Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "1 Algebraic functions\1.1 Binomial products\1.1.2 Quadratic"

Test results for the 1071 problems in "1.1.2.2 (c x)^m (a+b x^2)^p.m"

Problem 38: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 19 leaves, 1 step):

$$-\frac{\left(a+b x^2\right)^4}{8 a x^8}$$

Result (type 1, 43 leaves):

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

Problem 65: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 19 leaves, 1 step):

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

Result (type 1, 69 leaves):

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

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

$$\int x^3 \left(a+b x^2\right)^8 \, dx$$

Optimal (type 1, 34 leaves, 3 steps):

$$-\frac{a \left(a+b x^2\right)^9}{18 b^2}+\frac{\left(a+b x^2\right)^{10}}{20 b^2}$$

Result (type 1, 106 leaves):

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

Problem 101: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 19 leaves, 1 step):

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

Result (type 1, 100 leaves):

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

Problem 102: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 40 leaves, 3 steps):

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

Result (type 1, 106 leaves):

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

Problem 196: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{17}}{\left(a+b\,x^2\right)^{10}}\,dx$$

Optimal (type 1, 19 leaves, 1 step):

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

Result (type 1, 101 leaves):

$$-\frac{a^8+9\,a^7\,b\,x^2+36\,a^6\,b^2\,x^4+84\,a^5\,b^3\,x^6+126\,a^4\,b^4\,x^8+126\,a^3\,b^5\,x^{10}+84\,a^2\,b^6\,x^{12}+36\,a\,b^7\,x^{14}+9\,b^8\,x^{16}}{18\,b^9\,\left(a+b\,x^2\right)^9}$$

Problem 197: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 39 leaves, 3 steps):

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

Result (type 1, 90 leaves):

$$-\frac{a^7+9\,a^6\,b\,x^2+36\,a^5\,b^2\,x^4+84\,a^4\,b^3\,x^6+126\,a^3\,b^4\,x^8+126\,a^2\,b^5\,x^{10}+84\,a\,b^6\,x^{12}+36\,b^7\,x^{14}}{144\,b^8\,\left(a+b\,x^2\right)^9}$$

Problem 337: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 15 leaves, 4 steps):

$$-\text{ArcTan}\left[\sqrt{x}\right]+\text{ArcTanh}\left[\sqrt{x}\right]$$

Result (type 3, 35 leaves):

$$-\text{ArcTan}\left[\sqrt{x}\right]-\frac{1}{2}\,\text{Log}\left[1-\sqrt{x}\right]+\frac{1}{2}\,\text{Log}\left[1+\sqrt{x}\right]$$

Problem 559: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{-9+4 x^2}}\, dx$$

Optimal (type 3, 19 leaves, 2 steps):

$$\frac{1}{2} \text{ArcTanh}\left[\frac{2 x}{\sqrt{-9+4 x^2}}\right]$$

Result (type 3, 43 leaves):

$$-\frac{1}{4} \text{Log}\left[1-\frac{2 x}{\sqrt{-9+4 x^2}}\right]+\frac{1}{4} \text{Log}\left[1+\frac{2 x}{\sqrt{-9+4 x^2}}\right]$$

Problem 589: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 184 leaves, 5 steps):

$$-\frac{20 a^2 c^3 \sqrt{c x} \sqrt{a+b x^2}}{231 b^2}+\frac{4 a c (c x)^{5/2} \sqrt{a+b x^2}}{77 b}+\frac{2 (c x)^{9/2} \sqrt{a+b x^2}}{11 c}+\frac{10 a^{11/4} c^{7/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{231 b^{9/4} \sqrt{a+b x^2}}$$

Result (type 4, 155 leaves):

$$\frac{1}{231 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, b^2 \sqrt{a+b x^2}} 2 c^3 \sqrt{c x} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(-10 a^3-4 a^2 b x^2+27 a b^2 x^4+21 b^3 x^6\right)+10 i a^3 \sqrt{1+\frac{a}{b x^2}} \sqrt{x}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]\right)$$

Problem 590: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 301 leaves, 6 steps):

$$\frac{4 a c (c x)^{3/2} \sqrt{a+b x^2}}{45 b}+\frac{2 (c x)^{7/2} \sqrt{a+b x^2}}{9 c}-\frac{4 a^2 c^2 \sqrt{c x} \sqrt{a+b x^2}}{15 b^{3/2} \left(\sqrt{a}+\sqrt{b} x\right)}+\frac{4 a^{9/4} c^{5/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{15 b^{7/4} \sqrt{a+b x^2}}-\frac{2 a^{9/4} c^{5/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{15 b^{7/4} \sqrt{a+b x^2}}$$

Result (type 4, 191 leaves):

$$\frac{1}{45 b^{3/2} \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \sqrt{a+b x^2}} 2 c^2 \sqrt{c x} \left(\sqrt{b} x \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \left(2 a^2+7 a b x^2+5 b^2 x^4\right)-6 a^{5/2} \sqrt{1+\frac{b x^2}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]+6 a^{5/2} \sqrt{1+\frac{b x^2}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]\right)$$

Problem 591: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 153 leaves, 4 steps):

$$\frac{4 a c \sqrt{c x} \sqrt{a+b x^2}}{21 b}+\frac{2 (c x)^{5/2} \sqrt{a+b x^2}}{7 c}-\frac{2 a^{7/4} c^{3/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{21 b^{5/4} \sqrt{a+b x^2}}$$

Result (type 4, 142 leaves):

$$\frac{2 c \sqrt{c x} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(2 a^2+5 a b x^2+3 b^2 x^4\right)-2 i a^2 \sqrt{1+\frac{a}{b x^2}} \sqrt{x} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{21 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} b \sqrt{a+b x^2}}$$

Problem 592: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 269 leaves, 5 steps):

$$\frac{2\,(c\,x)^{3/2}\,\sqrt{a+b\,x^2}}{5\,c}+\frac{4\,a\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{5\,\sqrt{b}\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{4\,a^{5/4}\,\sqrt{c}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{5\,b^{3/4}\,\sqrt{a+b\,x^2}}+$$
$$\frac{2\,a^{5/4}\,\sqrt{c}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{5\,b^{3/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 174 leaves):

$$\frac{1}{5\,\sqrt{b}\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\sqrt{a+b\,x^2}}2\,\sqrt{c\,x}$$
$$\left(\sqrt{b}\,x\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(a+b\,x^2\right)+2\,a^{3/2}\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-2\,a^{3/2}\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)$$

Problem 593: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 126 leaves, 3 steps):

$$\frac{2\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{3\,c}+\frac{2\,a^{3/4}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{3\,b^{1/4}\,\sqrt{c}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 103 leaves):

$$\frac{2\,x\left(a+b\,x^2+\frac{2\,i\,a\,\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}\right)}{3\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}$$

Problem 594: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 263 leaves, 5 steps):

$$-\frac{2\,\sqrt{a+b\,x^2}}{c\,\sqrt{c\,x}}+\frac{4\,\sqrt{b}\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{c^2\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{4\,a^{1/4}\,b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{c^{3/2}\,\sqrt{a+b\,x^2}}+$$
$$\frac{2\,a^{1/4}\,b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{c^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 174 leaves):

$$\left(x\left(-2\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(a+b\,x^2\right)+4\,\sqrt{a}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-\right.\right.$$
$$\left.\left.4\,\sqrt{a}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,(c\,x)^{3/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 595: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 126 leaves, 3 steps):

$$-\frac{2\sqrt{a+b x^2}}{3 c (c x)^{3/2}}+\frac{2 b^{3/4}\left(\sqrt{a}+\sqrt{b} x\right)\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4}\sqrt{c x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{3 a^{1/4} c^{5/2}\sqrt{a+b x^2}}$$

Result (type 4, 106 leaves):

$$\frac{2 x\left(-a-b x^2+\frac{2 i b\sqrt{1+\frac{a}{b x^2}}\ x^{5/2}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}\right)}{3 (c x)^{5/2}\sqrt{a+b x^2}}$$

Problem 596: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 303 leaves, 6 steps):

$$-\frac{2\sqrt{a+b x^2}}{5 c (c x)^{5/2}}-\frac{4 b\sqrt{a+b x^2}}{5 a c^3\sqrt{c x}}+\frac{4 b^{3/2}\sqrt{c x}\sqrt{a+b x^2}}{5 a c^4\left(\sqrt{a}+\sqrt{b} x\right)}-\frac{4 b^{5/4}\left(\sqrt{a}+\sqrt{b} x\right)\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4}\sqrt{c x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{5 a^{3/4} c^{7/2}\sqrt{a+b x^2}}+$$

$$\frac{2 b^{5/4}\left(\sqrt{a}+\sqrt{b} x\right)\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4}\sqrt{c x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{5 a^{3/4} c^{7/2}\sqrt{a+b x^2}}$$

Result (type 4, 196 leaves):

$$\left(x\left(-2\sqrt{\frac{i\sqrt{b} x}{\sqrt{a}}}\left(a^2+3 a b x^2+2 b^2 x^4\right)+4\sqrt{a}\ b^{3/2} x^3\sqrt{1+\frac{b x^2}{a}}\ \text{EllipticE}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b} x}{\sqrt{a}}}\right],-1\right]-\right.\right.$$

$$\left.\left.4\sqrt{a}\ b^{3/2} x^3\sqrt{1+\frac{b x^2}{a}}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b} x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(5 a\sqrt{\frac{i\sqrt{b} x}{\sqrt{a}}}\ (c x)^{7/2}\sqrt{a+b x^2}\right)$$

Problem 597: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 212 leaves, 6 steps):

$$-\frac{8\,a^3\,c^3\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{231\,b^2}+\frac{8\,a^2\,c\,(c\,x)^{5/2}\,\sqrt{a+b\,x^2}}{385\,b}+\frac{4\,a\,(c\,x)^{9/2}\,\sqrt{a+b\,x^2}}{55\,c}+$$
$$\frac{2\,(c\,x)^{9/2}\,\left(a+b\,x^2\right)^{3/2}}{15\,c}+\frac{4\,a^{15/4}\,c^{7/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{231\,b^{9/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 166 leaves):

$$\frac{1}{1155\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,b^2\,\sqrt{a+b\,x^2}}$$
$$2\,c^3\,\sqrt{c\,x}\,\left(\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(-20\,a^4-8\,a^3\,b\,x^2+131\,a^2\,b^2\,x^4+196\,a\,b^3\,x^6+77\,b^4\,x^8\right)+20\,i\,a^4\,\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],\,-1\right]\right)$$

Problem 598: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 329 leaves, 7 steps):

$$\frac{8 a^2 c (c x)^{3/2} \sqrt{a+b x^2}}{195 b}+\frac{4 a (c x)^{7/2} \sqrt{a+b x^2}}{39 c}-\frac{8 a^3 c^2 \sqrt{c x} \sqrt{a+b x^2}}{65 b^{3/2} \left(\sqrt{a}+\sqrt{b} x\right)}+$$

$$\frac{2 (c x)^{7/2} \left(a+b x^2\right)^{3/2}}{13 c}+\frac{8 a^{13/4} c^{5/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{65 b^{7/4} \sqrt{a+b x^2}}-$$

$$\frac{4 a^{13/4} c^{5/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{65 b^{7/4} \sqrt{a+b x^2}}$$

Result (type 4, 202 leaves):

$$\left(2 c^2 \sqrt{c x} \left(\sqrt{b} x \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \left(4 a^3+29 a^2 b x^2+40 a b^2 x^4+15 b^3 x^6\right)-12 a^{7/2} \sqrt{1+\frac{b x^2}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]+\right.\right.$$
$$\left.\left.12 a^{7/2} \sqrt{1+\frac{b x^2}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]\right)\right) \bigg/ \left(195 b^{3/2} \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \sqrt{a+b x^2}\right)$$

Problem 599: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 181 leaves, 5 steps):

$$\frac{8 a^2 c \sqrt{c x} \sqrt{a+b x^2}}{77 b}+\frac{12 a (c x)^{5/2} \sqrt{a+b x^2}}{77 c}+\frac{2 (c x)^{5/2} \left(a+b x^2\right)^{3/2}}{11 c}-\frac{4 a^{11/4} c^{3/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{77 b^{5/4} \sqrt{a+b x^2}}$$

Result (type 4, 153 leaves):

$$\frac{1}{77 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} b \sqrt{a+b x^2}} 2 c \sqrt{c x} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(4 a^3+17 a^2 b x^2+20 a b^2 x^4+7 b^3 x^6\right)-4 i a^3 \sqrt{1+\frac{a}{b x^2}} \sqrt{x} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 600: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 297 leaves, 6 steps):

$$\frac{4\,a\,(c\,x)^{3/2}\,\sqrt{a+b\,x^2}}{15\,c}+\frac{8\,a^2\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{15\,\sqrt{b}\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+\frac{2\,(c\,x)^{3/2}\,\left(a+b\,x^2\right)^{3/2}}{9\,c}-\frac{8\,a^{9/4}\,\sqrt{c}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{15\,b^{3/4}\,\sqrt{a+b\,x^2}}+$$
$$\frac{4\,a^{9/4}\,\sqrt{c}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{15\,b^{3/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 188 leaves):

$$\frac{1}{45\,\sqrt{b}\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\sqrt{a+b\,x^2}}2\,\sqrt{c\,x}\,\left(\sqrt{b}\,x\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(11\,a^2+16\,a\,b\,x^2+5\,b^2\,x^4\right)+\right.$$
$$\left.12\,a^{5/2}\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]-12\,a^{5/2}\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]\right)$$

Problem 601: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 152 leaves, 4 steps):

$$\frac{4\,a\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{7\,c}+\frac{2\,\sqrt{c\,x}\,\left(a+b\,x^2\right)^{3/2}}{7\,c}+\frac{4\,a^{7/4}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{7\,b^{1/4}\,\sqrt{c}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 141 leaves):

$$\frac{\sqrt{x}\,\sqrt{a+b\,x^2}\,\left(\frac{6\,a\,\sqrt{x}}{7}+\frac{2}{7}\,b\,x^{5/2}\right)}{\sqrt{c\,x}}+\frac{8\,\mathrm{i}\,a^2\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{7\,\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}$$

Problem 602: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 296 leaves, 6 steps):

$$\frac{12\,b\,(c\,x)^{3/2}\,\sqrt{a+b\,x^2}}{5\,c^3}+\frac{24\,a\,\sqrt{b}\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{5\,c^2\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{2\,\left(a+b\,x^2\right)^{3/2}}{c\,\sqrt{c\,x}}-\frac{24\,a^{5/4}\,b^{1/4}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{5\,c^{3/2}\,\sqrt{a+b\,x^2}}+$$
$$\frac{12\,a^{5/4}\,b^{1/4}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{5\,c^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 190 leaves):

$$\left(x\left(2\,\sqrt{\frac{\mathrm{i}\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(-5\,a^2-4\,a\,b\,x^2+b^2\,x^4\right)+24\,a^{3/2}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-\right.\right.$$
$$\left.\left.24\,a^{3/2}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(5\,\sqrt{\frac{\mathrm{i}\,\sqrt{b}\,x}{\sqrt{a}}}\,(c\,x)^{3/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 603: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 152 leaves, 4 steps):

$$\frac{4\,b\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{3\,c^3}-\frac{2\,\left(a+b\,x^2\right)^{3/2}}{3\,c\,(c\,x)^{3/2}}+\frac{4\,a^{3/4}\,b^{3/4}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{3\,c^{5/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 130 leaves):

$$\frac{x\,\left(-2\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(a^2-b^2\,x^4\right)+8\,i\,a\,b\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],\,-1\right]\right)}{3\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,(c\,x)^{5/2}\,\sqrt{a+b\,x^2}}$$

Problem 604: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 297 leaves, 6 steps):

$$-\frac{12\,b\,\sqrt{a+b\,x^2}}{5\,c^3\,\sqrt{c\,x}}+\frac{24\,b^{3/2}\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{5\,c^4\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{2\,\left(a+b\,x^2\right)^{3/2}}{5\,c\,(c\,x)^{5/2}}-\frac{24\,a^{1/4}\,b^{5/4}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{5\,c^{7/2}\,\sqrt{a+b\,x^2}}+$$

$$\frac{12\,a^{1/4}\,b^{5/4}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{5\,c^{7/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 193 leaves):

$$\left(x\,\left(-2\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(a^2+8\,a\,b\,x^2+7\,b^2\,x^4\right)+24\,\sqrt{a}\,b^{3/2}\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]-\right.\right.$$

$$\left.\left.24\,\sqrt{a}\,b^{3/2}\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]\right)\right)\Big/\left(5\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,(c\,x)^{7/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 605: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 152 leaves, 4 steps):

$$-\frac{4 b \sqrt{a+b x^2}}{7 c^3 (c x)^{3/2}}-\frac{2 \left(a+b x^2\right)^{3/2}}{7 c (c x)^{7/2}}+\frac{4 b^{7/4} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{7 a^{1/4} c^{9/2} \sqrt{a+b x^2}}$$

Result (type 4, 121 leaves):

$$\frac{x^{9/2} \left(-\frac{2 \left(a+b x^2\right) \left(a+3 b x^2\right)}{x^{7/2}}+\frac{8 i b^2 \sqrt{1+\frac{a}{b x^2}} \, x \, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}\right)}{7 (c x)^{9/2} \sqrt{a+b x^2}}$$

Problem 606: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 331 leaves, 7 steps):

$$-\frac{4 b \sqrt{a+b x^2}}{15 c^3 (c x)^{5/2}}-\frac{8 b^2 \sqrt{a+b x^2}}{15 a c^5 \sqrt{c x}}+\frac{8 b^{5/2} \sqrt{c x} \sqrt{a+b x^2}}{15 a c^6 \left(\sqrt{a}+\sqrt{b} x\right)}-\frac{2 \left(a+b x^2\right)^{3/2}}{9 c (c x)^{9/2}}-$$

$$\frac{8 b^{9/4} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{15 a^{3/4} c^{11/2} \sqrt{a+b x^2}}+\frac{4 b^{9/4} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{15 a^{3/4} c^{11/2} \sqrt{a+b x^2}}$$

Result (type 4, 213 leaves):

$$-\left(\left(2\sqrt{c\,x}\left(\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\left(5\,a^3+16\,a^2\,b\,x^2+23\,a\,b^2\,x^4+12\,b^3\,x^6\right)-12\sqrt{a}\,b^{5/2}\,x^5\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+12\sqrt{a}\,b^{5/2}\,x^5\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Bigg/\left(45\,a\,c^6\,x^5\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\sqrt{a+b\,x^2}\right)\right)$$

Problem 613: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 156 leaves, 4 steps):

$$-\frac{10\,a\,c^3\sqrt{c\,x}\sqrt{a+b\,x^2}}{21\,b^2}+\frac{2\,c\,(c\,x)^{5/2}\sqrt{a+b\,x^2}}{7\,b}+\frac{5\,a^{7/4}\,c^{7/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{21\,b^{9/4}\sqrt{a+b\,x^2}}$$

Result (type 4, 144 leaves):

$$\frac{2\,c^3\sqrt{c\,x}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(-5\,a^2-2\,a\,b\,x^2+3\,b^2\,x^4\right)+5\,i\,a^2\sqrt{1+\frac{a}{b\,x^2}}\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{21\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,b^2\sqrt{a+b\,x^2}}$$

Problem 614: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 273 leaves, 5 steps):

$$\frac{2\,c\,(c\,x)^{3/2}\sqrt{a+b\,x^2}}{5\,b}-\frac{6\,a\,c^2\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{5\,b^{3/2}\left(\sqrt{a}+\sqrt{b}\,x\right)}+\frac{6\,a^{5/4}\,c^{5/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{5\,b^{7/4}\sqrt{a+b\,x^2}}-$$

$$\frac{3\,a^{5/4}\,c^{5/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{5\,b^{7/4}\sqrt{a+b\,x^2}}$$

Result (type 4, 177 leaves) :

$$\frac{1}{5\,b^{3/2}\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,\sqrt{a+b\,x^2}}2\,c^2\sqrt{c\,x}$$

$$\left(\sqrt{b}\,x\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\left(a+b\,x^2\right)-3\,a^{3/2}\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+3\,a^{3/2}\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)$$

Problem 615: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 127 leaves, 3 steps) :

$$\frac{2\,c\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{3\,b}-\frac{a^{3/4}\,c^{3/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{3\,b^{5/4}\sqrt{a+b\,x^2}}$$

Result (type 4, 106 leaves) :

$$\frac{2\,c\sqrt{c\,x}\left(a+b\,x^2-\frac{i\,a\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}\right)}{3\,b\sqrt{a+b\,x^2}}$$

Problem 616: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 236 leaves, 4 steps):

$$\frac{2 \sqrt{c x} \sqrt{a+b x^2}}{\sqrt{b} \left(\sqrt{a}+\sqrt{b} x\right)}-\frac{2 a^{1/4} \sqrt{c} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{b^{3/4} \sqrt{a+b x^2}}+$$

$$\frac{a^{1/4} \sqrt{c} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{b^{3/4} \sqrt{a+b x^2}}$$

Result (type 4, 111 leaves):

$$\frac{2 i x \sqrt{c x} \sqrt{1+\frac{b x^2}{a}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right]\right)}{\left(\frac{i \sqrt{b} x}{\sqrt{a}}\right)^{3/2} \sqrt{a+b x^2}}$$

Problem 617: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 97 leaves, 2 steps):

$$\frac{\left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{a^{1/4} b^{1/4} \sqrt{c} \sqrt{a+b x^2}}$$

Result (type 4, 90 leaves):

$$\frac{2 i \sqrt{1+\frac{a}{b x^2}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \sqrt{c x} \sqrt{a+b x^2}}$$

Problem 618: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 268 leaves, 5 steps):

$$-\frac{2\sqrt{a+b\,x^2}}{a\,c\,\sqrt{c\,x}}+\frac{2\sqrt{b}\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{a\,c^2\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{2\,b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{a^{3/4}\,c^{3/2}\,\sqrt{a+b\,x^2}}+$$
$$\frac{b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{a^{3/4}\,c^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 176 leaves):

$$-\left(\left(2\,x\left(\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\left(a+b\,x^2\right)-\sqrt{a}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+\right.\right.\right.$$
$$\left.\left.\left.\sqrt{a}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(a\,\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,(c\,x)^{3/2}\,\sqrt{a+b\,x^2}\right)\right)$$

Problem 619: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 129 leaves, 3 steps):

$$-\frac{2\sqrt{a+b\,x^2}}{3\,a\,c\,(c\,x)^{3/2}}-\frac{b^{3/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{3\,a^{5/4}\,c^{5/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 109 leaves):

$$\frac{2\,x\left(-a-b\,x^2-\frac{i\,b\,\sqrt{1+\frac{a}{b\,x^2}}\;x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}\right)}{3\,a\,(c\,x)^{5/2}\,\sqrt{a+b\,x^2}}$$

Problem 620: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 306 leaves, 6 steps):

$$-\frac{2\,\sqrt{a+b\,x^2}}{5\,a\,c\,(c\,x)^{5/2}}+\frac{6\,b\,\sqrt{a+b\,x^2}}{5\,a^2\,c^3\,\sqrt{c\,x}}-\frac{6\,b^{3/2}\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{5\,a^2\,c^4\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$
$$\frac{6\,b^{5/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{5\,a^{7/4}\,c^{7/2}\,\sqrt{a+b\,x^2}}-\frac{3\,b^{5/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{5\,a^{7/4}\,c^{7/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 198 leaves):

$$\left(x\left(2\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(-a^2+2\,a\,b\,x^2+3\,b^2\,x^4\right)-6\,\sqrt{a}\,b^{3/2}\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+\right.\right.$$
$$\left.\left.6\,\sqrt{a}\,b^{3/2}\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(5\,a^2\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,(c\,x)^{7/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 621: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 153 leaves, 4 steps):

$$-\frac{c\,(c\,x)^{5/2}}{b\,\sqrt{a+b\,x^2}}+\frac{5\,c^3\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}{3\,b^2}-\frac{5\,a^{3/4}\,c^{7/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\frac{1}{2}\right]}{6\,b^{9/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 131 leaves):

$$\frac{c^3 \sqrt{c x} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(5 a+2 b x^2\right)-5 i a \sqrt{1+\frac{a}{b x^2}} \sqrt{x}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{3 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, b^2 \sqrt{a+b x^2}}$$

Problem 622: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 266 leaves, 5 steps):

$$-\frac{c (c x)^{3/2}}{b \sqrt{a+b x^2}}+\frac{3 c^2 \sqrt{c x} \sqrt{a+b x^2}}{b^{3/2} \left(\sqrt{a}+\sqrt{b} x\right)}-\frac{3 a^{1/4} c^{5/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{b^{7/4} \sqrt{a+b x^2}}+$$
$$\frac{3 a^{1/4} c^{5/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right],\frac{1}{2}\right]}{2 b^{7/4} \sqrt{a+b x^2}}$$

Result (type 4, 168 leaves):

$$-\frac{1}{b^{3/2} \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \sqrt{a+b x^2}}$$
$$c^2 \sqrt{c x} \left(\sqrt{b} x \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}-3 \sqrt{a} \sqrt{1+\frac{b x^2}{a}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]+3 \sqrt{a} \sqrt{1+\frac{b x^2}{a}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]\right)$$

Problem 623: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 125 leaves, 3 steps):

$$-\frac{c\sqrt{c\,x}}{b\sqrt{a+b\,x^2}}+\frac{c^{3/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{2\,a^{1/4}\,b^{5/4}\sqrt{a+b\,x^2}}$$

Result (type 4, 115 leaves):

$$-\frac{c\sqrt{c\,x}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}-i\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,b\sqrt{a+b\,x^2}}$$

Problem 624: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 266 leaves, 5 steps):

$$\frac{(c\,x)^{3/2}}{a\,c\sqrt{a+b\,x^2}}-\frac{\sqrt{c\,x}\sqrt{a+b\,x^2}}{a\sqrt{b}\left(\sqrt{a}+\sqrt{b}\,x\right)}+\frac{\sqrt{c}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{a^{3/4}\,b^{3/4}\sqrt{a+b\,x^2}}-$$

$$\frac{\sqrt{c}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{2\,a^{3/4}\,b^{3/4}\sqrt{a+b\,x^2}}$$

Result (type 4, 166 leaves):

$$\frac{1}{a\sqrt{b}\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\sqrt{a+b\,x^2}}$$

$$\sqrt{c\,x}\left(\sqrt{b}\,x\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}-\sqrt{a}\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+\sqrt{a}\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)$$

Problem 625: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 126 leaves, 3 steps):

$$\frac{\sqrt{c\,x}}{a\,c\,\sqrt{a+b\,x^2}}+\frac{\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{2\,a^{5/4}\,b^{1/4}\,\sqrt{c}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 117 leaves):

$$\frac{x}{a\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}+\frac{i\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{a\,\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,\sqrt{c\,x}\,\sqrt{a+b\,x^2}}$$

Problem 626: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 296 leaves, 6 steps):

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

$$\frac{3\,b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{a^{7/4}\,c^{3/2}\,\sqrt{a+b\,x^2}}+\frac{3\,b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{2\,a^{7/4}\,c^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 180 leaves):

$$\left(x\left(-\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\left(2a+3bx^2\right)+3\sqrt{a}\,\sqrt{b}\,x\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-3\sqrt{a}\,\sqrt{b}\,x\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Bigg/\left(a^2\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,(c\,x)^{3/2}\sqrt{a+bx^2}\right)$$

Problem 627: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{1}{a\,c\,(c\,x)^{3/2}\sqrt{a+bx^2}}-\frac{5\sqrt{a+bx^2}}{3a^2c\,(c\,x)^{3/2}}-\frac{5b^{3/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{6a^{9/4}c^{5/2}\sqrt{a+bx^2}}$$

Result (type 4, 130 leaves):

$$\frac{x\left(-\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(2a+5bx^2\right)-5\,i\,b\sqrt{1+\frac{a}{bx^2}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{3a^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,(c\,x)^{5/2}\sqrt{a+bx^2}}$$

Problem 628: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 331 leaves, 7 steps):

$$\frac{1}{a\,c\,(c\,x)^{5/2}\sqrt{a+b\,x^2}}-\frac{7\sqrt{a+b\,x^2}}{5\,a^2\,c\,(c\,x)^{5/2}}+\frac{21\,b\sqrt{a+b\,x^2}}{5\,a^3\,c^3\sqrt{c\,x}}-\frac{21\,b^{3/2}\sqrt{c\,x}\sqrt{a+b\,x^2}}{5\,a^3\,c^4\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$

$$\frac{21\,b^{5/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{5\,a^{11/4}\,c^{7/2}\sqrt{a+b\,x^2}}-\frac{21\,b^{5/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{10\,a^{11/4}\,c^{7/2}\sqrt{a+b\,x^2}}$$

Result (type 4, 197 leaves):

$$\left(x\left(\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\left(-2\,a^2+14\,a\,b\,x^2+21\,b^2\,x^4\right)-21\sqrt{a}\,b^{3/2}\,x^3\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+\right.\right.$$

$$\left.\left.21\sqrt{a}\,b^{3/2}\,x^3\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(5\,a^3\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,(c\,x)^{7/2}\sqrt{a+b\,x^2}\right)$$

Problem 629: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 155 leaves, 4 steps):

$$-\frac{c\,(c\,x)^{5/2}}{3\,b\left(a+b\,x^2\right)^{3/2}}-\frac{5\,c^3\sqrt{c\,x}}{6\,b^2\sqrt{a+b\,x^2}}+\frac{5\,c^{7/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{12\,a^{1/4}\,b^{9/4}\sqrt{a+b\,x^2}}$$

Result (type 4, 117 leaves):

$$\frac{c^3\sqrt{c\,x}\left(-5\,a-7\,b\,x^2+\frac{5\,i\sqrt{1+\frac{a}{b\,x^2}}\sqrt{x}\,\left(a+b\,x^2\right)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}\right)}{6\,b^2\left(a+b\,x^2\right)^{3/2}}$$

Problem 630: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 304 leaves, 6 steps):

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

$$\frac{c^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{2\,a^{3/4}\,b^{7/4}\,\sqrt{a+b\,x^2}}-\frac{c^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{4\,a^{3/4}\,b^{7/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 195 leaves):

$$\left(c^2\,\sqrt{c\,x}\,\left(\sqrt{b}\,x\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(a+3\,b\,x^2\right)-3\,\sqrt{a}\,\left(a+b\,x^2\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]+\right.\right.$$

$$\left.\left.3\,\sqrt{a}\,\left(a+b\,x^2\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]\right)\right)\Bigg/\left(6\,a\,b^{3/2}\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(a+b\,x^2\right)^{3/2}\right)$$

Problem 631: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 156 leaves, 4 steps):

$$-\frac{c\,\sqrt{c\,x}}{3\,b\,\left(a+b\,x^2\right)^{3/2}}+\frac{c\,\sqrt{c\,x}}{6\,a\,b\,\sqrt{a+b\,x^2}}+\frac{c^{3/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{a^{1/4}\,\sqrt{c}}\right],\,\frac{1}{2}\right]}{12\,a^{5/4}\,b^{5/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 137 leaves):

$$\frac{c\,\sqrt{c\,x}\,\left(\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(-a+b\,x^2\right)+i\,\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\left(a+b\,x^2\right)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],\,-1\right]\right)}{6\,a\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,b\,\left(a+b\,x^2\right)^{3/2}}$$

Problem 632: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 302 leaves, 6 steps):

$$\frac{(c x)^{3/2}}{3 a c \left(a+b x^2\right)^{3/2}}+\frac{(c x)^{3/2}}{2 a^2 c \sqrt{a+b x^2}}-\frac{\sqrt{c x} \sqrt{a+b x^2}}{2 a^2 \sqrt{b} \left(\sqrt{a}+\sqrt{b} x\right)}+$$
$$\frac{\sqrt{c} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{2 a^{7/4} b^{3/4} \sqrt{a+b x^2}}-\frac{\sqrt{c} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{4 a^{7/4} b^{3/4} \sqrt{a+b x^2}}$$

Result (type 4, 194 leaves):

$$\left(i x \sqrt{c x} \left(\sqrt{b} x \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \left(5 a+3 b x^2\right)-3 \sqrt{a} \left(a+b x^2\right) \sqrt{1+\frac{b x^2}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]+\right.\right.$$
$$\left.\left.3 \sqrt{a} \left(a+b x^2\right) \sqrt{1+\frac{b x^2}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]\right)\right) \Big/ \left(6 a^{5/2} \left(\frac{i \sqrt{b} x}{\sqrt{a}}\right)^{3/2} \left(a+b x^2\right)^{3/2}\right)$$

Problem 633: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 157 leaves, 4 steps):

$$\frac{\sqrt{c x}}{3 a c \left(a+b x^2\right)^{3/2}}+\frac{5 \sqrt{c x}}{6 a^2 c \sqrt{a+b x^2}}+\frac{5 \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{a^{1/4} \sqrt{c}}\right], \frac{1}{2}\right]}{12 a^{9/4} b^{1/4} \sqrt{c} \sqrt{a+b x^2}}$$

Result (type 4, 115 leaves):

$$\frac{x\left(7a+5bx^2+\frac{5\,i\,\sqrt{1+\frac{a}{b x^2}}\,\sqrt{x}\,(a+bx^2)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}\right)}{6a^2\sqrt{c x}\,(a+bx^2)^{3/2}}$$

Problem 634: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 333 leaves, 7 steps):

$$\frac{1}{3ac\sqrt{cx}\,(a+bx^2)^{3/2}}+\frac{7}{6a^2c\sqrt{cx}\,\sqrt{a+bx^2}}-\frac{7\sqrt{a+bx^2}}{2a^3c\sqrt{cx}}+\frac{7\sqrt{b}\,\sqrt{cx}\,\sqrt{a+bx^2}}{2a^3c^2\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{7b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{cx}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{2a^{11/4}c^{3/2}\sqrt{a+bx^2}}+\frac{7b^{1/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{cx}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{4a^{11/4}c^{3/2}\sqrt{a+bx^2}}$$

Result (type 4, 208 leaves):

$$\left(x\left(-\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,(12a^2+35abx^2+21b^2x^4)+21\sqrt{a}\,\sqrt{b}\,x\,(a+bx^2)\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-21\sqrt{a}\,\sqrt{b}\,x\,(a+bx^2)\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(6a^3\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,(cx)^{3/2}\,(a+bx^2)^{3/2}\right)$$

Problem 635: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 185 leaves, 5 steps):

$$\frac{1}{3ac\,(cx)^{3/2}\,(a+bx^2)^{3/2}}+\frac{3}{2a^2c\,(cx)^{3/2}\sqrt{a+bx^2}}-\frac{5\sqrt{a+bx^2}}{2a^3c\,(cx)^{3/2}}-\frac{5b^{3/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{cx}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{4a^{13/4}c^{5/2}\sqrt{a+bx^2}}$$

Result (type 4, 127 leaves):

$$\frac{x\left(-4a^2-21abx^2-15b^2x^4-\frac{15\,\mathrm{i}\,b\sqrt{1+\frac{a}{bx^2}}\,x^{5/2}\,(a+bx^2)\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{\mathrm{i}\sqrt{a}}{\sqrt{b}}}}\right)}{6a^3\,(c\,x)^{5/2}\,(a+bx^2)^{3/2}}$$

Problem 636: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 362 leaves, 8 steps):

$$\frac{1}{3ac\,(cx)^{5/2}\,(a+bx^2)^{3/2}}+\frac{11}{6a^2c\,(cx)^{5/2}\sqrt{a+bx^2}}-\frac{77\sqrt{a+bx^2}}{30a^3c\,(cx)^{5/2}}+\frac{77b\sqrt{a+bx^2}}{10a^4c^3\sqrt{cx}}-\frac{77b^{3/2}\sqrt{cx}\,\sqrt{a+bx^2}}{10a^4c^4\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$
$$\frac{77b^{5/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{cx}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{10a^{15/4}c^{7/2}\sqrt{a+bx^2}}-\frac{77b^{5/4}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{cx}}{a^{1/4}\sqrt{c}}\right],\frac{1}{2}\right]}{20a^{15/4}c^{7/2}\sqrt{a+bx^2}}$$

Result (type 4, 222 leaves):

$$\left(x\left(\sqrt{\frac{\mathrm{i}\sqrt{b}\,x}{\sqrt{a}}}\left(-12a^3+132a^2bx^2+385ab^2x^4+231b^3x^6\right)-231\sqrt{a}\,b^{3/2}x^3\,(a+bx^2)\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+\right.\right.$$
$$\left.\left.231\sqrt{a}\,b^{3/2}x^3\,(a+bx^2)\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(30a^4\sqrt{\frac{\mathrm{i}\sqrt{b}\,x}{\sqrt{a}}}\,(cx)^{7/2}\,(a+bx^2)^{3/2}\right)$$

Problem 649: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 21 leaves, 2 steps):

$$\frac{2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{a}\,\sqrt{x}\right],-1\right]}{\sqrt{a}}$$

Result (type 4, 65 leaves):

$$-\frac{2\,i\,\sqrt{-\frac{1}{a}}\,a\,\sqrt{1-\frac{1}{a^2\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-\frac{1}{a}}}{\sqrt{x}}\right],-1\right]}{\sqrt{1-a^2\,x^2}}$$

Problem 650: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 67 leaves, 2 steps):

$$\frac{\left(1+\sqrt{a}\,x\right)\sqrt{\frac{1+a\,x^2}{\left(1+\sqrt{a}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[a^{1/4}\,\sqrt{x}\right],\frac{1}{2}\right]}{a^{1/4}\,\sqrt{1+a\,x^2}}$$

Result (type 4, 68 leaves):

$$\frac{2\,i\,\sqrt{\frac{a+\frac{1}{x^2}}{a}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i}{\sqrt{a}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i}{\sqrt{a}}}\,\sqrt{1+a\,x^2}}$$

Problem 651: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 50 leaves, 2 steps):

$$\frac{x^{1+m}\,\left(a+b\,x^2\right)^{5/2}\,\text{Hypergeometric2F1}\left[1,\frac{6+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]}{a\,(1+m)}$$

Result (type 5, 109 leaves):

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

$$x^{1+m}\,\sqrt{a+b\,x^2}\,\left(a\,(3+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{1+m}{2},\,\frac{3+m}{2},\,-\frac{b\,x^2}{a}\right]+b\,(1+m)\,x^2\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{3+m}{2},\,\frac{5+m}{2},\,-\frac{b\,x^2}{a}\right]\right)$$

Problem 659: Result more than twice size of optimal antiderivative.

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

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

$$\frac{x^m\,\sqrt{a+b\,x^2}\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{2},\,\frac{2+m}{2},\,-\frac{b\,x^2}{a}\right]}{a\,m}$$

Result (type 5, 105 leaves):

$$\frac{1}{a^2\,m\,(2+m)\,\sqrt{1+\frac{b\,x^2}{a}}}x^m\,\sqrt{a+b\,x^2}\,\left(a\,(2+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{m}{2},\,1+\frac{m}{2},\,-\frac{b\,x^2}{a}\right]-b\,m\,x^2\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,1+\frac{m}{2},\,2+\frac{m}{2},\,-\frac{b\,x^2}{a}\right]\right)$$

Problem 660: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 51 leaves, 2 steps):

$$-\frac{x^{-1+m}\,\sqrt{a+b\,x^2}\,\text{Hypergeometric2F1}\left[1,\,\frac{m}{2},\,\frac{1+m}{2},\,-\frac{b\,x^2}{a}\right]}{a\,(1-m)}$$

Result (type 5, 110 leaves):

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

$$x^{-1+m}\,\sqrt{a+b\,x^2}\,\left(a\,(1+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},\,\frac{1}{2}\,(-1+m),\,\frac{1+m}{2},\,-\frac{b\,x^2}{a}\right]-b\,(-1+m)\,x^2\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{1+m}{2},\,\frac{3+m}{2},\,-\frac{b\,x^2}{a}\right]\right)$$

Problem 661: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 17 leaves, 1 step):

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

Result (type 5, 97 leaves):

$$\frac{1}{(2+m)\sqrt{1+\frac{b\,x^2}{a}}}x^{2+m}\sqrt{a+b\,x^2}\left((3+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},-\frac{b\,x^2}{a}\right]-\text{Hypergeometric2F1}\left[\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},-\frac{b\,x^2}{a}\right]\right)$$

Problem 662: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 17 leaves, ? steps):

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

Result (type 5, 97 leaves):

$$\frac{1}{(2+m)\sqrt{1+\frac{b\,x^2}{a}}}x^{2+m}\sqrt{a+b\,x^2}\left((3+m)\,\text{Hypergeometric2F1}\left[-\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},-\frac{b\,x^2}{a}\right]-\text{Hypergeometric2F1}\left[\frac{1}{2},1+\frac{m}{2},2+\frac{m}{2},-\frac{b\,x^2}{a}\right]\right)$$

Problem 663: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 15 leaves, 1 step):

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

Result (type 5, 131 leaves):

$$\frac{1}{a^2 (2+m) \sqrt{1+\frac{b x^2}{a}}} x^m \sqrt{a+b x^2} \left(a (2+m) \text{Hypergeometric2F1}\left[-\frac{1}{2}, \frac{m}{2}, 1+\frac{m}{2}, -\frac{b x^2}{a}\right] - b x^2 \left(m \text{Hypergeometric2F1}\left[\frac{1}{2}, 1+\frac{m}{2}, 2+\frac{m}{2}, -\frac{b x^2}{a}\right] + \text{Hypergeometric2F1}\left[\frac{3}{2}, 1+\frac{m}{2}, 2+\frac{m}{2}, -\frac{b x^2}{a}\right]\right)\right)$$

Problem 664: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 5, 131 leaves):

$$\frac{1}{a^2 (2+m) \sqrt{1+\frac{b x^2}{a}}} x^m \sqrt{a+b x^2} \left(a (2+m) \text{Hypergeometric2F1}\left[-\frac{1}{2}, \frac{m}{2}, 1+\frac{m}{2}, -\frac{b x^2}{a}\right] - b x^2 \left(m \text{Hypergeometric2F1}\left[\frac{1}{2}, 1+\frac{m}{2}, 2+\frac{m}{2}, -\frac{b x^2}{a}\right] + \text{Hypergeometric2F1}\left[\frac{3}{2}, 1+\frac{m}{2}, 2+\frac{m}{2}, -\frac{b x^2}{a}\right]\right)\right)$$

Problem 669: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 101 leaves, 6 steps):

$$\frac{3}{2} (a+b x^2)^{1/3} - \frac{1}{2} \sqrt{3} a^{1/3} \text{ArcTan}\left[\frac{a^{1/3}+2 (a+b x^2)^{1/3}}{\sqrt{3} a^{1/3}}\right] - \frac{1}{2} a^{1/3} \text{Log}[x] + \frac{3}{4} a^{1/3} \text{Log}\left[a^{1/3} - (a+b x^2)^{1/3}\right]$$

Result (type 5, 61 leaves):

$$\frac{6\left(a+b x^2\right)-3 a\left(1+\frac{a}{b x^2}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{4\left(a+b x^2\right)^{2/3}}$$

Problem 670: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 107 leaves, 6 steps):

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

Result (type 5, 67 leaves):

$$\frac{-2\left(a+b x^2\right)-b\left(1+\frac{a}{b x^2}\right)^{2/3} x^2 \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{4 x^2\left(a+b x^2\right)^{2/3}}$$

Problem 671: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 135 leaves, 7 steps):

$$-\frac{\left(a+b x^2\right)^{1/3}}{4 x^4}-\frac{b\left(a+b x^2\right)^{1/3}}{12 a x^2}+\frac{b^2 \text{ArcTan}\left[\frac{a^{1/3}+2\left(a+b x^2\right)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{6 \sqrt{3}\, a^{5/3}}+\frac{b^2 \text{Log}[x]}{18 a^{5/3}}-\frac{b^2 \text{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{12 a^{5/3}}$$

Result (type 5, 82 leaves):

$$\frac{-3 a^2-4 a b x^2-b^2 x^4+b^2\left(1+\frac{a}{b x^2}\right)^{2/3} x^4 \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{12 a x^4\left(a+b x^2\right)^{2/3}}$$

Problem 672: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 314 leaves, 5 steps):

$$-\frac{54\,a^2\,x\,\left(a+b\,x^2\right)^{1/3}}{935\,b^2}+\frac{6\,a\,x^3\,\left(a+b\,x^2\right)^{1/3}}{187\,b}+\frac{3}{17}\,x^5\,\left(a+b\,x^2\right)^{1/3}-\left(54\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\;a^3\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(935\,b^3\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 90 leaves) :

$$\frac{3\,\left(-18\,a^3\,x-8\,a^2\,b\,x^3+65\,a\,b^2\,x^5+55\,b^3\,x^7+18\,a^3\,x\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{935\,b^2\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 673: Result unnecessarily involves higher level functions.

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

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

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

$$\left(6\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\;a^2\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 78 leaves) :

$$\frac{3\,x\,\left(2\,a^2+7\,a\,b\,x^2+5\,b^2\,x^4-2\,a^2\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{55\,b\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 674: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 266 leaves, 3 steps) :

$$\frac{3}{5} x \left(a+b x^2\right)^{1/3}-\left(2\times 3^{3/4} \sqrt{2-\sqrt{3}}\, a \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/\left(5 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 63 leaves):

$$\frac{3 x \left(a+b x^2\right)+2 a x \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{3}{2},-\frac{b x^2}{a}\right]}{5 \left(a+b x^2\right)^{2/3}}$$

Problem 675: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 260 leaves, 3 steps):

$$-\frac{\left(a+b x^2\right)^{1/3}}{x}-\left(2 \sqrt{2-\sqrt{3}} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/\left(3^{1/4} x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 68 leaves):

$$-\frac{\left(a+b x^2\right)^{1/3}}{x}+\frac{2 b x \left(\frac{a+b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{3}{2},-\frac{b x^2}{a}\right]}{3 \left(a+b x^2\right)^{2/3}}$$

Problem 676: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a+b x^2\right)^{1/3}}{3 x^3}-\frac{2 b \left(a+b x^2\right)^{1/3}}{9 a x}+$$
$$\left(2 \sqrt{2-\sqrt{3}}\, b \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Big/$$
$$\left(9\times 3^{1/4}\, a x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 88 leaves):

$$\left(-\frac{1}{3 x^3}-\frac{2 b}{9 a x}\right) \left(a+b x^2\right)^{1/3}-\frac{2 b^2 x \left(\frac{a+b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 a \left(a+b x^2\right)^{2/3}}$$

Problem 681: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 101 leaves, 6 steps):

$$\frac{3}{4} \left(a+b x^2\right)^{2/3}+\frac{1}{2} \sqrt{3}\, a^{2/3}\, \text{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]-\frac{1}{2} a^{2/3} \text{Log}[x]+\frac{3}{4} a^{2/3} \text{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]$$

Result (type 5, 61 leaves):

$$\frac{3 \left(a+b x^2\right)-6 a \left(1+\frac{a}{b x^2}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{4 \left(a+b x^2\right)^{1/3}}$$

Problem 682: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 104 leaves, 6 steps):

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

Result (type 5, 67 leaves):

$$\frac{-a-b x^2-2 b \left(1+\frac{a}{b x^2}\right)^{1/3} x^2 \operatorname{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{2 x^2 \left(a+b x^2\right)^{1/3}}$$

Problem 683: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 135 leaves, 7 steps):

$$-\frac{\left(a+b x^2\right)^{2/3}}{4 x^4}-\frac{b \left(a+b x^2\right)^{2/3}}{6 a x^2}-\frac{b^2 \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3} a^{1/3}}\right]}{6 \sqrt{3} a^{4/3}}+\frac{b^2 \operatorname{Log}[x]}{18 a^{4/3}}-\frac{b^2 \operatorname{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{12 a^{4/3}}$$

Result (type 5, 83 leaves):

$$\frac{-3 a^2-5 a b x^2-2 b^2 x^4+2 b^2 \left(1+\frac{a}{b x^2}\right)^{1/3} x^4 \operatorname{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{12 a x^4 \left(a+b x^2\right)^{1/3}}$$

Problem 684: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 601 leaves, 7 steps):

$$-\frac{108\,a^2\,x\,\left(a+b\,x^2\right)^{2/3}}{1729\,b^2}+\frac{12\,a\,x^3\,\left(a+b\,x^2\right)^{2/3}}{247\,b}+\frac{3}{19}\,x^5\,\left(a+b\,x^2\right)^{2/3}-\frac{324\,a^3\,x}{1729\,b^2\,\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}+$$

$$\left(162\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\;a^{10/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(1729\,b^3\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(108\,\sqrt{2}\,3^{3/4}\,a^{10/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(1729\,b^3\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 90 leaves):

$$\frac{3\,\left(-36\,a^3\,x-8\,a^2\,b\,x^3+119\,a\,b^2\,x^5+91\,b^3\,x^7+36\,a^3\,x\,\left(1+\frac{b\,x^2}{a}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{1729\,b^2\,\left(a+b\,x^2\right)^{1/3}}$$

Problem 685: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 577 leaves, 6 steps):

$$\frac{12\,a\,x\left(a+b\,x^2\right)^{2/3}}{91\,b}+\frac{3}{13}x^3\left(a+b\,x^2\right)^{2/3}+\frac{36\,a^2\,x}{91\,b\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}-$$

$$\left(18\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^{7/3}\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(91\,b^2\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(12\sqrt{2}\;3^{3/4}\,a^{7/3}\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 79 leaves) :

$$\frac{3\left(4\,a^2\,x+11\,a\,b\,x^3+7\,b^2\,x^5-4\,a^2\,x\left(1+\frac{b\,x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b\,x^2}{a}\right]\right)}{91\,b\left(a+b\,x^2\right)^{1/3}}$$

Problem 686: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 550 leaves, 5 steps) :

$$\frac{3}{7} x \left(a+b x^2\right)^{2/3}-\frac{12 a x}{7 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}+\left(6\times 3^{1/4} \sqrt{2+\sqrt{3}}\ a^{4/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/\left(7 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(4 \sqrt{2}\ 3^{3/4} a^{4/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 63 leaves) :

$$\frac{3 x \left(a+b x^2\right)+4 a x \left(1+\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{7 \left(a+b x^2\right)^{1/3}}$$

Problem 687: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 538 leaves, 5 steps) :

$$-\frac{\left(a+b x^2\right)^{2/3}}{x}-\frac{4 b x}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}+\left(2\times 3^{1/4}\sqrt{2+\sqrt{3}}\ a^{1/3}\left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)-$$
$$\left(4\sqrt{2}\ a^{1/3}\left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$
$$\left(3^{1/4} x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 68 leaves) :

$$-\frac{\left(a+b x^2\right)^{2/3}}{x}+\frac{4 b x\left(\frac{a+b x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{3\left(a+b x^2\right)^{1/3}}$$

Problem 688: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 575 leaves, 6 steps) :

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

$$\left(2\sqrt{2+\sqrt{3}}\ b\left(a^{1/3}-(a+b x^2)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(a+b x^2)^{1/3}+(a+b x^2)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-(a+b x^2)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-(a+b x^2)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-(a+b x^2)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

$$\left(4\sqrt{2}\ b\left(a^{1/3}-(a+b x^2)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(a+b x^2)^{1/3}+(a+b x^2)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-(a+b x^2)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-(a+b x^2)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-(a+b x^2)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 5, 88 leaves):

$$\left(-\frac{1}{3 x^3}-\frac{4 b}{9 a x}\right)(a+b x^2)^{2/3}+\frac{4 b^2 x\left(\frac{a+b x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 a (a+b x^2)^{1/3}}$$

Problem 693: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 117 leaves, 7 steps):

$$\frac{3}{2}a(a+b x^2)^{1/3}+\frac{3}{8}(a+b x^2)^{4/3}-\frac{1}{2}\sqrt{3}\ a^{4/3}\text{ArcTan}\left[\frac{a^{1/3}+2(a+b x^2)^{1/3}}{\sqrt{3}\ a^{1/3}}\right]-\frac{1}{2}a^{4/3}\text{Log}[x]+\frac{3}{4}a^{4/3}\text{Log}\left[a^{1/3}-(a+b x^2)^{1/3}\right]$$

Result (type 5, 76 leaves):

$$\frac{3\left(5 a^2+6 a b x^2+b^2 x^4\right)-6 a^2\left(1+\frac{a}{b x^2}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{8(a+b x^2)^{2/3}}$$

Problem 694: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 116 leaves, 7 steps):

$$2 b \left(a+b x^2\right)^{1/3}-\frac{\left(a+b x^2\right)^{4/3}}{2 x^2}-\frac{2 a^{1/3} b \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3} a^{1/3}}\right]}{\sqrt{3}}-\frac{2}{3} a^{1/3} b \operatorname{Log}[x]+a^{1/3} b \operatorname{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]$$

Result (type 5, 73 leaves):

$$\frac{a b-\frac{a^2}{2 x^2}+\frac{3 b^2 x^2}{2}-a b \left(1+\frac{a}{b x^2}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{\left(a+b x^2\right)^{2/3}}$$

Problem 695: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 132 leaves, 7 steps):

$$-\frac{b \left(a+b x^2\right)^{1/3}}{3 x^2}-\frac{\left(a+b x^2\right)^{4/3}}{4 x^4}-\frac{b^2 \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3} a^{1/3}}\right]}{3 \sqrt{3} a^{2/3}}-\frac{b^2 \operatorname{Log}[x]}{9 a^{2/3}}+\frac{b^2 \operatorname{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{6 a^{2/3}}$$

Result (type 5, 80 leaves):

$$\frac{-3 a^2-10 a b x^2-7 b^2 x^4-2 b^2 \left(1+\frac{a}{b x^2}\right)^{2/3} x^4 \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{12 x^4 \left(a+b x^2\right)^{2/3}}$$

Problem 696: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 335 leaves, 6 steps):

$$-\frac{432\,a^3\,x\,\left(a+b\,x^2\right)^{1/3}}{21\,505\,b^2}+\frac{48\,a^2\,x^3\,\left(a+b\,x^2\right)^{1/3}}{4301\,b}+\frac{24}{391}\,a\,x^5\,\left(a+b\,x^2\right)^{1/3}+\frac{3}{23}\,x^5\,\left(a+b\,x^2\right)^{4/3}-\left(432\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\;a^4\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Bigg/\left(21\,505\,b^3\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 100 leaves):

$$\frac{1}{21\,505\,b^2\,\left(a+b\,x^2\right)^{2/3}}3\,x\,\left(-144\,a^4-64\,a^3\,b\,x^2+1455\,a^2\,b^2\,x^4+2310\,a\,b^3\,x^6+935\,b^4\,x^8+144\,a^4\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)$$

Problem 697: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 311 leaves, 5 steps):

$$\frac{48\,a^2\,x\,\left(a+b\,x^2\right)^{1/3}}{935\,b}+\frac{24}{187}\,a\,x^3\,\left(a+b\,x^2\right)^{1/3}+\frac{3}{17}\,x^3\,\left(a+b\,x^2\right)^{4/3}+\left(48\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\;a^3\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Bigg/\left(935\,b^2\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 90 leaves):

$$\frac{3\,\left(16\,a^3\,x+111\,a^2\,b\,x^3+150\,a\,b^2\,x^5+55\,b^3\,x^7-16\,a^3\,x\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{935\,b\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 698: Result unnecessarily involves higher level functions.

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

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

$$\frac{24}{55} a x \left(a+b x^2\right)^{1/3}+\frac{3}{11} x \left(a+b x^2\right)^{4/3}-\left(16\times 3^{3/4} \sqrt{2-\sqrt{3}}\, a^2 \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/\left(55 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 76 leaves) :

$$\frac{39 a^2 x+54 a b x^3+15 b^2 x^5+16 a^2 x \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{3}{2},-\frac{b x^2}{a}\right]}{55 \left(a+b x^2\right)^{2/3}}$$

Problem 699: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 280 leaves, 4 steps) :

$$\frac{8}{5} b x \left(a+b x^2\right)^{1/3}-\frac{\left(a+b x^2\right)^{4/3}}{x}-\left(16 \sqrt{2-\sqrt{3}}\, a \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/\left(5\times 3^{1/4} x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 78 leaves) :

$$\left(-\frac{a}{x}+\frac{3 b x}{5}\right) \left(a+b x^2\right)^{1/3}+\frac{16 a b x \left(\frac{a+b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{3}{2},-\frac{b x^2}{a}\right]}{15 \left(a+b x^2\right)^{2/3}}$$

Problem 700: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 284 leaves, 4 steps):

$$-\frac{8 b \left(a+b x^2\right)^{1/3}}{9 x}-\frac{\left(a+b x^2\right)^{4/3}}{3 x^3}-\left(16 \sqrt{2-\sqrt{3}}\, b \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Big/ \left(9\times 3^{1/4} x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 80 leaves):

$$\frac{-9 a^2-42 a b x^2-33 b^2 x^4+16 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 x^3 \left(a+b x^2\right)^{2/3}}$$

Problem 706: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 86 leaves, 5 steps):

$$\frac{\sqrt{3}\ \text{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\ a^{1/3}}\right]}{2 a^{1/3}}-\frac{\text{Log}[x]}{2 a^{1/3}}+\frac{3 \text{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{4 a^{1/3}}$$

Result (type 5, 48 leaves):

$$-\frac{3 \left(1+\frac{a}{b x^2}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{2 \left(a+b x^2\right)^{1/3}}$$

Problem 707: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 110 leaves, 6 steps):

$$-\frac{\left(a+b x^2\right)^{2/3}}{2 a x^2}-\frac{b \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{2 \sqrt{3}\, a^{4/3}}+\frac{b \operatorname{Log}[x]}{6 a^{4/3}}-\frac{b \operatorname{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{4 a^{4/3}}$$

Result (type 5, 69 leaves):

$$\frac{-a-b x^2+b \left(1+\frac{a}{b x^2}\right)^{1/3} x^2 \operatorname{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{2 a x^2 \left(a+b x^2\right)^{1/3}}$$

Problem 708: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 138 leaves, 7 steps):

$$-\frac{\left(a+b x^2\right)^{2/3}}{4 a x^4}+\frac{b \left(a+b x^2\right)^{2/3}}{3 a^2 x^2}+\frac{b^2 \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{3 \sqrt{3}\, a^{7/3}}-\frac{b^2 \operatorname{Log}[x]}{9 a^{7/3}}+\frac{b^2 \operatorname{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{6 a^{7/3}}$$

Result (type 5, 82 leaves):

$$\frac{-3 a^2+a b x^2+4 b^2 x^4-4 b^2 \left(1+\frac{a}{b x^2}\right)^{1/3} x^4 \operatorname{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{12 a^2 x^4 \left(a+b x^2\right)^{1/3}}$$

Problem 709: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 580 leaves, 6 steps):

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

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

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(182\,b^3\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(27\,\sqrt{2}\;3^{3/4}\,a^{7/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 79 leaves) :

$$\frac{3\,\left(-9\,a^2\,x-2\,a\,b\,x^3+7\,b^2\,x^5+9\,a^2\,x\,\left(1+\frac{b\,x^2}{a}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{91\,b^2\,\left(a+b\,x^2\right)^{1/3}}$$

Problem 710: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 556 leaves, 5 steps) :

$$\frac{3x\left(a+bx^2\right)^{2/3}}{7b}+\frac{9ax}{7b\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}-\left(9\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^{4/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+bx^2\right)^{1/3}+\left(a+bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(14b^2x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(3\sqrt{2}\;3^{3/4}a^{4/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+bx^2\right)^{1/3}+\left(a+bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(7b^2x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 62 leaves):

$$\frac{3x\left(a+bx^2-a\left(1+\frac{bx^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{bx^2}{a}\right]\right)}{7b\left(a+bx^2\right)^{1/3}}$$

Problem 711: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 529 leaves, 4 steps):

$$-\frac{3\,x}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}+\left(3\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^{1/3}\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(2\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(\sqrt{2}\;3^{3/4}\,a^{1/3}\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 47 leaves) :

$$\frac{x\left(\frac{a+b\,x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b\,x^2}{a}\right]}{\left(a+b\,x^2\right)^{1/3}}$$

Problem 712: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 546 leaves, 5 steps) :

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

$$\left(3^{1/4}\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

$$\left(\sqrt{2}\left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 69 leaves):

$$\frac{-3\left(a+b x^2\right)+b x^2\left(1+\frac{b x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{3 a x\left(a+b x^2\right)^{1/3}}$$

Problem 713: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 578 leaves, 6 steps):

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

$$\left(5 \sqrt{2+\sqrt{3}}\, b \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Big/$$

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

$$\left(5 \sqrt{2}\, b \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Big/$$

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

Result (type 5, 83 leaves):

$$\frac{-9 a^2+6 a b x^2+15 b^2 x^4-5 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 a^2 x^3 \left(a+b x^2\right)^{1/3}}$$

Problem 718: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 86 leaves, 5 steps):

$$-\frac{\sqrt{3}\ \text{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\ a^{1/3}}\right]}{2 a^{2/3}}-\frac{\text{Log}[x]}{2 a^{2/3}}+\frac{3 \text{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{4 a^{2/3}}$$

Result (type 5, 48 leaves):

$$-\frac{3 \left(1+\frac{a}{b x^2}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{4 \left(a+b x^2\right)^{2/3}}$$

Problem 719: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 107 leaves, 6 steps):

$$-\frac{\left(a+b x^2\right)^{1/3}}{2 a x^2}+\frac{b \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{\sqrt{3}\, a^{5/3}}+\frac{b \operatorname{Log}[x]}{3 a^{5/3}}-\frac{b \operatorname{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{2 a^{5/3}}$$

Result (type 5, 69 leaves):

$$\frac{-a-b x^2+b \left(1+\frac{a}{b x^2}\right)^{2/3} x^2 \operatorname{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{2 a x^2 \left(a+b x^2\right)^{2/3}}$$

Problem 720: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 138 leaves, 7 steps):

$$-\frac{\left(a+b x^2\right)^{1/3}}{4 a x^4}+\frac{5 b \left(a+b x^2\right)^{1/3}}{12 a^2 x^2}-\frac{5 b^2 \operatorname{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{6 \sqrt{3}\, a^{8/3}}-\frac{5 b^2 \operatorname{Log}[x]}{18 a^{8/3}}+\frac{5 b^2 \operatorname{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{12 a^{8/3}}$$

Result (type 5, 83 leaves):

$$\frac{-3 a^2+2 a b x^2+5 b^2 x^4-5 b^2 \left(1+\frac{a}{b x^2}\right)^{2/3} x^4 \operatorname{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{a}{b x^2}\right]}{12 a^2 x^4 \left(a+b x^2\right)^{2/3}}$$

Problem 721: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 293 leaves, 4 steps):

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

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(55\,b^3\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 79 leaves):

$$\frac{3\,\left(-9\,a^2\,x-4\,a\,b\,x^3+5\,b^2\,x^5+9\,a^2\,x\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{55\,b^2\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 722: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 269 leaves, 3 steps):

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

$$\left(3\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\,\,a\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 62 leaves):

$$\frac{3\,x\,\left(a+b\,x^2-a\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{5\,b\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 723: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 246 leaves, 2 steps):

$$-\left(\left(3^{3/4}\sqrt{2-\sqrt{3}}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)\right)$$

Result (type 5, 47 leaves):

$$\frac{x\,\left(\frac{a+b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{\left(a+b\,x^2\right)^{2/3}}$$

Problem 724: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 265 leaves, 3 steps):

$$-\frac{\left(a+b\,x^2\right)^{1/3}}{a\,x}+\left(\sqrt{2-\sqrt{3}}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(3^{1/4}\,a\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 70 leaves):

$$\frac{-3\,\left(a+b\,x^2\right)-b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2}{3},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{3\,a\,x\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 725: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 293 leaves, 4 steps):

$$-\frac{\left(a+b x^2\right)^{1/3}}{3 a x^3}+\frac{7 b \left(a+b x^2\right)^{1/3}}{9 a^2 x}-\left(7 \sqrt{2-\sqrt{3}}\, b \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/ \left(9 \times 3^{1/4} a^2 x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 83 leaves):

$$\frac{-9 a^2+12 a b x^2+21 b^2 x^4+7 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2}{3},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 a^2 x^3 \left(a+b x^2\right)^{2/3}}$$

Problem 730: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 104 leaves, 6 steps):

$$\frac{3}{2 a \left(a+b x^2\right)^{1/3}}+\frac{\sqrt{3}\, \text{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3}\, a^{1/3}}\right]}{2 a^{4/3}}-\frac{\text{Log}[x]}{2 a^{4/3}}+\frac{3 \,\text{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{4 a^{4/3}}$$

Result (type 5, 55 leaves):

$$\frac{3-3 \left(1+\frac{a}{b x^2}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{2 a \left(a+b x^2\right)^{1/3}}$$

Problem 731: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 123 leaves, 7 steps):

$$-\frac{2 b}{a^2 \left(a+b x^2\right)^{1/3}}-\frac{1}{2 a x^2 \left(a+b x^2\right)^{1/3}}-\frac{2 b \text{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3} a^{1/3}}\right]}{\sqrt{3} a^{7/3}}+\frac{2 b \text{Log}[x]}{3 a^{7/3}}-\frac{b \text{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{a^{7/3}}$$

Result (type 5, 70 leaves):

$$\frac{-a-4 b x^2+4 b \left(1+\frac{a}{b x^2}\right)^{1/3} x^2 \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{2 a^2 x^2 \left(a+b x^2\right)^{1/3}}$$

Problem 732: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 159 leaves, 8 steps):

$$\frac{7 b^2}{3 a^3 \left(a+b x^2\right)^{1/3}}-\frac{1}{4 a x^4 \left(a+b x^2\right)^{1/3}}+\frac{7 b}{12 a^2 x^2 \left(a+b x^2\right)^{1/3}}+\frac{7 b^2 \text{ArcTan}\left[\frac{a^{1/3}+2 \left(a+b x^2\right)^{1/3}}{\sqrt{3} a^{1/3}}\right]}{3 \sqrt{3} a^{10/3}}-\frac{7 b^2 \text{Log}[x]}{9 a^{10/3}}+\frac{7 b^2 \text{Log}\left[a^{1/3}-\left(a+b x^2\right)^{1/3}\right]}{6 a^{10/3}}$$

Result (type 5, 83 leaves):

$$\frac{-3 a^2+7 a b x^2+28 b^2 x^4-28 b^2 \left(1+\frac{a}{b x^2}\right)^{1/3} x^4 \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{a}{b x^2}\right]}{12 a^3 x^4 \left(a+b x^2\right)^{1/3}}$$

Problem 733: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 577 leaves, 6 steps):

$$-\frac{3x^3}{2b\left(a+bx^2\right)^{1/3}}+\frac{27x\left(a+bx^2\right)^{2/3}}{14b^2}+\frac{81ax}{14b^2\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}-$$

$$\left(81\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^{4/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+bx^2\right)^{1/3}+\left(a+bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(28b^3x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(27\times 3^{3/4}a^{4/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+bx^2\right)^{1/3}+\left(a+bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 65 leaves) :

$$\frac{3x\left(9a+2bx^2-9a\left(1+\frac{bx^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{bx^2}{a}\right]\right)}{14b^2\left(a+bx^2\right)^{1/3}}$$

Problem 734: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 553 leaves, 5 steps) :

$$-\frac{3 x}{2 b \left(a+b x^2\right)^{1/3}}-\frac{9 x}{2 b \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}+\left(9\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/\left(4 b^2 x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(3\times 3^{3/4} a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 55 leaves) :

$$\frac{3 x \left(-1+\left(1+\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{2 b \left(a+b x^2\right)^{1/3}}$$

Problem 735: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 552 leaves, 5 steps) :

$$\frac{3x}{2a\left(a+bx^2\right)^{1/3}}+\frac{3x}{2a\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}-$$
$$\left(3\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+bx^2\right)^{1/3}+\left(a+bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(4a^{2/3}bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\right)+$$
$$\left(3^{3/4}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a+bx^2\right)^{1/3}+\left(a+bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(\sqrt{2}\,a^{2/3}bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a+bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a+bx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 58 leaves):

$$\frac{3x-x\left(1+\frac{bx^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{bx^2}{a}\right]}{2a\left(a+bx^2\right)^{1/3}}$$

Problem 736: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 571 leaves, 6 steps):

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

$$\left(5\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

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

$$\left(5\,\left(a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a+b\,x^2\right)^{1/3}+\left(a+b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a+b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 70 leaves):

$$\frac{-6\,a-15\,b\,x^2+5\,b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{6\,a^2\,x\,\left(a+b\,x^2\right)^{1/3}}$$

Problem 737: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 599 leaves, 7 steps):

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

$$\left(55 \sqrt{2+\sqrt{3}}\, b \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$

$$\left(12\times 3^{3/4} a^{8/3} x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(55 b \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a+b x^2\right)^{1/3}+\left(a+b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a+b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$

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

Result (type 5, 83 leaves):

$$\frac{-18 a^2+66 a b x^2+165 b^2 x^4-55 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{54 a^3 x^3 \left(a+b x^2\right)^{1/3}}$$

Problem 738: Result unnecessarily involves higher level functions.

