+2\,\sqrt{-\frac{a\,d-b\,c}{b}}\,\sqrt{d\left(x-\frac{\sqrt{-a\,b}}{b}\right)^2+\frac{2\,d\,\sqrt{-a\,b}\,\left(x-\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}{x-\frac{\sqrt{-a\,b}}{b}}\right)}{4\,a^3\,\sqrt{-a\,b}\,(a\,d-b\,c)\,\sqrt{-\frac{a\,d-b\,c}{b}}}$$

$$+\frac{5\,b^3}{4\,a^3\,\sqrt{-a\,b}\,(a\,d-b\,c)\,\sqrt{d\left(x+\frac{\sqrt{-a\,b}}{b}\right)^2-\frac{2\,d\,\sqrt{-a\,b}\,\left(x+\frac{\sqrt{-a\,b}}{b}\right)}{b}-\frac{a\,d-b\,c}{b}}}$$

$$-\frac{5 b^3 \ln\left(\frac{-\frac{2(ad-bc)}{b}-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}+2\sqrt{-\frac{ad-bc}{b}}\sqrt{d\left(x+\frac{\sqrt{-ab}}{b}\right)^2-\frac{2d\sqrt{-ab}\left(x+\frac{\sqrt{-ab}}{b}\right)}{b}-\frac{ad-bc}{b}}}{x+\frac{\sqrt{-ab}}{b}}\right)}{4 a^3\sqrt{-ab}\,(ad-bc)\sqrt{-\frac{ad-bc}{b}}}$$

Problem 214: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2}{(bx^2+a)^2(dx^2+c)^{5/2}}\,dx$$

Optimal(type 3, 139 leaves, 6 steps):

$$-\frac{5dx}{6(-ad+bc)^2(dx^2+c)^{3/2}}-\frac{x}{2(-ad+bc)(bx^2+a)(dx^2+c)^{3/2}}+\frac{b(4ad+bc)\arctan\left(\frac{x\sqrt{-ad+bc}}{\sqrt{a}\sqrt{dx^2+c}}\right)}{2(-ad+bc)^{7/2}\sqrt{a}}-\frac{d(2ad+13bc)x}{6c(-ad+bc)^3\sqrt{dx^2+c}}$$

Result(type ?, 2368 leaves): Display of huge result suppressed!

Problem 215: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^2(bx^2+a)^2(dx^2+c)^{5/2}}\,dx$$

Optimal(type 3, 251 leaves, 7 steps):

$$\frac{d(2ad+3bc)}{6ac(-ad+bc)^2x(dx^2+c)^{3/2}}+\frac{b}{2a(-ad+bc)x(bx^2+a)(dx^2+c)^{3/2}}-\frac{b^3(-8ad+3bc)\arctan\left(\frac{x\sqrt{-ad+bc}}{\sqrt{a}\sqrt{dx^2+c}}\right)}{2a^{5/2}(-ad+bc)^{7/2}}$$
$$+\frac{d(-8a^2d^2+20acbd+3b^2c^2)}{6ac^2(-ad+bc)^3x\sqrt{dx^2+c}}-\frac{(-16a^3d^3+40a^2bcd^2-18ab^2c^2d+9b^3c^3)\sqrt{dx^2+c}}{6a^2c^3(-ad+bc)^3x}$$

Result(type ?, 2512 leaves): Display of huge result suppressed!

Problem 221: Result more than twice size of optimal antiderivative.

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

Optimal(type 4, 192 leaves, 4 steps):

$$\frac{(Ab-aB)(ex)^{5/2}}{3abe(bx^2+a)^{3/2}}-\frac{(Ab+5aB)e\sqrt{ex}}{6ab^2\sqrt{bx^2+a}}$$

$$+\frac{(A b+5 a B) e^{3/2} \sqrt{\cos\left(2 \arctan\left(\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right)\right)^2}\, \text{EllipticF}\left(\sin\left(2 \arctan\left(\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right)\right), \frac{\sqrt{2}}{2}\right) (\sqrt{a}+x \sqrt{b}) \sqrt{\frac{b x^2+a}{(\sqrt{a}+x \sqrt{b})^2}}}{12 \cos\left(2 \arctan\left(\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right)\right) a^{5/4} b^{9/4} \sqrt{b x^2+a}}$$

Result(type 4, 428 leaves):

$$\frac{1}{12 x a b^3 (b x^2+a)^{3/2}} \Bigg(\Bigg(A \sqrt{2} \sqrt{-a b} \sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{\frac{-b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{-\frac{x b}{\sqrt{-a b}}}\, \text{EllipticF}\left(\sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}}, \frac{\sqrt{2}}{2}\right) x^2 b^2$$
$$+5 B \sqrt{2} \sqrt{-a b} \sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{\frac{-b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{-\frac{x b}{\sqrt{-a b}}}\, \text{EllipticF}\left(\sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}}, \frac{\sqrt{2}}{2}\right) x^2 a b$$
$$+A \sqrt{2} \sqrt{-a b} \sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{\frac{-b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{-\frac{x b}{\sqrt{-a b}}}\, \text{EllipticF}\left(\sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}}, \frac{\sqrt{2}}{2}\right) a b$$
$$+5 B \sqrt{2} \sqrt{-a b} \sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{\frac{-b x+\sqrt{-a b}}{\sqrt{-a b}}} \sqrt{-\frac{x b}{\sqrt{-a b}}}\, \text{EllipticF}\left(\sqrt{\frac{b x+\sqrt{-a b}}{\sqrt{-a b}}}, \frac{\sqrt{2}}{2}\right) a^2+2 A x^3 b^3-14 B x^3 a b^2-2 A x a b^2$$
$$-10 B x a^2 b\Bigg) e \sqrt{e x}\Bigg)$$

Problem 231: Result more than twice size of optimal antiderivative.

$$\int \frac{(e x)^{5/2} \sqrt{-d x^2+c}}{-b x^2+a}\, dx$$

Optimal(type 4, 308 leaves, 15 steps):

$$-\frac{2 e (e x)^{3/2} \sqrt{-d x^2+c}}{5 b}-\frac{2 c^{3/4} (-5 a d+2 b c) e^{5/2} \text{EllipticE}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, \mathrm{I}\right) \sqrt{1-\frac{d x^2}{c}}}{5 b^2 d^{3/4} \sqrt{-d x^2+c}}$$
$$+\frac{2 c^{3/4} (-5 a d+2 b c) e^{5/2} \text{EllipticF}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, \mathrm{I}\right) \sqrt{1-\frac{d x^2}{c}}}{5 b^2 d^{3/4} \sqrt{-d x^2+c}}-\frac{c^{1/4} (-a d+b c) e^{5/2} \text{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, -\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \mathrm{I}\right) \sqrt{a} \sqrt{1-\frac{d x^2}{c}}}{b^{5/2} d^{1/4} \sqrt{-d x^2+c}}$$
$$+\frac{c^{1/4} (-a d+b c) e^{5/2} \text{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, \frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \mathrm{I}\right) \sqrt{a} \sqrt{1-\frac{d x^2}{c}}}{b^{5/2} d^{1/4} \sqrt{-d x^2+c}}$$

Result(type 4, 1490 leaves):

$$\frac{1}{10 x b^2 (d x^2 - c) (\sqrt{a b}\, d + \sqrt{c d}\, b) (\sqrt{c d}\, b - \sqrt{a b}\, d)} \Bigg(e^2 \sqrt{e x} \sqrt{-d x^2 + c} \Bigg(5 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d + \sqrt{c d}\, b}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a^2 b c d^2 - 5 \sqrt{a b} \sqrt{c d} \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d + \sqrt{c d}\, b}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a^2 d^2 - 5 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d + \sqrt{c d}\, b}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a b^2 c^2 d + 5 \sqrt{a b} \sqrt{c d} \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d + \sqrt{c d}\, b}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a b c d + 5 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b - \sqrt{a b}\, d}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a^2 b c d^2 + 5 \sqrt{a b} \sqrt{c d} \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b - \sqrt{a b}\, d}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a^2 d^2 - 5 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b - \sqrt{a b}\, d}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a b^2 c^2 d - 5 \sqrt{a b} \sqrt{c d} \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b - \sqrt{a b}\, d}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a b c d - 20 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticE}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a^2 b c d^2 + 28 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticE}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a b^2 c^2 d - 8 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticE}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, b^3 c^3 + 10 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticF}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a^2 b c d^2 - 14 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticF}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, a b^2 c^2 d + 4 \sqrt{2} \sqrt{-\frac{x d}{\sqrt{c d}}} \,\mathrm{EllipticF}\Bigg(\sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{2}}{2}\Bigg) \sqrt{\frac{d x + \sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x + \sqrt{c d}}{\sqrt{c d}}}\, b^3 c^3 + 4 x^4 a b^2 d^3 - 4 x^4 b^3 c d^2 - 4 x^2 a b^2 c d^2 + 4 x^2 b^3 c^2 d \Bigg) \Bigg)$$

Problem 232: Result more than twice size of optimal antiderivative.

$$\int \frac{(e x)^{3/2}\sqrt{-d x^2+c}}{-b x^2+a}\,dx$$

Optimal (type 4, 237 leaves, 10 steps):

$$-\frac{2 e\sqrt{e x}\,\sqrt{-d x^2+c}}{3 b}-\frac{2 c^{1/4}(-3 a d+2 b c)\,e^{3/2}\,\text{EllipticF}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}},\,I\right)\sqrt{1-\frac{d x^2}{c}}}{3 b^2 d^{1/4}\sqrt{-d x^2+c}}$$
$$+\frac{c^{1/4}(-a d+b c)\,e^{3/2}\,\text{EllipticPi}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}},\,-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\,I\right)\sqrt{1-\frac{d x^2}{c}}}{b^2 d^{1/4}\sqrt{-d x^2+c}}$$
$$+\frac{c^{1/4}(-a d+b c)\,e^{3/2}\,\text{EllipticPi}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}},\,\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\,I\right)\sqrt{1-\frac{d x^2}{c}}}{b^2 d^{1/4}\sqrt{-d x^2+c}}$$

Result (type 4, 1285 leaves):

$$\frac{1}{6 b x\,(d x^2-c)\sqrt{a b}\,\left(\sqrt{a b}\,d+\sqrt{c d}\,b\right)\left(\sqrt{c d}\,b-\sqrt{a b}\,d\right)}\Bigg(e\sqrt{e x}\,\sqrt{-d x^2+c}\,\Bigg(6\sqrt{2}\,\text{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)a^2 d^2\sqrt{a b}\,\sqrt{c d}\,\sqrt{-\frac{x d}{\sqrt{c d}}}\,\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\,\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}-10\sqrt{2}\,\text{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)a b c d\sqrt{a b}\,\sqrt{c d}\,\sqrt{-\frac{x d}{\sqrt{c d}}}\,\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\,\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}+4\sqrt{2}\,\text{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)b^2 c^2\sqrt{a b}\,\sqrt{c d}\,\sqrt{-\frac{x d}{\sqrt{c d}}}\,\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\,\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}+3\sqrt{2}\,\sqrt{-\frac{x d}{\sqrt{c d}}}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\,\frac{\sqrt{c d}\,b}{\sqrt{a b}\,d+\sqrt{c d}\,b},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\,\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\,a^2 b c d^2-3\sqrt{a b}\,\sqrt{c d}\,\sqrt{2}\,\sqrt{-\frac{x d}{\sqrt{c d}}}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\,\frac{\sqrt{c d}\,b}{\sqrt{a b}\,d+\sqrt{c d}\,b},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\,\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\,a^2 d^2-3\sqrt{2}\,\sqrt{-\frac{x d}{\sqrt{c d}}}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\,\frac{\sqrt{c d}\,b}{\sqrt{a b}\,d+\sqrt{c d}\,b},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\,\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\,a b^2 c^2 d+3\sqrt{a b}\,\sqrt{c d}\,\sqrt{2}\,\sqrt{-\frac{x d}{\sqrt{c d}}}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\,\frac{\sqrt{c d}\,b}{\sqrt{a b}\,d+\sqrt{c d}\,b},\right.$$

$$\frac{\sqrt{2}}{2}\Big)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a\,b\,c\,d-3\sqrt{2}\sqrt{-\frac{xd}{\sqrt{cd}}}\,\text{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\frac{\sqrt{cd}\,b}{\sqrt{cd}\,b-\sqrt{ab}\,d},$$

$$\frac{\sqrt{2}}{2}\Big)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a^2\,b\,c\,d^2-3\sqrt{ab}\sqrt{cd}\sqrt{2}\sqrt{-\frac{xd}{\sqrt{cd}}}\,\text{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\frac{\sqrt{cd}\,b}{\sqrt{cd}\,b-\sqrt{ab}\,d},$$

$$\frac{\sqrt{2}}{2}\Big)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a^2\,d^2+3\sqrt{2}\sqrt{-\frac{xd}{\sqrt{cd}}}\,\text{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\frac{\sqrt{cd}\,b}{\sqrt{cd}\,b-\sqrt{ab}\,d},$$

$$\frac{\sqrt{2}}{2}\Big)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a\,b^2\,c^2\,d+3\sqrt{ab}\sqrt{cd}\sqrt{2}\sqrt{-\frac{xd}{\sqrt{cd}}}\,\text{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\frac{\sqrt{cd}\,b}{\sqrt{cd}\,b-\sqrt{ab}\,d},$$

$$\frac{\sqrt{2}}{2}\Big)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a\,b\,c\,d+4x^3\,a\,b\,d^3\sqrt{ab}-4x^3\,b^2\,c\,d^2\sqrt{ab}-4\,x\,a\,b\,c\,d^2\sqrt{ab}+4\,x\,b^2\,c^2\,d\sqrt{ab}\Big)\Big)$$

Problem 233: Result more than twice size of optimal antiderivative.

$$\int\frac{(-dx^2+c)^{3/2}}{(-bx^2+a)\sqrt{ex}}\,dx$$

Optimal(type 4, 250 leaves, 10 steps):

$$\frac{2d\sqrt{ex}\sqrt{-dx^2+c}}{3be}+\frac{2c^{1/4}d^{3/4}(-3ad+5bc)\,\text{EllipticF}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},I\right)\sqrt{1-\frac{dx^2}{c}}}{3b^2\sqrt{e}\sqrt{-dx^2+c}}$$

$$+\frac{c^{1/4}(-ad+bc)^2\,\text{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},I\right)\sqrt{1-\frac{dx^2}{c}}}{a\,b^2\,d^{1/4}\sqrt{e}\sqrt{-dx^2+c}}+\frac{c^{1/4}(-ad+bc)^2\,\text{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},I\right)\sqrt{1-\frac{dx^2}{c}}}{a\,b^2\,d^{1/4}\sqrt{e}\sqrt{-dx^2+c}}$$

Result(type 4, 1720 leaves):

$$\frac{1}{6b\sqrt{ex}\,(dx^2-c)\sqrt{ab}\left(\sqrt{ab}\,d+\sqrt{cd}\,b\right)\left(\sqrt{cd}\,b-\sqrt{ab}\,d\right)}\Bigg(\sqrt{-dx^2+c}\,d\Bigg(3\sqrt{2}\sqrt{-\frac{xd}{\sqrt{cd}}}\,\text{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\frac{\sqrt{cd}\,b}{\sqrt{cd}\,b-\sqrt{ab}\,d},$$

$$\frac{\sqrt{2}}{2}\Big)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a^2\,b\,c\,d^2+3\sqrt{ab}\sqrt{cd}\sqrt{2}\sqrt{-\frac{xd}{\sqrt{cd}}}\,\text{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\frac{\sqrt{cd}\,b}{\sqrt{cd}\,b-\sqrt{ab}\,d},$$

$$\frac{\sqrt{2}}{2}\Big)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a^2\,d^2-6\sqrt{2}\sqrt{-\frac{xd}{\sqrt{cd}}}\,\text{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\frac{\sqrt{cd}\,b}{\sqrt{cd}\,b-\sqrt{ab}\,d},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a\,b^2\,c^2\,d-6\sqrt{a\,b}\,\sqrt{c\,d}\,\sqrt{2}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{c\,d}\,b-\sqrt{a\,b}\,d},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a\,b\,c\,d+3\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{c\,d}\,b-\sqrt{a\,b}\,d},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{2}\,b^3\,c^3\,\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}+3\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{c\,d}\,b-\sqrt{a\,b}\,d},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{2}\,b^2\,c^2\,\sqrt{c\,d}\,\sqrt{a\,b}\,\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}-6\sqrt{2}\,\mathrm{EllipticF}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},$$

$$\frac{\sqrt{2}}{2}\Bigg)a^2\,d^2\,\sqrt{a\,b}\,\sqrt{c\,d}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}+16\sqrt{2}\,\mathrm{EllipticF}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},$$

$$\frac{\sqrt{2}}{2}\Bigg)a\,b\,c\,d\sqrt{a\,b}\,\sqrt{c\,d}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}-10\sqrt{2}\,\mathrm{EllipticF}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},$$

$$\frac{\sqrt{2}}{2}\Bigg)b^2\,c^2\,\sqrt{a\,b}\,\sqrt{c\,d}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}-3\sqrt{2}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{a\,b}\,d+\sqrt{c\,d}\,b},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a^2\,b\,c\,d^2+3\sqrt{a\,b}\,\sqrt{c\,d}\,\sqrt{2}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{a\,b}\,d+\sqrt{c\,d}\,b},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a^2\,d^2+6\sqrt{2}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{a\,b}\,d+\sqrt{c\,d}\,b},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a\,b^2\,c^2\,d-6\sqrt{a\,b}\,\sqrt{c\,d}\,\sqrt{2}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{a\,b}\,d+\sqrt{c\,d}\,b},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,a\,b\,c\,d-3\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{a\,b}\,d+\sqrt{c\,d}\,b},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{2}\,b^3\,c^3\,\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}+3\,\mathrm{EllipticPi}\Bigg(\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}},\,\frac{\sqrt{c\,d}\,b}{\sqrt{a\,b}\,d+\sqrt{c\,d}\,b},$$

$$\frac{\sqrt{2}}{2}\Bigg)\sqrt{2}\,b^2\,c^2\,\sqrt{c\,d}\,\sqrt{a\,b}\,\sqrt{\frac{dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{\frac{-dx+\sqrt{cd}}{\sqrt{cd}}}\,\sqrt{-\frac{x\,d}{\sqrt{c\,d}}}-4x^3\,a\,b\,d^3\sqrt{a\,b}+4x^3\,b^2\,c\,d^2\sqrt{a\,b}+4x\,a\,b\,c\,d^2\sqrt{a\,b}-4x\,b^2\,c^2\,d\sqrt{a\,b}\Bigg)\Bigg)$$

Problem 234: Result more than twice size of optimal antiderivative.

$$\int \frac{(-d x^2+c)^{3/2}}{(e x)^{5/2}(-b x^2+a)}\, dx$$

Optimal(type 4, 252 leaves, 10 steps):

$$-\frac{2 c \sqrt{-d x^2+c}}{3 a e (e x)^{3/2}}+\frac{2 c^{1/4} d^{3/4} (-3 a d+b c) \operatorname{EllipticF}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{3 a b e^{5/2} \sqrt{-d x^2+c}}$$
$$+\frac{c^{1/4} (-a d+b c)^2 \operatorname{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, -\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{a^2 b d^{1/4} e^{5/2} \sqrt{-d x^2+c}}+\frac{c^{1/4} (-a d+b c)^2 \operatorname{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, \frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{a^2 b d^{1/4} e^{5/2} \sqrt{-d x^2+c}}$$

Result(type 4, 1739 leaves):

$$\frac{1}{6 x a e^2 \sqrt{e x}\, (d x^2-c) \sqrt{a b}\, (\sqrt{a b}\, d+\sqrt{c d}\, b)(\sqrt{c d}\, b-\sqrt{a b}\, d)} \Bigg(\sqrt{-d x^2+c}\, d \Bigg(3 \sqrt{2} \operatorname{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x a^2 b c d^2 \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} + 3 \sqrt{2} \operatorname{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x a^2 d^2 \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} - 6 \sqrt{2} \operatorname{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x a b^2 c^2 d \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} - 6 \sqrt{2} \operatorname{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x a b c d \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} + 3 \sqrt{2} \operatorname{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x b^3 c^3 \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} + 3 \sqrt{2} \operatorname{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x b^2 c^2 \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} - 6 \sqrt{2} \operatorname{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x a^2 d^2 \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} + 8 \sqrt{2} \operatorname{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \right.$$
$$\left.\frac{\sqrt{2}}{2}\right) x a b c d \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} - 2 \sqrt{2} \operatorname{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \right.$$

$$\frac{\sqrt{2}}{2}\Bigg) x b^2 c^2 \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} - 3\sqrt{2}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$

$$\frac{\sqrt{2}}{2}\Bigg) x a^2 b c d^2 \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} + 3\sqrt{2}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$

$$\frac{\sqrt{2}}{2}\Bigg) x a^2 d^2 \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} + 6\sqrt{2}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$

$$\frac{\sqrt{2}}{2}\Bigg) x a b^2 c^2 d \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} - 6\sqrt{2}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$

$$\frac{\sqrt{2}}{2}\Bigg) x a b c d \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} - 3\sqrt{2}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$

$$\frac{\sqrt{2}}{2}\Bigg) x b^3 c^3 \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} + 3\sqrt{2}\,\text{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$

$$\frac{\sqrt{2}}{2}\Bigg) x b^2 c^2 \sqrt{a b} \sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}} \sqrt{-\frac{x d}{\sqrt{c d}}} \sqrt{c d} + 4 x^2 a b c d^2 \sqrt{a b} - 4 x^2 b^2 c^2 d \sqrt{a b} - 4 a b c^2 d \sqrt{a b} + 4 b^2 c^3 \sqrt{a b}\Bigg)\Bigg)$$

Problem 235: Result more than twice size of optimal antiderivative.

$$\int \frac{(-d x^2+c)^{3/2}}{(e x)^{7/2}(-b x^2+a)}\, dx$$

Optimal(type 4, 347 leaves, 16 steps):

$$-\frac{2 c \sqrt{-d x^2+c}}{5 a e (e x)^{5/2}} - \frac{2(-7 a d+5 b c)\sqrt{-d x^2+c}}{5 a^2 e^3 \sqrt{e x}} - \frac{2 c^{3/4} d^{1/4}(-7 a d+5 b c)\,\text{EllipticE}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}, I\right)\sqrt{1-\frac{d x^2}{c}}}{5 a^2 e^{7/2}\sqrt{-d x^2+c}}$$

$$+\frac{2 c^{3/4} d^{1/4}(-7 a d+5 b c)\,\text{EllipticF}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}, I\right)\sqrt{1-\frac{d x^2}{c}}}{5 a^2 e^{7/2}\sqrt{-d x^2+c}} - \frac{c^{1/4}(-a d+b c)^2\,\text{EllipticPi}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}, -\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}}, I\right)\sqrt{1-\frac{d x^2}{c}}}{a^{5/2} d^{1/4} e^{7/2}\sqrt{b}\sqrt{-d x^2+c}}$$

$$+\frac{c^{1/4}(-a d+b c)^2\,\text{EllipticPi}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}, \frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}}, I\right)\sqrt{1-\frac{d x^2}{c}}}{a^{5/2} d^{1/4} e^{7/2}\sqrt{b}\sqrt{-d x^2+c}}$$

Result(type ?, 2027 leaves): Display of huge result suppressed!