$$\int (c x)^{13/3} \left(a+b x^2\right)^{1/3} dx$$

Optimal (type 3, 195 leaves, 6 steps):

$$-\frac{5 a^2 c^3 (c x)^{4/3} \left(a+b x^2\right)^{1/3}}{108 b^2}+\frac{a c (c x)^{10/3} \left(a+b x^2\right)^{1/3}}{36 b}+$$

$$\frac{(c x)^{16/3} \left(a+b x^2\right)^{1/3}}{6 c}-\frac{5 a^3 c^{13/3} \text{ArcTan}\left[\frac{1+\frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} \left(a+b x^2\right)^{1/3}}}{\sqrt{3}}\right]}{54 \sqrt{3}\, b^{8/3}}-\frac{5 a^3 c^{13/3} \text{Log}\left[b^{1/3} (c x)^{2/3}-c^{2/3} \left(a+b x^2\right)^{1/3}\right]}{108 b^{8/3}}$$

Result (type 5, 98 leaves):

$$\frac{c^3 (c x)^{4/3} \left(-5 a^3 - 2 a^2 b x^2 + 21 a b^2 x^4 + 18 b^3 x^6 + 5 a^3 \left(1 + \frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3}, \frac{2}{3}, \frac{5}{3}, -\frac{b x^2}{a}\right]\right)}{108 b^2 \left(a + b x^2\right)^{2/3}}$$

Problem 739: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 164 leaves, 5 steps):

$$\frac{a c (c x)^{4/3} \left(a + b x^2\right)^{1/3}}{12 b} + \frac{(c x)^{10/3} \left(a + b x^2\right)^{1/3}}{4 c} + \frac{a^2 c^{7/3} \text{ArcTan}\left[\frac{1 + \frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} (a + b x^2)^{1/3}}}{\sqrt{3}}\right]}{6 \sqrt{3} b^{5/3}} + \frac{a^2 c^{7/3} \text{Log}\left[b^{1/3} (c x)^{2/3} - c^{2/3} \left(a + b x^2\right)^{1/3}\right]}{12 b^{5/3}}$$

Result (type 5, 83 leaves):

$$\frac{c (c x)^{4/3} \left(a^2 + 4 a b x^2 + 3 b^2 x^4 - a^2 \left(1 + \frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3}, \frac{2}{3}, \frac{5}{3}, -\frac{b x^2}{a}\right]\right)}{12 b \left(a + b x^2\right)^{2/3}}$$

Problem 740: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 133 leaves, 4 steps):

$$\frac{(c x)^{4/3} \left(a + b x^2\right)^{1/3}}{2 c} - \frac{a c^{1/3} \text{ArcTan}\left[\frac{1 + \frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} (a + b x^2)^{1/3}}}{\sqrt{3}}\right]}{2 \sqrt{3} b^{2/3}} - \frac{a c^{1/3} \text{Log}\left[b^{1/3} (c x)^{2/3} - c^{2/3} \left(a + b x^2\right)^{1/3}\right]}{4 b^{2/3}}$$

Result (type 5, 68 leaves):

$$\frac{x (c x)^{1/3} \left(2 \left(a + b x^2\right) + a \left(1 + \frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3}, \frac{2}{3}, \frac{5}{3}, -\frac{b x^2}{a}\right]\right)}{4 \left(a + b x^2\right)^{2/3}}$$

Problem 741: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 131 leaves, 4 steps):

$$-\frac{3\left(a+b x^2\right)^{1/3}}{2 c (c x)^{2/3}}-\frac{\sqrt{3}\, b^{1/3} \operatorname{ArcTan}\left[\frac{1+\frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} \left(a+b x^2\right)^{1/3}}}{\sqrt{3}}\right]}{2 c^{5/3}}-\frac{3 b^{1/3} \operatorname{Log}\left[b^{1/3} (c x)^{2/3}-c^{2/3} \left(a+b x^2\right)^{1/3}\right]}{4 c^{5/3}}$$

Result (type 5, 72 leaves):

$$\frac{x \left(-6 \left(a+b x^2\right)+3 b x^2 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^2}{a}\right]\right)}{4 (c x)^{5/3} \left(a+b x^2\right)^{2/3}}$$

Problem 746: Result unnecessarily involves higher level functions.

$$\int (c x)^{10/3} \left(a+b x^2\right)^{1/3} \, dx$$

Optimal (type 4, 451 leaves, 6 steps):

$$-\frac{14 a^2 c^3 (c x)^{1/3} \left(a+b x^2\right)^{1/3}}{135 b^2}+\frac{2 a c (c x)^{7/3} \left(a+b x^2\right)^{1/3}}{45 b}+\frac{(c x)^{13/3} \left(a+b x^2\right)^{1/3}}{5 c}+$$

$$\left(7 a^2 c^{7/3} (c x)^{1/3} \left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right) \sqrt{\frac{c^{4/3}+\frac{b^{2/3} (c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}} \operatorname{EllipticF}\left[\operatorname{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right], \frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Bigg/$$

$$\left(135 \times 3^{1/4} b^2 \sqrt{-\frac{b^{1/3} (c x)^{2/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)}{\left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 98 leaves):

$$\frac{1}{135 b^2 \left(a+b x^2\right)^{2/3}} c^3 (c x)^{1/3} \left(-14 a^3-8 a^2 b x^2+33 a b^2 x^4+27 b^3 x^6+14 a^3 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b x^2}{a}\right]\right)$$

Problem 747: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 418 leaves, 5 steps):

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

$$\left(a\,c^{1/3}\,(c\,x)^{1/3}\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{\left(a+b\,x^2\right)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

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

Result (type 5, 85 leaves) :

$$\frac{c\,(c\,x)^{1/3}\left(2\,a^2+5\,a\,b\,x^2+3\,b^2\,x^4-2\,a^2\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b\,x^2}{a}\right]\right)}{9\,b\left(a+b\,x^2\right)^{2/3}}$$

Problem 748: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 381 leaves, 4 steps) :

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

$$\left((c\,x)^{1/3}\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{\left(a+b\,x^2\right)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

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

Result (type 5, 63 leaves) :

$$\frac{x\left(a+b\,x^2+2\,a\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b\,x^2}{a}\right]\right)}{(c\,x)^{2/3}\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 749: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 391 leaves, 4 steps):

$$-\frac{3\,\left(a+b\,x^2\right)^{1/3}}{5\,c\,(c\,x)^{5/3}}+\left(3^{3/4}\,b\,(c\,x)^{1/3}\,\left(a+b\,x^2\right)^{1/3}\,\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{(a+b\,x^2)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(5\,a\,c^{11/3}\,\sqrt{-\frac{b^{1/3}\,(c\,x)^{2/3}\,\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}\right)}{\left(a+b\,x^2\right)^{1/3}\,\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}\right)^2}}\right)$$

Result (type 5, 69 leaves):

$$-\frac{3\,x\left(a+b\,x^2-2\,b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b\,x^2}{a}\right]\right)}{5\,(c\,x)^{8/3}\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 750: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 422 leaves, 5 steps):

$$-\frac{3\,(a+b\,x^2)^{1/3}}{11\,c\,(c\,x)^{11/3}}-\frac{6\,b\,(a+b\,x^2)^{1/3}}{55\,a\,c^3\,(c\,x)^{5/3}}-\left(3\times 3^{3/4}\,b^2\,(c\,x)^{1/3}\,(a+b\,x^2)^{1/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{(a+b\,x^2)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}}\right],\ \frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(55\,a^2\,c^{17/3}\sqrt{-\frac{b^{1/3}\,(c\,x)^{2/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}\right)}{(a+b\,x^2)^{1/3}\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{(a+b\,x^2)^{1/3}}\right)^2}}\right)$$

Result (type 5, 93 leaves):

$$-\frac{3\,(c\,x)^{1/3}\left(5\,a^2+7\,a\,b\,x^2+2\,b^2\,x^4+6\,b^2\,x^4\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{6},\ \frac{2}{3},\ \frac{7}{6},\ -\frac{b\,x^2}{a}\right]\right)}{55\,a\,c^5\,x^4\,(a+b\,x^2)^{2/3}}$$

Problem 754: Result unnecessarily involves higher level functions.

$$\int (c\,x)^{13/3}\,(a+b\,x^2)^{4/3}\,dx$$

Optimal (type 3, 223 leaves, 7 steps):

$$-\frac{5\,a^3\,c^3\,(c\,x)^{4/3}\,(a+b\,x^2)^{1/3}}{324\,b^2}+\frac{a^2\,c\,(c\,x)^{10/3}\,(a+b\,x^2)^{1/3}}{108\,b}+\frac{a\,(c\,x)^{16/3}\,(a+b\,x^2)^{1/3}}{18\,c}+\frac{(c\,x)^{16/3}\,(a+b\,x^2)^{4/3}}{8\,c}-\frac{5\,a^4\,c^{13/3}\,\text{ArcTan}\left[\frac{1+\frac{2\,b^{1/3}\,(c\,x)^{2/3}}{c^{2/3}\,(a+b\,x^2)^{1/3}}}{\sqrt{3}}\right]}{162\,\sqrt{3}\,b^{8/3}}-\frac{5\,a^4\,c^{13/3}\,\text{Log}\left[b^{1/3}\,(c\,x)^{2/3}-c^{2/3}\,(a+b\,x^2)^{1/3}\right]}{324\,b^{8/3}}$$

Result (type 5, 109 leaves):

$$\frac{1}{648\,b^2\,(a+b\,x^2)^{2/3}}c^3\,(c\,x)^{4/3}\left(-10\,a^4-4\,a^3\,b\,x^2+123\,a^2\,b^2\,x^4+198\,a\,b^3\,x^6+81\,b^4\,x^8+10\,a^4\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{2}{3},\ \frac{2}{3},\ \frac{5}{3},\ -\frac{b\,x^2}{a}\right]\right)$$

Problem 755: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 192 leaves, 6 steps):

$$\frac{a^2 c (c x)^{4/3} \left(a+b x^2\right)^{1/3}}{27 b}+\frac{a (c x)^{10/3} \left(a+b x^2\right)^{1/3}}{9 c}+\frac{(c x)^{10/3} \left(a+b x^2\right)^{4/3}}{6 c}+\frac{2 a^3 c^{7/3} \text{ArcTan}\left[\frac{1+\frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} \left(a+b x^2\right)^{1/3}}}{\sqrt{3}}\right]}{27 \sqrt{3} b^{5/3}}+\frac{a^3 c^{7/3} \text{Log}\left[b^{1/3} (c x)^{2/3}-c^{2/3} \left(a+b x^2\right)^{1/3}\right]}{27 b^{5/3}}$$

Result (type 5, 96 leaves):

$$\frac{c (c x)^{4/3} \left(2 a^3+17 a^2 b x^2+24 a b^2 x^4+9 b^3 x^6-2 a^3 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^2}{a}\right]\right)}{54 b \left(a+b x^2\right)^{2/3}}$$

Problem 756: Result unnecessarily involves higher level functions.

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

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

$$\frac{a (c x)^{4/3} \left(a+b x^2\right)^{1/3}}{3 c}+\frac{(c x)^{4/3} \left(a+b x^2\right)^{4/3}}{4 c}-\frac{a^2 c^{1/3} \text{ArcTan}\left[\frac{1+\frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} \left(a+b x^2\right)^{1/3}}}{\sqrt{3}}\right]}{3 \sqrt{3} b^{2/3}}-\frac{a^2 c^{1/3} \text{Log}\left[b^{1/3} (c x)^{2/3}-c^{2/3} \left(a+b x^2\right)^{1/3}\right]}{6 b^{2/3}}$$

Result (type 5, 83 leaves):

$$\frac{(c x)^{1/3} \left(7 a^2 x+10 a b x^3+3 b^2 x^5+2 a^2 x \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^2}{a}\right]\right)}{12 \left(a+b x^2\right)^{2/3}}$$

Problem 757: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 153 leaves, 5 steps):

$$\frac{2 b (c x)^{4/3} \left(a+b x^2\right)^{1/3}}{c^3}-\frac{3 \left(a+b x^2\right)^{4/3}}{2 c (c x)^{2/3}}-\frac{2 a b^{1/3} \text{ArcTan}\left[\frac{1+\frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3} \left(a+b x^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3} c^{5/3}}-\frac{a b^{1/3} \text{Log}\left[b^{1/3} (c x)^{2/3}-c^{2/3} \left(a+b x^2\right)^{1/3}\right]}{c^{5/3}}$$

Result (type 5, 83 leaves):

$$\frac{x\left(-3 a^2-2 a b x^2+b^2 x^4+2 a b x^2\left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^2}{a}\right]\right)}{2 (c x)^{5/3}\left(a+b x^2\right)^{2/3}}$$

Problem 758: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 157 leaves, 5 steps):

$$-\frac{3 b\left(a+b x^2\right)^{1/3}}{2 c^3 (c x)^{2/3}}-\frac{3\left(a+b x^2\right)^{4/3}}{8 c (c x)^{8/3}}-\frac{\sqrt{3}\, b^{4/3} \text{ArcTan}\left[\frac{1+\frac{2 b^{1/3} (c x)^{2/3}}{c^{2/3}\left(a+b x^2\right)^{1/3}}}{\sqrt{3}}\right]}{2 c^{11/3}}-\frac{3 b^{4/3} \text{Log}\left[b^{1/3} (c x)^{2/3}-c^{2/3}\left(a+b x^2\right)^{1/3}\right]}{4 c^{11/3}}$$

Result (type 5, 83 leaves):

$$-\frac{3 x\left(a^2+6 a b x^2+5 b^2 x^4-2 b^2 x^4\left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^2}{a}\right]\right)}{8 (c x)^{11/3}\left(a+b x^2\right)^{2/3}}$$

Problem 762: Result unnecessarily involves higher level functions.

$$\int (c x)^{10/3}\left(a+b x^2\right)^{4/3} \, dx$$

Optimal (type 4, 479 leaves, 7 steps):

$$-\frac{16 a^3 c^3 (c x)^{1/3}\left(a+b x^2\right)^{1/3}}{405 b^2}+\frac{16 a^2 c (c x)^{7/3}\left(a+b x^2\right)^{1/3}}{945 b}+\frac{8 a (c x)^{13/3}\left(a+b x^2\right)^{1/3}}{105 c}+\frac{(c x)^{13/3}\left(a+b x^2\right)^{4/3}}{7 c}+$$

$$\left(8 a^3 c^{7/3} (c x)^{1/3}\left(a+b x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3} (c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(405 \times 3^{1/4} b^2 \sqrt{-\frac{b^{1/3} (c x)^{2/3}\left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)}{\left(a+b x^2\right)^{1/3}\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 109 leaves):

$$\frac{1}{2835\, b^2 \left(a+b x^2\right)^{2/3}} c^3 (c x)^{1/3} \left(-112 a^4-64 a^3 b x^2+669 a^2 b^2 x^4+1026 a b^3 x^6+405 b^4 x^8+112 a^4 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b x^2}{a}\right]\right)$$

Problem 763: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 448 leaves, 6 steps):

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

$$\left(8 a^2 c^{1/3} (c x)^{1/3} \left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right) \sqrt{\frac{c^{4/3}+\frac{b^{2/3} (c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}} \text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right],\frac{1}{4} \left(2+\sqrt{3}\right)\right]\right) \Bigg/$$

$$\left(135 \times 3^{1/4} b \sqrt{-\frac{b^{1/3} (c x)^{2/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)}{\left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 96 leaves):

$$\frac{c (c x)^{1/3} \left(16 a^3+67 a^2 b x^2+78 a b^2 x^4+27 b^3 x^6-16 a^3 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b x^2}{a}\right]\right)}{135 b \left(a+b x^2\right)^{2/3}}$$

Problem 764: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 414 leaves, 5 steps):

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

$$\left(8 a (c x)^{1/3} \left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right) \sqrt{\frac{c^{4/3}+\frac{b^{2/3} (c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right], \frac{1}{4}\left(2+\sqrt{3}\right)\right]\right) \Big/$$

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

Result (type 5, 83 leaves):

$$\frac{11 a^2 x+14 a b x^3+3 b^2 x^5+16 a^2 x \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{2}{3}, \frac{7}{6}, -\frac{b x^2}{a}\right]}{9 (c x)^{2/3} \left(a+b x^2\right)^{2/3}}$$

Problem 765: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{4/3}}{(c x)^{8/3}} \, dx$$

Optimal (type 4, 414 leaves, 5 steps):

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

$$\left(8 b (c x)^{1/3} \left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right) \sqrt{\frac{c^{4/3}+\frac{b^{2/3} (c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right], \frac{1}{4}\left(2+\sqrt{3}\right)\right]\right) \Big/$$

$$\left(5 \times 3^{1/4} c^{11/3} \sqrt{-\frac{b^{1/3} (c x)^{2/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)}{\left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 84 leaves):

$$\frac{x\left(-3 a^2+2 a b x^2+5 b^2 x^4+16 a b x^2\left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b x^2}{a}\right]\right)}{5 (c x)^{8/3}\left(a+b x^2\right)^{2/3}}$$

Problem 766: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{4/3}}{(c x)^{14/3}} \, dx$$

Optimal (type 4, 419 leaves, 5 steps):

$$-\frac{24 b \left(a+b x^2\right)^{1/3}}{55 c^3 (c x)^{5/3}}-\frac{3 \left(a+b x^2\right)^{4/3}}{11 c (c x)^{11/3}}+\left(8\times 3^{3/4} b^2 (c x)^{1/3}\left(a+b x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}(c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\ \text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(55 a c^{17/3}\sqrt{-\frac{b^{1/3}(c x)^{2/3}\left(c^{2/3}-\frac{b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)}{\left(a+b x^2\right)^{1/3}\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 90 leaves):

$$\frac{3 (c x)^{1/3}\left(-5 a^2-18 a b x^2-13 b^2 x^4+16 b^2 x^4\left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b x^2}{a}\right]\right)}{55 c^5 x^4\left(a+b x^2\right)^{2/3}}$$

Problem 767: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{4/3}}{(c x)^{20/3}} \, dx$$

Optimal (type 4, 450 leaves, 6 steps):

$$-\frac{24\,b\,\left(a+b\,x^2\right)^{1/3}}{187\,c^3\,(c\,x)^{11/3}}-\frac{48\,b^2\,\left(a+b\,x^2\right)^{1/3}}{935\,a\,c^5\,(c\,x)^{5/3}}-\frac{3\,\left(a+b\,x^2\right)^{4/3}}{17\,c\,(c\,x)^{17/3}}-\left(24\times 3^{3/4}\,b^3\,(c\,x)^{1/3}\,\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{\left(a+b\,x^2\right)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}\right],\,\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(935\,a^2\,c^{23/3}\sqrt{-\frac{b^{1/3}\,(c\,x)^{2/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)}{\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 104 leaves):

$$-\frac{1}{935\,a\,c^7\,x^6\,\left(a+b\,x^2\right)^{2/3}}3\,(c\,x)^{1/3}\left(55\,a^3+150\,a^2\,b\,x^2+111\,a\,b^2\,x^4+16\,b^3\,x^6+48\,b^3\,x^6\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{6},\,\frac{2}{3},\,\frac{7}{6},\,-\frac{b\,x^2}{a}\right]\right)$$

Problem 771: Result unnecessarily involves higher level functions.

$$\int\frac{(c\,x)^{19/3}}{\left(a+b\,x^2\right)^{2/3}}\,dx$$

Optimal (type 3, 198 leaves, 6 steps):

$$\frac{10\,a^2\,c^5\,(c\,x)^{4/3}\left(a+b\,x^2\right)^{1/3}}{27\,b^3}-\frac{2\,a\,c^3\,(c\,x)^{10/3}\left(a+b\,x^2\right)^{1/3}}{9\,b^2}+\frac{c\,(c\,x)^{16/3}\left(a+b\,x^2\right)^{1/3}}{6\,b}+$$

$$\frac{20\,a^3\,c^{19/3}\,\text{ArcTan}\left[\frac{1+\frac{2\,b^{1/3}\,(c\,x)^{2/3}}{c^{2/3}\,\left(a+b\,x^2\right)^{1/3}}}{\sqrt{3}}\right]}{27\,\sqrt{3}\,b^{11/3}}+\frac{10\,a^3\,c^{19/3}\,\text{Log}\left[b^{1/3}\,(c\,x)^{2/3}-c^{2/3}\left(a+b\,x^2\right)^{1/3}\right]}{27\,b^{11/3}}$$

Result (type 5, 98 leaves):

$$\frac{c^5\,(c\,x)^{4/3}\left(20\,a^3+8\,a^2\,b\,x^2-3\,a\,b^2\,x^4+9\,b^3\,x^6-20\,a^3\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{2}{3},\,\frac{2}{3},\,\frac{5}{3},\,-\frac{b\,x^2}{a}\right]\right)}{54\,b^3\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 772: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 167 leaves, 5 steps):

$$-\frac{5\,a\,c^3\,(c\,x)^{4/3}\,\left(a+b\,x^2\right)^{1/3}}{12\,b^2}+\frac{c\,(c\,x)^{10/3}\,\left(a+b\,x^2\right)^{1/3}}{4\,b}-\frac{5\,a^2\,c^{13/3}\,\text{ArcTan}\left[\frac{1+\frac{2\,b^{1/3}\,(c\,x)^{2/3}}{c^{2/3}\,\left(a+b\,x^2\right)^{1/3}}}{\sqrt{3}}\right]}{6\,\sqrt{3}\,b^{8/3}}-\frac{5\,a^2\,c^{13/3}\,\text{Log}\left[b^{1/3}\,(c\,x)^{2/3}-c^{2/3}\,\left(a+b\,x^2\right)^{1/3}\right]}{12\,b^{8/3}}$$

Result (type 5, 87 leaves):

$$\frac{c^3\,(c\,x)^{4/3}\,\left(-5\,a^2-2\,a\,b\,x^2+3\,b^2\,x^4+5\,a^2\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b\,x^2}{a}\right]\right)}{12\,b^2\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 773: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 131 leaves, 4 steps):

$$\frac{c\,(c\,x)^{4/3}\,\left(a+b\,x^2\right)^{1/3}}{2\,b}+\frac{a\,c^{7/3}\,\text{ArcTan}\left[\frac{1+\frac{2\,b^{1/3}\,(c\,x)^{2/3}}{c^{2/3}\,\left(a+b\,x^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\,b^{5/3}}+\frac{a\,c^{7/3}\,\text{Log}\left[b^{1/3}\,(c\,x)^{2/3}-c^{2/3}\,\left(a+b\,x^2\right)^{1/3}\right]}{2\,b^{5/3}}$$

Result (type 5, 69 leaves):

$$\frac{c\,(c\,x)^{4/3}\,\left(a+b\,x^2-a\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b\,x^2}{a}\right]\right)}{2\,b\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 774: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 106 leaves, 3 steps):

$$-\frac{\sqrt{3}\,c^{1/3}\,\text{ArcTan}\left[\frac{1+\frac{2\,b^{1/3}\,(c\,x)^{2/3}}{c^{2/3}\,\left(a+b\,x^2\right)^{1/3}}}{\sqrt{3}}\right]}{2\,b^{2/3}}-\frac{3\,c^{1/3}\,\text{Log}\left[b^{1/3}\,(c\,x)^{2/3}-c^{2/3}\,\left(a+b\,x^2\right)^{1/3}\right]}{4\,b^{2/3}}$$

Result (type 5, 57 leaves):

$$\frac{3\,x\,(c\,x)^{1/3}\,\left(\frac{a+b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{b\,x^2}{a}\right]}{4\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 779: Result unnecessarily involves higher level functions.

$$\int \frac{(c x)^{10/3}}{\left(a+b x^2\right)^{2/3}} \, dx$$

Optimal (type 4, 421 leaves, 5 steps):

$$-\frac{7 a c^3 (c x)^{1/3} \left(a+b x^2\right)^{1/3}}{9 b^2}+\frac{c (c x)^{7/3} \left(a+b x^2\right)^{1/3}}{3 b}+\left(7 a c^{7/3} (c x)^{1/3} \left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right) \sqrt{\frac{c^{4/3}+\frac{b^{2/3} (c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}} \text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right], \frac{1}{4}\left(2+\sqrt{3}\right)\right]\right) \Bigg/ \left(18 \times 3^{1/4} b^2 \sqrt{-\frac{b^{1/3} (c x)^{2/3} \left(c^{2/3}-\frac{b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)}{\left(a+b x^2\right)^{1/3} \left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3} (c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 87 leaves):

$$\frac{c^3 (c x)^{1/3} \left(-7 a^2-4 a b x^2+3 b^2 x^4+7 a^2 \left(1+\frac{b x^2}{a}\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b x^2}{a}\right]\right)}{9 b^2 \left(a+b x^2\right)^{2/3}}$$

Problem 780: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 388 leaves, 4 steps):

$$\frac{c\,(c\,x)^{1/3}\left(a+b\,x^2\right)^{1/3}}{b}-\left(c^{1/3}\,(c\,x)^{1/3}\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{\left(a+b\,x^2\right)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$
$$\left(2\times 3^{1/4}\,b\,\sqrt{-\frac{b^{1/3}\,(c\,x)^{2/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)}{\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 66 leaves):

$$\frac{c\,(c\,x)^{1/3}\left(a+b\,x^2-a\left(1+\frac{b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b\,x^2}{a}\right]\right)}{b\left(a+b\,x^2\right)^{2/3}}$$

Problem 781: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 364 leaves, 3 steps):

$$\left(3^{3/4}\,(c\,x)^{1/3}\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{\left(a+b\,x^2\right)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$
$$\left(2\,a\,c^{5/3}\sqrt{-\frac{b^{1/3}\,(c\,x)^{2/3}\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)}{\left(a+b\,x^2\right)^{1/3}\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 55 leaves):

$$\frac{3\,x\left(\frac{a+b\,x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b\,x^2}{a}\right]}{(c\,x)^{2/3}\left(a+b\,x^2\right)^{2/3}}$$

Problem 782: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 394 leaves, 4 steps):

$$-\frac{3\,\left(a+b\,x^2\right)^{1/3}}{5\,a\,c\,(c\,x)^{5/3}}-\left(3\times 3^{3/4}\,b\,(c\,x)^{1/3}\,\left(a+b\,x^2\right)^{1/3}\,\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}\,(c\,x)^{4/3}}{\left(a+b\,x^2\right)^{2/3}}+\frac{b^{1/3}\,c^{2/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\;\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]\right)\Bigg/$$

$$\left(10\,a^2\,c^{11/3}\,\sqrt{-\frac{b^{1/3}\,(c\,x)^{2/3}\,\left(c^{2/3}-\frac{b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)}{\left(a+b\,x^2\right)^{1/3}\,\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right)\,b^{1/3}\,(c\,x)^{2/3}}{\left(a+b\,x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 72 leaves):

$$-\frac{3\,x\,\left(a+b\,x^2+3\,b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\,\frac{2}{3},\,\frac{7}{6},\,-\frac{b\,x^2}{a}\right]\right)}{5\,a\,(c\,x)^{8/3}\,\left(a+b\,x^2\right)^{2/3}}$$

Problem 783: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 425 leaves, 5 steps):

$$-\frac{3\left(a+b x^2\right)^{1/3}}{11 a c (c x)^{11/3}}+\frac{27 b\left(a+b x^2\right)^{1/3}}{55 a^2 c^3 (c x)^{5/3}}+\left(27\times 3^{3/4} b^2 (c x)^{1/3}\left(a+b x^2\right)^{1/3}\left(c^{2/3}-\frac{b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)\sqrt{\frac{c^{4/3}+\frac{b^{2/3}(c x)^{4/3}}{\left(a+b x^2\right)^{2/3}}+\frac{b^{1/3} c^{2/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcCos}\left[\frac{c^{2/3}-\frac{\left(1-\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}{c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(110 a^3 c^{17/3}\sqrt{-\frac{b^{1/3}(c x)^{2/3}\left(c^{2/3}-\frac{b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)}{\left(a+b x^2\right)^{1/3}\left(c^{2/3}-\frac{\left(1+\sqrt{3}\right) b^{1/3}(c x)^{2/3}}{\left(a+b x^2\right)^{1/3}}\right)^2}}\right)$$

Result (type 5, 93 leaves):

$$\frac{3 (c x)^{1/3}\left(-5 a^2+4 a b x^2+9 b^2 x^4+27 b^2 x^4\left(1+\frac{b x^2}{a}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{2}{3},\frac{7}{6},-\frac{b x^2}{a}\right]\right)}{55 a^2 c^5 x^4\left(a+b x^2\right)^{2/3}}$$

Problem 787: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 121 leaves, 5 steps):

$$-\frac{4 a^2 x\left(a+b x^2\right)^{1/4}}{77 b^2}+\frac{2 a x^3\left(a+b x^2\right)^{1/4}}{77 b}+\frac{2}{11} x^5\left(a+b x^2\right)^{1/4}+\frac{8 a^{7/2}\left(1+\frac{b x^2}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{77 b^{5/2}\left(a+b x^2\right)^{3/4}}$$

Result (type 5, 89 leaves):

$$\frac{2 x\left(-2 a^3-a^2 b x^2+8 a b^2 x^4+7 b^3 x^6+2 a^3\left(1+\frac{b x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{77 b^2\left(a+b x^2\right)^{3/4}}$$

Problem 788: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 97 leaves, 4 steps):

$$\frac{2 a x\left(a+b x^2\right)^{1/4}}{21 b}+\frac{2}{7} x^3\left(a+b x^2\right)^{1/4}-\frac{4 a^{5/2}\left(1+\frac{b x^2}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{21 b^{3/2}\left(a+b x^2\right)^{3/4}}$$

Result (type 5, 76 leaves):

$$\frac{2\,x\left(a^2+4\,a\,b\,x^2+3\,b^2\,x^4-a^2\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b\,x^2}{a}\right]\right)}{21\,b\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 789: Result unnecessarily involves higher level functions.

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

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

$$\frac{2}{3}\,x\,\left(a+b\,x^2\right)^{1/4}+\frac{2\,a^{3/2}\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{3\,\sqrt{b}\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 62 leaves):

$$\frac{2\,x\,\left(a+b\,x^2\right)+a\,x\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b\,x^2}{a}\right]}{3\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 790: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 72 leaves, 3 steps):

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

Result (type 5, 68 leaves):

$$-\frac{\left(a+b\,x^2\right)^{1/4}}{x}+\frac{b\,x\,\left(\frac{a+b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b\,x^2}{a}\right]}{2\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 791: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 99 leaves, 4 steps):

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

Result (type 5, 85 leaves):

$$\frac{-2 \left(2 a^2+3 a b x^2+b^2 x^4\right)-b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]}{12 a x^3 \left(a+b x^2\right)^{3/4}}$$

Problem 792: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 123 leaves, 5 steps):

$$-\frac{\left(a+b x^2\right)^{1/4}}{5 x^5}-\frac{b \left(a+b x^2\right)^{1/4}}{30 a x^3}+\frac{b^2 \left(a+b x^2\right)^{1/4}}{12 a^2 x}+\frac{b^{5/2} \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{12 a^{3/2} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\frac{-24 a^3-28 a^2 b x^2+6 a b^2 x^4+10 b^3 x^6+5 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]}{120 a^2 x^5 \left(a+b x^2\right)^{3/4}}$$

Problem 793: Result unnecessarily involves higher level functions.

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

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

$$-\frac{4 a^2 x \left(a-b x^2\right)^{1/4}}{77 b^2}-\frac{2 a x^3 \left(a-b x^2\right)^{1/4}}{77 b}+\frac{2}{11} x^5 \left(a-b x^2\right)^{1/4}+\frac{8 a^{7/2} \left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{77 b^{5/2} \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 89 leaves):

$$\frac{2 x \left(-2 a^3+a^2 b x^2+8 a b^2 x^4-7 b^3 x^6+2 a^3 \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{77 b^2 \left(a-b x^2\right)^{3/4}}$$

Problem 794: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 101 leaves, 4 steps):

$$-\frac{2 a x \left(a-b x^2\right)^{1/4}}{21 b}+\frac{2}{7} x^3 \left(a-b x^2\right)^{1/4}+\frac{4 a^{5/2} \left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{21 b^{3/2} \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 79 leaves):

$$\frac{2 \left(-a^2 x+4 a b x^3-3 b^2 x^5+a^2 x \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{21 b \left(a-b x^2\right)^{3/4}}$$

Problem 795: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 78 leaves, 3 steps):

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

Result (type 5, 63 leaves):

$$\frac{2 a x-2 b x^3+a x \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{3 \left(a-b x^2\right)^{3/4}}$$

Problem 796: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 76 leaves, 3 steps):

$$-\frac{\left(a-b x^2\right)^{1/4}}{x}-\frac{\sqrt{a} \sqrt{b} \left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{\left(a-b x^2\right)^{3/4}}$$

Result (type 5, 70 leaves):

$$-\frac{\left(a-b x^2\right)^{1/4}}{x}-\frac{b x \left(\frac{a-b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{2 \left(a-b x^2\right)^{3/4}}$$

Problem 797: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 84 leaves):

$$\frac{-4 a^2+6 a b x^2-2 b^2 x^4-b^2 x^4 \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{12 a x^3 \left(a-b x^2\right)^{3/4}}$$

Problem 798: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 128 leaves, 5 steps):

$$-\frac{\left(a-b x^2\right)^{1/4}}{5 x^5}+\frac{b \left(a-b x^2\right)^{1/4}}{30 a x^3}+\frac{b^2 \left(a-b x^2\right)^{1/4}}{12 a^2 x}-\frac{b^{5/2} \left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{12 a^{3/2} \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 95 leaves):

$$\frac{-24 a^3+28 a^2 b x^2+6 a b^2 x^4-10 b^3 x^6-5 b^3 x^6 \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{120 a^2 x^5 \left(a-b x^2\right)^{3/4}}$$

Problem 799: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 143 leaves, 6 steps):

$$\frac{8 a^3 x}{65 b^2 \left(a+b x^2\right)^{1/4}}-\frac{4 a^2 x \left(a+b x^2\right)^{3/4}}{65 b^2}+\frac{2 a x^3 \left(a+b x^2\right)^{3/4}}{39 b}+\frac{2}{13} x^5 \left(a+b x^2\right)^{3/4}-\frac{8 a^{7/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{65 b^{5/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 89 leaves):

$$\frac{2 x \left(-6 a^3-a^2 b x^2+20 a b^2 x^4+15 b^3 x^6+6 a^3 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{195 b^2 \left(a+b x^2\right)^{1/4}}$$

Problem 800: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 119 leaves, 5 steps):

$$-\frac{4 a^2 x}{15 b \left(a+b x^2\right)^{1/4}}+\frac{2 a x \left(a+b x^2\right)^{3/4}}{15 b}+\frac{2}{9} x^3 \left(a+b x^2\right)^{3/4}+\frac{4 a^{5/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{15 b^{3/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 78 leaves):

$$\frac{2 x \left(3 a^2+8 a b x^2+5 b^2 x^4-3 a^2 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{45 b \left(a+b x^2\right)^{1/4}}$$

Problem 801: Result unnecessarily involves higher level functions.

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

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

$$\frac{6 a x}{5 \left(a+b x^2\right)^{1/4}}+\frac{2}{5} x \left(a+b x^2\right)^{3/4}-\frac{6 a^{3/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{5 \sqrt{b} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 63 leaves):

$$\frac{2 x \left(a+b x^2\right)+3 a x \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{5 \left(a+b x^2\right)^{1/4}}$$

Problem 802: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 88 leaves, 4 steps):

$$\frac{3 b x}{\left(a+b x^2\right)^{1/4}}-\frac{\left(a+b x^2\right)^{3/4}}{x}-\frac{3 \sqrt{a} \sqrt{b} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{\left(a+b x^2\right)^{1/4}}$$

Result (type 5, 68 leaves):

$$-\frac{\left(a+b x^2\right)^{3/4}}{x}+\frac{3 b x \left(\frac{a+b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^2}{a}\right]}{2 \left(a+b x^2\right)^{1/4}}$$

Problem 803: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 121 leaves, 5 steps):

$$\frac{b^2 x}{2 a \left(a+b x^2\right)^{1/4}}-\frac{\left(a+b x^2\right)^{3/4}}{3 x^3}-\frac{b \left(a+b x^2\right)^{3/4}}{2 a x}-\frac{b^{3/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{2 \sqrt{a} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 88 leaves):

$$\left(-\frac{1}{3 x^3}-\frac{b}{2 a x}\right) \left(a+b x^2\right)^{3/4}+\frac{b^2 x \left(\frac{a+b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^2}{a}\right]}{4 a \left(a+b x^2\right)^{1/4}}$$

Problem 804: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 145 leaves, 6 steps):

$$-\frac{3 b^3 x}{20 a^2 \left(a+b x^2\right)^{1/4}}-\frac{\left(a+b x^2\right)^{3/4}}{5 x^5}-\frac{b \left(a+b x^2\right)^{3/4}}{10 a x^3}+\frac{3 b^2 \left(a+b x^2\right)^{3/4}}{20 a^2 x}+\frac{3 b^{5/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{20 a^{3/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 94 leaves) :

$$\frac{-8 a^3-12 a^2 b x^2+2 a b^2 x^4+6 b^3 x^6-3 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{40 a^2 x^5 \left(a+b x^2\right)^{1/4}}$$

Problem 805: Result unnecessarily involves higher level functions.

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

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

$$-\frac{4 a^2 x \left(a-b x^2\right)^{3/4}}{65 b^2}-\frac{2 a x^3 \left(a-b x^2\right)^{3/4}}{39 b}+\frac{2}{13} x^5 \left(a-b x^2\right)^{3/4}+\frac{8 a^{7/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{65 b^{5/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 89 leaves) :

$$\frac{2 x \left(-6 a^3+a^2 b x^2+20 a b^2 x^4-15 b^3 x^6+6 a^3 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{195 b^2 \left(a-b x^2\right)^{1/4}}$$

Problem 806: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 101 leaves, 4 steps) :

$$-\frac{2 a x \left(a-b x^2\right)^{3/4}}{15 b}+\frac{2}{9} x^3 \left(a-b x^2\right)^{3/4}+\frac{4 a^{5/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{15 b^{3/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 80 leaves) :

$$\frac{2 \left(-3 a^2 x+8 a b x^3-5 b^2 x^5+3 a^2 x \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{45 b \left(a-b x^2\right)^{1/4}}$$

Problem 807: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 78 leaves, 3 steps) :

$$\frac{2}{5} x \left(a-b x^2\right)^{3/4}+\frac{6 a^{3/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{5 \sqrt{b} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 64 leaves):

$$\frac{2 a x-2 b x^3+3 a x \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{5 \left(a-b x^2\right)^{1/4}}$$

Problem 808: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 76 leaves, 3 steps):

$$-\frac{\left(a-b x^2\right)^{3/4}}{x}-\frac{3 \sqrt{a} \sqrt{b} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 70 leaves):

$$-\frac{\left(a-b x^2\right)^{3/4}}{x}-\frac{3 b x \left(\frac{a-b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{2 \left(a-b x^2\right)^{1/4}}$$

Problem 809: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a-b x^2\right)^{3/4}}{3 x^3}+\frac{b \left(a-b x^2\right)^{3/4}}{2 a x}+\frac{b^{3/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{2 \sqrt{a} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 84 leaves):

$$\frac{-4 a^2+10 a b x^2-6 b^2 x^4+3 b^2 x^4 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{12 a x^3 \left(a-b x^2\right)^{1/4}}$$

Problem 810: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 128 leaves, 5 steps):

$$-\frac{\left(a-b x^2\right)^{3/4}}{5 x^5}+\frac{b \left(a-b x^2\right)^{3/4}}{10 a x^3}+\frac{3 b^2 \left(a-b x^2\right)^{3/4}}{20 a^2 x}+\frac{3 b^{5/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{20 a^{3/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 95 leaves):

$$\frac{-8 a^3+12 a^2 b x^2+2 a b^2 x^4-6 b^3 x^6+3 b^3 x^6 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{40 a^2 x^5 \left(a-b x^2\right)^{1/4}}$$

Problem 811: Result unnecessarily involves higher level functions.

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

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

$$\frac{10}{21} a x \left(a+b x^2\right)^{1/4}+\frac{2}{7} x \left(a+b x^2\right)^{5/4}+\frac{10 a^{5/2} \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{21 \sqrt{b} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 76 leaves):

$$\frac{16 a^2 x+22 a b x^3+6 b^2 x^5+5 a^2 x \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]}{21 \left(a+b x^2\right)^{3/4}}$$

Problem 812: Result unnecessarily involves higher level functions.

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

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

$$\frac{10}{21} a x \left(a-b x^2\right)^{1/4}+\frac{2}{7} x \left(a-b x^2\right)^{5/4}+\frac{10 a^{5/2} \left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{21 \sqrt{b} \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 77 leaves):

$$\frac{16\,a^2\,x-22\,a\,b\,x^3+6\,b^2\,x^5+5\,a^2\,x\,\left(1-\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b\,x^2}{a}\right]}{21\,\left(a-b\,x^2\right)^{3/4}}$$

Problem 813: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 111 leaves, 5 steps):

$$\frac{14\,a^2\,x}{15\,\left(a+b\,x^2\right)^{1/4}}+\frac{14}{45}\,a\,x\,\left(a+b\,x^2\right)^{3/4}+\frac{2}{9}\,x\,\left(a+b\,x^2\right)^{7/4}-\frac{14\,a^{5/2}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{15\,\sqrt{b}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 76 leaves):

$$\frac{24\,a^2\,x+34\,a\,b\,x^3+10\,b^2\,x^5+21\,a^2\,x\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b\,x^2}{a}\right]}{45\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 814: Result unnecessarily involves higher level functions.

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

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

$$\frac{14}{45}\,a\,x\,\left(a-b\,x^2\right)^{3/4}+\frac{2}{9}\,x\,\left(a-b\,x^2\right)^{7/4}+\frac{14\,a^{5/2}\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{15\,\sqrt{b}\,\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 77 leaves):

$$\frac{24\,a^2\,x-34\,a\,b\,x^3+10\,b^2\,x^5+21\,a^2\,x\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b\,x^2}{a}\right]}{45\,\left(a-b\,x^2\right)^{1/4}}$$

Problem 815: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 146 leaves, 6 steps):

$$-\frac{16\,a^3\,x}{39\,b^3\,\left(a+b\,x^2\right)^{1/4}}+\frac{8\,a^2\,x\,\left(a+b\,x^2\right)^{3/4}}{39\,b^3}-\frac{20\,a\,x^3\,\left(a+b\,x^2\right)^{3/4}}{117\,b^2}+\frac{2\,x^5\,\left(a+b\,x^2\right)^{3/4}}{13\,b}+\frac{16\,a^{7/2}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{39\,b^{7/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 90 leaves):

$$\frac{2\,\left(12\,a^3\,x+2\,a^2\,b\,x^3-a\,b^2\,x^5+9\,b^3\,x^7-12\,a^3\,x\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{117\,b^3\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 816: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 122 leaves, 5 steps):

$$\frac{8\,a^2\,x}{15\,b^2\,\left(a+b\,x^2\right)^{1/4}}-\frac{4\,a\,x\,\left(a+b\,x^2\right)^{3/4}}{15\,b^2}+\frac{2\,x^3\,\left(a+b\,x^2\right)^{3/4}}{9\,b}-\frac{8\,a^{5/2}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{15\,b^{5/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 79 leaves):

$$\frac{2\,\left(-6\,a^2\,x-a\,b\,x^3+5\,b^2\,x^5+6\,a^2\,x\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{45\,b^2\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 817: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 98 leaves, 4 steps):

$$-\frac{4\,a\,x}{5\,b\,\left(a+b\,x^2\right)^{1/4}}+\frac{2\,x\,\left(a+b\,x^2\right)^{3/4}}{5\,b}+\frac{4\,a^{3/2}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{5\,b^{3/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 62 leaves):

$$\frac{2\,x\,\left(a+b\,x^2-a\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{5\,b\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 818: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 71 leaves, 3 steps):

$$\frac{2 x}{\left(a+b x^2\right)^{1/4}}-\frac{2 \sqrt{a} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{\sqrt{b} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 47 leaves):

$$\frac{x \left(\frac{a+b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^2}{a}\right]}{\left(a+b x^2\right)^{1/4}}$$

Problem 819: Result unnecessarily involves higher level functions.

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

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

$$\frac{b x}{a \left(a+b x^2\right)^{1/4}}-\frac{\left(a+b x^2\right)^{3/4}}{a x}-\frac{\sqrt{b} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{\sqrt{a} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 69 leaves):

$$\frac{-2 \left(a+b x^2\right)+b x^2 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^2}{a}\right]}{2 a x \left(a+b x^2\right)^{1/4}}$$

Problem 820: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 124 leaves, 5 steps):

$$-\frac{b^2 x}{2 a^2 \left(a+b x^2\right)^{1/4}}-\frac{\left(a+b x^2\right)^{3/4}}{3 a x^3}+\frac{b \left(a+b x^2\right)^{3/4}}{2 a^2 x}+\frac{b^{3/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{2 a^{3/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 83 leaves):

$$\frac{-4 a^2+2 a b x^2+6 b^2 x^4-3 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{12 a^2 x^3 \left(a+b x^2\right)^{1/4}}$$

Problem 821: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 148 leaves, 6 steps):

$$\frac{7 b^3 x}{20 a^3 \left(a+b x^2\right)^{1/4}}-\frac{\left(a+b x^2\right)^{3/4}}{5 a x^5}+\frac{7 b \left(a+b x^2\right)^{3/4}}{30 a^2 x^3}-\frac{7 b^2 \left(a+b x^2\right)^{3/4}}{20 a^3 x}-\frac{7 b^{5/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{20 a^{5/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 94 leaves):

$$\frac{-24 a^3+4 a^2 b x^2-14 a b^2 x^4-42 b^3 x^6+21 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{120 a^3 x^5 \left(a+b x^2\right)^{1/4}}$$

Problem 822: Result unnecessarily involves higher level functions.

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

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

$$-\frac{8 a^2 x \left(a-b x^2\right)^{3/4}}{39 b^3}-\frac{20 a x^3 \left(a-b x^2\right)^{3/4}}{117 b^2}-\frac{2 x^5 \left(a-b x^2\right)^{3/4}}{13 b}+\frac{16 a^{7/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{39 b^{7/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 89 leaves):

$$\frac{2 x \left(-12 a^3+2 a^2 b x^2+a b^2 x^4+9 b^3 x^6+12 a^3 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{117 b^3 \left(a-b x^2\right)^{1/4}}$$

Problem 823: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 104 leaves, 4 steps):

$$-\frac{4\,a\,x\,\left(a-b\,x^2\right)^{3/4}}{15\,b^2}-\frac{2\,x^3\,\left(a-b\,x^2\right)^{3/4}}{9\,b}+\frac{8\,a^{5/2}\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{15\,b^{5/2}\,\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 79 leaves):

$$\frac{2\,\left(-6\,a^2\,x+a\,b\,x^3+5\,b^2\,x^5+6\,a^2\,x\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,\frac{b\,x^2}{a}\right]\right)}{45\,b^2\,\left(a-b\,x^2\right)^{1/4}}$$

Problem 824: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 81 leaves, 3 steps):

$$-\frac{2\,x\,\left(a-b\,x^2\right)^{3/4}}{5\,b}+\frac{4\,a^{3/2}\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{5\,b^{3/2}\,\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 64 leaves):

$$\frac{2\,x\,\left(-a+b\,x^2+a\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,\frac{b\,x^2}{a}\right]\right)}{5\,b\,\left(a-b\,x^2\right)^{1/4}}$$

Problem 825: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 58 leaves, 2 steps):

$$\frac{2\,\sqrt{a}\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{\sqrt{b}\,\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 48 leaves):

$$\frac{x\,\left(\frac{a-b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,\frac{b\,x^2}{a}\right]}{\left(a-b\,x^2\right)^{1/4}}$$

Problem 826: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 79 leaves, 3 steps):

$$-\frac{\left(a-b x^2\right)^{3/4}}{a x}-\frac{\sqrt{b}\,\left(1-\frac{b x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 71 leaves):

$$\frac{-2 a+2 b x^2-b x^2 \left(1-\frac{b x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{2 a x \left(a-b x^2\right)^{1/4}}$$

Problem 827: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a-b x^2\right)^{3/4}}{3 a x^3}-\frac{b \left(a-b x^2\right)^{3/4}}{2 a^2 x}-\frac{b^{3/2}\,\left(1-\frac{b x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{2 a^{3/2}\,\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 84 leaves):

$$\frac{-4 a^2-2 a b x^2+6 b^2 x^4-3 b^2 x^4 \left(1-\frac{b x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{12 a^2 x^3 \left(a-b x^2\right)^{1/4}}$$

Problem 828: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a-b x^2\right)^{3/4}}{5 a x^5}-\frac{7 b \left(a-b x^2\right)^{3/4}}{30 a^2 x^3}-\frac{7 b^2 \left(a-b x^2\right)^{3/4}}{20 a^3 x}-\frac{7 b^{5/2}\,\left(1-\frac{b x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{20 a^{5/2}\,\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 95 leaves):

$$\frac{-24 a^3-4 a^2 b x^2-14 a b^2 x^4+42 b^3 x^6-21 b^3 x^6 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{120 a^3 x^5 \left(a-b x^2\right)^{1/4}}$$

Problem 829: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 124 leaves, 5 steps):

$$\frac{40 a^2 x \left(a+b x^2\right)^{1/4}}{77 b^3}-\frac{20 a x^3 \left(a+b x^2\right)^{1/4}}{77 b^2}+\frac{2 x^5 \left(a+b x^2\right)^{1/4}}{11 b}-\frac{80 a^{7/2} \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{77 b^{7/2} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 90 leaves):

$$\frac{2 \left(20 a^3 x+10 a^2 b x^3-3 a b^2 x^5+7 b^3 x^7-20 a^3 x \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{77 b^3 \left(a+b x^2\right)^{3/4}}$$

Problem 830: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 100 leaves, 4 steps):

$$-\frac{4 a x \left(a+b x^2\right)^{1/4}}{7 b^2}+\frac{2 x^3 \left(a+b x^2\right)^{1/4}}{7 b}+\frac{8 a^{5/2} \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{7 b^{5/2} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 78 leaves):

$$\frac{2 \left(-2 a^2 x-a b x^3+b^2 x^5+2 a^2 x \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{7 b^2 \left(a+b x^2\right)^{3/4}}$$

Problem 831: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 78 leaves, 3 steps):

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

Result (type 5, 62 leaves):

$$\frac{2\,x\,\left(a+b\,x^2-a\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{3}{4},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]\right)}{3\,b\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 832: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 56 leaves, 2 steps):

$$\frac{2\,\sqrt{a}\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{\sqrt{b}\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 47 leaves):

$$\frac{x\,\left(\frac{a+b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{3}{4},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{\left(a+b\,x^2\right)^{3/4}}$$

Problem 833: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 76 leaves, 3 steps):

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

Result (type 5, 70 leaves):

$$\frac{-2\,\left(a+b\,x^2\right)-b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{3}{4},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{2\,a\,x\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 834: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a+b x^2\right)^{1/4}}{3 a x^3}+\frac{5 b \left(a+b x^2\right)^{1/4}}{6 a^2 x}+\frac{5 b^{3/2} \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{6 a^{3/2} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 83 leaves):

$$\frac{-4 a^2+6 a b x^2+10 b^2 x^4+5 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]}{12 a^2 x^3 \left(a+b x^2\right)^{3/4}}$$

Problem 835: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a+b x^2\right)^{1/4}}{5 a x^5}+\frac{3 b \left(a+b x^2\right)^{1/4}}{10 a^2 x^3}-\frac{3 b^2 \left(a+b x^2\right)^{1/4}}{4 a^3 x}-\frac{3 b^{5/2} \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{4 a^{5/2} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\frac{-8 a^3+4 a^2 b x^2-18 a b^2 x^4-30 b^3 x^6-15 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]}{40 a^3 x^5 \left(a+b x^2\right)^{3/4}}$$

Problem 836: Result unnecessarily involves higher level functions.

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

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

$$-\frac{40 a^2 x \left(a-b x^2\right)^{1/4}}{77 b^3}-\frac{20 a x^3 \left(a-b x^2\right)^{1/4}}{77 b^2}-\frac{2 x^5 \left(a-b x^2\right)^{1/4}}{11 b}+\frac{80 a^{7/2} \left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{77 b^{7/2} \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\frac{2\left(-20\,a^3\,x+10\,a^2\,b\,x^3+3\,a\,b^2\,x^5+7\,b^3\,x^7+20\,a^3\,x\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b\,x^2}{a}\right]\right)}{77\,b^3\left(a-b\,x^2\right)^{3/4}}$$

Problem 837: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 104 leaves, 4 steps):

$$-\frac{4\,a\,x\left(a-b\,x^2\right)^{1/4}}{7\,b^2}-\frac{2\,x^3\left(a-b\,x^2\right)^{1/4}}{7\,b}+\frac{8\,a^{5/2}\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{7\,b^{5/2}\left(a-b\,x^2\right)^{3/4}}$$

Result (type 5, 77 leaves):

$$\frac{2\,x\left(-2\,a^2+a\,b\,x^2+b^2\,x^4+2\,a^2\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b\,x^2}{a}\right]\right)}{7\,b^2\left(a-b\,x^2\right)^{3/4}}$$

Problem 838: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 81 leaves, 3 steps):

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

Result (type 5, 64 leaves):

$$\frac{2\,x\left(-a+b\,x^2+a\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b\,x^2}{a}\right]\right)}{3\,b\left(a-b\,x^2\right)^{3/4}}$$

Problem 839: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 58 leaves, 2 steps):

$$\frac{2\sqrt{a}\left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{b}\left(a-b x^2\right)^{3/4}}$$

Result (type 5, 48 leaves):

$$\frac{x\left(\frac{a-b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{\left(a-b x^2\right)^{3/4}}$$

Problem 840: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 78 leaves, 3 steps):

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

Result (type 5, 70 leaves):

$$\frac{-2 a+2 b x^2+b x^2\left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{2 a x\left(a-b x^2\right)^{3/4}}$$

Problem 841: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a-b x^2\right)^{1/4}}{3 a x^3}-\frac{5 b\left(a-b x^2\right)^{1/4}}{6 a^2 x}+\frac{5 b^{3/2}\left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{6 a^{3/2}\left(a-b x^2\right)^{3/4}}$$

Result (type 5, 84 leaves):

$$\frac{-4 a^2-6 a b x^2+10 b^2 x^4+5 b^2 x^4\left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{12 a^2 x^3\left(a-b x^2\right)^{3/4}}$$

Problem 842: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(a-b x^2\right)^{1/4}}{5 a x^5}-\frac{3 b \left(a-b x^2\right)^{1/4}}{10 a^2 x^3}-\frac{3 b^2 \left(a-b x^2\right)^{1/4}}{4 a^3 x}+\frac{3 b^{5/2} \left(1-\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{4 a^{5/2} \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 95 leaves):

$$\frac{-8 a^3-4 a^2 b x^2-18 a b^2 x^4+30 b^3 x^6+15 b^3 x^6 \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{40 a^3 x^5 \left(a-b x^2\right)^{3/4}}$$

Problem 843: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 124 leaves, 5 steps):

$$\frac{8 a^2 x}{3 b^3 \left(a+b x^2\right)^{1/4}}-\frac{4 a x^3}{9 b^2 \left(a+b x^2\right)^{1/4}}+\frac{2 x^5}{9 b \left(a+b x^2\right)^{1/4}}-\frac{16 a^{5/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{3 b^{7/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 78 leaves):

$$\frac{2 \left(-12 a^2 x-2 a b x^3+b^2 x^5+12 a^2 x \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{9 b^3 \left(a+b x^2\right)^{1/4}}$$

Problem 844: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 100 leaves, 4 steps):

$$-\frac{12 a x}{5 b^2 \left(a+b x^2\right)^{1/4}}+\frac{2 x^3}{5 b \left(a+b x^2\right)^{1/4}}+\frac{24 a^{3/2} \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{5 b^{5/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 64 leaves):

$$\frac{2\,x\left(6\,a+b\,x^2-6\,a\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b\,x^2}{a}\right]\right)}{5\,b^2\left(a+b\,x^2\right)^{1/4}}$$

Problem 845: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 74 leaves, 3 steps):

$$\frac{2\,x}{b\left(a+b\,x^2\right)^{1/4}}-\frac{4\,\sqrt{a}\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{b^{3/2}\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 53 leaves):

$$\frac{2\,x\left(-1+\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b\,x^2}{a}\right]\right)}{b\left(a+b\,x^2\right)^{1/4}}$$

Problem 846: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 56 leaves, 2 steps):

$$\frac{2\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,\sqrt{b}\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 55 leaves):

$$\frac{2\,x-x\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b\,x^2}{a}\right]}{a\left(a+b\,x^2\right)^{1/4}}$$

Problem 847: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 76 leaves, 3 steps):

$$-\frac{1}{a\,x\,\left(a+b\,x^2\right)^{1/4}}-\frac{3\,\sqrt{b}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{a^{3/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 71 leaves):

$$\frac{-2\,\left(a+3\,b\,x^2\right)+3\,b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{2\,a^2\,x\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 848: Result unnecessarily involves higher level functions.

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

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

$$-\frac{1}{3\,a\,x^3\,\left(a+b\,x^2\right)^{1/4}}+\frac{7\,b}{6\,a^2\,x\,\left(a+b\,x^2\right)^{1/4}}+\frac{7\,b^{3/2}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{2\,a^{5/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 83 leaves):

$$\frac{-4\,a^2+14\,a\,b\,x^2+42\,b^2\,x^4-21\,b^2\,x^4\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{12\,a^3\,x^3\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 849: Result unnecessarily involves higher level functions.

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

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

$$-\frac{1}{5\,a\,x^5\,\left(a+b\,x^2\right)^{1/4}}+\frac{11\,b}{30\,a^2\,x^3\,\left(a+b\,x^2\right)^{1/4}}-\frac{77\,b^2}{60\,a^3\,x\,\left(a+b\,x^2\right)^{1/4}}-\frac{77\,b^{5/2}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{20\,a^{7/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 94 leaves):

$$\frac{-24\,a^3+44\,a^2\,b\,x^2-154\,a\,b^2\,x^4-462\,b^3\,x^6+231\,b^3\,x^6\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{120\,a^4\,x^5\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 850: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 124 leaves, 5 steps):

$$\frac{2 x^5}{b \left(a-b x^2\right)^{1/4}}+\frac{8 a x \left(a-b x^2\right)^{3/4}}{3 b^3}+\frac{20 x^3 \left(a-b x^2\right)^{3/4}}{9 b^2}-\frac{16 a^{5/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{3 b^{7/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 78 leaves):

$$-\frac{2 x \left(-12 a^2+2 a b x^2+b^2 x^4+12 a^2 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, \frac{b x^2}{a}\right]\right)}{9 b^3 \left(a-b x^2\right)^{1/4}}$$

Problem 851: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 101 leaves, 4 steps):

$$\frac{2 x^3}{b \left(a-b x^2\right)^{1/4}}+\frac{12 x \left(a-b x^2\right)^{3/4}}{5 b^2}-\frac{24 a^{3/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{5 b^{5/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 65 leaves):

$$-\frac{2 x \left(-6 a+b x^2+6 a \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{3}{2}, \frac{b x^2}{a}\right]\right)}{5 b^2 \left(a-b x^2\right)^{1/4}}$$

Problem 852: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 77 leaves, 3 steps):

$$\frac{2 x}{b \left(a-b x^2\right)^{1/4}}-\frac{4 \sqrt{a} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{b^{3/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 54 leaves):

$$-\frac{2\,x\left(-1+\left(1-\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b\,x^2}{a}\right]\right)}{b\left(a-b\,x^2\right)^{1/4}}$$

Problem 853: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 77 leaves, 3 steps):

$$\frac{2\,x}{a\left(a-b\,x^2\right)^{1/4}}-\frac{2\left(1-\frac{b\,x^2}{a}\right)^{1/4}\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,\sqrt{b}\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 54 leaves):

$$-\frac{x\left(-2+\left(1-\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b\,x^2}{a}\right]\right)}{a\left(a-b\,x^2\right)^{1/4}}$$

Problem 854: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 99 leaves, 4 steps):

$$\frac{2}{a\,x\left(a-b\,x^2\right)^{1/4}}-\frac{3\left(a-b\,x^2\right)^{3/4}}{a^2\,x}-\frac{3\,\sqrt{b}\left(1-\frac{b\,x^2}{a}\right)^{1/4}\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{a^{3/2}\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 71 leaves):

$$\frac{-2\,a+6\,b\,x^2-3\,b\,x^2\left(1-\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b\,x^2}{a}\right]}{2\,a^2\,x\left(a-b\,x^2\right)^{1/4}}$$

Problem 855: Result unnecessarily involves higher level functions.

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

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

$$\frac{2}{a x^3 \left(a-b x^2\right)^{1/4}}-\frac{7 \left(a-b x^2\right)^{3/4}}{3 a^2 x^3}-\frac{7 b \left(a-b x^2\right)^{3/4}}{2 a^3 x}-\frac{7 b^{3/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{2 a^{5/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 84 leaves):

$$\frac{-4 a^2-14 a b x^2+42 b^2 x^4-21 b^2 x^4 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{12 a^3 x^3 \left(a-b x^2\right)^{1/4}}$$

Problem 856: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 151 leaves, 6 steps):

$$\frac{2}{a x^5 \left(a-b x^2\right)^{1/4}}-\frac{11 \left(a-b x^2\right)^{3/4}}{5 a^2 x^5}-\frac{77 b \left(a-b x^2\right)^{3/4}}{30 a^3 x^3}-\frac{77 b^2 \left(a-b x^2\right)^{3/4}}{20 a^4 x}-\frac{77 b^{5/2} \left(1-\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{20 a^{7/2} \left(a-b x^2\right)^{1/4}}$$

Result (type 5, 95 leaves):

$$\frac{-24 a^3-44 a^2 b x^2-154 a b^2 x^4+462 b^3 x^6-231 b^3 x^6 \left(1-\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{120 a^4 x^5 \left(a-b x^2\right)^{1/4}}$$

Problem 857: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 78 leaves, 3 steps):

$$\frac{2 x}{3 a \left(a+b x^2\right)^{3/4}}+\frac{2 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{3 \sqrt{a} \sqrt{b} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 55 leaves):

$$\frac{x \left(2+\left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{3 a \left(a+b x^2\right)^{3/4}}$$

Problem 858: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 78 leaves, 3 steps):

$$\frac{2 x}{5 a \left(a+b x^2\right)^{5/4}}+\frac{6 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} \, x}{\sqrt{a}}\right],2\right]}{5 a^{3/2} \sqrt{b} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 72 leaves):

$$\frac{8 a x+6 b x^3-3 x \left(a+b x^2\right) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{5 a^2 \left(a+b x^2\right)^{5/4}}$$

Problem 859: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 97 leaves, 4 steps):

$$\frac{2 x}{7 a \left(a+b x^2\right)^{7/4}}+\frac{10 x}{21 a^2 \left(a+b x^2\right)^{3/4}}+\frac{10 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} \, x}{\sqrt{a}}\right],2\right]}{21 a^{3/2} \sqrt{b} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 75 leaves):

$$\frac{2 x \left(8 a+5 b x^2\right)+5 x \left(a+b x^2\right) \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{b x^2}{a}\right]}{21 a^2 \left(a+b x^2\right)^{7/4}}$$

Problem 860: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 81 leaves, 3 steps):

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

Result (type 5, 56 leaves):

$$\frac{x\left(2+\left(1-\frac{b x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{3 a\left(a-b x^2\right)^{3/4}}$$

Problem 861: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 101 leaves, 4 steps):

$$\frac{2 x}{5 a\left(a-b x^2\right)^{5/4}}+\frac{6 x}{5 a^2\left(a-b x^2\right)^{1/4}}-\frac{6\left(1-\frac{b x^2}{a}\right)^{1/4}\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5 a^{3/2}\sqrt{b}\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 74 leaves):

$$\frac{8 a x-6 b x^3-3 x\left(a-b x^2\right)\left(1-\frac{b x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{5 a^2\left(a-b x^2\right)^{5/4}}$$

Problem 862: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 101 leaves, 4 steps):

$$\frac{2 x}{7 a\left(a-b x^2\right)^{7/4}}+\frac{10 x}{21 a^2\left(a-b x^2\right)^{3/4}}+\frac{10\left(1-\frac{b x^2}{a}\right)^{3/4}\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{21 a^{3/2}\sqrt{b}\left(a-b x^2\right)^{3/4}}$$

Result (type 5, 77 leaves):

$$\frac{2 x\left(8 a-5 b x^2\right)+5 x\left(a-b x^2\right)\left(1-\frac{b x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{b x^2}{a}\right]}{21 a^2\left(a-b x^2\right)^{7/4}}$$

Problem 863: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 99 leaves, 5 steps):

$$-\frac{128 x}{1053 \left(2+3 x^2\right)^{1/4}}+\frac{32 x \left(2+3 x^2\right)^{3/4}}{1053}-\frac{40 x^3 \left(2+3 x^2\right)^{3/4}}{1053}+\frac{2}{39} x^5 \left(2+3 x^2\right)^{3/4}+\frac{128\times 2^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{1053 \sqrt{3}}$$

Result (type 5, 54 leaves):

$$\frac{2 x \left(\left(2+3 x^2\right)^{3/4} \left(16-20 x^2+27 x^4\right)-16\times 2^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3 x^2}{2}\right]\right)}{1053}$$

Problem 864: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 81 leaves, 4 steps):

$$\frac{32 x}{135 \left(2+3 x^2\right)^{1/4}}-\frac{8}{135} x \left(2+3 x^2\right)^{3/4}+\frac{2}{27} x^3 \left(2+3 x^2\right)^{3/4}-\frac{32\times 2^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{135 \sqrt{3}}$$

Result (type 5, 49 leaves):

$$\frac{2}{135} x \left(\left(2+3 x^2\right)^{3/4} \left(-4+5 x^2\right)+4\times 2^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3 x^2}{2}\right]\right)$$

Problem 865: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 63 leaves, 3 steps):

$$-\frac{8 x}{15 \left(2+3 x^2\right)^{1/4}}+\frac{2}{15} x \left(2+3 x^2\right)^{3/4}+\frac{8\times 2^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{15 \sqrt{3}}$$

Result (type 5, 41 leaves):

$$\frac{2}{15} x \left(\left(2+3 x^2\right)^{3/4}-2^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3 x^2}{2}\right]\right)$$

Problem 866: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 43 leaves, 2 steps):

$$\frac{2 x}{\left(2+3 x^2\right)^{1/4}}-\frac{2\times 2^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{\sqrt{3}}$$

Result (type 5, 24 leaves):

$$\frac{x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3 x^2}{2}\right]}{2^{1/4}}$$

Problem 867: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 63 leaves, 3 steps):

$$\frac{3 x}{2\left(2+3 x^2\right)^{1/4}}-\frac{\left(2+3 x^2\right)^{3/4}}{2 x}-\frac{\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{2^{3/4}}$$

Result (type 5, 46 leaves):

$$-\frac{\left(2+3 x^2\right)^{3/4}}{2 x}+\frac{3 x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3 x^2}{2}\right]}{4\times 2^{1/4}}$$

Problem 868: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 83 leaves, 4 steps):

$$-\frac{9\,x}{8\,\left(2+3\,x^2\right)^{1/4}}-\frac{\left(2+3\,x^2\right)^{3/4}}{6\,x^3}+\frac{3\,\left(2+3\,x^2\right)^{3/4}}{8\,x}+\frac{3\,\sqrt{3}\;\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\;x\right],\,2\right]}{4\times 2^{3/4}}$$

Result (type 5, 55 leaves):

$$\left(-\frac{1}{6\,x^3}+\frac{3}{8\,x}\right)\,\left(2+3\,x^2\right)^{3/4}-\frac{9\,x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{3\,x^2}{2}\right]}{16\times 2^{1/4}}$$

Problem 869: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 101 leaves, 5 steps):

$$\frac{189\,x}{160\,\left(2+3\,x^2\right)^{1/4}}-\frac{\left(2+3\,x^2\right)^{3/4}}{10\,x^5}+\frac{7\,\left(2+3\,x^2\right)^{3/4}}{40\,x^3}-\frac{63\,\left(2+3\,x^2\right)^{3/4}}{160\,x}-\frac{63\,\sqrt{3}\;\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\;x\right],\,2\right]}{80\times 2^{3/4}}$$

Result (type 5, 62 leaves):

$$\left(-\frac{1}{10\,x^5}+\frac{7}{40\,x^3}-\frac{63}{160\,x}\right)\,\left(2+3\,x^2\right)^{3/4}+\frac{189\,x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{3\,x^2}{2}\right]}{320\times 2^{1/4}}$$

Problem 870: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 83 leaves, 4 steps):

$$-\frac{32\,x\,\left(2-3\,x^2\right)^{3/4}}{1053}-\frac{40\,x^3\,\left(2-3\,x^2\right)^{3/4}}{1053}-\frac{2}{39}\,x^5\,\left(2-3\,x^2\right)^{3/4}+\frac{128\times 2^{1/4}\;\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\;x\right],\,2\right]}{1053\,\sqrt{3}}$$

Result (type 5, 55 leaves):

$$\frac{2\,x\,\left(-\left(2-3\,x^2\right)^{3/4}\,\left(16+20\,x^2+27\,x^4\right)+16\times 2^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,\frac{3\,x^2}{2}\right]\right)}{1053}$$

Problem 871: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 65 leaves, 3 steps):

$$-\frac{8}{135} x \left(2-3 x^2\right)^{3/4}-\frac{2}{27} x^3 \left(2-3 x^2\right)^{3/4}+\frac{32\times 2^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\sqrt{\frac{3}{2}} x\right],2\right]}{135 \sqrt{3}}$$

Result (type 5, 50 leaves):

$$\frac{2}{135} x \left(-\left(2-3 x^2\right)^{3/4} \left(4+5 x^2\right)+4\times 2^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3 x^2}{2}\right]\right)$$

Problem 872: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 47 leaves, 2 steps):

$$-\frac{2}{15} x \left(2-3 x^2\right)^{3/4}+\frac{8\times 2^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\sqrt{\frac{3}{2}} x\right],2\right]}{15 \sqrt{3}}$$

Result (type 5, 41 leaves):

$$-\frac{2}{15} x \left(\left(2-3 x^2\right)^{3/4}-2^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3 x^2}{2}\right]\right)$$

Problem 873: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 28 leaves, 1 step):

$$\frac{2\times 2^{1/4} \text{EllipticE}\left[\frac{1}{2} \text{ArcSin}\left[\sqrt{\frac{3}{2}} x\right],2\right]}{\sqrt{3}}$$

Result (type 5, 24 leaves):

$$\frac{x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3x^2}{2}\right]}{2^{1/4}}$$

Problem 874: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 47 leaves, 2 steps):

$$-\frac{\left(2-3x^2\right)^{3/4}}{2x}-\frac{\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{2^{3/4}}$$

Result (type 5, 46 leaves):

$$-\frac{\left(2-3x^2\right)^{3/4}}{2x}-\frac{3x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3x^2}{2}\right]}{4\times 2^{1/4}}$$

Problem 875: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 67 leaves, 3 steps):

$$-\frac{\left(2-3x^2\right)^{3/4}}{6x^3}-\frac{3\left(2-3x^2\right)^{3/4}}{8x}-\frac{3\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{4\times 2^{3/4}}$$

Result (type 5, 55 leaves):

$$\left(-\frac{1}{6x^3}-\frac{3}{8x}\right)\left(2-3x^2\right)^{3/4}-\frac{9x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3x^2}{2}\right]}{16\times 2^{1/4}}$$

Problem 876: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(2-3x^2\right)^{3/4}}{10x^5}-\frac{7\left(2-3x^2\right)^{3/4}}{40x^3}-\frac{63\left(2-3x^2\right)^{3/4}}{160x}-\frac{63\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{80\times 2^{3/4}}$$

Result (type 5, 62 leaves):

$$\left(-\frac{1}{10x^5}-\frac{7}{40x^3}-\frac{63}{160x}\right)\left(2-3x^2\right)^{3/4}-\frac{189\,x\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3x^2}{2}\right]}{320\times 2^{1/4}}$$

Problem 877: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 83 leaves, 4 steps):

$$\frac{160x\left(2+3x^2\right)^{1/4}}{2079}-\frac{40}{693}x^3\left(2+3x^2\right)^{1/4}+\frac{2}{33}x^5\left(2+3x^2\right)^{1/4}-\frac{320\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{2079\sqrt{3}}$$

Result (type 5, 54 leaves):

$$\frac{2x\left(\left(2+3x^2\right)^{1/4}\left(80-60x^2+63x^4\right)-80\times 2^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3x^2}{2}\right]\right)}{2079}$$

Problem 878: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 65 leaves, 3 steps):

$$-\frac{8}{63}x\left(2+3x^2\right)^{1/4}+\frac{2}{21}x^3\left(2+3x^2\right)^{1/4}+\frac{16\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{63\sqrt{3}}$$

Result (type 5, 49 leaves):

$$\frac{2}{63}x\left(\left(-4+3x^2\right)\left(2+3x^2\right)^{1/4}+4\times 2^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3x^2}{2}\right]\right)$$

Problem 879: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 47 leaves, 2 steps):

$$\frac{2}{9} x \left(2+3x^2\right)^{1/4} - \frac{4\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{9\sqrt{3}}$$

Result (type 5, 41 leaves):

$$\frac{2}{9} x \left(\left(2+3x^2\right)^{1/4} - 2^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3x^2}{2}\right]\right)$$

Problem 880: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 27 leaves, 1 step):

$$\frac{2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{\sqrt{3}}$$

Result (type 5, 24 leaves):

$$\frac{x\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3x^2}{2}\right]}{2^{3/4}}$$

Problem 881: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 49 leaves, 2 steps):

$$-\frac{\left(2+3x^2\right)^{1/4}}{2x} - \frac{\sqrt{3}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{2\times 2^{1/4}}$$

Result (type 5, 46 leaves):

$$-\frac{\left(2+3 x^2\right)^{1/4}}{2 x}-\frac{3 x \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]}{4\times 2^{3/4}}$$

Problem 882: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 67 leaves, 3 steps):

$$-\frac{\left(2+3 x^2\right)^{1/4}}{6 x^3}+\frac{5 \left(2+3 x^2\right)^{1/4}}{8 x}+\frac{5 \sqrt{3} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\sqrt{\frac{3}{2}} x\right],2\right]}{8\times 2^{1/4}}$$

Result (type 5, 55 leaves):

$$\left(-\frac{1}{6 x^3}+\frac{5}{8 x}\right) \left(2+3 x^2\right)^{1/4}+\frac{15 x \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]}{16\times 2^{3/4}}$$

Problem 883: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(2+3 x^2\right)^{1/4}}{10 x^5}+\frac{9 \left(2+3 x^2\right)^{1/4}}{40 x^3}-\frac{27 \left(2+3 x^2\right)^{1/4}}{32 x}-\frac{27 \sqrt{3} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\sqrt{\frac{3}{2}} x\right],2\right]}{32\times 2^{1/4}}$$

Result (type 5, 58 leaves):

$$-\frac{\left(2+3 x^2\right)^{1/4} \left(16-36 x^2+135 x^4\right)}{160 x^5}-\frac{81 x \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]}{64\times 2^{3/4}}$$

Problem 884: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 83 leaves, 4 steps):

$$-\frac{160\,x\,\left(2-3\,x^2\right)^{1/4}}{2079}-\frac{40}{693}\,x^3\,\left(2-3\,x^2\right)^{1/4}-\frac{2}{33}\,x^5\,\left(2-3\,x^2\right)^{1/4}+\frac{320\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{2079\,\sqrt{3}}$$

Result (type 5, 55 leaves):

$$\frac{2\,x\,\left(-\left(2-3\,x^2\right)^{1/4}\,\left(80+60\,x^2+63\,x^4\right)+80\times 2^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3\,x^2}{2}\right]\right)}{2079}$$

Problem 885: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 65 leaves, 3 steps):

$$-\frac{8}{63}\,x\,\left(2-3\,x^2\right)^{1/4}-\frac{2}{21}\,x^3\,\left(2-3\,x^2\right)^{1/4}+\frac{16\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{63\,\sqrt{3}}$$

Result (type 5, 50 leaves):

$$\frac{2}{63}\,x\,\left(-\left(2-3\,x^2\right)^{1/4}\,\left(4+3\,x^2\right)+4\times 2^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3\,x^2}{2}\right]\right)$$

Problem 886: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 47 leaves, 2 steps):

$$-\frac{2}{9}\,x\,\left(2-3\,x^2\right)^{1/4}+\frac{4\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{9\,\sqrt{3}}$$

Result (type 5, 41 leaves):

$$-\frac{2}{9}\,x\,\left(\left(2-3\,x^2\right)^{1/4}-2^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3\,x^2}{2}\right]\right)$$

Problem 887: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 27 leaves, 1 step):

$$\frac{2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],\,2\right]}{\sqrt{3}}$$

Result (type 5, 24 leaves):

$$\frac{x\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{3}{4},\,\frac{3}{2},\,\frac{3\,x^2}{2}\right]}{2^{3/4}}$$

Problem 888: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 49 leaves, 2 steps):

$$-\frac{\left(2-3\,x^2\right)^{1/4}}{2\,x}+\frac{\sqrt{3}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],\,2\right]}{2\times 2^{1/4}}$$

Result (type 5, 46 leaves):

$$-\frac{\left(2-3\,x^2\right)^{1/4}}{2\,x}+\frac{3\,x\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{3}{4},\,\frac{3}{2},\,\frac{3\,x^2}{2}\right]}{4\times 2^{3/4}}$$

Problem 889: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 67 leaves, 3 steps):

$$-\frac{\left(2-3\,x^2\right)^{1/4}}{6\,x^3}-\frac{5\,\left(2-3\,x^2\right)^{1/4}}{8\,x}+\frac{5\,\sqrt{3}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],\,2\right]}{8\times 2^{1/4}}$$

Result (type 5, 55 leaves):

$$\left(-\frac{1}{6 x^3}-\frac{5}{8 x}\right) \left(2-3 x^2\right)^{1/4}+\frac{15 x \, \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3 x^2}{2}\right]}{16 \times 2^{3/4}}$$

Problem 890: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(2-3 x^2\right)^{1/4}}{10 x^5}-\frac{9 \left(2-3 x^2\right)^{1/4}}{40 x^3}-\frac{27 \left(2-3 x^2\right)^{1/4}}{32 x}+\frac{27 \sqrt{3} \, \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\sqrt{\frac{3}{2}} x\right],2\right]}{32 \times 2^{1/4}}$$

Result (type 5, 58 leaves):

$$-\frac{\left(2-3 x^2\right)^{1/4} \left(16+36 x^2+135 x^4\right)}{160 x^5}+\frac{81 x \, \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3 x^2}{2}\right]}{64 \times 2^{3/4}}$$

Problem 891: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 258 leaves, 7 steps):

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

$$\frac{128 \times 2^{1/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{1053 \sqrt{3} x}+$$

$$\frac{64 \times 2^{1/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{1053 \sqrt{3} x}$$

Result (type 5, 68 leaves):

$$\frac{2\,x\left(-32+8\,x^2+6\,x^4+81\,x^6+16\times 2^{3/4}\left(2-3\,x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3\,x^2}{2}\right]\right)}{1053\left(-2+3\,x^2\right)^{1/4}}$$

Problem 892: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 240 leaves, 6 steps):

$$\frac{8}{135}\,x\left(-2+3\,x^2\right)^{3/4}+\frac{2}{27}\,x^3\left(-2+3\,x^2\right)^{3/4}+\frac{32\,x\left(-2+3\,x^2\right)^{1/4}}{135\left(\sqrt{2}+\sqrt{-2+3\,x^2}\right)}-$$

$$\frac{32\times 2^{1/4}\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3\,x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2+3\,x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2+3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{135\,\sqrt{3}\,x}+$$

$$\frac{16\times 2^{1/4}\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3\,x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2+3\,x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2+3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{135\,\sqrt{3}\,x}$$

Result (type 5, 63 leaves):

$$\frac{2\,x\left(-8+2\,x^2+15\,x^4+4\times 2^{3/4}\left(2-3\,x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3\,x^2}{2}\right]\right)}{135\left(-2+3\,x^2\right)^{1/4}}$$

Problem 893: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 222 leaves, 5 steps):

$$\frac{2}{15} x \left(-2+3 x^2\right)^{3/4}+\frac{8 x \left(-2+3 x^2\right)^{1/4}}{15 \left(\sqrt{2}+\sqrt{-2+3 x^2}\right)}-\frac{8\times 2^{1/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{15 \sqrt{3} x}+$$

$$\frac{4\times 2^{1/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{15 \sqrt{3} x}$$

Result (type 5, 57 leaves) :

$$\frac{2 x \left(-2+3 x^2+2^{3/4} \left(2-3 x^2\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3 x^2}{2}\right]\right)}{15 \left(-2+3 x^2\right)^{1/4}}$$

Problem 894: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 199 leaves, 4 steps) :

$$\frac{2 x \left(-2+3 x^2\right)^{1/4}}{\sqrt{2}+\sqrt{-2+3 x^2}}-\frac{2\times 2^{1/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{\sqrt{3} x}+$$

$$\frac{2^{1/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{\sqrt{3} x}$$

Result (type 5, 41 leaves) :

$$\frac{x \left(2-3 x^2\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3 x^2}{2}\right]}{\left(-4+6 x^2\right)^{1/4}}$$

Problem 895: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 221 leaves, 5 steps):

$$\frac{\left(-2+3 x^2\right)^{3/4}}{2 x}-\frac{3 x \left(-2+3 x^2\right)^{1/4}}{2 \left(\sqrt{2}+\sqrt{-2+3 x^2}\right)}+\frac{\sqrt{3} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{2^{3/4} x}-\frac{\sqrt{3} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{2\times 2^{3/4} x}$$

Result (type 5, 63 leaves):

$$\frac{-8+12 x^2-3\times 2^{3/4} x^2 \left(2-3 x^2\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3 x^2}{2}\right]}{8 x \left(-2+3 x^2\right)^{1/4}}$$

Problem 896: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 242 leaves, 6 steps):

$$\frac{\left(-2+3 x^2\right)^{3/4}}{6 x^3}+\frac{3 \left(-2+3 x^2\right)^{3/4}}{8 x}-\frac{9 x \left(-2+3 x^2\right)^{1/4}}{8 \left(\sqrt{2}+\sqrt{-2+3 x^2}\right)}+\frac{3 \sqrt{3} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{4\times 2^{3/4} x}-\frac{3 \sqrt{3} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{8\times 2^{3/4} x}$$

Result (type 5, 71 leaves):

$$\frac{4\left(-8-6x^2+27x^4\right)-27\times 2^{3/4}x^4\left(2-3x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3x^2}{2}\right]}{96x^3\left(-2+3x^2\right)^{1/4}}$$

Problem 897: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 260 leaves, 7 steps):

$$\frac{\left(-2+3x^2\right)^{3/4}}{10x^5}+\frac{7\left(-2+3x^2\right)^{3/4}}{40x^3}+\frac{63\left(-2+3x^2\right)^{3/4}}{160x}-\frac{189x\left(-2+3x^2\right)^{1/4}}{160\left(\sqrt{2}+\sqrt{-2+3x^2}\right)}+$$

$$\frac{63\sqrt{3}\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2+3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2+3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{80\times 2^{3/4}x}-$$

$$\frac{63\sqrt{3}\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2+3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{160\times 2^{3/4}x}$$

Result (type 5, 76 leaves):

$$\frac{4\left(-32-8x^2-42x^4+189x^6\right)-189\times 2^{3/4}x^6\left(2-3x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},\frac{3x^2}{2}\right]}{640x^5\left(-2+3x^2\right)^{1/4}}$$

Problem 898: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 260 leaves, 7 steps):

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

$$\frac{128\times 2^{1/4}\,\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\,\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{1053\,\sqrt{3}\,x}+$$

$$\frac{64\times 2^{1/4}\,\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\,\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{1053\,\sqrt{3}\,x}$$

Result (type 5, 68 leaves):

$$\frac{2\,x\,\left(32+8\,x^2-6\,x^4+81\,x^6-16\times 2^{3/4}\,\left(2+3\,x^2\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3\,x^2}{2}\right]\right)}{1053\,\left(-2-3\,x^2\right)^{1/4}}$$

Problem 899: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 242 leaves, 6 steps):

$$\frac{8}{135}\,x\,\left(-2-3\,x^2\right)^{3/4}-\frac{2}{27}\,x^3\,\left(-2-3\,x^2\right)^{3/4}+\frac{32\,x\,\left(-2-3\,x^2\right)^{1/4}}{135\,\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)}+$$

$$\frac{32\times 2^{1/4}\,\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\,\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{135\,\sqrt{3}\,x}-$$

$$\frac{16\times 2^{1/4}\,\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\,\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{135\,\sqrt{3}\,x}$$

Result (type 5, 63 leaves):

$$\frac{2\,x\left(-8-2\,x^2+15\,x^4+4\times 2^{3/4}\left(2+3\,x^2\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{3\,x^2}{2}\right]\right)}{135\left(-2-3\,x^2\right)^{1/4}}$$

Problem 900: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 224 leaves, 5 steps):

$$-\frac{2}{15}\,x\left(-2-3\,x^2\right)^{3/4}-\frac{8\,x\left(-2-3\,x^2\right)^{1/4}}{15\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)}-\frac{8\times 2^{1/4}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\,\frac{1}{2}\right]}{15\,\sqrt{3}\,x}+$$

$$\frac{4\times 2^{1/4}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\,\frac{1}{2}\right]}{15\,\sqrt{3}\,x}$$

Result (type 5, 58 leaves):

$$\frac{2\,x\left(2+3\,x^2-2^{3/4}\left(2+3\,x^2\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{3\,x^2}{2}\right]\right)}{15\left(-2-3\,x^2\right)^{1/4}}$$

Problem 901: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 202 leaves, 4 steps):

$$\frac{2x\left(-2-3x^2\right)^{1/4}}{\sqrt{2}+\sqrt{-2-3x^2}}+\frac{2\times 2^{1/4}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{\sqrt{3}\,x}-$$

$$\frac{2^{1/4}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{\sqrt{3}\,x}$$

Result (type 5, 41 leaves) :

$$\frac{x\left(2+3x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3x^2}{2}\right]}{\left(-4-6x^2\right)^{1/4}}$$

Problem 902: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 223 leaves, 5 steps) :

$$\frac{\left(-2-3x^2\right)^{3/4}}{2x}+\frac{3x\left(-2-3x^2\right)^{1/4}}{2\left(\sqrt{2}+\sqrt{-2-3x^2}\right)}+\frac{\sqrt{3}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{2^{3/4}\,x}-$$

$$\frac{\sqrt{3}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{2\times 2^{3/4}\,x}$$

Result (type 5, 63 leaves) :

$$\frac{-8-12x^2+3\times 2^{3/4}x^2\left(2+3x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3x^2}{2}\right]}{8x\left(-2-3x^2\right)^{1/4}}$$

Problem 903: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 244 leaves, 6 steps):

$$\frac{\left(-2-3x^2\right)^{3/4}}{6x^3}-\frac{3\left(-2-3x^2\right)^{3/4}}{8x}-\frac{9x\left(-2-3x^2\right)^{1/4}}{8\left(\sqrt{2}+\sqrt{-2-3x^2}\right)}-\frac{3\sqrt{3}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{4\times 2^{3/4}x}+$$

$$\frac{3\sqrt{3}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{8\times 2^{3/4}x}$$

Result (type 5, 71 leaves):

$$\frac{4\left(-8+6x^2+27x^4\right)-27\times 2^{3/4}x^4\left(2+3x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3x^2}{2}\right]}{96x^3\left(-2-3x^2\right)^{1/4}}$$

Problem 904: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 262 leaves, 7 steps):

$$\frac{\left(-2-3x^2\right)^{3/4}}{10x^5}-\frac{7\left(-2-3x^2\right)^{3/4}}{40x^3}+\frac{63\left(-2-3x^2\right)^{3/4}}{160x}+\frac{189x\left(-2-3x^2\right)^{1/4}}{160\left(\sqrt{2}+\sqrt{-2-3x^2}\right)}+$$

$$\frac{63\sqrt{3}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{80\times 2^{3/4}x}-$$

$$\frac{63\sqrt{3}\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3x^2}\right)^2}}\left(\sqrt{2}+\sqrt{-2-3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{160\times 2^{3/4}x}$$

Result (type 5, 76 leaves):

$$\frac{-4\left(32-8x^2+42x^4+189x^6\right)+189\times 2^{3/4}x^6\left(2+3x^2\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{3x^2}{2}\right]}{640x^5\left(-2-3x^2\right)^{1/4}}$$

Problem 905: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 138 leaves, 5 steps):

$$\frac{160 x \left(-2+3 x^2\right)^{1/4}}{2079}+\frac{40}{693} x^3 \left(-2+3 x^2\right)^{1/4}+\frac{2}{33} x^5 \left(-2+3 x^2\right)^{1/4}+$$
$$\frac{160 \times 2^{3/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right], \frac{1}{2}\right]}{2079 \sqrt{3} x}$$

Result (type 5, 68 leaves):

$$\frac{2 x \left(-160+120 x^2+54 x^4+189 x^6+80 \times 2^{1/4} \left(2-3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3}{4}, \frac{3}{2}, \frac{3 x^2}{2}\right]\right)}{2079 \left(-2+3 x^2\right)^{3/4}}$$

Problem 906: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 120 leaves, 4 steps):

$$\frac{8}{63} x \left(-2+3 x^2\right)^{1/4}+\frac{2}{21} x^3 \left(-2+3 x^2\right)^{1/4}+\frac{8 \times 2^{3/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right], \frac{1}{2}\right]}{63 \sqrt{3} x}$$

Result (type 5, 63 leaves):

$$\frac{2 x \left(-8+6 x^2+9 x^4+4 \times 2^{1/4} \left(2-3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3}{4}, \frac{3}{2}, \frac{3 x^2}{2}\right]\right)}{63 \left(-2+3 x^2\right)^{3/4}}$$

Problem 907: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 102 leaves, 3 steps):

$$\frac{2}{9} x \left(-2+3 x^2\right)^{1/4}+\frac{2\times 2^{3/4} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{9 \sqrt{3} x}$$

Result (type 5, 57 leaves):

$$\frac{2 x \left(-2+3 x^2+2^{1/4} \left(2-3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3 x^2}{2}\right]\right)}{9 \left(-2+3 x^2\right)^{3/4}}$$

Problem 908: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 82 leaves, 2 steps):

$$\frac{\sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{2^{1/4} \sqrt{3} x}$$

Result (type 5, 41 leaves):

$$\frac{x \left(2-3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3 x^2}{2}\right]}{\left(-4+6 x^2\right)^{3/4}}$$

Problem 909: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 104 leaves, 3 steps):

$$\frac{\left(-2+3 x^2\right)^{1/4}}{2 x}+\frac{\sqrt{3} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{4\times 2^{1/4} x}$$

Result (type 5, 63 leaves):

$$\frac{-8+12 x^2+3\times 2^{1/4} x^2 \left(2-3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3 x^2}{2}\right]}{8 x \left(-2+3 x^2\right)^{3/4}}$$

Problem 910: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 122 leaves, 4 steps):

$$\frac{\left(-2+3 x^2\right)^{1/4}}{6 x^3}+\frac{5 \left(-2+3 x^2\right)^{1/4}}{8 x}+\frac{5 \sqrt{3} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{16\times 2^{1/4} x}$$

Result (type 5, 68 leaves):

$$\frac{-32-72 x^2+180 x^4+45\times 2^{1/4} x^4 \left(2-3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3 x^2}{2}\right]}{96 x^3 \left(-2+3 x^2\right)^{3/4}}$$

Problem 911: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 140 leaves, 5 steps):

$$\frac{\left(-2+3 x^2\right)^{1/4}}{10 x^5}+\frac{9 \left(-2+3 x^2\right)^{1/4}}{40 x^3}+\frac{27 \left(-2+3 x^2\right)^{1/4}}{32 x}+\frac{27 \sqrt{3} \sqrt{\frac{x^2}{\left(\sqrt{2}+\sqrt{-2+3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2+3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{64\times 2^{1/4} x}$$

Result (type 5, 73 leaves):

$$\frac{-128-96 x^2-648 x^4+1620 x^6+405\times 2^{1/4} x^6 \left(2-3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},\frac{3 x^2}{2}\right]}{640 x^5 \left(-2+3 x^2\right)^{3/4}}$$

Problem 912: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 139 leaves, 5 steps):

$$-\frac{160\,x\,\left(-2-3\,x^2\right)^{1/4}}{2079}+\frac{40}{693}\,x^3\,\left(-2-3\,x^2\right)^{1/4}-\frac{2}{33}\,x^5\,\left(-2-3\,x^2\right)^{1/4}+\frac{160\times 2^{3/4}\,\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\,\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{2079\,\sqrt{3}\,x}$$

Result (type 5, 68 leaves):

$$\frac{2\,x\,\left(160+120\,x^2-54\,x^4+189\,x^6-80\times 2^{1/4}\,\left(2+3\,x^2\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3\,x^2}{2}\right]\right)}{2079\,\left(-2-3\,x^2\right)^{3/4}}$$

Problem 913: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 121 leaves, 4 steps):

$$\frac{8}{63}\,x\,\left(-2-3\,x^2\right)^{1/4}-\frac{2}{21}\,x^3\,\left(-2-3\,x^2\right)^{1/4}-\frac{8\times 2^{3/4}\,\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)^2}}\,\left(\sqrt{2}+\sqrt{-2-3\,x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\left(-2-3\,x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{63\,\sqrt{3}\,x}$$

Result (type 5, 63 leaves):

$$\frac{2\,x\,\left(-8-6\,x^2+9\,x^4+4\times 2^{1/4}\,\left(2+3\,x^2\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3\,x^2}{2}\right]\right)}{63\,\left(-2-3\,x^2\right)^{3/4}}$$

Problem 914: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 103 leaves, 3 steps):

$$-\frac{2}{9} x \left(-2-3 x^2\right)^{1/4}+\frac{2\times 2^{3/4} \sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2-3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2-3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{9 \sqrt{3} x}$$

Result (type 5, 58 leaves):

$$\frac{2 x \left(2+3 x^2-2^{1/4} \left(2+3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]\right)}{9 \left(-2-3 x^2\right)^{3/4}}$$

Problem 915: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 84 leaves, 2 steps):

$$-\frac{\sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2-3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2-3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{2^{1/4} \sqrt{3} x}$$

Result (type 5, 41 leaves):

$$\frac{x \left(2+3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]}{\left(-4-6 x^2\right)^{3/4}}$$

Problem 916: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 105 leaves, 3 steps):

$$\frac{\left(-2-3 x^2\right)^{1/4}}{2 x}+\frac{\sqrt{3} \sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2-3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2-3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{4\times 2^{1/4} x}$$

Result (type 5, 63 leaves):

$$\frac{-8-12 x^2-3\times 2^{1/4} x^2 \left(2+3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]}{8 x \left(-2-3 x^2\right)^{3/4}}$$

Problem 917: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 123 leaves, 4 steps):

$$\frac{\left(-2-3 x^2\right)^{1/4}}{6 x^3}-\frac{5 \left(-2-3 x^2\right)^{1/4}}{8 x}-\frac{5 \sqrt{3} \sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2-3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2-3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{16\times 2^{1/4} x}$$

Result (type 5, 68 leaves):

$$\frac{-32+72 x^2+180 x^4+45\times 2^{1/4} x^4 \left(2+3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]}{96 x^3 \left(-2-3 x^2\right)^{3/4}}$$

Problem 918: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 141 leaves, 5 steps):

$$\frac{\left(-2-3 x^2\right)^{1/4}}{10 x^5}-\frac{9 \left(-2-3 x^2\right)^{1/4}}{40 x^3}+\frac{27 \left(-2-3 x^2\right)^{1/4}}{32 x}+\frac{27 \sqrt{3} \sqrt{-\frac{x^2}{\left(\sqrt{2}+\sqrt{-2-3 x^2}\right)^2}} \left(\sqrt{2}+\sqrt{-2-3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\left(-2-3 x^2\right)^{1/4}}{2^{1/4}}\right],\frac{1}{2}\right]}{64\times 2^{1/4} x}$$

Result (type 5, 76 leaves):

$$\frac{-4 \left(32-24 x^2+162 x^4+405 x^6\right)-405\times 2^{1/4} x^6 \left(2+3 x^2\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{3}{2},-\frac{3 x^2}{2}\right]}{640 x^5 \left(-2-3 x^2\right)^{3/4}}$$

Problem 919: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 152 leaves, 8 steps):

$$-\frac{a^2 c^3 \sqrt{c x} \left(a+b x^2\right)^{1/4}}{12 b^2}+\frac{a c (c x)^{5/2} \left(a+b x^2\right)^{1/4}}{30 b}+\frac{(c x)^{9/2} \left(a+b x^2\right)^{1/4}}{5 c}-\frac{a^{5/2} c^2 \left(1+\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{12 b^{3/2} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 98 leaves):

$$\frac{c^3 \sqrt{c x} \left(-5 a^3-3 a^2 b x^2+14 a b^2 x^4+12 b^3 x^6+5 a^3 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)}{60 b^2 \left(a+b x^2\right)^{3/4}}$$

Problem 920: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 118 leaves, 7 steps):

$$\frac{a c \sqrt{c x} \left(a+b x^2\right)^{1/4}}{6 b}+\frac{(c x)^{5/2} \left(a+b x^2\right)^{1/4}}{3 c}+\frac{a^{3/2} \left(1+\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{6 \sqrt{b} \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 83 leaves):

$$\frac{c \sqrt{c x} \left(a^2+3 a b x^2+2 b^2 x^4-a^2 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)}{6 b \left(a+b x^2\right)^{3/4}}$$

Problem 921: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 89 leaves, 6 steps):

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

Result (type 5, 62 leaves):

$$\frac{x \left(a+b x^2+a \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)}{\sqrt{c x} \left(a+b x^2\right)^{3/4}}$$

Problem 922: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 94 leaves, 6 steps):

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

Result (type 5, 69 leaves):

$$-\frac{2 x \left(a+b x^2-b x^2 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^2}{a}\right]\right)}{3 (c x)^{5/2} \left(a+b x^2\right)^{3/4}}$$

Problem 923: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 123 leaves, 7 steps):

$$-\frac{2 \left(a+b x^2\right)^{1/4}}{7 c (c x)^{7/2}}-\frac{2 b \left(a+b x^2\right)^{1/4}}{21 a c^3 (c x)^{3/2}}+\frac{4 b^{5/2} \left(1+\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{21 a^{3/2} c^6 \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 92 leaves):

$$-\frac{2 \sqrt{c x} \left(3 a^2+4 a b x^2+b^2 x^4+2 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^2}{a}\right]\right)}{21 a c^5 x^4 \left(a+b x^2\right)^{3/4}}$$

Problem 924: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 154 leaves, 8 steps):

$$-\frac{2 \left(a+b x^2\right)^{1/4}}{11 c (c x)^{11/2}}-\frac{2 b \left(a+b x^2\right)^{1/4}}{77 a c^3 (c x)^{7/2}}+\frac{4 b^2 \left(a+b x^2\right)^{1/4}}{77 a^2 c^5 (c x)^{3/2}}-\frac{8 b^{7/2} \left(1+\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{77 a^{5/2} c^8 \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 103 leaves):

$$\frac{2 \sqrt{c x} \left(-7 a^3 - 8 a^2 b x^2 + a b^2 x^4 + 2 b^3 x^6 + 4 b^3 x^6 \left(1 + \frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^2}{a}\right]\right)}{77 a^2 c^7 x^6 \left(a + b x^2\right)^{3/4}}$$

Problem 925: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 147 leaves, 7 steps):

$$\frac{a c (c x)^{3/2} \left(a + b x^2\right)^{1/4}}{16 b} + \frac{(c x)^{7/2} \left(a + b x^2\right)^{1/4}}{4 c} + \frac{3 a^2 c^{5/2} \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{32 b^{7/4}} - \frac{3 a^2 c^{5/2} \text{ArcTanh}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{32 b^{7/4}}$$

Result (type 5, 83 leaves):

$$\frac{c (c x)^{3/2} \left(a^2 + 5 a b x^2 + 4 b^2 x^4 - a^2 \left(1 + \frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4}, \frac{3}{4}, \frac{7}{4}, -\frac{b x^2}{a}\right]\right)}{16 b \left(a + b x^2\right)^{3/4}}$$

Problem 926: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 116 leaves, 6 steps):

$$\frac{(c x)^{3/2} \left(a + b x^2\right)^{1/4}}{2 c} - \frac{a \sqrt{c} \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{4 b^{3/4}} + \frac{a \sqrt{c} \text{ArcTanh}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{4 b^{3/4}}$$

Result (type 5, 68 leaves):

$$\frac{x \sqrt{c x} \left(3 \left(a + b x^2\right) + a \left(1 + \frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4}, \frac{3}{4}, \frac{7}{4}, -\frac{b x^2}{a}\right]\right)}{6 \left(a + b x^2\right)^{3/4}}$$

Problem 927: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 107 leaves, 6 steps):

$$-\frac{2\,(a+b\,x^2)^{1/4}}{c\,\sqrt{c\,x}}-\frac{b^{1/4}\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,(a+b\,x^2)^{1/4}}\right]}{c^{3/2}}+\frac{b^{1/4}\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,(a+b\,x^2)^{1/4}}\right]}{c^{3/2}}$$

Result (type 5, 72 leaves) :

$$\frac{x\left(-6\,(a+b\,x^2)+2\,b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)}{3\,(c\,x)^{3/2}\,(a+b\,x^2)^{3/4}}$$

Problem 932: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 122 leaves, 7 steps) :

$$-\frac{a\,c\,\sqrt{c\,x}\,(a-b\,x^2)^{1/4}}{6\,b}+\frac{(c\,x)^{5/2}\,(a-b\,x^2)^{1/4}}{3\,c}-\frac{a^{3/2}\,\left(1-\frac{a}{b\,x^2}\right)^{3/4}(c\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{6\,\sqrt{b}\,(a-b\,x^2)^{3/4}}$$

Result (type 5, 84 leaves) :

$$-\frac{c\,\sqrt{c\,x}\,\left(a^2-3\,a\,b\,x^2+2\,b^2\,x^4-a^2\,\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,\frac{b\,x^2}{a}\right]\right)}{6\,b\,(a-b\,x^2)^{3/4}}$$

Problem 933: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 92 leaves, 6 steps) :

$$\frac{\sqrt{c\,x}\,(a-b\,x^2)^{1/4}}{c}-\frac{\sqrt{a}\,\sqrt{b}\,\left(1-\frac{a}{b\,x^2}\right)^{3/4}(c\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{c^2\,(a-b\,x^2)^{3/4}}$$

Result (type 5, 66 leaves) :

$$\frac{a\,x-b\,x^3+a\,x\,\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,\frac{b\,x^2}{a}\right]}{\sqrt{c\,x}\,(a-b\,x^2)^{3/4}}$$

Problem 934: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 97 leaves, 6 steps):

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

Result (type 5, 70 leaves):

$$-\frac{2 x\left(a-b x^2+b x^2\left(1-\frac{b x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^2}{a}\right]\right)}{3 (c x)^{5/2}\left(a-b x^2\right)^{3/4}}$$

Problem 935: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 127 leaves, 7 steps):

$$-\frac{2\left(a-b x^2\right)^{1/4}}{7 c (c x)^{7/2}}+\frac{2 b\left(a-b x^2\right)^{1/4}}{21 a c^3 (c x)^{3/2}}+\frac{4 b^{5/2}\left(1-\frac{a}{b x^2}\right)^{3/4}(c x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{21 a^{3/2} c^6\left(a-b x^2\right)^{3/4}}$$

Result (type 5, 93 leaves):

$$-\frac{2\sqrt{c x}\left(3 a^2-4 a b x^2+b^2 x^4+2 b^2 x^4\left(1-\frac{b x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^2}{a}\right]\right)}{21 a c^5 x^4\left(a-b x^2\right)^{3/4}}$$

Problem 936: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 159 leaves, 8 steps):

$$-\frac{2\left(a-b x^2\right)^{1/4}}{11 c (c x)^{11/2}}+\frac{2 b\left(a-b x^2\right)^{1/4}}{77 a c^3 (c x)^{7/2}}+\frac{4 b^2\left(a-b x^2\right)^{1/4}}{77 a^2 c^5 (c x)^{3/2}}+\frac{8 b^{7/2}\left(1-\frac{a}{b x^2}\right)^{3/4}(c x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{77 a^{5/2} c^8\left(a-b x^2\right)^{3/4}}$$

Result (type 5, 105 leaves):

$$-\frac{2\sqrt{c\,x}\left(7\,a^3-8\,a^2\,b\,x^2-a\,b^2\,x^4+2\,b^3\,x^6+4\,b^3\,x^6\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b\,x^2}{a}\right]\right)}{77\,a^2\,c^7\,x^6\left(a-b\,x^2\right)^{3/4}}$$

Problem 937: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 343 leaves, 13 steps):

$$-\frac{a\,c\,(c\,x)^{3/2}\left(a-b\,x^2\right)^{1/4}}{16\,b}+\frac{(c\,x)^{7/2}\left(a-b\,x^2\right)^{1/4}}{4\,c}-\frac{3\,a^2\,c^{5/2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{32\sqrt{2}\,b^{7/4}}+\frac{3\,a^2\,c^{5/2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{32\sqrt{2}\,b^{7/4}}+\frac{3\,a^2\,c^{5/2}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{64\sqrt{2}\,b^{7/4}}-\frac{3\,a^2\,c^{5/2}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{64\sqrt{2}\,b^{7/4}}$$

Result (type 5, 84 leaves):

$$-\frac{c\,(c\,x)^{3/2}\left(a^2-5\,a\,b\,x^2+4\,b^2\,x^4-a^2\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,x^2}{a}\right]\right)}{16\,b\left(a-b\,x^2\right)^{3/4}}$$

Problem 938: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 307 leaves, 12 steps):

$$\frac{(c\,x)^{3/2}\left(a-b\,x^2\right)^{1/4}}{2\,c}-\frac{a\sqrt{c}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{4\sqrt{2}\,b^{3/4}}+\frac{a\sqrt{c}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{4\sqrt{2}\,b^{3/4}}+\frac{a\sqrt{c}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{8\sqrt{2}\,b^{3/4}}-\frac{a\sqrt{c}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{8\sqrt{2}\,b^{3/4}}$$

Result (type 5, 69 leaves):

$$\frac{x\sqrt{c\,x}\left(3\,a-3\,b\,x^2+a\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,x^2}{a}\right]\right)}{6\left(a-b\,x^2\right)^{3/4}}$$

Problem 939: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 296 leaves, 12 steps):

$$-\frac{2\left(a-b\,x^2\right)^{1/4}}{c\sqrt{c\,x}}+\frac{b^{1/4}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\left(a-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,c^{3/2}}-\frac{b^{1/4}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\left(a-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,c^{3/2}}-\frac{b^{1/4}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{2\sqrt{2}\,c^{3/2}}+\frac{b^{1/4}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{2\sqrt{2}\,c^{3/2}}$$

Result (type 5, 72 leaves):

$$-\frac{2\,x\left(3\,a-3\,b\,x^2+b\,x^2\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,x^2}{a}\right]\right)}{3\,(c\,x)^{3/2}\left(a-b\,x^2\right)^{3/4}}$$

Problem 944: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 117 leaves, 6 steps):

$$\frac{c\sqrt{c\,x}\left(a+b\,x^2\right)^{3/4}}{2\,b}-\frac{a\,c^{3/2}\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{\sqrt{c}\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{5/4}}-\frac{a\,c^{3/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\sqrt{c\,x}}{\sqrt{c}\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{5/4}}$$

Result (type 5, 69 leaves):

$$\frac{c\sqrt{c\,x}\left(a+b\,x^2-a\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)}{2\,b\left(a+b\,x^2\right)^{1/4}}$$

Problem 945: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 83 leaves, 5 steps):

$$\frac{\text{ArcTan}\left[\frac{b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{1/4}\sqrt{c}}+\frac{\text{ArcTanh}\left[\frac{b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{1/4}\sqrt{c}}$$

Result (type 5, 55 leaves):

$$\frac{2\,x\,\left(\frac{a+b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{4},\,\frac{5}{4},\,-\frac{b\,x^2}{a}\right]}{\sqrt{c\,x}\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 949: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 156 leaves, 6 steps):

$$\frac{7\,a^2\,c^4\,x\,\sqrt{c\,x}}{20\,b^2\,\left(a+b\,x^2\right)^{1/4}}-\frac{7\,a\,c^3\,(c\,x)^{3/2}\,\left(a+b\,x^2\right)^{3/4}}{30\,b^2}+\frac{c\,(c\,x)^{7/2}\,\left(a+b\,x^2\right)^{3/4}}{5\,b}+\frac{7\,a^{5/2}\,c^4\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{20\,b^{5/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 87 leaves):

$$\frac{c^3\,(c\,x)^{3/2}\,\left(-7\,a^2-a\,b\,x^2+6\,b^2\,x^4+7\,a^2\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)}{30\,b^2\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 950: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 125 leaves, 5 steps):

$$-\frac{a\,c^2\,x\,\sqrt{c\,x}}{2\,b\,\left(a+b\,x^2\right)^{1/4}}+\frac{c\,(c\,x)^{3/2}\,\left(a+b\,x^2\right)^{3/4}}{3\,b}-\frac{a^{3/2}\,c^2\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{2\,b^{3/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 69 leaves):

$$\frac{c\,(c\,x)^{3/2}\left(a+b\,x^2-a\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,b\left(a+b\,x^2\right)^{1/4}}$$

Problem 951: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 83 leaves, 4 steps):

$$\frac{x\sqrt{c\,x}}{\left(a+b\,x^2\right)^{1/4}}+\frac{\sqrt{a}\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{c\,x}\;\text{EllipticE}\left[\frac{1}{2}\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{b}\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 57 leaves):

$$\frac{2\,x\sqrt{c\,x}\left(\frac{a+b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]}{3\left(a+b\,x^2\right)^{1/4}}$$

Problem 952: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 90 leaves, 4 steps):

$$-\frac{2}{c\sqrt{c\,x}\left(a+b\,x^2\right)^{1/4}}+\frac{2\sqrt{b}\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{c\,x}\;\text{EllipticE}\left[\frac{1}{2}\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,c^2\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 75 leaves):

$$\frac{x\left(-6\left(a+b\,x^2\right)+4\,b\,x^2\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,a\,(c\,x)^{3/2}\left(a+b\,x^2\right)^{1/4}}$$

Problem 953: Result unnecessarily involves higher level functions.

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

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

$$\frac{4\,b}{5\,a\,c^3\,\sqrt{c\,x}\,\left(a+b\,x^2\right)^{1/4}}-\frac{2\,\left(a+b\,x^2\right)^{3/4}}{5\,a\,c\,\left(c\,x\right)^{5/2}}-\frac{4\,b^{3/2}\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5\,a^{3/2}\,c^4\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 88 leaves):

$$\frac{x\,\left(-6\,a^2+6\,a\,b\,x^2+12\,b^2\,x^4-8\,b^2\,x^4\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{15\,a^2\,\left(c\,x\right)^{7/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 954: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 157 leaves, 6 steps):

$$-\frac{8\,b^2}{15\,a^2\,c^5\,\sqrt{c\,x}\,\left(a+b\,x^2\right)^{1/4}}-\frac{2\,\left(a+b\,x^2\right)^{3/4}}{9\,a\,c\,\left(c\,x\right)^{9/2}}+\frac{4\,b\,\left(a+b\,x^2\right)^{3/4}}{15\,a^2\,c^3\,\left(c\,x\right)^{5/2}}+\frac{8\,b^{5/2}\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{15\,a^{5/2}\,c^6\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 103 leaves):

$$\frac{2\,\sqrt{c\,x}\,\left(-5\,a^3+a^2\,b\,x^2-6\,a\,b^2\,x^4-12\,b^3\,x^6+8\,b^3\,x^6\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{45\,a^3\,c^6\,x^5\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 955: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 308 leaves, 12 steps):

$$-\frac{c\,\sqrt{c\,x}\,\left(a-b\,x^2\right)^{3/4}}{2\,b}-\frac{a\,c^{3/2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{4\,\sqrt{2}\,b^{5/4}}+\frac{a\,c^{3/2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{4\,\sqrt{2}\,b^{5/4}}-$$
$$\frac{a\,c^{3/2}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}-\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{8\,\sqrt{2}\,b^{5/4}}+\frac{a\,c^{3/2}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}+\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{8\,\sqrt{2}\,b^{5/4}}$$

Result (type 5, 71 leaves):

$$\frac{c\sqrt{c\,x}\,\left(-a+b\,x^2+a\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b\,x^2}{a}\right]\right)}{2\,b\,\left(a-b\,x^2\right)^{1/4}}$$

Problem 956: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 272 leaves, 11 steps):

$$-\frac{\text{ArcTan}\left[1-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{1/4}\sqrt{c}}+\frac{\text{ArcTan}\left[1+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{1/4}\sqrt{c}}-\frac{\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}-\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{2\sqrt{2}\,b^{1/4}\sqrt{c}}+\frac{\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}+\frac{\sqrt{2}\,b^{1/4}\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{2\sqrt{2}\,b^{1/4}\sqrt{c}}$$

Result (type 5, 56 leaves):

$$\frac{2\,x\,\left(\frac{a-b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{b\,x^2}{a}\right]}{\sqrt{c\,x}\,\left(a-b\,x^2\right)^{1/4}}$$

Problem 960: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 128 leaves, 5 steps):

$$-\frac{a\,c^3\,\left(a-b\,x^2\right)^{3/4}}{2\,b^2\sqrt{c\,x}}-\frac{c\,(c\,x)^{3/2}\,\left(a-b\,x^2\right)^{3/4}}{3\,b}+\frac{a^{3/2}\,c^2\,\left(1-\frac{a}{b\,x^2}\right)^{1/4}\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{2\,b^{3/2}\,\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 71 leaves):

$$\frac{c\,(c\,x)^{3/2}\,\left(-a+b\,x^2+a\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,x^2}{a}\right]\right)}{3\,b\,\left(a-b\,x^2\right)^{1/4}}$$

Problem 961: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 90 leaves, 4 steps):

$$-\frac{c\left(a-b x^2\right)^{3/4}}{b\sqrt{c x}}+\frac{\sqrt{a}\left(1-\frac{a}{b x^2}\right)^{1/4}\sqrt{c x}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{b}\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 58 leaves):

$$\frac{2 x\sqrt{c x}\left(\frac{a-b x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b x^2}{a}\right]}{3\left(a-b x^2\right)^{1/4}}$$

Problem 962: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 68 leaves, 3 steps):

$$-\frac{2\sqrt{b}\left(1-\frac{a}{b x^2}\right)^{1/4}\sqrt{c x}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,c^2\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 76 leaves):

$$\frac{x\left(-6 a+6 b x^2-4 b x^2\left(1-\frac{b x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b x^2}{a}\right]\right)}{3 a\,(c x)^{3/2}\left(a-b x^2\right)^{1/4}}$$

Problem 963: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 100 leaves, 4 steps):

$$-\frac{2\left(a-b x^2\right)^{3/4}}{5 a c\,(c x)^{5/2}}-\frac{4 b^{3/2}\left(1-\frac{a}{b x^2}\right)^{1/4}\sqrt{c x}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5 a^{3/2}c^4\left(a-b x^2\right)^{1/4}}$$

Result (type 5, 89 leaves):

$$\frac{x\left(-6\left(a^2+a b x^2-2 b^2 x^4\right)-8 b^2 x^4\left(1-\frac{b x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b x^2}{a}\right]\right)}{15 a^2\,(c x)^{7/2}\left(a-b x^2\right)^{1/4}}$$

Problem 964: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 130 leaves, 5 steps):

$$-\frac{2\,\left(a-b\,x^2\right)^{3/4}}{9\,a\,c\,(c\,x)^{9/2}}-\frac{4\,b\,\left(a-b\,x^2\right)^{3/4}}{15\,a^2\,c^3\,(c\,x)^{5/2}}-\frac{8\,b^{5/2}\,\left(1-\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\;\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{15\,a^{5/2}\,c^6\,\left(a-b\,x^2\right)^{1/4}}$$

Result (type 5, 104 leaves):

$$-\frac{2\,\sqrt{c\,x}\,\left(5\,a^3+a^2\,b\,x^2+6\,a\,b^2\,x^4-12\,b^3\,x^6+8\,b^3\,x^6\,\left(1-\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},\frac{b\,x^2}{a}\right]\right)}{45\,a^3\,c^6\,x^5\,\left(a-b\,x^2\right)^{1/4}}$$

Problem 965: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 86 leaves, 6 steps):

$$\frac{c\,\sqrt{c\,x}\,\left(a+b\,x^2\right)^{1/4}}{b}+\frac{\sqrt{a}\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(c\,x)^{3/2}\;\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{b}\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 66 leaves):

$$\frac{c\,\sqrt{c\,x}\,\left(a+b\,x^2-a\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)}{b\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 966: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 66 leaves, 5 steps):

$$-\frac{2\,\sqrt{b}\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(c\,x)^{3/2}\;\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,c^2\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 55 leaves):

$$\frac{2\,x\,\left(\frac{a+b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,-\frac{b\,x^2}{a}\right]}{\sqrt{c\,x}\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 967: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 97 leaves, 6 steps):

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

Result (type 5, 72 leaves):

$$-\frac{2\,x\,\left(a+b\,x^2+2\,b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,-\frac{b\,x^2}{a}\right]\right)}{3\,a\,(c\,x)^{5/2}\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 968: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 126 leaves, 7 steps):

$$-\frac{2\,\left(a+b\,x^2\right)^{1/4}}{7\,a\,c\,(c\,x)^{7/2}}+\frac{4\,b\,\left(a+b\,x^2\right)^{1/4}}{7\,a^2\,c^3\,(c\,x)^{3/2}}-\frac{8\,b^{5/2}\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(c\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{7\,a^{5/2}\,c^6\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 92 leaves):

$$\frac{2\,\sqrt{c\,x}\,\left(-a^2+a\,b\,x^2+2\,b^2\,x^4+4\,b^2\,x^4\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,-\frac{b\,x^2}{a}\right]\right)}{7\,a^2\,c^5\,x^4\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 969: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(c\,x)^{13/2}\,\left(a+b\,x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 157 leaves, 8 steps):

$$-\frac{2\left(a+b x^2\right)^{1/4}}{11 a c (c x)^{11/2}}+\frac{20 b \left(a+b x^2\right)^{1/4}}{77 a^2 c^3 (c x)^{7/2}}-\frac{40 b^2 \left(a+b x^2\right)^{1/4}}{77 a^3 c^5 (c x)^{3/2}}+\frac{80 b^{7/2} \left(1+\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{77 a^{7/2} c^8 \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 104 leaves):

$$-\frac{2 \sqrt{c x} \left(7 a^3-3 a^2 b x^2+10 a b^2 x^4+20 b^3 x^6+40 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)}{77 a^3 c^7 x^6 \left(a+b x^2\right)^{3/4}}$$

Problem 970: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 117 leaves, 6 steps):

$$\frac{c (c x)^{3/2} \left(a+b x^2\right)^{1/4}}{2 b}+\frac{3 a c^{5/2} \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{4 b^{7/4}}-\frac{3 a c^{5/2} \text{ArcTanh}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{4 b^{7/4}}$$

Result (type 5, 69 leaves):

$$\frac{c (c x)^{3/2} \left(a+b x^2-a \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^2}{a}\right]\right)}{2 b \left(a+b x^2\right)^{3/4}}$$

Problem 971: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 84 leaves, 5 steps):

$$-\frac{\sqrt{c} \text{ArcTan}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{b^{3/4}}+\frac{\sqrt{c} \text{ArcTanh}\left[\frac{b^{1/4} \sqrt{c x}}{\sqrt{c} \left(a+b x^2\right)^{1/4}}\right]}{b^{3/4}}$$

Result (type 5, 57 leaves):

$$\frac{2 x \sqrt{c x} \left(\frac{a+b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^2}{a}\right]}{3 \left(a+b x^2\right)^{3/4}}$$

Problem 975: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 91 leaves, 6 steps):

$$-\frac{c\,\sqrt{c\,x}\,\left(a-b\,x^2\right)^{1/4}}{b}-\frac{\sqrt{a}\,\left(1-\frac{a}{b\,x^2}\right)^{3/4}\,(c\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{\sqrt{b}\,\left(a-b\,x^2\right)^{3/4}}$$

Result (type 5, 68 leaves):

$$\frac{c\,\sqrt{c\,x}\,\left(-a+b\,x^2+a\,\left(1-\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,\frac{b\,x^2}{a}\right]\right)}{b\,\left(a-b\,x^2\right)^{3/4}}$$

Problem 976: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 68 leaves, 5 steps):

$$-\frac{2\,\sqrt{b}\,\left(1-\frac{a}{b\,x^2}\right)^{3/4}\,(c\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{\sqrt{a}\,c^2\,\left(a-b\,x^2\right)^{3/4}}$$

Result (type 5, 56 leaves):

$$\frac{2\,x\,\left(\frac{a-b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{5}{4},\,\frac{b\,x^2}{a}\right]}{\sqrt{c\,x}\,\left(a-b\,x^2\right)^{3/4}}$$

Problem 977: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 100 leaves, 6 steps):

$$-\frac{2\,\left(a-b\,x^2\right)^{1/4}}{3\,a\,c\,(c\,x)^{3/2}}-\frac{4\,b^{3/2}\,\left(1-\frac{a}{b\,x^2}\right)^{3/4}\,(c\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCsc}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{3\,a^{3/2}\,c^4\,\left(a-b\,x^2\right)^{3/4}}$$

Result (type 5, 76 leaves):

$$\frac{x \left(-2 a+2 b x^2+4 b x^2 \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^2}{a}\right]\right)}{3 a (c x)^{5/2} \left(a-b x^2\right)^{3/4}}$$

Problem 978: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 130 leaves, 7 steps):

$$-\frac{2 \left(a-b x^2\right)^{1/4}}{7 a c (c x)^{7/2}}-\frac{4 b \left(a-b x^2\right)^{1/4}}{7 a^2 c^3 (c x)^{3/2}}-\frac{8 b^{5/2} \left(1-\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{7 a^{5/2} c^6 \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 94 leaves):

$$\frac{\sqrt{c x} \left(-2 \left(a^2+a b x^2-2 b^2 x^4\right)+8 b^2 x^4 \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^2}{a}\right]\right)}{7 a^2 c^5 x^4 \left(a-b x^2\right)^{3/4}}$$

Problem 979: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(c x)^{13/2} \left(a-b x^2\right)^{3/4}} \, dx$$

Optimal (type 4, 162 leaves, 8 steps):

$$-\frac{2 \left(a-b x^2\right)^{1/4}}{11 a c (c x)^{11/2}}-\frac{20 b \left(a-b x^2\right)^{1/4}}{77 a^2 c^3 (c x)^{7/2}}-\frac{40 b^2 \left(a-b x^2\right)^{1/4}}{77 a^3 c^5 (c x)^{3/2}}-\frac{80 b^{7/2} \left(1-\frac{a}{b x^2}\right)^{3/4} (c x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCsc}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{77 a^{7/2} c^8 \left(a-b x^2\right)^{3/4}}$$

Result (type 5, 105 leaves):

$$\frac{2 \sqrt{c x} \left(-7 a^3-3 a^2 b x^2-10 a b^2 x^4+20 b^3 x^6+40 b^3 x^6 \left(1-\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},\frac{b x^2}{a}\right]\right)}{77 a^3 c^7 x^6 \left(a-b x^2\right)^{3/4}}$$

Problem 980: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 308 leaves, 12 steps):

$$-\frac{c\,(c\,x)^{3/2}\left(a-b\,x^2\right)^{1/4}}{2\,b}-\frac{3\,a\,c^{5/2}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{4\,\sqrt{2}\,b^{7/4}}+\frac{3\,a\,c^{5/2}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{4\,\sqrt{2}\,b^{7/4}}+\frac{3\,a\,c^{5/2}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}-\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{8\,\sqrt{2}\,b^{7/4}}-\frac{3\,a\,c^{5/2}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}+\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{8\,\sqrt{2}\,b^{7/4}}$$

Result (type 5, 71 leaves):

$$\frac{c\,(c\,x)^{3/2}\left(-a+b\,x^2+a\left(1-\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,x^2}{a}\right]\right)}{2\,b\left(a-b\,x^2\right)^{3/4}}$$

Problem 981: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 272 leaves, 11 steps):

$$-\frac{\sqrt{c}\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{3/4}}+\frac{\sqrt{c}\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{3/4}}+\frac{\sqrt{c}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}-\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{2\,\sqrt{2}\,b^{3/4}}-\frac{\sqrt{c}\,\text{Log}\left[\sqrt{c}+\frac{\sqrt{b}\,\sqrt{c}\,x}{\sqrt{a-b\,x^2}}+\frac{\sqrt{2}\,b^{1/4}\,\sqrt{c\,x}}{\left(a-b\,x^2\right)^{1/4}}\right]}{2\,\sqrt{2}\,b^{3/4}}$$

Result (type 5, 58 leaves):

$$\frac{2\,x\,\sqrt{c\,x}\left(\frac{a-b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{b\,x^2}{a}\right]}{3\left(a-b\,x^2\right)^{3/4}}$$

Problem 985: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 146 leaves, 7 steps):

$$\frac{5\,a\,c^3\,\sqrt{c\,x}}{2\,b^2\left(a+b\,x^2\right)^{1/4}}+\frac{c\,(c\,x)^{5/2}}{2\,b\left(a+b\,x^2\right)^{1/4}}-\frac{5\,a\,c^{7/2}\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{9/4}}-\frac{5\,a\,c^{7/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{9/4}}$$

Result (type 5, 73 leaves):

$$\frac{c^3 \sqrt{c\,x} \left(5\,a + b\,x^2 - 5\,a \left(1 + \frac{b\,x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{4}, \frac{5}{4}, -\frac{b\,x^2}{a}\right]\right)}{2\,b^2 \left(a + b\,x^2\right)^{1/4}}$$

Problem 986: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 107 leaves, 6 steps):

$$-\frac{2\,c\,\sqrt{c\,x}}{b\,\left(a + b\,x^2\right)^{1/4}} + \frac{c^{3/2}\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{5/4}} + \frac{c^{3/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{c\,x}}{\sqrt{c}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{5/4}}$$

Result (type 5, 60 leaves):

$$\frac{2\,c\,\sqrt{c\,x}\,\left(-1 + \left(1 + \frac{b\,x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{4}, \frac{5}{4}, -\frac{b\,x^2}{a}\right]\right)}{b\,\left(a + b\,x^2\right)^{1/4}}$$

Problem 991: Result unnecessarily involves higher level functions.

$$\int \frac{(c\,x)^{13/2}}{\left(a + b\,x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 155 leaves, 6 steps):

$$\frac{77\,a^2\,c^5\,(c\,x)^{3/2}}{60\,b^3\,\left(a + b\,x^2\right)^{1/4}} - \frac{11\,a\,c^3\,(c\,x)^{7/2}}{30\,b^2\,\left(a + b\,x^2\right)^{1/4}} + \frac{c\,(c\,x)^{11/2}}{5\,b\,\left(a + b\,x^2\right)^{1/4}} + \frac{77\,a^{5/2}\,c^6\,\left(1 + \frac{a}{b\,x^2}\right)^{1/4} \sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right], 2\right]}{20\,b^{7/2}\,\left(a + b\,x^2\right)^{1/4}}$$

Result (type 5, 87 leaves):

$$\frac{c^5\,(c\,x)^{3/2}\,\left(-77\,a^2 - 11\,a\,b\,x^2 + 6\,b^2\,x^4 + 77\,a^2\,\left(1 + \frac{b\,x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, -\frac{b\,x^2}{a}\right]\right)}{30\,b^3\,\left(a + b\,x^2\right)^{1/4}}$$

Problem 992: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 124 leaves, 5 steps):

$$-\frac{7\,a\,c^3\,(c\,x)^{3/2}}{6\,b^2\,\left(a+b\,x^2\right)^{1/4}}+\frac{c\,(c\,x)^{7/2}}{3\,b\,\left(a+b\,x^2\right)^{1/4}}-\frac{7\,a^{3/2}\,c^4\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{2\,b^{5/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 73 leaves):

$$\frac{c^3\,(c\,x)^{3/2}\,\left(7\,a+b\,x^2-7\,a\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)}{3\,b^2\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 993: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 90 leaves, 4 steps):

$$\frac{c\,(c\,x)^{3/2}}{b\,\left(a+b\,x^2\right)^{1/4}}+\frac{3\,\sqrt{a}\,c^2\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{b^{3/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 60 leaves):

$$\frac{2\,c\,(c\,x)^{3/2}\,\left(-1+\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)}{b\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 994: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 63 leaves, 3 steps):

$$-\frac{2\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{\sqrt{a}\,\sqrt{b}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 63 leaves):

$$-\frac{2\,x\,\sqrt{c\,x}\,\left(-3+2\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)}{3\,a\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 995: Result unnecessarily involves higher level functions.

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

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

$$-\frac{2}{a\,c\,\sqrt{c\,x}\,\left(a+b\,x^2\right)^{1/4}}+\frac{4\,\sqrt{b}\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{a^{3/2}\,c^2\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 76 leaves):

$$\frac{x\,\left(-6\,\left(a+2\,b\,x^2\right)+8\,b\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)}{3\,a^2\,(c\,x)^{3/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 996: Result unnecessarily involves higher level functions.