Problem 237: Result more than twice size of optimal antiderivative.

$$\int \frac{(e x)^{3/2}}{(-b x^2+a)(-d x^2+c)^{3/2}}\, dx$$

Optimal(type 4, 240 leaves, 10 steps):

$$-\frac{e\sqrt{e x}}{(-a d+b c)\sqrt{-d x^2+c}}-\frac{c^{1/4} e^{3/2}\,\mathrm{EllipticF}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}, I\right)\sqrt{1-\frac{d x^2}{c}}}{d^{1/4}(-a d+b c)\sqrt{-d x^2+c}}+\frac{c^{1/4} e^{3/2}\,\mathrm{EllipticPi}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}, -\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}}, I\right)\sqrt{1-\frac{d x^2}{c}}}{d^{1/4}(-a d+b c)\sqrt{-d x^2+c}}$$
$$+\frac{c^{1/4} e^{3/2}\,\mathrm{EllipticPi}\left(\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}, \frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}}, I\right)\sqrt{1-\frac{d x^2}{c}}}{d^{1/4}(-a d+b c)\sqrt{-d x^2+c}}$$

Result(type 4, 701 leaves):

$$-\frac{1}{2 x\left(\sqrt{c d}\, b-\sqrt{a b}\, d\right)\left(\sqrt{a b}\, d+\sqrt{c d}\, b\right)\sqrt{a b}\,(a d-b c)\,(d x^2-c)}\Bigg(b\Bigg(\sqrt{2}\sqrt{-\frac{x d}{\sqrt{c d}}}\,\mathrm{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\, a b c d+\mathrm{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{c d}\, b-\sqrt{a b}\, d},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{2}\, a d\sqrt{a b}\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{-\frac{x d}{\sqrt{c d}}}\sqrt{c d}-\mathrm{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{2}\, a d\sqrt{a b}\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{-\frac{x d}{\sqrt{c d}}}\sqrt{c d}+\mathrm{EllipticF}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{2}\, b c\sqrt{a b}\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{-\frac{x d}{\sqrt{c d}}}\sqrt{c d}-\sqrt{2}\sqrt{-\frac{x d}{\sqrt{c d}}}\,\mathrm{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\, a b c d+\mathrm{EllipticPi}\left(\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}, \frac{\sqrt{c d}\, b}{\sqrt{a b}\, d+\sqrt{c d}\, b},\right.$$
$$\left.\frac{\sqrt{2}}{2}\right)\sqrt{2}\, a d\sqrt{a b}\sqrt{\frac{d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{\frac{-d x+\sqrt{c d}}{\sqrt{c d}}}\sqrt{-\frac{x d}{\sqrt{c d}}}\sqrt{c d}-2 x a d^2\sqrt{a b}+2 x b c d\sqrt{a b}\Bigg)\sqrt{-d x^2+c}\, e\sqrt{e x}\Bigg)$$

Problem 238: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-d x^2+c}}{\sqrt{e x}\,(-b x^2+a)^2}\, dx$$

Optimal(type 4, 253 leaves, 10 steps):

$$\frac{\sqrt{ex}\,\sqrt{-dx^2+c}}{2ae(-bx^2+a)}+\frac{c^{1/4}d^{3/4}\,\mathrm{EllipticF}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},I\right)\sqrt{1-\frac{dx^2}{c}}}{2ab\sqrt{e}\,\sqrt{-dx^2+c}}+\frac{c^{1/4}(-ad+3bc)\,\mathrm{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},I\right)\sqrt{1-\frac{dx^2}{c}}}{4a^2bd^{1/4}\sqrt{e}\,\sqrt{-dx^2+c}}$$

$$+\frac{c^{1/4}(-ad+3bc)\,\mathrm{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},I\right)\sqrt{1-\frac{dx^2}{c}}}{4a^2bd^{1/4}\sqrt{e}\,\sqrt{-dx^2+c}}$$

Result(type ?, 2250 leaves): Display of huge result suppressed!

Problem 239: Result more than twice size of optimal antiderivative.

$$\int\frac{(-dx^2+c)^{3/2}}{(ex)^{3/2}(-bx^2+a)^2}\,dx$$

Optimal(type 4, 403 leaves, 16 steps):

$$-\frac{(-ad+5bc)\sqrt{-dx^2+c}}{2a^2be\sqrt{ex}}+\frac{(-ad+bc)\sqrt{-dx^2+c}}{2abe(-bx^2+a)\sqrt{ex}}-\frac{c^{3/4}d^{1/4}(-ad+5bc)\,\mathrm{EllipticE}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},I\right)\sqrt{1-\frac{dx^2}{c}}}{2a^2be^{3/2}\sqrt{-dx^2+c}}$$

$$+\frac{c^{3/4}d^{1/4}(-ad+5bc)\,\mathrm{EllipticF}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},I\right)\sqrt{1-\frac{dx^2}{c}}}{2a^2be^{3/2}\sqrt{-dx^2+c}}$$

$$-\frac{c^{1/4}(-a^2d^2-4acbd+5b^2c^2)\,\mathrm{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},I\right)\sqrt{1-\frac{dx^2}{c}}}{4a^{5/2}b^{3/2}d^{1/4}e^{3/2}\sqrt{-dx^2+c}}$$

$$+\frac{c^{1/4}(-a^2d^2-4acbd+5b^2c^2)\,\mathrm{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}},\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},I\right)\sqrt{1-\frac{dx^2}{c}}}{4a^{5/2}b^{3/2}d^{1/4}e^{3/2}\sqrt{-dx^2+c}}$$

Result(type ?, 3878 leaves): Display of huge result suppressed!

Problem 240: Result more than twice size of optimal antiderivative.

$$\int\frac{(ex)^{7/2}}{(-bx^2+a)^2(-dx^2+c)^{3/2}}\,dx$$

Optimal(type 4, 332 leaves, 11 steps):

$$\frac{(a d+2 b c) e^3 \sqrt{e x}}{2 b(-a d+b c)^2 \sqrt{-d x^2+c}}+\frac{a e^3 \sqrt{e x}}{2 b(-a d+b c)\left(-b x^2+a\right) \sqrt{-d x^2+c}}+\frac{c^{1/4}(a d+2 b c) e^{7/2} \operatorname{EllipticF}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{2 b d^{1/4}(-a d+b c)^2 \sqrt{-d x^2+c}}$$
$$-\frac{c^{1/4}(a d+5 b c) e^{7/2} \operatorname{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}},-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{4 b d^{1/4}(-a d+b c)^2 \sqrt{-d x^2+c}}$$
$$-\frac{c^{1/4}(a d+5 b c) e^{7/2} \operatorname{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, \frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{4 b d^{1/4}(-a d+b c)^2 \sqrt{-d x^2+c}}$$

Result(type ?, 2529 leaves): Display of huge result suppressed!

Problem 241: Result more than twice size of optimal antiderivative.

$$\int \frac{(e x)^{3/2}}{\left(-b x^2+a\right)^2\left(-d x^2+c\right)^{3/2}} \, dx$$

Optimal(type 4, 303 leaves, 11 steps):

$$\frac{3 d e \sqrt{e x}}{2(-a d+b c)^2 \sqrt{-d x^2+c}}+\frac{e \sqrt{e x}}{2(-a d+b c)\left(-b x^2+a\right) \sqrt{-d x^2+c}}+\frac{3 c^{1/4} d^{3/4} e^{3/2} \operatorname{EllipticF}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{2(-a d+b c)^2 \sqrt{-d x^2+c}}$$
$$-\frac{c^{1/4}(5 a d+b c) e^{3/2} \operatorname{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}},-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{4 a d^{1/4}(-a d+b c)^2 \sqrt{-d x^2+c}}$$
$$-\frac{c^{1/4}(5 a d+b c) e^{3/2} \operatorname{EllipticPi}\left(\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}, \frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, I\right) \sqrt{1-\frac{d x^2}{c}}}{4 a d^{1/4}(-a d+b c)^2 \sqrt{-d x^2+c}}$$

Result(type ?, 2276 leaves): Display of huge result suppressed!

Problem 242: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(e x)^{3/2}\left(-b x^2+a\right)^2\left(-d x^2+c\right)^{3/2}} \, dx$$

Optimal(type 4, 506 leaves, 17 steps):

$$\frac{d(2 a d+b c)}{2 a c(-a d+b c)^2 e \sqrt{e x} \sqrt{-d x^2+c}}+\frac{b}{2 a(-a d+b c) e\left(-b x^2+a\right) \sqrt{e x} \sqrt{-d x^2+c}}-\frac{\left(6 a^2 d^2-8 a c b d+5 b^2 c^2\right) \sqrt{-d x^2+c}}{2 a^2 c^2(-a d+b c)^2 e \sqrt{e x}}$$

$$-\frac{d^{1/4}\left(6a^2d^2-8acbd+5b^2c^2\right)\operatorname{EllipticE}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}, I\right)\sqrt{1-\frac{dx^2}{c}}}{2a^2c^{5/4}(-ad+bc)^2e^{3/2}\sqrt{-dx^2+c}}+\frac{d^{1/4}\left(6a^2d^2-8acbd+5b^2c^2\right)\operatorname{EllipticF}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}, I\right)\sqrt{1-\frac{dx^2}{c}}}{2a^2c^{5/4}(-ad+bc)^2e^{3/2}\sqrt{-dx^2+c}}$$

$$-\frac{b^{3/2}c^{1/4}(-11ad+5bc)\operatorname{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}, -\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}}, I\right)\sqrt{1-\frac{dx^2}{c}}}{4a^{5/2}d^{1/4}(-ad+bc)^2e^{3/2}\sqrt{-dx^2+c}}$$

$$+\frac{b^{3/2}c^{1/4}(-11ad+5bc)\operatorname{EllipticPi}\left(\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}, \frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}}, I\right)\sqrt{1-\frac{dx^2}{c}}}{4a^{5/2}d^{1/4}(-ad+bc)^2e^{3/2}\sqrt{-dx^2+c}}$$

Result(type ?, 3384 leaves): Display of huge result suppressed!

Problem 243: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{bx^2+a}}{x\sqrt{dx^2+c}}\,dx$$

Optimal(type 3, 68 leaves, 8 steps):

$$-\frac{\operatorname{arctanh}\left(\frac{\sqrt{c}\sqrt{bx^2+a}}{\sqrt{a}\sqrt{dx^2+c}}\right)\sqrt{a}}{\sqrt{c}}+\frac{\operatorname{arctanh}\left(\frac{\sqrt{d}\sqrt{bx^2+a}}{\sqrt{b}\sqrt{dx^2+c}}\right)\sqrt{b}}{\sqrt{d}}$$

Result(type 3, 176 leaves):

$$-\frac{1}{2\sqrt{x^4bd+x^2ad+bcx^2+ac}\sqrt{bd}\sqrt{ac}}\left(\sqrt{bx^2+a}\sqrt{dx^2+c}\left(a\ln\left(\frac{x^2ad+bcx^2+2\sqrt{ac}\sqrt{x^4bd+x^2ad+bcx^2+ac}+2ac}{x^2}\right)\sqrt{bd}\right.\right.$$
$$\left.\left.-\ln\left(\frac{2bdx^2+2\sqrt{x^4bd+x^2ad+bcx^2+ac}\sqrt{bd}+ad+bc}{2\sqrt{bd}}\right)b\sqrt{ac}\right)\right)$$

Problem 245: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3(bx^2+a)^{3/2}}{\sqrt{dx^2+c}}\,dx$$

Optimal(type 3, 155 leaves, 7 steps):

$$-\frac{(-ad+bc)^2(ad+5bc)\operatorname{arctanh}\left(\frac{\sqrt{d}\sqrt{bx^2+a}}{\sqrt{b}\sqrt{dx^2+c}}\right)}{16b^{3/2}d^{7/2}}-\frac{(ad+5bc)(bx^2+a)^{3/2}\sqrt{dx^2+c}}{24bd^2}+\frac{(bx^2+a)^{5/2}\sqrt{dx^2+c}}{6bd}$$

$$+\frac{(-a d+b c)(a d+5 b c)\sqrt{b x^2+a}\,\sqrt{d x^2+c}}{16 b d^3}$$

Result(type 3, 531 leaves):

$$-\frac{1}{96\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,d^3 b\sqrt{b d}}\Bigg(\sqrt{b x^2+a}\,\sqrt{d x^2+c}\,\Bigg(-16 x^4 b^2 d^2\sqrt{b d}\,\sqrt{x^4 b d+x^2 a d+b c x^2+a c}$$

$$-28\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,x^2 a d^2 b\sqrt{b d}+20\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,x^2 b^2 c d\sqrt{b d}$$

$$+3\ln\left(\frac{2 b d x^2+2\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,\sqrt{b d}+a d+b c}{2\sqrt{b d}}\right)a^3 d^3+9\ln\left(\frac{2 b d x^2+2\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,\sqrt{b d}+a d+b c}{2\sqrt{b d}}\right)a^2 c d^2 b$$

$$-27\ln\left(\frac{2 b d x^2+2\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,\sqrt{b d}+a d+b c}{2\sqrt{b d}}\right)a c^2 b^2 d+15 b^3\ln\left(\frac{2 b d x^2+2\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,\sqrt{b d}+a d+b c}{2\sqrt{b d}}\right)c^3$$

$$-6\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,a^2 d^2\sqrt{b d}+44\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,a c d b\sqrt{b d}-30\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,c^2 b^2\sqrt{b d}\Bigg)\Bigg)$$

Problem 246: Result more than twice size of optimal antiderivative.

$$\int\frac{x(b x^2+a)^{3/2}}{\sqrt{d x^2+c}}\,dx$$

Optimal(type 3, 99 leaves, 6 steps):

$$\frac{3(-a d+b c)^2\operatorname{arctanh}\left(\frac{\sqrt{d}\,\sqrt{b x^2+a}}{\sqrt{b}\,\sqrt{d x^2+c}}\right)}{8 d^{5/2}\sqrt{b}}+\frac{(b x^2+a)^{3/2}\sqrt{d x^2+c}}{4 d}-\frac{3(-a d+b c)\sqrt{b x^2+a}\,\sqrt{d x^2+c}}{8 d^2}$$

Result(type 3, 336 leaves):

$$\frac{1}{16\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,d^2\sqrt{b d}}\Bigg(\sqrt{b x^2+a}\,\sqrt{d x^2+c}\,\Bigg(4 b\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,x^2 d\sqrt{b d}$$

$$+3\ln\left(\frac{2 b d x^2+2\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,\sqrt{b d}+a d+b c}{2\sqrt{b d}}\right)a^2 d^2-6 b\ln\left(\frac{2 b d x^2+2\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,\sqrt{b d}+a d+b c}{2\sqrt{b d}}\right)a c d$$

$$+3 b^2\ln\left(\frac{2 b d x^2+2\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,\sqrt{b d}+a d+b c}{2\sqrt{b d}}\right)c^2+10\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,a d\sqrt{b d}$$

$$-6 b\sqrt{x^4 b d+x^2 a d+b c x^2+a c}\,c\sqrt{b d}\Bigg)\Bigg)$$

Problem 248: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3 (b x^2 + a)^{5/2}}{\sqrt{d x^2 + c}} \, dx$$

Optimal(type 3, 199 leaves, 8 steps):

$$\frac{5 (-a d + b c)^3 (a d + 7 b c) \operatorname{arctanh}\left(\frac{\sqrt{d}\sqrt{b x^2 + a}}{\sqrt{b}\sqrt{d x^2 + c}}\right)}{128 b^{3/2} d^{9/2}} + \frac{5 (-a d + b c) (a d + 7 b c) (b x^2 + a)^{3/2} \sqrt{d x^2 + c}}{192 b d^3} - \frac{(a d + 7 b c) (b x^2 + a)^{5/2} \sqrt{d x^2 + c}}{48 b d^2}$$

$$+ \frac{(b x^2 + a)^{7/2} \sqrt{d x^2 + c}}{8 b d} - \frac{5 (-a d + b c)^2 (a d + 7 b c) \sqrt{b x^2 + a}\sqrt{d x^2 + c}}{128 b d^4}$$

Result(type 3, 769 leaves):

$$-\frac{1}{768 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, d^4 b \sqrt{b d}} \Bigg(\sqrt{b x^2 + a}\sqrt{d x^2 + c} \Bigg(-96 x^6 b^3 d^3 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d}$$

$$- 272 x^4 a b^2 d^3 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d} + 112 x^4 b^3 c d^2 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d} - 236 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, x^2 a^2 d^3 b \sqrt{b d}$$

$$+ 344 b^2 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, x^2 a c d^2 \sqrt{b d} - 140 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, x^2 c^2 b^3 d \sqrt{b d}$$

$$+ 15 \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) a^4 d^4 + 60 \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) a^3 c d^3 b$$

$$- 270 b^2 \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) a^2 c^2 d^2$$

$$+ 300 \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) a c^3 b^3 d$$

$$- 105 b^4 \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) c^4 - 30 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, a^3 d^3 \sqrt{b d}$$

$$+ 382 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, a^2 c d^2 b \sqrt{b d} - 530 b^2 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, a c^2 d \sqrt{b d} + 210 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, c^3 b^3 \sqrt{b d}\Bigg)\Bigg)$$

Problem 249: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x^2 + a)^{5/2}}{x \sqrt{d x^2 + c}} \, dx$$

Optimal(type 3, 149 leaves, 9 steps):

$$\frac{\left(15 a^2 d^2 - 10 a c b d + 3 b^2 c^2\right) \operatorname{arctanh}\left(\frac{\sqrt{d}\,\sqrt{b x^2 + a}}{\sqrt{b}\,\sqrt{d x^2 + c}}\right)\sqrt{b}}{8 d^{5/2}} - \frac{a^{5/2} \operatorname{arctanh}\left(\frac{\sqrt{c}\,\sqrt{b x^2 + a}}{\sqrt{a}\,\sqrt{d x^2 + c}}\right)}{\sqrt{c}} + \frac{b \left(b x^2 + a\right)^{3/2}\sqrt{d x^2 + c}}{4 d}$$
$$- \frac{b\,(-7 a d + 3 b c)\sqrt{b x^2 + a}\,\sqrt{d x^2 + c}}{8 d^2}$$

Result(type 3, 445 leaves):

$$-\frac{1}{16 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, d^2 \sqrt{b d}\,\sqrt{a c}} \Bigg(\sqrt{b x^2 + a}\,\sqrt{d x^2 + c}\,\Bigg(-4 b^2 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, x^2 d \sqrt{b d}\,\sqrt{a c}$$
$$+ 8 a^3 \ln\left(\frac{x^2 a d + b c x^2 + 2\sqrt{a c}\,\sqrt{x^4 b d + x^2 a d + b c x^2 + a c} + 2 a c}{x^2}\right) d^2 \sqrt{b d}$$
$$- 15 b \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\,\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) a^2 d^2 \sqrt{a c}$$
$$+ 10 b^2 \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\,\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) a c d \sqrt{a c}$$
$$- 3 b^3 \ln\left(\frac{2 b d x^2 + 2\sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\,\sqrt{b d} + a d + b c}{2\sqrt{b d}}\right) c^2 \sqrt{a c} - 18 b \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, a d \sqrt{b d}\,\sqrt{a c}$$
$$+ 6 b^2 \sqrt{x^4 b d + x^2 a d + b c x^2 + a c}\, c \sqrt{b d}\,\sqrt{a c}\Bigg)\Bigg)$$

Problem 262: Unable to integrate problem.

$$\int \frac{x^5}{\left(-x^2 + 1\right)^{1/3} \left(x^2 + 3\right)}\, dx$$

Optimal(type 3, 80 leaves, 7 steps):

$$\frac{3\left(-x^2 + 1\right)^{2/3}}{2} + \frac{3\left(-x^2 + 1\right)^{5/3}}{10} - \frac{9 \ln\left(x^2 + 3\right) 2^{1/3}}{8} + \frac{27 \ln\left(2^{2/3} - \left(-x^2 + 1\right)^{1/3}\right) 2^{1/3}}{8} + \frac{9 \arctan\left(\frac{\left(1 + \left(-2 x^2 + 2\right)^{1/3}\right)\sqrt{3}}{3}\right)\sqrt{3}\, 2^{1/3}}{4}$$

Result(type 8, 43 leaves):

$$\frac{3\left(x^2 - 6\right)\left(x^2 - 1\right)}{10\left(-x^2 + 1\right)^{1/3}} + \int \frac{9 x}{\left(x^2 + 3\right)\left(-x^2 + 1\right)^{1/3}}\, dx$$

Problem 263: Unable to integrate problem.

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

Optimal(type 3, 72 leaves, 7 steps):

$$-\frac{(-x^2+1)^{2/3}}{6x^2} - \frac{\ln(x^2+3)\,2^{1/3}}{72} + \frac{\ln\left(2^{2/3} - (-x^2+1)^{1/3}\right) 2^{1/3}}{24} + \frac{\arctan\left(\frac{\left(1+(-2x^2+2)^{1/3}\right)\sqrt{3}}{3}\right)\sqrt{3}\,2^{1/3}}{36}$$

Result(type 8, 41 leaves):

$$\frac{x^2-1}{6x^2(-x^2+1)^{1/3}} + \int \frac{x}{9(x^2+3)(-x^2+1)^{1/3}}\, dx$$

Problem 264: Unable to integrate problem.

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

Optimal(type 4, 420 leaves, 7 steps):

$$-\frac{3x(-x^2+1)^{2/3}}{7} - \frac{3\,\mathrm{arctanh}(x)\,2^{1/3}}{4} + \frac{9\,\mathrm{arctanh}\left(\frac{x}{1+2^{1/3}(-x^2+1)^{1/3}}\right)2^{1/3}}{4} + \frac{54x}{7\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)} + \frac{3\arctan\left(\frac{\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{4}$$
$$+ \frac{3\arctan\left(\frac{\left(1-2^{1/3}(-x^2+1)^{1/3}\right)\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{4}$$
$$- \frac{18\,3^{3/4}\left(1-(-x^2+1)^{1/3}\right)\mathrm{EllipticF}\left(\frac{1-(-x^2+1)^{1/3}+\sqrt{3}}{1-(-x^2+1)^{1/3}-\sqrt{3}}, 2I - I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{1+(-x^2+1)^{1/3}+(-x^2+1)^{2/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}}{7x\sqrt{\frac{-1+(-x^2+1)^{1/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}}$$
$$+ \frac{27\,3^{1/4}\left(1-(-x^2+1)^{1/3}\right)\mathrm{EllipticE}\left(\frac{1-(-x^2+1)^{1/3}+\sqrt{3}}{1-(-x^2+1)^{1/3}-\sqrt{3}}, 2I - I\sqrt{3}\right)\sqrt{\frac{1+(-x^2+1)^{1/3}+(-x^2+1)^{2/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)}{7x\sqrt{\frac{-1+(-x^2+1)^{1/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}}$$

Result(type 8, 45 leaves):

$$\frac{3x(x^2-1)}{7(-x^2+1)^{1/3}} + \int -\frac{9(2x^2-1)}{7(x^2+3)(-x^2+1)^{1/3}}\, dx$$

Problem 265: Unable to integrate problem.

$$\int \frac{x^2}{\left(-x^2+1\right)^{1/3}\left(x^2+3\right)}\,dx$$

Optimal(type 4, 407 leaves, 6 steps):

$$\frac{\operatorname{arctanh}(x)\,2^{1/3}}{4}-\frac{3\operatorname{arctanh}\left(\frac{x}{1+2^{1/3}\left(-x^2+1\right)^{1/3}}\right)2^{1/3}}{4}-\frac{3x}{1-\left(-x^2+1\right)^{1/3}-\sqrt{3}}-\frac{\arctan\left(\frac{\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{4}$$
$$-\frac{\arctan\left(\frac{\left(1-2^{1/3}\left(-x^2+1\right)^{1/3}\right)\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{4}$$
$$+\frac{3^{3/4}\left(1-\left(-x^2+1\right)^{1/3}\right)\operatorname{EllipticF}\left(\frac{1-\left(-x^2+1\right)^{1/3}+\sqrt{3}}{1-\left(-x^2+1\right)^{1/3}-\sqrt{3}},2I-I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{1+\left(-x^2+1\right)^{1/3}+\left(-x^2+1\right)^{2/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}}{x\sqrt{\frac{-1+\left(-x^2+1\right)^{1/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}}$$
$$-\frac{3\,3^{1/4}\left(1-\left(-x^2+1\right)^{1/3}\right)\operatorname{EllipticE}\left(\frac{1-\left(-x^2+1\right)^{1/3}+\sqrt{3}}{1-\left(-x^2+1\right)^{1/3}-\sqrt{3}},2I-I\sqrt{3}\right)\sqrt{\frac{1+\left(-x^2+1\right)^{1/3}+\left(-x^2+1\right)^{2/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)}{2x\sqrt{\frac{-1+\left(-x^2+1\right)^{1/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}}$$

Result(type 8, 22 leaves):

$$\int \frac{x^2}{\left(-x^2+1\right)^{1/3}\left(x^2+3\right)}\,dx$$

Problem 266: Unable to integrate problem.

$$\int \frac{1}{x^3\left(-x^2+1\right)^{1/3}\left(x^2+3\right)^2}\,dx$$

Optimal(type 3, 141 leaves, 12 steps):

$$-\frac{5\left(-x^2+1\right)^{2/3}}{72\left(x^2+3\right)}-\frac{\left(-x^2+1\right)^{2/3}}{6x^2\left(x^2+3\right)}+\frac{\ln(x)}{54}-\frac{\ln\left(x^2+3\right)2^{1/3}}{96}-\frac{\ln\left(1-\left(-x^2+1\right)^{1/3}\right)}{36}+\frac{\ln\left(2^{2/3}-\left(-x^2+1\right)^{1/3}\right)2^{1/3}}{32}$$
$$+\frac{\arctan\left(\frac{\left(1+\left(-2x^2+2\right)^{1/3}\right)\sqrt{3}}{3}\right)\sqrt{3}\,2^{1/3}}{48}-\frac{\arctan\left(\frac{\left(1+2\left(-x^2+1\right)^{1/3}\right)\sqrt{3}}{3}\right)\sqrt{3}}{54}$$

Result(type 8, 64 leaves):

$$\frac{(x^2-1)(5x^2+12)}{72(-x^2+1)^{1/3}(x^2+3)x^2}+\int\frac{5x^2-12}{108x(x^2+3)(-x^2+1)^{1/3}}\,dx$$

Problem 267: Unable to integrate problem.

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

Optimal(type 4, 427 leaves, 7 steps):

$$\frac{x(-x^2+1)^{2/3}}{24(x^2+3)}-\frac{\operatorname{arctanh}(x)\,2^{1/3}}{48}+\frac{\operatorname{arctanh}\left(\frac{x}{1+2^{1/3}(-x^2+1)^{1/3}}\right)2^{1/3}}{16}-\frac{x}{24\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)}+\frac{\arctan\left(\frac{\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{48}$$
$$+\frac{\arctan\left(\frac{\left(1-2^{1/3}(-x^2+1)^{1/3}\right)\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{48}$$
$$+\frac{3^{3/4}\left(1-(-x^2+1)^{1/3}\right)\operatorname{EllipticF}\left(\frac{1-(-x^2+1)^{1/3}+\sqrt{3}}{1-(-x^2+1)^{1/3}-\sqrt{3}},2I-I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{1+(-x^2+1)^{1/3}+(-x^2+1)^{2/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}}{72x\sqrt{\frac{-1+(-x^2+1)^{1/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}}$$
$$-\frac{3^{1/4}\left(1-(-x^2+1)^{1/3}\right)\operatorname{EllipticE}\left(\frac{1-(-x^2+1)^{1/3}+\sqrt{3}}{1-(-x^2+1)^{1/3}-\sqrt{3}},2I-I\sqrt{3}\right)\sqrt{\frac{1+(-x^2+1)^{1/3}+(-x^2+1)^{2/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)}{48x\sqrt{\frac{-1+(-x^2+1)^{1/3}}{\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)^2}}}$$

Result(type 8, 50 leaves):

$$-\frac{x(x^2-1)}{24(x^2+3)(-x^2+1)^{1/3}}+\int\frac{x^2+21}{72(x^2+3)(-x^2+1)^{1/3}}\,dx$$

Problem 268: Unable to integrate problem.

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

Optimal(type 4, 443 leaves, 8 steps):

$$-\frac{(-x^2+1)^{2/3}}{8x}+\frac{(-x^2+1)^{2/3}}{24x(x^2+3)}+\frac{7\operatorname{arctanh}(x)\,2^{1/3}}{432}-\frac{7\operatorname{arctanh}\left(\frac{x}{1+2^{1/3}(-x^2+1)^{1/3}}\right)2^{1/3}}{144}+\frac{x}{8\left(1-(-x^2+1)^{1/3}-\sqrt{3}\right)}$$

$$-\frac{7\arctan\left(\frac{\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{432}-\frac{7\arctan\left(\frac{\left(1-2^{1/3}\left(-x^2+1\right)^{1/3}\right)\sqrt{3}}{x}\right)\sqrt{3}\,2^{1/3}}{432}$$

$$-\frac{3^{3/4}\left(1-\left(-x^2+1\right)^{1/3}\right)\operatorname{EllipticF}\left(\frac{1-\left(-x^2+1\right)^{1/3}+\sqrt{3}}{1-\left(-x^2+1\right)^{1/3}-\sqrt{3}},2I-I\sqrt{3}\right)\sqrt{2}\sqrt{\frac{1+\left(-x^2+1\right)^{1/3}+\left(-x^2+1\right)^{2/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}}{24x\sqrt{\frac{-1+\left(-x^2+1\right)^{1/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}}$$

$$+\frac{3^{1/4}\left(1-\left(-x^2+1\right)^{1/3}\right)\operatorname{EllipticE}\left(\frac{1-\left(-x^2+1\right)^{1/3}+\sqrt{3}}{1-\left(-x^2+1\right)^{1/3}-\sqrt{3}},2I-I\sqrt{3}\right)\sqrt{\frac{1+\left(-x^2+1\right)^{1/3}+\left(-x^2+1\right)^{2/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}\left(\frac{\sqrt{6}}{2}+\frac{\sqrt{2}}{2}\right)}{16x\sqrt{\frac{-1+\left(-x^2+1\right)^{1/3}}{\left(1-\left(-x^2+1\right)^{1/3}-\sqrt{3}\right)^2}}}$$

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Result(type 8, 61 leaves):
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$$\frac{\left(x^2-1\right)\left(3x^2+8\right)}{24\left(-x^2+1\right)^{1/3}\left(x^2+3\right)x}+\int -\frac{3x^2+23}{72\left(x^2+3\right)\left(-x^2+1\right)^{1/3}}\,dx$$

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Problem 269: Unable to integrate problem.
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$$\int \frac{x^4}{\left(-3x^2+2\right)^{1/4}\left(-3x^2+4\right)}\,dx$$

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Optimal(type 4, 148 leaves, 6 steps):
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$$\frac{2x\left(-3x^2+2\right)^{3/4}}{45}+\frac{4\,2^{1/4}\arctan\left(\frac{\left(2^{3/4}-2^{1/4}\sqrt{-3x^2+2}\right)\sqrt{3}}{3x\left(-3x^2+2\right)^{1/4}}\right)\sqrt{3}}{27}+\frac{4\,2^{1/4}\operatorname{arctanh}\left(\frac{\left(2^{3/4}+2^{1/4}\sqrt{-3x^2+2}\right)\sqrt{3}}{3x\left(-3x^2+2\right)^{1/4}}\right)\sqrt{3}}{27}$$

$$-\frac{16\sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\operatorname{EllipticE}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right),\sqrt{2}\right)\sqrt{3}\,2^{1/4}}{45\cos\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

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Result(type 8, 51 leaves):
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$$-\frac{2\left(3x^2-2\right)x}{45\left(-3x^2+2\right)^{1/4}}-\left(\int \frac{8\left(9x^2-2\right)}{45\left(3x^2-4\right)\left(-3x^2+2\right)^{1/4}}\,dx\right)$$

Problem 270: Unable to integrate problem.

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

Optimal(type 3, 25 leaves, 5 steps):

$$\frac{\arctan\left((3x^2-1)^{1/4}\right)}{3}-\frac{\operatorname{arctanh}\left((3x^2-1)^{1/4}\right)}{3}$$

Result(type 8, 22 leaves):

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

Problem 271: Unable to integrate problem.

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

Optimal(type 3, 43 leaves, 1 step):

$$-\frac{\arctan\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{12}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{12}$$

Result(type 8, 21 leaves):

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

Problem 272: Unable to integrate problem.

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

Optimal(type 3, 93 leaves, 1 step):

$$-\frac{\arctan\left(\frac{\left(2\,2^{3/4}+2\,2^{1/4}\sqrt{3x^2+2}\right)\sqrt{3}}{6x(3x^2+2)^{1/4}}\right)2^{3/4}\sqrt{3}}{18}+\frac{\operatorname{arctanh}\left(\frac{\left(2\,2^{3/4}-2\,2^{1/4}\sqrt{3x^2+2}\right)\sqrt{3}}{6x(3x^2+2)^{1/4}}\right)2^{3/4}\sqrt{3}}{18}$$

Result(type 8, 24 leaves):

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

Problem 273: Unable to integrate problem.

$$\int \frac{x^2}{(3x^2+a)^{3/4}(3x^2+2a)}\,dx$$

Optimal(type 3, 90 leaves, 1 step):

$$-\frac{\arctan\left(\frac{a^{3/4}\left(1+\frac{\sqrt{3x^2+a}}{\sqrt{a}}\right)\sqrt{3}}{3x(3x^2+a)^{1/4}}\right)\sqrt{3}}{9a^{1/4}}+\frac{\operatorname{arctanh}\left(\frac{a^{3/4}\left(1-\frac{\sqrt{3x^2+a}}{\sqrt{a}}\right)\sqrt{3}}{3x(3x^2+a)^{1/4}}\right)\sqrt{3}}{9a^{1/4}}$$

Result(type 8, 26 leaves):

$$\int \frac{x^2}{(3x^2+a)^{3/4}(3x^2+2a)}\,dx$$

Problem 274: Unable to integrate problem.

$$\int \frac{x^2}{(bx^2+a)^{3/4}(bx^2+2a)}\,dx$$

Optimal(type 3, 87 leaves, 1 step):

$$-\frac{\arctan\left(\frac{a^{3/4}\left(1+\frac{\sqrt{bx^2+a}}{\sqrt{a}}\right)}{x(bx^2+a)^{1/4}\sqrt{b}}\right)}{a^{1/4}b^{3/2}}+\frac{\operatorname{arctanh}\left(\frac{a^{3/4}\left(1-\frac{\sqrt{bx^2+a}}{\sqrt{a}}\right)}{x(bx^2+a)^{1/4}\sqrt{b}}\right)}{a^{1/4}b^{3/2}}$$

Result(type 8, 26 leaves):

$$\int \frac{x^2}{(bx^2+a)^{3/4}(bx^2+2a)}\,dx$$

Problem 275: Unable to integrate problem.

$$\int \frac{x^2}{(-bx^2+a)^{3/4}(-bx^2+2a)}\,dx$$

Optimal(type 3, 91 leaves, 1 step):

$$\frac{\arctan\left(\frac{a^{3/4}\left(1-\frac{\sqrt{-bx^2+a}}{\sqrt{a}}\right)}{x(-bx^2+a)^{1/4}\sqrt{b}}\right)}{a^{1/4}b^{3/2}}-\frac{\operatorname{arctanh}\left(\frac{a^{3/4}\left(1+\frac{\sqrt{-bx^2+a}}{\sqrt{a}}\right)}{x(-bx^2+a)^{1/4}\sqrt{b}}\right)}{a^{1/4}b^{3/2}}$$

Result(type 8, 28 leaves):

$$\int \frac{x^2}{(-b x^2+a)^{3/4}(-b x^2+2 a)}\, dx$$

Problem 276: Unable to integrate problem.

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

Optimal(type 3, 115 leaves, 14 steps):

$$\frac{2(-3x^2+2)^{1/4}}{9} - \frac{2^{3/4}\arctan\left(1+(-6x^2+4)^{1/4}\right)}{9} - \frac{2^{3/4}\arctan\left(2^{1/4}(-3x^2+2)^{1/4}-1\right)}{9} + \frac{\ln\left(-2^{3/4}(-3x^2+2)^{1/4}+\sqrt{2}+\sqrt{-3x^2+2}\right)2^{3/4}}{18} - \frac{\ln\left(2^{3/4}(-3x^2+2)^{1/4}+\sqrt{2}+\sqrt{-3x^2+2}\right)2^{3/4}}{18}$$

Result(type 8, 70 leaves):

$$-\frac{2(3x^2-2)}{9(-3x^2+2)^{3/4}} - \frac{\left(\int \frac{4x}{3(3x^2-4)\left(-(3x^2-2)^3\right)^{1/4}}\, dx\right)\left(-(3x^2-2)^3\right)^{1/4}}{(-3x^2+2)^{3/4}}$$

Problem 277: Unable to integrate problem.

$$\int \frac{x^6}{(-3 x^2+2)^{3/4}(-3 x^2+4)}\, dx$$

Optimal(type 4, 162 leaves, 11 steps):

$$\frac{80x(-3x^2+2)^{1/4}}{567} + \frac{2x^3(-3x^2+2)^{1/4}}{63} + \frac{8\,2^{3/4}\arctan\left(\frac{\left(2^{3/4}-2^{1/4}\sqrt{-3x^2+2}\right)\sqrt{3}}{3x(-3x^2+2)^{1/4}}\right)\sqrt{3}}{81} - \frac{8\,2^{3/4}\operatorname{arctanh}\left(\frac{\left(2^{3/4}+2^{1/4}\sqrt{-3x^2+2}\right)\sqrt{3}}{3x(-3x^2+2)^{1/4}}\right)\sqrt{3}}{81} - \frac{160\,2^{3/4}\sqrt{\cos\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)^2}\,\operatorname{EllipticF}\left(\sin\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right),\sqrt{2}\right)\sqrt{3}}{1701\cos\left(\frac{\arcsin\left(\frac{x\sqrt{6}}{2}\right)}{2}\right)}$$

Result(type 8, 84 leaves):

$$-\frac{2x(9x^2+40)(3x^2-2)}{567(-3x^2+2)^{3/4}} - \frac{\left(\int \frac{16(93x^2-40)}{567(3x^2-4)\left(-(3x^2-2)^3\right)^{1/4}}\, dx\right)\left(-(3x^2-2)^3\right)^{1/4}}{(-3x^2+2)^{3/4}}$$

Problem 278: Unable to integrate problem.

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

Optimal(type 3, 43 leaves, 1 step):

$$\frac{\arctan\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{18}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{18}$$

Result(type 8, 24 leaves):

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

Problem 279: Unable to integrate problem.