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

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

$$-\frac{2}{5\,a\,c\,(c\,x)^{5/2}\,\left(a+b\,x^2\right)^{1/4}}+\frac{12\,b}{5\,a^2\,c^3\,\sqrt{c\,x}\,\left(a+b\,x^2\right)^{1/4}}-\frac{24\,b^{3/2}\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{c\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{5\,a^{5/2}\,c^4\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 86 leaves):

$$-\frac{2\,x\,\left(a^2-6\,a\,b\,x^2-12\,b^2\,x^4+8\,b^2\,x^4\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)}{5\,a^3\,(c\,x)^{7/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 997: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 157 leaves, 6 steps):

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

Result (type 5, 105 leaves):

$$\frac{1}{9\,a^4\,c^6\,x^5\,\left(a+b\,x^2\right)^{1/4}}\sqrt{c\,x}\,\left(-2\,\left(a^3-2\,a^2\,b\,x^2+12\,a\,b^2\,x^4+24\,b^3\,x^6\right)+32\,b^3\,x^6\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1010: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 345 leaves, 7 steps):

$$\frac{81\,a^3\,x\,\left(a+b\,x^2\right)^{1/6}}{2816\,b^3}-\frac{9\,a^2\,x^3\,\left(a+b\,x^2\right)^{1/6}}{704\,b^2}+\frac{3\,a\,x^5\,\left(a+b\,x^2\right)^{1/6}}{352\,b}+\frac{3}{22}\,x^7\,\left(a+b\,x^2\right)^{1/6}-$$
$$\left(81\times 3^{3/4}\,\sqrt{2-\sqrt{3}}\,a^4\,\left(a+b\,x^2\right)^{1/6}\,\left(1-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+b\,x^2}\right)^{1/3}+\left(\frac{a}{a+b\,x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}\right],-7+4\,\sqrt{3}\right]\right)\Bigg/$$
$$\left(2816\,b^4\,x\,\left(\frac{a}{a+b\,x^2}\right)^{1/3}\sqrt{-\frac{1-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 101 leaves):

$$\frac{1}{2816\,b^3\,\left(a+b\,x^2\right)^{5/6}}3\,\left(27\,a^4\,x+15\,a^3\,b\,x^3-4\,a^2\,b^2\,x^5+136\,a\,b^3\,x^7+128\,b^4\,x^9-27\,a^4\,x\,\left(1+\frac{b\,x^2}{a}\right)^{5/6}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1011: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 321 leaves, 6 steps):

$$-\frac{27 a^2 x \left(a+b x^2\right)^{1/6}}{640 b^2}+\frac{3 a x^3 \left(a+b x^2\right)^{1/6}}{160 b}+\frac{3}{16} x^5 \left(a+b x^2\right)^{1/6}+$$

$$\left(27\times 3^{3/4} \sqrt{2-\sqrt{3}}\; a^3 \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(640 b^3 x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 90 leaves) :

$$\frac{3 \left(-9 a^3 x-5 a^2 b x^3+44 a b^2 x^5+40 b^3 x^7+9 a^3 x \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{640 b^2 \left(a+b x^2\right)^{5/6}}$$

Problem 1012: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 297 leaves, 5 steps) :

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

$$\left(3\times 3^{3/4} \sqrt{2-\sqrt{3}}\; a^2 \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 5, 76 leaves) :

$$\frac{3 x \left(a^2+5 a b x^2+4 b^2 x^4-a^2 \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{40 b \left(a+b x^2\right)^{5/6}}$$

Problem 1013: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 273 leaves, 4 steps):

$$\frac{3}{4} x \left(a+b x^2\right)^{1/6} + \left(3^{3/4} \sqrt{2-\sqrt{3}}\; a \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right], -7+4\sqrt{3}\right]\right) \Big/ \left(4 b x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 62 leaves):

$$\frac{3 x \left(a+b x^2\right) + a x \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{5}{6}, \frac{3}{2}, -\frac{b x^2}{a}\right]}{4 \left(a+b x^2\right)^{5/6}}$$

Problem 1014: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 266 leaves, 4 steps):

$$-\frac{\left(a+b x^2\right)^{1/6}}{x} + \left(\sqrt{2-\sqrt{3}} \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right], -7+4\sqrt{3}\right]\right) \Big/ \left(3^{1/4} x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 68 leaves):

$$-\frac{\left(a+b x^2\right)^{1/6}}{x}+\frac{b x \left(\frac{a+b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]}{3 \left(a+b x^2\right)^{5/6}}$$

Problem 1015: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 297 leaves, 5 steps):

$$-\frac{\left(a+b x^2\right)^{1/6}}{3 x^3}-\frac{b \left(a+b x^2\right)^{1/6}}{9 a x}-\left(2 \sqrt{2-\sqrt{3}}\, b \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/ \left(9\times 3^{1/4} a x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 85 leaves):

$$\frac{-3 \left(3 a^2+4 a b x^2+b^2 x^4\right)-2 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 a x^3 \left(a+b x^2\right)^{5/6}}$$

Problem 1016: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 323 leaves, 6 steps):

$$-\frac{\left(a+b x^2\right)^{1/6}}{5 x^5}-\frac{b \left(a+b x^2\right)^{1/6}}{45 a x^3}+\frac{8 b^2 \left(a+b x^2\right)^{1/6}}{135 a^2 x}+$$

$$\left(16 \sqrt{2-\sqrt{3}}\; b^2 \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$

$$\left(135 \times 3^{1/4} a^2 x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 94 leaves) :

$$\frac{-81 a^3-90 a^2 b x^2+15 a b^2 x^4+24 b^3 x^6+16 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]}{405 a^2 x^5 \left(a+b x^2\right)^{5/6}}$$

Problem 1017: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{1/6}}{x^8}\, dx$$

Optimal (type 4, 347 leaves, 7 steps) :

$$-\frac{\left(a+b x^2\right)^{1/6}}{7 x^7}-\frac{b \left(a+b x^2\right)^{1/6}}{105 a x^5}+\frac{2 b^2 \left(a+b x^2\right)^{1/6}}{135 a^2 x^3}-\frac{16 b^3 \left(a+b x^2\right)^{1/6}}{405 a^3 x}-$$

$$\left(32 \sqrt{2-\sqrt{3}}\; b^3 \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$

$$\left(405 \times 3^{1/4} a^3 x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 108 leaves) :

$$\frac{1}{8505 a^3 x^7 \left(a+b x^2\right)^{5/6}}\left(-3 \left(405 a^4+432 a^3 b x^2-15 a^2 b^2 x^4+70 a b^3 x^6+112 b^4 x^8\right)-224 b^4 x^8 \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]\right)$$

Problem 1018: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 659 leaves, 9 steps):

$$-\frac{243 a^3 x}{896 b^3 \left(a+b x^2\right)^{1/6}}+\frac{81 a^2 x \left(a+b x^2\right)^{5/6}}{448 b^3}-\frac{9 a x^3 \left(a+b x^2\right)^{5/6}}{56 b^2}+\frac{3 x^5 \left(a+b x^2\right)^{5/6}}{20 b}-\frac{243 a^4 x}{896 b^3 \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{7/6} \left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)}-$$
$$\left(243\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^4 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$
$$\left(1792 b^4 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)+$$
$$\frac{81\times 3^{3/4} a^4 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{448 \sqrt{2}\, b^4 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 90 leaves):

$$\frac{3 \left(135 a^3 x+15 a^2 b x^3-8 a b^2 x^5+112 b^3 x^7-135 a^3 x \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{2240 b^3 \left(a+b x^2\right)^{1/6}}$$

Problem 1019: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 635 leaves, 8 steps):

$$\frac{81 a^2 x}{224 b^2 \left(a+b x^2\right)^{1/6}}-\frac{27 a x \left(a+b x^2\right)^{5/6}}{112 b^2}+\frac{3 x^3 \left(a+b x^2\right)^{5/6}}{14 b}+\frac{81 a^3 x}{224 b^2 \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{7/6} \left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)}+$$

$$\left(81\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^3 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(448 b^3 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)-$$

$$\frac{27\times 3^{3/4} a^3 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{112\sqrt{2}\, b^3 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 79 leaves):

$$\frac{3 \left(-9 a^2 x-a b x^3+8 b^2 x^5+9 a^2 x \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{112 b^2 \left(a+b x^2\right)^{1/6}}$$

Problem 1020: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 611 leaves, 7 steps):

$$-\frac{9 a x}{16 b \left(a+b x^2\right)^{1/6}}+\frac{3 x \left(a+b x^2\right)^{5/6}}{8 b}-\frac{9 a^2 x}{16 b \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{7/6} \left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)}-$$

$$\left(9\times 3^{1/4} \sqrt{2+\sqrt{3}}\ a^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Big/$$

$$\left(32 b^2 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)+$$

$$\frac{3\times 3^{3/4} a^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{8 \sqrt{2}\ b^2 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 62 leaves) :

$$\frac{3 x \left(a+b x^2-a \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{8 b \left(a+b x^2\right)^{1/6}}$$

Problem 1021: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 577 leaves, 6 steps) :

$$\frac{3x}{2\left(a+bx^2\right)^{1/6}}+\frac{3ax}{2\left(\frac{a}{a+bx^2}\right)^{2/3}\left(a+bx^2\right)^{7/6}\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)}+$$

$$\left(3\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a\left(1-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+bx^2}\right)^{1/3}+\left(\frac{a}{a+bx^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

$$\frac{3^{3/4}\,a\left(1-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+bx^2}\right)^{1/3}+\left(\frac{a}{a+bx^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{\sqrt{2}\,bx\left(\frac{a}{a+bx^2}\right)^{2/3}\left(a+bx^2\right)^{1/6}\sqrt{-\frac{1-\left(\frac{a}{a+bx^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 47 leaves) :

$$\frac{x\left(\frac{a+bx^2}{a}\right)^{1/6}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{bx^2}{a}\right]}{\left(a+bx^2\right)^{1/6}}$$

Problem 1022: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 586 leaves, 7 steps) :

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

$$\frac{3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+b\,x^2}\right)^{1/3}+\left(\frac{a}{a+b\,x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}\right],\,-7+4\sqrt{3}\right]}{2\,x\left(\frac{a}{a+b\,x^2}\right)^{2/3}\left(a+b\,x^2\right)^{1/6}\sqrt{-\frac{1-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)^2}}}-$$

$$\frac{\sqrt{2}\left(1-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+b\,x^2}\right)^{1/3}+\left(\frac{a}{a+b\,x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}\right],\,-7+4\sqrt{3}\right]}{3^{1/4}\,x\left(\frac{a}{a+b\,x^2}\right)^{2/3}\left(a+b\,x^2\right)^{1/6}\sqrt{-\frac{1-\left(\frac{a}{a+b\,x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b\,x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 70 leaves) :

$$\frac{-3\left(a+b\,x^2\right)+2\,b\,x^2\left(1+\frac{b\,x^2}{a}\right)^{1/6}\text{Hypergeometric2F1}\left[\frac{1}{6},\,\frac{1}{2},\,\frac{3}{2},\,-\frac{b\,x^2}{a}\right]}{3\,a\,x\left(a+b\,x^2\right)^{1/6}}$$

Problem 1023: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 633 leaves, 8 steps) :

$$-\frac{4 b^2 x}{9 a^2 \left(a+b x^2\right)^{1/6}}-\frac{\left(a+b x^2\right)^{5/6}}{3 a x^3}+\frac{4 b \left(a+b x^2\right)^{5/6}}{9 a^2 x}-\frac{4 b^2 x}{9 a \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{7/6} \left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)}-$$

$$\frac{2 \sqrt{2+\sqrt{3}}\, b \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],\ -7+4 \sqrt{3}\right]}{3\times 3^{3/4} a x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}+$$

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

Result (type 5, 83 leaves) :

$$\frac{-9 a^2+3 a b x^2+12 b^2 x^4-8 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 a^2 x^3 \left(a+b x^2\right)^{1/6}}$$

Problem 1024: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 661 leaves, 9 steps) :

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

$$\frac{4 \sqrt{2+\sqrt{3}}\, b^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{9\times 3^{3/4} a^2 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}-$$

$$\frac{8 \sqrt{2}\, b^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{27\times 3^{1/4} a^2 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 94 leaves) :

$$\frac{-81 a^3+9 a^2 b x^2-30 a b^2 x^4-120 b^3 x^6+80 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]}{405 a^3 x^5 \left(a+b x^2\right)^{1/6}}$$

Problem 1025: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 324 leaves, 6 steps) :

$$\frac{81 a^2 x \left(a+b x^2\right)^{1/6}}{128 b^3}-\frac{9 a x^3 \left(a+b x^2\right)^{1/6}}{32 b^2}+\frac{3 x^5 \left(a+b x^2\right)^{1/6}}{16 b}-\left(81\times 3^{3/4}\sqrt{2-\sqrt{3}}\, a^3 \left(a+b x^2\right)^{1/6}\left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(128 b^4 x\left(\frac{a}{a+b x^2}\right)^{1/3}\sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 89 leaves):

$$\frac{3 x \left(27 a^3+15 a^2 b x^2-4 a b^2 x^4+8 b^3 x^6-27 a^3 \left(1+\frac{b x^2}{a}\right)^{5/6}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{128 b^3 \left(a+b x^2\right)^{5/6}}$$

Problem 1026: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 300 leaves, 5 steps):

$$-\frac{27 a x \left(a+b x^2\right)^{1/6}}{40 b^2}+\frac{3 x^3 \left(a+b x^2\right)^{1/6}}{10 b}+\left(27\times 3^{3/4}\sqrt{2-\sqrt{3}}\, a^2 \left(a+b x^2\right)^{1/6}\left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(40 b^3 x\left(\frac{a}{a+b x^2}\right)^{1/3}\sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 79 leaves):

$$\frac{3 \left(-9 a^2 x-5 a b x^3+4 b^2 x^5+9 a^2 x \left(1+\frac{b x^2}{a}\right)^{5/6}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{40 b^2 \left(a+b x^2\right)^{5/6}}$$

Problem 1027: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 276 leaves, 4 steps):

$$\frac{3 x \left(a+b x^2\right)^{1/6}}{4 b}-\left(3\times 3^{3/4} \sqrt{2-\sqrt{3}}\, a \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/ \left(4 b^2 x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 62 leaves):

$$\frac{3 x \left(a+b x^2-a \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{4 b \left(a+b x^2\right)^{5/6}}$$

Problem 1028: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 252 leaves, 3 steps):

$$\left(3^{3/4} \sqrt{2-\sqrt{3}} \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/ \left(b x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 47 leaves):

$$\frac{x\left(\frac{a+b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]}{\left(a+b x^2\right)^{5/6}}$$

Problem 1029: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 273 leaves, 4 steps):

$$-\frac{\left(a+b x^2\right)^{1/6}}{a x}-\left(2 \sqrt{2-\sqrt{3}}\left(a+b x^2\right)^{1/6}\left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/ \left(3^{1/4} a x\left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 70 leaves):

$$\frac{-3\left(a+b x^2\right)-2 b x^2\left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]}{3 a x\left(a+b x^2\right)^{5/6}}$$

Problem 1030: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 300 leaves, 5 steps):

$$-\frac{\left(a+b x^2\right)^{1/6}}{3 a x^3}+\frac{8 b \left(a+b x^2\right)^{1/6}}{9 a^2 x}+\left(16 \sqrt{2-\sqrt{3}}\, b \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Big/ \left(9 \times 3^{1/4} a^2 x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 83 leaves):

$$\frac{-9 a^2+15 a b x^2+24 b^2 x^4+16 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]}{27 a^2 x^3 \left(a+b x^2\right)^{5/6}}$$

Problem 1031: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 326 leaves, 6 steps):

$$-\frac{\left(a+b x^2\right)^{1/6}}{5 a x^5}+\frac{14 b \left(a+b x^2\right)^{1/6}}{45 a^2 x^3}-\frac{112 b^2 \left(a+b x^2\right)^{1/6}}{135 a^3 x}-\left(224 \sqrt{2-\sqrt{3}}\, b^2 \left(a+b x^2\right)^{1/6} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Big/ \left(135 \times 3^{1/4} a^3 x \left(\frac{a}{a+b x^2}\right)^{1/3} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 94 leaves):

$$\frac{-81 a^3+45 a^2 b x^2-210 a b^2 x^4-336 b^3 x^6-224 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{5/6} \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{6},\frac{3}{2},-\frac{b x^2}{a}\right]}{405 a^3 x^5 \left(a+b x^2\right)^{5/6}}$$

Problem 1032: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 654 leaves, 9 steps):

$$\frac{1215 a^2 x}{224 b^3 \left(a+b x^2\right)^{1/6}}-\frac{3 x^5}{b \left(a+b x^2\right)^{1/6}}-\frac{405 a x \left(a+b x^2\right)^{5/6}}{112 b^3}+\frac{45 x^3 \left(a+b x^2\right)^{5/6}}{14 b^2}+\frac{1215 a^3 x}{224 b^3 \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{7/6} \left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)}+$$

$$\left(1215\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^3 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

$$\left(448 b^4 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)-$$

$$\frac{405\times 3^{3/4} a^3 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{112 \sqrt{2}\, b^4 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 79 leaves):

$$\frac{3 \left(-135 a^2 x-15 a b x^3+8 b^2 x^5+135 a^2 x \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{112 b^3 \left(a+b x^2\right)^{1/6}}$$

Problem 1033: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 630 leaves, 8 steps):

$$-\frac{81 a x}{16 b^2 \left(a+b x^2\right)^{1/6}}-\frac{3 x^3}{b \left(a+b x^2\right)^{1/6}}+\frac{27 x \left(a+b x^2\right)^{5/6}}{8 b^2}-\frac{81 a^2 x}{16 b^2 \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{7/6} \left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)}-$$

$$\left(81\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right], -7+4 \sqrt{3}\right]\right) \Big/$$

$$\left(32 b^3 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\right)+$$

$$\frac{27\times 3^{3/4} a^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right], -7+4 \sqrt{3}\right]}{8 \sqrt{2}\, b^3 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 64 leaves):

$$\frac{3 x \left(9 a+b x^2-9 a \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^2}{a}\right]\right)}{8 b^2 \left(a+b x^2\right)^{1/6}}$$

Problem 1034: Result unnecessarily involves higher level functions.

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

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

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

$$\left(9\times 3^{1/4}\sqrt{2+\sqrt{3}}\,a\left(1-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+bx^2}\right)^{1/3}+\left(\frac{a}{a+bx^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

$$\frac{3\times 3^{3/4}a\left(1-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+bx^2}\right)^{1/3}+\left(\frac{a}{a+bx^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{\sqrt{2}\,b^2x\left(\frac{a}{a+bx^2}\right)^{2/3}\left(a+bx^2\right)^{1/6}\sqrt{-\frac{1-\left(\frac{a}{a+bx^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 53 leaves):

$$\frac{3x\left(-1+\left(1+\frac{bx^2}{a}\right)^{1/6}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{bx^2}{a}\right]\right)}{b\left(a+bx^2\right)^{1/6}}$$

Problem 1035: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(a+bx^2\right)^{7/6}}\,dx$$

Optimal (type 4, 555 leaves, 5 steps):

$$-\frac{3x}{\left(\frac{a}{a+bx^2}\right)^{2/3}\left(a+bx^2\right)^{7/6}\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)}-$$

$$\left(3\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+bx^2}\right)^{1/3}+\left(\frac{a}{a+bx^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

$$\frac{\sqrt{2}\ 3^{3/4}\left(1-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)\sqrt{\frac{1+\left(\frac{a}{a+bx^2}\right)^{1/3}+\left(\frac{a}{a+bx^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{bx\left(\frac{a}{a+bx^2}\right)^{2/3}\left(a+bx^2\right)^{1/6}\sqrt{-\frac{1-\left(\frac{a}{a+bx^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+bx^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 55 leaves) :

$$\frac{3x-2x\left(1+\frac{bx^2}{a}\right)^{1/6}\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{bx^2}{a}\right]}{a\left(a+bx^2\right)^{1/6}}$$

Problem 1036: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\left(a+bx^2\right)^{7/6}}\,dx$$

Optimal (type 4, 614 leaves, 8 steps) :

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

$$\left(2 \times 3^{1/4} \sqrt{2+\sqrt{3}} \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right], -7+4 \sqrt{3}\right]\right) \Bigg/$$

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

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

Result (type 5, 71 leaves):

$$\frac{-3 \left(a+4 b x^2\right)+8 b x^2 \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^2}{a}\right]}{3 a^2 x \left(a+b x^2\right)^{1/6}}$$

Problem 1037: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 652 leaves, 9 steps):

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

$$\left(20 \sqrt{2+\sqrt{3}}\, b \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right], -7+4 \sqrt{3}\right]\right) \Bigg/$$

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

$$\frac{40 \sqrt{2}\, b \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right], -7+4 \sqrt{3}\right]}{9 \times 3^{1/4} a^2 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 83 leaves):

$$\frac{-9 a^2+30 a b x^2+120 b^2 x^4-80 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6}, \frac{1}{2}, \frac{3}{2}, -\frac{b x^2}{a}\right]}{27 a^3 x^3 \left(a+b x^2\right)^{1/6}}$$

Problem 1038: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 680 leaves, 10 steps):

$$\frac{3}{a x^5 \left(a+b x^2\right)^{1/6}}+\frac{128 b^3 x}{27 a^4 \left(a+b x^2\right)^{1/6}}-\frac{16 \left(a+b x^2\right)^{5/6}}{5 a^2 x^5}+\frac{32 b \left(a+b x^2\right)^{5/6}}{9 a^3 x^3}-\frac{128 b^2 \left(a+b x^2\right)^{5/6}}{27 a^4 x}+\frac{128 b^3 x}{27 a^3 \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{7/6} \left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)}+$$

$$\left(64 \sqrt{2+\sqrt{3}}\; b^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\; \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/$$

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

$$\frac{128 \sqrt{2}\; b^2 \left(1-\left(\frac{a}{a+b x^2}\right)^{1/3}\right) \sqrt{\frac{1+\left(\frac{a}{a+b x^2}\right)^{1/3}+\left(\frac{a}{a+b x^2}\right)^{2/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}{1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{27\times 3^{1/4} a^3 x \left(\frac{a}{a+b x^2}\right)^{2/3} \left(a+b x^2\right)^{1/6} \sqrt{-\frac{1-\left(\frac{a}{a+b x^2}\right)^{1/3}}{\left(1-\sqrt{3}-\left(\frac{a}{a+b x^2}\right)^{1/3}\right)^2}}}$$

Result (type 5, 97 leaves) :

$$\frac{1}{405 a^4 x^5 \left(a+b x^2\right)^{1/6}}\left(-3 \left(27 a^3-48 a^2 b x^2+160 a b^2 x^4+640 b^3 x^6\right)+1280 b^3 x^6 \left(1+\frac{b x^2}{a}\right)^{1/6} \text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)$$

Test results for the 349 problems in "1.1.2.3 (a+b x^2)^p (c+d x^2)^q.m"

Problem 72: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 27 leaves, 4 steps) :

$$\text{ArcSinh}[x]-\sqrt{2}\; \text{ArcTanh}\left[\frac{\sqrt{2}\; x}{\sqrt{1+x^2}}\right]$$

Result (type 3, 64 leaves) :

$$\text{ArcSinh}[x]+\frac{\text{Log}[1-x]-\text{Log}[1+x]+\text{Log}\left[1-x+\sqrt{2}\sqrt{1+x^2}\right]-\text{Log}\left[1+x+\sqrt{2}\sqrt{1+x^2}\right]}{\sqrt{2}}$$

Problem 109: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 648 leaves, 8 steps):

$$\frac{18144 a^3 x\left(a-b x^2\right)^{2/3}}{1235}-\frac{23544 a^2 x\left(a-b x^2\right)^{5/3}}{6175}-\frac{378}{475} a x\left(a-b x^2\right)^{5/3}\left(3 a+b x^2\right)-\frac{3}{25} x\left(a-b x^2\right)^{5/3}\left(3 a+b x^2\right)^2-$$
$$\frac{72576 a^4 x}{1235\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}-\left(36288\times 3^{1/4}\sqrt{2+\sqrt{3}}\, a^{13/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(1235 b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$
$$\left(24192\sqrt{2}\, 3^{3/4} a^{13/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$
$$\left(1235 b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 99 leaves):

$$-\frac{1}{6175\left(a-b x^2\right)^{1/3}}3\left(-15255 a^4 x+3390 a^3 b x^3+8992 a^2 b^2 x^5+2626 a b^3 x^7+247 b^4 x^9-40320 a^4 x\left(1-\frac{b x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)$$

Problem 110: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 617 leaves, 7 steps):

$$\frac{7776\, a^2\, x\, \left(a-b\, x^2\right)^{2/3}}{1729}-\frac{252}{247}\, a\, x\, \left(a-b\, x^2\right)^{5/3}-\frac{3}{19}\, x\, \left(a-b\, x^2\right)^{5/3}\, \left(3\, a+b\, x^2\right)-\frac{31104\, a^3\, x}{1729\, \left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)}-$$

$$\left(15552\times 3^{1/4}\, \sqrt{2+\sqrt{3}}\, a^{10/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)\, \sqrt{\frac{a^{2/3}+a^{1/3}\, \left(a-b\, x^2\right)^{1/3}+\left(a-b\, x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}\right],\, -7+4\, \sqrt{3}\right]\right)\Bigg/\left(1729\, b\, x\, \sqrt{-\frac{a^{1/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(10368\, \sqrt{2}\, 3^{3/4}\, a^{10/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)\, \sqrt{\frac{a^{2/3}+a^{1/3}\, \left(a-b\, x^2\right)^{1/3}+\left(a-b\, x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}\right],\, -7+4\, \sqrt{3}\right]\right)\Bigg/$$

$$\left(1729\, b\, x\, \sqrt{-\frac{a^{1/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 88 leaves):

$$-\frac{1}{1729\, \left(a-b\, x^2\right)^{1/3}}3\, \left(-1731\, a^3\, x+961\, a^2\, b\, x^3+679\, a\, b^2\, x^5+91\, b^3\, x^7-3456\, a^3\, x\, \left(1-\frac{b\, x^2}{a}\right)^{1/3}\, \text{Hypergeometric2F1}\left[\frac{1}{3},\, \frac{1}{2},\, \frac{3}{2},\, \frac{b\, x^2}{a}\right]\right)$$

Problem 111: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 588 leaves, 6 steps):

$$\frac{18}{13} a x \left(a-b x^2\right)^{2/3}-\frac{3}{13} x \left(a-b x^2\right)^{5/3}-\frac{72 a^2 x}{13 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}-$$

$$\left(36\times 3^{1/4} \sqrt{2+\sqrt{3}}\; a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/\left(13 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(24 \sqrt{2}\; 3^{3/4} a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$

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

Result (type 5, 76 leaves):

$$-\frac{3 \left(-5 a^2 x+4 a b x^3+b^2 x^5-8 a^2 x \left(1-\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{13 \left(a-b x^2\right)^{1/3}}$$

Problem 112: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 740 leaves, 6 steps):

$$\frac{3\,x}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}+\frac{2^{1/3}\,a^{1/6}\,\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{\sqrt{3}\,\sqrt{b}}+\frac{2^{1/3}\,a^{1/6}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{\sqrt{3}\,\sqrt{b}}-\frac{2^{1/3}\,a^{1/6}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{3\,\sqrt{b}}+$$

$$\frac{2^{1/3}\,a^{1/6}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-b\,x^2\right)^{1/3}\right)}\right]}{\sqrt{b}}+\left(3\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,a^{1/3}\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Bigg/\left(2\,b\,x\,\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(\sqrt{2}\,3^{3/4}\,a^{1/3}\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 6, 162 leaves):

$$\left(9\,a\,x\left(a-b\,x^2\right)^{2/3}\text{AppellF1}\left[\frac{1}{2},-\frac{2}{3},1,\frac{3}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]\right)\Bigg/$$

$$\left(\left(3\,a+b\,x^2\right)\left(9\,a\,\text{AppellF1}\left[\frac{1}{2},-\frac{2}{3},1,\frac{3}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]-2\,b\,x^2\left(\text{AppellF1}\left[\frac{3}{2},-\frac{2}{3},2,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]+2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]\right)\right)\right)$$

Problem 113: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 584 leaves, 6 steps):

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

$$\left(\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

$$\left(\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 5, 86 leaves):

$$\frac{x\left(a-b x^2\right)^{2/3}}{6 a\left(3 a+b x^2\right)}+\frac{x\left(\frac{a-b x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{18 a\left(a-b x^2\right)^{1/3}}$$

Problem 114: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 818 leaves, 8 steps):

$$\frac{x\left(a-b x^2\right)^{2/3}}{12 a\left(3 a+b x^2\right)^2}+\frac{x\left(a-b x^2\right)^{2/3}}{36 a^2\left(3 a+b x^2\right)}-\frac{x}{36 a^2\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+$$

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}\sqrt{a}}{\sqrt{b}\,x}\right]}{72\times 2^{2/3}\sqrt{3}\,a^{11/6}\sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-b x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{72\times 2^{2/3}\sqrt{3}\,a^{11/6}\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{216\times 2^{2/3}\,a^{11/6}\sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-b x^2\right)^{1/3}\right)}\right]}{72\times 2^{2/3}\,a^{11/6}\sqrt{b}}-$$

$$\left(\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(24\times 3^{3/4}\,a^{5/3}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 6, 350 leaves):

$$\left(x\left(\frac{3\left(a-b x^2\right)\left(6 a+b x^2\right)}{a^2}+\left(54\left(3 a+b x^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Bigg/\right.\right.$$

$$\left(9 a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)+$$

$$\left(5 b x^2\left(3 a+b x^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Bigg/\left(a\left(15 a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\right.\right.$$

$$\left.\left.\left.\left.2 b x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right)\right)\right)\Bigg/\left(108\left(a-b x^2\right)^{1/3}\left(3 a+b x^2\right)^2\right)$$

Problem 115: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 849 leaves, 9 steps):

$$\frac{x\left(a-b x^2\right)^{2/3}}{18 a\left(3 a+b x^2\right)^3}+\frac{x\left(a-b x^2\right)^{2/3}}{54 a^2\left(3 a+b x^2\right)^2}+\frac{x\left(a-b x^2\right)^{2/3}}{144 a^3\left(3 a+b x^2\right)}-\frac{x}{144 a^3\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+$$

$$\frac{7\,\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{1296\times 2^{2/3}\sqrt{3}\,a^{17/6}\sqrt{b}}+\frac{7\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-b x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{1296\times 2^{2/3}\sqrt{3}\,a^{17/6}\sqrt{b}}-\frac{7\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{3888\times 2^{2/3}a^{17/6}\sqrt{b}}+\frac{7\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-b x^2\right)^{1/3}\right)}\right]}{1296\times 2^{2/3}a^{17/6}\sqrt{b}}-$$

$$\left(\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(96\times 3^{3/4}a^{8/3}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(72\sqrt{2}\,3^{1/4}a^{8/3}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 364 leaves):

$$\left(x\left(\left(a-b x^2\right)\left(75 a^2+26 a b x^2+3 b^2 x^4\right)+\left(69 a^2\left(3 a+b x^2\right)^2\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\right.\right.$$

$$\left(9 a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)+$$

$$\left(5 a b\left(3 a x+b x^3\right)^2\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\left(15 a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\right.$$

$$\left.\left.\left.2 b x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right)\right)\Big/\left(432 a^3\left(a-b x^2\right)^{1/3}\left(3 a+b x^2\right)^3\right)$$

Problem 116: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 668 leaves, 9 steps):

$$\frac{2809728\, a^4 x \left(a-b x^2\right)^{2/3}}{267995}+\frac{1404864\, a^3 x \left(a-b x^2\right)^{5/3}}{191425}-\frac{33264\, a^2 x \left(a-b x^2\right)^{8/3}}{14725}-\frac{432}{775} a x \left(a-b x^2\right)^{8/3} \left(3 a+b x^2\right)-\frac{3}{31} x \left(a-b x^2\right)^{8/3} \left(3 a+b x^2\right)^2-$$

$$\frac{11238912\, a^5 x}{267995 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}-\left(5619456 \times 3^{1/4} \sqrt{2+\sqrt{3}}\; a^{16/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/\left(267995\, b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(3746304 \sqrt{2}\; 3^{3/4} a^{16/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/\left(267995\, b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 110 leaves) :

$$\frac{1}{1339975 \left(a-b x^2\right)^{1/3}} 3 \left(5815935\, a^5 x-5312355\, a^4 b x^3-1675114\, a^3 b^2 x^5+\right.$$

$$\left.749658\, a^2 b^3 x^7+378651\, a b^4 x^9+43225\, b^5 x^{11}+6243840\, a^5 x \left(1-\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)$$

Problem 117: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 637 leaves, 8 steps) :

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

$$\frac{114048\, a^4\, x}{8645\, \left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)}-\left(57024\times 3^{1/4}\, \sqrt{2+\sqrt{3}}\, a^{13/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)\, \sqrt{\frac{a^{2/3}+a^{1/3}\, \left(a-b\, x^2\right)^{1/3}+\left(a-b\, x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}\right],\, -7+4\, \sqrt{3}\right]\right)\Bigg/\left(8645\, b\, x\, \sqrt{-\frac{a^{1/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(38016\, \sqrt{2}\, 3^{3/4}\, a^{13/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)\, \sqrt{\frac{a^{2/3}+a^{1/3}\, \left(a-b\, x^2\right)^{1/3}+\left(a-b\, x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}}\right],\, -7+4\, \sqrt{3}\right]\right)\Bigg/$$

$$\left(8645\, b\, x\, \sqrt{-\frac{a^{1/3}\, \left(a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\, a^{1/3}-\left(a-b\, x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 99 leaves) :

$$\frac{1}{43225\, \left(a-b\, x^2\right)^{1/3}}$$

$$3\, \left(66315\, a^4\, x-72370\, a^3\, b\, x^3-4956\, a^2\, b^2\, x^5+9282\, a\, b^3\, x^7+1729\, b^4\, x^9+63360\, a^4\, x\, \left(1-\frac{b\, x^2}{a}\right)^{1/3}\, \text{Hypergeometric2F1}\left[\frac{1}{3},\, \frac{1}{2},\, \frac{3}{2},\, \frac{b\, x^2}{a}\right]\right)$$

Problem 118: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 608 leaves, 7 steps) :

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

$$\left(3600\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,a^{10/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(1729\,b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(2400\,\sqrt{2}\,3^{3/4}\,a^{10/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(1729\,b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 88 leaves) :

$$\frac{3\,\left(929\,a^3\,x-1167\,a^2\,b\,x^3+147\,a\,b^2\,x^5+91\,b^3\,x^7+800\,a^3\,x\,\left(1-\frac{b\,x^2}{a}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{3}{2},\,\frac{b\,x^2}{a}\right]\right)}{1729\,\left(a-b\,x^2\right)^{1/3}}$$

Problem 119: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 765 leaves, 7 steps) :

$$-\frac{3}{7}x\left(a-b x^2\right)^{2/3}+\frac{96 a x}{7\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+\frac{4\times 2^{1/3} a^{7/6}\,\text{ArcTan}\left[\frac{\sqrt{3}\sqrt{a}}{\sqrt{b}\,x}\right]}{\sqrt{3}\sqrt{b}}+$$

$$\frac{4\times 2^{1/3} a^{7/6}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-b x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{\sqrt{3}\sqrt{b}}-\frac{4\times 2^{1/3} a^{7/6}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{3\sqrt{b}}+\frac{4\times 2^{1/3} a^{7/6}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-b x^2\right)^{1/3}\right)}\right]}{\sqrt{b}}+$$

$$\left(48\times 3^{1/4}\sqrt{2+\sqrt{3}}\,a^{4/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(7 b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(32\sqrt{2}\,3^{3/4} a^{4/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(7 b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 333 leaves):

$$\frac{1}{7\left(a-b x^2\right)^{1/3}}x\left(-3 a+3 b x^2+\left(144 a^3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\left(\left(3 a+b x^2\right)\right.\right.$$

$$\left.\left(9 a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right)-$$

$$\left(160 a^2 b x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\left(\left(3 a+b x^2\right)\right.$$

$$\left.\left.\left(15 a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right)\right)$$

Problem 120: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 775 leaves, 7 steps):

$$\frac{2x\left(a-bx^2\right)^{2/3}}{3\left(3a+bx^2\right)}-\frac{11x}{3\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}-\frac{2^{1/3}a^{1/6}\,\text{ArcTan}\left[\frac{\sqrt{3}\sqrt{a}}{\sqrt{b}\,x}\right]}{\sqrt{3}\sqrt{b}}-$$

$$\frac{2^{1/3}a^{1/6}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-bx^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{\sqrt{3}\sqrt{b}}+\frac{2^{1/3}a^{1/6}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{3\sqrt{b}}-\frac{2^{1/3}a^{1/6}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-bx^2\right)^{1/3}\right)}\right]}{\sqrt{b}}-$$

$$\left(11\sqrt{2+\sqrt{3}}\,a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

$$\left(11\sqrt{2}\,a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(3\times 3^{1/4}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 320 leaves):

$$\frac{1}{9\left(a-bx^2\right)^{1/3}\left(3a+bx^2\right)}x\left(6a-6bx^2-\left(27a^2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\Bigg/\right.$$

$$\left(9a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+2bx^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\right)+$$

$$\left(55abx^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\Bigg/$$

$$\left.\left(15a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+2bx^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\right)\right)$$

Problem 121: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 815 leaves, 9 steps):

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

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3} \sqrt{a}}{\sqrt{b} x}\right]}{18\times 2^{2/3} \sqrt{3} a^{5/6} \sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3} a^{1/6} \left(a^{1/3}-2^{1/3} \left(a-b x^2\right)^{1/3}\right)}{\sqrt{b} x}\right]}{18\times 2^{2/3} \sqrt{3} a^{5/6} \sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right]}{54\times 2^{2/3} a^{5/6} \sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b} x}{a^{1/6} \left(a^{1/3}+2^{1/3} \left(a-b x^2\right)^{1/3}\right)}\right]}{18\times 2^{2/3} a^{5/6} \sqrt{b}}+$$

$$\left(\sqrt{2+\sqrt{3}} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$

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

$$\left(\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$

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

Result (type 6, 346 leaves):

$$\left(x \left(9 a-12 b x^2+\frac{3 b^2 x^4}{a}+\left(27 a \left(3 a+b x^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\right.\right.$$

$$\left(9 a \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2 \left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)-$$

$$\left(5 b x^2 \left(3 a+b x^2\right) \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\left(15 a \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\right.$$

$$\left.\left.\left.2 b x^2 \left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right)\right)\Big/\left(54 \left(a-b x^2\right)^{1/3} \left(3 a+b x^2\right)^2\right)$$

Problem 122: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 659 leaves, 8 steps):

$$-\frac{1552608\,a^3\,x\,\left(a-b\,x^2\right)^{2/3}}{43225}-\frac{36288\,a^2\,x\,\left(a-b\,x^2\right)^{2/3}\,\left(3\,a+b\,x^2\right)}{6175}-\frac{18}{19}\,a\,x\,\left(a-b\,x^2\right)^{2/3}\,\left(3\,a+b\,x^2\right)^2-\frac{3}{25}\,x\,\left(a-b\,x^2\right)^{2/3}\,\left(3\,a+b\,x^2\right)^3-$$
$$\frac{3794688\,a^4\,x}{8645\,\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}-\left(1897344\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\;a^{13/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(8645\,b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)+$$
$$\left(1264896\,\sqrt{2}\;3^{3/4}\,a^{13/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(8645\,b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 98 leaves):

$$\frac{1}{43225\,\left(a-b\,x^2\right)^{1/3}}$$
$$3\,x\,\left(-941085\,a^4+727830\,a^3\,b\,x^2+184044\,a^2\,b^2\,x^4+27482\,a\,b^3\,x^6+1729\,b^4\,x^8+2108160\,a^4\,\left(1-\frac{b\,x^2}{a}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{3}{2},\,\frac{b\,x^2}{a}\right]\right)$$

Problem 123: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 628 leaves, 7 steps):

$$-\frac{15768\,a^2\,x\,\left(a-b\,x^2\right)^{2/3}}{1729}-\frac{324}{247}\,a\,x\,\left(a-b\,x^2\right)^{2/3}\,\left(3\,a+b\,x^2\right)-\frac{3}{19}\,x\,\left(a-b\,x^2\right)^{2/3}\,\left(3\,a+b\,x^2\right)^2-$$

$$\frac{215136\,a^3\,x}{1729\,\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}-\left(107568\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,a^{10/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/\left(1729\,b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(71712\,\sqrt{2}\,3^{3/4}\,a^{10/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(1729\,b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 88 leaves):

$$\frac{1}{1729\,\left(a-b\,x^2\right)^{1/3}}3\,\left(-8343\,a^3\,x+7041\,a^2\,b\,x^3+1211\,a\,b^2\,x^5+91\,b^3\,x^7+23904\,a^3\,x\,\left(1-\frac{b\,x^2}{a}\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\,\frac{1}{2},\,\frac{3}{2},\,\frac{b\,x^2}{a}\right]\right)$$

Problem 124: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 597 leaves, 6 steps):

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

$$\left(1620\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/\left(91 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(1080 \sqrt{2}\, 3^{3/4} a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 77 leaves):

$$\frac{3 \left(-87 a^2 x+80 a b x^3+7 b^2 x^5+360 a^2 x \left(1-\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{91 \left(a-b x^2\right)^{1/3}}$$

Problem 125: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 568 leaves, 5 steps):

$$-\frac{3}{7}x\left(a-bx^2\right)^{2/3}-\frac{72\,a\,x}{7\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}-\left(36\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^{4/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(7\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(24\sqrt{2}\;3^{3/4}\,a^{4/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(7\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 62 leaves):

$$\frac{3\,x\left(-a+bx^2+8\,a\left(1-\frac{bx^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{bx^2}{a}\right]\right)}{7\left(a-bx^2\right)^{1/3}}$$

Problem 126: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 204 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{2\times 2^{2/3}\sqrt{3}\,a^{5/6}\sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-bx^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{2\times 2^{2/3}\sqrt{3}\,a^{5/6}\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{6\times 2^{2/3}\,a^{5/6}\sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-bx^2\right)^{1/3}\right)}\right]}{2\times 2^{2/3}\,a^{5/6}\sqrt{b}}$$

Result (type 6, 162 leaves):

$$\left(9\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3\,a}\right]\right)\Bigg/\left(\left(a-bx^2\right)^{1/3}\left(3\,a+bx^2\right)\right.$$

$$\left.\left(9\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3\,a}\right]+2\,b\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3\,a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3\,a}\right]\right)\right)\right)$$

Problem 127: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 787 leaves, 7 steps):

$$\frac{x \left(a-b x^2\right)^{2/3}}{24 a^2 \left(3 a+b x^2\right)}-\frac{x}{24 a^2 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3} \sqrt{a}}{\sqrt{b} x}\right]}{8\times 2^{2/3} \sqrt{3} a^{11/6} \sqrt{b}}+$$
$$\frac{\text{ArcTan}\left[\frac{\sqrt{3} a^{1/6} \left(a^{1/3}-2^{1/3} \left(a-b x^2\right)^{1/3}\right)}{\sqrt{b} x}\right]}{8\times 2^{2/3} \sqrt{3} a^{11/6} \sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right]}{24\times 2^{2/3} a^{11/6} \sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b} x}{a^{1/6} \left(a^{1/3}+2^{1/3} \left(a-b x^2\right)^{1/3}\right)}\right]}{8\times 2^{2/3} a^{11/6} \sqrt{b}}-$$
$$\left(\sqrt{2+\sqrt{3}} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$
$$\left(16\times 3^{3/4} a^{5/3} b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$
$$\left(\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Big/$$
$$\left(12 \sqrt{2}\, 3^{1/4} a^{5/3} b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 322 leaves):

$$\left(x\left(\left(189\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\right.\right.$$

$$\left(9\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2\,b\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)+$$

$$\left.\left.\frac{3 a-3 b x^2+\frac{5\,a\,b\,x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]}{15\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2\,b\,x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)}}{a^2}\right)\right)\Big/\left(72\left(a-b x^2\right)^{1/3}\left(3 a+b x^2\right)\right)$$

Problem 128: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 818 leaves, 8 steps) :

$$\frac{x\left(a-b x^2\right)^{2/3}}{48 a^2\left(3 a+b x^2\right)^2}+\frac{5 x\left(a-b x^2\right)^{2/3}}{288 a^3\left(3 a+b x^2\right)}-\frac{5 x}{288 a^3\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+$$

$$\frac{5\,\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{144\times 2^{2/3}\sqrt{3}\,a^{17/6}\sqrt{b}}+\frac{5\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-b x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{144\times 2^{2/3}\sqrt{3}\,a^{17/6}\sqrt{b}}-\frac{5\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{432\times 2^{2/3}\,a^{17/6}\sqrt{b}}+\frac{5\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-b x^2\right)^{1/3}\right)}\right]}{144\times 2^{2/3}\,a^{17/6}\sqrt{b}}-$$

$$\left(5\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(192\times 3^{3/4} a^{8/3} b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$

$$\left(5\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(144\sqrt{2}\;3^{1/4} a^{8/3} b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 352 leaves):

$$\left(x\left(3\left(a-b x^2\right)\left(21 a+5 b x^2\right)+\left(675 a^2\left(3 a+b x^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\right.\right.$$

$$\left(9 a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)+$$

$$\left(25 a b x^2\left(3 a+b x^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Big/\left(15 a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\right.$$

$$\left.\left.\left.2 b x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right)\right)\Big/\left(864 a^3\left(a-b x^2\right)^{1/3}\left(3 a+b x^2\right)^2\right)$$

Problem 129: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 623 leaves, 7 steps):

$$\frac{2538}{91} a x \left(a-b x^2\right)^{2/3}+\frac{81}{13} x \left(a-b x^2\right)^{2/3} \left(3 a+b x^2\right)+\frac{6 x \left(3 a+b x^2\right)^2}{\left(a-b x^2\right)^{1/3}}+\frac{20088 a^2 x}{91 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+$$

$$\left(10044\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/\left(91 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(6696 \sqrt{2}\, 3^{3/4} a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 76 leaves):

$$-\frac{3 x \left(-3051 a^2+132 a b x^2+7 b^2 x^4+2232 a^2 \left(1-\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{91 \left(a-b x^2\right)^{1/3}}$$

Problem 130: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 592 leaves, 6 steps):

$$\frac{45}{7} x \left(a-b x^2\right)^{2/3}+\frac{6 x \left(3 a+b x^2\right)}{\left(a-b x^2\right)^{1/3}}+\frac{324 a x}{7 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+$$

$$\left(162\times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^{4/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/ \left(7 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(108 \sqrt{2}\, 3^{3/4} a^{4/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/$$

$$\left(7 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 62 leaves) :

$$-\frac{3 x \left(-57 a+b x^2+36 a \left(1-\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]\right)}{7 \left(a-b x^2\right)^{1/3}}$$

Problem 131: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 561 leaves, 5 steps) :

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

$$\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(2\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(3\sqrt{2}\;3^{3/4}a^{1/3}\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 5, 51 leaves):

$$-\frac{3\,x\left(-2+\left(1-\frac{b\,x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b\,x^2}{a}\right]\right)}{\left(a-b\,x^2\right)^{1/3}}$$

Problem 132: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 776 leaves, 7 steps):

$$\frac{3\,x}{8\,a^2\,\left(a-b\,x^2\right)^{1/3}}+\frac{3\,x}{8\,a^2\,\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{8\times 2^{2/3}\,\sqrt{3}\,a^{11/6}\,\sqrt{b}}+$$

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\,\left(a^{1/3}-2^{1/3}\,\left(a-b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{8\times 2^{2/3}\,\sqrt{3}\,a^{11/6}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{24\times 2^{2/3}\,a^{11/6}\,\sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\,\left(a^{1/3}+2^{1/3}\,\left(a-b\,x^2\right)^{1/3}\right)}\right]}{8\times 2^{2/3}\,a^{11/6}\,\sqrt{b}}+$$

$$\left(3\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

$$\left(16\,a^{5/3}\,b\,x\,\sqrt{-\frac{a^{1/3}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(3^{3/4}\,\left(a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)\,\sqrt{\frac{a^{2/3}+a^{1/3}\,\left(a-b\,x^2\right)^{1/3}+\left(a-b\,x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)\,a^{1/3}-\left(a-b\,x^2\right)^{1/3}}\right],\,-7+4\,\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 6, 325 leaves) :

$$\frac{1}{8\,\left(a-b\,x^2\right)^{1/3}}\times\left(-\left(\left(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3},\,1,\,\frac{3}{2},\,\frac{b\,x^2}{a},\,-\frac{b\,x^2}{3\,a}\right]\right)\Big/\left(\left(3\,a+b\,x^2\right)\right.\right.\right.$$

$$\left.\left.\left.\left(9\,a\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3},\,1,\,\frac{3}{2},\,\frac{b\,x^2}{a},\,-\frac{b\,x^2}{3\,a}\right]+2\,b\,x^2\,\left(-\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{3},\,2,\,\frac{5}{2},\,\frac{b\,x^2}{a},\,-\frac{b\,x^2}{3\,a}\right]+\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3},\,1,\,\frac{5}{2},\,\frac{b\,x^2}{a},\,-\frac{b\,x^2}{3\,a}\right]\right)\right)\right)\right)+$$

$$\left.\frac{3-\frac{5\,a\,b\,x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]}{\left(3\,a+b\,x^2\right)\,\left(15\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]+2\,b\,x^2\,\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]\right)\right)}}{a^2}\right)$$

Problem 133: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 807 leaves, 8 steps):

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

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3} \sqrt{a}}{\sqrt{b} x}\right]}{16\times 2^{2/3} \sqrt{3} a^{17/6} \sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3} a^{1/6} \left(a^{1/3}-2^{1/3} \left(a-b x^2\right)^{1/3}\right)}{\sqrt{b} x}\right]}{16\times 2^{2/3} \sqrt{3} a^{17/6} \sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right]}{48\times 2^{2/3} a^{17/6} \sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b} x}{a^{1/6} \left(a^{1/3}+2^{1/3} \left(a-b x^2\right)^{1/3}\right)}\right]}{16\times 2^{2/3} a^{17/6} \sqrt{b}}+$$

$$\left(\sqrt{2+\sqrt{3}} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

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

$$\left(\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right)\Bigg/$$

$$\left(6 \sqrt{2} 3^{1/4} a^{8/3} b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 323 leaves):

$$\left(x \left(21 a+6 b x^2+\left(27 a^2 \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Bigg/\right.\right.$$

$$\left(9 a \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2 \left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)-$$

$$\left(10 a b x^2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\Bigg/\left(15 a \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\right.$$

$$\left.\left.\left.2 b x^2 \left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right)\right)\Bigg/\left(72 a^3 \left(a-b x^2\right)^{1/3} \left(3 a+b x^2\right)\right)$$

Problem 134: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 849 leaves, 9 steps):

$$\frac{x}{48 a^2 \left(a-b x^2\right)^{1/3} \left(3 a+b x^2\right)^2}+\frac{17 x}{192 a^3 \left(a-b x^2\right)^{1/3} \left(3 a+b x^2\right)}-\frac{19 x \left(a-b x^2\right)^{2/3}}{1152 a^4 \left(3 a+b x^2\right)}+\frac{19 x}{1152 a^4 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}+$$

$$\frac{7 \text{ArcTan}\left[\frac{\sqrt{3} \sqrt{a}}{\sqrt{b} x}\right]}{288 \times 2^{2/3} \sqrt{3} a^{23/6} \sqrt{b}}+\frac{7 \text{ArcTan}\left[\frac{\sqrt{3} a^{1/6} \left(a^{1/3}-2^{1/3} \left(a-b x^2\right)^{1/3}\right)}{\sqrt{b} x}\right]}{288 \times 2^{2/3} \sqrt{3} a^{23/6} \sqrt{b}}-\frac{7 \text{ArcTanh}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right]}{864 \times 2^{2/3} a^{23/6} \sqrt{b}}+\frac{7 \text{ArcTanh}\left[\frac{\sqrt{b} x}{a^{1/6} \left(a^{1/3}+2^{1/3} \left(a-b x^2\right)^{1/3}\right)}\right]}{288 \times 2^{2/3} a^{23/6} \sqrt{b}}+$$

$$\left(19 \sqrt{2+\sqrt{3}} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/$$

$$\left(768 \times 3^{3/4} a^{11/3} b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(19 \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]\right) \Bigg/$$

$$\left(576 \sqrt{2} \, 3^{1/4} a^{11/3} b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 353 leaves):

$$\left(819 a^2 x+420 a b x^3+57 b^2 x^5+\left(999 a^2 x \left(3 a+b x^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right) \Big/\right.$$

$$\left(9 a \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+2 b x^2 \left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)-$$

$$\left(95 a b x^3 \left(3 a+b x^2\right) \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right) \Big/ \left(15 a \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\right.$$

$$\left.\left.2 b x^2 \left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{b x^2}{a},-\frac{b x^2}{3 a}\right]\right)\right)\right) \Big/ \left(3456 a^4 \left(a-b x^2\right)^{1/3} \left(3 a+b x^2\right)^2\right)$$

Problem 135: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 653 leaves, 8 steps):

$$-\frac{3240}{91} a x \left(a-b x^2\right)^{2/3}-\frac{81}{13} x \left(a-b x^2\right)^{2/3} \left(3 a+b x^2\right)-\frac{9 x \left(3 a+b x^2\right)^2}{2 \left(a-b x^2\right)^{1/3}}+\frac{3 x \left(3 a+b x^2\right)^3}{2 \left(a-b x^2\right)^{4/3}}-\frac{36936 a^2 x}{91 \left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}-\left(18468 \times 3^{1/4} \sqrt{2+\sqrt{3}}\, a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right], -7+4 \sqrt{3}\right]\right) \Big/ \left(91 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+\left(12312 \sqrt{2}\, 3^{3/4} a^{7/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right) \sqrt{\frac{a^{2/3}+a^{1/3} \left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}}\right], -7+4 \sqrt{3}\right]\right) \Big/ \left(91 b x \sqrt{-\frac{a^{1/3} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 96 leaves):

$$-\frac{1}{91 \left(a-b x^2\right)^{4/3}} 3 \left(1647 a^3 x-4743 a^2 b x^3+177 a b^2 x^5+7 b^3 x^7-4104 a^2 x \left(a-b x^2\right) \left(1-\frac{b x^2}{a}\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3}, \frac{1}{2}, \frac{3}{2}, \frac{b x^2}{a}\right]\right)$$

Problem 136: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 596 leaves, 7 steps):

$$-\frac{27}{14}x\left(a-b x^2\right)^{2/3}+\frac{3 x\left(3 a+b x^2\right)^2}{2\left(a-b x^2\right)^{4/3}}-\frac{324 a x}{7\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}-$$
$$\left(162\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^{4/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\texttt{EllipticE}\left[\texttt{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(7 b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)+$$
$$\left(108\sqrt{2}\;3^{3/4}a^{4/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-b x^2\right)^{1/3}+\left(a-b x^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\;\texttt{EllipticF}\left[\texttt{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$
$$\left(7 b x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 5, 83 leaves) :

$$\frac{81 a^2 x+90 a b x^3-3 b^2 x^5+108 a x\left(a-b x^2\right)\left(1-\frac{b x^2}{a}\right)^{1/3}\texttt{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{b x^2}{a}\right]}{7\left(a-b x^2\right)^{4/3}}$$

Problem 138: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 590 leaves, 6 steps) :

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

$$\left(9\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

$$\left(8a^{2/3}bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(3\times 3^{3/4}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 5, 74 leaves):

$$\frac{15ax-9bx^3-3x\left(a-bx^2\right)\left(1-\frac{bx^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},\frac{bx^2}{a}\right]}{4a\left(a-bx^2\right)^{4/3}}$$

Problem 139: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 796 leaves, 8 steps):

$$\frac{3x}{32a^2\left(a-bx^2\right)^{4/3}}+\frac{21x}{64a^3\left(a-bx^2\right)^{1/3}}+\frac{21x}{64a^3\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}+$$

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}\sqrt{a}}{\sqrt{b}\,x}\right]}{32\times 2^{2/3}\sqrt{3}\,a^{17/6}\sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-bx^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{32\times 2^{2/3}\sqrt{3}\,a^{17/6}\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{96\times 2^{2/3}a^{17/6}\sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-bx^2\right)^{1/3}\right)}\right]}{32\times 2^{2/3}a^{17/6}\sqrt{b}}+$$

$$\left(21\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(128\,a^{8/3}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\right)-$$

$$\left(7\times 3^{3/4}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}\left(a-bx^2\right)^{1/3}+\left(a-bx^2\right)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(32\sqrt{2}\,a^{8/3}\,b\,x\sqrt{-\frac{a^{1/3}\left(a^{1/3}-\left(a-bx^2\right)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-\left(a-bx^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 347 leaves):

$$\frac{1}{64a^3\left(a-bx^2\right)^{1/3}}x\left(\frac{3\left(9a-7bx^2\right)}{a-bx^2}-\left(153a^2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\Big/\left(\left(3a+bx^2\right)\right.\right.$$

$$\left.\left.\left(9a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+2bx^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\right)\right)-$$

$$\left(35abx^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\Big/\left(\left(3a+bx^2\right)\right.$$

$$\left.\left.\left(15a\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+2bx^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\right)\right)\right)$$

Problem 140: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 827 leaves, 9 steps):

$$\frac{5x}{384a^3(a-bx^2)^{4/3}}+\frac{79x}{768a^4(a-bx^2)^{1/3}}+\frac{x}{24a^2(a-bx^2)^{4/3}(3a+bx^2)}+\frac{79x}{768a^4\left(\left(1-\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}\right)}+$$

$$\frac{\sqrt{3}\,\mathrm{ArcTan}\left[\frac{\sqrt{3}\sqrt{a}}{\sqrt{b}\,x}\right]}{128\times 2^{2/3}a^{23/6}\sqrt{b}}+\frac{\sqrt{3}\,\mathrm{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}(a-bx^2)^{1/3}\right)}{\sqrt{b}\,x}\right]}{128\times 2^{2/3}a^{23/6}\sqrt{b}}-\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{128\times 2^{2/3}a^{23/6}\sqrt{b}}+\frac{3\,\mathrm{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}(a-bx^2)^{1/3}\right)}\right]}{128\times 2^{2/3}a^{23/6}\sqrt{b}}+$$

$$\left(79\sqrt{2+\sqrt{3}}\left(a^{1/3}-(a-bx^2)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(a-bx^2)^{1/3}+(a-bx^2)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}\right)^2}}\ \mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(512\times 3^{3/4}a^{11/3}bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(a-bx^2)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}\right)^2}}\right)-$$

$$\left(79\left(a^{1/3}-(a-bx^2)^{1/3}\right)\sqrt{\frac{a^{2/3}+a^{1/3}(a-bx^2)^{1/3}+(a-bx^2)^{2/3}}{\left(\left(1-\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}\right)^2}}\ \mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}}{\left(1-\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

$$\left(384\sqrt{2}\,3^{1/4}a^{11/3}bx\sqrt{-\frac{a^{1/3}\left(a^{1/3}-(a-bx^2)^{1/3}\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-(a-bx^2)^{1/3}\right)^2}}\right)$$

Result (type 6, 346 leaves):

$$\left(x\left(\frac{897a^2-444abx^2-237b^2x^4}{a-bx^2}-\left(1161a^2\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\Big/\right.\right.$$

$$\left(9a\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+2bx^2\left(-\mathrm{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+\mathrm{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\right)-$$

$$\left(395abx^2\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\Big/\left(15a\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+\right.$$

$$\left.\left.\left.2bx^2\left(-\mathrm{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]+\mathrm{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},\frac{bx^2}{a},-\frac{bx^2}{3a}\right]\right)\right)\right)\right)\Big/\left(2304a^4(a-bx^2)^{1/3}(3a+bx^2)\right)$$

Problem 141: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 252 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{2\times 2^{2/3}\,\sqrt{3}\,(-a)^{1/3}\,\sqrt{a}\,\sqrt{b}}-\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}\,\left((-a)^{1/3}-2^{1/3}\,(-a+b\,x^2)^{1/3}\right)}{(-a)^{1/3}\,\sqrt{b}\,x}\right]}{2\times 2^{2/3}\,\sqrt{3}\,(-a)^{1/3}\,\sqrt{a}\,\sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{6\times 2^{2/3}\,(-a)^{1/3}\,\sqrt{a}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{(-a)^{1/3}\,\sqrt{b}\,x}{\sqrt{a}\,\left((-a)^{1/3}+2^{1/3}\,(-a+b\,x^2)^{1/3}\right)}\right]}{2\times 2^{2/3}\,(-a)^{1/3}\,\sqrt{a}\,\sqrt{b}}$$

Result (type 6, 163 leaves):

$$-\left(\left(9\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]\right)\Big/\left((-a+b\,x^2)^{1/3}\,(3\,a+b\,x^2)\right.\right.$$
$$\left.\left.\left(9\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]+2\,b\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]\right)\right)\right)\right)$$

Problem 142: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 202 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{6\times 2^{2/3}\,a^{5/6}\,\sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\sqrt{b}\,x}{a^{1/6}\,\left(a^{1/3}+2^{1/3}\,(a+b\,x^2)^{1/3}\right)}\right]}{2\times 2^{2/3}\,a^{5/6}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{2\times 2^{2/3}\,\sqrt{3}\,a^{5/6}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\,a^{1/6}\,\left(a^{1/3}-2^{1/3}\,(a+b\,x^2)^{1/3}\right)}{\sqrt{b}\,x}\right]}{2\times 2^{2/3}\,\sqrt{3}\,a^{5/6}\,\sqrt{b}}$$

Result (type 6, 166 leaves):

$$\left(9\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b\,x^2}{a},\frac{b\,x^2}{3\,a}\right]\right)\Big/\left((3\,a-b\,x^2)\,(a+b\,x^2)^{1/3}\right.$$
$$\left.\left(9\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b\,x^2}{a},\frac{b\,x^2}{3\,a}\right]+2\,b\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\frac{b\,x^2}{a},\frac{b\,x^2}{3\,a}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\frac{b\,x^2}{a},\frac{b\,x^2}{3\,a}\right]\right)\right)\right)$$

Problem 143: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 204 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{d}\,x}{\sqrt{c}}\right]}{2\times 2^{2/3}\,\sqrt{3}\,c^{5/6}\,\sqrt{d}}+\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{d}\,x}{c^{1/6}\,\left(c^{1/3}+2^{1/3}\,(c+3\,d\,x^2)^{1/3}\right)}\right]}{2\times 2^{2/3}\,c^{5/6}\,\sqrt{d}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{c}}{\sqrt{d}\,x}\right]}{2\times 2^{2/3}\,c^{5/6}\,\sqrt{d}}-\frac{\text{ArcTanh}\left[\frac{c^{1/6}\,\left(c^{1/3}-2^{1/3}\,(c+3\,d\,x^2)^{1/3}\right)}{\sqrt{d}\,x}\right]}{2\times 2^{2/3}\,c^{5/6}\,\sqrt{d}}$$

Result (type 6, 153 leaves):

$$\left(3\,c\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{3\,d\,x^2}{c},\frac{d\,x^2}{c}\right]\right)\Big/\left(\left(c-d\,x^2\right)\,\left(c+3\,d\,x^2\right)^{1/3}\right.$$
$$\left.\left(3\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{3\,d\,x^2}{c},\frac{d\,x^2}{c}\right]+2\,d\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\frac{3\,d\,x^2}{c},\frac{d\,x^2}{c}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\frac{3\,d\,x^2}{c},\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 144: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 204 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{a}}{\sqrt{b}\,x}\right]}{2\times2^{2/3}\,\sqrt{3}\,a^{5/6}\,\sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}\left(a-b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{2\times2^{2/3}\,\sqrt{3}\,a^{5/6}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{6\times2^{2/3}\,a^{5/6}\,\sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{a^{1/6}\left(a^{1/3}+2^{1/3}\left(a-b\,x^2\right)^{1/3}\right)}\right]}{2\times2^{2/3}\,a^{5/6}\,\sqrt{b}}$$

Result (type 6, 162 leaves):

$$\left(9\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]\right)\Big/\left(\left(a-b\,x^2\right)^{1/3}\,\left(3\,a+b\,x^2\right)\right.$$
$$\left.\left(9\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]+2\,b\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b\,x^2}{a},-\frac{b\,x^2}{3\,a}\right]\right)\right)\right)$$

Problem 145: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 204 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{c}}{\sqrt{d}\,x}\right]}{2\times2^{2/3}\,c^{5/6}\,\sqrt{d}}+\frac{\text{ArcTan}\left[\frac{c^{1/6}\left(c^{1/3}-2^{1/3}\left(c-3\,d\,x^2\right)^{1/3}\right)}{\sqrt{d}\,x}\right]}{2\times2^{2/3}\,c^{5/6}\,\sqrt{d}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\,\sqrt{d}\,x}{\sqrt{c}}\right]}{2\times2^{2/3}\,\sqrt{3}\,c^{5/6}\,\sqrt{d}}+\frac{\sqrt{3}\,\text{ArcTanh}\left[\frac{\sqrt{3}\,\sqrt{d}\,x}{c^{1/6}\left(c^{1/3}+2^{1/3}\left(c-3\,d\,x^2\right)^{1/3}\right)}\right]}{2\times2^{2/3}\,c^{5/6}\,\sqrt{d}}$$

Result (type 6, 156 leaves):

$$\left(3\,c\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{3\,d\,x^2}{c},-\frac{d\,x^2}{c}\right]\right)\Big/\left(\left(c-3\,d\,x^2\right)^{1/3}\,\left(c+d\,x^2\right)\right.$$
$$\left.\left(3\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{3\,d\,x^2}{c},-\frac{d\,x^2}{c}\right]+2\,d\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{3\,d\,x^2}{c},-\frac{d\,x^2}{c}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{3\,d\,x^2}{c},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 146: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 113 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{2\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{2\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{6\times 2^{2/3}}+\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{2\times 2^{2/3}}$$

Result (type 6, 118 leaves):

$$-\left(\left(9\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(1-x^2\right)^{1/3}\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 147: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 109 leaves, 1 step):

$$-\frac{\text{ArcTan}[x]}{6\times 2^{2/3}}+\frac{\text{ArcTan}\left[\frac{x}{1+2^{1/3}\left(1+x^2\right)^{1/3}}\right]}{2\times 2^{2/3}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{3}}{x}\right]}{2\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1+x^2\right)^{1/3}\right)}{x}\right]}{2\times 2^{2/3}\sqrt{3}}$$

Result (type 6, 124 leaves):

$$-\left(\left(9\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-x^2,\frac{x^2}{3}\right]\right)\Big/\left(\left(-3+x^2\right)\left(1+x^2\right)^{1/3}\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-x^2,\frac{x^2}{3}\right]+2\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-x^2,\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-x^2,\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 148: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 96 leaves, 1 step):

$$-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2^{2/3}\,(1+x)^{2/3}}{\sqrt{3}\,(1-x)^{1/3}}\right]}{2^{2/3}}-\frac{\text{Log}\left[3+x^2\right]}{2\times 2^{2/3}}+\frac{3\,\text{Log}\left[2^{1/3}\,(1-x)^{1/3}+(1+x)^{2/3}\right]}{2\times 2^{2/3}}$$

Result (type 6, 203 leaves):

$$\frac{1}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)}3\,x\left(\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+\left(x\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(-6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)\right)$$

Problem 149: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 95 leaves, 1 step):

$$\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1}{\sqrt{3}}-\frac{2^{2/3}\,(1-x)^{2/3}}{\sqrt{3}\,(1+x)^{1/3}}\right]}{2^{2/3}}+\frac{\text{Log}\left[3+x^2\right]}{2\times 2^{2/3}}-\frac{3\,\text{Log}\left[(1-x)^{2/3}+2^{1/3}\,(1+x)^{1/3}\right]}{2\times 2^{2/3}}$$

Result (type 6, 203 leaves):

$$\frac{1}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)}3\,x\left(\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+\left(x\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(-\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)\right)$$

Problem 150: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 151 leaves, 1 step):

$$\frac{\sqrt{b}\ \text{ArcTan}\left[\frac{\sqrt{b}\ x}{3 \sqrt{a}}\right]}{12 a^{5/6} d}+\frac{\sqrt{b}\ \text{ArcTan}\left[\frac{\left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)^2}{3 a^{1/6} \sqrt{b}\ x}\right]}{12 a^{5/6} d}-\frac{\sqrt{b}\ \text{ArcTanh}\left[\frac{\sqrt{3}\ a^{1/6} \left(a^{1/3}-\left(a+b x^2\right)^{1/3}\right)}{\sqrt{b}\ x}\right]}{4 \sqrt{3}\ a^{5/6} d}$$

Result (type 6, 169 leaves):

$$\left(27 a b x \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{b x^2}{9 a}\right]\right) \Big/ \left(d \left(a+b x^2\right)^{1/3} \left(9 a+b x^2\right) \left(27 a \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{b x^2}{9 a}\right]-2 b x^2 \left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{9 a}\right]+3 \,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{9 a}\right]\right)\right)\right)$$

Problem 151: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 153 leaves, 1 step):

$$-\frac{\sqrt{b}\ \text{ArcTan}\left[\frac{\sqrt{3}\ a^{1/6} \left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)}{\sqrt{b}\ x}\right]}{4 \sqrt{3}\ a^{5/6} d}-\frac{\sqrt{b}\ \text{ArcTanh}\left[\frac{\sqrt{b}\ x}{3 \sqrt{a}}\right]}{12 a^{5/6} d}+\frac{\sqrt{b}\ \text{ArcTanh}\left[\frac{\left(a^{1/3}-\left(a-b x^2\right)^{1/3}\right)^2}{3 a^{1/6} \sqrt{b}\ x}\right]}{12 a^{5/6} d}$$

Result (type 6, 167 leaves):

$$-\left(\left(27 a b x \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},\frac{b x^2}{9 a}\right]\right) \Big/ \left(d \left(a-b x^2\right)^{1/3} \left(9 a-b x^2\right) \left(27 a \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b x^2}{a},\frac{b x^2}{9 a}\right]+2 b x^2 \left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{9 a}\right]+3 \,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{9 a}\right]\right)\right)\right)\right)$$

Problem 152: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 151 leaves, 1 step):

$$\frac{\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}+\left(-a+b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{4\,\sqrt{3}\,a^{5/6}\,d}+\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{3\,\sqrt{a}}\right]}{12\,a^{5/6}\,d}-\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{\left(a^{1/3}+\left(-a+b\,x^2\right)^{1/3}\right)^2}{3\,a^{1/6}\,\sqrt{b}\,x}\right]}{12\,a^{5/6}\,d}$$

Result (type 6, 168 leaves):

$$-\left(\left(27\,a\,b\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{9\,a}\right]\right)\Big/\left(d\,\left(9\,a-b\,x^2\right)\,\left(-a+b\,x^2\right)^{1/3}\right.\right.$$
$$\left.\left.\left(27\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{9\,a}\right]+2\,b\,x^2\,\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{9\,a}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{9\,a}\right]\right)\right)\right)\right)$$

Problem 153: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 153 leaves, 1 step):

$$-\frac{\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{3\,\sqrt{a}}\right]}{12\,a^{5/6}\,d}-\frac{\sqrt{b}\,\text{ArcTan}\left[\frac{\left(a^{1/3}+\left(-a-b\,x^2\right)^{1/3}\right)^2}{3\,a^{1/6}\,\sqrt{b}\,x}\right]}{12\,a^{5/6}\,d}+\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}+\left(-a-b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{4\,\sqrt{3}\,a^{5/6}\,d}$$

Result (type 6, 172 leaves):

$$\left(27\,a\,b\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{9\,a}\right]\right)\Big/\left(d\,\left(-a-b\,x^2\right)^{1/3}\,\left(9\,a+b\,x^2\right)\right.$$
$$\left.\left(27\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{9\,a}\right]-2\,b\,x^2\,\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{9\,a}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{9\,a}\right]\right)\right)\right)$$

Problem 154: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 151 leaves, 1 step):

$$\frac{\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{3\,\sqrt{2}}\right]}{12\times 2^{5/6}\,d}+\frac{\sqrt{b}\,\text{ArcTan}\left[\frac{\left(2^{1/3}-\left(2+b\,x^2\right)^{1/3}\right)^2}{3\times 2^{1/6}\,\sqrt{b}\,x}\right]}{12\times 2^{5/6}\,d}-\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{2^{1/6}\,\sqrt{3}\,\left(2^{1/3}-\left(2+b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{4\times 2^{5/6}\,\sqrt{3}\,d}$$

Result (type 6, 148 leaves):

$$-\left(\left(27\,b\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{18}\right]\right)\Big/\left(d\,\left(2+b\,x^2\right)^{1/3}\,\left(18+b\,x^2\right)\right.\right.$$
$$\left.\left.\left(-27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{18}\right]+b\,x^2\,\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{18}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{18}\right]\right)\right)\right)\right)$$

Problem 155: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 147 leaves, 1 step):

$$\frac{\sqrt{b}\,\text{ArcTan}\left[\frac{2^{1/6}\,\sqrt{3}\,\left(2^{1/3}+\left(-2+b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{4\times 2^{5/6}\,\sqrt{3}\,d}+\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{3\,\sqrt{2}}\right]}{12\times 2^{5/6}\,d}-\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{\left(2^{1/3}+\left(-2+b\,x^2\right)^{1/3}\right)^2}{3\times 2^{1/6}\,\sqrt{b}\,x}\right]}{12\times 2^{5/6}\,d}$$

Result (type 6, 148 leaves):

$$\left(27\,b\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{2},\frac{b\,x^2}{18}\right]\right)\Big/\left(d\,\left(-18+b\,x^2\right)\,\left(-2+b\,x^2\right)^{1/3}\right.$$
$$\left.\left(27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{b\,x^2}{2},\frac{b\,x^2}{18}\right]+b\,x^2\,\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{b\,x^2}{2},\frac{b\,x^2}{18}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{b\,x^2}{2},\frac{b\,x^2}{18}\right]\right)\right)\right)$$

Problem 156: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 123 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{x}{\sqrt{6}}\right]}{4\times 2^{5/6}\,\sqrt{3}\,d}+\frac{\text{ArcTan}\left[\frac{\left(2^{1/3}-\left(2+3\,x^2\right)^{1/3}\right)^2}{3\times 2^{1/6}\,\sqrt{3}\,x}\right]}{4\times 2^{5/6}\,\sqrt{3}\,d}-\frac{\text{ArcTanh}\left[\frac{2^{1/6}\,\left(2^{1/3}-\left(2+3\,x^2\right)^{1/3}\right)}{x}\right]}{4\times 2^{5/6}\,d}$$

Result (type 6, 136 leaves):

$$-\left(\left(9\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{3\,x^2}{2},-\frac{x^2}{6}\right]\right)\Big/\left(d\,\left(6+x^2\right)\,\left(2+3\,x^2\right)^{1/3}\right.\right.$$
$$\left.\left.\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{3\,x^2}{2},-\frac{x^2}{6}\right]+x^2\,\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\frac{3\,x^2}{2},-\frac{x^2}{6}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\frac{3\,x^2}{2},-\frac{x^2}{6}\right]\right)\right)\right)\right)$$

Problem 157: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 123 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{2^{1/6} \left(2^{1/3}-\left(2-3 x^2\right)^{1/3}\right)}{x}\right]}{4\times 2^{5/6} d}-\frac{\text{ArcTanh}\left[\frac{x}{\sqrt{6}}\right]}{4\times 2^{5/6} \sqrt{3} d}+\frac{\text{ArcTanh}\left[\frac{\left(2^{1/3}-\left(2-3 x^2\right)^{1/3}\right)^2}{3\times 2^{1/6} \sqrt{3} x}\right]}{4\times 2^{5/6} \sqrt{3} d}$$

Result (type 6, 136 leaves):

$$\left(9 x \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]\right) \Big/$$
$$\left(d \left(2-3 x^2\right)^{1/3} \left(-6+x^2\right) \left(9 \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]+x^2 \left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]+3 \text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]\right)\right)\right)$$

Problem 158: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 119 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2^{1/6} \left(2^{1/3}+\left(-2+3 x^2\right)^{1/3}\right)}{x}\right]}{4\times 2^{5/6} d}+\frac{\text{ArcTanh}\left[\frac{x}{\sqrt{6}}\right]}{4\times 2^{5/6} \sqrt{3} d}-\frac{\text{ArcTanh}\left[\frac{\left(2^{1/3}+\left(-2+3 x^2\right)^{1/3}\right)^2}{3\times 2^{1/6} \sqrt{3} x}\right]}{4\times 2^{5/6} \sqrt{3} d}$$

Result (type 6, 136 leaves):

$$\left(9 x \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]\right) \Big/$$
$$\left(d \left(-6+x^2\right) \left(-2+3 x^2\right)^{1/3} \left(9 \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]+x^2 \left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]+3 \text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},\frac{3 x^2}{2},\frac{x^2}{6}\right]\right)\right)\right)$$

Problem 159: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 119 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{x}{\sqrt{6}}\right]}{4\times 2^{5/6}\sqrt{3}\,d}-\frac{\text{ArcTan}\left[\frac{\left(2^{1/3}+\left(-2-3x^2\right)^{1/3}\right)^2}{3\times 2^{1/6}\sqrt{3}\,x}\right]}{4\times 2^{5/6}\sqrt{3}\,d}+\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(2^{1/3}+\left(-2-3x^2\right)^{1/3}\right)}{x}\right]}{4\times 2^{5/6}\,d}$$

Result (type 6, 136 leaves):

$$-\left(\left(9\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{3x^2}{2},-\frac{x^2}{6}\right]\right)\Big/\left(d\left(-2-3x^2\right)^{1/3}\left(6+x^2\right)\right.\right.$$
$$\left.\left.\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\frac{3x^2}{2},-\frac{x^2}{6}\right]+x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\frac{3x^2}{2},-\frac{x^2}{6}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\frac{3x^2}{2},-\frac{x^2}{6}\right]\right)\right)\right)\right)$$

Problem 160: Result unnecessarily involves higher level functions.