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

Optimal(type 3, 55 leaves, 1 step):

$$\frac{\arctan\left(\frac{x\sqrt{b}\,\sqrt{2}}{2(bx^2-1)^{1/4}}\right)\sqrt{2}}{2b^{3/2}}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{b}\,\sqrt{2}}{2(bx^2-1)^{1/4}}\right)\sqrt{2}}{2b^{3/2}}$$

Result(type 8, 24 leaves):

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

Problem 280: Unable to integrate problem.

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

Optimal(type 3, 57 leaves, 1 step):

$$\frac{\arctan\left(\frac{x\sqrt{b}\,\sqrt{2}}{2(-bx^2-1)^{1/4}}\right)\sqrt{2}}{2b^{3/2}}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{b}\,\sqrt{2}}{2(-bx^2-1)^{1/4}}\right)\sqrt{2}}{2b^{3/2}}$$

Result(type 8, 26 leaves):

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

Problem 281: Unable to integrate problem.

$$\int \frac{x^7}{(3x^2-2)(3x^2-1)^{3/4}}\,dx$$

Optimal(type 3, 58 leaves, 7 steps):

$$\frac{14(3x^2-1)^{1/4}}{81}+\frac{8(3x^2-1)^{5/4}}{405}+\frac{2(3x^2-1)^{9/4}}{729}-\frac{8\arctan\left((3x^2-1)^{1/4}\right)}{81}-\frac{8\operatorname{arctanh}\left((3x^2-1)^{1/4}\right)}{81}$$

Result(type 8, 70 leaves):

$$\frac{2(45x^4+78x^2+284)(3x^2-1)^{1/4}}{3645}+\frac{\left(\int \frac{8x}{27(3x^2-2)\left((3x^2-1)^3\right)^{1/4}}\,dx\right)\left((3x^2-1)^3\right)^{1/4}}{(3x^2-1)^{3/4}}$$

Problem 282: Unable to integrate problem.

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

Optimal(type 3, 36 leaves, 6 steps):

$$\frac{2(3x^2-1)^{1/4}}{9}-\frac{2\arctan\left((3x^2-1)^{1/4}\right)}{9}-\frac{2\operatorname{arctanh}\left((3x^2-1)^{1/4}\right)}{9}$$

Result(type 8, 58 leaves):

$$\frac{2(3x^2-1)^{1/4}}{9}+\frac{\left(\int \frac{2x}{3(3x^2-2)\left((3x^2-1)^3\right)^{1/4}}\,dx\right)\left((3x^2-1)^3\right)^{1/4}}{(3x^2-1)^{3/4}}$$

Problem 283: Unable to integrate problem.

$$\int \frac{x^6}{(3x^2-2)(3x^2-1)^{3/4}}\,dx$$

Optimal(type 4, 158 leaves, 15 steps):

$$\frac{40x(3x^2-1)^{1/4}}{567}+\frac{2x^3(3x^2-1)^{1/4}}{63}+\frac{2\arctan\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{81}-\frac{2\operatorname{arctanh}\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{81}$$
$$+\frac{40\sqrt{\cos\left(2\arctan\left((3x^2-1)^{1/4}\right)\right)^2}\,\operatorname{EllipticF}\left(\sin\left(2\arctan\left((3x^2-1)^{1/4}\right)\right),\frac{\sqrt{2}}{2}\right)\left(1+\sqrt{3x^2-1}\right)\sqrt{\frac{x^2}{\left(1+\sqrt{3x^2-1}\right)^2}}\,\sqrt{3}}{1701\cos\left(2\arctan\left((3x^2-1)^{1/4}\right)\right)x}$$

Result(type 8, 72 leaves):

$$\frac{2x(9x^2+20)(3x^2-1)^{1/4}}{567}+\frac{\left(\int \frac{4(93x^2-20)}{567(3x^2-2)\left((3x^2-1)^3\right)^{1/4}}\,dx\right)\left((3x^2-1)^3\right)^{1/4}}{(3x^2-1)^{3/4}}$$

Problem 284: Unable to integrate problem.

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

Optimal(type 4, 144 leaves, 11 steps):

$$\frac{2x(3x^2-1)^{1/4}}{27}+\frac{\arctan\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{27}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{27}$$
$$+\frac{2\sqrt{\cos\left(2\arctan\left((3x^2-1)^{1/4}\right)\right)^2}\,\text{EllipticF}\left(\sin\left(2\arctan\left((3x^2-1)^{1/4}\right)\right),\frac{\sqrt{2}}{2}\right)\left(1+\sqrt{3x^2-1}\right)\sqrt{\frac{x^2}{\left(1+\sqrt{3x^2-1}\right)^2}}\sqrt{3}}{81\cos\left(2\arctan\left((3x^2-1)^{1/4}\right)\right)x}$$

Result(type 8, 65 leaves):

$$\frac{2x(3x^2-1)^{1/4}}{27}+\frac{\left(\int \frac{4(6x^2-1)}{27(3x^2-2)\left((3x^2-1)^3\right)^{1/4}}\,dx\right)\left((3x^2-1)^3\right)^{1/4}}{(3x^2-1)^{3/4}}$$

Problem 285: Unable to integrate problem.

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

Optimal(type 3, 43 leaves, 1 step):

$$\frac{\arctan\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{18}-\frac{\operatorname{arctanh}\left(\frac{x\sqrt{6}}{2(3x^2-1)^{1/4}}\right)\sqrt{6}}{18}$$

Result(type 8, 24 leaves):

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

Problem 286: Unable to integrate problem.

$$\int \frac{(ex)^{5/2}(dx^2+c)}{(bx^2+a)^{3/4}}\,dx$$

Optimal(type 3, 133 leaves, 7 steps):

$$\frac{(-7ad+8bc)e(ex)^{3/2}(bx^2+a)^{1/4}}{16b^2}+\frac{d(ex)^{7/2}(bx^2+a)^{1/4}}{4be}+\frac{3a(-7ad+8bc)e^{5/2}\arctan\left(\frac{b^{1/4}\sqrt{ex}}{(bx^2+a)^{1/4}\sqrt{e}}\right)}{32b^{11/4}}$$
$$-\frac{3a(-7ad+8bc)e^{5/2}\operatorname{arctanh}\left(\frac{b^{1/4}\sqrt{ex}}{(bx^2+a)^{1/4}\sqrt{e}}\right)}{32b^{11/4}}$$

Result(type 8, 115 leaves):

$$-\frac{x(-4bdx^2+7ad-8bc)(bx^2+a)^{1/4}e^2\sqrt{ex}}{16b^2}+\frac{\left(\int\frac{3a(7ad-8bc)x}{32b^2\left(e^2x^2(bx^2+a)^3\right)^{1/4}}\,dx\right)e^2\sqrt{ex}\left(e^2x^2(bx^2+a)^3\right)^{1/4}}{x(bx^2+a)^{3/4}}$$

Problem 287: Unable to integrate problem.

$$\int \frac{(ex)^{7/2}(dx^2+c)}{(bx^2+a)^{3/4}}\,dx$$

Optimal(type 4, 177 leaves, 8 steps):

$$\frac{(-9ad+10bc)e(ex)^{5/2}(bx^2+a)^{1/4}}{30b^2}+\frac{d(ex)^{9/2}(bx^2+a)^{1/4}}{5be}$$
$$-\frac{a^{3/2}(-9ad+10bc)e^2\left(1+\frac{a}{bx^2}\right)^{3/4}(ex)^{3/2}\sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\operatorname{EllipticF}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{12\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)b^{5/2}(bx^2+a)^{3/4}}$$
$$-\frac{a(-9ad+10bc)e^3(bx^2+a)^{1/4}\sqrt{ex}}{12b^3}$$

Result(type 8, 137 leaves):

$$\frac{(12b^2dx^4-18abdx^2+20b^2cx^2+45a^2d-50abc)(bx^2+a)^{1/4}e^3\sqrt{ex}}{60b^3}+\frac{\left(\int-\frac{a^2(9ad-10bc)}{24b^3\left(e^2x^2(bx^2+a)^3\right)^{1/4}}\,dx\right)e^3\sqrt{ex}\left(e^2x^2(bx^2+a)^3\right)^{1/4}}{x(bx^2+a)^{3/4}}$$

Problem 288: Unable to integrate problem.

$$\int \frac{(ex)^{3/2}(dx^2+c)}{(bx^2+a)^{3/4}}\,dx$$

Optimal(type 4, 142 leaves, 7 steps):

$$\frac{d(ex)^{5/2}(bx^2+a)^{1/4}}{3be}+\frac{(-5ad+6bc)\left(1+\frac{a}{bx^2}\right)^{3/4}(ex)^{3/2}\sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\operatorname{EllipticF}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)\sqrt{a}}{6\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)b^{3/2}(bx^2+a)^{3/4}}$$
$$+\frac{(-5ad+6bc)e(bx^2+a)^{1/4}\sqrt{ex}}{6b^2}$$

Result(type 8, 109 leaves):

$$-\frac{(-2bdx^2+5ad-6bc)(bx^2+a)^{1/4}e\sqrt{ex}}{6b^2}+\frac{\left(\int\frac{a(5ad-6bc)}{12b^2\left(e^2x^2(bx^2+a)^3\right)^{1/4}}\,dx\right)e\sqrt{ex}\left(e^2x^2(bx^2+a)^3\right)^{1/4}}{x(bx^2+a)^{3/4}}$$

Problem 289: Unable to integrate problem.

$$\int \frac{dx^2+c}{\sqrt{ex}\,(bx^2+a)^{3/4}}\,dx$$

Optimal(type 4, 115 leaves, 6 steps):

$$-\frac{(-ad+2bc)\left(1+\frac{a}{bx^2}\right)^{3/4}(ex)^{3/2}\sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2}\,\operatorname{EllipticF}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right),\sqrt{2}\right)}{\cos\left(\frac{\operatorname{arccot}\left(\frac{x\sqrt{b}}{\sqrt{a}}\right)}{2}\right)e^2(bx^2+a)^{3/4}\sqrt{a}\sqrt{b}}+\frac{d(bx^2+a)^{1/4}\sqrt{ex}}{be}$$

Result(type 8, 87 leaves):

$$\frac{d(bx^2+a)^{1/4}x}{b\sqrt{ex}}+\frac{\left(\int-\frac{ad-2bc}{2b\left(e^2x^2(bx^2+a)^3\right)^{1/4}}\,dx\right)\left(e^2x^2(bx^2+a)^3\right)^{1/4}}{\sqrt{ex}\,(bx^2+a)^{3/4}}$$

Problem 290: Unable to integrate problem.

$$\int \frac{d x^2+c}{(e x)^{13/2} (b x^2+a)^{3/4}} \, dx$$

Optimal(type 4, 179 leaves, 8 steps):

$$-\frac{2 c (b x^2+a)^{1/4}}{11 a e (e x)^{11/2}}+\frac{2 (-11 a d+10 b c) (b x^2+a)^{1/4}}{77 a^2 e^3 (e x)^{7/2}}-\frac{4 b (-11 a d+10 b c) (b x^2+a)^{1/4}}{77 a^3 e^5 (e x)^{3/2}}$$
$$+\frac{8 b^{5/2} (-11 a d+10 b c) \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2} \operatorname{EllipticF}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right)}{77 \cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{7/2} e^8 (b x^2+a)^{3/4}}$$

Result(type 8, 140 leaves):

$$-\frac{2 (b x^2+a)^{1/4} (-22 a b d x^4+20 b^2 c x^4+11 a^2 d x^2-10 a b c x^2+7 a^2 c)}{77 a^3 x^5 e^6 \sqrt{e x}}+\frac{\left(\int \frac{4 b^2 (11 a d-10 b c)}{77 a^3 \left(e^2 x^2 (b x^2+a)^3\right)^{1/4}} \, dx\right) \left(e^2 x^2 (b x^2+a)^3\right)^{1/4}}{e^6 \sqrt{e x} (b x^2+a)^{3/4}}$$

Problem 292: Unable to integrate problem.

$$\int \frac{(e x)^{9/2} (d x^2+c)}{(b x^2+a)^{5/4}} \, dx$$

Optimal(type 4, 177 leaves, 6 steps):

$$-\frac{7 a (-11 a d+10 b c) e^3 (e x)^{3/2}}{60 b^3 (b x^2+a)^{1/4}}+\frac{(-11 a d+10 b c) e (e x)^{7/2}}{30 b^2 (b x^2+a)^{1/4}}+\frac{d (e x)^{11/2}}{5 b e (b x^2+a)^{1/4}}$$
$$-\frac{7 a^{3/2} (-11 a d+10 b c) e^4 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2} \operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{e x}}{20 \cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{7/2} (b x^2+a)^{1/4}}$$

Result(type 8, 142 leaves):

$$-\frac{x\left(-6 b d x^2+17 a d-10 b c\right)\left(b x^2+a\right)^{3/4} e^4 \sqrt{e x}}{30 b^3}+\frac{\left(\int \frac{a x\left(37 a b d x^2-30 b^2 c x^2+17 a^2 d-10 a b c\right)}{20 b^4\left(x^2+\frac{a}{b}\right)\left(\left(b x^2+a\right) e^2 x^2\right)^{1/4}} \, dx\right) e^4 \sqrt{e x}\left(\left(b x^2+a\right) e^2 x^2\right)^{1/4}}{x\left(b x^2+a\right)^{1/4}}$$

Problem 293: Unable to integrate problem.

$$\int \frac{d x^2+c}{(e x)^{3/2}\left(b x^2+a\right)^{5/4}} \, dx$$

Optimal(type 4, 116 leaves, 4 steps):

$$-\frac{2 c}{a e\left(b x^2+a\right)^{1/4} \sqrt{e x}}+\frac{2(-a d+2 b c)\left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2} \operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{e x}}{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) a^{3/2} e^2\left(b x^2+a\right)^{1/4} \sqrt{b}}$$

Result(type 8, 114 leaves):

$$-\frac{2 c\left(b x^2+a\right)^{3/4}}{a^2 e \sqrt{e x}}+\frac{\left(\int \frac{x\left(2 b^2 c x^2+a^2 d+a b c\right)}{a^2 b\left(x^2+\frac{a}{b}\right)\left(\left(b x^2+a\right) e^2 x^2\right)^{1/4}} \, dx\right)\left(\left(b x^2+a\right) e^2 x^2\right)^{1/4}}{e \sqrt{e x}\left(b x^2+a\right)^{1/4}}$$

Problem 294: Unable to integrate problem.

$$\int \frac{(e x)^{5/2}\left(d x^2+c\right)}{\left(b x^2+a\right)^{7/4}} \, dx$$

Optimal(type 3, 144 leaves, 7 steps):

$$\frac{2(-a d+b c)(e x)^{7/2}}{3 a b e\left(b x^2+a\right)^{3/4}}-\frac{(-7 a d+4 b c) e(e x)^{3/2}\left(b x^2+a\right)^{1/4}}{6 a b^2}-\frac{(-7 a d+4 b c) e^{5/2} \arctan\left(\frac{b^{1/4} \sqrt{e x}}{\left(b x^2+a\right)^{1/4} \sqrt{e}}\right)}{4 b^{11/4}}$$
$$+\frac{(-7 a d+4 b c) e^{5/2} \operatorname{arctanh}\left(\frac{b^{1/4} \sqrt{e x}}{\left(b x^2+a\right)^{1/4} \sqrt{e}}\right)}{4 b^{11/4}}$$

Result(type 8, 125 leaves):

$$\frac{d x \left(b x^2+a\right)^{1/4} e^2 \sqrt{e x}}{2 b^2}+\frac{\left(\int -\frac{x \left(7 a b d x^2-4 b^2 c x^2+3 a^2 d\right)}{4 b^3 \left(x^2+\frac{a}{b}\right) \left(e^2 x^2 \left(b x^2+a\right)^3\right)^{1/4}} \, dx\right) e^2 \sqrt{e x} \left(e^2 x^2 \left(b x^2+a\right)^3\right)^{1/4}}{x \left(b x^2+a\right)^{3/4}}$$

Problem 295: Unable to integrate problem.

$$\int \frac{\sqrt{e x} \left(d x^2+c\right)}{\left(b x^2+a\right)^{7/4}} \, dx$$

Optimal(type 3, 95 leaves, 6 steps):

$$\frac{2 (-a d+b c) (e x)^{3/2}}{3 a b e \left(b x^2+a\right)^{3/4}}-\frac{d \arctan\left(\frac{b^{1/4} \sqrt{e x}}{\left(b x^2+a\right)^{1/4} \sqrt{e}}\right) \sqrt{e}}{b^{7/4}}+\frac{d \operatorname{arctanh}\left(\frac{b^{1/4} \sqrt{e x}}{\left(b x^2+a\right)^{1/4} \sqrt{e}}\right) \sqrt{e}}{b^{7/4}}$$

Result(type 8, 24 leaves):

$$\int \frac{\sqrt{e x} \left(d x^2+c\right)}{\left(b x^2+a\right)^{7/4}} \, dx$$

Problem 297: Unable to integrate problem.

$$\int \frac{(e x)^{7/2} \left(d x^2+c\right)}{\left(b x^2+a\right)^{7/4}} \, dx$$

Optimal(type 4, 189 leaves, 8 steps):

$$\frac{2 (-a d+b c) (e x)^{9/2}}{3 a b e \left(b x^2+a\right)^{3/4}}-\frac{(-3 a d+2 b c) e (e x)^{5/2} \left(b x^2+a\right)^{1/4}}{3 a b^2}$$

$$+\frac{5 (-3 a d+2 b c) e^2 \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2} \operatorname{EllipticF}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{a}}{6 \cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{5/2} \left(b x^2+a\right)^{3/4}}$$

$$+\frac{5 (-3 a d+2 b c) e^3 \left(b x^2+a\right)^{1/4} \sqrt{e x}}{6 b^3}$$

Result(type 8, 144 leaves):

$$-\frac{\left(-2 b d x^2+11 a d-6 b c\right) \left(b x^2+a\right)^{1/4} e^3 \sqrt{e x}}{6 b^3}+\frac{\left(\int \frac{a \left(23 a b d x^2-18 b^2 c x^2+11 a^2 d-6 a b c\right)}{12 b^4 \left(x^2+\frac{a}{b}\right) \left(e^2 x^2 \left(b x^2+a\right)^3\right)^{1/4}} \, dx\right) e^3 \sqrt{e x} \left(e^2 x^2 \left(b x^2+a\right)^3\right)^{1/4}}{x \left(b x^2+a\right)^{3/4}}$$

Problem 298: Unable to integrate problem.

$$\int \frac{(e x)^{13/2} \left(d x^2+c\right)}{\left(b x^2+a\right)^{9/4}} \, dx$$

Optimal(type 4, 221 leaves, 7 steps):

$$\frac{2 (-a d+b c) (e x)^{15/2}}{5 a b e \left(b x^2+a\right)^{5/4}}-\frac{77 a (-3 a d+2 b c) e^5 (e x)^{3/2}}{60 b^4 \left(b x^2+a\right)^{1/4}}+\frac{11 (-3 a d+2 b c) e^3 (e x)^{7/2}}{30 b^3 \left(b x^2+a\right)^{1/4}}-\frac{(-3 a d+2 b c) e (e x)^{11/2}}{5 a b^2 \left(b x^2+a\right)^{1/4}}$$

$$-\frac{77 a^{3/2} (-3 a d+2 b c) e^6 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{\cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right)^2} \operatorname{EllipticE}\left(\sin\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right), \sqrt{2}\right) \sqrt{e x}}{20 \cos\left(\frac{\operatorname{arccot}\left(\frac{x \sqrt{b}}{\sqrt{a}}\right)}{2}\right) b^{9/2} \left(b x^2+a\right)^{1/4}}$$

Result(type 8, 177 leaves):

$$-\frac{x \left(-6 b d x^2+27 a d-10 b c\right) \left(b x^2+a\right)^{3/4} e^6 \sqrt{e x}}{30 b^4}$$

$$+\frac{\left(\int \frac{a x \left(87 a b^2 d x^4-50 b^3 c x^4+94 a^2 b d x^2-40 a b^2 c x^2+27 a^3 d-10 a^2 b c\right)}{20 b^6 \left(x^4+\frac{2 a x^2}{b}+\frac{a^2}{b^2}\right) \left(\left(b x^2+a\right) e^2 x^2\right)^{1/4}} \, dx\right) e^6 \sqrt{e x} \left(\left(b x^2+a\right) e^2 x^2\right)^{1/4}}{x \left(b x^2+a\right)^{1/4}}$$

Problem 299: Unable to integrate problem.

$$\int (e x)^m \left(b x^2+a\right)^p \left(d x^2+c\right)^q \, dx$$

Optimal(type 6, 97 leaves, 3 steps):

$$\frac{(e x)^{1+m} \left(b x^2+a\right)^p \left(d x^2+c\right)^q \mathit{AppellF1}\left(\frac{1}{2}+\frac{m}{2}, -p, -q, \frac{3}{2}+\frac{m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right)}{e (1+m) \left(1+\frac{b x^2}{a}\right)^p \left(1+\frac{d x^2}{c}\right)^q}$$

Result(type 8, 26 leaves):

$$\int (e x)^m (b x^2+a)^p (d x^2+c)^q \, dx$$

Problem 300: Unable to integrate problem.

$$\int (b x^2+a)^p (d x^2+c)^q \, dx$$

Optimal(type 6, 75 leaves, 3 steps):

$$\frac{x (b x^2+a)^p (d x^2+c)^q \mathit{AppellF1}\left(\frac{1}{2}, -p, -q, \frac{3}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right)}{\left(1+\frac{b x^2}{a}\right)^p \left(1+\frac{d x^2}{c}\right)^q}$$

Result(type 8, 21 leaves):

$$\int (b x^2+a)^p (d x^2+c)^q \, dx$$

Problem 301: Unable to integrate problem.

$$\int x^5 (b x^2+a)^p (d x^2+c)^q \, dx$$

Optimal(type 5, 238 leaves, 5 steps):

$$-\frac{(b c (2+p)+a d (2+q)) (b x^2+a)^{1+p} (d x^2+c)^{1+q}}{2 b^2 d^2 (2+p+q) (3+p+q)}+\frac{x^2 (b x^2+a)^{1+p} (d x^2+c)^{1+q}}{2 b d (3+p+q)}$$
$$+\frac{1}{2 b^3 d^2 (1+p) (2+p+q) (3+p+q) \left(\frac{b (d x^2+c)}{-a d+b c}\right)^q}\Big((b^2 c^2 (p^2+3 p+2)+2 a b c d (1+p) (1+q)+a^2 d^2 (q^2+3 q+2)) (b x^2$$
$$+a)^{1+p} (d x^2+c)^q \operatorname{hypergeom}\left([-q, 1+p], [2+p], -\frac{d (b x^2+a)}{-a d+b c}\right)\Big)$$

Result(type 8, 24 leaves):

$$\int x^5 (b x^2+a)^p (d x^2+c)^q \, dx$$

Test results for the 31 problems in "1.1.2.5 (a+b x^2)^p (c+d x^2)^q (e+f x^2)^r.txt"

Problem 10: Result more than twice size of optimal antiderivative.

$$\int (b x^2+a) (d x^2+c)^{3/2} \sqrt{f x^2+e} \, dx$$

Optimal(type 4, 566 leaves, 7 steps):

$$-\frac{(7 a d f(-3 c^2 f^2-7 c d e f+2 d^2 e^2)-b (-6 c^3 f^3+9 c^2 d e f^2-19 c d^2 e^2 f+8 d^3 e^3)) x \sqrt{d x^2+c}}{105 d^2 f^2 \sqrt{f x^2+e}}$$

$$-\frac{e^{3/2}\left(7adf(-9cf+de)-b\left(-3c^2f^2-9cdef+4d^2e^2\right)\right)\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},\sqrt{1-\frac{de}{cf}}\right)\sqrt{dx^2+c}}{105\,df^{5/2}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}$$

$$+\frac{1}{105\,d^2f^{5/2}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}\Bigg(\left(7adf\left(-3c^2f^2-7cdef+2d^2e^2\right)-b\left(-6c^3f^3+9c^2def^2-19cd^2e^2f\right.\right.$$

$$\left.\left.+8d^3e^3\right)\right)\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticE}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},\sqrt{1-\frac{de}{cf}}\right)\sqrt{e}\sqrt{dx^2+c}\Bigg)+\frac{(7adf-2bcf+bde)\,x\,(dx^2+c)^{3/2}\sqrt{fx^2+e}}{35\,df}$$

$$+\frac{bx(dx^2+c)^{5/2}\sqrt{fx^2+e}}{7d}+\frac{\left(7adf(3cf+de)-b\left(6c^2f^2-6cdef+4d^2e^2\right)\right)x\sqrt{dx^2+c}\sqrt{fx^2+e}}{105\,df^2}$$

Result(type 4, 1331 leaves):

$$\frac{1}{105\,d\left(dfx^4+cfx^2+dex^2+ce\right)f^3\sqrt{-\frac{d}{c}}}\Bigg(\sqrt{dx^2+c}\sqrt{fx^2+e}\Bigg(42\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)ac^2def^3$$

$$-56\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)acd^2e^2f^2-18\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)bc^2de^2f^2$$

$$+23\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)bcd^2e^3f+21\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)ac^2def^3$$

$$+49\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)acd^2e^2f^2+9\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)bc^2de^2f^2$$

$$-19\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)bcd^2e^3f+18\sqrt{-\frac{d}{c}}\,x^7bd^3ef^3+63\sqrt{-\frac{d}{c}}\,x^5acd^2f^4+28\sqrt{-\frac{d}{c}}\,x^5ad^3ef^3$$

$$+27\sqrt{-\frac{d}{c}}\,x^5bc^2df^4-\sqrt{-\frac{d}{c}}\,x^5bd^3e^2f^2+42\sqrt{-\frac{d}{c}}\,x^3ac^2df^4+7\sqrt{-\frac{d}{c}}\,x^3ad^3e^2f^2-4\sqrt{-\frac{d}{c}}\,x^3bd^3e^3f+3\sqrt{-\frac{d}{c}}\,xbc^3ef^3$$

$$-8\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)bd^3e^4+8\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)bd^3e^4+39\sqrt{-\frac{d}{c}}\,x^7bcd^2f^4$$

$$+15\sqrt{-\frac{d}{c}}\,x^9bd^3f^4+21\sqrt{-\frac{d}{c}}\,x^7ad^3f^4+3\sqrt{-\frac{d}{c}}\,x^3bc^3f^4+14\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)ad^3e^3f$$

$$+3\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)bc^3ef^3-14\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)ad^3e^3f$$

$$-6\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b\,c^3 e f^3+51\sqrt{-\frac{d}{c}}\,x^5 b\,c\,d^2 e f^3+70\sqrt{-\frac{d}{c}}\,x^3 a\,c\,d^2 e f^3+36\sqrt{-\frac{d}{c}}\,x^3 b\,c^2 d\,e f^3$$
$$+8\sqrt{-\frac{d}{c}}\,x^3 b\,c\,d^2 e^2 f^2+42\sqrt{-\frac{d}{c}}\,x\,a\,c^2 d\,e f^3+7\sqrt{-\frac{d}{c}}\,x\,a\,c\,d^2 e^2 f^2+9\sqrt{-\frac{d}{c}}\,x\,b\,c^2 d\,e^2 f^2-4\sqrt{-\frac{d}{c}}\,x\,b\,c\,d^2 e^3 f\Big)\Big)$$

Problem 11: Result more than twice size of optimal antiderivative.

$$\int (b x^2+a)\sqrt{d x^2+c}\,(f x^2+e)^{3/2}\,dx$$

Optimal(type 4, 565 leaves, 7 steps):

$$\frac{b x (d x^2+c)^{3/2}(f x^2+e)^{3/2}}{7 d}+\frac{\left(7 a d f(-2 c^2 f^2+7 c d e f+3 d^2 e^2)-b\left(-8 c^3 f^3+19 c^2 d e f^2-9 c d^2 e^2 f+6 d^3 e^3\right)\right) x\sqrt{d x^2+c}}{105 d^3 f\sqrt{f x^2+e}}$$
$$+\frac{e^{3/2}\left(7 a d f(-c f+9 d e)-b\left(-4 c^2 f^2+9 c d e f+3 d^2 e^2\right)\right)\sqrt{\frac{1}{1+\frac{f x^2}{e}}}\sqrt{1+\frac{f x^2}{e}}\,\mathrm{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{f x^2}{e}}},\sqrt{1-\frac{d e}{c f}}\right)\sqrt{d x^2+c}}{105 d^2 f^{3/2}\sqrt{\frac{e (d x^2+c)}{c (f x^2+e)}}\sqrt{f x^2+e}}$$
$$-\frac{1}{105 d^3 f^{3/2}\sqrt{\frac{e(d x^2+c)}{c(f x^2+e)}}\sqrt{f x^2+e}}\Bigg(\left(7 a d f(-2 c^2 f^2+7 c d e f+3 d^2 e^2)-b\left(-8 c^3 f^3+19 c^2 d e f^2-9 c d^2 e^2 f\right.\right.$$
$$\left.\left.+6 d^3 e^3\right)\right)\sqrt{\frac{1}{1+\frac{f x^2}{e}}}\sqrt{1+\frac{f x^2}{e}}\,\mathrm{EllipticE}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{f x^2}{e}}},\sqrt{1-\frac{d e}{c f}}\right)\sqrt{e}\sqrt{d x^2+c}\Bigg)+\frac{(7 a d f-4 b c f+3 b d e)\,x\,(d x^2+c)^{3/2}\sqrt{f x^2+e}}{35 d^2}$$
$$+\frac{\left(14 a d f(-c f+3 d e)+b\left(8 c^2 f^2-15 c d e f+3 d^2 e^2\right)\right) x\sqrt{d x^2+c}\sqrt{f x^2+e}}{105 d^2 f}$$

Result(type 4, 1331 leaves):

$$\frac{1}{105 f^2 (d f x^4+c f x^2+d e x^2+c e)\, d^2\sqrt{-\frac{d}{c}}}\Bigg(\sqrt{d x^2+c}\sqrt{f x^2+e}\Bigg(7\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a\,c^2 d\,e f^3$$
$$+14\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a\,c\,d^2 e^2 f^2+10\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b\,c^2 d\,e^2 f^2$$
$$-12\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b\,c\,d^2 e^3 f-14\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a\,c^2 d\,e f^3$$

$$+49\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) a c d^2 e^2 f^2-19\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c^2 d e^2 f^2$$

$$+9\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c d^2 e^3 f+39\sqrt{-\frac{d}{c}}\,x^7 b d^3 e f^3+28\sqrt{-\frac{d}{c}}\,x^5 a c d^2 f^4+63\sqrt{-\frac{d}{c}}\,x^5 a d^3 e f^3$$

$$-\sqrt{-\frac{d}{c}}\,x^5 b c^2 d f^4+27\sqrt{-\frac{d}{c}}\,x^5 b d^3 e^2 f^2+7\sqrt{-\frac{d}{c}}\,x^3 a c^2 d f^4+42\sqrt{-\frac{d}{c}}\,x^3 a d^3 e^2 f^2+3\sqrt{-\frac{d}{c}}\,x^3 b d^3 e^3 f-4\sqrt{-\frac{d}{c}}\,x b c^3 e f^3$$

$$+6\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b d^3 e^4-6\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b d^3 e^4+18\sqrt{-\frac{d}{c}}\,x^7 b c d^2 f^4$$

$$+15\sqrt{-\frac{d}{c}}\,x^9 b d^3 f^4+21\sqrt{-\frac{d}{c}}\,x^7 a d^3 f^4-4\sqrt{-\frac{d}{c}}\,x^3 b c^3 f^4-21\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) a d^3 e^3 f$$

$$-4\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c^3 e f^3+21\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) a d^3 e^3 f$$

$$+8\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c^3 e f^3+51\sqrt{-\frac{d}{c}}\,x^5 b c d^2 e f^3+70\sqrt{-\frac{d}{c}}\,x^3 a c d^2 e f^3+8\sqrt{-\frac{d}{c}}\,x^3 b c^2 d e f^3$$

$$+36\sqrt{-\frac{d}{c}}\,x^3 b c d^2 e^2 f^2+7\sqrt{-\frac{d}{c}}\,x a c^2 d e f^3+42\sqrt{-\frac{d}{c}}\,x a c d^2 e^2 f^2+9\sqrt{-\frac{d}{c}}\,x b c^2 d e^2 f^2+3\sqrt{-\frac{d}{c}}\,x b c d^2 e^3 f\Bigg)\Bigg)$$

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Problem 12: Result more than twice size of optimal antiderivative.
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$$\int\frac{(b x^2+a)\,(d x^2+c)^{5/2}}{\sqrt{f x^2+e}}\,dx$$

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Optimal(type 4, 573 leaves, 7 steps):
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$$\frac{\left(7 a d f\left(23 c^2 f^2-23 c d e f+8 d^2 e^2\right)-b\left(-15 c^3 f^3+103 c^2 d e f^2-128 c d^2 e^2 f+48 d^3 e^3\right)\right) x\sqrt{d x^2+c}}{105 d f^3\sqrt{f x^2+e}}$$

$$-\frac{1}{105 d f^{7/2}\sqrt{\frac{e(d x^2+c)}{c(f x^2+e)}}\,\sqrt{f x^2+e}}\Bigg(\left(7 a d f\left(23 c^2 f^2-23 c d e f+8 d^2 e^2\right)-b\left(-15 c^3 f^3+103 c^2 d e f^2-128 c d^2 e^2 f\right.\right.$$

$$\left.\left.+48 d^3 e^3\right)\right)\sqrt{\frac{1}{1+\frac{f x^2}{e}}}\,\sqrt{1+\frac{f x^2}{e}}\,\mathrm{EllipticE}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{f x^2}{e}}},\sqrt{1-\frac{d e}{c f}}\right)\sqrt{e}\,\sqrt{d x^2+c}\Bigg)$$

$$+\frac{1}{105 f^{7/2}\sqrt{\frac{e(d x^2+c)}{c(f x^2+e)}}\,\sqrt{f x^2+e}}\Bigg(\left(7 a f\left(15 c^2 f^2-11 c d e f+4 d^2 e^2\right)-b e\left(45 c^2 f^2-61 c d e f\right.\right.$$

$$+24 d^2 e^2)) \sqrt{\frac{1}{1+\frac{fx^2}{e}}} \sqrt{1+\frac{fx^2}{e}} \operatorname{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}}, \sqrt{1-\frac{de}{cf}}\right)\sqrt{e}\sqrt{dx^2+c}\Bigg)$$

$$-\frac{(-7adf-5bcf+6bde)\,x\,(dx^2+c)^{3/2}\sqrt{fx^2+e}}{35f^2}+\frac{bx\,(dx^2+c)^{5/2}\sqrt{fx^2+e}}{7f}$$

$$-\frac{(28adf(-2cf+de)-b(15c^2f^2-43cdef+24d^2e^2))\,x\sqrt{dx^2+c}\sqrt{fx^2+e}}{105f^3}$$

Result(type 4, 1385 leaves):

$$\frac{1}{105 f^4 (dfx^4+cfx^2+dex^2+ce)\sqrt{-\frac{d}{c}}}\Bigg(\sqrt{dx^2+c}\sqrt{fx^2+e}\Bigg(-238\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a c^2 d e f^3$$

$$+189\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a c d^2 e^2 f^2+164\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b c^2 d e^2 f^2$$

$$-152\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b c d^2 e^3 f+161\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a c^2 d e f^3$$

$$-161\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a c d^2 e^2 f^2-103\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b c^2 d e^2 f^2$$

$$+128\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b c d^2 e^3 f+105\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a c^3 f^4$$

$$-3\sqrt{-\frac{d}{c}}\,x^7 b d^3 e f^3+98\sqrt{-\frac{d}{c}}\,x^5 a c d^2 f^4-7\sqrt{-\frac{d}{c}}\,x^5 a d^3 e f^3+90\sqrt{-\frac{d}{c}}\,x^5 b c^2 d f^4+6\sqrt{-\frac{d}{c}}\,x^5 b d^3 e^2 f^2+77\sqrt{-\frac{d}{c}}\,x^3 a c^2 d f^4$$

$$-28\sqrt{-\frac{d}{c}}\,x^3 a d^3 e^2 f^2+24\sqrt{-\frac{d}{c}}\,x^3 b d^3 e^3 f+45\sqrt{-\frac{d}{c}}\,x b c^3 e f^3+48\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b d^3 e^4$$

$$-48\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b d^3 e^4+60\sqrt{-\frac{d}{c}}\,x^7 b c d^2 f^4+15\sqrt{-\frac{d}{c}}\,x^9 b d^3 f^4+21\sqrt{-\frac{d}{c}}\,x^7 a d^3 f^4+45\sqrt{-\frac{d}{c}}\,x^3 b c^3 f^4$$

$$-56\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a d^3 e^3 f-60\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b c^3 e f^3$$

$$+56\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a d^3 e^3 f+15\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)b c^3 e f^3$$

$$-19\sqrt{-\frac{d}{c}}\,x^5 b c d^2 e f^3+70\sqrt{-\frac{d}{c}}\,x^3 a c d^2 e f^3+29\sqrt{-\frac{d}{c}}\,x^3 b c^2 d e f^3-55\sqrt{-\frac{d}{c}}\,x^3 b c d^2 e^2 f^2+77\sqrt{-\frac{d}{c}}\,x a c^2 d e f^3-28\sqrt{-\frac{d}{c}}\,x a c d^2 e^2 f^2$$

$$-61\sqrt{-\frac{d}{c}}\,x b c^2 d e^2 f^2+24\sqrt{-\frac{d}{c}}\,x b c d^2 e^3 f\Bigg)\Bigg)$$

Problem 14: Result more than twice size of optimal antiderivative.

$$\int \frac{b x^2 + a}{(d x^2 + c)^{7/2} \sqrt{f x^2 + e}}\, dx$$

Optimal(type 4, 435 leaves, 5 steps):

$$-\frac{\left(b c e (-9 c f + d e) + a \left(15 c^2 f^2 - 11 c d e f + 4 d^2 e^2\right)\right) \sqrt{\frac{1}{1 + \frac{f x^2}{e}}} \sqrt{1 + \frac{f x^2}{e}}\, \mathrm{EllipticF}\left(\frac{x \sqrt{f}}{\sqrt{e} \sqrt{1 + \frac{f x^2}{e}}}, \sqrt{1 - \frac{d e}{c f}}\right) \sqrt{e} \sqrt{f} \sqrt{d x^2 + c}}{15 c^3 (-c f + d e)^3 \sqrt{\frac{e (d x^2 + c)}{c (f x^2 + e)}} \sqrt{f x^2 + e}}$$

$$- \frac{(-a d + b c) x \sqrt{f x^2 + e}}{5 c (-c f + d e) (d x^2 + c)^{5/2}} + \frac{(4 a d (-2 c f + d e) + b c (3 c f + d e)) x \sqrt{f x^2 + e}}{15 c^2 (-c f + d e)^2 (d x^2 + c)^{3/2}}$$

$$+ \frac{1}{15 c^{5/2} (-c f + d e)^3 \sqrt{d} \sqrt{d x^2 + c} \sqrt{\frac{c (f x^2 + e)}{e (d x^2 + c)}}} \Bigg(\left(b c \left(-3 c^2 f^2 - 7 c d e f + 2 d^2 e^2\right) + a d \left(23 c^2 f^2 - 23 c d e f\right.\right.$$

$$\left.\left. + 8 d^2 e^2\right)\right) \sqrt{\frac{1}{1 + \frac{d x^2}{c}}} \sqrt{1 + \frac{d x^2}{c}}\, \mathrm{EllipticE}\left(\frac{x \sqrt{d}}{\sqrt{c} \sqrt{1 + \frac{d x^2}{c}}}, \sqrt{1 - \frac{c f}{d e}}\right) \sqrt{f x^2 + e} \Bigg)$$

Result(type ?, 3038 leaves): Display of huge result suppressed!