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

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

$$\frac{1}{12}\text{ArcTan}\left[\frac{x}{3}\right]+\frac{1}{12}\text{ArcTan}\left[\frac{\left(1-\left(1+x^2\right)^{1/3}\right)^2}{3x}\right]-\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\left(1-\left(1+x^2\right)^{1/3}\right)}{x}\right]}{4\sqrt{3}}$$

Result (type 6, 124 leaves):

$$-\left(\left(27\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-x^2,-\frac{x^2}{9}\right]\right)\Big/\left(\left(1+x^2\right)^{1/3}\left(9+x^2\right)\right.\right.$$
$$\left.\left.\left(-27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-x^2,-\frac{x^2}{9}\right]+2x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-x^2,-\frac{x^2}{9}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-x^2,-\frac{x^2}{9}\right]\right)\right)\right)\right)$$

Problem 161: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 104 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{b}\,x}{3}\right]}{12\sqrt{b}}+\frac{\text{ArcTan}\left[\frac{\left(1-\left(1+b\,x^2\right)^{1/3}\right)^2}{3\sqrt{b}\,x}\right]}{12\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\left(1-\left(1+b\,x^2\right)^{1/3}\right)}{\sqrt{b}\,x}\right]}{4\sqrt{3}\sqrt{b}}$$

Result (type 6, 137 leaves):

$$-\left(\left(27\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-b\,x^2,-\frac{b\,x^2}{9}\right]\right)\Big/\left(\left(1+b\,x^2\right)^{1/3}\left(9+b\,x^2\right)\left(-27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-b\,x^2,-\frac{b\,x^2}{9}\right]+2\,b\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{9}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{9}\right]\right)\right)\right)\right)$$

Problem 162: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 74 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-\left(1-x^2\right)^{1/3}\right)}{x}\right]}{4\sqrt{3}}+\frac{1}{12}\text{ArcTanh}\left[\frac{x}{3}\right]-\frac{1}{12}\text{ArcTanh}\left[\frac{\left(1-\left(1-x^2\right)^{1/3}\right)^2}{3\,x}\right]$$

Result (type 6, 125 leaves):

$$\frac{1}{4\left(1-x^2\right)^{1/3}}\left(\left(\frac{-1+x}{-3+x}\right)^{1/3}\left(\frac{1+x}{-3+x}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},-\frac{4}{-3+x},-\frac{2}{-3+x}\right]-\left(\frac{-1+x}{3+x}\right)^{1/3}\left(\frac{1+x}{3+x}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},\frac{1}{3},\frac{5}{3},\frac{2}{3+x},\frac{4}{3+x}\right]\right)$$

Problem 166: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 328 leaves, 6 steps):

$$\frac{\left(7\,a\,c-\frac{2\,b\,c^2}{d}+\frac{3\,a^2\,d}{b}\right)x\sqrt{a+b\,x^2}}{15\sqrt{c+d\,x^2}}-\frac{2\left(b\,c-3\,a\,d\right)x\sqrt{a+b\,x^2}\sqrt{c+d\,x^2}}{15\,d}+\frac{b\,x\sqrt{a+b\,x^2}\left(c+d\,x^2\right)^{3/2}}{5\,d}+$$
$$\frac{\sqrt{c}\left(2\,b^2\,c^2-7\,a\,b\,c\,d-3\,a^2\,d^2\right)\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{15\,b\,d^{3/2}\sqrt{\frac{c\left(a+b\,x^2\right)}{a\left(c+d\,x^2\right)}}\sqrt{c+d\,x^2}}-\frac{c^{3/2}\left(b\,c-9\,a\,d\right)\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{15\,d^{3/2}\sqrt{\frac{c\left(a+b\,x^2\right)}{a\left(c+d\,x^2\right)}}\sqrt{c+d\,x^2}}$$

Result (type 4, 243 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, x \left(a+b x^2\right) \left(c+d x^2\right) \left(6 a d+b \left(c+3 d x^2\right)\right)-i\, c \left(-2 b^2 c^2+7 a b c d+3 a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]-\right.$$

$$\left.2 i\, c \left(b^2 c^2-4 a b c d+3 a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Big/ \left(15 \sqrt{\frac{b}{a}}\, d^2 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 167: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 249 leaves, 5 steps):

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

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

Result (type 4, 198 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, x \left(a+b x^2\right) \left(c+d x^2\right)-i\, c\, (b c+a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]-\right.$$

$$\left.i\, c\, (-b c+a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Big/ \left(3 \sqrt{\frac{b}{a}}\, d \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 169: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 84 leaves, 1 step):

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

Result (type 4, 133 leaves):

$$\frac{x\left(c+d x^2\right)+\frac{i c \sqrt{1+\frac{b x^2}{a}}\ \sqrt{1+\frac{d x^2}{c}}\left(\text{EllipticE}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\ x\right],\frac{a d}{b c}\right]-\text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\ x\right],\frac{a d}{b c}\right]\right)}{\sqrt{\frac{b}{a}}}}{a \sqrt{a+b x^2}\ \sqrt{c+d x^2}}$$

Problem 170: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 237 leaves, 4 steps):

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

Result (type 4, 243 leaves):

$$\left(\sqrt{\frac{b}{a}}\ x\left(c+d x^2\right)\left(2 a^2 d-2 b^2 c x^2+a b\left(-3 c+d x^2\right)\right)+i c(-2 b c+a d)\left(a+b x^2\right) \sqrt{1+\frac{b x^2}{a}}\ \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticE}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\ x\right],\frac{a d}{b c}\right]-\right.$$
$$\left.2 i c(-b c+a d)\left(a+b x^2\right) \sqrt{1+\frac{b x^2}{a}}\ \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\ x\right],\frac{a d}{b c}\right]\right) \Big/ \left(3 a^2 \sqrt{\frac{b}{a}}\ (-b c+a d)\left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}\right)$$

Problem 171: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 309 leaves, 5 steps):

$$\frac{x\sqrt{c+d x^2}}{5 a \left(a+b x^2\right)^{5/2}}+\frac{(4 b c-3 a d) x \sqrt{c+d x^2}}{15 a^2 (b c-a d) \left(a+b x^2\right)^{3/2}}+\frac{\left(8 b^2 c^2-13 a b c d+3 a^2 d^2\right) \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right],1-\frac{a d}{b c}\right]}{15 a^{5/2} \sqrt{b} (b c-a d)^2 \sqrt{a+b x^2} \sqrt{\frac{a \left(c+d x^2\right)}{c \left(a+b x^2\right)}}}-$$

$$\frac{2 c^{3/2} \sqrt{d} (2 b c-3 a d) \sqrt{a+b x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 a^3 (b c-a d)^2 \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 285 leaves) :

$$\frac{1}{15 a^3 \sqrt{\frac{b}{a}} (b c-a d)^2 \left(a+b x^2\right)^{5/2} \sqrt{c+d x^2}}$$

$$\left(\sqrt{\frac{b}{a}}\, x \left(c+d x^2\right) \left(3 a^2 (b c-a d)^2+a (-b c+a d) (-4 b c+3 a d) \left(a+b x^2\right)+\left(8 b^2 c^2-13 a b c d+3 a^2 d^2\right) \left(a+b x^2\right)^2\right)+\right.$$

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

$$\left.\left(\left(8 b^2 c^2-13 a b c d+3 a^2 d^2\right) \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]+\left(-8 b^2 c^2+17 a b c d-9 a^2 d^2\right) \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]\right)\right)$$

Problem 172: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 410 leaves, 7 steps) :

$$-\frac{2\,(b\,c+a\,d)\,(b^2\,c^2-6\,a\,b\,c\,d+a^2\,d^2)\,x\,\sqrt{a+b\,x^2}}{35\,b^2\,d\,\sqrt{c+d\,x^2}}+\frac{1}{35}\left(9\,a\,c+\frac{b\,c^2}{d}-\frac{2\,a^2\,d}{b}\right)x\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}+\frac{2\,(4\,b\,c-a\,d)\,x\,(a+b\,x^2)^{3/2}\,\sqrt{c+d\,x^2}}{35\,b}+$$

$$\frac{d\,x\,(a+b\,x^2)^{5/2}\,\sqrt{c+d\,x^2}}{7\,b}+\frac{2\,\sqrt{c}\,(b\,c+a\,d)\,(b^2\,c^2-6\,a\,b\,c\,d+a^2\,d^2)\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{35\,b^2\,d^{3/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}-$$

$$\frac{c^{3/2}\,(b^2\,c^2-18\,a\,b\,c\,d+a^2\,d^2)\,\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{35\,b\,d^{3/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 302 leaves):

$$\frac{1}{35\,b\,\sqrt{\frac{b}{a}}\,d^2\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,x\,(a+b\,x^2)\,(c+d\,x^2)\,\left(a^2\,d^2+a\,b\,d\,(17\,c+8\,d\,x^2)+b^2\,(c^2+8\,c\,d\,x^2+5\,d^2\,x^4)\right)+\right.$$

$$2\,\mathrm{i}\,c\,(b^3\,c^3-5\,a\,b^2\,c^2\,d-5\,a^2\,b\,c\,d^2+a^3\,d^3)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-$$

$$\left.\mathrm{i}\,c\,(2\,b^3\,c^3-11\,a\,b^2\,c^2\,d+8\,a^2\,b\,c\,d^2+a^3\,d^3)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 173: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 336 leaves, 6 steps):

$$\frac{(3\,b^2\,c^2+7\,a\,b\,c\,d-2\,a^2\,d^2)\,x\,\sqrt{a+b\,x^2}}{15\,b^2\,\sqrt{c+d\,x^2}}+\frac{2\,(3\,b\,c-a\,d)\,x\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{15\,b}+\frac{d\,x\,(a+b\,x^2)^{3/2}\,\sqrt{c+d\,x^2}}{5\,b}-$$

$$\frac{\sqrt{c}\,(3\,b^2\,c^2+7\,a\,b\,c\,d-2\,a^2\,d^2)\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{15\,b^2\,\sqrt{d}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}+\frac{c^{3/2}\,(9\,b\,c-a\,d)\,\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{15\,b\,\sqrt{d}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 246 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, x\, (a+b x^2)\, (c+d x^2)\, (6 b c+a d+3 b d x^2)+i\, c\, (-3 b^2 c^2-7 a b c d+2 a^2 d^2)\, \sqrt{1+\frac{b x^2}{a}}\, \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]-i\, c\, (-3 b^2 c^2+2 a b c d+a^2 d^2)\, \sqrt{1+\frac{b x^2}{a}}\, \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Bigg/ \left(15 b \sqrt{\frac{b}{a}}\, d\, \sqrt{a+b x^2}\, \sqrt{c+d x^2}\right)$$

Problem 174: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 273 leaves, 5 steps):

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

Result (type 4, 199 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, x\, (a+b x^2)\, (c+d x^2)+2\, i\, c\, (-2 b c+a d)\, \sqrt{1+\frac{b x^2}{a}}\, \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]-i\, c\, (-b c+a d)\, \sqrt{1+\frac{b x^2}{a}}\, \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Bigg/ \left(3 b \sqrt{\frac{b}{a}}\, \sqrt{a+b x^2}\, \sqrt{c+d x^2}\right)$$

Problem 175: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 267 leaves, 5 steps):

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

Result (type 4, 191 leaves):

$$\left(-i\,c\,(-b\,c+2\,a\,d)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+(b\,c-a\,d)\left(\sqrt{\frac{b}{a}}\,x\,(c+d\,x^2)-i\,c\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\right)\Big/\left(a^2\left(\frac{b}{a}\right)^{3/2}\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 176: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 232 leaves):

$$\left(\sqrt{\frac{b}{a}}\,x\,(c+d\,x^2)\,(a^2\,d+2\,b^2\,c\,x^2+a\,b\,(3\,c+2\,d\,x^2))+2\,i\,c\,(b\,c+a\,d)\,(a+b\,x^2)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-i\,c\,(2\,b\,c+a\,d)\,(a+b\,x^2)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\Big/\left(3\,a^3\left(\frac{b}{a}\right)^{3/2}(a+b\,x^2)^{3/2}\,\sqrt{c+d\,x^2}\right)$$

Problem 177: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 315 leaves, 5 steps):

$$\frac{(b c-a d) x \sqrt{c+d x^2}}{5 a b \left(a+b x^2\right)^{5/2}}+\frac{2 (2 b c+a d) x \sqrt{c+d x^2}}{15 a^2 b \left(a+b x^2\right)^{3/2}}+$$
$$\frac{\left(8 b^2 c^2-3 a b c d-2 a^2 d^2\right) \sqrt{c+d x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 1-\frac{a d}{b c}\right]}{15 a^{5/2} b^{3/2} (b c-a d) \sqrt{a+b x^2} \sqrt{\frac{a \left(c+d x^2\right)}{c \left(a+b x^2\right)}}}-\frac{c^{3/2} \sqrt{d} (4 b c-a d) \sqrt{a+b x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{15 a^3 b (b c-a d) \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 285 leaves):

$$\left(\sqrt{\frac{b}{a}} x \left(c+d x^2\right) \left(3 a^2 (b c-a d)^2+2 a (b c-a d) (2 b c+a d) \left(a+b x^2\right)+\left(8 b^2 c^2-3 a b c d-2 a^2 d^2\right) \left(a+b x^2\right)^2\right)-\right.$$
$$i c \left(a+b x^2\right)^2 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}$$
$$\left.\left(\left(-8 b^2 c^2+3 a b c d+2 a^2 d^2\right) \text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]+\left(8 b^2 c^2-7 a b c d-a^2 d^2\right) \text{EllipticF}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right)\right) \Big/$$
$$\left(15 a^4 \left(\frac{b}{a}\right)^{3/2} (b c-a d) \left(a+b x^2\right)^{5/2} \sqrt{c+d x^2}\right)$$

Problem 178: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{2+b x^2} \sqrt{3+d x^2} \, dx$$

Optimal (type 4, 235 leaves, 5 steps):

$$\frac{(3b+2d)\,x\sqrt{2+bx^2}}{3b\sqrt{3+dx^2}}+\frac{1}{3}x\sqrt{2+bx^2}\,\sqrt{3+dx^2}-$$
$$\frac{\sqrt{2}\,(3b+2d)\sqrt{2+bx^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{3}}\right],1-\frac{3b}{2d}\right]}{3b\sqrt{d}\sqrt{\frac{2+bx^2}{3+dx^2}}\sqrt{3+dx^2}}+\frac{2\sqrt{2}\sqrt{2+bx^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{3}}\right],1-\frac{3b}{2d}\right]}{\sqrt{d}\sqrt{\frac{2+bx^2}{3+dx^2}}\sqrt{3+dx^2}}$$

Result (type 4, 127 leaves):

$$\frac{1}{3\sqrt{b}\,d}\left(\sqrt{b}\,d\,x\sqrt{2+bx^2}\,\sqrt{3+dx^2}-i\sqrt{3}\,(3b+2d)\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}}\right],\frac{2d}{3b}\right]+i\sqrt{3}\,(3b-2d)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}}\right],\frac{2d}{3b}\right]\right)$$

Problem 191: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 13 leaves, 4 steps):

$$-\text{EllipticE}[\text{ArcSin}[x],-1]+2\,\text{EllipticF}[\text{ArcSin}[x],-1]$$

Result (type 4, 12 leaves):

$$-i\,\text{EllipticE}[i\,\text{ArcSinh}[x],-1]$$

Problem 192: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 31 leaves, 3 steps):

$$-\frac{1}{3}\sqrt{2}\,\text{EllipticE}\left[\text{ArcSin}[x],-\frac{3}{2}\right]+\frac{5\,\text{EllipticF}\left[\text{ArcSin}[x],-\frac{3}{2}\right]}{3\sqrt{2}}$$

Result (type 4, 27 leaves):

$$-\frac{i\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\,x\right],-\frac{2}{3}\right]}{\sqrt{3}}$$

Problem 193: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 35 leaves, 3 steps):

$$-\frac{1}{3}\sqrt{2}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{x}{2}\right],-6\right]+\frac{7}{3}\sqrt{2}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{x}{2}\right],-6\right]$$

Result (type 4, 27 leaves):

$$-\frac{2\,i\ \text{EllipticE}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{3}{2}}\ x\right],-\frac{1}{6}\right]}{\sqrt{3}}$$

Problem 194: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 35 leaves, 3 steps):

$$-\frac{2}{3}\sqrt{2}\ \text{EllipticE}\left[\text{ArcSin}[2x],-\frac{3}{8}\right]+\frac{11\ \text{EllipticF}\left[\text{ArcSin}[2x],-\frac{3}{8}\right]}{6\sqrt{2}}$$

Result (type 4, 27 leaves):

$$-\frac{i\ \text{EllipticE}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{3}{2}}\ x\right],-\frac{8}{3}\right]}{\sqrt{3}}$$

Problem 195: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{x\sqrt{2+3x^2}}{3\sqrt{1+x^2}}-\frac{\sqrt{2}\sqrt{2+3x^2}\,\text{EllipticE}\left[\text{ArcTan}[x],-\frac{1}{2}\right]}{3\sqrt{1+x^2}\sqrt{\frac{2+3x^2}{1+x^2}}}+\frac{\sqrt{2+3x^2}\,\text{EllipticF}\left[\text{ArcTan}[x],-\frac{1}{2}\right]}{\sqrt{2}\sqrt{1+x^2}\sqrt{\frac{2+3x^2}{1+x^2}}}$$

Result (type 4, 27 leaves):

$$-\frac{\mathrm{i}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\,x\right],\frac{2}{3}\right]}{\sqrt{3}}$$

Problem 196: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 136 leaves, 4 steps):

$$\frac{x\sqrt{2+3x^2}}{3\sqrt{4+x^2}}-\frac{\sqrt{2}\sqrt{2+3x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{x}{2}\right],-5\right]}{3\sqrt{4+x^2}\sqrt{\frac{2+3x^2}{4+x^2}}}+\frac{2\sqrt{2}\sqrt{2+3x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{x}{2}\right],-5\right]}{\sqrt{4+x^2}\sqrt{\frac{2+3x^2}{4+x^2}}}$$

Result (type 4, 27 leaves):

$$-\frac{2\,\mathrm{i}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\,x\right],\frac{1}{6}\right]}{\sqrt{3}}$$

Problem 197: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 148 leaves, 4 steps):

$$\frac{4x\sqrt{2+3x^2}}{3\sqrt{1+4x^2}}-\frac{2\sqrt{2}\sqrt{2+3x^2}\,\text{EllipticE}\left[\text{ArcTan}[2x],\frac{5}{8}\right]}{3\sqrt{\frac{2+3x^2}{1+4x^2}}\sqrt{1+4x^2}}+\frac{\sqrt{2+3x^2}\,\text{EllipticF}\left[\text{ArcTan}[2x],\frac{5}{8}\right]}{2\sqrt{2}\sqrt{\frac{2+3x^2}{1+4x^2}}\sqrt{1+4x^2}}$$

Result (type 4, 27 leaves):

$$-\frac{i\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\,x\right],\frac{8}{3}\right]}{\sqrt{3}}$$

Problem 199: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 423 leaves, 7 steps):

$$-\frac{8\,(b\,c-2\,a\,d)\,\left(6\,b^2\,c^2-11\,a\,b\,c\,d+11\,a^2\,d^2\right)\,x\,\sqrt{a+b\,x^2}}{105\,d^3\,\sqrt{c+d\,x^2}}+\frac{b\,\left(24\,b^2\,c^2-71\,a\,b\,c\,d+71\,a^2\,d^2\right)\,x\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{105\,d^3}-\frac{6\,b\,(b\,c-2\,a\,d)\,x\,\left(a+b\,x^2\right)^{3/2}\,\sqrt{c+d\,x^2}}{35\,d^2}+\frac{b\,x\,\left(a+b\,x^2\right)^{5/2}\,\sqrt{c+d\,x^2}}{7\,d}+\frac{8\,\sqrt{c}\,(b\,c-2\,a\,d)\,\left(6\,b^2\,c^2-11\,a\,b\,c\,d+11\,a^2\,d^2\right)\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{105\,d^{7/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}-\frac{\sqrt{c}\,(3\,b\,c-7\,a\,d)\,\left(8\,b^2\,c^2-11\,a\,b\,c\,d+15\,a^2\,d^2\right)\,\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{105\,d^{7/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 321 leaves):

$$\frac{1}{105\,\sqrt{\frac{b}{a}}\,d^4\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\left(b\,\sqrt{\frac{b}{a}}\,d\,x\,\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)\,\left(122\,a^2\,d^2+a\,b\,d\,\left(-89\,c+66\,d\,x^2\right)+3\,b^2\,\left(8\,c^2-6\,c\,d\,x^2+5\,d^2\,x^4\right)\right)-8\,i\,b\,c\,\left(-6\,b^3\,c^3+23\,a\,b^2\,c^2\,d-33\,a^2\,b\,c\,d^2+22\,a^3\,d^3\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-i\,\left(48\,b^4\,c^4-208\,a\,b^3\,c^3\,d+353\,a^2\,b^2\,c^2\,d^2-298\,a^3\,b\,c\,d^3+105\,a^4\,d^4\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 200: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 344 leaves, 6 steps):

$$\frac{\left(8 b^2 c^2-23 a b c d+23 a^2 d^2\right) x \sqrt{a+b x^2}}{15 d^2 \sqrt{c+d x^2}}-\frac{4 b (b c-2 a d) x \sqrt{a+b x^2} \sqrt{c+d x^2}}{15 d^2}+$$
$$\frac{b x \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{5 d}-\frac{\sqrt{c} \left(8 b^2 c^2-23 a b c d+23 a^2 d^2\right) \sqrt{a+b x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 d^{5/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}+$$
$$\frac{\sqrt{c} \left(4 b^2 c^2-11 a b c d+15 a^2 d^2\right) \sqrt{a+b x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 d^{5/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 260 leaves):

$$\left(b \sqrt{\frac{b}{a}}\, d x \left(a+b x^2\right) \left(c+d x^2\right) \left(-4 b c+11 a d+3 b d x^2\right)-\right.$$
$$i b c \left(8 b^2 c^2-23 a b c d+23 a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]-$$
$$\left.i \left(-8 b^3 c^3+27 a b^2 c^2 d-34 a^2 b c d^2+15 a^3 d^3\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]\right) \Big/ \left(15 \sqrt{\frac{b}{a}}\, d^3 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 201: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 260 leaves, 5 steps):

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

Result (type 4, 216 leaves):

$$\left(b \sqrt{\frac{b}{a}} d x \left(a+b x^2\right) \left(c+d x^2\right)-2 i b c \left(-b c+2 a d\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right],\frac{a d}{b c}\right]-i \left(2 b^2 c^2-5 a b c d+3 a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right],\frac{a d}{b c}\right]\right)\Big/\left(3 \sqrt{\frac{b}{a}} d^2 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 205: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 255 leaves, 4 steps):

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

Result (type 4, 261 leaves):

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

$$2\,\mathrm{i}\,b\,c\left(-b c+2 a d\right)\left(a+b x^2\right)\sqrt{1+\frac{b x^2}{a}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a d}{b c}\right]-\mathrm{i}\left(2 b^2 c^2-5 a b c d+3 a^2 d^2\right)$$

$$\left.\left(a+b x^2\right)\sqrt{1+\frac{b x^2}{a}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a d}{b c}\right]\right)\Big/\left(3 a^2\sqrt{\frac{b}{a}}\left(b c-a d\right)^2\left(a+b x^2\right)^{3/2}\sqrt{c+d x^2}\right)$$

Problem 206: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 334 leaves, 5 steps):

$$\frac{b x\sqrt{c+d x^2}}{5 a\left(b c-a d\right)\left(a+b x^2\right)^{5/2}}+\frac{4 b\left(b c-2 a d\right) x\sqrt{c+d x^2}}{15 a^2\left(b c-a d\right)^2\left(a+b x^2\right)^{3/2}}+\frac{\sqrt{b}\left(8 b^2 c^2-23 a b c d+23 a^2 d^2\right)\sqrt{c+d x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],1-\frac{a d}{b c}\right]}{15 a^{5/2}\left(b c-a d\right)^3\sqrt{a+b x^2}\sqrt{\frac{a\left(c+d x^2\right)}{c\left(a+b x^2\right)}}}-$$

$$\frac{\sqrt{c}\sqrt{d}\left(4 b^2 c^2-11 a b c d+15 a^2 d^2\right)\sqrt{a+b x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 a^3\left(b c-a d\right)^3\sqrt{\frac{c\left(a+b x^2\right)}{a\left(c+d x^2\right)}}\sqrt{c+d x^2}}$$

Result (type 4, 301 leaves):

$$\frac{1}{15\, a^3 \sqrt{\frac{b}{a}}\, (b\, c - a\, d)^3\, (a + b\, x^2)^{5/2} \sqrt{c + d\, x^2}}$$

$$\left(b \sqrt{\frac{b}{a}}\, x\, (c + d\, x^2)\, \left(3\, a^2\, (b\, c - a\, d)^2 + 4\, a\, (b\, c - 2\, a\, d)\, (b\, c - a\, d)\, (a + b\, x^2) + (8\, b^2\, c^2 - 23\, a\, b\, c\, d + 23\, a^2\, d^2)\, (a + b\, x^2)^2\right) + \right.$$

$$i\, (a + b\, x^2)^2 \sqrt{1 + \frac{b\, x^2}{a}} \sqrt{1 + \frac{d\, x^2}{c}} \left(b\, c\, (8\, b^2\, c^2 - 23\, a\, b\, c\, d + 23\, a^2\, d^2)\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a\, d}{b\, c}\right] + \right.$$

$$\left.\left.(-8\, b^3\, c^3 + 27\, a\, b^2\, c^2\, d - 34\, a^2\, b\, c\, d^2 + 15\, a^3\, d^3)\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a\, d}{b\, c}\right]\right)\right)$$

Problem 207: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 445 leaves, 7 steps):

$$\frac{(48\, b^3\, c^3 - 128\, a\, b^2\, c^2\, d + 103\, a^2\, b\, c\, d^2 - 15\, a^3\, d^3)\, x \sqrt{a + b\, x^2}}{15\, c\, d^3 \sqrt{c + d\, x^2}} - \frac{(b\, c - a\, d)\, x\, (a + b\, x^2)^{5/2}}{c\, d \sqrt{c + d\, x^2}} - \frac{b\, (24\, b^2\, c^2 - 43\, a\, b\, c\, d + 15\, a^2\, d^2)\, x \sqrt{a + b\, x^2} \sqrt{c + d\, x^2}}{15\, c\, d^3} +$$

$$\frac{b\, (6\, b\, c - 5\, a\, d)\, x\, (a + b\, x^2)^{3/2} \sqrt{c + d\, x^2}}{5\, c\, d^2} - \frac{(48\, b^3\, c^3 - 128\, a\, b^2\, c^2\, d + 103\, a^2\, b\, c\, d^2 - 15\, a^3\, d^3) \sqrt{a + b\, x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1 - \frac{b\, c}{a\, d}\right]}{15 \sqrt{c}\, d^{7/2} \sqrt{\frac{c\, (a + b\, x^2)}{a\, (c + d\, x^2)}} \sqrt{c + d\, x^2}} +$$

$$\frac{b \sqrt{c}\, (24\, b^2\, c^2 - 61\, a\, b\, c\, d + 45\, a^2\, d^2) \sqrt{a + b\, x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1 - \frac{b\, c}{a\, d}\right]}{15\, d^{7/2} \sqrt{\frac{c\, (a + b\, x^2)}{a\, (c + d\, x^2)}} \sqrt{c + d\, x^2}}$$

Result (type 4, 318 leaves):

$$\frac{1}{15\sqrt{\frac{b}{a}}\,c\,d^4\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,x\,\left(a+b\,x^2\right)\,\left(-45\,a^2\,b\,c\,d^2+15\,a^3\,d^3+a\,b^2\,c\,d\,\left(61\,c+16\,d\,x^2\right)-3\,b^3\,c\,\left(8\,c^2+2\,c\,d\,x^2-d^2\,x^4\right)\right)+\right.$$

$$i\,b\,c\,\left(-48\,b^3\,c^3+128\,a\,b^2\,c^2\,d-103\,a^2\,b\,c\,d^2+15\,a^3\,d^3\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+$$

$$\left.4\,i\,b\,c\,\left(12\,b^3\,c^3-38\,a\,b^2\,c^2\,d+41\,a^2\,b\,c\,d^2-15\,a^3\,d^3\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 208: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 346 leaves, 6 steps):

$$-\frac{\left(8\,b^2\,c^2-13\,a\,b\,c\,d+3\,a^2\,d^2\right)\,x\,\sqrt{a+b\,x^2}}{3\,c\,d^2\,\sqrt{c+d\,x^2}}-\frac{\left(b\,c-a\,d\right)\,x\,\left(a+b\,x^2\right)^{3/2}}{c\,d\,\sqrt{c+d\,x^2}}+\frac{b\,\left(4\,b\,c-3\,a\,d\right)\,x\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{3\,c\,d^2}+$$

$$\frac{\left(8\,b^2\,c^2-13\,a\,b\,c\,d+3\,a^2\,d^2\right)\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,\sqrt{c}\,d^{5/2}\,\sqrt{\frac{c\,\left(a+b\,x^2\right)}{a\,\left(c+d\,x^2\right)}}\,\sqrt{c+d\,x^2}}-\frac{2\,b\,\sqrt{c}\,\left(2\,b\,c-3\,a\,d\right)\,\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,d^{5/2}\,\sqrt{\frac{c\,\left(a+b\,x^2\right)}{a\,\left(c+d\,x^2\right)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 256 leaves):

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

$$i\,b\,c\,\left(8\,b^2\,c^2-13\,a\,b\,c\,d+3\,a^2\,d^2\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-$$

$$\left.i\,b\,c\,\left(8\,b^2\,c^2-17\,a\,b\,c\,d+9\,a^2\,d^2\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\Big/\left(3\,\sqrt{\frac{b}{a}}\,c\,d^3\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 209: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 258 leaves, 5 steps):

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

Result (type 4, 196 leaves):

$$\left(i b c (-2 b c+a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]+(-b c+a d) \left(\sqrt{\frac{b}{a}}\, d x \left(a+b x^2\right)-2 i b c \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right)\right) \Big/ \left(\sqrt{\frac{b}{a}}\, c d^2 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 210: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 84 leaves, 1 step):

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

Result (type 4, 136 leaves):

$$\frac{\frac{x \left(a+b x^2\right)}{c}+\frac{i a \sqrt{\frac{b}{a}} \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]-\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right)}{d}}{\sqrt{a+b x^2} \sqrt{c+d x^2}}$$

Problem 212: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 242 leaves, 4 steps):

$$\frac{b x}{a (b c-a d) \sqrt{a+b x^2} \sqrt{c+d x^2}}+\frac{\sqrt{d} (b c+a d) \sqrt{a+b x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{a \sqrt{c} (b c-a d)^2 \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}-$$
$$\frac{2 b \sqrt{c} \sqrt{d} \sqrt{a+b x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{a (b c-a d)^2 \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 224 leaves):

$$\left(\sqrt{\frac{b}{a}} \left(\sqrt{\frac{b}{a}} x \left(a^2 d^2+a b d^2 x^2+b^2 c \left(c+d x^2\right)\right)+i b c (b c+a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \, \text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right],\frac{a d}{b c}\right]+\right.\right.$$
$$\left.\left. i b c (-b c+a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right],\frac{a d}{b c}\right]\right)\right) \Big/ \left(b c (b c-a d)^2 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 213: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 323 leaves, 5 steps):

$$\frac{b x}{3 a (b c-a d) \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}+\frac{2 b (b c-3 a d) x}{3 a^2 (b c-a d)^2 \sqrt{a+b x^2} \sqrt{c+d x^2}}+$$
$$\frac{\sqrt{d} \left(2 b^2 c^2-7 a b c d-3 a^2 d^2\right) \sqrt{a+b x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{3 a^2 \sqrt{c} (b c-a d)^3 \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}-\frac{b \sqrt{c} \sqrt{d} (b c-9 a d) \sqrt{a+b x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{3 a^2 (b c-a d)^3 \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 337 leaves):

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

$$\Bigg(\sqrt{\frac{b}{a}}\, x\, \left(3\, a^4\, d^3 + 6\, a^3\, b\, d^3\, x^2 - 2\, b^4\, c^2\, x^2\, (c + d\, x^2) + a^2\, b^2\, d\, (8\, c^2 + 8\, c\, d\, x^2 + 3\, d^2\, x^4) + a\, b^3\, c\, (-3\, c^2 + 4\, c\, d\, x^2 + 7\, d^2\, x^4)\right) +$$

$$i\, b\, c\, (-2\, b^2\, c^2 + 7\, a\, b\, c\, d + 3\, a^2\, d^2)\, (a + b\, x^2) \sqrt{1 + \frac{b\, x^2}{a}} \sqrt{1 + \frac{d\, x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a\, d}{b\, c}\right] +$$

$$2\, i\, b\, c\, (b^2\, c^2 - 4\, a\, b\, c\, d + 3\, a^2\, d^2)\, (a + b\, x^2) \sqrt{1 + \frac{b\, x^2}{a}} \sqrt{1 + \frac{d\, x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a\, d}{b\, c}\right]\Bigg)$$

Problem 219: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 10 leaves, 1 step):

$$\frac{\text{EllipticF}[\text{ArcSin}[x], -2]}{\sqrt{2}}$$

Result (type 4, 58 leaves):

$$-\frac{i\, \sqrt{1 - x^2}\, \sqrt{1 + 2\, x^2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{2}\, x\right], -\frac{1}{2}\right]}{2\, \sqrt{1 + x^2 - 2\, x^4}}$$

Problem 222: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 12 leaves, 1 step):

$$\frac{\text{EllipticF}\left[\text{ArcSin}[x], -\frac{1}{2}\right]}{\sqrt{2}}$$

Result (type 4, 18 leaves):

$$-i\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{x}{\sqrt{2}}\right],-2\right]$$

Problem 224: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 8 leaves, 2 steps):

$$\frac{\text{ArcTanh}[x]}{\sqrt{2}}$$

Result (type 3, 26 leaves):

$$-\frac{\frac{1}{2}\,\text{Log}[1-x]-\frac{1}{2}\,\text{Log}[1+x]}{\sqrt{2}}$$

Problem 228: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 51 leaves, 1 step):

$$\frac{\sqrt{2+5x^2}\,\text{EllipticF}\left[\text{ArcTan}[x],-\frac{3}{2}\right]}{\sqrt{2}\,\sqrt{1+x^2}\,\sqrt{\frac{2+5x^2}{1+x^2}}}$$

Result (type 4, 19 leaves):

$$-\frac{i\,\text{EllipticF}\left[i\,\text{ArcSinh}[x],\frac{5}{2}\right]}{\sqrt{2}}$$

Problem 229: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 49 leaves, 1 step):

$$\frac{\sqrt{1+2x^2}\ \text{EllipticF}\left[\text{ArcTan}[x],-1\right]}{\sqrt{2}\ \sqrt{1+x^2}\ \sqrt{\frac{1+2x^2}{1+x^2}}}$$

Result (type 4, 17 leaves):

$$-\frac{i\ \text{EllipticF}\left[i\ \text{ArcSinh}[x],2\right]}{\sqrt{2}}$$

Problem 230: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 51 leaves, 1 step):

$$\frac{\sqrt{2+3x^2}\ \text{EllipticF}\left[\text{ArcTan}[x],-\frac{1}{2}\right]}{\sqrt{2}\ \sqrt{1+x^2}\ \sqrt{\frac{2+3x^2}{1+x^2}}}$$

Result (type 4, 19 leaves):

$$-\frac{i\ \text{EllipticF}\left[i\ \text{ArcSinh}[x],\frac{3}{2}\right]}{\sqrt{2}}$$

Problem 232: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 47 leaves, 1 step):

$$\frac{\sqrt{2+x^2}\ \text{EllipticF}\left[\text{ArcTan}[x],\frac{1}{2}\right]}{\sqrt{2}\ \sqrt{1+x^2}\ \sqrt{\frac{2+x^2}{1+x^2}}}$$

Result (type 4, 19 leaves):

$$-\frac{i\ \text{EllipticF}\left[i\ \text{ArcSinh}[x],\frac{1}{2}\right]}{\sqrt{2}}$$

Problem 233: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 10 leaves, 1 step):

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{x}{\sqrt{2}}\right],\,-2\right]$$

Result (type 4, 19 leaves):

$$-\frac{i\,\text{EllipticF}\left[i\,\text{ArcSinh}[x],\,-\frac{1}{2}\right]}{\sqrt{2}}$$

Problem 243: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 12 leaves, 1 step):

$$-\text{EllipticF}\left[\text{ArcCos}\left[\frac{x}{\sqrt{2}}\right],\,2\right]$$

Result (type 4, 47 leaves):

$$\frac{\sqrt{1-x^2}\,\sqrt{1-\frac{x^2}{2}}\,\text{EllipticF}\left[\text{ArcSin}[x],\,\frac{1}{2}\right]}{\sqrt{-2+3x^2-x^4}}$$

Problem 248: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{-1-x^2}\,\sqrt{2+5x^2}}\,dx$$

Optimal (type 4, 53 leaves, 1 step):

$$\frac{\sqrt{2+5x^2}\,\text{EllipticF}\left[\text{ArcTan}[x],\,-\frac{3}{2}\right]}{\sqrt{2}\,\sqrt{-1-x^2}\,\sqrt{\frac{2+5x^2}{1+x^2}}}$$

Result (type 4, 39 leaves):

$$-\frac{i\sqrt{1+x^2}\ \text{EllipticF}\left[i\ \text{ArcSinh}[x],\frac{5}{2}\right]}{\sqrt{2}\ \sqrt{-1-x^2}}$$

Problem 249: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 51 leaves, 1 step):

$$\frac{\sqrt{1+2x^2}\ \text{EllipticF}[\text{ArcTan}[x],-1]}{\sqrt{2}\ \sqrt{-1-x^2}\ \sqrt{\frac{1+2x^2}{1+x^2}}}$$

Result (type 4, 37 leaves):

$$-\frac{i\sqrt{1+x^2}\ \text{EllipticF}[i\ \text{ArcSinh}[x],2]}{\sqrt{2}\ \sqrt{-1-x^2}}$$

Problem 250: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 53 leaves, 1 step):

$$\frac{\sqrt{2+3x^2}\ \text{EllipticF}\left[\text{ArcTan}[x],-\frac{1}{2}\right]}{\sqrt{2}\ \sqrt{-1-x^2}\ \sqrt{\frac{2+3x^2}{1+x^2}}}$$

Result (type 4, 39 leaves):

$$-\frac{i\sqrt{1+x^2}\ \text{EllipticF}\left[i\ \text{ArcSinh}[x],\frac{3}{2}\right]}{\sqrt{2}\ \sqrt{-1-x^2}}$$

Problem 252: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 49 leaves, 1 step):

$$\frac{\sqrt{2+x^2}\ \text{EllipticF}\left[\text{ArcTan}[x],\frac{1}{2}\right]}{\sqrt{2}\ \sqrt{-1-x^2}\ \sqrt{\frac{2+x^2}{1+x^2}}}$$

Result (type 4, 53 leaves) :

$$-\frac{i\ \sqrt{1+x^2}\ \sqrt{2+x^2}\ \text{EllipticF}\left[i\ \text{ArcSinh}[x],\frac{1}{2}\right]}{\sqrt{2}\ \sqrt{-\left(1+x^2\right)\ \left(2+x^2\right)}}$$

Problem 253: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 31 leaves, 2 steps) :

$$\frac{\sqrt{1+x^2}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{x}{\sqrt{2}}\right],-2\right]}{\sqrt{-1-x^2}}$$

Result (type 4, 39 leaves) :

$$-\frac{i\ \sqrt{1+x^2}\ \text{EllipticF}\left[i\ \text{ArcSinh}[x],-\frac{1}{2}\right]}{\sqrt{2}\ \sqrt{-1-x^2}}$$

Problem 292: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 61 leaves, 1 step) :

$$\frac{\sqrt{c+d\,x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{x}{2}\right],1-\frac{4\,d}{c}\right]}{c\ \sqrt{4+x^2}\ \sqrt{\frac{c+d\,x^2}{c\,\left(4+x^2\right)}}}$$

Result (type 4, 47 leaves) :

$$-\frac{i\ \sqrt{\frac{c+d\,x^2}{c}}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\frac{x}{2}\right],\frac{4\,d}{c}\right]}{\sqrt{c+d\,x^2}}$$

Problem 293: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 6 leaves, 1 step):

$$-\text{EllipticF}[\text{ArcCos}[x],2]$$

Result (type 4, 27 leaves):

$$\frac{\sqrt{1-2x^2}\,\text{EllipticF}[\text{ArcSin}[x],2]}{\sqrt{-1+2x^2}}$$

Problem 301: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 62 leaves, ? steps):

$$-\frac{2^{-2-m}\sqrt{x^2}\,\left(2-4x^2\right)^{1+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\left(1-2x^2\right)^2\right]}{(1+m)\,x}$$

Result (type 6, 122 leaves):

$$\left(3x\left(1-2x^2\right)^m\,\text{AppellF1}\left[\frac{1}{2},-m,\frac{1}{2},\frac{3}{2},2x^2,x^2\right]\right)\Big/$$
$$\left(\sqrt{1-x^2}\,\left(3\,\text{AppellF1}\left[\frac{1}{2},-m,\frac{1}{2},\frac{3}{2},2x^2,x^2\right]+x^2\left(-4\,m\,\text{AppellF1}\left[\frac{3}{2},1-m,\frac{1}{2},\frac{5}{2},2x^2,x^2\right]+\text{AppellF1}\left[\frac{3}{2},-m,\frac{3}{2},\frac{5}{2},2x^2,x^2\right]\right)\right)\right)$$

Problem 304: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 129 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{2\times 2^{3/4}+2\times 2^{1/4}\sqrt{2+3x^2}}{2\sqrt{3}\,x\,\left(2+3x^2\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{2\times 2^{3/4}-2\times 2^{1/4}\sqrt{2+3x^2}}{2\sqrt{3}\,x\,\left(2+3x^2\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{3}}$$

Result (type 6, 135 leaves):

$$-\left(\left(4\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]\right)\Big/\left(\left(2+3\,x^2\right)^{1/4}\left(4+3\,x^2\right)\right.\right.$$
$$\left.\left.\left(-4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]\right)\right)\right)\right)$$

Problem 305: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2-\sqrt{2}\,\sqrt{2-3\,x^2}}{2^{1/4}\,\sqrt{3}\,x\,\left(2-3\,x^2\right)^{1/4}}\right]}{2\times 2^{3/4}\,\sqrt{3}}+\frac{\text{ArcTanh}\left[\frac{2+\sqrt{2}\,\sqrt{2-3\,x^2}}{2^{1/4}\,\sqrt{3}\,x\,\left(2-3\,x^2\right)^{1/4}}\right]}{2\times 2^{3/4}\,\sqrt{3}}$$

Result (type 6, 135 leaves):

$$-\left(\left(4\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\Big/\left(\left(2-3\,x^2\right)^{1/4}\left(-4+3\,x^2\right)\right.\right.$$
$$\left.\left.\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\right)\right)\right)$$

Problem 306: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 129 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{2\times 2^{3/4}+2\times 2^{1/4}\,\sqrt{2+b\,x^2}}{2\,\sqrt{b}\,x\,\left(2+b\,x^2\right)^{1/4}}\right]}{2\times 2^{3/4}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{2\times 2^{3/4}-2\times 2^{1/4}\,\sqrt{2+b\,x^2}}{2\,\sqrt{b}\,x\,\left(2+b\,x^2\right)^{1/4}}\right]}{2\times 2^{3/4}\,\sqrt{b}}$$

Result (type 6, 144 leaves):

$$-\left(\left(12\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]\right)\Big/\left(\left(2+b\,x^2\right)^{1/4}\left(4+b\,x^2\right)\right.\right.$$
$$\left.\left.\left(-12\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]+b\,x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]\right)\right)\right)\right)$$

Problem 307: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 124 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2-\sqrt{2} \sqrt{2-b x^2}}{2^{1/4} \sqrt{b} x \left(2-b x^2\right)^{1/4}}\right]}{2\times 2^{3/4} \sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{2+\sqrt{2} \sqrt{2-b x^2}}{2^{1/4} \sqrt{b} x \left(2-b x^2\right)^{1/4}}\right]}{2\times 2^{3/4} \sqrt{b}}$$

Result (type 6, 145 leaves):

$$-\left(\left(12 x \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]\right)\Big/\left(\left(2-b x^2\right)^{1/4} \left(-4+b x^2\right) \left(12 \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]+b x^2 \left(2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]\right)\right)\right)$$

Problem 308: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{a^{3/4} \left(1+\frac{\sqrt{a+3 x^2}}{\sqrt{a}}\right)}{\sqrt{3} x \left(a+3 x^2\right)^{1/4}}\right]}{2 \sqrt{3} a^{3/4}}-\frac{\text{ArcTanh}\left[\frac{a^{3/4} \left(1-\frac{\sqrt{a+3 x^2}}{\sqrt{a}}\right)}{\sqrt{3} x \left(a+3 x^2\right)^{1/4}}\right]}{2 \sqrt{3} a^{3/4}}$$

Result (type 6, 155 leaves):

$$-\left(\left(2 a x \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]\right)\Big/\left(\left(a+3 x^2\right)^{1/4} \left(2 a+3 x^2\right) \left(-2 a \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]+x^2 \left(2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]\right)\right)\right)$$

Problem 309: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{a^{3/4}\left(1-\frac{\sqrt{a-3x^2}}{\sqrt{a}}\right)}{\sqrt{3}\,x\,(a-3x^2)^{1/4}}\right]}{2\sqrt{3}\,a^{3/4}}+\frac{\text{ArcTanh}\left[\frac{a^{3/4}\left(1+\frac{\sqrt{a-3x^2}}{\sqrt{a}}\right)}{\sqrt{3}\,x\,(a-3x^2)^{1/4}}\right]}{2\sqrt{3}\,a^{3/4}}$$

Result (type 6, 155 leaves):

$$-\left(\left(2\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]\right)\Big/\left((a-3x^2)^{1/4}(-2a+3x^2)\left(2\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]\right)\right)\right)\right)$$

Problem 310: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{a^{3/4}\left(1+\frac{\sqrt{a+b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a+b x^2)^{1/4}}\right]}{2\,a^{3/4}\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{a^{3/4}\left(1-\frac{\sqrt{a+b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a+b x^2)^{1/4}}\right]}{2\,a^{3/4}\sqrt{b}}$$

Result (type 6, 165 leaves):

$$\left(6\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]\right)\Big/\left((a+b x^2)^{1/4}(2a+b x^2)\left(6\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]-b x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]\right)\right)\right)$$

Problem 311: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 124 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{a^{3/4}\left(1-\frac{\sqrt{a-b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a-b x^2)^{1/4}}\right]}{2\,a^{3/4}\sqrt{b}}+\frac{\text{ArcTanh}\left[\frac{a^{3/4}\left(1+\frac{\sqrt{a-b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a-b x^2)^{1/4}}\right]}{2\,a^{3/4}\sqrt{b}}$$

Result (type 6, 162 leaves):

$$\left(6\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]\right)\Big/\left(\left(a-b\,x^2\right)^{1/4}\left(2\,a-b\,x^2\right)\left(6\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]+b\,x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]\right)\right)\right)$$

Problem 312: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}}$$

Result (type 6, 127 leaves):

$$\left(2\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},3\,x^2,\frac{3\,x^2}{2}\right]\right)\Big/\left(\left(-2+3\,x^2\right)\left(-1+3\,x^2\right)^{1/4}\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},3\,x^2,\frac{3\,x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},3\,x^2,\frac{3\,x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},3\,x^2,\frac{3\,x^2}{2}\right]\right)\right)\right)$$

Problem 313: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1-3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1-3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}}$$

Result (type 6, 127 leaves):

$$\left(2\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]\right)\Big/\left(\left(-1-3\,x^2\right)^{1/4}\left(2+3\,x^2\right)\left(-2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]\right)\right)\right)$$

Problem 314: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\,\left(-1+b\,x^2\right)^{1/4}}\right]}{2\,\sqrt{2}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\,\left(-1+b\,x^2\right)^{1/4}}\right]}{2\,\sqrt{2}\,\sqrt{b}}$$

Result (type 6, 132 leaves):

$$\left(6\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},b\,x^2,\frac{b\,x^2}{2}\right]\right)\Big/\left(\left(-2+b\,x^2\right)\left(-1+b\,x^2\right)^{1/4}\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},b\,x^2,\frac{b\,x^2}{2}\right]+b\,x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},b\,x^2,\frac{b\,x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},b\,x^2,\frac{b\,x^2}{2}\right]\right)\right)\right)$$

Problem 315: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 79 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\,\left(-1-b\,x^2\right)^{1/4}}\right]}{2\,\sqrt{2}\,\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\,\left(-1-b\,x^2\right)^{1/4}}\right]}{2\,\sqrt{2}\,\sqrt{b}}$$

Result (type 6, 137 leaves):

$$\left(6\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]\right)\Big/\left(\left(-1-b\,x^2\right)^{1/4}\left(2+b\,x^2\right)\left(-6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]+b\,x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]\right)\right)\right)$$

Problem 316: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 85 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a+3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}\,a^{3/4}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a+3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}\,a^{3/4}}$$

Result (type 6, 157 leaves):

$$\left(2\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]\right)\Big/\left(\left(-2\,a+3\,x^2\right)\,\left(-a+3\,x^2\right)^{1/4}\right.$$
$$\left.\left(2\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]+x^2\,\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]\right)\right)\right)$$

Problem 317: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 85 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a-3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}\,a^{3/4}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a-3\,x^2\right)^{1/4}}\right]}{2\,\sqrt{6}\,a^{3/4}}$$

Result (type 6, 157 leaves):

$$\left(2\,a\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]\right)\Big/\left(\left(-a-3\,x^2\right)^{1/4}\,\left(2\,a+3\,x^2\right)\right.$$
$$\left.\left(-2\,a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]+x^2\,\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]\right)\right)\right)$$

Problem 318: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4}\left(-a+b x^2\right)^{1/4}}\right]}{2\sqrt{2}\, a^{3/4}\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4}\left(-a+b x^2\right)^{1/4}}\right]}{2\sqrt{2}\, a^{3/4}\sqrt{b}}$$

Result (type 6, 163 leaves):

$$-\left(\left(6\, a\, x\, \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]\right)\Big/\left(\left(2 a-b x^2\right)\left(-a+b x^2\right)^{1/4}\left(6\, a\, \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]+b x^2\left(2\, \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]\right)\right)\right)\right)$$

Problem 319: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 103 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4}\left(-a-b x^2\right)^{1/4}}\right]}{2\sqrt{2}\, a^{3/4}\sqrt{b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4}\left(-a-b x^2\right)^{1/4}}\right]}{2\sqrt{2}\, a^{3/4}\sqrt{b}}$$

Result (type 6, 168 leaves):

$$-\left(\left(6\, a\, x\, \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]\right)\Big/\left(\left(-a-b x^2\right)^{1/4}\left(2 a+b x^2\right)\left(6\, a\, \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]-b x^2\left(2\, \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]\right)\right)\right)\right)$$

Problem 320: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 53 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{x}{\sqrt{2}\left(-1+x^2\right)^{1/4}}\right]}{2\sqrt{2}}+\frac{\text{ArcTanh}\left[\frac{x}{\sqrt{2}\left(-1+x^2\right)^{1/4}}\right]}{2\sqrt{2}}$$

Result (type 6, 115 leaves):

$$-\left(\left(6\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},x^2,\frac{x^2}{2}\right]\right)\Big/\left(\left(-2+x^2\right)\left(-1+x^2\right)^{1/4}\left(6\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},x^2,\frac{x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},x^2,\frac{x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},x^2,\frac{x^2}{2}\right]\right)\right)\right)\right)$$

Problem 321: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 362 leaves, 13 steps):

$$\frac{6\,a\,b\,x}{5\,d\,\left(a+b\,x^2\right)^{1/4}}-\frac{2\,b\,\left(b\,c-a\,d\right)\,x}{d^2\,\left(a+b\,x^2\right)^{1/4}}+\frac{2\,b\,x\,\left(a+b\,x^2\right)^{3/4}}{5\,d}-\frac{6\,a^{3/2}\,\sqrt{b}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5\,d\,\left(a+b\,x^2\right)^{1/4}}+$$

$$\frac{2\,\sqrt{a}\,\sqrt{b}\,\left(b\,c-a\,d\right)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{d^2\,\left(a+b\,x^2\right)^{1/4}}+\frac{a^{1/4}\,\left(-b\,c+a\,d\right)^{3/2}\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{d^{5/2}\,x}-$$

$$\frac{a^{1/4}\,\left(-b\,c+a\,d\right)^{3/2}\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{d^{5/2}\,x}$$

Result (type 6, 431 leaves):

$$\left(2\,x\left(-\left(\left(9\,a^2\,c\,\left(-2\,b\,c+5\,a\,d\right)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.\right.\right.$$
$$\left.\left.\left.x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)+$$
$$\left(b\left(-5\,a\,c\,\left(6\,a\,c+b\,c\,x^2+14\,a\,d\,x^2+6\,b\,d\,x^4\right)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,x^2\,\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)\right.\right.$$
$$\left.\left.\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\Big/\left(-10\,a\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},\right.\right.$$
$$\left.\left.\left.\left.-\frac{d\,x^2}{c}\right]+x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)\Big/\left(15\,d\,\left(a+b\,x^2\right)^{1/4}\,\left(c+d\,x^2\right)\right)$$

Problem 322: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 302 leaves, 12 steps):

$$\frac{2 b x \left(a+b x^2\right)^{1/4}}{3 d}+\frac{2 a^{3/2} \sqrt{b} \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{3 d \left(a+b x^2\right)^{3/4}}-\frac{2 \sqrt{a} \sqrt{b} (b c-a d) \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{d^2 \left(a+b x^2\right)^{3/4}}+$$
$$\frac{a^{1/4} (b c-a d) \sqrt{-\frac{b x^2}{a}} \text{EllipticPi}\left[-\frac{\sqrt{a} \sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{\left(a+b x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{d^2 x}+\frac{a^{1/4} (b c-a d) \sqrt{-\frac{b x^2}{a}} \text{EllipticPi}\left[\frac{\sqrt{a} \sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{\left(a+b x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{d^2 x}$$

Result (type 6, 435 leaves):

$$\frac{1}{9 d \left(a+b x^2\right)^{3/4} \left(c+d x^2\right)} 2 x \left(-\left(\left(9 a^2 c (-2 b c+3 a d) \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\middle/\left(-6 a c \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.\right.\right.$$
$$\left.\left.x^2 \left(4 a d \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)+$$
$$\left(b \left(-5 a c \left(6 a c+3 b c x^2+10 a d x^2+6 b d x^4\right) \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 x^2 \left(a+b x^2\right) \left(c+d x^2\right)\right.\right.$$
$$\left.\left.\left(4 a d \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\middle/\left(-10 a c\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2 \left(4 a d \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 323: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 244 leaves, 8 steps):

$$\frac{2\,b\,x}{d\,\left(a+b\,x^2\right)^{1/4}}-\frac{2\,\sqrt{a}\,\sqrt{b}\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{d\,\left(a+b\,x^2\right)^{1/4}}+$$
$$\frac{a^{1/4}\,\sqrt{-b\,c+a\,d}\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],\,-1\right]}{d^{3/2}\,x}-\frac{a^{1/4}\,\sqrt{-b\,c+a\,d}\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],\,-1\right]}{d^{3/2}\,x}$$

Result (type 6, 161 leaves):

$$\left(6\,a\,c\,x\,\left(a+b\,x^2\right)^{3/4}\,\text{AppellF1}\left[\frac{1}{2},\,-\frac{3}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Big/\left(\left(c+d\,x^2\right)\,\left(6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\,-\frac{3}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+\right.\right.$$
$$\left.\left.x^2\,\left(-4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\,-\frac{3}{4},\,2,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 324: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 199 leaves, 8 steps):

$$\frac{2\,\sqrt{a}\,\sqrt{b}\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{d\,\left(a+b\,x^2\right)^{3/4}}-$$
$$\frac{a^{1/4}\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],\,-1\right]}{d\,x}-\frac{a^{1/4}\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],\,-1\right]}{d\,x}$$

Result (type 6, 160 leaves):

$$\left(6\,a\,c\,x\,\left(a+b\,x^2\right)^{1/4}\,\text{AppellF1}\left[\frac{1}{2},\,-\frac{1}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Big/\left(\left(c+d\,x^2\right)\,\left(6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\,-\frac{1}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+\right.\right.$$
$$\left.\left.x^2\,\left(-4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\,-\frac{1}{4},\,2,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 325: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 167 leaves, 4 steps):

$$\frac{a^{1/4}\sqrt{-\frac{b x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{(a+b x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{\sqrt{d}\sqrt{-b c+a d}\,x}-\frac{a^{1/4}\sqrt{-\frac{b x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{(a+b x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{\sqrt{d}\sqrt{-b c+a d}\,x}$$

Result (type 6, 160 leaves) :

$$-\left(\left(6 a c x \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left((a+b x^2)^{1/4}(c+d x^2)\left(-6 a c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 326: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 152 leaves, 5 steps) :

$$\frac{a^{1/4}\sqrt{-\frac{b x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{(a+b x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{(b c-a d)\,x}+\frac{a^{1/4}\sqrt{-\frac{b x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{(a+b x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{(b c-a d)\,x}$$

Result (type 6, 161 leaves) :

$$-\left(\left(6 a c x \,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left((a+b x^2)^{3/4}(c+d x^2)\left(-6 a c\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 327: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 233 leaves, 7 steps) :

$$\frac{2\sqrt{b}\left(1+\frac{b x^2}{a}\right)^{1/4}\text{EllipticE}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,(b c-a d)\,(a+b x^2)^{1/4}}+$$

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

Result (type 6, 339 leaves) :

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

$$2 x\left(-\frac{3 b}{a}-\left(9 c\,(b c+a d)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left((c+d x^2)\left(-6 a c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.\right.\right.$$
$$\left.\left.x^2\left(4 a d\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)-$$
$$\left(5 b c d x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left((c+d x^2)\left(-10 a c\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.\right.$$
$$\left.\left.\left.x^2\left(4 a d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 328: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 254 leaves, 9 steps) :

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

$$\frac{a^{1/4} d\sqrt{-\frac{b x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{(a+b x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{(b c-a d)^2\,x}-\frac{a^{1/4} d\sqrt{-\frac{b x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{(a+b x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{(b c-a d)^2\,x}$$

Result (type 6, 342 leaves) :

$$\frac{1}{9\left(-b c+a d\right)\left(a+b x^2\right)^{3/4}} 2 x \left(-\frac{3 b}{a}+\left(9 c \left(b c-3 a d\right) \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(\left(c+d x^2\right)\left(-6 a c\, \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d\, \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c\, \text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)+\left(5 b c d x^2 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(\left(c+d x^2\right)\left(-10 a c\, \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d\, \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c\, \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 329: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 274 leaves, 10 steps):

$$\frac{2 b x}{5 a\left(b c-a d\right)\left(a+b x^2\right)^{5/4}}+\frac{2\sqrt{b}\left(3 b c-8 a d\right)\left(1+\frac{b x^2}{a}\right)^{1/4} \text{EllipticE}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right],2\right]}{5 a^{3/2}\left(b c-a d\right)^2\left(a+b x^2\right)^{1/4}}+\frac{a^{1/4} d^{3/2}\sqrt{-\frac{b x^2}{a}}\, \text{EllipticPi}\left[-\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{\left(a+b x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{\left(-b c+a d\right)^{5/2} x}-\frac{a^{1/4} d^{3/2}\sqrt{-\frac{b x^2}{a}}\, \text{EllipticPi}\left[\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{\left(a+b x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{\left(-b c+a d\right)^{5/2} x}$$

Result (type 6, 404 leaves):

$$\left(2 x\left(\frac{3 b\left(-9 a^2 d+3 b^2 c x^2+4 a b\left(c-2 d x^2\right)\right)}{a+b x^2}+\left(9 a c\left(-3 b^2 c^2+8 a b c d+5 a^2 d^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(\left(c+d x^2\right)\left(6 a c\, \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-x^2\left(4 a d\, \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c\, \text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)-\left(5 a b c d\left(-3 b c+8 a d\right) x^2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(\left(c+d x^2\right)\left(-10 a c\, \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d\, \text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c\, \text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)\right)\Big/\left(15 a^2\left(b c-a d\right)^2\left(a+b x^2\right)^{1/4}\right)$$

Problem 330: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 304 leaves, 10 steps):

$$\frac{2 b x}{7 a (b c-a d) \left(a+b x^2\right)^{7/4}}+\frac{2 b (5 b c-12 a d) x}{21 a^2 (b c-a d)^2 \left(a+b x^2\right)^{3/4}}+\frac{2 \sqrt{b} (5 b c-12 a d) \left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{21 a^{3/2} (b c-a d)^2 \left(a+b x^2\right)^{3/4}}+$$

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

Result (type 6, 408 leaves):

$$\left(2 x \left(\frac{3 b \left(-15 a^2 d+5 b^2 c x^2+4 a b \left(2 c-3 d x^2\right)\right)}{a+b x^2}+\right.\right.$$

$$\left(9 a c \left(5 b^2 c^2-12 a b c d+21 a^2 d^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/ \left(\left(c+d x^2\right) \left(6 a c \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-\right.\right.$$

$$\left.\left.x^2 \left(4 a d \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)+$$

$$\left(5 a b c d (-5 b c+12 a d) x^2 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/ \left(\left(c+d x^2\right) \left(-10 a c \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.\right.$$

$$\left.\left.\left.\left.x^2 \left(4 a d \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)\right) \Big/ \left(63 a^2 (b c-a d)^2 \left(a+b x^2\right)^{3/4}\right)$$

Problem 331: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 340 leaves, 9 steps):

$$\frac{b\,(5\,b\,c-a\,d)\,x}{2\,c\,d^2\,(a+b\,x^2)^{1/4}}-\frac{(b\,c-a\,d)\,x\,(a+b\,x^2)^{3/4}}{2\,c\,d\,(c+d\,x^2)}-\frac{\sqrt{a}\,\sqrt{b}\,(5\,b\,c-a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{2\,c\,d^2\,(a+b\,x^2)^{1/4}}+$$

$$\frac{a^{1/4}\,\sqrt{-b\,c+a\,d}\,(5\,b\,c+2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],\,-1\right]}{4\,c\,d^{5/2}\,x}-$$

$$\frac{a^{1/4}\,\sqrt{-b\,c+a\,d}\,(5\,b\,c+2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],\,-1\right]}{4\,c\,d^{5/2}\,x}$$

Result (type 6, 436 leaves) :

$$\frac{1}{6\,d\,(a+b\,x^2)^{1/4}\,(c+d\,x^2)}x\left(-\left(\left(18\,a^2\,(b\,c+a\,d)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.\right.$$
$$\left.\left.\left.x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)+$$
$$\left(5\,a\,c\,\left(6\,a^2\,d-b^2\,c\,x^2+a\,b\,(-6\,c+5\,d\,x^2)\right)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,(b\,c-a\,d)\,x^2\,(a+b\,x^2)\right.$$
$$\left.\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\Big/\left(c\left(10\,a\,c\right.\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)$$

Problem 332: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 279 leaves, 9 steps) :

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

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

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

Result (type 6, 439 leaves) :

$$\frac{1}{6 d \left(a+b x^2\right)^{3/4} \left(c+d x^2\right)} x \left(-\left(\left(18 a^2 (b c+a d) \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-6 a c \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.\right.\right.$$

$$\left.\left.x^2 \left(4 a d \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)+$$

$$\left(5 a c \left(6 a^2 d-3 b^2 c x^2+a b \left(-6 c+7 d x^2\right)\right) \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 (b c-a d) x^2 \left(a+b x^2\right)\right.$$

$$\left.\left(4 a d \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\Big/\left(c \left(10 a c \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-x^2 \left(4 a d \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 333: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 309 leaves, 9 steps) :

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

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

Result (type 6, 320 leaves) :

$$\frac{1}{6\left(a+b x^2\right)^{1/4}\left(c+d x^2\right)} x \left(\frac{3\left(a+b x^2\right)}{c}-\left(18 a^2 \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-6 a c \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c \text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)+\left(5 a b x^2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-10 a c \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d \text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c \text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 334: Result unnecessarily involves higher level functions.

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

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

$$\frac{x\left(a+b x^2\right)^{1/4}}{2 c\left(c+d x^2\right)}+\frac{\sqrt{a}\sqrt{b}\left(1+\frac{b x^2}{a}\right)^{3/4} \text{EllipticF}\left[\frac{1}{2}\text{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right],2\right]}{2 c d\left(a+b x^2\right)^{3/4}}-\frac{a^{1/4}(b c-2 a d)\sqrt{-\frac{b x^2}{a}}\, \text{EllipticPi}\left[-\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{\left(a+b x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{4 c d(b c-a d) x}-\frac{a^{1/4}(b c-2 a d)\sqrt{-\frac{b x^2}{a}}\, \text{EllipticPi}\left[\frac{\sqrt{a}\sqrt{d}}{\sqrt{-b c+a d}},\text{ArcSin}\left[\frac{\left(a+b x^2\right)^{1/4}}{a^{1/4}}\right],-1\right]}{4 c d(b c-a d) x}$$

Result (type 6, 322 leaves):

$$\frac{1}{6\left(a+b x^2\right)^{3/4}\left(c+d x^2\right)} x \left(\frac{3\left(a+b x^2\right)}{c}-\left(18 a^2 \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-6 a c \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)-\left(5 a b x^2 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-10 a c \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(4 a d \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 335: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 336 leaves, 9 steps):

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

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

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

Result (type 6, 358 leaves):

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

$$x\left(-\frac{3\,d\,(a+b\,x^2)}{c\,(b\,c-a\,d)}+\left(18\,a\,(-2\,b\,c+a\,d)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((b\,c-a\,d)\left(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.\right.$$

$$\left.\left.x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)+$$

$$\left(5\,a\,b\,d\,x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((-b\,c+a\,d)\left(-10\,a\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.$$

$$\left.\left.\left.x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)$$

Problem 336: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 292 leaves, 9 steps):

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

$$\frac{a^{1/4}\,\left(5\,b\,c-2\,a\,d\right)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],\,-1\right]}{4\,c\,\left(b\,c-a\,d\right)^2\,x}+$$

$$\frac{a^{1/4}\,\left(5\,b\,c-2\,a\,d\right)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{\left(a+b\,x^2\right)^{1/4}}{a^{1/4}}\right],\,-1\right]}{4\,c\,\left(b\,c-a\,d\right)^2\,x}$$

Result (type 6, 340 leaves) :

$$\Bigg(x\,\Bigg(-\frac{3\,d\,\left(a+b\,x^2\right)}{c}+\left(18\,a\,\left(-2\,b\,c+a\,d\right)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{3}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Bigg/\Bigg(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\,\frac{3}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+$$
$$x^2\,\left(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{4},\,2,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Bigg)+$$
$$\left(5\,a\,b\,d\,x^2\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Bigg/\Bigg(-10\,a\,c\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+$$
$$x^2\,\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\,\frac{3}{4},\,2,\,\frac{7}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{4},\,1,\,\frac{7}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(6\,\left(b\,c-a\,d\right)\,\left(a+b\,x^2\right)^{3/4}\,\left(c+d\,x^2\right)\right)$$

Problem 337: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 314 leaves, 10 steps) :

$$-\frac{d\,x}{2\,c\,(b\,c-a\,d)\,(a+b\,x^2)^{1/4}\,(c+d\,x^2)}+\frac{\sqrt{b}\,(4\,b\,c+a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{2\,\sqrt{a}\,c\,(b\,c-a\,d)^2\,(a+b\,x^2)^{1/4}}-$$

$$\frac{a^{1/4}\,\sqrt{d}\,(7\,b\,c-2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{4\,c\,(-b\,c+a\,d)^{5/2}\,x}+$$

$$\frac{a^{1/4}\,\sqrt{d}\,(7\,b\,c-2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{4\,c\,(-b\,c+a\,d)^{5/2}\,x}$$

Result (type 6, 480 leaves) :

$$\Bigg(x\,\Bigg(\Big(18\,(2\,b^2\,c^2+4\,a\,b\,c\,d-a^2\,d^2)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Big)\Big/\Big(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+$$
$$x^2\,\Big(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Big)\Big)+$$
$$\Big(5\,a\,c\,(6\,a^2\,d^2+5\,a\,b\,d^2\,x^2+4\,b^2\,c\,(6\,c+5\,d\,x^2))\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-$$
$$3\,x^2\,(a^2\,d^2+a\,b\,d^2\,x^2+4\,b^2\,c\,(c+d\,x^2))\,\Big(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Big)\Big)\Big/$$
$$\Big(a\,c\,\Big(10\,a\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-x^2\,\Big(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+$$
$$b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Big)\Big)\Big)\Bigg)\Bigg)\Big/\Big(6\,(b\,c-a\,d)^2\,(a+b\,x^2)^{1/4}\,(c+d\,x^2)\Big)$$

Problem 338: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 345 leaves, 10 steps) :

$$\frac{b\,(4\,b\,c+3\,a\,d)\,x}{6\,a\,c\,(b\,c-a\,d)^2\,(a+b\,x^2)^{3/4}}-\frac{d\,x}{2\,c\,(b\,c-a\,d)\,(a+b\,x^2)^{3/4}\,(c+d\,x^2)}+$$

$$\frac{\sqrt{b}\,(4\,b\,c+3\,a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{6\,\sqrt{a}\,c\,(b\,c-a\,d)^2\,(a+b\,x^2)^{3/4}}-\frac{a^{1/4}\,d\,(9\,b\,c-2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],\,-1\right]}{4\,c\,(b\,c-a\,d)^3\,x}-$$

$$\frac{a^{1/4}\,d\,(9\,b\,c-2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\,\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],\,-1\right]}{4\,c\,(b\,c-a\,d)^3\,x}$$

Result (type 6, 485 leaves) :

$$\left(x\left(-\left(\left(18\,(2\,b^2\,c^2-12\,a\,b\,c\,d+3\,a^2\,d^2)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{3}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Big/\left(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\,\frac{3}{4},\,1,\,\frac{3}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+\right.\right.\right.\right.$$
$$\left.\left.x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{4},\,2,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)+$$
$$\left(5\,a\,c\,(18\,a^2\,d^2+21\,a\,b\,d^2\,x^2+4\,b^2\,c\,(6\,c+7\,d\,x^2))\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]-\right.$$
$$\left.3\,x^2\,(3\,a^2\,d^2+3\,a\,b\,d^2\,x^2+4\,b^2\,c\,(c+d\,x^2))\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\,\frac{3}{4},\,2,\,\frac{7}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{4},\,1,\,\frac{7}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\Big/$$
$$\left(a\,c\left(10\,a\,c\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{4},\,1,\,\frac{5}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]-x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\,\frac{3}{4},\,2,\,\frac{7}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+\right.\right.\right.$$
$$\left.\left.\left.\left.\left.3\,b\,c\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{4},\,1,\,\frac{7}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)\right)\Big/\left(18\,(b\,c-a\,d)^2\,(a+b\,x^2)^{3/4}\,(c+d\,x^2)\right)$$

Problem 339: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 371 leaves, 11 steps) :

$$\frac{b\,(4\,b\,c+5\,a\,d)\,x}{10\,a\,c\,(b\,c-a\,d)^2\,(a+b\,x^2)^{5/4}}-\frac{d\,x}{2\,c\,(b\,c-a\,d)\,(a+b\,x^2)^{5/4}\,(c+d\,x^2)}+$$

$$\frac{\sqrt{b}\,(12\,b^2\,c^2-52\,a\,b\,c\,d-5\,a^2\,d^2)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]}{10\,a^{3/2}\,c\,(b\,c-a\,d)^3\,(a+b\,x^2)^{1/4}}-$$

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

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

Result (type 6, 634 leaves) :

$$\frac{1}{30\,a^2\,(b\,c-a\,d)^3\,(a+b\,x^2)^{1/4}\,(c+d\,x^2)}$$
$$x\left(\left(18\,a\,(6\,b^3\,c^3-26\,a\,b^2\,c^2\,d-30\,a^2\,b\,c\,d^2+5\,a^3\,d^3)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.$$
$$\left.\left. x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)+$$
$$\left(-5\,a\,c\,\left(30\,a^4\,d^3+55\,a^3\,b\,d^3\,x^2-12\,b^4\,c^2\,x^2\,(6\,c+5\,d\,x^2)+a^2\,b^2\,d\,(336\,c^2+284\,c\,d\,x^2+25\,d^2\,x^4)+4\,a\,b^3\,c\,(-24\,c^2+57\,c\,d\,x^2+65\,d^2\,x^4)\right)\right.$$
$$\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+$$
$$3\,x^2\,\left(5\,a^4\,d^3+10\,a^3\,b\,d^3\,x^2-12\,b^4\,c^2\,x^2\,(c+d\,x^2)+a^2\,b^2\,d\,(56\,c^2+56\,c\,d\,x^2+5\,d^2\,x^4)+4\,a\,b^3\,c\,(-4\,c^2+9\,c\,d\,x^2+13\,d^2\,x^4)\right)$$
$$\left.\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\Big/\left(c\,(a+b\,x^2)\,\left(10\,a\,c\right.\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)$$

Problem 340: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 419 leaves, 11 steps) :

$$\frac{b\,(4\,b\,c+7\,a\,d)\,x}{14\,a\,c\,(b\,c-a\,d)^2\,(a+b\,x^2)^{7/4}}+\frac{b\,(20\,b^2\,c^2-76\,a\,b\,c\,d-21\,a^2\,d^2)\,x}{42\,a^2\,c\,(b\,c-a\,d)^3\,(a+b\,x^2)^{3/4}}-$$

$$\frac{d\,x}{2\,c\,(b\,c-a\,d)\,(a+b\,x^2)^{7/4}\,(c+d\,x^2)}+\frac{\sqrt{b}\,(20\,b^2\,c^2-76\,a\,b\,c\,d-21\,a^2\,d^2)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{42\,a^{3/2}\,c\,(b\,c-a\,d)^3\,(a+b\,x^2)^{3/4}}+$$

$$\frac{a^{1/4}\,d^2\,(13\,b\,c-2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[-\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{4\,c\,(b\,c-a\,d)^4\,x}+$$

$$\frac{a^{1/4}\,d^2\,(13\,b\,c-2\,a\,d)\,\sqrt{-\frac{b\,x^2}{a}}\,\text{EllipticPi}\left[\frac{\sqrt{a}\,\sqrt{d}}{\sqrt{-b\,c+a\,d}},\text{ArcSin}\left[\frac{(a+b\,x^2)^{1/4}}{a^{1/4}}\right],-1\right]}{4\,c\,(b\,c-a\,d)^4\,x}$$

Result (type 6, 637 leaves):

$$\frac{1}{126\,a^2\,(b\,c-a\,d)^3\,(a+b\,x^2)^{3/4}\,(c+d\,x^2)}$$
$$\times\left(\left(18\,a\,(-10\,b^3\,c^3+38\,a\,b^2\,c^2\,d-126\,a^2\,b\,c\,d^2+21\,a^3\,d^3)\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(-6\,a\,c\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.$$
$$\left.x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)+$$
$$\left(-5\,a\,c\,(126\,a^4\,d^3+273\,a^3\,b\,d^3\,x^2-20\,b^4\,c^2\,x^2\,(6\,c+7\,d\,x^2)+4\,a\,b^3\,c\,(-48\,c^2+61\,c\,d\,x^2+133\,d^2\,x^4)+a^2\,b^2\,d\,(528\,c^2+604\,c\,d\,x^2+147\,d^2\,x^4))\right.$$
$$\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+$$
$$3\,x^2\,(21\,a^4\,d^3+42\,a^3\,b\,d^3\,x^2-20\,b^4\,c^2\,x^2\,(c+d\,x^2)+4\,a\,b^3\,c\,(-8\,c^2+11\,c\,d\,x^2+19\,d^2\,x^4)+a^2\,b^2\,d\,(88\,c^2+88\,c\,d\,x^2+21\,d^2\,x^4))$$
$$\left.\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\Big/\left(c\,(a+b\,x^2)\left(10\,a\,c\,\text{AppellF1}\left[\frac{3}{2},\right.\right.\right.$$
$$\left.\left.\left.\left.\frac{3}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-x^2\left(4\,a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)$$

Problem 341: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 79 leaves, 3 steps):

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

Result (type 6, 172 leaves):

$$\left(3 a c x\left(a+b x^2\right)^p\left(c+d x^2\right)^q\text{AppellF1}\left[\frac{1}{2},-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(3 a c\,\text{AppellF1}\left[\frac{1}{2},-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+2 x^2\left(b c p\,\text{AppellF1}\left[\frac{3}{2},1-p,-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d q\,\text{AppellF1}\left[\frac{3}{2},-p,1-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)$$

Problem 346: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 57 leaves, 2 steps):

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

Result (type 6, 162 leaves):

$$-\left(\left(3 a c x\left(a+b x^2\right)^p\text{AppellF1}\left[\frac{1}{2},-p,1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(\left(c+d x^2\right)\left(-3 a c\,\text{AppellF1}\left[\frac{1}{2},-p,1,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+2 x^2\left(-b c p\,\text{AppellF1}\left[\frac{3}{2},1-p,1,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d\,\text{AppellF1}\left[\frac{3}{2},-p,2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 347: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 57 leaves, 2 steps):

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

Result (type 6, 162 leaves):

$$-\left(\left(3 a c x\left(a+b x^2\right)^p\text{AppellF1}\left[\frac{1}{2},-p,2,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(\left(c+d x^2\right)^2\left(-3 a c\,\text{AppellF1}\left[\frac{1}{2},-p,2,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-2 x^2\left(b c p\,\text{AppellF1}\left[\frac{3}{2},1-p,2,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-2 a d\,\text{AppellF1}\left[\frac{3}{2},-p,3,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 348: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 57 leaves, 2 steps):

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

Result (type 6, 162 leaves):

$$-\left(\left(3\,a\,c\,x\left(a+b\,x^2\right)^p\text{AppellF1}\left[\frac{1}{2},-p,3,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(\left(c+d\,x^2\right)^3\left(-3\,a\,c\,\text{AppellF1}\left[\frac{1}{2},-p,3,\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-2\,x^2\left(b\,c\,p\,\text{AppellF1}\left[\frac{3}{2},1-p,3,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-3\,a\,d\,\text{AppellF1}\left[\frac{3}{2},-p,4,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)$$

Problem 349: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 53 leaves, 1 step):

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

Result (type 6, 594 leaves):

$$3\,a\,c\,x\,\left(a+b\,x^2\right)^{\frac{b\,c}{-2\,b\,c+2\,a\,d}}\,\left(c+d\,x^2\right)^{\frac{a\,d}{2\,b\,c-2\,a\,d}}\,\left(\left(d\,\text{AppellF1}\left[\frac{1}{2},\frac{b\,c}{2\,b\,c-2\,a\,d},1+\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\right.$$
$$\left(\left(c+d\,x^2\right)\,\left(3\,a\,c\,\left(-b\,c+a\,d\right)\,\text{AppellF1}\left[\frac{1}{2},\frac{b\,c}{2\,b\,c-2\,a\,d},1+\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+x^2\,\left(a\,d\,\left(2\,b\,c-3\,a\,d\right)\,\text{AppellF1}\left[\frac{3}{2},\frac{b\,c}{2\,b\,c-2\,a\,d},\right.\right.\right.\right.$$
$$\left.\left.\left.\left.2+\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b^2\,c^2\,\text{AppellF1}\left[\frac{3}{2},1+\frac{b\,c}{2\,b\,c-2\,a\,d},1+\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)+$$
$$\left(b\,\text{AppellF1}\left[\frac{1}{2},1+\frac{b\,c}{2\,b\,c-2\,a\,d},\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(\left(a+b\,x^2\right)\,\left(3\,a\,c\,\left(b\,c-a\,d\right)\,\text{AppellF1}\left[\frac{1}{2},1+\frac{b\,c}{2\,b\,c-2\,a\,d},\right.\right.\right.$$
$$\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{3}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\Big]+x^2\,\left(a^2\,d^2\,\text{AppellF1}\left[\frac{3}{2},1+\frac{b\,c}{2\,b\,c-2\,a\,d},1+\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.$$
$$\left.\left.\left.\left.b\,c\,\left(-3\,b\,c+2\,a\,d\right)\,\text{AppellF1}\left[\frac{3}{2},2+\frac{b\,c}{2\,b\,c-2\,a\,d},\frac{a\,d}{-2\,b\,c+2\,a\,d},\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)$$

Test results for the 1156 problems in "1.1.2.4 (e x)^m (a+b x^2)^p (c+d x^2)^q.m"

Problem 31: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 42 leaves, 3 steps):

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

Result (type 1, 107 leaves):

$$\frac{1}{84}\,x^2\,\left(42\,a^5\,A+21\,a^4\,\left(5\,A\,b+a\,B\right)\,x^2+70\,a^3\,b\,\left(2\,A\,b+a\,B\right)\,x^4+105\,a^2\,b^2\,\left(A\,b+a\,B\right)\,x^6+42\,a\,b^3\,\left(A\,b+2\,a\,B\right)\,x^8+7\,b^4\,\left(A\,b+5\,a\,B\right)\,x^{10}+6\,b^5\,B\,x^{12}\right)$$

Problem 47: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 48 leaves, 3 steps):

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

Result (type 1, 118 leaves):

$$-\frac{1}{84 x^{14}}\left(21 b^5 x^{10} \left(A+2 B x^2\right)+35 a b^4 x^8 \left(2 A+3 B x^2\right)+35 a^2 b^3 x^6 \left(3 A+4 B x^2\right)+21 a^3 b^2 x^4 \left(4 A+5 B x^2\right)+7 a^4 b x^2 \left(5 A+6 B x^2\right)+a^5 \left(6 A+7 B x^2\right)\right)$$

Problem 108: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 11 leaves, 2 steps):

$$-b x+(a+b) \operatorname{ArcTanh}[x]$$

Result (type 3, 28 leaves):

$$\frac{1}{2} \left(-2 b x-(a+b) \operatorname{Log}[1-x]+(a+b) \operatorname{Log}[1+x]\right)$$

Problem 336: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 234 leaves, 6 steps):

$$\frac{b x^{1+m}}{4 a (b c-a d) \left(a+b x^2\right)^2}+\frac{b (b c (3-m)-a d (7-m)) x^{1+m}}{8 a^2 (b c-a d)^2 \left(a+b x^2\right)}+\frac{1}{8 a^3 (b c-a d)^3 (1+m)}$$
$$b \left(a^2 d^2 \left(15-8 m+m^2\right)-2 a b c d \left(5-6 m+m^2\right)+b^2 c^2 \left(3-4 m+m^2\right)\right) x^{1+m} \operatorname{Hypergeometric2F1}\left[1, \frac{1+m}{2}, \frac{3+m}{2}, -\frac{b x^2}{a}\right]-$$
$$\frac{d^3 x^{1+m} \operatorname{Hypergeometric2F1}\left[1, \frac{1+m}{2}, \frac{3+m}{2}, -\frac{d x^2}{c}\right]}{c (b c-a d)^3 (1+m)}$$

Result (type 6, 196 leaves):

$$\left(a c (3+m) x^{1+m} \operatorname{AppellF1}\left[\frac{1+m}{2}, 3, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right) \Big/$$
$$\left((1+m) \left(a+b x^2\right)^3 \left(c+d x^2\right) \left(a c (3+m) \operatorname{AppellF1}\left[\frac{1+m}{2}, 3, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]-\right.\right.$$
$$\left.\left.2 x^2 \left(a d \operatorname{AppellF1}\left[\frac{3+m}{2}, 3, 2, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]+3 b c \operatorname{AppellF1}\left[\frac{3+m}{2}, 4, 1, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 341: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 230 leaves, 6 steps):

$$\frac{d (b c+a d) x^{1+m}}{2 a c (b c-a d)^2 \left(c+d x^2\right)}+\frac{b x^{1+m}}{2 a (b c-a d) \left(a+b x^2\right) \left(c+d x^2\right)}-$$
$$\frac{b^2 (a d (5-m)-b (c-c m)) x^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b x^2}{a}\right]}{2 a^2 (b c-a d)^3 (1+m)}-\frac{d^2 (a d (1-m)-b c (5-m)) x^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d x^2}{c}\right]}{2 c^2 (b c-a d)^3 (1+m)}$$

Result (type 6, 195 leaves):

$$\left(a c (3+m) x^{1+m} \text{AppellF1}\left[\frac{1+m}{2},2,2,\frac{3+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/$$
$$\left((1+m) \left(a+b x^2\right)^2 \left(c+d x^2\right)^2 \left(a c (3+m) \text{AppellF1}\left[\frac{1+m}{2},2,2,\frac{3+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-\right.\right.$$
$$\left.\left.4 x^2 \left(a d \text{AppellF1}\left[\frac{3+m}{2},2,3,\frac{5+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c \text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 342: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 325 leaves, 7 steps):

$$\frac{d (2 b c+a d) x^{1+m}}{4 a c (b c-a d)^2 \left(c+d x^2\right)^2}+\frac{b x^{1+m}}{2 a (b c-a d) \left(a+b x^2\right) \left(c+d x^2\right)^2}+\frac{d \left(4 b^2 c^2-a^2 d^2 (3-m)+a b c d (11-m)\right) x^{1+m}}{8 a c^2 (b c-a d)^3 \left(c+d x^2\right)}-$$
$$\frac{b^3 (a d (7-m)-b (c-c m)) x^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b x^2}{a}\right]}{2 a^2 (b c-a d)^4 (1+m)}+\frac{1}{8 c^3 (b c-a d)^4 (1+m)}$$
$$d^2 \left(b^2 c^2 \left(35-12 m+m^2\right)-2 a b c d \left(7-8 m+m^2\right)+a^2 d^2 \left(3-4 m+m^2\right)\right) x^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d x^2}{c}\right]$$

Result (type 6, 197 leaves):

$$\left(a\,c\,(3+m)\,x^{1+m}\,\text{AppellF1}\left[\frac{1+m}{2},2,3,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/$$
$$\left((1+m)\,\left(a+b\,x^2\right)^2\,\left(c+d\,x^2\right)^3\,\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},2,3,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-\right.\right.$$
$$\left.\left.2\,x^2\,\left(3\,a\,d\,\text{AppellF1}\left[\frac{3+m}{2},2,4,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+2\,b\,c\,\text{AppellF1}\left[\frac{3+m}{2},3,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 681: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 80 leaves, 6 steps):

$$-\frac{\sqrt{c}\,\text{ArcTanh}\left[\frac{\sqrt{c+d\,x^2}}{\sqrt{c}}\right]}{a}+\frac{\sqrt{b\,c-a\,d}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{c+d\,x^2}}{\sqrt{b\,c-a\,d}}\right]}{a\,\sqrt{b}}$$

Result (type 3, 229 leaves):

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

Problem 683: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 113 leaves, 7 steps):

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

Result (type 3, 281 leaves):

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

$$\left.\sqrt{b}\,\sqrt{b\,c-a\,d}\,\mathrm{Log}\left[\frac{2\,a^2\left(\sqrt{b}\,c-\mathrm{i}\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{\sqrt{b}\,(b\,c-a\,d)^{3/2}\left(\mathrm{i}\,\sqrt{a}+\sqrt{b}\,x\right)}\right]+\sqrt{b}\,\sqrt{b\,c-a\,d}\,\mathrm{Log}\left[\frac{2\,a^2\left(\sqrt{b}\,c+\mathrm{i}\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{\sqrt{b}\,(b\,c-a\,d)^{3/2}\left(-\mathrm{i}\,\sqrt{a}+\sqrt{b}\,x\right)}\right]\right)$$

Problem 690: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 96 leaves, 7 steps):

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

Result (type 3, 271 leaves):

$$\frac{1}{2\,a\,b^{3/2}}\left(2\,a\,\sqrt{b}\,d\,\sqrt{c+d\,x^2}+2\,b^{3/2}\,c^{3/2}\,\mathrm{Log}[x]-2\,b^{3/2}\,c^{3/2}\,\mathrm{Log}\left[c+\sqrt{c}\,\sqrt{c+d\,x^2}\right]+\right.$$

$$\left.(b\,c-a\,d)^{3/2}\,\mathrm{Log}\left[-\frac{2\,a\,b^{3/2}\left(\sqrt{b}\,c-\mathrm{i}\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{(b\,c-a\,d)^{5/2}\left(\mathrm{i}\,\sqrt{a}+\sqrt{b}\,x\right)}\right]+(b\,c-a\,d)^{3/2}\,\mathrm{Log}\left[-\frac{2\,a\,b^{3/2}\left(\sqrt{b}\,c+\mathrm{i}\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{(b\,c-a\,d)^{5/2}\left(-\mathrm{i}\,\sqrt{a}+\sqrt{b}\,x\right)}\right]\right)$$

Problem 692: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 114 leaves, 7 steps):

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

Result (type 3, 284 leaves):

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

$$\left.\frac{(b c-a d)^{3/2}\,\text{Log}\left[\frac{2 a^2\sqrt{b}\left(\sqrt{b}\,c-\mathrm{i}\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{(b c-a d)^{5/2}\left(\mathrm{i}\sqrt{a}+\sqrt{b}\,x\right)}\right]}{\sqrt{b}}+\frac{(b c-a d)^{3/2}\,\text{Log}\left[\frac{2 a^2\sqrt{b}\left(\sqrt{b}\,c+\mathrm{i}\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{(b c-a d)^{5/2}\left(-\mathrm{i}\sqrt{a}+\sqrt{b}\,x\right)}\right]}{\sqrt{b}}\right)$$

Problem 695: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 144 leaves, 7 steps):

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

Result (type 3, 298 leaves):

$$\frac{1}{210\,b^{9/2}\,d}\left(2\sqrt{b}\,\sqrt{c+d x^2}\,\left(-105 a^3 d^3+15 b^3\left(c+d x^2\right)^3+35 a^2 b d^2\left(7 c+d x^2\right)-7 a b^2 d\left(23 c^2+11 c d x^2+3 d^2 x^4\right)\right)+\right.$$

$$105 a d\,(b c-a d)^{5/2}\,\text{Log}\left[-\frac{2 b^{9/2}\left(\sqrt{b}\,c-\mathrm{i}\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{(b c-a d)^{7/2}\left(\mathrm{i}\,a^{3/2}+a\sqrt{b}\,x\right)}\right]+$$

$$\left.105 a d\,(b c-a d)^{5/2}\,\text{Log}\left[-\frac{2 b^{9/2}\left(\sqrt{b}\,c+\mathrm{i}\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{(b c-a d)^{7/2}\left(-\mathrm{i}\,a^{3/2}+a\sqrt{b}\,x\right)}\right]\right)$$

Problem 697: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 119 leaves, 6 steps):

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

Result (type 3, 268 leaves):

$$\frac{1}{30 b^{7/2}}\left(2 \sqrt{b} \sqrt{c+d x^2} \left(15 a^2 d^2-5 a b d \left(7 c+d x^2\right)+b^2 \left(23 c^2+11 c d x^2+3 d^2 x^4\right)\right)-15 (b c-a d)^{5/2} \text{Log}\left[\frac{2 b^{7/2} \left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{7/2} \left(i \sqrt{a}+\sqrt{b} x\right)}\right]-15 (b c-a d)^{5/2} \text{Log}\left[\frac{2 b^{7/2} \left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{7/2} \left(-i \sqrt{a}+\sqrt{b} x\right)}\right]\right)$$

Problem 699: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 124 leaves, 8 steps):

$$\frac{d (2 b c-a d) \sqrt{c+d x^2}}{b^2}+\frac{d \left(c+d x^2\right)^{3/2}}{3 b}-\frac{c^{5/2} \text{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{a}+\frac{(b c-a d)^{5/2} \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{a b^{5/2}}$$

Result (type 3, 288 leaves):

$$\frac{1}{6 a b^{5/2}}\left(2 a \sqrt{b} d \sqrt{c+d x^2} \left(7 b c-3 a d+b d x^2\right)+6 b^{5/2} c^{5/2} \text{Log}[x]-6 b^{5/2} c^{5/2} \text{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]+3 (b c-a d)^{5/2} \text{Log}\left[-\frac{2 a b^{5/2} \left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{7/2} \left(i \sqrt{a}+\sqrt{b} x\right)}\right]+3 (b c-a d)^{5/2} \text{Log}\left[-\frac{2 a b^{5/2} \left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{7/2} \left(-i \sqrt{a}+\sqrt{b} x\right)}\right]\right)$$

Problem 701: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 144 leaves, 8 steps):

$$\frac{d (b c+2 a d) \sqrt{c+d x^2}}{2 a b}-\frac{c \left(c+d x^2\right)^{3/2}}{2 a x^2}+\frac{c^{3/2} (2 b c-5 a d) \text{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{2 a^2}-\frac{(b c-a d)^{5/2} \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{a^2 b^{3/2}}$$

Result (type 3, 311 leaves) :

$$\frac{1}{2}\left(2\left(\frac{d^2}{b}-\frac{c^2}{2\,a\,x^2}\right)\sqrt{c+d\,x^2}+\frac{c^{3/2}\,\left(-2\,b\,c+5\,a\,d\right)\,\text{Log}[x]}{a^2}+\frac{c^{3/2}\,\left(2\,b\,c-5\,a\,d\right)\,\text{Log}\left[c+\sqrt{c}\,\sqrt{c+d\,x^2}\right]}{a^2}-\frac{\left(b\,c-a\,d\right)^{5/2}\,\text{Log}\left[\frac{2\,a^2\,b^{3/2}\,\left(\sqrt{b}\,c-i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{(b\,c-a\,d)^{7/2}\,\left(i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]}{a^2\,b^{3/2}}-\frac{\left(b\,c-a\,d\right)^{5/2}\,\text{Log}\left[\frac{2\,a^2\,b^{3/2}\,\left(\sqrt{b}\,c+i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{(b\,c-a\,d)^{7/2}\,\left(-i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]}{a^2\,b^{3/2}}\right)$$

Problem 706: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 80 leaves, 6 steps) :

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{c+d\,x^2}}{\sqrt{c}}\right]}{a\,\sqrt{c}}+\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{c+d\,x^2}}{\sqrt{b\,c-a\,d}}\right]}{a\,\sqrt{b\,c-a\,d}}$$

Result (type 3, 229 leaves) :

$$\frac{\frac{2\,\text{Log}[x]}{\sqrt{c}}-\frac{2\,\text{Log}\left[c+\sqrt{c}\,\sqrt{c+d\,x^2}\right]}{\sqrt{c}}+\frac{\sqrt{b}\,\left(\text{Log}\left[-\frac{2\,a\,\left(\sqrt{b}\,c-i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{\sqrt{b}\,\sqrt{b\,c-a\,d}\,\left(i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]+\text{Log}\left[-\frac{2\,a\,\left(\sqrt{b}\,c+i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{\sqrt{b}\,\sqrt{b\,c-a\,d}\,\left(-i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]\right)}{\sqrt{b\,c-a\,d}}}{2\,a}$$

Problem 707: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 115 leaves, 7 steps) :

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

Result (type 3, 292 leaves):

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

Problem 718: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 107 leaves, 7 steps):

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

Result (type 3, 316 leaves):

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

Problem 720: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 156 leaves, 8 steps):

$$-\frac{d\,(b\,c-3\,a\,d)}{2\,a\,c^2\,(b\,c-a\,d)\,\sqrt{c+d\,x^2}}-\frac{1}{2\,a\,c\,x^2\,\sqrt{c+d\,x^2}}+\frac{(2\,b\,c+3\,a\,d)\,\text{ArcTanh}\left[\frac{\sqrt{c+d\,x^2}}{\sqrt{c}}\right]}{2\,a^2\,c^{5/2}}-\frac{b^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{c+d\,x^2}}{\sqrt{b\,c-a\,d}}\right]}{a^2\,(b\,c-a\,d)^{3/2}}$$

Result (type 3, 355 leaves):

$$\frac{1}{2}\left(\frac{\frac{2\,d^2}{b\,c-a\,d}-\frac{d+\frac{c}{x^2}}{a}}{c^2\,\sqrt{c+d\,x^2}}-\frac{(2\,b\,c+3\,a\,d)\,\text{Log}[x]}{a^2\,c^{5/2}}+\frac{(2\,b\,c+3\,a\,d)\,\text{Log}\left[c+\sqrt{c}\,\sqrt{c+d\,x^2}\right]}{a^2\,c^{5/2}}-\right.$$
$$\left.\frac{b^{5/2}\,\text{Log}\left[\frac{2\,a^2\,\left(\sqrt{b}\,c\,\sqrt{b\,c-a\,d}-i\,\sqrt{a}\,d\,\sqrt{b\,c-a\,d}\,x+b\,c\,\sqrt{c+d\,x^2}-a\,d\,\sqrt{c+d\,x^2}\right)}{b^{5/2}\,\left(i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]}{a^2\,(b\,c-a\,d)^{3/2}}-\frac{b^{5/2}\,\text{Log}\left[\frac{2\,a^2\,\left(\sqrt{b}\,c\,\sqrt{b\,c-a\,d}+i\,\sqrt{a}\,d\,\sqrt{b\,c-a\,d}\,x+b\,c\,\sqrt{c+d\,x^2}-a\,d\,\sqrt{c+d\,x^2}\right)}{b^{5/2}\,\left(-i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]}{a^2\,(b\,c-a\,d)^{3/2}}\right)$$

Problem 727: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 145 leaves, 8 steps):

$$-\frac{d}{3\,c\,(b\,c-a\,d)\,(c+d\,x^2)^{3/2}}-\frac{d\,(2\,b\,c-a\,d)}{c^2\,(b\,c-a\,d)^2\,\sqrt{c+d\,x^2}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{c+d\,x^2}}{\sqrt{c}}\right]}{a\,c^{5/2}}+\frac{b^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{c+d\,x^2}}{\sqrt{b\,c-a\,d}}\right]}{a\,(b\,c-a\,d)^{5/2}}$$

Result (type 3, 365 leaves):

$$\frac{1}{6}\left(\frac{2\,d}{c\,(-b\,c+a\,d)\,(c+d\,x^2)^{3/2}}+\frac{6\,d\,(-2\,b\,c+a\,d)}{c^2\,(b\,c-a\,d)^2\,\sqrt{c+d\,x^2}}+\frac{6\,\text{Log}[x]}{a\,c^{5/2}}-\frac{6\,\text{Log}\left[c+\sqrt{c}\,\sqrt{c+d\,x^2}\right]}{a\,c^{5/2}}+\right.$$
$$\left.\frac{3\,b^{5/2}\,\text{Log}\left[-\frac{2\,a\,(b\,c-a\,d)\,\left(\sqrt{b}\,c\,\sqrt{b\,c-a\,d}-i\,\sqrt{a}\,d\,\sqrt{b\,c-a\,d}\,x+b\,c\,\sqrt{c+d\,x^2}-a\,d\,\sqrt{c+d\,x^2}\right)}{i\,\sqrt{a}\,b^{5/2}+b^3\,x}\right]}{a\,(b\,c-a\,d)^{5/2}}+\frac{3\,b^{5/2}\,\text{Log}\left[-\frac{2\,a\,(b\,c-a\,d)\,\left(\sqrt{b}\,c\,\sqrt{b\,c-a\,d}+i\,\sqrt{a}\,d\,\sqrt{b\,c-a\,d}\,x+b\,c\,\sqrt{c+d\,x^2}-a\,d\,\sqrt{c+d\,x^2}\right)}{-i\,\sqrt{a}\,b^{5/2}+b^3\,x}\right]}{a\,(b\,c-a\,d)^{5/2}}\right)$$

Problem 729: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 211 leaves, 9 steps):

$$-\frac{d (3 b c-5 a d)}{6 a c^2 (b c-a d) \left(c+d x^2\right)^{3/2}}-\frac{1}{2 a c x^2 \left(c+d x^2\right)^{3/2}}-\frac{d \left(b^2 c^2-8 a b c d+5 a^2 d^2\right)}{2 a c^3 (b c-a d)^2 \sqrt{c+d x^2}}+\frac{(2 b c+5 a d) \operatorname{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{2 a^2 c^{7/2}}-\frac{b^{7/2} \operatorname{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{a^2 (b c-a d)^{5/2}}$$

Result (type 3, 409 leaves):

$$\frac{1}{2} \left(\frac{\sqrt{c+d x^2} \left(-\frac{3}{a x^2}+\frac{2 c d^2}{(b c-a d) \left(c+d x^2\right)^2}+\frac{6 d^2 (3 b c-2 a d)}{(b c-a d)^2 \left(c+d x^2\right)}\right)}{3 c^3}-\frac{(2 b c+5 a d) \operatorname{Log}[x]}{a^2 c^{7/2}}+\frac{(2 b c+5 a d) \operatorname{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]}{a^2 c^{7/2}}-\right.$$

$$\left.\frac{b^{7/2} \operatorname{Log}\left[\frac{2 a^2 (b c-a d) \left(\sqrt{b} c \sqrt{b c-a d}-i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{i \sqrt{a} b^{7/2}+b^4 x}\right]}{a^2 (b c-a d)^{5/2}}-\frac{b^{7/2} \operatorname{Log}\left[\frac{2 a^2 (b c-a d) \left(\sqrt{b} c \sqrt{b c-a d}+i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{-i \sqrt{a} b^{7/2}+b^4 x}\right]}{a^2 (b c-a d)^{5/2}}\right)$$

Problem 736: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 119 leaves, 7 steps):

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

Result (type 3, 313 leaves):

$$\frac{1}{4 a^2}\left(\frac{2 a \sqrt{c+d x^2}}{a+b x^2}+4 \sqrt{c} \operatorname{Log}[x]-4 \sqrt{c} \operatorname{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]+\right.$$

$$\left.\frac{(2 b c-a d) \operatorname{Log}\left[-\frac{4 a^2 \sqrt{b}\left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\sqrt{b c-a d}(2 b c-a d)\left(i \sqrt{a}+\sqrt{b} x\right)}\right]}{\sqrt{b} \sqrt{b c-a d}}+\frac{(2 b c-a d) \operatorname{Log}\left[-\frac{4 a^2 \sqrt{b}\left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\sqrt{b c-a d}(2 b c-a d)\left(-i \sqrt{a}+\sqrt{b} x\right)}\right]}{\sqrt{b} \sqrt{b c-a d}}\right)$$

Problem 738: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 159 leaves, 8 steps):

$$-\frac{b \sqrt{c+d x^2}}{a^2\left(a+b x^2\right)}-\frac{\sqrt{c+d x^2}}{2 a x^2\left(a+b x^2\right)}+\frac{(4 b c-a d) \operatorname{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{2 a^3 \sqrt{c}}-\frac{\sqrt{b}(4 b c-3 a d) \operatorname{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^3 \sqrt{b c-a d}}$$

Result (type 3, 343 leaves):

$$-\frac{1}{4 a^3}\left(\frac{2 a\left(a+2 b x^2\right) \sqrt{c+d x^2}}{x^2\left(a+b x^2\right)}+\frac{2(4 b c-a d) \operatorname{Log}[x]}{\sqrt{c}}-\frac{2(4 b c-a d) \operatorname{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]}{\sqrt{c}}+\right.$$

$$\left.\frac{\sqrt{b}(4 b c-3 a d) \operatorname{Log}\left[\frac{4 a^3\left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\sqrt{b}(4 b c-3 a d) \sqrt{b c-a d}\left(i \sqrt{a}+\sqrt{b} x\right)}\right]}{\sqrt{b c-a d}}+\frac{\sqrt{b}(4 b c-3 a d) \operatorname{Log}\left[\frac{4 i a^3\left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\sqrt{b}(4 b c-3 a d) \sqrt{b c-a d}\left(\sqrt{a}+i \sqrt{b} x\right)}\right]}{\sqrt{b c-a d}}\right)$$

Problem 745: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 129 leaves, 7 steps):

$$\frac{(b c-a d) \sqrt{c+d x^2}}{2 a b \left(a+b x^2\right)}-\frac{c^{3/2} \text{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{a^2}+\frac{\sqrt{b c-a d} (2 b c+a d) \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^2 b^{3/2}}$$

Result (type 3, 381 leaves):

$$\frac{1}{4 a^2}\left(\frac{2 a (b c-a d) \sqrt{c+d x^2}}{b \left(a+b x^2\right)}+4 c^{3/2} \text{Log}[x]-4 c^{3/2} \text{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]+\right.$$

$$\left.\frac{\left(2 b^2 c^2-a b c d-a^2 d^2\right) \text{Log}\left[-\frac{4 a^2 b^{3/2} \left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\sqrt{b c-a d} \left(2 b^2 c^2-a b c d-a^2 d^2\right) \left(i \sqrt{a}+\sqrt{b} x\right)}\right]}{b^{3/2} \sqrt{b c-a d}}+\frac{\left(2 b^2 c^2-a b c d-a^2 d^2\right) \text{Log}\left[-\frac{4 i a^2 b^{3/2} \left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\sqrt{b c-a d} \left(2 b^2 c^2-a b c d-a^2 d^2\right) \left(\sqrt{a}+i \sqrt{b} x\right)}\right]}{b^{3/2} \sqrt{b c-a d}}\right)$$

Problem 747: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 170 leaves, 8 steps):

$$-\frac{(2 b c-a d) \sqrt{c+d x^2}}{2 a^2 \left(a+b x^2\right)}-\frac{c \sqrt{c+d x^2}}{2 a x^2 \left(a+b x^2\right)}+\frac{\sqrt{c} (4 b c-3 a d) \text{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{2 a^3}-\frac{\sqrt{b c-a d} (4 b c-a d) \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^3 \sqrt{b}}$$

Result (type 3, 405 leaves):

$$-\frac{1}{4 a^3}\left(\frac{2 a \sqrt{c+d x^2}\,\left(2 b c x^2+a\left(c-d x^2\right)\right)}{x^2\left(a+b x^2\right)}+2\sqrt{c}\,(4 b c-3 a d)\,\mathrm{Log}[x]-2\sqrt{c}\,(4 b c-3 a d)\,\mathrm{Log}\left[c+\sqrt{c}\,\sqrt{c+d x^2}\right]+\right.$$

$$\left.\frac{\left(4 b^2 c^2-5 a b c d+a^2 d^2\right)\mathrm{Log}\left[\frac{4 a^3 \sqrt{b}\left(\sqrt{b}\,c-i\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{\sqrt{b c-a d}\,\left(4 b^2 c^2-5 a b c d+a^2 d^2\right)\left(i\sqrt{a}+\sqrt{b}\,x\right)}\right]}{\sqrt{b}\,\sqrt{b c-a d}}+\frac{\left(4 b^2 c^2-5 a b c d+a^2 d^2\right)\mathrm{Log}\left[\frac{4 i a^3 \sqrt{b}\left(\sqrt{b}\,c+i\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{\sqrt{b c-a d}\,\left(4 b^2 c^2-5 a b c d+a^2 d^2\right)\left(\sqrt{a}+i\sqrt{b}\,x\right)}\right]}{\sqrt{b}\,\sqrt{b c-a d}}\right)$$

Problem 750: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 198 leaves, 7 steps):

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

$$\frac{(2 b c-7 a d)\left(c+d x^2\right)^{5/2}}{10 b^2 (b c-a d)}+\frac{a\left(c+d x^2\right)^{7/2}}{2 b (b c-a d)\left(a+b x^2\right)}-\frac{(2 b c-7 a d)(b c-a d)^{3/2}\,\mathrm{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 b^{9/2}}$$

Result (type 3, 332 leaves):

$$\frac{1}{60 b^{9/2}}\left(2\sqrt{b}\,\sqrt{c+d x^2}\left(46 b^2 c^2-140 a b c d+90 a^2 d^2+2 b d (11 b c-10 a d) x^2+6 b^2 d^2 x^4+\frac{15 a (b c-a d)^2}{a+b x^2}\right)-\right.$$

$$15 (2 b c-7 a d)(b c-a d)^{3/2}\,\mathrm{Log}\left[\frac{4 b^{9/2}\left(\sqrt{b}\,c-i\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{(2 b c-7 a d)(b c-a d)^{5/2}\left(i\sqrt{a}+\sqrt{b}\,x\right)}\right]-$$

$$\left.15 (2 b c-7 a d)(b c-a d)^{3/2}\,\mathrm{Log}\left[\frac{4 b^{9/2}\left(\sqrt{b}\,c+i\sqrt{a}\,d x+\sqrt{b c-a d}\,\sqrt{c+d x^2}\right)}{(2 b c-7 a d)(b c-a d)^{5/2}\left(-i\sqrt{a}+\sqrt{b}\,x\right)}\right]\right)$$

Problem 752: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 126 leaves, 6 steps):

$$\frac{5 d (b c-a d) \sqrt{c+d x^2}}{2 b^3}+\frac{5 d \left(c+d x^2\right)^{3/2}}{6 b^2}-\frac{\left(c+d x^2\right)^{5/2}}{2 b \left(a+b x^2\right)}-\frac{5 d (b c-a d)^{3/2} \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 b^{7/2}}$$

Result (type 3, 289 leaves):

$$\frac{1}{12 b^{7/2}}\left(-\frac{2 \sqrt{b} \sqrt{c+d x^2} \left(3 (b c-a d)^2+2 d (-7 b c+6 a d) \left(a+b x^2\right)-2 b d^2 x^2 \left(a+b x^2\right)\right)}{a+b x^2}-\right.$$
$$\left.15 d (b c-a d)^{3/2} \text{Log}\left[\frac{4 b^{7/2} \left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{5 d (b c-a d)^{5/2} \left(i \sqrt{a}+\sqrt{b} x\right)}\right]-15 d (b c-a d)^{3/2} \text{Log}\left[\frac{4 b^{7/2} \left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{5 d (b c-a d)^{5/2} \left(-i \sqrt{a}+\sqrt{b} x\right)}\right]\right)$$

Problem 754: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 160 leaves, 8 steps):

$$-\frac{d (b c-3 a d) \sqrt{c+d x^2}}{2 a b^2}+\frac{(b c-a d) \left(c+d x^2\right)^{3/2}}{2 a b \left(a+b x^2\right)}-\frac{c^{5/2} \text{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{a^2}+\frac{(b c-a d)^{3/2} (2 b c+3 a d) \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^2 b^{5/2}}$$

Result (type 3, 344 leaves):

$$\frac{1}{4}\left(\frac{2\sqrt{c+d x^2}\left(2 d^2+\frac{(b c-a d)^2}{a\left(a+b x^2\right)}\right)}{b^2}+\frac{4 c^{5/2} \operatorname{Log}[x]}{a^2}-\frac{4 c^{5/2} \operatorname{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]}{a^2}+\right.$$

$$\left.\frac{(b c-a d)^{3/2}(2 b c+3 a d) \operatorname{Log}\left[-\frac{4 a^2 b^{5/2}\left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{5/2}(2 b c+3 a d)\left(i \sqrt{a}+\sqrt{b} x\right)}\right]}{a^2 b^{5/2}}+\frac{(b c-a d)^{3/2}(2 b c+3 a d) \operatorname{Log}\left[-\frac{4 a^2 b^{5/2}\left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{5/2}(2 b c+3 a d)\left(-i \sqrt{a}+\sqrt{b} x\right)}\right]}{a^2 b^{5/2}}\right)$$

Problem 756: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 180 leaves, 8 steps):

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

Result (type 3, 349 leaves):

$$-\frac{1}{4 a^3}\left(2 a \sqrt{c+d x^2}\left(\frac{c^2}{x^2}+\frac{(b c-a d)^2}{b\left(a+b x^2\right)}\right)+2 c^{3/2}(4 b c-5 a d) \operatorname{Log}[x]-2 c^{3/2}(4 b c-5 a d) \operatorname{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]+\right.$$

$$\left.\frac{(b c-a d)^{3/2}(4 b c+a d) \operatorname{Log}\left[\frac{4 a^3 b^{3/2}\left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{5/2}(4 b c+a d)\left(i \sqrt{a}+\sqrt{b} x\right)}\right]}{b^{3/2}}+\frac{(b c-a d)^{3/2}(4 b c+a d) \operatorname{Log}\left[\frac{4 a^3 b^{3/2}\left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{(b c-a d)^{5/2}(4 b c+a d)\left(-i \sqrt{a}+\sqrt{b} x\right)}\right]}{b^{3/2}}\right)$$

Problem 763: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 130 leaves, 7 steps):

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

Result (type 3, 360 leaves):

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

Problem 765: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 185 leaves, 8 steps):

$$-\frac{b\,(2\,b\,c-a\,d)\,\sqrt{c+d\,x^2}}{2\,a^2\,c\,(b\,c-a\,d)\,(a+b\,x^2)}-\frac{\sqrt{c+d\,x^2}}{2\,a\,c\,x^2\,(a+b\,x^2)}+\frac{(4\,b\,c+a\,d)\,\text{ArcTanh}\left[\frac{\sqrt{c+d\,x^2}}{\sqrt{c}}\right]}{2\,a^3\,c^{3/2}}-\frac{b^{3/2}\,(4\,b\,c-5\,a\,d)\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{c+d\,x^2}}{\sqrt{b\,c-a\,d}}\right]}{2\,a^3\,(b\,c-a\,d)^{3/2}}$$

Result (type 3, 387 leaves):

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

$$\frac{2\,(4 b c+a d)\,\mathrm{Log}\left[c+\sqrt{c}\,\sqrt{c+d x^2}\right]}{c^{3/2}}+\frac{b^{3/2}\,(4 b c-5 a d)\,\mathrm{Log}\left[\frac{4 a^3\left(\sqrt{b}\,c\,\sqrt{b c-a d}-i\sqrt{a}\,d\sqrt{b c-a d}\,x+b c\sqrt{c+d x^2}-a d\sqrt{c+d x^2}\right)}{b^{3/2}\,(4 b c-5 a d)\,\left(i\sqrt{a}+\sqrt{b}\,x\right)}\right]}{(b c-a d)^{3/2}}+$$

$$\left.\frac{b^{3/2}\,(4 b c-5 a d)\,\mathrm{Log}\left[\frac{4 i a^3\left(\sqrt{b}\,c\,\sqrt{b c-a d}+i\sqrt{a}\,d\sqrt{b c-a d}\,x+b c\sqrt{c+d x^2}-a d\sqrt{c+d x^2}\right)}{b^{3/2}\,(4 b c-5 a d)\,\left(\sqrt{a}+i\sqrt{b}\,x\right)}\right]}{(b c-a d)^{3/2}}\right)$$

Problem 772: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 170 leaves, 8 steps):

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

Result (type 3, 406 leaves):

$$\frac{1}{4}\left(\frac{2\sqrt{c+d x^2}\left(\frac{b^2}{a^2+a b x^2}+\frac{2 d^2}{c^2+c d x^2}\right)}{(b c-a d)^2}+\frac{4 \operatorname{Log}[x]}{a^2 c^{3/2}}-\frac{4 \operatorname{Log}\left[c+\sqrt{c}\sqrt{c+d x^2}\right]}{a^2 c^{3/2}}+\right.$$

$$\frac{b^{3/2}(2 b c-5 a d) \operatorname{Log}\left[-\frac{4 a^2 (b c-a d)\left(\sqrt{b}\, c \sqrt{b c-a d}-i \sqrt{a}\, d \sqrt{b c-a d}\, x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{b^{3/2}(2 b c-5 a d)\left(i \sqrt{a}+\sqrt{b}\, x\right)}\right]}{a^2 (b c-a d)^{5/2}}+$$

$$\left.\frac{b^{3/2}(2 b c-5 a d) \operatorname{Log}\left[-\frac{4 a^2 (b c-a d)\left(\sqrt{b}\, c \sqrt{b c-a d}+i \sqrt{a}\, d \sqrt{b c-a d}\, x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{b^{3/2}(2 b c-5 a d)\left(-i \sqrt{a}+\sqrt{b}\, x\right)}\right]}{a^2 (b c-a d)^{5/2}}\right)$$

Problem 774: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 241 leaves, 9 steps):

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

$$\frac{1}{2 a c x^2\left(a+b x^2\right)\sqrt{c+d x^2}}+\frac{(4 b c+3 a d) \operatorname{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{2 a^3 c^{5/2}}-\frac{b^{5/2}(4 b c-7 a d) \operatorname{ArcTanh}\left[\frac{\sqrt{b}\sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^3 (b c-a d)^{5/2}}$$

Result (type 3, 451 leaves):

$$\frac{1}{4}\left(4\sqrt{c+d x^2}\left(-\frac{d^3}{c^2 (b c-a d)^2 (c+d x^2)}+\frac{-\frac{1}{2 c^2 x^2}-\frac{b^3}{2 (b c-a d)^2 (a+b x^2)}}{a^2}\right)-\frac{2 (4 b c+3 a d) \text{Log}[x]}{a^3 c^{5/2}}+\right.$$

$$\frac{2 (4 b c+3 a d) \text{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]}{a^3 c^{5/2}}-\frac{b^{5/2} (4 b c-7 a d) \text{Log}\left[\frac{4 a^3 (b c-a d) \left(\sqrt{b} c \sqrt{b c-a d}-i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{b^{5/2} (4 b c-7 a d) \left(i \sqrt{a}+\sqrt{b} x\right)}\right]}{a^3 (b c-a d)^{5/2}}-$$

$$\left.\frac{b^{5/2} (4 b c-7 a d) \text{Log}\left[\frac{4 a^3 (b c-a d) \left(\sqrt{b} c \sqrt{b c-a d}+i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{b^{5/2} (4 b c-7 a d) \left(-i \sqrt{a}+\sqrt{b} x\right)}\right]}{a^3 (b c-a d)^{5/2}}\right)$$

Problem 781: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 225 leaves, 9 steps):

$$\frac{d (3 b c+2 a d)}{6 a c (b c-a d)^2 (c+d x^2)^{3/2}}+\frac{b}{2 a (b c-a d) (a+b x^2) (c+d x^2)^{3/2}}+$$

$$\frac{d (b^2 c^2+6 a b c d-2 a^2 d^2)}{2 a c^2 (b c-a d)^3 \sqrt{c+d x^2}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{a^2 c^{5/2}}+\frac{b^{5/2} (2 b c-7 a d) \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^2 (b c-a d)^{7/2}}$$

Result (type 3, 461 leaves):

$$\sqrt{c+d x^2}\left(-\frac{b^3}{2 a (-b c+a d)^3 (a+b x^2)}+\frac{d^2}{3 c (b c-a d)^2 (c+d x^2)^2}+\frac{d^2 (3 b c-a d)}{c^2 (b c-a d)^3 (c+d x^2)}\right)+\frac{\text{Log}[x]}{a^2 c^{5/2}}-$$

$$\frac{\text{Log}\left[c+\sqrt{c}\sqrt{c+d x^2}\right]}{a^2 c^{5/2}}+\frac{b^{5/2}(2 b c-7 a d)\,\text{Log}\left[-\frac{4 a^2 (b c-a d)^2\left(\sqrt{b}\, c\sqrt{b c-a d}+i\sqrt{a}\, d\sqrt{b c-a d}\, x+b c\sqrt{c+d x^2}-a d\sqrt{c+d x^2}\right)}{b^{5/2}(2 b c-7 a d)\left(-i\sqrt{a}+\sqrt{b}\, x\right)}\right]}{4 a^2 (b c-a d)^{7/2}}+$$

$$\frac{b^{5/2}(2 b c-7 a d)\,\text{Log}\left[\frac{4 a^2 (b c-a d)^2\left(-\sqrt{b}\, c\sqrt{b c-a d}+i\sqrt{a}\, d\sqrt{b c-a d}\, x-b c\sqrt{c+d x^2}+a d\sqrt{c+d x^2}\right)}{b^{5/2}(2 b c-7 a d)\left(i\sqrt{a}+\sqrt{b}\, x\right)}\right]}{4 a^2 (b c-a d)^{7/2}}$$

Problem 783: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 304 leaves, 10 steps):

$$-\frac{d (6 b^2 c^2-6 a b c d+5 a^2 d^2)}{6 a^2 c^2 (b c-a d)^2 (c+d x^2)^{3/2}}-\frac{b (2 b c-a d)}{2 a^2 c (b c-a d) (a+b x^2) (c+d x^2)^{3/2}}-\frac{1}{2 a c x^2 (a+b x^2) (c+d x^2)^{3/2}}-$$

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

Result (type 3, 489 leaves):

$$\frac{1}{4}\left(\frac{2}{3}\sqrt{c+d x^2}\left(-\frac{3}{a^2 c^3 x^2}+\frac{3 b^4}{a^2 (-b c+a d)^3 (a+b x^2)}-\frac{2 d^3}{c^2 (b c-a d)^2 (c+d x^2)^2}+\frac{12 d^3 (-2 b c+a d)}{c^3 (b c-a d)^3 (c+d x^2)}\right)-\frac{2 (4 b c+5 a d) \operatorname{Log}[x]}{a^3 c^{7/2}}+\right.$$

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

$$\left.\frac{b^{7/2} (4 b c-9 a d) \operatorname{Log}\left[\frac{4 a^3 (b c-a d)^2 \left(\sqrt{b} c \sqrt{b c-a d}+i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{b^{7/2} (4 b c-9 a d) \left(-i \sqrt{a}+\sqrt{b} x\right)}\right]}{a^3 (b c-a d)^{7/2}}\right)$$

Problem 785: Result unnecessarily involves imaginary or complex numbers.

$$\int (e x)^{3/2} \sqrt{a+b x^2} \left(A+B x^2\right) dx$$

Optimal (type 4, 212 leaves, 5 steps):

$$\frac{4 a (11 A b-5 a B) e \sqrt{e x} \sqrt{a+b x^2}}{231 b^2}+\frac{2 (11 A b-5 a B) (e x)^{5/2} \sqrt{a+b x^2}}{77 b e}+$$

$$\frac{2 B (e x)^{5/2} \left(a+b x^2\right)^{3/2}}{11 b e}-\frac{2 a^{7/4} (11 A b-5 a B) e^{3/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \operatorname{EllipticF}\left[2 \operatorname{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{231 b^{9/4} \sqrt{a+b x^2}}$$

Result (type 4, 159 leaves):

$$\frac{1}{231 b^2 \sqrt{a+b x^2}} 2 e \sqrt{e x}$$

$$\left(-\left(a+b x^2\right) \left(10 a^2 B-2 a b \left(11 A+3 B x^2\right)-3 b^2 x^2 \left(11 A+7 B x^2\right)\right)+\frac{2 i a^2 (-11 A b+5 a B) \sqrt{1+\frac{a}{b x^2}} \sqrt{x} \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}\right)$$

Problem 786: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{e\,x}\,\sqrt{a+b\,x^2}\,\left(A+B\,x^2\right)\,dx$$

Optimal (type 4, 337 leaves, 6 steps):

$$\frac{2\,(3\,A\,b-a\,B)\,(e\,x)^{3/2}\,\sqrt{a+b\,x^2}}{15\,b\,e}+\frac{4\,a\,(3\,A\,b-a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{15\,b^{3/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+\frac{2\,B\,(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{3/2}}{9\,b\,e}-$$
$$\frac{4\,a^{5/4}\,(3\,A\,b-a\,B)\,\sqrt{e}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{15\,b^{7/4}\,\sqrt{a+b\,x^2}}+$$
$$\frac{2\,a^{5/4}\,(3\,A\,b-a\,B)\,\sqrt{e}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{15\,b^{7/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 234 leaves):

$$\frac{1}{45\,b^2\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}2\,e\left(b\,x^2\,\left(a+b\,x^2\right)\,\left(9\,A\,b+2\,a\,B+5\,b\,B\,x^2\right)-\frac{1}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}6\,a\,(-3\,A\,b+a\,B)\left(\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(a+b\,x^2\right)-\right.\right.$$
$$\left.\left.\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]+\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 787: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+b\,x^2}\,\left(A+B\,x^2\right)}{\sqrt{e\,x}}\,dx$$

Optimal (type 4, 176 leaves, 4 steps):

$$\frac{2\,(7\,A\,b-a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{21\,b\,e}+\frac{2\,B\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{3/2}}{7\,b\,e}+\frac{2\,a^{3/4}\,(7\,A\,b-a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{21\,b^{5/4}\,\sqrt{e}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 132 leaves) :

$$\frac{2\,x\,\left(\left(a+b\,x^2\right)\,\left(7\,A\,b+2\,a\,B+3\,b\,B\,x^2\right)-\frac{2\,i\,a\,(-7\,A\,b+a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}\right)}{21\,b\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}$$

Problem 788: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 333 leaves, 6 steps) :

$$\frac{2\,(5\,A\,b+a\,B)\,(e\,x)^{3/2}\,\sqrt{a+b\,x^2}}{5\,a\,e^3}+\frac{4\,(5\,A\,b+a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{5\,\sqrt{b}\,e^2\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-$$

$$\frac{2\,A\,\left(a+b\,x^2\right)^{3/2}}{a\,e\,\sqrt{e\,x}}-\frac{4\,a^{1/4}\,(5\,A\,b+a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{5\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}+$$

$$\frac{2\,a^{1/4}\,(5\,A\,b+a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{5\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 186 leaves) :

$$\frac{1}{5\,(e\,x)^{3/2}}x^{3/2}\left(\frac{2\sqrt{a+b\,x^2}\,\left(-5\,A+B\,x^2\right)}{\sqrt{x}}-\frac{4\,(5\,A\,b+a\,B)\,x\left(-\left(b+\frac{a}{x^2}\right)\sqrt{x}+\frac{i\,a\sqrt{1+\frac{a}{b\,x^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}}\right)}{b\sqrt{a+b\,x^2}}\right)$$

Problem 789: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 172 leaves, 4 steps):

$$\frac{2\,(A\,b+a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{3\,a\,e^3}-\frac{2\,A\,\left(a+b\,x^2\right)^{3/2}}{3\,a\,e\,(e\,x)^{3/2}}+\frac{2\,(A\,b+a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{a^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{3\,a^{1/4}\,b^{1/4}\,e^{5/2}\sqrt{a+b\,x^2}}$$

Result (type 4, 120 leaves):

$$\frac{2\,x\left(\left(a+b\,x^2\right)\left(-A+B\,x^2\right)+\frac{2\,i\,(A\,b+a\,B)\sqrt{1+\frac{a}{b\,x^2}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}\right)}{3\,(e\,x)^{5/2}\sqrt{a+b\,x^2}}$$

Problem 790: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+b\,x^2}\,\left(A+B\,x^2\right)}{(e\,x)^{7/2}}\,dx$$

Optimal (type 4, 338 leaves, 6 steps):

$$-\frac{2\,(A\,b+5\,a\,B)\,\sqrt{a+b\,x^2}}{5\,a\,e^3\,\sqrt{e\,x}}+\frac{4\,\sqrt{b}\,(A\,b+5\,a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{5\,a\,e^4\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{2\,A\,\left(a+b\,x^2\right)^{3/2}}{5\,a\,e\,(e\,x)^{5/2}}-$$
$$\frac{4\,b^{1/4}\,(A\,b+5\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,a^{3/4}\,e^{7/2}\,\sqrt{a+b\,x^2}}+$$
$$\frac{2\,b^{1/4}\,(A\,b+5\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,a^{3/4}\,e^{7/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 217 leaves):

$$\left(x\left(-2\,\sqrt{a}\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(a+b\,x^2\right)\,\left(A-5\,B\,x^2\right)-4\,\sqrt{b}\,(A\,b+5\,a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{7/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]+\right.\right.$$
$$\left.\left.4\,\sqrt{b}\,(A\,b+5\,a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{7/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(5\,\sqrt{a}\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,(e\,x)^{7/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 791: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+b\,x^2}\,\left(A+B\,x^2\right)}{x^{9/2}}\,dx$$

Optimal (type 4, 152 leaves, 4 steps):

$$\frac{2\,(A\,b-7\,a\,B)\,\sqrt{a+b\,x^2}}{21\,a\,x^{3/2}}-\frac{2\,A\,\left(a+b\,x^2\right)^{3/2}}{7\,a\,x^{7/2}}-\frac{2\,b^{3/4}\,(A\,b-7\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{21\,a^{5/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 139 leaves):

$$\left(-\frac{2 A}{7 x^{7/2}}-\frac{2 (2 A b+7 a B)}{21 a x^{3/2}}\right) \sqrt{a+b x^2}+\frac{4 i b (-A b+7 a B) \sqrt{1+\frac{a}{b x^2}}\, x \,\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{21 a \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \sqrt{a+b x^2}}$$

Problem 792: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+b x^2} \left(A+B x^2\right)}{x^{11/2}} \, dx$$

Optimal (type 4, 331 leaves, 7 steps):

$$\frac{2 (A b-3 a B) \sqrt{a+b x^2}}{15 a x^{5/2}}+\frac{4 b (A b-3 a B) \sqrt{a+b x^2}}{15 a^2 \sqrt{x}}-\frac{4 b^{3/2} (A b-3 a B) \sqrt{x} \sqrt{a+b x^2}}{15 a^2 \left(\sqrt{a}+\sqrt{b} x\right)}-$$

$$\frac{2 A \left(a+b x^2\right)^{3/2}}{9 a x^{9/2}}+\frac{4 b^{5/4} (A b-3 a B) \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \,\text{EllipticE}\left[2 \,\text{ArcTan}\left[\frac{b^{1/4} \sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{15 a^{7/4} \sqrt{a+b x^2}}-$$

$$\frac{2 b^{5/4} (A b-3 a B) \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \,\text{EllipticF}\left[2 \,\text{ArcTan}\left[\frac{b^{1/4} \sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{15 a^{7/4} \sqrt{a+b x^2}}$$

Result (type 4, 237 leaves):

$$-\left(\left(2 \left(\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \left(a+b x^2\right) \left(-6 A b^2 x^4+2 a b x^2 \left(A+9 B x^2\right)+a^2 \left(5 A+9 B x^2\right)\right)-\right.\right.\right.$$

$$6 \sqrt{a} b^{3/2} (-A b+3 a B) x^5 \sqrt{1+\frac{b x^2}{a}} \,\text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]+$$

$$\left.\left.\left.6 \sqrt{a} b^{3/2} (-A b+3 a B) x^5 \sqrt{1+\frac{b x^2}{a}} \,\text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right],-1\right]\right)\right) \Big/ \left(45 a^2 x^{9/2} \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \sqrt{a+b x^2}\right)\right)$$

Problem 793: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+b x^2}\,\left(A+B x^2\right)}{x^{13/2}}\,dx$$

Optimal (type 4, 187 leaves, 5 steps):

$$\frac{2\,(5 A b-11 a B)\,\sqrt{a+b x^2}}{77\,a\,x^{7/2}}+\frac{4\,b\,(5 A b-11 a B)\,\sqrt{a+b x^2}}{231\,a^2\,x^{3/2}}-\frac{2\,A\,\left(a+b x^2\right)^{3/2}}{11\,a\,x^{11/2}}+\frac{2\,b^{7/4}\,(5 A b-11 a B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{231\,a^{9/4}\,\sqrt{a+b x^2}}$$

Result (type 4, 163 leaves):

$$\left(-\frac{2\,A}{11\,x^{11/2}}-\frac{2\,(2 A b+11 a B)}{77\,a\,x^{7/2}}-\frac{4\,b\,(-5 A b+11 a B)}{231\,a^2\,x^{3/2}}\right)\sqrt{a+b x^2}-\frac{4\,i\,b^2\,(-5 A b+11 a B)\,\sqrt{1+\frac{a}{b x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{231\,a^2\,\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,\sqrt{a+b x^2}}$$

Problem 794: Result unnecessarily involves imaginary or complex numbers.

$$\int (e x)^{3/2}\,\left(a+b x^2\right)^{3/2}\,\left(A+B x^2\right)\,dx$$

Optimal (type 4, 252 leaves, 6 steps):

$$\frac{8\,a^2\,(3 A b-a B)\,e\,\sqrt{e x}\,\sqrt{a+b x^2}}{231\,b^2}+\frac{4\,a\,(3 A b-a B)\,(e x)^{5/2}\,\sqrt{a+b x^2}}{77\,b\,e}+\frac{2\,(3 A b-a B)\,(e x)^{5/2}\,\left(a+b x^2\right)^{3/2}}{33\,b\,e}+\frac{2\,B\,(e x)^{5/2}\,\left(a+b x^2\right)^{5/2}}{15\,b\,e}-\frac{4\,a^{11/4}\,(3 A b-a B)\,e^{3/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{231\,b^{9/4}\,\sqrt{a+b x^2}}$$

Result (type 4, 178 leaves):

$$\frac{1}{1155\, b^2 \sqrt{a+b x^2}} 2 e \sqrt{e x} \left(-\left(a+b x^2\right) \left(20 a^3 B-12 a^2 b \left(5 A+B x^2\right)-7 b^3 x^4 \left(15 A+11 B x^2\right)-a b^2 x^2 \left(195 A+119 B x^2\right)\right)+\right.$$

$$\left.\frac{20 \, i \, a^3 \left(-3 A b+a B\right) \sqrt{1+\frac{a}{b x^2}} \sqrt{x} \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}\right)$$

Problem 795: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{e x} \left(a+b x^2\right)^{3/2} \left(A+B x^2\right) \, dx$$

Optimal (type 4, 377 leaves, 7 steps):

$$\frac{4 a \left(13 A b-3 a B\right) (e x)^{3/2} \sqrt{a+b x^2}}{195 b e}+\frac{8 a^2 \left(13 A b-3 a B\right) \sqrt{e x} \sqrt{a+b x^2}}{195 b^{3/2} \left(\sqrt{a}+\sqrt{b} x\right)}+\frac{2 \left(13 A b-3 a B\right) (e x)^{3/2} \left(a+b x^2\right)^{3/2}}{117 b e}+$$

$$\frac{2 B (e x)^{3/2} \left(a+b x^2\right)^{5/2}}{13 b e}-\frac{8 a^{9/4} \left(13 A b-3 a B\right) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \, \text{EllipticE}\left[2 \, \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{195 b^{7/4} \sqrt{a+b x^2}}+$$

$$\frac{4 a^{9/4} \left(13 A b-3 a B\right) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \, \text{EllipticF}\left[2 \, \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{195 b^{7/4} \sqrt{a+b x^2}}$$

Result (type 4, 214 leaves):

$$\frac{1}{585\,b^2\sqrt{a+b\,x^2}}2\sqrt{x}\,\sqrt{e\,x}\left(b\sqrt{x}\,\left(a+b\,x^2\right)\left(12\,a^2\,B+5\,b^2\,x^2\,\left(13\,A+9\,B\,x^2\right)+a\,b\,\left(143\,A+75\,B\,x^2\right)\right)+\right.$$

$$\left.12\,a^2\,\left(-13\,A\,b+3\,a\,B\right)\left(-\left(b+\frac{a}{x^2}\right)\sqrt{x}+\frac{i\,a\,\sqrt{1+\frac{a}{b\,x^2}}\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}}\right)\right)$$

Problem 796: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 214 leaves, 5 steps):

$$\frac{4\,a\,\left(11\,A\,b-a\,B\right)\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{77\,b\,e}+\frac{2\,\left(11\,A\,b-a\,B\right)\sqrt{e\,x}\,\left(a+b\,x^2\right)^{3/2}}{77\,b\,e}+$$

$$\frac{2\,B\sqrt{e\,x}\,\left(a+b\,x^2\right)^{5/2}}{11\,b\,e}+\frac{4\,a^{7/4}\,\left(11\,A\,b-a\,B\right)\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{a^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{77\,b^{5/4}\sqrt{e}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 155 leaves):

$$\frac{1}{77\,b\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}$$

$$2\,x\left(\left(a+b\,x^2\right)\left(4\,a^2\,B+b^2\,x^2\,\left(11\,A+7\,B\,x^2\right)+a\,b\,\left(33\,A+13\,B\,x^2\right)\right)-\frac{4\,\mathrm{i}\,a^2\,\left(-11\,A\,b+a\,B\right)\,\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}\right)$$

Problem 797: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 367 leaves, 7 steps):

$$\frac{4\,\left(9\,A\,b+a\,B\right)\,\left(e\,x\right)^{3/2}\,\sqrt{a+b\,x^2}}{15\,e^3}+\frac{8\,a\,\left(9\,A\,b+a\,B\right)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{15\,\sqrt{b}\,e^2\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+\frac{2\,\left(9\,A\,b+a\,B\right)\,\left(e\,x\right)^{3/2}\,\left(a+b\,x^2\right)^{3/2}}{9\,a\,e^3}-$$

$$\frac{2\,A\,\left(a+b\,x^2\right)^{5/2}}{a\,e\,\sqrt{e\,x}}-\frac{8\,a^{5/4}\,\left(9\,A\,b+a\,B\right)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{15\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}+$$

$$\frac{4\,a^{5/4}\,\left(9\,A\,b+a\,B\right)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{15\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 206 leaves):

$$\frac{1}{15\,(e\,x)^{3/2}}x^{3/2}\left(\frac{2\sqrt{a+b\,x^2}\,\left(-45\,a\,A+9\,A\,b\,x^2+11\,a\,B\,x^2+5\,b\,B\,x^4\right)}{3\sqrt{x}}-\frac{8\,a\,(9\,A\,b+a\,B)\,x\left(-\left(b+\frac{a}{x^2}\right)\sqrt{x}+\frac{i\,a\sqrt{1+\frac{a}{b\,x^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{i\sqrt{a}}{\sqrt{b}}\right)^{3/2}}\right)}{b\sqrt{a+b\,x^2}}\right)$$

Problem 798: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b\,x^2\right)^{3/2}\left(A+B\,x^2\right)}{(e\,x)^{5/2}}\,dx$$

Optimal (type 4, 210 leaves, 5 steps) :

$$\frac{4\,(7\,A\,b+3\,a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{21\,e^3}+\frac{2\,(7\,A\,b+3\,a\,B)\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{3/2}}{21\,a\,e^3}-$$

$$\frac{2\,A\,\left(a+b\,x^2\right)^{5/2}}{3\,a\,e\,(e\,x)^{3/2}}+\frac{4\,a^{3/4}\,(7\,A\,b+3\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{21\,b^{1/4}\,e^{5/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 140 leaves):

$$\frac{2\,x\,\left(\left(a+b\,x^2\right)\,\left(-7\,a\,A+7\,A\,b\,x^2+9\,a\,B\,x^2+3\,b\,B\,x^4\right)+\frac{4\,i\,a\,(7\,A\,b+3\,a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}\right)}{21\,(e\,x)^{5/2}\,\sqrt{a+b\,x^2}}$$