Problem 16: Result more than twice size of optimal antiderivative.

$$\int \frac{b x^2 + a}{(d x^2 + c)^{5/2} (f x^2 + e)^{3/2}}\, dx$$

Optimal(type 4, 409 leaves, 5 steps):

$$-\frac{(-a d + b c) x}{3 c (-c f + d e) (d x^2 + c)^{3/2} \sqrt{f x^2 + e}} + \frac{(2 a d (-3 c f + d e) + b c (3 c f + d e)) x}{3 c^2 (-c f + d e)^2 \sqrt{d x^2 + c} \sqrt{f x^2 + e}}$$

$$+ \frac{\left(b c e (7 c f + d e) + a \left(-3 c^2 f^2 - 7 c d e f + 2 d^2 e^2\right)\right) \sqrt{\frac{1}{1 + \frac{f x^2}{e}}} \sqrt{1 + \frac{f x^2}{e}}\, \mathrm{EllipticE}\left(\frac{x \sqrt{f}}{\sqrt{e} \sqrt{1 + \frac{f x^2}{e}}}, \sqrt{1 - \frac{d e}{c f}}\right) \sqrt{f} \sqrt{d x^2 + c}}{3 c^2 (-c f + d e)^3 \sqrt{e} \sqrt{\frac{e (d x^2 + c)}{c (f x^2 + e)}} \sqrt{f x^2 + e}}$$

$$-\frac{(a d(-9 c f+d e)+b c(3 c f+5 d e))\sqrt{\frac{1}{1+\frac{f x^2}{e}}}\sqrt{1+\frac{f x^2}{e}}\,\mathrm{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{f x^2}{e}}},\sqrt{1-\frac{d e}{c f}}\right)\sqrt{e}\sqrt{f}\sqrt{d x^2+c}}{3 c^2(-c f+d e)^3\sqrt{\frac{e(d x^2+c)}{c(f x^2+e)}}\sqrt{f x^2+e}}$$

Result(type 4, 1741 leaves):

$$-\frac{1}{3\sqrt{f x^2+e}\,(c f-d e)^3 c^2\sqrt{-\frac{d}{c}}\, e\,(d x^2+c)^{3/2}}\Bigg(2 x^5 a d^4 e^2 f\sqrt{-\frac{d}{c}}-6 x^3 a c^3 d f^3\sqrt{-\frac{d}{c}}+x^3 b c d^3 e^3\sqrt{-\frac{d}{c}}+3 x a c d^3 e^3\sqrt{-\frac{d}{c}}+3 x b c^4 e f^2\sqrt{-\frac{d}{c}}$$

$$-3 x a c^4 f^3\sqrt{-\frac{d}{c}}+6\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) a c^3 d e f^2\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}-8\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\right.$$

$$\left.\sqrt{\frac{c f}{d e}}\right) a c^2 d^2 e^2 f\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}-7\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c^3 d e^2 f\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+2\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\right.$$

$$\left.\sqrt{\frac{c f}{d e}}\right) b c^3 d e^2 f\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+3\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) a c^3 d e f^2\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\right.$$

$$\left.\sqrt{\frac{c f}{d e}}\right) x^2 b c d^3 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}-\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 b c d^3 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}-3 x^5 a c^2 d^2 f^3\sqrt{-\frac{d}{c}}$$

$$-7 x^5 a c d^3 e f^2\sqrt{-\frac{d}{c}}+7 x^5 b c^2 d^2 e f^2\sqrt{-\frac{d}{c}}+x^5 b c d^3 e^2 f\sqrt{-\frac{d}{c}}-8 x^3 a c^2 d^2 e f^2\sqrt{-\frac{d}{c}}-4 x^3 a c d^3 e^2 f\sqrt{-\frac{d}{c}}+11 x^3 b c^3 d e f^2\sqrt{-\frac{d}{c}}$$

$$+4 x^3 b c^2 d^2 e^2 f\sqrt{-\frac{d}{c}}-8 x a c^2 d^2 e^2 f\sqrt{-\frac{d}{c}}+5 x b c^3 d e^2 f\sqrt{-\frac{d}{c}}+2\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 a d^4 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}$$

$$-2\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 a d^4 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+2\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) a c d^3 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}$$

$$-3\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c^4 e f^2\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c^2 d^2 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}$$

$$-2\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) a c d^3 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}-\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) b c^2 d^2 e^3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+2 x^3 a d^4 e^3\sqrt{-\frac{d}{c}}$$

$$+3\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 a c^2 d^2 e f^2\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+7\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 a c d^3 e^2 f\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}$$

$$-7\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 b c^2 d^2 e^2 f\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}+6\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 a c^2 d^2 e f^2\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}$$

$$-8\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 a c d^3 e^2 f\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}-3\,\mathrm{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{c f}{d e}}\right) x^2 b c^3 d e f^2\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}$$

$$+2\,\text{EllipticF}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)x^2 b c^2 d^2 e^2 f\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}+7\,\text{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a c^2 d^2 e^2 f\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\Bigg)$$

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Problem 18: Unable to integrate problem.
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$$\int \frac{2cx^2-\sqrt{-4ac+b^2}+b}{\sqrt{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}\sqrt{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}\,dx$$

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Optimal(type 4, 499 leaves, 5 steps):
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$$\frac{x\left(b-\sqrt{-4ac+b^2}\right)\sqrt{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}}{\sqrt{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}$$

$$-\frac{1}{2\sqrt{c}\sqrt{\frac{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}}\left(\sqrt{\frac{1}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}\,\text{EllipticE}\left(\frac{x\sqrt{2}\sqrt{c}}{\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}},\right.\right.$$

$$\left.\left.\sqrt{-\frac{2\sqrt{-4ac+b^2}}{b-\sqrt{-4ac+b^2}}}\right)\left(b-\sqrt{-4ac+b^2}\right)\sqrt{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{2}\right)$$

$$+\frac{1}{2\sqrt{c}\sqrt{\frac{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}}\left(\sqrt{\frac{1}{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}}\,\text{EllipticF}\left(\frac{x\sqrt{2}\sqrt{c}}{\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{1+\frac{2cx^2}{b+\sqrt{-4ac+b^2}}}},\right.\right.$$

$$\left.\left.\sqrt{-\frac{2\sqrt{-4ac+b^2}}{b-\sqrt{-4ac+b^2}}}\right)\left(b-\sqrt{-4ac+b^2}\right)\sqrt{1+\frac{2cx^2}{b-\sqrt{-4ac+b^2}}}\sqrt{b+\sqrt{-4ac+b^2}}\sqrt{2}\right)$$

Result(type 8, 73 leaves):

$$\int \frac{2 c x^2 - \sqrt{-4 a c + b^2} + b}{\sqrt{1 + \frac{2 c x^2}{b - \sqrt{-4 a c + b^2}}}\ \sqrt{1 + \frac{2 c x^2}{b + \sqrt{-4 a c + b^2}}}}\, dx$$

Problem 19: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x^2 + a)^2}{(d x^2 + c)\sqrt{f x^2 + e}}\, dx$$

Optimal(type 3, 138 leaves, 9 steps):

$$-\frac{b(-2 a f + b e)\operatorname{arctanh}\left(\frac{x\sqrt{f}}{\sqrt{f x^2 + e}}\right)}{2 d f^{3/2}} - \frac{b(-a d + b c)\operatorname{arctanh}\left(\frac{x\sqrt{f}}{\sqrt{f x^2 + e}}\right)}{d^2\sqrt{f}} + \frac{(-a d + b c)^2 \arctan\left(\frac{x\sqrt{-c f + d e}}{\sqrt{c}\sqrt{f x^2 + e}}\right)}{d^2\sqrt{c}\sqrt{-c f + d e}} + \frac{b^2 x\sqrt{f x^2 + e}}{2 d f}$$

Result(type 3, 1051 leaves):

$$\frac{b^2 x\sqrt{f x^2 + e}}{2 d f} - \frac{b^2 e \ln\left(\sqrt{f}\, x + \sqrt{f x^2 + e}\right)}{2 d f^{3/2}} + \frac{2 b a \ln\left(\sqrt{f}\, x + \sqrt{f x^2 + e}\right)}{d\sqrt{f}} - \frac{b^2 c \ln\left(\sqrt{f}\, x + \sqrt{f x^2 + e}\right)}{d^2\sqrt{f}}$$

$$+ \frac{\ln\left(\frac{-\frac{2(c f - d e)}{d} - \frac{2 f\sqrt{-c d}\left(x + \frac{\sqrt{-c d}}{d}\right)}{d} + 2\sqrt{-\frac{c f - d e}{d}}\sqrt{\left(x + \frac{\sqrt{-c d}}{d}\right)^2 f - \frac{2 f\sqrt{-c d}\left(x + \frac{\sqrt{-c d}}{d}\right)}{d} - \frac{c f - d e}{d}}}{x + \frac{\sqrt{-c d}}{d}}\right) a^2}{2\sqrt{-c d}\sqrt{-\frac{c f - d e}{d}}}$$

$$- \frac{\ln\left(\frac{-\frac{2(c f - d e)}{d} - \frac{2 f\sqrt{-c d}\left(x + \frac{\sqrt{-c d}}{d}\right)}{d} + 2\sqrt{-\frac{c f - d e}{d}}\sqrt{\left(x + \frac{\sqrt{-c d}}{d}\right)^2 f - \frac{2 f\sqrt{-c d}\left(x + \frac{\sqrt{-c d}}{d}\right)}{d} - \frac{c f - d e}{d}}}{x + \frac{\sqrt{-c d}}{d}}\right) a c b}{d\sqrt{-c d}\sqrt{-\frac{c f - d e}{d}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(cf-de)}{d}-\frac{2f\sqrt{-cd}\left(x+\frac{\sqrt{-cd}}{d}\right)}{d}+2\sqrt{-\frac{cf-de}{d}}\sqrt{\left(x+\frac{\sqrt{-cd}}{d}\right)^2 f-\frac{2f\sqrt{-cd}\left(x+\frac{\sqrt{-cd}}{d}\right)}{d}-\frac{cf-de}{d}}}{x+\frac{\sqrt{-cd}}{d}}\right)b^2c^2}{2d^2\sqrt{-cd}\sqrt{-\frac{cf-de}{d}}}$$

$$-\frac{\ln\left(\frac{-\frac{2(cf-de)}{d}+\frac{2f\sqrt{-cd}\left(x-\frac{\sqrt{-cd}}{d}\right)}{d}+2\sqrt{-\frac{cf-de}{d}}\sqrt{\left(x-\frac{\sqrt{-cd}}{d}\right)^2 f+\frac{2f\sqrt{-cd}\left(x-\frac{\sqrt{-cd}}{d}\right)}{d}-\frac{cf-de}{d}}}{x-\frac{\sqrt{-cd}}{d}}\right)a^2}{2\sqrt{-cd}\sqrt{-\frac{cf-de}{d}}}$$

$$+\frac{\ln\left(\frac{-\frac{2(cf-de)}{d}+\frac{2f\sqrt{-cd}\left(x-\frac{\sqrt{-cd}}{d}\right)}{d}+2\sqrt{-\frac{cf-de}{d}}\sqrt{\left(x-\frac{\sqrt{-cd}}{d}\right)^2 f+\frac{2f\sqrt{-cd}\left(x-\frac{\sqrt{-cd}}{d}\right)}{d}-\frac{cf-de}{d}}}{x-\frac{\sqrt{-cd}}{d}}\right)acb}{d\sqrt{-cd}\sqrt{-\frac{cf-de}{d}}}$$

$$-\frac{\ln\left(\frac{-\frac{2(cf-de)}{d}+\frac{2f\sqrt{-cd}\left(x-\frac{\sqrt{-cd}}{d}\right)}{d}+2\sqrt{-\frac{cf-de}{d}}\sqrt{\left(x-\frac{\sqrt{-cd}}{d}\right)^2 f+\frac{2f\sqrt{-cd}\left(x-\frac{\sqrt{-cd}}{d}\right)}{d}-\frac{cf-de}{d}}}{x-\frac{\sqrt{-cd}}{d}}\right)b^2c^2}{2d^2\sqrt{-cd}\sqrt{-\frac{cf-de}{d}}}$$

Problem 20: Result more than twice size of optimal antiderivative.

$$\int \frac{(dx^2+c)^{5/2}\sqrt{fx^2+e}}{bx^2+a}\,dx$$

Optimal(type 4, 649 leaves, 14 steps):

$$\frac{d^2 x (fx^2+e)^{3/2}\sqrt{dx^2+c}}{5bf} + \frac{d\left(7ce - \frac{2de^2}{f} + \frac{3c^2 f}{d}\right)x\sqrt{dx^2+c}}{15b\sqrt{fx^2+e}} + \frac{(-ad+bc)(-3adf+4bcf+bde)x\sqrt{dx^2+c}}{3b^3\sqrt{fx^2+e}}$$

$$+ \frac{de^{3/2}\left(-40abcdf+15a^2d^2f+b^2c(34cf-de)\right)\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}}, \sqrt{1-\frac{de}{cf}}\right)\sqrt{dx^2+c}}{15b^3cf^{3/2}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}$$

$$- \frac{1}{15b^3f^{3/2}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}\Bigg((15a^2d^2f^2-5abdf(7cf+de)+b^2(23c^2f^2+12cdef$$

$$-2d^2e^2))\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticE}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}}, \sqrt{1-\frac{de}{cf}}\right)\sqrt{e}\sqrt{dx^2+c}\Bigg)$$

$$+ \frac{(-ad+bc)^3e^{3/2}\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticPi}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}}, 1-\frac{be}{af}, \sqrt{1-\frac{de}{cf}}\right)\sqrt{dx^2+c}}{ab^3c\sqrt{f}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}} + \frac{d(-ad+bc)x\sqrt{dx^2+c}\sqrt{fx^2+e}}{3b^2}$$

$$- \frac{2d(-3cf+de)x\sqrt{dx^2+c}\sqrt{fx^2+e}}{15bf}$$

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Result(type 4, 1890 leaves):
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$$-\frac{1}{15(dfx^4+cfx^2+dex^2+ce)b^4f^2\sqrt{-\frac{d}{c}}\,a}\Bigg(\sqrt{dx^2+c}\sqrt{fx^2+e}\Bigg(-3\sqrt{-\frac{d}{c}}\,x^7ab^3d^3f^3+15\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\Bigg(\sqrt{-\frac{d}{c}}\,x,$$

$$\sqrt{\frac{cf}{de}}\Bigg)a^4d^3f^3-15\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticPi}\left(\sqrt{-\frac{d}{c}}\,x, \frac{bc}{ad}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right)a^4d^3f^3-5\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticF}\Bigg(\sqrt{-\frac{d}{c}}\,x,$$

$$\sqrt{\frac{cf}{de}}\Bigg)a^2b^2d^3e^2f-15\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x, \sqrt{\frac{cf}{de}}\right)a^3bd^3ef^2+5\sqrt{\frac{dx^2+c}{c}}\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\Bigg(\sqrt{-\frac{d}{c}}\,x,$$

$$\sqrt{\frac{cf}{de}}\Bigg) a^2 b^2 d^3 e^2 f + 45 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^3 b c d^2 f^3 + 15 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticPi}\Bigg(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d},$$

$$\frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\Bigg) a^3 b d^3 e f^2 - 45 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^2 b^2 c^2 d f^3 - 15 \sqrt{-\frac{d}{c}}\, x^3 a b^3 c d^2 e f^2 + 5 \sqrt{-\frac{d}{c}}\, x a^2 b^2 c d^2 e f^2$$

$$- 11 \sqrt{-\frac{d}{c}}\, x a b^3 c^2 d e f^2 - \sqrt{-\frac{d}{c}}\, x a b^3 c d^2 e^2 f - 45 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a^3 b c d^2 f^3$$

$$+ 45 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a^2 b^2 c^2 d f^3 + 35 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a^2 b^2 c d^2 e f^2$$

$$- 23 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a b^3 c^2 d e f^2 - 12 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a b^3 c d^2 e^2 f$$

$$- 45 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^2 b^2 c d^2 e f^2 + 45 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticPi}\Bigg(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d},$$

$$\frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\Bigg) a b^3 c^2 d e f^2 + 5 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a^2 b^2 c d^2 e f^2 - 11 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticF}\Bigg(\sqrt{-\frac{d}{c}}\, x,$$

$$\sqrt{\frac{cf}{de}}\Bigg) a b^3 c^2 d e f^2 + 13 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a b^3 c d^2 e^2 f + 5 \sqrt{-\frac{d}{c}}\, x^5 a^2 b^2 d^3 f^3$$

$$- 15 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a b^3 c^3 f^3 - 2 \sqrt{\frac{d x^2 + c}{c}} \sqrt{\frac{f x^2 + e}{e}} \, \text{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{cf}{de}}\right) a b^3 d^3 e^3$$

$$+2\sqrt{\frac{dx^2+c}{c}}\,\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticE}\left(\sqrt{-\frac{d}{c}}\,x,\sqrt{\frac{cf}{de}}\right)a\,b^3\,d^3\,e^3+15\sqrt{\frac{dx^2+c}{c}}\,\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticPi}\left(\sqrt{-\frac{d}{c}}\,x,\frac{b\,c}{a\,d},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right)a\,b^3\,c^3\,f^3$$

$$-15\sqrt{\frac{dx^2+c}{c}}\,\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticPi}\left(\sqrt{-\frac{d}{c}}\,x,\frac{b\,c}{a\,d},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right)b^4\,c^3\,e\,f^2-14\sqrt{-\frac{d}{c}}\,x^5\,a\,b^3\,c\,d^2\,f^3-4\sqrt{-\frac{d}{c}}\,x^5\,a\,b^3\,d^3\,e\,f^2+5\sqrt{-\frac{d}{c}}\,x^3\,a^2\,b^2\,c\,d^2\,f^3$$

$$\left.\left.+5\sqrt{-\frac{d}{c}}\,x^3\,a^2\,b^2\,d^3\,e\,f^2-11\sqrt{-\frac{d}{c}}\,x^3\,a\,b^3\,c^2\,d\,f^3-\sqrt{-\frac{d}{c}}\,x^3\,a\,b^3\,d^3\,e^2\,f\right)\right)$$

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Problem 21: Result more than twice size of optimal antiderivative.
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$$\int\frac{(dx^2+c)^{3/2}\sqrt{fx^2+e}}{bx^2+a}\,dx$$