Problem 799: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b\,x^2\right)^{3/2}\,\left(A+B\,x^2\right)}{(e\,x)^{7/2}}\,dx$$

Optimal (type 4, 365 leaves, 7 steps):

$$\frac{12\,b\,(A\,b+a\,B)\,(e\,x)^{3/2}\,\sqrt{a+b\,x^2}}{5\,a\,e^5}+\frac{24\,\sqrt{b}\,(A\,b+a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{5\,e^4\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{2\,(A\,b+a\,B)\,\left(a+b\,x^2\right)^{3/2}}{a\,e^3\,\sqrt{e\,x}}-$$

$$\frac{2\,A\,\left(a+b\,x^2\right)^{5/2}}{5\,a\,e\,(e\,x)^{5/2}}-\frac{24\,a^{1/4}\,b^{1/4}\,(A\,b+a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,e^{7/2}\,\sqrt{a+b\,x^2}}+$$

$$\frac{12\,a^{1/4}\,b^{1/4}\,(A\,b+a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,e^{7/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 232 leaves):

$$\left(x\left(2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(a+b x^2\right)\left(-a A+5 A b x^2+7 a B x^2+b B x^4\right)-24\sqrt{a}\sqrt{b}\left(A b+a B\right)\sqrt{1+\frac{a}{b x^2}}\,x^{7/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]+\right.\right.$$

$$\left.\left.24\sqrt{a}\sqrt{b}\left(A b+a B\right)\sqrt{1+\frac{a}{b x^2}}\,x^{7/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(5\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,(e x)^{7/2}\sqrt{a+b x^2}\right)$$

Problem 800: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 338 leaves, 6 steps):

$$\frac{2\left(9 A b-7 a B\right) e\,(e x)^{3/2}\sqrt{a+b x^2}}{45 b^2}+\frac{2 B\,(e x)^{7/2}\sqrt{a+b x^2}}{9 b e}-\frac{2 a\left(9 A b-7 a B\right) e^2\sqrt{e x}\sqrt{a+b x^2}}{15 b^{5/2}\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$

$$\frac{2 a^{5/4}\left(9 A b-7 a B\right) e^{5/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e x}}{a^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15 b^{11/4}\sqrt{a+b x^2}}-$$

$$\frac{a^{5/4}\left(9 A b-7 a B\right) e^{5/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e x}}{a^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15 b^{11/4}\sqrt{a+b x^2}}$$

Result (type 4, 237 leaves):

$$\frac{1}{45\, b^3\, x^3\, \sqrt{a+b\, x^2}} 2\, (e\, x)^{5/2} \left(b\, x^2\, (a+b\, x^2)\, (9\, A\, b-7\, a\, B+5\, b\, B\, x^2) + \frac{1}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}} 3\, a\, (-9\, A\, b+7\, a\, B) \left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\, (a+b\, x^2) - \sqrt{a}\, \sqrt{b}\, \sqrt{1+\frac{a}{b\, x^2}}\, x^{3/2}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right] + \sqrt{a}\, \sqrt{b}\, \sqrt{1+\frac{a}{b\, x^2}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]\right)\right)$$

Problem 801: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(e\, x)^{3/2}\, (A+B\, x^2)}{\sqrt{a+b\, x^2}}\, dx$$

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

$$\frac{2\, (7\, A\, b-5\, a\, B)\, e\, \sqrt{e\, x}\, \sqrt{a+b\, x^2}}{21\, b^2} + \frac{2\, B\, (e\, x)^{5/2}\, \sqrt{a+b\, x^2}}{7\, b\, e} - \frac{a^{3/4}\, (7\, A\, b-5\, a\, B)\, e^{3/2}\, (\sqrt{a}+\sqrt{b}\, x)\, \sqrt{\frac{a+b\, x^2}{(\sqrt{a}+\sqrt{b}\, x)^2}}\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{b^{1/4}\, \sqrt{e\, x}}{a^{1/4}\, \sqrt{e}}\right], \frac{1}{2}\right]}{21\, b^{9/4}\, \sqrt{a+b\, x^2}}$$

Result (type 4, 134 leaves):

$$\frac{2\, e\, \sqrt{e\, x} \left(-(a+b\, x^2)\, (-7\, A\, b+5\, a\, B-3\, b\, B\, x^2) + \frac{i\, a\, (-7\, A\, b+5\, a\, B)\, \sqrt{1+\frac{a}{b\, x^2}}\, \sqrt{x}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}\right)}{21\, b^2\, \sqrt{a+b\, x^2}}$$

Problem 802: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{e\, x}\, (A+B\, x^2)}{\sqrt{a+b\, x^2}}\, dx$$

Optimal (type 4, 299 leaves, 5 steps):

$$\frac{2 B (e x)^{3/2} \sqrt{a+b x^2}}{5 b e}+\frac{2 (5 A b-3 a B) \sqrt{e x} \sqrt{a+b x^2}}{5 b^{3/2} \left(\sqrt{a}+\sqrt{b} x\right)}-\frac{2 a^{1/4} (5 A b-3 a B) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{5 b^{7/4} \sqrt{a+b x^2}}+$$

$$\frac{a^{1/4} (5 A b-3 a B) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{5 b^{7/4} \sqrt{a+b x^2}}$$

Result (type 4, 181 leaves):

$$\frac{1}{5 b \sqrt{x}} 2 \sqrt{e x} \left(B x^{3/2} \sqrt{a+b x^2}-\frac{(5 A b-3 a B) x \left(-\left(b+\frac{a}{x^2}\right) \sqrt{x}+\frac{i a \sqrt{1+\frac{a}{b x^2}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{i \sqrt{a}}{\sqrt{b}}\right)^{3/2}}\right)}{b \sqrt{a+b x^2}}\right)$$

Problem 803: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{A+B x^2}{\sqrt{e x} \sqrt{a+b x^2}} \, dx$$

Optimal (type 4, 139 leaves, 3 steps):

$$\frac{2 B \sqrt{e x} \sqrt{a+b x^2}}{3 b e}+\frac{(3 A b-a B) \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{3 a^{1/4} b^{5/4} \sqrt{e} \sqrt{a+b x^2}}$$

Result (type 4, 116 leaves):

$$\frac{2\,x\left(B\left(a+b\,x^2\right)-\frac{i\,(-3\,A\,b+a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}\right)}{3\,b\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}$$

Problem 804: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{(e\,x)^{3/2}\,\sqrt{a+b\,x^2}}\,dx$$

Optimal (type 4, 290 leaves, 5 steps):

$$-\frac{2\,A\,\sqrt{a+b\,x^2}}{a\,e\,\sqrt{e\,x}}+\frac{2\,(A\,b+a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{a\,\sqrt{b}\,e^2\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{2\,(A\,b+a\,B)\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{a^{3/4}\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}+$$

$$\frac{(A\,b+a\,B)\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{a^{3/4}\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 193 leaves):

$$\left(x\left(2\,\sqrt{a}\,(A\,b+a\,B)\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-\right.\right.$$

$$\left.\left.2\left(A\,\sqrt{b}\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(a+b\,x^2\right)+\sqrt{a}\,(A\,b+a\,B)\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\right)\Big/\left(a\right.$$

$$\left.\sqrt{b}\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,(e\,x)^{3/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 805: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{(e\,x)^{5/2}\,\sqrt{a+b\,x^2}}\,dx$$

Optimal (type 4, 138 leaves, 3 steps):

$$-\frac{2\,A\,\sqrt{a+b\,x^2}}{3\,a\,e\,(e\,x)^{3/2}}-\frac{(A\,b-3\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{3\,a^{5/4}\,b^{1/4}\,e^{5/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 118 leaves):

$$\frac{2\,x\,\left(-A\,\left(a+b\,x^2\right)+\frac{i\,(-A\,b+3\,a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}\right)}{3\,a\,(e\,x)^{5/2}\,\sqrt{a+b\,x^2}}$$

Problem 806: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{(e\,x)^{7/2}\,\sqrt{a+b\,x^2}}\,dx$$

Optimal (type 4, 342 leaves, 6 steps):

$$-\frac{2\,A\,\sqrt{a+b\,x^2}}{5\,a\,e\,(e\,x)^{5/2}}+\frac{2\,(3\,A\,b-5\,a\,B)\,\sqrt{a+b\,x^2}}{5\,a^2\,e^3\,\sqrt{e\,x}}-\frac{2\,\sqrt{b}\,(3\,A\,b-5\,a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{5\,a^2\,e^4\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$

$$\frac{2\,b^{1/4}\,(3\,A\,b-5\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{5\,a^{7/4}\,e^{7/2}\,\sqrt{a+b\,x^2}}-$$

$$\frac{b^{1/4}\,(3\,A\,b-5\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{5\,a^{7/4}\,e^{7/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 221 leaves):

$$\left(x\left(2\sqrt{a}\sqrt{b}\left(-3Ab+5aB\right)x^3\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-\right.\right.$$

$$\left.\left.2\left(\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\left(a+bx^2\right)\left(-3Abx^2+a\left(A+5Bx^2\right)\right)+\sqrt{a}\sqrt{b}\left(-3Ab+5aB\right)x^3\sqrt{1+\frac{bx^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\right)\Big/\left(5\right.$$

$$\left.a^2\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,(e\,x)^{7/2}\sqrt{a+bx^2}\right)$$

Problem 807: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(e\,x)^{7/2}\left(A+Bx^2\right)}{\left(a+bx^2\right)^{3/2}}\,dx$$

Optimal (type 4, 211 leaves, 5 steps):

$$-\frac{\left(7Ab-9aB\right)e\,(e\,x)^{5/2}}{7b^2\sqrt{a+bx^2}}+\frac{2B\,(e\,x)^{9/2}}{7be\sqrt{a+bx^2}}+\frac{5\left(7Ab-9aB\right)e^3\sqrt{e\,x}\,\sqrt{a+bx^2}}{21b^3}-$$

$$\frac{5a^{3/4}\left(7Ab-9aB\right)e^{7/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{a^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{42b^{13/4}\sqrt{a+bx^2}}$$

Result (type 4, 168 leaves):

$$\frac{1}{21\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,b^3\sqrt{a+bx^2}}$$

$$e^3\sqrt{e\,x}\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(-45a^2B+ab\left(35A-18Bx^2\right)+2b^2x^2\left(7A+3Bx^2\right)\right)-5\,i\,a\left(7Ab-9aB\right)\sqrt{1+\frac{a}{bx^2}}\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 808: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(e\,x)^{5/2}\,\left(A+B\,x^2\right)}{\left(a+b\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 337 leaves, 6 steps):

$$-\frac{(5\,A\,b-7\,a\,B)\,e\,(e\,x)^{3/2}}{5\,b^2\,\sqrt{a+b\,x^2}}+\frac{2\,B\,(e\,x)^{7/2}}{5\,b\,e\,\sqrt{a+b\,x^2}}+\frac{3\,(5\,A\,b-7\,a\,B)\,e^2\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{5\,b^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-$$

$$\frac{3\,a^{1/4}\,(5\,A\,b-7\,a\,B)\,e^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{5\,b^{11/4}\,\sqrt{a+b\,x^2}}+$$

$$\frac{3\,a^{1/4}\,(5\,A\,b-7\,a\,B)\,e^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{10\,b^{11/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 229 leaves):

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

$$\left(b\,x^2\,\left(-5\,A\,b+7\,a\,B+2\,b\,B\,x^2\right)+\frac{1}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}3\,(5\,A\,b-7\,a\,B)\,\left(\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(a+b\,x^2\right)-\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],\,-1\right]+\right.\right.$$

$$\left.\left.\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],\,-1\right]\right)\right)$$

Problem 809: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{(3 A b-5 a B) e \sqrt{e x}}{3 b^2 \sqrt{a+b x^2}}+\frac{2 B (e x)^{5/2}}{3 b e \sqrt{a+b x^2}}+\frac{(3 A b-5 a B) e^{3/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{6 a^{1/4} b^{9/4} \sqrt{a+b x^2}}$$

Result (type 4, 143 leaves):

$$\frac{1}{3 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} b^2 \sqrt{a+b x^2}} e \sqrt{e x} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(-3 A b+5 a B+2 b B x^2\right)+i (3 A b-5 a B) \sqrt{1+\frac{a}{b x^2}} \sqrt{x} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]\right)$$

Problem 810: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 301 leaves, 5 steps):

$$\frac{(A b-a B) (e x)^{3/2}}{a b e \sqrt{a+b x^2}}-\frac{(A b-3 a B) \sqrt{e x} \sqrt{a+b x^2}}{a b^{3/2} \left(\sqrt{a}+\sqrt{b} x\right)}+\frac{(A b-3 a B) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{a^{3/4} b^{7/4} \sqrt{a+b x^2}}-$$

$$\frac{(A b-3 a B) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{2 a^{3/4} b^{7/4} \sqrt{a+b x^2}}$$

Result (type 4, 216 leaves):

$$\left(i e \left(\sqrt{a} \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(-A b+3 a B+2 b B x^2\right)+\sqrt{b} (A b-3 a B) \sqrt{1+\frac{a}{b x^2}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]-\right.\right.$$

$$\left.\left.\sqrt{b} (A b-3 a B) \sqrt{1+\frac{a}{b x^2}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]\right)\right) \Big/ \left(\left(\frac{i \sqrt{a}}{\sqrt{b}}\right)^{3/2} b^{5/2} \sqrt{e x} \sqrt{a+b x^2}\right)$$

Problem 811: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{A+B x^2}{\sqrt{e x}\, (a+b x^2)^{3/2}}\, dx$$

Optimal (type 4, 144 leaves, 3 steps):

$$\frac{(A b-a B) \sqrt{e x}}{a b e \sqrt{a+b x^2}}+\frac{(A b+a B) \left(\sqrt{a}+\sqrt{b}\, x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{2 a^{5/4} b^{5/4} \sqrt{e} \sqrt{a+b x^2}}$$

Result (type 4, 133 leaves):

$$\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, (A b-a B)\, x+i\, (A b+a B) \sqrt{1+\frac{a}{b x^2}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]}{a \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\, b \sqrt{e x} \sqrt{a+b x^2}}$$

Problem 812: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 333 leaves, 6 steps):

$$-\frac{2 A}{a e \sqrt{e x} \sqrt{a+b x^2}}-\frac{(3 A b-a B) (e x)^{3/2}}{a^2 e^3 \sqrt{a+b x^2}}+\frac{(3 A b-a B) \sqrt{e x} \sqrt{a+b x^2}}{a^2 \sqrt{b}\, e^2 \left(\sqrt{a}+\sqrt{b}\, x\right)}-$$
$$\frac{(3 A b-a B) \left(\sqrt{a}+\sqrt{b}\, x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{a^{7/4} b^{3/4} e^{3/2} \sqrt{a+b x^2}}+$$
$$\frac{(3 A b-a B) \left(\sqrt{a}+\sqrt{b}\, x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{2 a^{7/4} b^{3/4} e^{3/2} \sqrt{a+b x^2}}$$

Result (type 4, 202 leaves):

$$\left(x\left(\sqrt{b}\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\left(-2\,a\,A-3\,A\,b\,x^2+a\,B\,x^2\right)-\sqrt{a}\,\left(-3\,A\,b+a\,B\right)\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]+\right.\right.$$

$$\left.\left.\sqrt{a}\,\left(-3\,A\,b+a\,B\right)\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(a^2\sqrt{b}\,\sqrt{\frac{i\sqrt{b}\,x}{\sqrt{a}}}\,\left(e\,x\right)^{3/2}\sqrt{a+b\,x^2}\right)$$

Problem 813: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{\left(e\,x\right)^{5/2}\left(a+b\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 176 leaves, 4 steps):

$$-\frac{2\,A}{3\,a\,e\,\left(e\,x\right)^{3/2}\sqrt{a+b\,x^2}}-\frac{\left(5\,A\,b-3\,a\,B\right)\sqrt{e\,x}}{3\,a^2\,e^3\sqrt{a+b\,x^2}}-\frac{\left(5\,A\,b-3\,a\,B\right)\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{a^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{6\,a^{9/4}\,b^{1/4}\,e^{5/2}\sqrt{a+b\,x^2}}$$

Result (type 4, 146 leaves):

$$\left(x\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(-2\,a\,A-5\,A\,b\,x^2+3\,a\,B\,x^2\right)-i\,\left(5\,A\,b-3\,a\,B\right)\sqrt{1+\frac{a}{b\,x^2}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/$$

$$\left(3\,a^2\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,\left(e\,x\right)^{5/2}\sqrt{a+b\,x^2}\right)$$

Problem 814: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{\left(e\,x\right)^{7/2}\left(a+b\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 379 leaves, 7 steps):

$$-\frac{2\,A}{5\,a\,e\,(e\,x)^{5/2}\,\sqrt{a+b\,x^2}}-\frac{7\,A\,b-5\,a\,B}{5\,a^2\,e^3\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}+\frac{3\,(7\,A\,b-5\,a\,B)\,\sqrt{a+b\,x^2}}{5\,a^3\,e^3\,\sqrt{e\,x}}-$$

$$\frac{3\,\sqrt{b}\,(7\,A\,b-5\,a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{5\,a^3\,e^4\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+\frac{3\,b^{1/4}\,(7\,A\,b-5\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,a^{11/4}\,e^{7/2}\,\sqrt{a+b\,x^2}}-$$

$$\frac{3\,b^{1/4}\,(7\,A\,b-5\,a\,B)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{10\,a^{11/4}\,e^{7/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 233 leaves):

$$\left(x\left(\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,\left(21\,A\,b^2\,x^4+a\,b\,x^2\,(14\,A-15\,B\,x^2)-2\,a^2\,(A+5\,B\,x^2)\right)+\right.\right.$$

$$3\,\sqrt{a}\,\sqrt{b}\,(-7\,A\,b+5\,a\,B)\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-$$

$$\left.\left.3\,\sqrt{a}\,\sqrt{b}\,(-7\,A\,b+5\,a\,B)\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\Big/\left(5\,a^3\,\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\,(e\,x)^{7/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 815: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(e\,x)^{7/2}\,(A+B\,x^2)}{(a+b\,x^2)^{5/2}}\,dx$$

Optimal (type 4, 208 leaves, 5 steps):

$$-\frac{(A\,b-3\,a\,B)\,e\,(e\,x)^{5/2}}{3\,b^2\,(a+b\,x^2)^{3/2}}+\frac{2\,B\,(e\,x)^{9/2}}{3\,b\,e\,(a+b\,x^2)^{3/2}}-\frac{5\,(A\,b-3\,a\,B)\,e^3\,\sqrt{e\,x}}{6\,b^3\,\sqrt{a+b\,x^2}}+$$

$$\frac{5\,(A\,b-3\,a\,B)\,e^{7/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{12\,a^{1/4}\,b^{13/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 163 leaves):

$$\frac{(e\,x)^{7/2}\left(\frac{\sqrt{x}\,\left(15\,a^2\,B+b^2\,x^2\,\left(-7\,A+4\,B\,x^2\right)+a\,\left(-5\,A\,b+21\,b\,B\,x^2\right)\right)}{b^3\,\left(a+b\,x^2\right)}+\frac{5\,\mathrm{i}\,(A\,b-3\,a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,x\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,b^3}\right)}{6\,x^{7/2}\,\sqrt{a+b\,x^2}}$$

Problem 816: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 349 leaves, 6 steps):

$$\frac{(A\,b-a\,B)\,(e\,x)^{7/2}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/2}}+\frac{(A\,b-7\,a\,B)\,e\,(e\,x)^{3/2}}{6\,a\,b^2\,\sqrt{a+b\,x^2}}-\frac{(A\,b-7\,a\,B)\,e^2\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{2\,a\,b^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$

$$\frac{(A\,b-7\,a\,B)\,e^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{2\,a^{3/4}\,b^{11/4}\,\sqrt{a+b\,x^2}}-$$

$$\frac{(A\,b-7\,a\,B)\,e^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{4\,a^{3/4}\,b^{11/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 249 leaves):

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

$$(e\,x)^{5/2}\left(b\,x^2\,\left(-7\,a^2\,B+3\,A\,b^2\,x^2+a\,b\,\left(A-9\,B\,x^2\right)\right)-\frac{1}{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}3\,(A\,b-7\,a\,B)\,\left(a+b\,x^2\right)\left(\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}\,\left(a+b\,x^2\right)-\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\right.\right.$$

$$\left.\left.\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]+\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 817: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(e\,x)^{3/2}\,\left(A+B\,x^2\right)}{\left(a+b\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 185 leaves, 4 steps):

$$\frac{(A\,b-a\,B)\,(e\,x)^{5/2}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/2}}-\frac{(A\,b+5\,a\,B)\,e\,\sqrt{e\,x}}{6\,a\,b^2\,\sqrt{a+b\,x^2}}+\frac{(A\,b+5\,a\,B)\,e^{3/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{12\,a^{5/4}\,b^{9/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 163 leaves):

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

$$e\,\sqrt{e\,x}\,\left(\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(-5\,a^2\,B+A\,b^2\,x^2-a\,b\,\left(A+7\,B\,x^2\right)\right)+i\,(A\,b+5\,a\,B)\,\sqrt{1+\frac{a}{b\,x^2}}\,\sqrt{x}\,\left(a+b\,x^2\right)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 818: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 344 leaves, 6 steps):

$$\frac{(A\,b-a\,B)\,(e\,x)^{3/2}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/2}}+\frac{(A\,b+a\,B)\,(e\,x)^{3/2}}{2\,a^2\,b\,e\,\sqrt{a+b\,x^2}}-\frac{(A\,b+a\,B)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{2\,a^2\,b^{3/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$

$$\frac{(A\,b+a\,B)\,\sqrt{e}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{2\,a^{7/4}\,b^{7/4}\,\sqrt{a+b\,x^2}}-$$

$$\frac{(A\,b+a\,B)\,\sqrt{e}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{4\,a^{7/4}\,b^{7/4}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 247 leaves):

$$\frac{1}{6\,a^2\,b^2\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{3/2}}e\left(b\,x^2\,\left(a^2\,B+3\,A\,b^2\,x^2+a\,b\,\left(5\,A+3\,B\,x^2\right)\right)-\frac{1}{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}3\,\left(A\,b+a\,B\right)\,\left(a+b\,x^2\right)\left(\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,\left(a+b\,x^2\right)-\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]+\sqrt{a}\,\sqrt{b}\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 819: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 187 leaves, 4 steps):

$$\frac{\left(A\,b-a\,B\right)\,\sqrt{e\,x}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/2}}+\frac{\left(5\,A\,b+a\,B\right)\,\sqrt{e\,x}}{6\,a^2\,b\,e\,\sqrt{a+b\,x^2}}+\frac{\left(5\,A\,b+a\,B\right)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{12\,a^{9/4}\,b^{5/4}\,\sqrt{e}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 164 leaves):

$$\left(\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,x\,\left(-a^2\,B+5\,A\,b^2\,x^2+a\,b\,\left(7\,A+B\,x^2\right)\right)+i\,\left(5\,A\,b+a\,B\right)\,\sqrt{1+\frac{a}{b\,x^2}}\,x^{3/2}\,\left(a+b\,x^2\right)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\Big/\left(6\,a^2\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,b\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{3/2}\right)$$

Problem 820: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{\left(e\,x\right)^{3/2}\,\left(a+b\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 377 leaves, 7 steps):

$$-\frac{2\,A}{a\,e\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{3/2}}-\frac{\left(7\,A\,b-a\,B\right)\,\left(e\,x\right)^{3/2}}{3\,a^2\,e^3\,\left(a+b\,x^2\right)^{3/2}}-\frac{\left(7\,A\,b-a\,B\right)\,\left(e\,x\right)^{3/2}}{2\,a^3\,e^3\,\sqrt{a+b\,x^2}}+$$

$$\frac{\left(7\,A\,b-a\,B\right)\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{2\,a^3\,\sqrt{b}\,e^2\,\left(\sqrt{a}+\sqrt{b}\,x\right)}-\frac{\left(7\,A\,b-a\,B\right)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{2\,a^{11/4}\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}+$$

$$\frac{\left(7\,A\,b-a\,B\right)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{4\,a^{11/4}\,b^{3/4}\,e^{3/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 182 leaves):

$$\frac{1}{6\,a^3\,\left(e\,x\right)^{3/2}\,\sqrt{a+b\,x^2}}x\left(\frac{-21\,A\,b^2\,x^4+a^2\,\left(-12\,A+5\,B\,x^2\right)+a\,\left(-35\,A\,b\,x^2+3\,b\,B\,x^4\right)}{a+b\,x^2}+\frac{1}{b}\right.$$

$$\left.3\,\text{i}\,a\,\left(-7\,A\,b+a\,B\right)\,\sqrt{\frac{\text{i}\,\sqrt{b}\,x}{\sqrt{a}}}\,\sqrt{1+\frac{b\,x^2}{a}}\,\left(\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{\text{i}\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]-\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{\text{i}\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]\right)\right)$$

Problem 821: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 213 leaves, 5 steps):

$$-\frac{2\,A}{3\,a\,e\,\left(e\,x\right)^{3/2}\,\left(a+b\,x^2\right)^{3/2}}-\frac{\left(3\,A\,b-a\,B\right)\,\sqrt{e\,x}}{3\,a^2\,e^3\,\left(a+b\,x^2\right)^{3/2}}-\frac{5\,\left(3\,A\,b-a\,B\right)\,\sqrt{e\,x}}{6\,a^3\,e^3\,\sqrt{a+b\,x^2}}-$$

$$\frac{5\,\left(3\,A\,b-a\,B\right)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]}{12\,a^{13/4}\,b^{1/4}\,e^{5/2}\,\sqrt{a+b\,x^2}}$$

Result (type 4, 166 leaves):

$$\frac{x^{5/2}\left(\frac{-15\,A\,b^2\,x^4+a^2\,\left(-4\,A+7\,B\,x^2\right)+a\,\left(-21\,A\,b\,x^2+5\,b\,B\,x^4\right)}{a^3\,x^{3/2}\,\left(a+b\,x^2\right)}+\frac{5\,\mathrm{i}\,\left(-3\,A\,b+a\,B\right)\,\sqrt{1+\frac{a}{b\,x^2}}\,x\,\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{a^3\,\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}\right)}{6\,\left(e\,x\right)^{5/2}\,\sqrt{a+b\,x^2}}$$

Problem 822: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 288 leaves, 6 steps):

$$\frac{4\,c\,\left(11\,a^2\,d^2+b\,c\,\left(3\,b\,c-10\,a\,d\right)\right)\,e\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{231\,d^3}+\frac{2\,\left(11\,a^2\,d^2+b\,c\,\left(3\,b\,c-10\,a\,d\right)\right)\,\left(e\,x\right)^{5/2}\,\sqrt{c+d\,x^2}}{77\,d^2\,e}-\frac{2\,b\,\left(3\,b\,c-10\,a\,d\right)\,\left(e\,x\right)^{5/2}\,\left(c+d\,x^2\right)^{3/2}}{55\,d^2\,e}+$$
$$\frac{2\,b^2\,\left(e\,x\right)^{9/2}\,\left(c+d\,x^2\right)^{3/2}}{15\,d\,e^3}-\frac{2\,c^{7/4}\,\left(11\,a^2\,d^2+b\,c\,\left(3\,b\,c-10\,a\,d\right)\right)\,e^{3/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\mathrm{EllipticF}\left[2\,\mathrm{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{231\,d^{13/4}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 225 leaves):

$$\frac{1}{231\,x^{3/2}\,\sqrt{c+d\,x^2}}$$
$$\left(e\,x\right)^{3/2}\left(\frac{1}{5\,d^3}2\,\sqrt{x}\,\left(c+d\,x^2\right)\,\left(55\,a^2\,d^2\,\left(2\,c+3\,d\,x^2\right)+10\,a\,b\,d\,\left(-10\,c^2+6\,c\,d\,x^2+21\,d^2\,x^4\right)+b^2\,\left(30\,c^3-18\,c^2\,d\,x^2+14\,c\,d^2\,x^4+77\,d^3\,x^6\right)\right)-\right.$$
$$\left.\frac{4\,\mathrm{i}\,c^2\,\left(3\,b^2\,c^2-10\,a\,b\,c\,d+11\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}\,d^3}\right)$$

Problem 823: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 425 leaves, 7 steps):

$$\frac{2\left(39\,a^2\,d^2+b\,c\,\left(7\,b\,c-26\,a\,d\right)\right)\,(e\,x)^{3/2}\,\sqrt{c+d\,x^2}}{195\,d^2\,e}+\frac{4\,c\,\left(39\,a^2\,d^2+b\,c\,\left(7\,b\,c-26\,a\,d\right)\right)\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{195\,d^{5/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)}-\frac{2\,b\,\left(7\,b\,c-26\,a\,d\right)\,(e\,x)^{3/2}\,\left(c+d\,x^2\right)^{3/2}}{117\,d^2\,e}+\frac{2\,b^2\,(e\,x)^{7/2}\,\left(c+d\,x^2\right)^{3/2}}{13\,d\,e^3}-\frac{4\,c^{5/4}\,\left(39\,a^2\,d^2+b\,c\,\left(7\,b\,c-26\,a\,d\right)\right)\,\sqrt{e}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{195\,d^{11/4}\,\sqrt{c+d\,x^2}}+\frac{2\,c^{5/4}\,\left(39\,a^2\,d^2+b\,c\,\left(7\,b\,c-26\,a\,d\right)\right)\,\sqrt{e}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{195\,d^{11/4}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 282 leaves):

$$\frac{1}{585\,d^3\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}2\,e\left(d\,x^2\,\left(c+d\,x^2\right)\,\left(117\,a^2\,d^2+26\,a\,b\,d\,\left(2\,c+5\,d\,x^2\right)+b^2\,\left(-14\,c^2+10\,c\,d\,x^2+45\,d^2\,x^4\right)\right)+\frac{1}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}6\,c\,\left(7\,b^2\,c^2-26\,a\,b\,c\,d+39\,a^2\,d^2\right)\left(\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,\left(c+d\,x^2\right)-\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 824: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 244 leaves, 5 steps):

$$\frac{2\left(5 b^2 c^2-22 a b c d+77 a^2 d^2\right)\sqrt{e x}\,\sqrt{c+d x^2}}{231 d^2 e}-\frac{2 b\left(5 b c-22 a d\right)\sqrt{e x}\,\left(c+d x^2\right)^{3/2}}{77 d^2 e}+\frac{2 b^2\,(e x)^{5/2}\left(c+d x^2\right)^{3/2}}{11 d e^3}+$$

$$\frac{2 c^{3/4}\left(5 b^2 c^2-22 a b c d+77 a^2 d^2\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{231 d^{9/4}\sqrt{e}\,\sqrt{c+d x^2}}$$

Result (type 4, 189 leaves):

$$\frac{1}{231\sqrt{e x}\,\sqrt{c+d x^2}}\sqrt{x}\left(\frac{2\sqrt{x}\,\left(c+d x^2\right)\left(77 a^2 d^2+22 a b d\left(2 c+3 d x^2\right)+b^2\left(-10 c^2+6 c d x^2+21 d^2 x^4\right)\right)}{d^2}+\right.$$

$$\left.\frac{4\,\mathrm{i}\,c\left(5 b^2 c^2-22 a b c d+77 a^2 d^2\right)\sqrt{1+\frac{c}{d x^2}}\;x\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{d}}}\;d^2}\right)$$

Problem 825: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 421 leaves, 7 steps):

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

$$\frac{2 b^2(e x)^{3/2}\left(c+d x^2\right)^{3/2}}{9 d e^3}+\frac{4 c^{1/4}\left(b^2 c^2-3 a d\left(2 b c+5 a d\right)\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\,\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15 d^{7/4} e^{3/2}\sqrt{c+d x^2}}-$$

$$\frac{2 c^{1/4}\left(b^2 c^2-3 a d\left(2 b c+5 a d\right)\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\,\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15 d^{7/4} e^{3/2}\sqrt{c+d x^2}}$$

Result (type 4, 260 leaves):

$$\frac{1}{45 d^2 (e x)^{3/2}\sqrt{c+d x^2}}$$

$$2 x\left(d\left(c+d x^2\right)\left(-45 a^2 d+18 a b d x^2+b^2 x^2\left(2 c+5 d x^2\right)\right)-\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}6\left(b^2 c^2-6 a b c d-15 a^2 d^2\right)\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\left(c+d x^2\right)-\sqrt{c}\sqrt{d}\right.\right.$$

$$\left.\left.\sqrt{1+\frac{c}{d x^2}}\, x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\sqrt{c}\sqrt{d}\sqrt{1+\frac{c}{d x^2}}\, x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 826: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 234 leaves, 5 steps):

$$-\frac{2\left(b^2 c^2-7 a d\left(2 b c+a d\right)\right)\sqrt{e x}\sqrt{c+d x^2}}{21 c d e^3}-\frac{2 a^2\left(c+d x^2\right)^{3/2}}{3 c e(e x)^{3/2}}+\frac{2 b^2\sqrt{e x}\left(c+d x^2\right)^{3/2}}{7 d e^3}-$$

$$\frac{2\left(b^2 c^2-7 a d\left(2 b c+a d\right)\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\,\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{21 c^{1/4} d^{5/4} e^{5/2}\sqrt{c+d x^2}}$$

Result (type 4, 171 leaves) :

$$\frac{x^{5/2}\left(\frac{2\,(c+d\,x^2)\,\left(-7\,a^2\,d+14\,a\,b\,d\,x^2+b^2\,x^2\,(2\,c+3\,d\,x^2)\right)}{d\,x^{3/2}}+\frac{4\,\mathrm{i}\,\left(-b^2\,c^2+14\,a\,b\,c\,d+7\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}\,d}\right)}{21\,(e\,x)^{5/2}\,\sqrt{c+d\,x^2}}$$

Problem 827: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 421 leaves, 7 steps) :

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

$$\frac{2\,a\,(10\,b\,c+a\,d)\,(c+d\,x^2)^{3/2}}{5\,c^2\,e^3\,\sqrt{e\,x}}-\frac{4\,\left(b^2\,c^2+a\,d\,(10\,b\,c+a\,d)\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,c^{3/4}\,d^{3/4}\,e^{7/2}\,\sqrt{c+d\,x^2}}+$$

$$\frac{2\,\left(b^2\,c^2+a\,d\,(10\,b\,c+a\,d)\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,c^{3/4}\,d^{3/4}\,e^{7/2}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 226 leaves) :

$$\frac{1}{5\,(e\,x)^{7/2}}x^{7/2}\left(\frac{2\sqrt{c+d\,x^2}\,\left(-10\,a\,b\,c\,x^2+b^2\,c\,x^4-a^2\,\left(c+2\,d\,x^2\right)\right)}{c\,x^{5/2}}-\frac{1}{c\,d\,\sqrt{c+d\,x^2}}\right.$$

$$\left.4\,\left(b^2\,c^2+10\,a\,b\,c\,d+a^2\,d^2\right)\,x\left(-\left(d+\frac{c}{x^2}\right)\sqrt{x}+\frac{i\,c\,\sqrt{1+\frac{c}{d\,x^2}}\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{i\sqrt{c}}{\sqrt{d}}\right)^{3/2}}\right)\right)$$

Problem 828: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 213 leaves, 5 steps):

$$\frac{2\,\left(7\,b^2\,c^2+a\,d\,\left(14\,b\,c-a\,d\right)\right)\sqrt{x}\,\sqrt{c+d\,x^2}}{21\,c^2}-\frac{2\,a^2\,\left(c+d\,x^2\right)^{3/2}}{7\,c\,x^{7/2}}-\frac{2\,a\,\left(14\,b\,c-a\,d\right)\,\left(c+d\,x^2\right)^{3/2}}{21\,c^2\,x^{3/2}}+$$

$$\frac{2\,\left(7\,b^2\,c^2+a\,d\,\left(14\,b\,c-a\,d\right)\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]}{21\,c^{5/4}\,d^{1/4}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 160 leaves):

$$\frac{1}{21\, c\, x^{7/2}\sqrt{c+d x^2}} 2\left((c+d x^2)\left(-14\, a b c x^2+7 b^2 c x^4-a^2\left(3 c+2 d x^2\right)\right)+\frac{2\, i\left(7 b^2 c^2+14\, a b c d-a^2 d^2\right)\sqrt{1+\frac{c}{d x^2}}\, x^{9/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}\right)$$

Problem 829: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 386 leaves, 7 steps):

$$-\frac{2\left(15 b^2 c^2+a d\left(6 b c-a d\right)\right)\sqrt{c+d x^2}}{15 c^2\sqrt{x}}+\frac{4\sqrt{d}\left(15 b^2 c^2+a d\left(6 b c-a d\right)\right)\sqrt{x}\sqrt{c+d x^2}}{15 c^2\left(\sqrt{c}+\sqrt{d}\, x\right)}-\frac{2 a^2\left(c+d x^2\right)^{3/2}}{9 c x^{9/2}}-$$
$$\frac{2 a\left(6 b c-a d\right)\left(c+d x^2\right)^{3/2}}{15 c^2 x^{5/2}}-\frac{4 d^{1/4}\left(15 b^2 c^2+a d\left(6 b c-a d\right)\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\, \text{EllipticE}\left[2\, \text{ArcTan}\left[\frac{d^{1/4}\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]}{15 c^{7/4}\sqrt{c+d x^2}}+$$
$$\frac{2 d^{1/4}\left(15 b^2 c^2+a d\left(6 b c-a d\right)\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{d^{1/4}\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]}{15 c^{7/4}\sqrt{c+d x^2}}$$

Result (type 4, 283 leaves):

$$\frac{1}{45\,c^2\,x^{9/2}\,\sqrt{c+d\,x^2}}$$

$$2\left(\left(-c-d\,x^2\right)\left(5\,a^2\,c^2+2\,a\,c\,\left(9\,b\,c+a\,d\right)\,x^2+3\,\left(15\,b^2\,c^2+12\,a\,b\,c\,d-2\,a^2\,d^2\right)\,x^4\right)+\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}6\,\left(15\,b^2\,c^2+6\,a\,b\,c\,d-a^2\,d^2\right)\,x^4\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,\left(c+d\,x^2\right)-\right.\right.$$

$$\left.\left.\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 830: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 217 leaves, 5 steps):

$$-\frac{2\,\left(77\,b^2\,c^2-22\,a\,b\,c\,d+5\,a^2\,d^2\right)\,\sqrt{c+d\,x^2}}{231\,c^2\,x^{3/2}}-\frac{2\,a^2\,\left(c+d\,x^2\right)^{3/2}}{11\,c\,x^{11/2}}-\frac{2\,a\,\left(22\,b\,c-5\,a\,d\right)\,\left(c+d\,x^2\right)^{3/2}}{77\,c^2\,x^{7/2}}+$$

$$\frac{2\,d^{3/4}\,\left(77\,b^2\,c^2-22\,a\,b\,c\,d+5\,a^2\,d^2\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]}{231\,c^{9/4}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 187 leaves):

$$-\frac{2\,\sqrt{c+d\,x^2}\,\left(77\,b^2\,c^2\,x^4+22\,a\,b\,c\,x^2\,\left(3\,c+2\,d\,x^2\right)+a^2\,\left(21\,c^2+6\,c\,d\,x^2-10\,d^2\,x^4\right)\right)}{231\,c^2\,x^{11/2}}+$$

$$\frac{4\,i\,d\,\left(77\,b^2\,c^2-22\,a\,b\,c\,d+5\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{231\,c^2\,\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,\sqrt{c+d\,x^2}}$$

Problem 831: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right)^2 \sqrt{c+d x^2}}{x^{15/2}} \, dx$$

Optimal (type 4, 441 leaves, 8 steps):

$$-\frac{2 \left(39 b^2 c^2-26 a b c d+7 a^2 d^2\right) \sqrt{c+d x^2}}{195 c^2 x^{5/2}}-\frac{4 d \left(39 b^2 c^2-26 a b c d+7 a^2 d^2\right) \sqrt{c+d x^2}}{195 c^3 \sqrt{x}}+\frac{4 d^{3/2} \left(39 b^2 c^2-26 a b c d+7 a^2 d^2\right) \sqrt{x} \sqrt{c+d x^2}}{195 c^3 \left(\sqrt{c}+\sqrt{d} x\right)}-\frac{2 a^2 \left(c+d x^2\right)^{3/2}}{13 c x^{13/2}}-\frac{2 a (26 b c-7 a d) \left(c+d x^2\right)^{3/2}}{117 c^2 x^{9/2}}-\frac{4 d^{5/4} \left(39 b^2 c^2-26 a b c d+7 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{x}}{c^{1/4}}\right], \frac{1}{2}\right]}{195 c^{11/4} \sqrt{c+d x^2}}+\frac{2 d^{5/4} \left(39 b^2 c^2-26 a b c d+7 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{x}}{c^{1/4}}\right], \frac{1}{2}\right]}{195 c^{11/4} \sqrt{c+d x^2}}$$

Result (type 4, 241 leaves):

$$\frac{1}{585 c^3 x^{13/2} \sqrt{c+d x^2}} 2 \left(\left(-c-d x^2\right) \left(117 b^2 c^2 x^4 \left(c+2 d x^2\right)+26 a b c x^2 \left(5 c^2+2 c d x^2-6 d^2 x^4\right)+a^2 \left(45 c^3+10 c^2 d x^2-14 c d^2 x^4+42 d^3 x^6\right)\right)+\frac{1}{\left(\frac{i \sqrt{d} x}{\sqrt{c}}\right)^{3/2}} 6 i d^2 \left(39 b^2 c^2-26 a b c d+7 a^2 d^2\right) x^8 \sqrt{1+\frac{d x^2}{c}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]\right)\right)$$

Problem 832: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 530 leaves, 9 steps):

$$\frac{8 c^2 \left(51 a^2 d^2+b c \left(11 b c-42 a d\right)\right) e \left(e x\right)^{3/2} \sqrt{c+d x^2}}{9945 d^3}+\frac{4 c \left(51 a^2 d^2+b c \left(11 b c-42 a d\right)\right) \left(e x\right)^{7/2} \sqrt{c+d x^2}}{1989 d^2 e}-$$

$$\frac{8 c^3 \left(51 a^2 d^2+b c \left(11 b c-42 a d\right)\right) e^2 \sqrt{e x} \sqrt{c+d x^2}}{3315 d^{7/2} \left(\sqrt{c}+\sqrt{d} x\right)}+\frac{2 \left(51 a^2 d^2+b c \left(11 b c-42 a d\right)\right) \left(e x\right)^{7/2} \left(c+d x^2\right)^{3/2}}{663 d^2 e}-$$

$$\frac{2 b \left(11 b c-42 a d\right) \left(e x\right)^{7/2} \left(c+d x^2\right)^{5/2}}{357 d^2 e}+\frac{2 b^2 \left(e x\right)^{11/2} \left(c+d x^2\right)^{5/2}}{21 d e^3}+\frac{1}{3315 d^{15/4} \sqrt{c+d x^2}}$$

$$8 c^{13/4} \left(51 a^2 d^2+b c \left(11 b c-42 a d\right)\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]-$$

$$\frac{1}{3315 d^{15/4} \sqrt{c+d x^2}} 4 c^{13/4} \left(51 a^2 d^2+b c \left(11 b c-42 a d\right)\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]$$

Result (type 4, 304 leaves) :

$$\frac{1}{69615 d^4 x^{3/2} \sqrt{c+d x^2}} 2 \left(e x\right)^{5/2} \left(d \sqrt{x} \left(c+d x^2\right) \left(357 a^2 d^2 \left(4 c^2+25 c d x^2+15 d^2 x^4\right)+42 a b d \left(-28 c^3+20 c^2 d x^2+285 c d^2 x^4+195 d^3 x^6\right)+\right.\right.$$

$$\left.b^2 \left(308 c^4-220 c^3 d x^2+180 c^2 d^2 x^4+4485 c d^3 x^6+3315 d^4 x^8\right)\right)+84 c^3 \left(11 b^2 c^2-42 a b c d+51 a^2 d^2\right)$$

$$\left.\left(-\left(d+\frac{c}{x^2}\right) \sqrt{x}+\frac{i c \sqrt{1+\frac{c}{d x^2}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)}{\left(\frac{i \sqrt{c}}{\sqrt{d}}\right)^{3/2}}\right)\right)$$

Problem 833: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 340 leaves, 7 steps):

$$\frac{8\,c^2\left(57\,a^2\,d^2+b\,c\,(9\,b\,c-38\,a\,d)\right)e\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{4389\,d^3}+\frac{4\,c\left(57\,a^2\,d^2+b\,c\,(9\,b\,c-38\,a\,d)\right)(e\,x)^{5/2}\sqrt{c+d\,x^2}}{1463\,d^2\,e}+$$
$$\frac{2\left(57\,a^2\,d^2+b\,c\,(9\,b\,c-38\,a\,d)\right)(e\,x)^{5/2}\left(c+d\,x^2\right)^{3/2}}{627\,d^2\,e}-\frac{2\,b\,(9\,b\,c-38\,a\,d)\,(e\,x)^{5/2}\left(c+d\,x^2\right)^{5/2}}{285\,d^2\,e}+\frac{2\,b^2\,(e\,x)^{9/2}\left(c+d\,x^2\right)^{5/2}}{19\,d\,e^3}-$$
$$\frac{1}{4389\,d^{13/4}\sqrt{c+d\,x^2}}4\,c^{11/4}\left(57\,a^2\,d^2+b\,c\,(9\,b\,c-38\,a\,d)\right)e^{3/2}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]$$

Result (type 4, 259 leaves):

$$\frac{1}{4389\,x^{3/2}\sqrt{c+d\,x^2}}(e\,x)^{3/2}\left(\frac{1}{5\,d^3}2\,\sqrt{x}\,\left(c+d\,x^2\right)\left(285\,a^2\,d^2\left(4\,c^2+13\,c\,d\,x^2+7\,d^2\,x^4\right)+\right.\right.$$
$$\left.38\,a\,b\,d\left(-20\,c^3+12\,c^2\,d\,x^2+119\,c\,d^2\,x^4+77\,d^3\,x^6\right)+3\,b^2\left(60\,c^4-36\,c^3\,d\,x^2+28\,c^2\,d^2\,x^4+539\,c\,d^3\,x^6+385\,d^4\,x^8\right)\right)-$$
$$\left.\frac{8\,i\,c^3\left(9\,b^2\,c^2-38\,a\,b\,c\,d+57\,a^2\,d^2\right)\sqrt{1+\frac{c}{d\,x^2}}\;x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\;d^3}\right)$$

Problem 834: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 482 leaves, 8 steps):

$$\frac{4c\left(221a^2d^2+3bc\left(7bc-34ad\right)\right)(ex)^{3/2}\sqrt{c+dx^2}}{3315d^2e}+\frac{8c^2\left(221a^2d^2+3bc\left(7bc-34ad\right)\right)\sqrt{ex}\sqrt{c+dx^2}}{3315d^{5/2}\left(\sqrt{c}+\sqrt{d}\,x\right)}+$$

$$\frac{2\left(221a^2d^2+3bc\left(7bc-34ad\right)\right)(ex)^{3/2}\left(c+dx^2\right)^{3/2}}{1989d^2e}-\frac{2b\left(7bc-34ad\right)(ex)^{3/2}\left(c+dx^2\right)^{5/2}}{221d^2e}+\frac{2b^2(ex)^{7/2}\left(c+dx^2\right)^{5/2}}{17de^3}-$$

$$\frac{1}{3315d^{11/4}\sqrt{c+dx^2}}8c^{9/4}\left(221a^2d^2+3bc\left(7bc-34ad\right)\right)\sqrt{e}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+dx^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]+$$

$$\frac{1}{3315d^{11/4}\sqrt{c+dx^2}}4c^{9/4}\left(221a^2d^2+3bc\left(7bc-34ad\right)\right)\sqrt{e}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+dx^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]$$

Result (type 4, 316 leaves):

$$\frac{1}{9945d^3\sqrt{ex}\sqrt{c+dx^2}}$$

$$2e\left(dx^2\left(c+dx^2\right)\left(221a^2d^2\left(11c+5dx^2\right)+102abd\left(4c^2+25cdx^2+15d^2x^4\right)+b^2\left(-84c^3+60c^2dx^2+855cd^2x^4+585d^3x^6\right)\right)+\right.$$

$$\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}12c^2\left(21b^2c^2-102abcd+221a^2d^2\right)\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\left(c+dx^2\right)-\right.$$

$$\left.\left.\sqrt{c}\sqrt{d}\sqrt{1+\frac{c}{dx^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\sqrt{c}\sqrt{d}\sqrt{1+\frac{c}{dx^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 835: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 286 leaves, 6 steps):

$$\frac{4\,c\,\left(33\,a^2\,d^2+b\,c\,(b\,c-6\,a\,d)\right)\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{231\,d^2\,e}+\frac{2\,\left(33\,a^2\,d^2+b\,c\,(b\,c-6\,a\,d)\right)\sqrt{e\,x}\,\left(c+d\,x^2\right)^{3/2}}{231\,d^2\,e}-\frac{2\,b\,(b\,c-6\,a\,d)\sqrt{e\,x}\,\left(c+d\,x^2\right)^{5/2}}{33\,d^2\,e}+$$

$$\frac{2\,b^2\,(e\,x)^{5/2}\,\left(c+d\,x^2\right)^{5/2}}{15\,d\,e^3}+\frac{4\,c^{7/4}\,\left(33\,a^2\,d^2+b\,c\,(b\,c-6\,a\,d)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{231\,d^{9/4}\,\sqrt{e}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 223 leaves) :

$$\frac{1}{231\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}$$

$$\sqrt{x}\left(\frac{1}{5\,d^2}2\,\sqrt{x}\,\left(c+d\,x^2\right)\left(165\,a^2\,d^2\,\left(3\,c+d\,x^2\right)+30\,a\,b\,d\,\left(4\,c^2+13\,c\,d\,x^2+7\,d^2\,x^4\right)+b^2\,\left(-20\,c^3+12\,c^2\,d\,x^2+119\,c\,d^2\,x^4+77\,d^3\,x^6\right)\right)+\right.$$

$$\left.\frac{8\,i\,c^2\,\left(b^2\,c^2-6\,a\,b\,c\,d+33\,a^2\,d^2\right)\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d^2}\right)$$

Problem 836: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 476 leaves, 8 steps) :

$$-\frac{4\left(3 b^2 c^2-13 a d(2 b c+9 a d)\right)(e x)^{3/2}\sqrt{c+d x^2}}{195 d e^3}-\frac{8 c\left(3 b^2 c^2-13 a d(2 b c+9 a d)\right)\sqrt{e x}\sqrt{c+d x^2}}{195 d^{3/2} e^2\left(\sqrt{c}+\sqrt{d}\,x\right)}-$$

$$\frac{2\left(3 b^2 c^2-13 a d(2 b c+9 a d)\right)(e x)^{3/2}\left(c+d x^2\right)^{3/2}}{117 c d e^3}-\frac{2 a^2\left(c+d x^2\right)^{5/2}}{c e\sqrt{e x}}+\frac{2 b^2(e x)^{3/2}\left(c+d x^2\right)^{5/2}}{13 d e^3}+$$

$$\frac{8 c^{5/4}\left(3 b^2 c^2-13 a d(2 b c+9 a d)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{195 d^{7/4} e^{3/2}\sqrt{c+d x^2}}-$$

$$\frac{4 c^{5/4}\left(3 b^2 c^2-13 a d(2 b c+9 a d)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{195 d^{7/4} e^{3/2}\sqrt{c+d x^2}}$$

Result (type 4, 261 leaves):

$$\frac{1}{195\,(e x)^{3/2}}x^{3/2}\left(\frac{2\sqrt{c+d x^2}\left(117 a^2 d\left(-5 c+d x^2\right)+26 a b d x^2\left(11 c+5 d x^2\right)+3 b^2 x^2\left(4 c^2+25 c d x^2+15 d^2 x^4\right)\right)}{3 d\sqrt{x}}-\frac{1}{d^2\sqrt{c+d x^2}}8 c\left(-3 b^2 c^2+26 a b c d+117 a^2 d^2\right)\right.$$

$$\left.x\left(-\left(d+\frac{c}{x^2}\right)\sqrt{x}+\frac{\mathrm{i}\, c\sqrt{1+\frac{c}{d x^2}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{\mathrm{i}\sqrt{c}}{\sqrt{d}}\right)^{3/2}}\right)\right)$$

Problem 837: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 288 leaves, 6 steps):

$$-\frac{4 \left(3 b^2 c^2-11 a d (6 b c+7 a d)\right) \sqrt{e x} \sqrt{c+d x^2}}{231 d e^3}-\frac{2 \left(3 b^2 c^2-11 a d (6 b c+7 a d)\right) \sqrt{e x} \left(c+d x^2\right)^{3/2}}{231 c d e^3}-\frac{2 a^2 \left(c+d x^2\right)^{5/2}}{3 c e (e x)^{3/2}}+$$
$$\frac{2 b^2 \sqrt{e x} \left(c+d x^2\right)^{5/2}}{11 d e^3}-\frac{4 c^{3/4} \left(3 b^2 c^2-11 a d (6 b c+7 a d)\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{231 d^{5/4} e^{5/2} \sqrt{c+d x^2}}$$

Result (type 4, 202 leaves):

$$\frac{1}{231 (e x)^{5/2} \sqrt{c+d x^2}} x^{5/2} \left(\frac{2 \left(c+d x^2\right) \left(77 a^2 d \left(-c+d x^2\right)+66 a b d x^2 \left(3 c+d x^2\right)+3 b^2 x^2 \left(4 c^2+13 c d x^2+7 d^2 x^4\right)\right)}{d x^{3/2}}+\right.$$
$$\left.\frac{8 i c \left(-3 b^2 c^2+66 a b c d+77 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}} x \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} d}\right)$$

Problem 838: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 468 leaves, 8 steps):

$$\frac{4\left(b^2c^2+9ad\left(2bc+ad\right)\right)\left(ex\right)^{3/2}\sqrt{c+dx^2}}{15ce^5}+\frac{8\left(b^2c^2+9ad\left(2bc+ad\right)\right)\sqrt{ex}\sqrt{c+dx^2}}{15\sqrt{d}\,e^4\left(\sqrt{c}+\sqrt{d}\,x\right)}+\frac{2\left(b^2c^2+9ad\left(2bc+ad\right)\right)\left(ex\right)^{3/2}\left(c+dx^2\right)^{3/2}}{9c^2e^5}-$$

$$\frac{2a^2\left(c+dx^2\right)^{5/2}}{5ce\left(ex\right)^{5/2}}-\frac{2a\left(2bc+ad\right)\left(c+dx^2\right)^{5/2}}{c^2e^3\sqrt{ex}}-\frac{8c^{1/4}\left(b^2c^2+9ad\left(2bc+ad\right)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+dx^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15d^{3/4}e^{7/2}\sqrt{c+dx^2}}+$$

$$\frac{4c^{1/4}\left(b^2c^2+9ad\left(2bc+ad\right)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+dx^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15d^{3/4}e^{7/2}\sqrt{c+dx^2}}$$

Result (type 4, 240 leaves) :

$$\frac{1}{15\left(ex\right)^{7/2}}x^{7/2}\left(\frac{2\sqrt{c+dx^2}\left(18abx^2\left(-5c+dx^2\right)+b^2x^4\left(11c+5dx^2\right)-9a^2\left(c+7dx^2\right)\right)}{3x^{5/2}}-\frac{1}{d\sqrt{c+dx^2}}\right.$$

$$\left.8\left(b^2c^2+18abcd+9a^2d^2\right)x\left(-\left(d+\frac{c}{x^2}\right)\sqrt{x}+\frac{i\,c\sqrt{1+\frac{c}{dx^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{i\sqrt{c}}{\sqrt{d}}\right)^{3/2}}\right)\right)$$

Problem 839: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 430 leaves, 7 steps) :

$$\frac{2\left(117 a^2 d^2+7 b c\left(11 b c-26 a d\right)\right) e\,(e x)^{3/2}\sqrt{c+d x^2}}{585 d^3}-\frac{2 b\left(11 b c-26 a d\right)(e x)^{7/2}\sqrt{c+d x^2}}{117 d^2 e}+$$

$$\frac{2 b^2 (e x)^{11/2}\sqrt{c+d x^2}}{13 d e^3}-\frac{2 c\left(117 a^2 d^2+7 b c\left(11 b c-26 a d\right)\right) e^2\sqrt{e x}\,\sqrt{c+d x^2}}{195 d^{7/2}\left(\sqrt{c}+\sqrt{d}\,x\right)}+\frac{1}{195 d^{15/4}\sqrt{c+d x^2}}$$

$$2 c^{5/4}\left(117 a^2 d^2+7 b c\left(11 b c-26 a d\right)\right) e^{5/2}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\ \text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]-$$

$$\frac{1}{195 d^{15/4}\sqrt{c+d x^2}}c^{5/4}\left(117 a^2 d^2+7 b c\left(11 b c-26 a d\right)\right) e^{5/2}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]$$

Result (type 4, 237 leaves) :

$$\frac{1}{585 d^4 x^{3/2}\sqrt{c+d x^2}}$$

$$2\,(e x)^{5/2}\left(d\sqrt{x}\,\left(c+d x^2\right)\left(117 a^2 d^2+26 a b d\left(-7 c+5 d x^2\right)+b^2\left(77 c^2-55 c d x^2+45 d^2 x^4\right)\right)+3 c\left(77 b^2 c^2-182 a b c d+117 a^2 d^2\right)\right.$$

$$\left.\left(-\left(d+\frac{c}{x^2}\right)\sqrt{x}+\frac{i\,c\sqrt{1+\frac{c}{d x^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{i\sqrt{c}}{\sqrt{d}}\right)^{3/2}}\right)\right)$$

Problem 840: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 240 leaves, 5 steps):

$$\frac{2\,\left(77\,a^2\,d^2+5\,b\,c\,\left(9\,b\,c-22\,a\,d\right)\right)\,e\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{231\,d^3}-\frac{2\,b\,\left(9\,b\,c-22\,a\,d\right)\,(e\,x)^{5/2}\,\sqrt{c+d\,x^2}}{77\,d^2\,e}+\frac{2\,b^2\,(e\,x)^{9/2}\,\sqrt{c+d\,x^2}}{11\,d\,e^3}-$$
$$\frac{c^{3/4}\,\left(77\,a^2\,d^2+5\,b\,c\,\left(9\,b\,c-22\,a\,d\right)\right)\,e^{3/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{231\,d^{13/4}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 190 leaves):

$$\frac{1}{231\,x^{3/2}\,\sqrt{c+d\,x^2}}(e\,x)^{3/2}\left(\frac{2\,\sqrt{x}\,\left(c+d\,x^2\right)\,\left(77\,a^2\,d^2+22\,a\,b\,d\,\left(-5\,c+3\,d\,x^2\right)+3\,b^2\,\left(15\,c^2-9\,c\,d\,x^2+7\,d^2\,x^4\right)\right)}{d^3}-\right.$$
$$\left.\frac{2\,i\,c\,\left(45\,b^2\,c^2-110\,a\,b\,c\,d+77\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,d^3}\right)$$

Problem 841: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 375 leaves, 6 steps):

$$-\frac{2\,b\,(7\,b\,c-18\,a\,d)\,(e\,x)^{3/2}\sqrt{c+d\,x^2}}{45\,d^2\,e}+\frac{2\,b^2\,(e\,x)^{7/2}\sqrt{c+d\,x^2}}{9\,d\,e^3}+\frac{2\,\left(15\,a^2\,d^2+b\,c\,(7\,b\,c-18\,a\,d)\right)\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{15\,d^{5/2}\left(\sqrt{c}+\sqrt{d}\,x\right)}-$$

$$\frac{2\,c^{1/4}\left(15\,a^2\,d^2+b\,c\,(7\,b\,c-18\,a\,d)\right)\sqrt{e}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15\,d^{11/4}\sqrt{c+d\,x^2}}+$$

$$\frac{c^{1/4}\left(15\,a^2\,d^2+b\,c\,(7\,b\,c-18\,a\,d)\right)\sqrt{e}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{15\,d^{11/4}\sqrt{c+d\,x^2}}$$

Result (type 4, 249 leaves):

$$\frac{1}{45\,d^3\sqrt{e\,x}\,\sqrt{c+d\,x^2}}$$

$$2\,e\left(b\,d\,x^2\,(c+d\,x^2)\,(-7\,b\,c+18\,a\,d+5\,b\,d\,x^2)+\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}3\,(7\,b^2\,c^2-18\,a\,b\,c\,d+15\,a^2\,d^2)\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,(c+d\,x^2)-\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\right.\right.$$

$$\left.\left.x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 842: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 193 leaves, 4 steps):

$$-\frac{2\,b\,(5\,b\,c-14\,a\,d)\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{21\,d^2\,e}+\frac{2\,b^2\,(e\,x)^{5/2}\sqrt{c+d\,x^2}}{7\,d\,e^3}+$$

$$\frac{(5\,b^2\,c^2-14\,a\,b\,c\,d+21\,a^2\,d^2)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{21\,c^{1/4}\,d^{9/4}\sqrt{e}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 148 leaves) :

$$\frac{2\,x\left(-b\,\left(c+d\,x^2\right)\,\left(5\,b\,c-14\,a\,d-3\,b\,d\,x^2\right)+\frac{\mathrm{i}\,\left(5\,b^2\,c^2-14\,a\,b\,c\,d+21\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}}\right)}{21\,d^2\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}$$

Problem 843: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 372 leaves, 6 steps) :

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

$$\frac{2\,\left(3\,b^2\,c^2-5\,a\,d\,\left(2\,b\,c+a\,d\right)\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,c^{3/4}\,d^{7/4}\,e^{3/2}\,\sqrt{c+d\,x^2}}-$$

$$\frac{\left(3\,b^2\,c^2-5\,a\,d\,\left(2\,b\,c+a\,d\right)\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{5\,c^{3/4}\,d^{7/4}\,e^{3/2}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 200 leaves) :

$$\frac{1}{5\,c\,d^2\,(e\,x)^{3/2}\,\sqrt{c+d\,x^2}}2\,x\left(d\,\left(-5\,a^2\,d+b^2\,c\,x^2\right)\,\left(c+d\,x^2\right)+\left(3\,b^2\,c^2-10\,a\,b\,c\,d-5\,a^2\,d^2\right)\,x^{3/2}\left(-\left(d+\frac{c}{x^2}\right)\,\sqrt{x}+\frac{\dot{\imath}\,c\,\sqrt{1+\frac{c}{d\,x^2}}\,\left(\text{EllipticE}\left[\dot{\imath}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\dot{\imath}\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[\dot{\imath}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\dot{\imath}\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)}{\left(\frac{\dot{\imath}\,\sqrt{c}}{\sqrt{d}}\right)^{3/2}}\right)\right)$$

Problem 844: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 184 leaves, 4 steps):

$$-\frac{2\,a^2\,\sqrt{c+d\,x^2}}{3\,c\,e\,(e\,x)^{3/2}}+\frac{2\,b^2\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{3\,d\,e^3}-\frac{\left(b^2\,c^2-6\,a\,b\,c\,d+a^2\,d^2\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{3\,c^{5/4}\,d^{5/4}\,e^{5/2}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 165 leaves):

$$\left(x\left(2\,\sqrt{\frac{\dot{\imath}\,\sqrt{c}}{\sqrt{d}}}\,\left(-a^2\,d+b^2\,c\,x^2\right)\,\left(c+d\,x^2\right)-2\,\dot{\imath}\,\left(b^2\,c^2-6\,a\,b\,c\,d+a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{5/2}\,\text{EllipticF}\left[\dot{\imath}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\dot{\imath}\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(3\,c\,\sqrt{\frac{\dot{\imath}\,\sqrt{c}}{\sqrt{d}}}\,d\,(e\,x)^{5/2}\,\sqrt{c+d\,x^2}\right)$$

Problem 845: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 387 leaves, 6 steps):

$$-\frac{2 a^2 \sqrt{c+d x^2}}{5 c e (e x)^{5/2}}-\frac{2 a (10 b c-3 a d) \sqrt{c+d x^2}}{5 c^2 e^3 \sqrt{e x}}+\frac{2 \left(5 b^2 c^2+10 a b c d-3 a^2 d^2\right) \sqrt{e x} \sqrt{c+d x^2}}{5 c^2 \sqrt{d} e^4 \left(\sqrt{c}+\sqrt{d} x\right)}-$$
$$\frac{2 \left(5 b^2 c^2+10 a b c d-3 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{5 c^{7/4} d^{3/4} e^{7/2} \sqrt{c+d x^2}}+$$
$$\frac{\left(5 b^2 c^2+10 a b c d-3 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{5 c^{7/4} d^{3/4} e^{7/2} \sqrt{c+d x^2}}$$

Result (type 4, 217 leaves):

$$\frac{1}{5 (e x)^{7/2}} x^{7/2} \left(-\frac{2 a \sqrt{c+d x^2} \left(10 b c x^2+a \left(c-3 d x^2\right)\right)}{c^2 x^{5/2}}-\frac{1}{c^2 d \sqrt{c+d x^2}}\right.$$
$$\left.2 \left(5 b^2 c^2+10 a b c d-3 a^2 d^2\right) x \left(-\left(d+\frac{c}{x^2}\right) \sqrt{x}+\frac{i c \sqrt{1+\frac{c}{d x^2}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)}{\left(\frac{i \sqrt{c}}{\sqrt{d}}\right)^{3/2}}\right)\right)$$

Problem 846: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right)^2}{(e x)^{9/2} \sqrt{c+d x^2}} \, dx$$

Optimal (type 4, 193 leaves, 4 steps):

$$-\frac{2 a^2 \sqrt{c+d x^2}}{7 c e (e x)^{7/2}}-\frac{2 a (14 b c-5 a d) \sqrt{c+d x^2}}{21 c^2 e^3 (e x)^{3/2}}+\frac{\left(21 b^2 c^2-14 a b c d+5 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{21 c^{9/4} d^{1/4} e^{9/2} \sqrt{c+d x^2}}$$

Result (type 4, 159 leaves):

$$\frac{x^{9/2} \left(\frac{2 a \left(c+d x^2\right) \left(-3 a c-14 b c x^2+5 a d x^2\right)}{c^2 x^{7/2}}+\frac{2 i \left(21 b^2 c^2-14 a b c d+5 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}} \, x \, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{c^2 \sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}\right)}{21 (e x)^{9/2} \sqrt{c+d x^2}}$$

Problem 847: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 438 leaves, 7 steps):

$$-\frac{2 a^2 \sqrt{c+d x^2}}{9 c e (e x)^{9/2}}-\frac{2 a (18 b c-7 a d) \sqrt{c+d x^2}}{45 c^2 e^3 (e x)^{5/2}}-\frac{2 \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \sqrt{c+d x^2}}{15 c^3 e^5 \sqrt{e x}}+\frac{2 \sqrt{d} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \sqrt{e x} \sqrt{c+d x^2}}{15 c^3 e^6 \left(\sqrt{c}+\sqrt{d} x\right)}-$$

$$\frac{2 d^{1/4} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{15 c^{11/4} e^{11/2} \sqrt{c+d x^2}}+$$

$$\frac{d^{1/4} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{15 c^{11/4} e^{11/2} \sqrt{c+d x^2}}$$

Result (type 4, 288 leaves):

$$\left(\sqrt{e x}\left(-2\sqrt{\frac{i\sqrt{d}\,x}{\sqrt{c}}}\left(c+d x^2\right)\left(45 b^2 c^2 x^4+18 a b c x^2\left(c-3 d x^2\right)+a^2\left(5 c^2-7 c d x^2+21 d^2 x^4\right)\right)+\right.\right.$$

$$6\sqrt{c}\,\sqrt{d}\left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) x^5\sqrt{1+\frac{d x^2}{c}}\ \text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{d}\,x}{\sqrt{c}}}\right],-1\right]-$$

$$\left.\left.6\sqrt{c}\,\sqrt{d}\left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) x^5\sqrt{1+\frac{d x^2}{c}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{d}\,x}{\sqrt{c}}}\right],-1\right]\right)\right)\Bigg/\left(45 c^3 e^6 x^5\sqrt{\frac{i\sqrt{d}\,x}{\sqrt{c}}}\sqrt{c+d x^2}\right)$$

Problem 848: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b x^2\right)^2}{(e x)^{13/2}\sqrt{c+d x^2}}\,dx$$

Optimal (type 4, 242 leaves, 5 steps):

$$-\frac{2 a^2\sqrt{c+d x^2}}{11 c e (e x)^{11/2}}-\frac{2 a\left(22 b c-9 a d\right)\sqrt{c+d x^2}}{77 c^2 e^3 (e x)^{7/2}}-\frac{2\left(77 b^2 c^2-5 a d\left(22 b c-9 a d\right)\right)\sqrt{c+d x^2}}{231 c^3 e^5 (e x)^{3/2}}-$$

$$\frac{d^{3/4}\left(77 b^2 c^2-5 a d\left(22 b c-9 a d\right)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{231 c^{13/4} e^{13/2}\sqrt{c+d x^2}}$$