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Optimal(type 4, 459 leaves, 7 steps):
```

$$\frac{(-3adf+4bcf+bde)\,x\sqrt{dx^2+c}}{3b^2\sqrt{fx^2+e}}+\frac{d\,(-3ad+5bc)\,e^{3/2}\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\,\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},\sqrt{1-\frac{de}{cf}}\right)\sqrt{dx^2+c}}{3b^2c\sqrt{f}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\,\sqrt{fx^2+e}}$$

$$+\frac{(-ad+bc)^2e^{3/2}\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\,\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticPi}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},1-\frac{be}{af},\sqrt{1-\frac{de}{cf}}\right)\sqrt{dx^2+c}}{a\,b^2c\sqrt{f}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\,\sqrt{fx^2+e}}$$

$$-\frac{(-3adf+4bcf+bde)\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\,\sqrt{1+\frac{fx^2}{e}}\,\mathrm{EllipticE}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},\sqrt{1-\frac{de}{cf}}\right)\sqrt{e}\,\sqrt{dx^2+c}}{3b^2\sqrt{f}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\,\sqrt{fx^2+e}}+\frac{dx\sqrt{dx^2+c}\,\sqrt{fx^2+e}}{3b}$$

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Result(type 4, 1058 leaves):
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$$\frac{1}{3\left(d f x^4+c f x^2+d e x^2+c e\right) b^3 \sqrt{-\frac{d}{c}}\, f a}\left(\sqrt{d x^2+c}\,\sqrt{f x^2+e}\left(\sqrt{-\frac{d}{c}}\, x^5 a b^2 d^2 f^2+\sqrt{-\frac{d}{c}}\, x^3 a b^2 c d f^2+\sqrt{-\frac{d}{c}}\, x^3 a b^2 d^2 e f\right.\right.$$

$$+3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a^3 d^2 f^2-6\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a^2 b c d f^2$$

$$+3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a b^2 c^2 f^2+\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a b^2 c d e f$$

$$-\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a b^2 d^2 e^2-3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a^2 b d^2 e f$$

$$+4\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a b^2 c d e f+\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a b^2 d^2 e^2$$

$$-3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^3 d^2 f^2+6\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^2 b c d f^2$$

$$+3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^2 b d^2 e f-3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a b^2 c^2 f^2$$

$$-6\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a b^2 c d e f+3\sqrt{\frac{d x^2+c}{c}}\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) b^3 c^2 e f$$

$$\left.\left.+\sqrt{-\frac{d}{c}}\, x a b^2 c d e f\right)\right)$$

Problem 23: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{fx^2+e}}{(bx^2+a)\,(dx^2+c)^{7/2}}\,dx$$

Optimal(type 4, 714 leaves, 9 steps):

$$\frac{b^3 e^{3/2}\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticPi}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},1-\frac{be}{af},\sqrt{1-\frac{de}{cf}}\right)\sqrt{dx^2+c}}{ac(-ad+bc)^3\sqrt{f}\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}$$
$$+\frac{de^{3/2}(bc(-11cf+9de)-2ad(-3cf+2de))\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},\sqrt{1-\frac{de}{cf}}\right)\sqrt{f}\sqrt{dx^2+c}}{15c^3(-ad+bc)^2(-cf+de)^2\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}$$
$$-\frac{dx\sqrt{fx^2+e}}{5c(-ad+bc)\,(dx^2+c)^{5/2}}-\frac{d(bc(-8cf+9de)-ad(-3cf+4de))x\sqrt{fx^2+e}}{15c^2(-ad+bc)^2(-cf+de)\,(dx^2+c)^{3/2}}$$
$$+\frac{1}{15c^{5/2}(-ad+bc)^2(-cf+de)^2\sqrt{dx^2+c}\sqrt{\frac{c(fx^2+e)}{e(dx^2+c)}}}\Bigg(\left(ad\left(3c^2f^2-13cdef+8d^2e^2\right)-2bc\left(4c^2f^2-14cdef\right.\right.$$
$$\left.\left.+9d^2e^2\right)\right)\sqrt{\frac{1}{1+\frac{dx^2}{c}}}\sqrt{1+\frac{dx^2}{c}}\,\text{EllipticE}\left(\frac{x\sqrt{d}}{\sqrt{c}\sqrt{1+\frac{dx^2}{c}}},\sqrt{1-\frac{cf}{de}}\right)\sqrt{d}\sqrt{fx^2+e}\Bigg)$$
$$-\frac{b^2\sqrt{\frac{1}{1+\frac{dx^2}{c}}}\sqrt{1+\frac{dx^2}{c}}\,\text{EllipticE}\left(\frac{x\sqrt{d}}{\sqrt{c}\sqrt{1+\frac{dx^2}{c}}},\sqrt{1-\frac{cf}{de}}\right)\sqrt{d}\sqrt{fx^2+e}}{(-ad+bc)^3\sqrt{c}\sqrt{dx^2+c}\sqrt{\frac{c(fx^2+e)}{e(dx^2+c)}}}$$

Result(type ?, 6244 leaves): Display of huge result suppressed!

Problem 29: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(bx^2+a)^2\sqrt{-dx^2+c}\sqrt{fx^2+e}}\,dx$$

Optimal(type 4, 369 leaves, 11 steps):

$$\frac{b^2 x\sqrt{-dx^2+c}\,\sqrt{fx^2+e}}{2a(ad+bc)(-af+be)(bx^2+a)}+\frac{b\,\mathrm{EllipticE}\left(\frac{x\sqrt{d}}{\sqrt{c}},\sqrt{-\frac{cf}{de}}\right)\sqrt{c}\,\sqrt{d}\,\sqrt{1-\frac{dx^2}{c}}\,\sqrt{fx^2+e}}{2a(ad+bc)(-af+be)\sqrt{-dx^2+c}\,\sqrt{1+\frac{fx^2}{e}}}$$

$$+\frac{\left(b^2ce-3a^2df+ab(-2cf+2de)\right)\mathrm{EllipticPi}\left(\frac{x\sqrt{d}}{\sqrt{c}},-\frac{bc}{ad},\sqrt{-\frac{cf}{de}}\right)\sqrt{c}\,\sqrt{1-\frac{dx^2}{c}}\,\sqrt{1+\frac{fx^2}{e}}}{2a^2(ad+bc)(-af+be)\sqrt{d}\,\sqrt{-dx^2+c}\,\sqrt{fx^2+e}}$$

$$-\frac{\mathrm{EllipticF}\left(\frac{x\sqrt{d}}{\sqrt{c}},\sqrt{-\frac{cf}{de}}\right)\sqrt{c}\,\sqrt{d}\,\sqrt{1-\frac{dx^2}{c}}\,\sqrt{1+\frac{fx^2}{e}}}{2a(ad+bc)\sqrt{-dx^2+c}\,\sqrt{fx^2+e}}$$

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Result(type 4, 1104 leaves):
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$$\frac{1}{2\sqrt{\frac{d}{c}}\,(bx^2+a)\,a^2\,(af-be)\,(ad+bc)\,(dfx^4-cfx^2+dex^2-ce)}\Bigg(\Bigg(-\sqrt{\frac{d}{c}}\,x^5ab^2df+\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticF}\Bigg(x\sqrt{\frac{d}{c}},$$

$$\sqrt{-\frac{cf}{de}}\Bigg)x^2a^2bdf-\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticF}\left(x\sqrt{\frac{d}{c}},\sqrt{-\frac{cf}{de}}\right)x^2ab^2de+\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticE}\Bigg(x\sqrt{\frac{d}{c}},$$

$$\sqrt{-\frac{cf}{de}}\Bigg)x^2ab^2de-3\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticPi}\left(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\right)x^2a^2bdf-2\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticPi}\Bigg(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},$$

$$\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\Bigg)x^2ab^2cf+2\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticPi}\left(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\right)x^2ab^2de+\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticPi}\Bigg(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},$$

$$\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\Bigg)x^2b^3ce+\sqrt{\frac{d}{c}}\,x^3ab^2cf-\sqrt{\frac{d}{c}}\,x^3ab^2de+\sqrt{\frac{fx^2+e}{e}}\,\sqrt{-\frac{dx^2-c}{c}}\,\mathrm{EllipticF}\left(x\sqrt{\frac{d}{c}},\sqrt{-\frac{cf}{de}}\right)a^3df$$

$$-\sqrt{\frac{fx^2+e}{e}}\sqrt{-\frac{dx^2-c}{c}}\,\text{EllipticF}\left(x\sqrt{\frac{d}{c}},\sqrt{-\frac{cf}{de}}\right)a^2bde+\sqrt{\frac{fx^2+e}{e}}\sqrt{-\frac{dx^2-c}{c}}\,\text{EllipticE}\left(x\sqrt{\frac{d}{c}},\sqrt{-\frac{cf}{de}}\right)a^2bde$$

$$-3\sqrt{\frac{fx^2+e}{e}}\sqrt{-\frac{dx^2-c}{c}}\,\text{EllipticPi}\left(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\right)a^3df-2\sqrt{\frac{fx^2+e}{e}}\sqrt{-\frac{dx^2-c}{c}}\,\text{EllipticPi}\left(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\right)a^2bcf$$

$$+2\sqrt{\frac{fx^2+e}{e}}\sqrt{-\frac{dx^2-c}{c}}\,\text{EllipticPi}\left(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\right)a^2bde+\sqrt{\frac{fx^2+e}{e}}\sqrt{-\frac{dx^2-c}{c}}\,\text{EllipticPi}\left(x\sqrt{\frac{d}{c}},-\frac{bc}{ad},\frac{\sqrt{-\frac{f}{e}}}{\sqrt{\frac{d}{c}}}\right)ab^2ce$$

$$\left.\left.+\sqrt{\frac{d}{c}}\,xab^2ce\right)\sqrt{fx^2+e}\sqrt{-dx^2+c}\right)$$

Problem 30: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{(bx^2+a)^2\sqrt{dx^2+c}\sqrt{fx^2+e}}\,dx$$

Optimal(type 4, 502 leaves, 8 steps):

$$-\frac{bfx\sqrt{dx^2+c}}{2a(-ad+bc)(-af+be)\sqrt{fx^2+e}}+\frac{b\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticE}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},\sqrt{1-\frac{de}{cf}}\right)\sqrt{e}\sqrt{f}\sqrt{dx^2+c}}{2a(-ad+bc)(-af+be)\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}$$

$$-\frac{d\sqrt{\frac{1}{1+\frac{fx^2}{e}}}\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticF}\left(\frac{x\sqrt{f}}{\sqrt{e}\sqrt{1+\frac{fx^2}{e}}},\sqrt{1-\frac{de}{cf}}\right)\sqrt{e}\sqrt{f}\sqrt{dx^2+c}}{2c(-ad+bc)(-af+be)\sqrt{\frac{e(dx^2+c)}{c(fx^2+e)}}\sqrt{fx^2+e}}+\frac{b^2x\sqrt{dx^2+c}\sqrt{fx^2+e}}{2a(-ad+bc)(-af+be)(bx^2+a)}$$

$$+\frac{\left(b^2 c e+3 a^2 d f-2 a b (c f+d e)\right) \operatorname{EllipticPi}\left(\frac{x\sqrt{d}}{\sqrt{-c}}, \frac{b c}{a d}, \sqrt{\frac{c f}{d e}}\right) \sqrt{-c}\, \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}}{2 a^2 (-a d+b c) (-a f+b e) \sqrt{d}\, \sqrt{d x^2+c}\, \sqrt{f x^2+e}}$$

Result(type 4, 1077 leaves):

$$-\frac{1}{2\sqrt{-\frac{d}{c}}\,(b x^2+a)\, a^2 (a f-b e)(a d-b c)\left(d f x^4+c f x^2+d e x^2+c e\right)}\Bigg(\Bigg(-\sqrt{-\frac{d}{c}}\, x^5 a b^2 d f+\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x,\right.$$

$$\left.\sqrt{\frac{c f}{d e}}\right) x^2 a^2 b d f-\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) x^2 a b^2 d e+\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) x^2 a b^2 d e$$

$$-3\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) x^2 a^2 b d f+2\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) x^2 a b^2 c f$$

$$+2\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) x^2 a b^2 d e-\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) x^2 b^3 c e$$

$$-\sqrt{-\frac{d}{c}}\, x^3 a b^2 c f-\sqrt{-\frac{d}{c}}\, x^3 a b^2 d e+\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a^3 d f-\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticF}\left(\sqrt{-\frac{d}{c}}\, x,\right.$$

$$\left.\sqrt{\frac{c f}{d e}}\right) a^2 b d e+\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticE}\left(\sqrt{-\frac{d}{c}}\, x, \sqrt{\frac{c f}{d e}}\right) a^2 b d e-3\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^3 d f$$

$$+2\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^2 b c f+2\sqrt{\frac{d x^2+c}{c}}\,\sqrt{\frac{f x^2+e}{e}}\operatorname{EllipticPi}\left(\sqrt{-\frac{d}{c}}\, x, \frac{b c}{a d}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a^2 b d e$$

$$-\sqrt{\frac{dx^2+c}{c}}\,\sqrt{\frac{fx^2+e}{e}}\,\mathrm{EllipticPi}\left(\sqrt{-\frac{d}{c}}\,x, \frac{bc}{ad}, \frac{\sqrt{-\frac{f}{e}}}{\sqrt{-\frac{d}{c}}}\right) a b^2 c e - \sqrt{-\frac{d}{c}}\, x a b^2 c e\Bigg)\sqrt{fx^2+e}\,\sqrt{dx^2+c}\Bigg)$$

Problem 31: Unable to integrate problem.

$$\int \frac{\sqrt{bx^2+a}}{\sqrt{dx^2+c}\,\sqrt{fx^2+e}}\,dx$$

Optimal(type 4, 142 leaves, 2 steps):

$$\frac{a\,\mathrm{EllipticPi}\left(\frac{x\sqrt{-ad+bc}}{\sqrt{c}\,\sqrt{bx^2+a}}, \frac{bc}{-ad+bc}, \sqrt{\frac{c(-af+be)}{(-ad+bc)e}}\right)\sqrt{dx^2+c}\,\sqrt{\frac{a(fx^2+e)}{e(bx^2+a)}}}{\sqrt{c}\,\sqrt{-ad+bc}\,\sqrt{\frac{a(dx^2+c)}{c(bx^2+a)}}\,\sqrt{fx^2+e}}$$

Result(type 8, 30 leaves):

$$\int \frac{\sqrt{bx^2+a}}{\sqrt{dx^2+c}\,\sqrt{fx^2+e}}\,dx$$

Test results for the 17 problems in "1.1.2.6 (g x)^m (a+b x^2)^p (c+d x^2)^q (e+f x^2)^r.txt"

Problem 1: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 189 leaves, 2 steps):

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

Result(type 3, 1228 leaves):

$$\frac{1}{(11+m)(9+m)(7+m)(5+m)(3+m)(1+m)}\Big(x\big(B b^3 d m^5 x^{10} + 25 B b^3 d m^4 x^{10} + A b^3 d m^5 x^8 + 3 B a b^2 d m^5 x^8 + B b^3 c m^5 x^8 + 230 B b^3 d m^3 x^{10}$$
$$+ 27 A b^3 d m^4 x^8 + 81 B a b^2 d m^4 x^8 + 27 B b^3 c m^4 x^8 + 950 B b^3 d m^2 x^{10} + 3 A a b^2 d m^5 x^6 + A b^3 c m^5 x^6 + 262 A b^3 d m^3 x^8 + 3 B a^2 b d m^5 x^6 + 3 B a b^2 c m^5 x^6$$
$$+ 786 B a b^2 d m^3 x^8 + 262 B b^3 c m^3 x^8 + 1689 B b^3 d m x^{10} + 87 A a b^2 d m^4 x^6 + 29 A b^3 c m^4 x^6 + 1122 A b^3 d m^2 x^8 + 87 B a^2 b d m^4 x^6 + 87 B a b^2 c m^4 x^6$$
$$+ 3366 B a b^2 d m^2 x^8 + 1122 B b^3 c m^2 x^8 + 945 B d b^3 x^{10} + 3 A a^2 b d m^5 x^4 + 3 A a b^2 c m^5 x^4 + 906 A a b^2 d m^3 x^6 + 302 A b^3 c m^3 x^6 + 2041 A b^3 d m x^8$$
$$+ B a^3 d m^5 x^4 + 3 B a^2 b c m^5 x^4 + 906 B a^2 b d m^3 x^6 + 906 B a b^2 c m^3 x^6 + 6123 B a b^2 d m x^8 + 2041 B b^3 c m x^8 + 93 A a^2 b d m^4 x^4 + 93 A a b^2 c m^4 x^4$$

$$+ 4098 A a b^2 d m^2 x^6 + 1366 A b^3 c m^2 x^6 + 1155 A b^3 d x^8 + 31 B a^3 d m^4 x^4 + 93 B a^2 b c m^4 x^4 + 4098 B a^2 b d m^2 x^6 + 4098 B a b^2 c m^2 x^6 + 3465 B a b^2 d x^8$$
$$+ 1155 B b^3 c x^8 + A a^3 d m^5 x^2 + 3 A a^2 b c m^5 x^2 + 1050 A a^2 b d m^3 x^4 + 1050 A a b^2 c m^3 x^4 + 7731 A a b^2 d m x^6 + 2577 A b^3 c m x^6 + B a^3 c m^5 x^2$$
$$+ 350 B a^3 d m^3 x^4 + 1050 B a^2 b c m^3 x^4 + 7731 B a^2 b d m x^6 + 7731 B a b^2 c m x^6 + 33 A a^3 d m^4 x^2 + 99 A a^2 b c m^4 x^2 + 5190 A a^2 b d m^2 x^4 + 5190 A a b^2 c m^2 x^4$$
$$+ 4455 A a b^2 d x^6 + 1485 A b^3 c x^6 + 33 B a^3 c m^4 x^2 + 1730 B a^3 d m^2 x^4 + 5190 B a^2 b c m^2 x^4 + 4455 B a^2 b d x^6 + 4455 B a b^2 c x^6 + A a^3 c m^5 + 406 A a^3 d m^3 x^2$$
$$+ 1218 A a^2 b c m^3 x^2 + 10467 A a^2 b d m x^4 + 10467 A a b^2 c m x^4 + 406 B a^3 c m^3 x^2 + 3489 B a^3 d m x^4 + 10467 B a^2 b c m x^4 + 35 A a^3 c m^4 + 2262 A a^3 d m^2 x^2$$
$$+ 6786 A a^2 b c m^2 x^2 + 6237 A a^2 b d x^4 + 6237 A a b^2 c x^4 + 2262 B a^3 c m^2 x^2 + 2079 B a^3 d x^4 + 6237 B a^2 b c x^4 + 470 A a^3 c m^3 + 5353 A a^3 d m x^2$$
$$+ 16059 A a^2 b c m x^2 + 5353 B a^3 c m x^2 + 3010 A a^3 c m^2 + 3465 A a^3 d x^2 + 10395 A a^2 b c x^2 + 3465 B a^3 c x^2 + 9129 A a^3 c m + 10395 A c a^3\Big) (e x)^m\Big)$$

Problem 2: Result more than twice size of optimal antiderivative.

$$\int (e x)^m (b x^2 + a)(B x^2 + A)(d x^2 + c)\, dx$$

Optimal(type 3, 97 leaves, 2 steps):

$$\frac{a A c (e x)^{1+m}}{e (1+m)} + \frac{(a A d + A b c + a B c)(e x)^{3+m}}{e^3 (3+m)} + \frac{(A b d + a B d + b B c)(e x)^{5+m}}{e^5 (5+m)} + \frac{b B d (e x)^{7+m}}{e^7 (7+m)}$$

Result(type 3, 320 leaves):

$$\frac{1}{(7+m)(5+m)(3+m)(1+m)}\Big(x \Big(B b d m^3 x^6 + 9 B b d m^2 x^6 + A b d m^3 x^4 + B a d m^3 x^4 + B b c m^3 x^4 + 23 B b d m x^6 + 11 A b d m^2 x^4 + 11 B a d m^2 x^4$$
$$+ 11 B b c m^2 x^4 + 15 B b d x^6 + A a d m^3 x^2 + A b c m^3 x^2 + 31 A b d m x^4 + B a c m^3 x^2 + 31 B a d m x^4 + 31 B b c m x^4 + 13 A a d m^2 x^2 + 13 A b c m^2 x^2$$
$$+ 21 A b d x^4 + 13 B a c m^2 x^2 + 21 B a d x^4 + 21 B b c x^4 + A a c m^3 + 47 A a d m x^2 + 47 A b c m x^2 + 47 B a c m x^2 + 15 A a c m^2 + 35 A a d x^2 + 35 A b c x^2$$
$$+ 35 B a c x^2 + 71 A a c m + 105 A a c\Big) (e x)^m\Big)$$

Problem 3: Unable to integrate problem.

$$\int \frac{(e x)^m (B x^2 + A)(d x^2 + c)}{(b x^2 + a)^3}\, dx$$

Optimal(type 5, 201 leaves, 3 steps):

$$-\frac{(A b (a d (1-m) - b c (3-m)) - a B (b c (1+m) - a d (3+m)))(e x)^{1+m}}{8 a^2 b^2 e (b x^2 + a)} + \frac{(A b - a B)(e x)^{1+m} (d x^2 + c)}{4 a b e (b x^2 + a)^2}$$
$$+ \frac{(A b (1-m)(b c (3-m) + a d (1+m)) + a B (1+m)(a d (3+m) + b (-c m + c)))(e x)^{1+m} \operatorname{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a}\right)}{8 a^3 b^2 e (1+m)}$$

Result(type 8, 31 leaves):

$$\int \frac{(e x)^m (B x^2 + A)(d x^2 + c)}{(b x^2 + a)^3}\, dx$$

Problem 4: Result more than twice size of optimal antiderivative.

$$\int (e x)^m \left(b x^2 + a\right) \left(B x^2 + A\right) \left(d x^2 + c\right)^2 dx$$

Optimal(type 3, 144 leaves, 2 steps):

$$\frac{a A c^2 (e x)^{1+m}}{e (1+m)} + \frac{c (2 a A d + A b c + a B c) (e x)^{3+m}}{e^3 (3+m)} + \frac{(a d (A d + 2 B c) + b c (2 A d + B c)) (e x)^{5+m}}{e^5 (5+m)} + \frac{d (A b d + a B d + 2 b B c) (e x)^{7+m}}{e^7 (7+m)} + \frac{b B d^2 (e x)^{9+m}}{e^9 (9+m)}$$

Result(type 3, 710 leaves):

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

Problem 5: Result more than twice size of optimal antiderivative.

$$\int (e x)^m \left(b x^2 + a\right)^3 \left(B x^2 + A\right) \left(d x^2 + c\right)^3 dx$$

Optimal(type 3, 379 leaves, 2 steps):

$$\frac{a^3 A c^3 (e x)^{1+m}}{e (1+m)} + \frac{a^2 c^2 (a B c + 3 A (a d + b c)) (e x)^{3+m}}{e^3 (3+m)} + \frac{3 a c \left(a B c (a d + b c) + A \left(a^2 d^2 + 3 a c b d + b^2 c^2\right)\right) (e x)^{5+m}}{e^5 (5+m)} + \frac{\left(3 a B c \left(a^2 d^2 + 3 a c b d + b^2 c^2\right) + A \left(a^3 d^3 + 9 a^2 b c d^2 + 9 a b^2 c^2 d + b^3 c^3\right)\right) (e x)^{7+m}}{e^7 (7+m)} + \frac{\left(a^3 B d^3 + 9 a b^2 c d (A d + B c) + 3 a^2 b d^2 (A d + 3 B c) + b^3 c^2 (3 A d + B c)\right) (e x)^{9+m}}{e^9 (9+m)} + \frac{3 b d \left(a^2 B d^2 + b^2 c (A d + B c) + a b d (A d + 3 B c)\right) (e x)^{11+m}}{e^{11} (11+m)} + \frac{b^2 d^2 (A b d + 3 a B d + 3 b B c) (e x)^{13+m}}{e^{13} (13+m)} + \frac{b^3 B d^3 (e x)^{15+m}}{e^{15} (15+m)}$$

Result(type ?, 3952 leaves): Display of huge result suppressed!

Problem 6: Result more than twice size of optimal antiderivative.

$$\int (e x)^m \left(b x^2 + a\right)^2 \left(B x^2 + A\right) \left(d x^2 + c\right)^3 dx$$

Optimal(type 3, 284 leaves, 2 steps):

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

Result(type ?, 2442 leaves): Display of huge result suppressed!

Problem 7: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 189 leaves, 2 steps):

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

Result(type 3, 1228 leaves):

$$\frac{1}{(11+m)(9+m)(7+m)(5+m)(3+m)(1+m)}\left(x\left(Bbd^3m^5x^{10}+25Bbd^3m^4x^{10}+Abd^3m^5x^8+Bad^3m^5x^8+3Bbcd^2m^5x^8+230Bbd^3m^3x^{10}+27Abd^3m^4x^8+27Bad^3m^4x^8+81Bbcd^2m^4x^8+950Bbd^3m^2x^{10}+Aad^3m^5x^6+3Abcd^2m^5x^6+262Abd^3m^3x^8+3Bacd^2m^5x^6+262Bad^3m^3x^8+3Bbc^2dm^5x^6+786Bbcd^2m^3x^8+1689Bbd^3mx^{10}+29Aad^3m^4x^6+87Abcd^2m^4x^6+1122Abd^3m^2x^8+87Bacd^2m^4x^6+1122Bad^3m^2x^8+87Bbc^2dm^4x^6+3366Bbcd^2m^2x^8+945bBd^3x^{10}+3Aacd^2m^5x^4+302Aad^3m^3x^6+3Abc^2dm^5x^4+906Abcd^2m^3x^6+2041Abd^3mx^8+3Bac^2dm^5x^4+906Bacd^2m^3x^6+2041Bad^3mx^8+Bbc^3m^5x^4+906Bbc^2dm^3x^6+6123Bbcd^2mx^8+93Aacd^2m^4x^4+1366Aad^3m^2x^6+93Abc^2dm^4x^4+4098Abcd^2m^2x^6+1155Abd^3x^8+93Bac^2dm^4x^4+4098Bacd^2m^2x^6+1155Bad^3x^8+31Bbc^3m^4x^4+4098Bbc^2dm^2x^6+3465Bbcd^2x^8+3Aac^2dm^5x^2+1050Aacd^2m^3x^4+2577Aad^3mx^6+Abc^3m^5x^2+1050Abc^2dm^3x^4+7731Abcd^2mx^6+Bac^3m^5x^2+1050Bac^2dm^3x^4+7731Bacd^2mx^6+350Bbc^3m^3x^4+7731Bbc^2dmx^6+99Aac^2dm^4x^2+5190Aacd^2m^2x^4+1485Aad^3x^6+33Abc^3m^4x^2+5190Abc^2dm^2x^4+4455Abcd^2x^6+33Bac^3m^4x^2+5190Bac^2dm^2x^4+4455Bacd^2x^6+1730Bbc^3m^2x^4+4455Bbc^2dx^6+Aac^3m^5+1218Aac^2dm^3x^2+10467Aacd^2mx^4+406Abc^3m^3x^2+10467Abc^2dmx^4+406Bac^3m^3x^2+10467Bac^2dmx^4+3489Bbc^3mx^4+35Aac^3m^4+6786Aac^2dm^2x^2+6237Aacd^2x^4+2262Abc^3m^2x^2+6237Abc^2dx^4+2262Bac^3m^2x^2+6237Bac^2dx^4+2079Bbc^3x^4+470Aac^3m^3+16059Aac^2dmx^2+5353Abc^3mx^2+5353Bac^3mx^2+3010Aac^3m^2+10395Aac^2dx^2+3465Abc^3x^2+3465Bac^3x^2+9129Aac^3m+10395aAc^3\right)(ex)^m\right)$$

Problem 8: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 121 leaves, 2 steps):

$$\frac{A c^3 (e x)^{1+m}}{e (1+m)} + \frac{c^2 (3 A d + B c) (e x)^{3+m}}{e^3 (3+m)} + \frac{3 c d (A d + B c) (e x)^{5+m}}{e^5 (5+m)} + \frac{d^2 (A d + 3 B c) (e x)^{7+m}}{e^7 (7+m)} + \frac{B d^3 (e x)^{9+m}}{e^9 (9+m)}$$

Result(type 3, 474 leaves):

$$\frac{1}{(9+m)(7+m)(5+m)(3+m)(1+m)} \left(x \left(B d^3 m^4 x^8 + 16 B d^3 m^3 x^8 + A d^3 m^4 x^6 + 3 B c d^2 m^4 x^6 + 86 B d^3 m^2 x^8 + 18 A d^3 m^3 x^6 + 54 B c d^2 m^3 x^6 + 176 B d^3 m x^8 + 3 A c d^2 m^4 x^4 + 104 A d^3 m^2 x^6 + 3 B c^2 d m^4 x^4 + 312 B c d^2 m^2 x^6 + 105 B d^3 x^8 + 60 A c d^2 m^3 x^4 + 222 A d^3 m x^6 + 60 B c^2 d m^3 x^4 + 666 B c d^2 m x^6 + 3 A c^2 d m^4 x^2 + 390 A c d^2 m^2 x^4 + 135 A d^3 x^6 + B c^3 m^4 x^2 + 390 B c^2 d m^2 x^4 + 405 B c d^2 x^6 + 66 A c^2 d m^3 x^2 + 900 A c d^2 m x^4 + 22 B c^3 m^3 x^2 + 900 B c^2 d m x^4 + A c^3 m^4 + 492 A c^2 d m^2 x^2 + 567 A c d^2 x^4 + 164 B c^3 m^2 x^2 + 567 B c^2 d x^4 + 24 A c^3 m^3 + 1374 A c^2 d m x^2 + 458 B c^3 m x^2 + 206 A c^3 m^2 + 945 A c^2 d x^2 + 315 B c^3 x^2 + 744 A c^3 m + 945 A c^3\right) (e x)^m\right)$$

Problem 9: Unable to integrate problem.

$$\int \frac{(e x)^m (B x^2 + A) (d x^2 + c)^3}{b x^2 + a} \, dx$$

Optimal(type 5, 256 leaves, 3 steps):

$$-\frac{\left(a^3 B d^3 + 3 a b^2 c d (A d + B c) - a^2 b d^2 (A d + 3 B c) - b^3 c^2 (3 A d + B c)\right) (e x)^{1+m}}{b^4 e (1+m)} + \frac{d \left(a^2 B d^2 + 3 b^2 c (A d + B c) - a b d (A d + 3 B c)\right) (e x)^{3+m}}{b^3 e^3 (3+m)} + \frac{d^2 (A b d - a B d + 3 b B c) (e x)^{5+m}}{b^2 e^5 (5+m)} + \frac{B d^3 (e x)^{7+m}}{b e^7 (7+m)} + \frac{(A b - a B) (-a d + b c)^3 (e x)^{1+m} \operatorname{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a}\right)}{a b^4 e (1+m)}$$

Result(type 8, 33 leaves):

$$\int \frac{(e x)^m (B x^2 + A) (d x^2 + c)^3}{b x^2 + a} \, dx$$

Problem 10: Unable to integrate problem.

$$\int \frac{(e x)^m (b x^2 + a)^3 (B x^2 + A)}{d x^2 + c} \, dx$$

Optimal(type 5, 258 leaves, 3 steps):

$$\frac{\left(a^3 B d^3 - b^3 c^2 (-A d + B c) + 3 a b^2 c d (-A d + B c) - 3 a^2 b d^2 (-A d + B c)\right) (e x)^{1+m}}{d^4 e (1+m)} + \frac{b \left(3 a^2 B d^2 + b^2 c (-A d + B c) - 3 a b d (-A d + B c)\right) (e x)^{3+m}}{d^3 e^3 (3+m)} - \frac{b^2 (-A b d - 3 a B d + b B c) (e x)^{5+m}}{d^2 e^5 (5+m)} + \frac{b^3 B (e x)^{7+m}}{d e^7 (7+m)} + \frac{(-a d + b c)^3 (-A d + B c) (e x)^{1+m} \operatorname{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{d x^2}{c}\right)}{c d^4 e (1+m)}$$

Result(type 8, 33 leaves):

$$\int \frac{(e x)^m (b x^2 + a)^3 (B x^2 + A)}{d x^2 + c} \, dx$$

Problem 11: Unable to integrate problem.

$$\int \frac{(e x)^m (B x^2 + A)}{(b x^2 + a)^3 (d x^2 + c)} \, dx$$

Optimal(type 5, 332 leaves, 6 steps):

$$\frac{(A b - a B) (e x)^{1+m}}{4 a (-a d + b c) e (b x^2 + a)^2} + \frac{(A b (b c (3 - m) - a d (7 - m)) + a B (a d (3 - m) + b c (1 + m))) (e x)^{1+m}}{8 a^2 (-a d + b c)^2 e (b x^2 + a)}$$
$$+ \frac{1}{8 a^3 (-a d + b c)^3 e (1 + m)} \Big((A b (a^2 d^2 (m^2 - 8 m + 15) - 2 a b c d (m^2 - 6 m + 5) + b^2 c^2 (m^2 - 4 m + 3)) + a B (b^2 c^2 (-m^2 + 1) - 2 a b c d (-m^2 + 2 m + 3) - a^2 d^2 (m^2 - 4 m + 3))) (e x)^{1+m} \text{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a} \right) \Big)$$
$$+ \frac{d^2 (-A d + B c) (e x)^{1+m} \text{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{d x^2}{c} \right)}{c (-a d + b c)^3 e (1 + m)}$$

Result(type 8, 33 leaves):

$$\int \frac{(e x)^m (B x^2 + A)}{(b x^2 + a)^3 (d x^2 + c)} \, dx$$

Problem 12: Unable to integrate problem.

$$\int \frac{(e x)^m (B x^2 + A)}{(b x^2 + a)^2 (d x^2 + c)^2} \, dx$$

Optimal(type 5, 292 leaves, 6 steps):

$$\frac{d (a A d + A b c - 2 a B c) (e x)^{1+m}}{2 a c (-a d + b c)^2 e (d x^2 + c)} + \frac{(A b - a B) (e x)^{1+m}}{2 a (-a d + b c) e (b x^2 + a) (d x^2 + c)}$$
$$+ \frac{b (A b (b c (1 - m) - a d (5 - m)) + a B (a d (3 - m) + b c (1 + m))) (e x)^{1+m} \text{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{b x^2}{a} \right)}{2 a^2 (-a d + b c)^3 e (1 + m)}$$
$$- \frac{d (b c (B c (3 - m) - A d (5 - m)) + a d (A d (1 - m) + B c (1 + m))) (e x)^{1+m} \text{hypergeom}\left(\left[1, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], -\frac{d x^2}{c} \right)}{2 c^2 (-a d + b c)^3 e (1 + m)}$$

Result(type 8, 33 leaves):

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

Problem 13: Unable to integrate problem.

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

Optimal(type 5, 200 leaves, 3 steps):

$$-\frac{(-ad+bc)(ex)^{1+m}(Bx^2+A)}{4cde(dx^2+c)^2}+\frac{(bc(Ad(1+m)-Bc(3+m))+ad(Ad(3-m)-B(-cm+c)))(ex)^{1+m}}{8c^2d^2e(dx^2+c)}$$
$$+\frac{(ad(1-m)(Ad(3-m)+Bc(1+m))+bc(1+m)(Ad(1-m)+Bc(3+m)))(ex)^{1+m}\mathrm{hypergeom}\left(\left[1,\frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],-\frac{dx^2}{c}\right)}{8c^3d^2e(1+m)}$$

Result(type 8, 31 leaves):

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

Problem 14: Unable to integrate problem.

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

Optimal(type 5, 323 leaves, 6 steps):

$$\frac{(-Ad+Bc)(ex)^{1+m}}{4c(-ad+bc)e(dx^2+c)^2}+\frac{(bc(Bc(3-m)-Ad(7-m))+ad(Ad(3-m)+Bc(1+m)))(ex)^{1+m}}{8c^2(-ad+bc)^2e(dx^2+c)}$$
$$+\frac{b^2(Ab-aB)(ex)^{1+m}\mathrm{hypergeom}\left(\left[1,\frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],-\frac{bx^2}{a}\right)}{a(-ad+bc)^3e(1+m)}+\frac{1}{8c^3(-ad+bc)^3e(1+m)}\Big((b^2c^2(Bc(1-m)-Ad(5$$
$$-m))(3-m)-a^2d^2(1-m)(Ad(3-m)+Bc(1+m))+2abcd(Bc(-m^2+2m+3)+Ad(m^2-6m+5)))(ex)^{1+m}\mathrm{hypergeom}\left(\left[1,\frac{1}{2}\right.\right.$$
$$\left.\left.+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],-\frac{dx^2}{c}\right)\Big)$$

Result(type 8, 33 leaves):

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

Problem 15: Unable to integrate problem.

$$\int (e x)^m (b x^2+a)^p (B x^2+A) (d x^2+c)^2 \, dx$$

Optimal(type 5, 493 leaves, 5 steps):

$$\frac{1}{b^3 e (3+m+2p) (5+m+2p) (7+m+2p)} \Big(\big(a^2 B d^2 (m^2+8m+15) + b^2 c (8Bc + A d (7+m+2p)^2) - a b d (A d (3+m) (7+m+2p) + B c (27+m^2+2p+2m(6+p)))\big) (e x)^{1+m} (b x^2+a)^{1+p} \Big) - \frac{(a B d (5+m) - b (4Bc + A d (7+m+2p))) (e x)^{1+m} (b x^2+a)^{1+p} (d x^2+c)}{b^2 e (5+m+2p) (7+m+2p)} + \frac{B (e x)^{1+m} (b x^2+a)^{1+p} (d x^2+c)^2}{b e (7+m+2p)} - \frac{1}{b^3 e (1+m) (3+m+2p) (5+m+2p) (7+m+2p) \left(1+\frac{b x^2}{a}\right)^p} \Big((b c (3+m+2p) (2 b c (2+p) (a B (1+m) - A b (7+m+2p)) + (-a d + b c) (1+m) (a B (5+m) - A b (7+m+2p))) - a (1+m) (2 b c d (2+p) (a B (1+m) - A b (7+m+2p)) + d (-a d + b c) (1+m) (a B (5+m) - A b (7+m+2p)) + 2 (-a d + b c) (a B d (5+m) - b (4Bc + A d (7+m+2p))))) (e x)^{1+m} (b x^2+a)^p \operatorname{hypergeom}\left(\left[-p, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], -\frac{b x^2}{a}\right) \Big)$$

Result(type 8, 33 leaves):

$$\int (e x)^m (b x^2+a)^p (B x^2+A) (d x^2+c)^2 \, dx$$

Problem 16: Unable to integrate problem.

$$\int \frac{(e x)^m (b x^2+a)^p (B x^2+A)}{d x^2+c} \, dx$$

Optimal(type 6, 156 leaves, 6 steps):

$$-\frac{(-A d + B c) (e x)^{1+m} (b x^2+a)^p \operatorname{AppellF1}\left(\frac{1}{2}+\frac{m}{2}, -p, 1, \frac{3}{2}+\frac{m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right)}{c d e (1+m) \left(1+\frac{b x^2}{a}\right)^p} + \frac{B (e x)^{1+m} (b x^2+a)^p \operatorname{hypergeom}\left(\left[-p, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], -\frac{b x^2}{a}\right)}{d e (1+m) \left(1+\frac{b x^2}{a}\right)^p}$$

Result(type 8, 33 leaves):

$$\int \frac{(e x)^m (b x^2+a)^p (B x^2+A)}{d x^2+c} \, dx$$

Problem 17: Unable to integrate problem.

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

Optimal(type 6, 469 leaves, 8 steps):

$$\frac{(-Ad+Bc)\,(ex)^{1+m}(bx^2+a)^{1+p}}{4c(-ad+bc)\,e\,(dx^2+c)^2} + \frac{(ad(Ad(3-m)+Bc(1+m))+bc(Bc(1-m-2p)-Ad(5-m-2p)))\,(ex)^{1+m}(bx^2+a)^{1+p}}{8c^2(-ad+bc)^2 e\,(dx^2+c)} + \frac{1}{8c^3 d(-ad+bc)^2 e(1+m)\left(1+\frac{bx^2}{a}\right)^p}\Big((a^2d^2(1-m)(Ad(3-m)+Bc(1+m)) - 2abcd(Bc(1+m)(1-m-2p)+Ad(1-m)(3-m-2p)) + b^2c^2(1-m-2p)(Ad(3-m-2p)+Bc(1+m+2p)))\,(ex)^{1+m}(bx^2+a)^p\, AppellF1\left(\frac{1}{2}+\frac{m}{2}, -p, 1, \frac{3}{2}+\frac{m}{2}, -\frac{bx^2}{a}, -\frac{dx^2}{c}\right)\Big) - \frac{1}{8c^2 d(-ad+bc)^2 e(1+m)\left(1+\frac{bx^2}{a}\right)^p}\Big(b(ad(Ad(3-m)+Bc(1+m))+bc(Bc(1-m-2p)-Ad(5-m-2p)))(1+m+2p)\,(ex)^{1+m}(bx^2+a)^p\, \mathrm{hypergeom}\left(\left[-p, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], -\frac{bx^2}{a}\right)\Big)$$

Result(type 8, 33 leaves):

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

Test results for the 48 problems in "1.1.2.8 P(x) (c x)^m (a+b x^2)^p.txt"

Problem 19: Unable to integrate problem.

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

Optimal(type 5, 87 leaves, 3 steps):

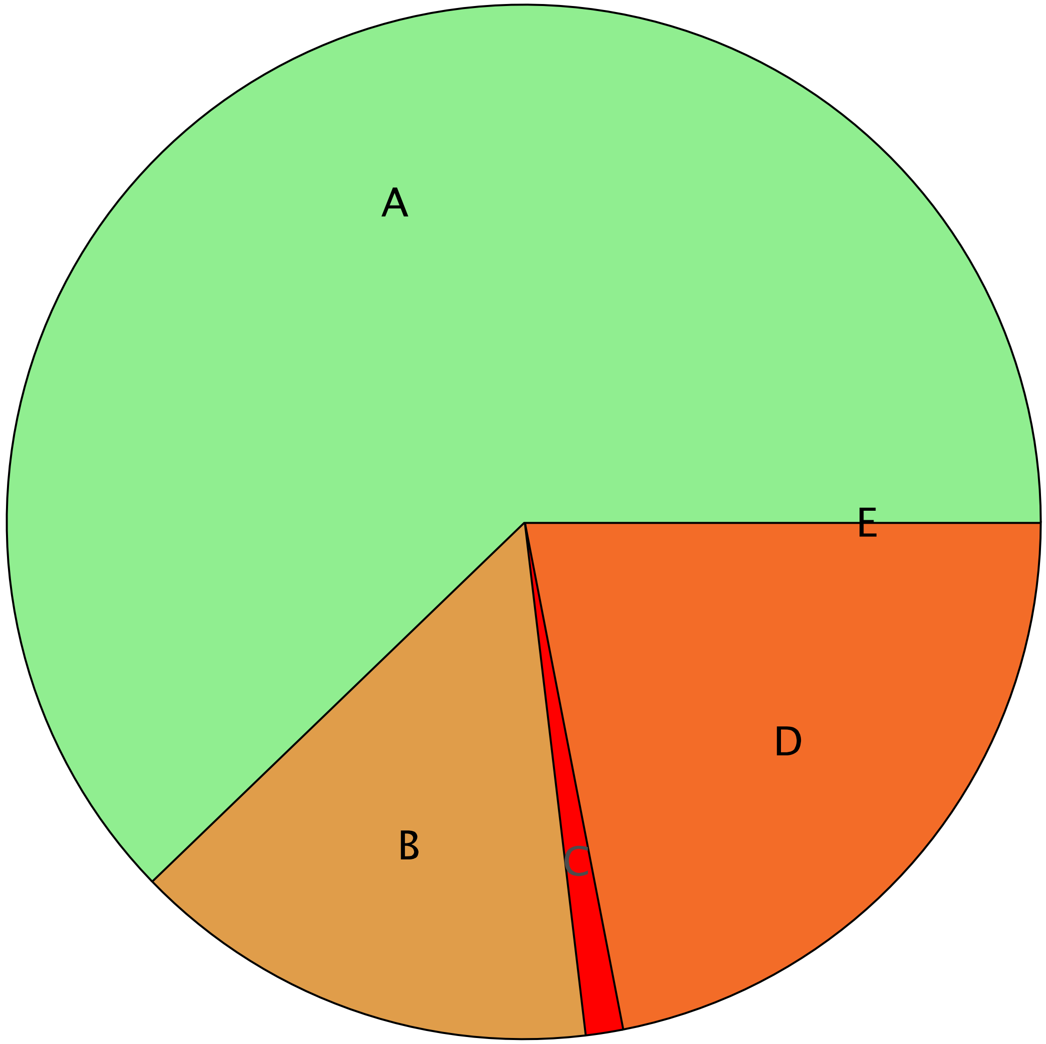
$$\frac{A\,(cx)^{1+m}\,\mathrm{hypergeom}\left(\left[1, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], -\frac{bx^2}{a}\right)}{ac(1+m)} + \frac{B\,(cx)^{2+m}\,\mathrm{hypergeom}\left(\left[1, 1+\frac{m}{2}\right], \left[\frac{m}{2}+2\right], -\frac{bx^2}{a}\right)}{ac^2(2+m)}$$

Result(type 8, 22 leaves):

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

Summary of Integration Test Results

770 integration problems



A - 479 optimal antiderivatives
B - 113 more than twice size of optimal antiderivatives
C - 9 unnecessarily complex antiderivatives
D - 169 unable to integrate problems
E - 0 integration timeouts