Result (type 4, 196 leaves):

$$\frac{1}{231 (e x)^{13/2}\sqrt{c+d x^2}}x^{13/2}\left(-\frac{2\left(c+d x^2\right)\left(77 b^2 c^2 x^4+22 a b c x^2\left(3 c-5 d x^2\right)+3 a^2\left(7 c^2-9 c d x^2+15 d^2 x^4\right)\right)}{c^3 x^{11/2}}-\right.$$

$$\left.\frac{2 i d\left(77 b^2 c^2-110 a b c d+45 a^2 d^2\right)\sqrt{1+\frac{c}{d x^2}}\ x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{c^3\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}\right)$$

Problem 849: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 296 leaves, 6 steps):

$$\frac{(b\,c-a\,d)^2\,(e\,x)^{9/2}}{c\,d^2\,e\,\sqrt{c+d\,x^2}}+\frac{5\,\left(117\,b^2\,c^2-198\,a\,b\,c\,d+77\,a^2\,d^2\right)\,e^3\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{231\,d^4}-$$

$$\frac{\left(117\,b^2\,c^2-198\,a\,b\,c\,d+77\,a^2\,d^2\right)\,e\,(e\,x)^{5/2}\,\sqrt{c+d\,x^2}}{77\,c\,d^3}+\frac{2\,b^2\,(e\,x)^{9/2}\,\sqrt{c+d\,x^2}}{11\,d^2\,e}-\frac{1}{462\,d^{17/4}\,\sqrt{c+d\,x^2}}$$

$$5\,c^{3/4}\,\left(117\,b^2\,c^2-198\,a\,b\,c\,d+77\,a^2\,d^2\right)\,e^{7/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]$$

Result (type 4, 226 leaves):

$$\frac{1}{231\,\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,d^4\,\sqrt{c+d\,x^2}}$$

$$e^3\,\sqrt{e\,x}\,\left(\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,\left(77\,a^2\,d^2\,\left(5\,c+2\,d\,x^2\right)+66\,a\,b\,d\,\left(-15\,c^2-6\,c\,d\,x^2+2\,d^2\,x^4\right)+3\,b^2\,\left(195\,c^3+78\,c^2\,d\,x^2-26\,c\,d^2\,x^4+14\,d^3\,x^6\right)\right)-\right.$$

$$\left.5\,i\,c\,\left(117\,b^2\,c^2-198\,a\,b\,c\,d+77\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,\sqrt{x}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 850: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 436 leaves, 7 steps):

$$\frac{(b c-a d)^2 (e x)^{7/2}}{c d^2 e \sqrt{c+d x^2}}-\frac{\left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e (e x)^{3/2} \sqrt{c+d x^2}}{45 c d^3}+$$

$$\frac{2 b^2 (e x)^{7/2} \sqrt{c+d x^2}}{9 d^2 e}+\frac{\left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e^2 \sqrt{e x} \sqrt{c+d x^2}}{15 d^{7/2} \left(\sqrt{c}+\sqrt{d} x\right)}-$$

$$\frac{c^{1/4} \left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{15 d^{15/4} \sqrt{c+d x^2}}+$$

$$\frac{c^{1/4} \left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{30 d^{15/4} \sqrt{c+d x^2}}$$

Result (type 4, 276 leaves) :

$$\frac{1}{45 d^4 x^3 \sqrt{c+d x^2}} (e x)^{5/2} \left(d x^2 \left(-45 a^2 d^2+18 a b d \left(7 c+2 d x^2\right)+b^2 \left(-77 c^2-22 c d x^2+10 d^2 x^4\right)\right)+\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}} 3 \left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) \left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} \left(c+d x^2\right)-\right.\right.$$

$$\left.\left.\sqrt{c} \sqrt{d} \sqrt{1+\frac{c}{d x^2}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]+\sqrt{c} \sqrt{d} \sqrt{1+\frac{c}{d x^2}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right)$$

Problem 851: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 245 leaves, 5 steps) :

$$\frac{(b c-a d)^2 (e x)^{5/2}}{c d^2 e \sqrt{c+d x^2}}-\frac{\left(45 b^2 c^2-70 a b c d+21 a^2 d^2\right) e \sqrt{e x} \sqrt{c+d x^2}}{21 c d^3}+\frac{2 b^2 (e x)^{5/2} \sqrt{c+d x^2}}{7 d^2 e}+$$

$$\frac{\left(45 b^2 c^2-70 a b c d+21 a^2 d^2\right) e^{3/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{42 c^{1/4} d^{13/4} \sqrt{c+d x^2}}$$

Result (type 4, 191 leaves):

$$\frac{1}{21 \sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} d^3 \sqrt{c+d x^2}} e \sqrt{e x} \left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} \left(-21 a^2 d^2+14 a b d \left(5 c+2 d x^2\right)-3 b^2 \left(15 c^2+6 c d x^2-2 d^2 x^4\right)\right)+\right.$$

$$\left.i \left(45 b^2 c^2-70 a b c d+21 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}} \sqrt{x} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 852: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 384 leaves, 6 steps):

$$\frac{(b c-a d)^2 (e x)^{3/2}}{c d^2 e \sqrt{c+d x^2}}+\frac{2 b^2 (e x)^{3/2} \sqrt{c+d x^2}}{5 d^2 e}-\frac{\left(21 b^2 c^2-30 a b c d+5 a^2 d^2\right) \sqrt{e x} \sqrt{c+d x^2}}{5 c d^{5/2} \left(\sqrt{c}+\sqrt{d} x\right)}+$$

$$\frac{\left(21 b^2 c^2-30 a b c d+5 a^2 d^2\right) \sqrt{e} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{5 c^{3/4} d^{11/4} \sqrt{c+d x^2}}-$$

$$\frac{\left(21 b^2 c^2-30 a b c d+5 a^2 d^2\right) \sqrt{e} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]}{10 c^{3/4} d^{11/4} \sqrt{c+d x^2}}$$

Result (type 4, 244 leaves):

$$\left(e\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d\,x^2\left(5\left(b\,c-a\,d\right)^2+2\,b^2\,c\left(c+d\,x^2\right)\right)-\left(21\,b^2\,c^2-30\,a\,b\,c\,d+5\,a^2\,d^2\right)\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\left(c+d\,x^2\right)+\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\left(-\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)\right)\Big/\left(5\,c\,\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d^3\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}\right)$$

Problem 853: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 193 leaves, 4 steps):

$$\frac{\left(b\,c-a\,d\right)^2\sqrt{e\,x}}{c\,d^2\,e\,\sqrt{c+d\,x^2}}+\frac{2\,b^2\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{3\,d^2\,e}-\frac{\left(5\,b^2\,c^2-6\,a\,b\,c\,d-3\,a^2\,d^2\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{6\,c^{5/4}\,d^{9/4}\,\sqrt{e}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 174 leaves):

$$\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,x\left(-6\,a\,b\,c\,d+3\,a^2\,d^2+b^2\,c\left(5\,c+2\,d\,x^2\right)\right)+i\left(-5\,b^2\,c^2+6\,a\,b\,c\,d+3\,a^2\,d^2\right)\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\Big/\left(3\,c\,\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d^2\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}\right)$$

Problem 854: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 393 leaves, 6 steps):

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

$$\frac{\left(3 b^2 c^2-2 a b c d+3 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{c^{7/4} d^{7/4} e^{3/2} \sqrt{c+d x^2}}+$$

$$\frac{\left(3 b^2 c^2-2 a b c d+3 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{2 c^{7/4} d^{7/4} e^{3/2} \sqrt{c+d x^2}}$$

Result (type 4, 250 leaves):

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

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

$$\left.\left.\sqrt{c} \left(3 b^2 c^2-2 a b c d+3 a^2 d^2\right) x \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]\right)\right) \Big/ \left(c^2 d^{3/2} \sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}} (e x)^{3/2} \sqrt{c+d x^2}\right)$$

Problem 855: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 207 leaves, 4 steps):

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

$$\frac{\left(3 b^2 c^2+a d (6 b c-5 a d)\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{6 c^{9/4} d^{5/4} e^{5/2} \sqrt{c+d x^2}}$$

Result (type 4, 181 leaves):

$$\left(x\left(-\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\left(3b^2c^2x^2-6abcdx^2+a^2d\left(2c+5dx^2\right)\right)-i\left(-3b^2c^2-6abcd+5a^2d^2\right)\sqrt{1+\frac{c}{dx^2}}\,x^{5/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Bigg/$$

$$\left(3c^2\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d\,(e x)^{5/2}\sqrt{c+dx^2}\right)$$

Problem 856: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+bx^2\right)^2}{(e x)^{7/2}\left(c+dx^2\right)^{3/2}}\,dx$$

Optimal (type 4, 434 leaves, 7 steps):

$$-\frac{2a^2}{5ce(ex)^{5/2}\sqrt{c+dx^2}}-\frac{2a(10bc-7ad)}{5c^2e^3\sqrt{ex}\sqrt{c+dx^2}}+\frac{\left(5b^2c^2-3ad(10bc-7ad)\right)(ex)^{3/2}}{5c^3e^5\sqrt{c+dx^2}}-$$

$$\frac{\left(5b^2c^2-3ad(10bc-7ad)\right)\sqrt{ex}\sqrt{c+dx^2}}{5c^3\sqrt{d}\,e^4\left(\sqrt{c}+\sqrt{d}\,x\right)}+\frac{\left(5b^2c^2-3ad(10bc-7ad)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+dx^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{5c^{11/4}d^{3/4}e^{7/2}\sqrt{c+dx^2}}-$$

$$\frac{\left(5b^2c^2-3ad(10bc-7ad)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+dx^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{10c^{11/4}d^{3/4}e^{7/2}\sqrt{c+dx^2}}$$

Result (type 4, 277 leaves):

$$\left(i\left(\sqrt{d}\sqrt{\frac{i\sqrt{d}\,x}{\sqrt{c}}}\left(5b^2c^2x^4-10abcx^2\left(2c+3dx^2\right)+a^2\left(-2c^2+14cdx^2+21d^2x^4\right)\right)-\right.\right.$$

$$\sqrt{c}\left(5b^2c^2-30abcd+21a^2d^2\right)x^3\sqrt{1+\frac{dx^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{d}\,x}{\sqrt{c}}}\right],-1\right]+$$

$$\left.\left.\sqrt{c}\left(5b^2c^2-30abcd+21a^2d^2\right)x^3\sqrt{1+\frac{dx^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{d}\,x}{\sqrt{c}}}\right],-1\right]\right)\right)\Bigg/\left(5c^{7/2}e^2\left(\frac{i\sqrt{d}\,x}{\sqrt{c}}\right)^{3/2}(ex)^{3/2}\sqrt{c+dx^2}\right)$$

Problem 857: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 302 leaves, 6 steps):

$$\frac{(b\,c-a\,d)^2\,(e\,x)^{9/2}}{3\,c\,d^2\,e\,(c+d\,x^2)^{3/2}}+\frac{(39\,b^2\,c^2-42\,a\,b\,c\,d+7\,a^2\,d^2)\,e\,(e\,x)^{5/2}}{14\,c\,d^3\,\sqrt{c+d\,x^2}}+\frac{2\,b^2\,(e\,x)^{9/2}}{7\,d^2\,e\,\sqrt{c+d\,x^2}}-\frac{5\,(39\,b^2\,c^2-42\,a\,b\,c\,d+7\,a^2\,d^2)\,e^3\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{42\,c\,d^4}+$$
$$\frac{5\,(39\,b^2\,c^2-42\,a\,b\,c\,d+7\,a^2\,d^2)\,e^{7/2}\,(\sqrt{c}+\sqrt{d}\,x)\,\sqrt{\frac{c+d\,x^2}{(\sqrt{c}+\sqrt{d}\,x)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{84\,c^{1/4}\,d^{17/4}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 222 leaves):

$$\frac{1}{42\,x^{7/2}\,\sqrt{c+d\,x^2}}(e\,x)^{7/2}\left(\frac{1}{d^4\,(c+d\,x^2)}\sqrt{x}\,\left(-7\,a^2\,d^2\,(5\,c+7\,d\,x^2)+14\,a\,b\,d\,(15\,c^2+21\,c\,d\,x^2+4\,d^2\,x^4)-b^2\,(195\,c^3+273\,c^2\,d\,x^2+52\,c\,d^2\,x^4-12\,d^3\,x^6)\right)+\right.$$
$$\left.\frac{5\,i\,(39\,b^2\,c^2-42\,a\,b\,c\,d+7\,a^2\,d^2)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,d^4}\right)$$

Problem 858: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 442 leaves, 7 steps):

$$\frac{(b c-a d)^2 (e x)^{7/2}}{3 c d^2 e \left(c+d x^2\right)^{3/2}}+\frac{\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e (e x)^{3/2}}{30 c d^3 \sqrt{c+d x^2}}+\frac{2 b^2 (e x)^{7/2}}{5 d^2 e \sqrt{c+d x^2}}-\frac{\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e^2 \sqrt{e x} \sqrt{c+d x^2}}{10 c d^{7/2} \left(\sqrt{c}+\sqrt{d} x\right)}+$$

$$\frac{\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{10 c^{3/4} d^{15/4} \sqrt{c+d x^2}}-$$

$$\frac{\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{20 c^{3/4} d^{15/4} \sqrt{c+d x^2}}$$

Result (type 4, 298 leaves):

$$\frac{1}{30 c d^4 x^3 \left(c+d x^2\right)^{3/2}} (e x)^{5/2} \left(-d x^2 \left(-5 a^2 d^2 \left(c+3 d x^2\right)+10 a b c d \left(7 c+9 d x^2\right)-b^2 c \left(77 c^2+99 c d x^2+12 d^2 x^4\right)\right)-\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}} 3 \left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) \left(c+d x^2\right) \left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} \left(c+d x^2\right)-\sqrt{c} \sqrt{d} \sqrt{1+\frac{c}{d x^2}}\, x^{3/2}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]+\sqrt{c} \sqrt{d} \sqrt{1+\frac{c}{d x^2}}\, x^{3/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right)$$

Problem 859: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 248 leaves, 5 steps):

$$\frac{(b c-a d)^2 (e x)^{5/2}}{3 c d^2 e \left(c+d x^2\right)^{3/2}}+\frac{\left(15 b^2 c^2-10 a b c d-a^2 d^2\right) e \sqrt{e x}}{6 c d^3 \sqrt{c+d x^2}}+\frac{2 b^2 (e x)^{5/2}}{3 d^2 e \sqrt{c+d x^2}}-$$

$$\frac{\left(15 b^2 c^2-10 a b c d-a^2 d^2\right) e^{3/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{12 c^{5/4} d^{13/4} \sqrt{c+d x^2}}$$

Result (type 4, 204 leaves):

$$\frac{1}{6\,x^{3/2}\,\sqrt{c+d\,x^2}}(e\,x)^{3/2}\left(\frac{\sqrt{x}\,\left(a^2\,d^2\,\left(-c+d\,x^2\right)-2\,a\,b\,c\,d\,\left(5\,c+7\,d\,x^2\right)+b^2\,c\,\left(15\,c^2+21\,c\,d\,x^2+4\,d^2\,x^4\right)\right)}{c\,d^3\,\left(c+d\,x^2\right)}+\frac{i\,\left(-15\,b^2\,c^2+10\,a\,b\,c\,d+a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{c\,\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,d^3}\right)$$

Problem 860: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 403 leaves, 6 steps):

$$\frac{(b\,c-a\,d)^2\,(e\,x)^{3/2}}{3\,c\,d^2\,e\,\left(c+d\,x^2\right)^{3/2}}-\frac{(b\,c-a\,d)\,(3\,b\,c+a\,d)\,(e\,x)^{3/2}}{2\,c^2\,d^2\,e\,\sqrt{c+d\,x^2}}+\frac{\left(7\,b^2\,c^2-2\,a\,b\,c\,d-a^2\,d^2\right)\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{2\,c^2\,d^{5/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)}-\frac{\left(7\,b^2\,c^2-2\,a\,b\,c\,d-a^2\,d^2\right)\,\sqrt{e}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{2\,c^{7/4}\,d^{11/4}\,\sqrt{c+d\,x^2}}+\frac{\left(7\,b^2\,c^2-2\,a\,b\,c\,d-a^2\,d^2\right)\,\sqrt{e}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{4\,c^{7/4}\,d^{11/4}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 281 leaves):

$$\frac{1}{6\,c^2\,d^3\,\sqrt{e\,x}\,\left(c+d\,x^2\right)^{3/2}}$$

$$e\left(d\,x^2\left(2\,c\,(b\,c-a\,d)^2-3\,\left(3\,b^2\,c^2-2\,a\,b\,c\,d-a^2\,d^2\right)\left(c+d\,x^2\right)\right)+\frac{1}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}3\,\left(7\,b^2\,c^2-2\,a\,b\,c\,d-a^2\,d^2\right)\left(c+d\,x^2\right)\left(\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,\left(c+d\,x^2\right)-\right.\right.$$

$$\left.\left.\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{c}{d\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)$$

Problem 861: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{(b\,c-a\,d)^2\,\sqrt{e\,x}}{3\,c\,d^2\,e\,\left(c+d\,x^2\right)^{3/2}}-\frac{(b\,c-a\,d)\,(7\,b\,c+5\,a\,d)\,\sqrt{e\,x}}{6\,c^2\,d^2\,e\,\sqrt{c+d\,x^2}}+\frac{\left(5\,b^2\,c^2+2\,a\,b\,c\,d+5\,a^2\,d^2\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]}{12\,c^{9/4}\,d^{9/4}\,\sqrt{e}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 169 leaves):

$$\frac{x\left(-7\,b^2\,c^2+2\,a\,b\,c\,d+5\,a^2\,d^2+\frac{2\,c\,(b\,c-a\,d)^2}{c+d\,x^2}+\frac{i\,\left(5\,b^2\,c^2+2\,a\,b\,c\,d+5\,a^2\,d^2\right)\sqrt{1+\frac{c}{d\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}\right)}{6\,c^2\,d^2\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}$$

Problem 862: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 442 leaves, 7 steps):

$$-\frac{2 a^2}{c e \sqrt{e x} \left(c+d x^2\right)^{3/2}}-\frac{\left(b^2 c^2-2 a b c d+7 a^2 d^2\right) (e x)^{3/2}}{3 c^2 d e^3 \left(c+d x^2\right)^{3/2}}+\frac{\left(b^2 c^2+a d (2 b c-7 a d)\right) (e x)^{3/2}}{2 c^3 d e^3 \sqrt{c+d x^2}}-$$
$$\frac{\left(b^2 c^2+a d (2 b c-7 a d)\right) \sqrt{e x} \sqrt{c+d x^2}}{2 c^3 d^{3/2} e^2 \left(\sqrt{c}+\sqrt{d} x\right)}+\frac{\left(b^2 c^2+a d (2 b c-7 a d)\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{2 c^{11/4} d^{7/4} e^{3/2} \sqrt{c+d x^2}}-$$
$$\frac{\left(b^2 c^2+a d (2 b c-7 a d)\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{4 c^{11/4} d^{7/4} e^{3/2} \sqrt{c+d x^2}}$$

Result (type 4, 222 leaves):

$$\frac{1}{6 c^3 d (e x)^{3/2} \sqrt{c+d x^2}} \times \left(\frac{b^2 c^2 x^2 \left(c+3 d x^2\right)+2 a b c d x^2 \left(5 c+3 d x^2\right)-a^2 d \left(12 c^2+35 c d x^2+21 d^2 x^4\right)}{c+d x^2}-\frac{1}{\left(\frac{i \sqrt{d} x}{\sqrt{c}}\right)^{3/2}}\right.$$
$$\left.3 i \left(b^2 c^2+2 a b c d-7 a^2 d^2\right) x^2 \sqrt{1+\frac{d x^2}{c}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]\right)\right)$$

Problem 863: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 258 leaves, 5 steps):

$$-\frac{2 a^2}{3 c e (e x)^{3/2} \left(c+d x^2\right)^{3/2}}-\frac{\left(b^2 c^2-2 a b c d+3 a^2 d^2\right) \sqrt{e x}}{3 c^2 d e^3 \left(c+d x^2\right)^{3/2}}+\frac{\left(b^2 c^2+5 a d (2 b c-3 a d)\right) \sqrt{e x}}{6 c^3 d e^3 \sqrt{c+d x^2}}+$$
$$\frac{\left(b^2 c^2+5 a d (2 b c-3 a d)\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]}{12 c^{13/4} d^{5/4} e^{5/2} \sqrt{c+d x^2}}$$

Result (type 4, 211 leaves):

$$\frac{1}{6\,(e\,x)^{5/2}\sqrt{c+d\,x^2}}x^{5/2}\left(\frac{b^2\,c^2\,x^2\,\left(-c+d\,x^2\right)+2\,a\,b\,c\,d\,x^2\,\left(7\,c+5\,d\,x^2\right)-a^2\,d\,\left(4\,c^2+21\,c\,d\,x^2+15\,d^2\,x^4\right)}{c^3\,d\,x^{3/2}\,\left(c+d\,x^2\right)}+\right.$$

$$\left.\frac{i\,\left(b^2\,c^2+10\,a\,b\,c\,d-15\,a^2\,d^2\right)\sqrt{1+\frac{c}{d\,x^2}}\;x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]}{c^3\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\;d}\right)$$

Problem 864: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 489 leaves, 8 steps):

$$-\frac{2\,a^2}{5\,c\,e\,(e\,x)^{5/2}\left(c+d\,x^2\right)^{3/2}}-\frac{2\,a\,\left(10\,b\,c-11\,a\,d\right)}{5\,c^2\,e^3\sqrt{e\,x}\,\left(c+d\,x^2\right)^{3/2}}+\frac{\left(5\,b^2\,c^2-70\,a\,b\,c\,d+77\,a^2\,d^2\right)\,(e\,x)^{3/2}}{15\,c^3\,e^5\,\left(c+d\,x^2\right)^{3/2}}+\frac{\left(5\,b^2\,c^2-70\,a\,b\,c\,d+77\,a^2\,d^2\right)\,(e\,x)^{3/2}}{10\,c^4\,e^5\sqrt{c+d\,x^2}}-$$

$$\frac{\left(5\,b^2\,c^2-70\,a\,b\,c\,d+77\,a^2\,d^2\right)\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{10\,c^4\sqrt{d}\,e^4\left(\sqrt{c}+\sqrt{d}\,x\right)}+\frac{\left(5\,b^2\,c^2-70\,a\,b\,c\,d+77\,a^2\,d^2\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{10\,c^{15/4}\,d^{3/4}\,e^{7/2}\sqrt{c+d\,x^2}}-$$

$$\frac{\left(5\,b^2\,c^2-70\,a\,b\,c\,d+77\,a^2\,d^2\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]}{20\,c^{15/4}\,d^{3/4}\,e^{7/2}\sqrt{c+d\,x^2}}$$

Result (type 4, 246 leaves):

$$\frac{1}{30\,c^4\,(e\,x)^{7/2}\,\sqrt{c+d\,x^2}}$$

$$x\left(\frac{1}{c+d\,x^2}\left(5\,b^2\,c^2\,x^4\,\left(5\,c+3\,d\,x^2\right)-10\,a\,b\,c\,x^2\,\left(12\,c^2+35\,c\,d\,x^2+21\,d^2\,x^4\right)+a^2\,\left(-12\,c^3+132\,c^2\,d\,x^2+385\,c\,d^2\,x^4+231\,d^3\,x^6\right)\right)+\frac{1}{d}\right.$$

$$\left.3\,\mathrm{i}\,c\,\left(5\,b^2\,c^2-70\,a\,b\,c\,d+77\,a^2\,d^2\right)\,x^2\,\sqrt{\frac{\mathrm{i}\,\sqrt{d}\,x}{\sqrt{c}}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{d}\,x}{\sqrt{c}}}\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{d}\,x}{\sqrt{c}}}\right],-1\right]\right)\right)$$

Problem 865: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 372 leaves, 11 steps):

$$\frac{2\,(2\,b\,c-7\,a\,d)\,e^3\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{21\,b^2\,d}-\frac{2\,e\,(e\,x)^{5/2}\,\sqrt{c-d\,x^2}}{7\,b}-\frac{2\,c^{1/4}\,\left(2\,b^2\,c^2+14\,a\,b\,c\,d-21\,a^2\,d^2\right)\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{21\,b^3\,d^{5/4}\,\sqrt{c-d\,x^2}}+$$

$$\frac{a\,c^{1/4}\,(b\,c-a\,d)\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^3\,d^{1/4}\,\sqrt{c-d\,x^2}}+$$

$$\frac{a\,c^{1/4}\,(b\,c-a\,d)\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^3\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 382 leaves):

$$\frac{1}{105\,b^2\,d\,x^3\,\sqrt{c-d\,x^2}}2\,(e\,x)^{7/2}\,\left(5\,\left(c-d\,x^2\right)\,\left(2\,b\,c-7\,a\,d-3\,b\,d\,x^2\right)+\left(25\,a^2\,c^2\,(-2\,b\,c+7\,a\,d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(a-b\,x^2\right)\right.\right.$$

$$\left.\left.\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)-$$

$$\left(9\,a\,c\,\left(-2\,b^2\,c^2-14\,a\,b\,c\,d+21\,a^2\,d^2\right)\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(a-b\,x^2\right)\right.$$

$$\left.\left.\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 866: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 414 leaves, 15 steps):

$$-\frac{2\,e\,(e\,x)^{3/2}\sqrt{c-d\,x^2}}{5\,b}-\frac{2\,c^{3/4}\,(2\,b\,c-5\,a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5\,b^2\,d^{3/4}\sqrt{c-d\,x^2}}+$$
$$\frac{2\,c^{3/4}\,(2\,b\,c-5\,a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5\,b^2\,d^{3/4}\sqrt{c-d\,x^2}}-$$
$$\frac{\sqrt{a}\,c^{1/4}\,(b\,c-a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{b^{5/2}\,d^{1/4}\sqrt{c-d\,x^2}}+$$
$$\frac{\sqrt{a}\,c^{1/4}\,(b\,c-a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{b^{5/2}\,d^{1/4}\sqrt{c-d\,x^2}}$$

Result (type 6, 418 leaves):

$$\frac{1}{35\,b\,(-a+b\,x^2)\sqrt{c-d\,x^2}}2\,e\,(e\,x)^{3/2}\left(-\left(\left(49\,a^2\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left.\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(11\,a\,c\,(7\,a\,c-9\,b\,c\,x^2-2\,a\,d\,x^2+7\,b\,d\,x^4)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.14\,x^2\,(a-b\,x^2)\,(c-d\,x^2)\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/$$
$$\left.\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 867: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}{a-b\,x^2}\,dx$$

Optimal (type 4, 315 leaves, 10 steps):

$$-\frac{2\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{3\,b}-\frac{2\,c^{1/4}\,(2\,b\,c-3\,a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{3\,b^2\,d^{1/4}\,\sqrt{c-d\,x^2}}+$$
$$\frac{c^{1/4}\,(b\,c-a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^2\,d^{1/4}\,\sqrt{c-d\,x^2}}+$$
$$\frac{c^{1/4}\,(b\,c-a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^2\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 418 leaves):

$$\frac{1}{15\,b\,(-a+b\,x^2)\,\sqrt{c-d\,x^2}}2\,e\,\sqrt{e\,x}\,\Bigg(-\Bigg(\Bigg(25\,a^2\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Big/$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Bigg)+$$
$$\Bigg(9\,a\,c\,(5\,a\,c-7\,b\,c\,x^2-2\,a\,d\,x^2+5\,b\,d\,x^4)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$10\,x^2\,(a-b\,x^2)\,(c-d\,x^2)\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Big/$$
$$\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Bigg)$$

Problem 868: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 365 leaves, 13 steps):

$$\frac{2\,c^{3/4}\,d^{1/4}\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b\,\sqrt{c-d\,x^2}}-\frac{2\,c^{3/4}\,d^{1/4}\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(b\,c-a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{\sqrt{a}\,b^{3/2}\,d^{1/4}\,\sqrt{c-d\,x^2}}+$$

$$\frac{c^{1/4}\,(b\,c-a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{\sqrt{a}\,b^{3/2}\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 164 leaves):

$$-\left(\left(14\,a\,c\,x\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}\,\text{AppellF1}\left[\frac{3}{4},-\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(3\,(a-b\,x^2)\,\left(-7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},-\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(-2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},-\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 869: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 283 leaves, 9 steps):

$$\frac{2\,c^{1/4}\,d^{3/4}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b\,\sqrt{e}\,\sqrt{c-d\,x^2}}+$$

$$\frac{c^{1/4}\,(b\,c-a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a\,b\,d^{1/4}\,\sqrt{e}\,\sqrt{c-d\,x^2}}+\frac{c^{1/4}\,(b\,c-a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a\,b\,d^{1/4}\,\sqrt{e}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 162 leaves):

$$-\left(\left(10\,a\,c\,x\,\sqrt{c-d\,x^2}\,\text{AppellF1}\left[\frac{1}{4},-\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\sqrt{e\,x}\,(a-b\,x^2)\,\left(-5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},-\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(-2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},-\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 870: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 392 leaves, 15 steps):

$$-\frac{2\sqrt{c-d x^2}}{a e\sqrt{e x}}-\frac{2 c^{3/4} d^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a e^{3/2}\sqrt{c-d x^2}}+\frac{2 c^{3/4} d^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a e^{3/2}\sqrt{c-d x^2}}-$$
$$\frac{c^{1/4}(b c-a d)\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{3/2}\sqrt{b}\ d^{1/4} e^{3/2}\sqrt{c-d x^2}}+\frac{c^{1/4}(b c-a d)\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{3/2}\sqrt{b}\ d^{1/4} e^{3/2}\sqrt{c-d x^2}}$$

Result (type 6, 337 leaves):

$$\frac{1}{21\,(e x)^{3/2}\sqrt{c-d x^2}}2 x\left(-\frac{21\left(c-d x^2\right)}{a}+\left(49 c\,(b c-2 a d)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right)\right.\right.$$
$$\left(7 a c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big)-$$
$$\left(33 b c d x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right)\left(11 a c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 871: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 308 leaves, 10 steps):

$$-\frac{2\sqrt{c-d x^2}}{3 a e (e x)^{3/2}}+\frac{2 c^{1/4} d^{3/4}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{3 a e^{5/2}\sqrt{c-d x^2}}+$$
$$\frac{c^{1/4}(b c-a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^2 d^{1/4} e^{5/2}\sqrt{c-d x^2}}+\frac{c^{1/4}(b c-a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^2 d^{1/4} e^{5/2}\sqrt{c-d x^2}}$$

Result (type 6, 338 leaves):

$$\frac{1}{15 (e x)^{5/2}\sqrt{c-d x^2}}2 x\left(-\frac{5\left(c-d x^2\right)}{a}+\left(25 c (3 b c-2 a d) x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right)\right.\right.$$
$$\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big)+$$
$$\left(9 b c d x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right)\left(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 872: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{c-d x^2}}{(e x)^{7/2}\left(a-b x^2\right)}\,dx$$

Optimal (type 4, 457 leaves, 16 steps):

$$-\frac{2\sqrt{c-d x^2}}{5 a e (e x)^{5/2}}-\frac{2(5 b c-2 a d)\sqrt{c-d x^2}}{5 a^2 c e^3\sqrt{e x}}-\frac{2 d^{1/4}(5 b c-2 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5 a^2 c^{1/4} e^{7/2}\sqrt{c-d x^2}}+$$
$$\frac{2 d^{1/4}(5 b c-2 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5 a^2 c^{1/4} e^{7/2}\sqrt{c-d x^2}}-\frac{\sqrt{b}\,c^{1/4}(b c-a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2} d^{1/4} e^{7/2}\sqrt{c-d x^2}}+$$
$$\frac{\sqrt{b}\,c^{1/4}(b c-a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2} d^{1/4} e^{7/2}\sqrt{c-d x^2}}$$

Result (type 6, 381 leaves):

$$\frac{1}{105\,a^2\,(e\,x)^{7/2}\,\sqrt{c-d\,x^2}}$$

$$2\,x\left(-\frac{21\,(c-d\,x^2)\,\left(5\,b\,c\,x^2+a\,(c-2\,d\,x^2)\right)}{c}+\left(49\,a\,(5\,b^2\,c^2-10\,a\,b\,c\,d+2\,a^2\,d^2)\,x^4\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((a-b\,x^2)\right.\right.$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big)+$$
$$\left(33\,a\,b\,d\,(5\,b\,c-2\,a\,d)\,x^6\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((a-b\,x^2)\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 873: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 485 leaves, 16 steps):

$$-\frac{2\,(11\,b\,c-9\,a\,d)\,e\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}{45\,b^2}+\frac{2\,d\,(e\,x)^{7/2}\,\sqrt{c-d\,x^2}}{9\,b\,e}-$$
$$\frac{2\,c^{3/4}\,(4\,b^2\,c^2-21\,a\,b\,c\,d+15\,a^2\,d^2)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{15\,b^3\,d^{3/4}\,\sqrt{c-d\,x^2}}+$$
$$\frac{2\,c^{3/4}\,(4\,b^2\,c^2-21\,a\,b\,c\,d+15\,a^2\,d^2)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{15\,b^3\,d^{3/4}\,\sqrt{c-d\,x^2}}-$$
$$\frac{\sqrt{a}\,c^{1/4}\,(b\,c-a\,d)^2\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}}+$$
$$\frac{\sqrt{a}\,c^{1/4}\,(b\,c-a\,d)^2\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 378 leaves):

$$\frac{1}{315\, b^2 \sqrt{c - d x^2}} 2 e (e x)^{3/2} \left(-7 (c - d x^2) (11 b c - 9 a d - 5 b d x^2) + \left(49 a^2 c^2 (-11 b c + 9 a d) \text{AppellF1}\left[\frac{3}{4}, \frac{1}{2}, 1, \frac{7}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right) \Big/ \left((-a + b x^2) \left(7 a c \text{AppellF1}\left[\frac{3}{4}, \frac{1}{2}, 1, \frac{7}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 2, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{7}{4}, \frac{3}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right)\right) + \left(33 a c (4 b^2 c^2 - 21 a b c d + 15 a^2 d^2) x^2 \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right) \Big/ \left((a - b x^2) \left(11 a c \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4}, \frac{1}{2}, 2, \frac{15}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{11}{4}, \frac{3}{2}, 1, \frac{15}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 874: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 372 leaves, 11 steps):

$$-\frac{2 (9 b c - 7 a d) e \sqrt{e x} \sqrt{c - d x^2}}{21 b^2} + \frac{2 d (e x)^{5/2} \sqrt{c - d x^2}}{7 b e} - \frac{2 c^{1/4} (12 b^2 c^2 - 35 a b c d + 21 a^2 d^2) e^{3/2} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]}{21 b^3 d^{1/4} \sqrt{c - d x^2}} + \frac{c^{1/4} (b c - a d)^2 e^{3/2} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]}{b^3 d^{1/4} \sqrt{c - d x^2}} + \frac{c^{1/4} (b c - a d)^2 e^{3/2} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]}{b^3 d^{1/4} \sqrt{c - d x^2}}$$

Result (type 6, 378 leaves):

$$\frac{1}{105\, b^2 \sqrt{c - d x^2}} 2 e \sqrt{e x} \left(-5 (c - d x^2) (9 b c - 7 a d - 3 b d x^2) + \left(25 a^2 c^2 (-9 b c + 7 a d) \text{AppellF1}\left[\frac{1}{4}, \frac{1}{2}, 1, \frac{5}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right) \Big/ \left((-a + b x^2) \left(5 a c \text{AppellF1}\left[\frac{1}{4}, \frac{1}{2}, 1, \frac{5}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4}, \frac{1}{2}, 2, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{5}{4}, \frac{3}{2}, 1, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right)\right) + \left(9 a c (12 b^2 c^2 - 35 a b c d + 21 a^2 d^2) x^2 \text{AppellF1}\left[\frac{5}{4}, \frac{1}{2}, 1, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right) \Big/ \left((a - b x^2) \left(9 a c \text{AppellF1}\left[\frac{5}{4}, \frac{1}{2}, 1, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4}, \frac{1}{2}, 2, \frac{13}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{9}{4}, \frac{3}{2}, 1, \frac{13}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 875: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 421 leaves, 15 steps):

$$\frac{2 d\,(e x)^{3/2}\sqrt{c-d x^2}}{5 b e}+\frac{2 c^{3/4} d^{1/4}\,(7 b c-5 a d)\,\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5 b^2\sqrt{c-d x^2}}-$$

$$\frac{2 c^{3/4} d^{1/4}\,(7 b c-5 a d)\,\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5 b^2\sqrt{c-d x^2}}-$$

$$\frac{c^{1/4}\,(b c-a d)^2\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{\sqrt{a}\,b^{5/2} d^{1/4}\sqrt{c-d x^2}}+$$

$$\frac{c^{1/4}\,(b c-a d)^2\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{\sqrt{a}\,b^{5/2} d^{1/4}\sqrt{c-d x^2}}$$

Result (type 6, 427 leaves):

$$\Bigg(2 x\sqrt{e x}\,\Bigg(\Bigg(49 a c^2\,(-5 b c+3 a d)\ \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg/$$
$$\left(7 a c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$
$$\Bigg(-33 a c d\,\left(7 a c-14 b c x^2-2 a d x^2+7 b d x^4\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-42 d x^2\,\left(a-b x^2\right)\,\left(c-d x^2\right)$$
$$\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Bigg/\Bigg(11 a c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(105 b\,\left(-a+b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 876: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 328 leaves, 10 steps):

$$\frac{2 d \sqrt{e x}\,\sqrt{c-d x^2}}{3 b e}+\frac{2 c^{1/4} d^{3/4}\,(5 b c-3 a d)\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{3 b^2 \sqrt{e}\,\sqrt{c-d x^2}}+$$
$$\frac{c^{1/4}\,(b c-a d)^2\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a b^2 d^{1/4}\sqrt{e}\,\sqrt{c-d x^2}}+\frac{c^{1/4}\,(b c-a d)^2\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a b^2 d^{1/4}\sqrt{e}\,\sqrt{c-d x^2}}$$

Result (type 6, 425 leaves):

$$\Bigg(2 x \Bigg(\bigg(25 a c^2 (-3 b c+a d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\bigg)\Big/$$
$$\bigg(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\bigg)+$$
$$\bigg(d \bigg(-9 a c\,\left(5 a c-10 b c x^2-2 a d x^2+5 b d x^4\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-10 x^2 \left(a-b x^2\right)\left(c-d x^2\right)$$
$$\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\bigg)\bigg)\Big/\bigg(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2 \left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\bigg)\Bigg)\Bigg)\Big/\left(15 b \sqrt{e x}\,\left(-a+b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 877: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 417 leaves, 15 steps):

$$-\frac{2 c \sqrt{c-d x^2}}{a e \sqrt{e x}}-\frac{2 c^{3/4} d^{1/4} (b c+a d) \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{a b e^{3/2} \sqrt{c-d x^2}}+$$

$$\frac{2 c^{3/4} d^{1/4} (b c+a d) \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{a b e^{3/2} \sqrt{c-d x^2}}-\frac{c^{1/4} (b c-a d)^2 \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{a^{3/2} b^{3/2} d^{1/4} e^{3/2} \sqrt{c-d x^2}}+$$

$$\frac{c^{1/4} (b c-a d)^2 \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{a^{3/2} b^{3/2} d^{1/4} e^{3/2} \sqrt{c-d x^2}}$$

Result (type 6, 436 leaves) :

$$\Bigg(2 c x \Bigg(\Bigg(49 c (b c-3 a d) x^2 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg/$$
$$\Bigg(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)+$$
$$\Bigg(33 a \left(b c x^2 \left(7 c-6 d x^2\right)+a \left(-7 c^2+7 c d x^2+d^2 x^4\right)\right) \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-$$
$$42 x^2 \left(a-b x^2\right) \left(c-d x^2\right) \left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Bigg/$$
$$\Bigg(a \Bigg(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \Bigg(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\left(21 (e x)^{3/2} \left(a-b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 878: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 330 leaves, 10 steps) :

$$-\frac{2c\sqrt{c-dx^2}}{3ae(ex)^{3/2}}+\frac{2c^{1/4}d^{3/4}(bc-3ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{3abe^{5/2}\sqrt{c-dx^2}}+$$

$$\frac{c^{1/4}(bc-ad)^2\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^2bd^{1/4}e^{5/2}\sqrt{c-dx^2}}+\frac{c^{1/4}(bc-ad)^2\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^2bd^{1/4}e^{5/2}\sqrt{c-dx^2}}$$

Result (type 6, 438 leaves):

$$\Bigg(2cx\Bigg(\Bigg(25c(3bc-5ad)x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Bigg/$$
$$\Bigg(5ac\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\Bigg(2bc\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Bigg)+$$
$$\Bigg(9a\left(bcx^2(5c-6dx^2)+a(-5c^2+5cdx^2+3d^2x^4)\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]-10x^2(a-bx^2)(c-dx^2)$$
$$\Bigg(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Bigg)\Bigg/\Bigg(a\Bigg(9ac\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+$$
$$2x^2\Bigg(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\Bigg(15(ex)^{5/2}(a-bx^2)\sqrt{c-dx^2}\Bigg)$$

Problem 879: Result unnecessarily involves higher level functions.

$$\int\frac{(c-dx^2)^{3/2}}{(ex)^{7/2}(a-bx^2)}\,dx$$

Optimal (type 4, 459 leaves, 16 steps):

$$-\frac{2c\sqrt{c-dx^2}}{5ae(ex)^{5/2}}-\frac{2(5bc-7ad)\sqrt{c-dx^2}}{5a^2e^3\sqrt{ex}}-\frac{2c^{3/4}d^{1/4}(5bc-7ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5a^2e^{7/2}\sqrt{c-dx^2}}+$$

$$\frac{2c^{3/4}d^{1/4}(5bc-7ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5a^2e^{7/2}\sqrt{c-dx^2}}-$$

$$\frac{c^{1/4}(bc-ad)^2\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2}\sqrt{b}\,d^{1/4}e^{7/2}\sqrt{c-dx^2}}+\frac{c^{1/4}(bc-ad)^2\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2}\sqrt{b}\,d^{1/4}e^{7/2}\sqrt{c-dx^2}}$$

Result (type 6, 380 leaves):

$$\frac{1}{105\,a^2\,(e\,x)^{7/2}\,\sqrt{c-d\,x^2}}\,2\,x\,\Bigg(-21\,(c-d\,x^2)\,(5\,b\,c\,x^2+a\,(c-7\,d\,x^2))+\Big(49\,a\,c\,(5\,b^2\,c^2-15\,a\,b\,c\,d+12\,a^2\,d^2)\,x^4\,\text{AppellF1}\Big[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big/\Big((a-b\,x^2)\Big(7\,a\,c\,\text{AppellF1}\Big[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+2\,x^2\Big(2\,b\,c\,\text{AppellF1}\Big[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+a\,d\,\text{AppellF1}\Big[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big)\Big)+\Big(33\,a\,b\,c\,d\,(5\,b\,c-7\,a\,d)\,x^6\,\text{AppellF1}\Big[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big/\Big((a-b\,x^2)\Big(11\,a\,c\,\text{AppellF1}\Big[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+2\,x^2\Big(2\,b\,c\,\text{AppellF1}\Big[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+a\,d\,\text{AppellF1}\Big[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big)\Big)\Bigg)$$

Problem 880: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 305 leaves, 10 steps):

$$\frac{2\,e^3\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{3\,b\,d}-\frac{2\,c^{1/4}\,(b\,c+3\,a\,d)\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\Big],-1\Big]}{3\,b^2\,d^{5/4}\,\sqrt{c-d\,x^2}}+\frac{a\,c^{1/4}\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\Big[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\Big[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\Big],-1\Big]}{b^2\,d^{1/4}\,\sqrt{c-d\,x^2}}+\frac{a\,c^{1/4}\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\Big[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\Big[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\Big],-1\Big]}{b^2\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 423 leaves):

$$\left(2 (e x)^{7/2} \left(\left(25 a^2 c^2 \text{AppellF1}\left[\frac{1}{4}, \frac{1}{2}, 1, \frac{5}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right) \Big/ \left(5 a c \text{AppellF1}\left[\frac{1}{4}, \frac{1}{2}, 1, \frac{5}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4}, \frac{1}{2}, 2, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{5}{4}, \frac{3}{2}, 1, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right) + \left(-9 a c \left(5 a c - 4 b c x^2 - 2 a d x^2 + 5 b d x^4\right) \text{AppellF1}\left[\frac{5}{4}, \frac{1}{2}, 1, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] - 10 x^2 \left(a - b x^2\right) \left(c - d x^2\right) \left(2 b c \text{AppellF1}\left[\frac{9}{4}, \frac{1}{2}, 2, \frac{13}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{9}{4}, \frac{3}{2}, 1, \frac{13}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right) \Big/ \left(9 a c \text{AppellF1}\left[\frac{5}{4}, \frac{1}{2}, 1, \frac{9}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4}, \frac{1}{2}, 2, \frac{13}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{9}{4}, \frac{3}{2}, 1, \frac{13}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right)\right)\right) \Big/ \left(15 b d x^3 \left(-a + b x^2\right) \sqrt{c - d x^2}\right)$$

Problem 881: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 349 leaves, 13 steps):

$$-\frac{2 c^{3/4} e^{5/2} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]}{b d^{3/4} \sqrt{c - d x^2}} + \frac{2 c^{3/4} e^{5/2} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]}{b d^{3/4} \sqrt{c - d x^2}} - \frac{\sqrt{a} c^{1/4} e^{5/2} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]}{b^{3/2} d^{1/4} \sqrt{c - d x^2}} + \frac{\sqrt{a} c^{1/4} e^{5/2} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]}{b^{3/2} d^{1/4} \sqrt{c - d x^2}}$$

Result (type 6, 165 leaves):

$$-\left(\left(22 a c x (e x)^{5/2} \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right) \Big/ \left(7 \left(-a + b x^2\right) \sqrt{c - d x^2} \left(11 a c \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4}, \frac{1}{2}, 2, \frac{15}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{11}{4}, \frac{3}{2}, 1, \frac{15}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 882: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{3/2}}{\left(a - b x^2\right) \sqrt{c - d x^2}} \, dx$$

Optimal (type 4, 261 leaves, 9 steps):

$$-\frac{2\, c^{1/4}\, e^{3/2}\, \sqrt{1-\frac{d\,x^2}{c}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,-1\right]}{b\, d^{1/4}\, \sqrt{c-d\,x^2}}+$$

$$\frac{c^{1/4}\, e^{3/2}\, \sqrt{1-\frac{d\,x^2}{c}}\; \text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,-1\right]}{b\, d^{1/4}\, \sqrt{c-d\,x^2}}+\frac{c^{1/4}\, e^{3/2}\, \sqrt{1-\frac{d\,x^2}{c}}\; \text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,-1\right]}{b\, d^{1/4}\, \sqrt{c-d\,x^2}}$$

Result (type 6, 165 leaves):

$$-\left(\left(18\, a\, c\, x\, (e\,x)^{3/2}\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(5\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\right.\right.$$
$$\left.\left.\left(9\, a\, c\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\, b\, c\, \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 883: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{e\,x}}{\left(a-b\,x^2\right)\sqrt{c-d\,x^2}}\, dx$$

Optimal (type 4, 203 leaves, 6 steps):

$$-\frac{c^{1/4}\, \sqrt{e}\, \sqrt{1-\frac{d\,x^2}{c}}\; \text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,-1\right]}{\sqrt{a}\,\sqrt{b}\, d^{1/4}\, \sqrt{c-d\,x^2}}+\frac{c^{1/4}\, \sqrt{e}\, \sqrt{1-\frac{d\,x^2}{c}}\; \text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,-1\right]}{\sqrt{a}\,\sqrt{b}\, d^{1/4}\, \sqrt{c-d\,x^2}}$$

Result (type 6, 165 leaves):

$$-\left(\left(14\, a\, c\, x\, \sqrt{e\,x}\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(3\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\right.\right.$$
$$\left.\left.\left(7\, a\, c\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\, b\, c\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 884: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\sqrt{e\,x}\,\left(a-b\,x^2\right)\sqrt{c-d\,x^2}}\, dx$$

Optimal (type 4, 188 leaves, 6 steps):

$$\frac{c^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\ \text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\ -1\right]}{a\, d^{1/4}\sqrt{e}\ \sqrt{c-d x^2}}+\frac{c^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\ \text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\ -1\right]}{a\, d^{1/4}\sqrt{e}\ \sqrt{c-d x^2}}$$

Result (type 6, 163 leaves):

$$-\left(\left(10\, a\, c\, x\, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\sqrt{e x}\ \left(-a+b x^2\right)\sqrt{c-d x^2}\right.\right.$$
$$\left.\left.\left(5\, a\, c\, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2\, b\, c\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 885: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(e x)^{3/2}\left(a-b x^2\right)\sqrt{c-d x^2}}\, dx$$

Optimal (type 4, 379 leaves, 15 steps):

$$-\frac{2\sqrt{c-d x^2}}{a\, c\, e\sqrt{e x}}-\frac{2\, d^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\ -1\right]}{a\, c^{1/4}\, e^{3/2}\sqrt{c-d x^2}}+\frac{2\, d^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\ -1\right]}{a\, c^{1/4}\, e^{3/2}\sqrt{c-d x^2}}-$$
$$\frac{\sqrt{b}\ c^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\ \text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\ -1\right]}{a^{3/2}\, d^{1/4}\, e^{3/2}\sqrt{c-d x^2}}+\frac{\sqrt{b}\ c^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\ \text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\ -1\right]}{a^{3/2}\, d^{1/4}\, e^{3/2}\sqrt{c-d x^2}}$$

Result (type 6, 338 leaves):

$$\frac{1}{21\,(e x)^{3/2}\sqrt{c-d x^2}}2 x\left(-\frac{21\left(c-d x^2\right)}{a\, c}+\left(49\,(b c-a d)\, x^2\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right)\right.\right.$$
$$\left.\left(7\, a\, c\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2\, b\, c\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)-$$
$$\left(33\, b\, d\, x^4\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right)\left(11\, a\, c\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.2 x^2\left(2\, b\, c\, \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 886: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(e\,x)^{5/2}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 297 leaves, 10 steps):

$$-\frac{2\,\sqrt{c-d\,x^2}}{3\,a\,c\,e\,(e\,x)^{3/2}}+\frac{2\,d^{3/4}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{3\,a\,c^{3/4}\,e^{5/2}\,\sqrt{c-d\,x^2}}+$$
$$\frac{b\,c^{1/4}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a^2\,d^{1/4}\,e^{5/2}\,\sqrt{c-d\,x^2}}+\frac{b\,c^{1/4}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a^2\,d^{1/4}\,e^{5/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 338 leaves):

$$\frac{1}{15\,(e\,x)^{5/2}\,\sqrt{c-d\,x^2}}2\,x\left(-\frac{5\,\left(c-d\,x^2\right)}{a\,c}+\left(25\,(3\,b\,c+a\,d)\,x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(a-b\,x^2\right)\right.\right.$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big)+$$
$$\left(9\,b\,d\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(-a+b\,x^2\right)\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 887: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(e\,x)^{7/2}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 444 leaves, 16 steps):

$$-\frac{2\sqrt{c-d x^2}}{5 a c e (e x)^{5/2}}-\frac{2 (5 b c+3 a d) \sqrt{c-d x^2}}{5 a^2 c^2 e^3 \sqrt{e x}}-\frac{2 d^{1/4} (5 b c+3 a d) \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5 a^2 c^{5/4} e^{7/2}\sqrt{c-d x^2}}+$$
$$\frac{2 d^{1/4} (5 b c+3 a d) \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{5 a^2 c^{5/4} e^{7/2}\sqrt{c-d x^2}}-$$
$$\frac{b^{3/2} c^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2} d^{1/4} e^{7/2}\sqrt{c-d x^2}}+\frac{b^{3/2} c^{1/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2} d^{1/4} e^{7/2}\sqrt{c-d x^2}}$$

Result (type 6, 383 leaves):

$$\left(2 x \left(-21 (c-d x^2) (5 b c x^2+a (c+3 d x^2))+\left(49 a c (5 b^2 c^2-5 a b c d-3 a^2 d^2) x^4\ \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left((a-b x^2)\left(7 a c\ \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\ \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\ \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(33 a b c d (5 b c+3 a d) x^6\ \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left((a-b x^2)\left(11 a c\ \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\ \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\ \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(105 a^2 c^2 (e x)^{7/2}\sqrt{c-d x^2}\right)$$

Problem 888: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{9/2}}{(a-b x^2)(c-d x^2)^{3/2}}\,dx$$

Optimal (type 4, 444 leaves, 15 steps):

$$-\frac{c\,e^3\,(e\,x)^{3/2}}{d\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+\frac{c^{3/4}\,(3\,b\,c-2\,a\,d)\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b\,d^{7/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{3/4}\,(3\,b\,c-2\,a\,d)\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b\,d^{7/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{a^{3/2}\,c^{1/4}\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^{3/2}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+\frac{a^{3/2}\,c^{1/4}\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^{3/2}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 424 leaves):

$$\left(c\,(e\,x)^{9/2}\left(\left(49\,a^2\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(-a+b\,x^2\right)\right.\right.\right.$$
$$\left.\left.\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(11\,a\,\left(7\,a\,c-4\,b\,c\,x^2-2\,a\,d\,x^2\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-14\,x^2\left(-a+b\,x^2\right)\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$\left.\left.a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(\left(a-b\,x^2\right)\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(7\,d\,(-b\,c+a\,d)\,x^3\,\sqrt{c-d\,x^2}\right)$$

Problem 889: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{7/2}}{\left(a-b\,x^2\right)\left(c-d\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 338 leaves, 10 steps):

$$-\frac{c\,e^3\sqrt{e\,x}}{d\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+\frac{c^{1/4}\,(b\,c-2\,a\,d)\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{b\,d^{5/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+$$

$$\frac{a\,c^{1/4}\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{b\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+\frac{a\,c^{1/4}\,e^{7/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{b\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 424 leaves):

$$\Bigg(c\,(e\,x)^{7/2}\Bigg(\Bigg(25\,a^2\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/\Bigg(\left(-a+b\,x^2\right)$$
$$\Bigg(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)+$$
$$\Bigg(9\,a\,\left(5\,a\,c-4\,b\,c\,x^2-2\,a\,d\,x^2\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-10\,x^2\,\left(-a+b\,x^2\right)\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg/\Bigg(\left(a-b\,x^2\right)\Bigg(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\Bigg(5\,d\,(-b\,c+a\,d)\,x^3\,\sqrt{c-d\,x^2}\Bigg)$$

Problem 890: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{5/2}}{\left(a-b\,x^2\right)\left(c-d\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 414 leaves, 15 steps):

$$-\frac{e\,(e\,x)^{3/2}}{(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+\frac{c^{3/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{d^{3/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-\frac{c^{3/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{d^{3/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{\sqrt{a}\,c^{1/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+\frac{\sqrt{a}\,c^{1/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 327 leaves):

$$\frac{1}{7\left(-b c+a d\right)\sqrt{c-d x^2}} e\, (e x)^{3/2} \left(7+\left(49 a^2 c\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right)\left(7 a c\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\, \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(11 a b c x^2\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right)\left(11 a c\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\, \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\, \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 891: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{3/2}}{\left(a-b x^2\right)\left(c-d x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 314 leaves, 10 steps):

$$-\frac{e\sqrt{e x}}{\left(b c-a d\right)\sqrt{c-d x^2}}-\frac{c^{1/4} e^{3/2}\sqrt{1-\frac{d x^2}{c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{d^{1/4}\left(b c-a d\right)\sqrt{c-d x^2}}+\frac{c^{1/4} e^{3/2}\sqrt{1-\frac{d x^2}{c}}\, \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{d^{1/4}\left(b c-a d\right)\sqrt{c-d x^2}}+\frac{c^{1/4} e^{3/2}\sqrt{1-\frac{d x^2}{c}}\, \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{d^{1/4}\left(b c-a d\right)\sqrt{c-d x^2}}$$

Result (type 6, 328 leaves):

$$\frac{1}{5\left(-b c+a d\right)\sqrt{c-d x^2}} e\sqrt{e x}\left(5+\left(25 a^2 c\, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right)\left(5 a c\, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\, \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(9 a b c x^2\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right)\left(9 a c\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\, \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\, \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 892: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{e x}}{\left(a-b x^2\right) \left(c-d x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 420 leaves, 15 steps):

$$-\frac{d (e x)^{3/2}}{c (b c-a d) e \sqrt{c-d x^2}}+\frac{d^{1/4} \sqrt{e} \sqrt{1-\frac{d x^2}{c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{c^{1/4} (b c-a d) \sqrt{c-d x^2}}-\frac{d^{1/4} \sqrt{e} \sqrt{1-\frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{c^{1/4} (b c-a d) \sqrt{c-d x^2}}-\frac{\sqrt{b} c^{1/4} \sqrt{e} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{\sqrt{a} d^{1/4} (b c-a d) \sqrt{c-d x^2}}+\frac{\sqrt{b} c^{1/4} \sqrt{e} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{\sqrt{a} d^{1/4} (b c-a d) \sqrt{c-d x^2}}$$

Result (type 6, 356 leaves):

$$\frac{1}{21 \sqrt{c-d x^2}} x \sqrt{e x} \left(-\frac{21 d}{b c^2-a c d}-\left(49 a (2 b c+a d) \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left((-b c+a d) \left(a-b x^2\right) \left(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(33 a b d x^2 \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left((-b c+a d) \left(a-b x^2\right) \left(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 893: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\sqrt{e x} \left(a-b x^2\right) \left(c-d x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 328 leaves, 10 steps):

$$-\frac{d\sqrt{e\,x}}{c\,(b\,c-a\,d)\,e\,\sqrt{c-d\,x^2}}-\frac{d^{3/4}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{c^{3/4}\,(b\,c-a\,d)\,\sqrt{e}\,\sqrt{c-d\,x^2}}+$$

$$\frac{b\,c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{e}\,\sqrt{c-d\,x^2}}+\frac{b\,c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{e}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 357 leaves) :

$$\frac{1}{5\sqrt{e\,x}\,\sqrt{c-d\,x^2}}x\left(-\frac{5\,d}{b\,c^2-a\,c\,d}+\left(25\,a\,(-2\,b\,c+a\,d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((-b\,c+a\,d)\,(a-b\,x^2)\right.\right.$$
$$\left.\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(9\,a\,b\,d\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((-b\,c+a\,d)\,(-a+b\,x^2)\right.$$
$$\left.\left.\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 894: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(e\,x)^{3/2}\,(a-b\,x^2)\,(c-d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 493 leaves, 16 steps) :

$$-\frac{d}{c\,(b\,c-a\,d)\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}-\frac{(2\,b\,c-3\,a\,d)\,\sqrt{c-d\,x^2}}{a\,c^2\,(b\,c-a\,d)\,e\,\sqrt{e\,x}}-$$

$$\frac{d^{1/4}\,(2\,b\,c-3\,a\,d)\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,c^{5/4}\,(b\,c-a\,d)\,e^{3/2}\,\sqrt{c-d\,x^2}}+\frac{d^{1/4}\,(2\,b\,c-3\,a\,d)\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,c^{5/4}\,(b\,c-a\,d)\,e^{3/2}\,\sqrt{c-d\,x^2}}-$$

$$\frac{b^{3/2}\,c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{3/2}\,d^{1/4}\,(b\,c-a\,d)\,e^{3/2}\,\sqrt{c-d\,x^2}}+\frac{b^{3/2}\,c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{3/2}\,d^{1/4}\,(b\,c-a\,d)\,e^{3/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 401 leaves) :

$$\frac{1}{21\,c^2\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}\times\left(\left(49\,c\,\left(2\,b^2\,c^2-2\,a\,b\,c\,d+3\,a^2\,d^2\right)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((b\,c-a\,d)\,\left(a-b\,x^2\right)\,\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+\frac{1}{-b\,c+a\,d}3\left(\frac{14\,b\,c\,\left(c-d\,x^2\right)}{a}+7\,d\,\left(-2\,c+3\,d\,x^2\right)+\left(11\,b\,c\,d\,(-2\,b\,c+3\,a\,d)\,x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(a-b\,x^2\right)\,\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\right)$$

Problem 895: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(e\,x)^{5/2}\,\left(a-b\,x^2\right)\,\left(c-d\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 397 leaves, 11 steps):

$$-\frac{d}{c\,(b\,c-a\,d)\,e\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}-\frac{(2\,b\,c-5\,a\,d)\,\sqrt{c-d\,x^2}}{3\,a\,c^2\,(b\,c-a\,d)\,e\,(e\,x)^{3/2}}+\frac{d^{3/4}\,(2\,b\,c-5\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{3\,a\,c^{7/4}\,(b\,c-a\,d)\,e^{5/2}\,\sqrt{c-d\,x^2}}+\frac{b^2\,c^{1/4}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a^2\,d^{1/4}\,(b\,c-a\,d)\,e^{5/2}\,\sqrt{c-d\,x^2}}+\frac{b^2\,c^{1/4}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a^2\,d^{1/4}\,(b\,c-a\,d)\,e^{5/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 413 leaves):

$$\frac{1}{15\,c^2\,(e\,x)^{5/2}\,\sqrt{c-d\,x^2}}\times\left(\frac{10\,b\,c\,\left(c-d\,x^2\right)+5\,a\,d\,\left(-2\,c+5\,d\,x^2\right)}{a\,(-b\,c+a\,d)}-\left(25\,c\,\left(6\,b^2\,c^2+2\,a\,b\,c\,d-5\,a^2\,d^2\right)\,x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((b\,c-a\,d)\,\left(-a+b\,x^2\right)\,\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+\left(9\,b\,c\,d\,(2\,b\,c-5\,a\,d)\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((b\,c-a\,d)\,\left(-a+b\,x^2\right)\,\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 896: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{7/2} \sqrt{c-d x^2}}{\left(a-b x^2\right)^2} \, dx$$

Optimal (type 4, 362 leaves, 11 steps):

$$\frac{7 e^3 \sqrt{e x} \sqrt{c-d x^2}}{6 b^2}+\frac{e (e x)^{5/2} \sqrt{c-d x^2}}{2 b \left(a-b x^2\right)}+\frac{c^{1/4} (8 b c-21 a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{6 b^3 d^{1/4} \sqrt{c-d x^2}}-$$
$$\frac{c^{1/4} (5 b c-7 a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 b^3 d^{1/4} \sqrt{c-d x^2}}-$$
$$\frac{c^{1/4} (5 b c-7 a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 b^3 d^{1/4} \sqrt{c-d x^2}}$$

Result (type 6, 426 leaves):

$$\left((e x)^{7/2} \left(\left(175 a^2 c^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$
$$\left(-9 a c \left(7 a \left(5 c-2 d x^2\right)+4 b x^2 \left(-7 c+5 d x^2\right)\right) \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-10 x^2 \left(7 a-4 b x^2\right) \left(c-d x^2\right)\right.$$
$$\left.\left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/\left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$\left.\left.\left.2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(30 b^2 x^3 \left(-a+b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 897: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{5/2} \sqrt{c-d x^2}}{\left(a-b x^2\right)^2} \, dx$$

Optimal (type 4, 413 leaves, 15 steps):

$$\frac{e\,(e\,x)^{3/2}\sqrt{c-d\,x^2}}{2\,b\,\left(a-b\,x^2\right)}-\frac{5\,c^{3/4}\,d^{1/4}\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,b^2\sqrt{c-d\,x^2}}+$$

$$\frac{5\,c^{3/4}\,d^{1/4}\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,b^2\sqrt{c-d\,x^2}}+\frac{c^{1/4}\,(3\,b\,c-5\,a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,b^{5/2}\,d^{1/4}\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(3\,b\,c-5\,a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,b^{5/2}\,d^{1/4}\sqrt{c-d\,x^2}}$$

Result (type 6, 318 leaves):

$$\frac{1}{14\,b\,\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}}e\,(e\,x)^{3/2}\left(-7\,c+7\,d\,x^2+\left(49\,a\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)-$$
$$\left(55\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left.\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 898: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{3/2}\sqrt{c-d\,x^2}}{\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 328 leaves, 10 steps):

$$\frac{e\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{2\,b\,\left(a-b\,x^2\right)}-\frac{3\,c^{1/4}\,d^{3/4}\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,b^2\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,\left(b\,c-3\,a\,d\right)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,b^2\,d^{1/4}\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,\left(b\,c-3\,a\,d\right)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,b^2\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 318 leaves) :

$$\frac{1}{10\,b\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}}e\,\sqrt{e\,x}\,\left(-5\,c+5\,d\,x^2+\left(25\,a\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)-$$
$$\left(27\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left.\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 899: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 417 leaves, 15 steps) :

$$\frac{(e x)^{3/2}\sqrt{c-d x^2}}{2 a e\left(a-b x^2\right)}-\frac{c^{3/4} d^{1/4}\sqrt{e}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a b\sqrt{c-d x^2}}+$$

$$\frac{c^{3/4} d^{1/4}\sqrt{e}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a b\sqrt{c-d x^2}}-\frac{c^{1/4}(b c+a d)\sqrt{e}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^{3/2} b^{3/2} d^{1/4}\sqrt{c-d x^2}}+$$

$$\frac{c^{1/4}(b c+a d)\sqrt{e}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^{3/2} b^{3/2} d^{1/4}\sqrt{c-d x^2}}$$

Result (type 6, 317 leaves):

$$\frac{1}{42\left(-a+b x^2\right)\sqrt{c-d x^2}}x\sqrt{e x}\left(-\frac{21\left(c-d x^2\right)}{a}-\left(49 c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.$$
$$\left(7 a c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)-$$
$$\left(33 c d x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$
$$\left.\left(11 a c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)$$

Problem 900: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{c-d x^2}}{\sqrt{e x}\left(a-b x^2\right)^2}\,dx$$

Optimal (type 4, 335 leaves, 10 steps):

$$\frac{\sqrt{e x}\sqrt{c-d x^2}}{2 a e\left(a-b x^2\right)}+\frac{c^{1/4} d^{3/4}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a b\sqrt{e}\sqrt{c-d x^2}}+$$

$$\frac{c^{1/4}(3 b c-a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^2 b d^{1/4}\sqrt{e}\sqrt{c-d x^2}}+\frac{c^{1/4}(3 b c-a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^2 b d^{1/4}\sqrt{e}\sqrt{c-d x^2}}$$

Result (type 6, 317 leaves):

$$\left(x\left(-\frac{5\left(c-d x^2\right)}{a}-\left(75 c^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+\left(9 c d x^2 \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10 \sqrt{e x}\left(-a+b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 901: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{c-d x^2}}{(e x)^{3/2}\left(a-b x^2\right)^2}\,dx$$

Optimal (type 4, 444 leaves, 16 steps):

$$-\frac{5\sqrt{c-d x^2}}{2 a^2 e\sqrt{e x}}+\frac{\sqrt{c-d x^2}}{2 a e\sqrt{e x}\left(a-b x^2\right)}-\frac{5 c^{3/4} d^{1/4}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a^2 e^{3/2}\sqrt{c-d x^2}}+\frac{5 c^{3/4} d^{1/4}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a^2 e^{3/2}\sqrt{c-d x^2}}-\frac{c^{1/4}(5 b c-3 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^{5/2}\sqrt{b}\,d^{1/4} e^{3/2}\sqrt{c-d x^2}}+\frac{c^{1/4}(5 b c-3 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^{5/2}\sqrt{b}\,d^{1/4} e^{3/2}\sqrt{c-d x^2}}$$

Result (type 6, 340 leaves):

$$\left(x\left(21\left(4 a-5 b x^2\right)\left(-c+d x^2\right)+\left(49 a c(5 b c-8 a d) x^2 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+\left(165 a b c d x^4 \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(42 a^2 (e x)^{3/2}\left(a-b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 902: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{c-d\,x^2}}{(e\,x)^{5/2}\,\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 355 leaves, 11 steps):

$$-\frac{7\sqrt{c-d\,x^2}}{6\,a^2\,e\,(e\,x)^{3/2}}+\frac{\sqrt{c-d\,x^2}}{2\,a\,e\,(e\,x)^{3/2}\,\left(a-b\,x^2\right)}+\frac{7\,c^{1/4}\,d^{3/4}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{6\,a^2\,e^{5/2}\,\sqrt{c-d\,x^2}}+$$
$$\frac{c^{1/4}\,(7\,b\,c-5\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,a^3\,d^{1/4}\,e^{5/2}\,\sqrt{c-d\,x^2}}+$$
$$\frac{c^{1/4}\,(7\,b\,c-5\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,a^3\,d^{1/4}\,e^{5/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 361 leaves):

$$\frac{1}{30\,a^2\,(e\,x)^{5/2}\,\sqrt{c-d\,x^2}}x\left(\frac{5\,\left(4\,a-7\,b\,x^2\right)\,\left(-c+d\,x^2\right)}{a-b\,x^2}+\left(25\,a\,c\,(21\,b\,c-8\,a\,d)\,x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(a-b\,x^2\right)\right.\right.$$
$$\left.\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(63\,a\,b\,c\,d\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(-a+b\,x^2\right)\right.$$
$$\left.\left.\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 903: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^{7/2}\,\left(c-d\,x^2\right)^{3/2}}{\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 429 leaves, 12 steps):

$$\frac{(57 b c-77 a d) e^3 \sqrt{e x} \sqrt{c-d x^2}}{42 b^3}-\frac{11 d e (e x)^{5/2} \sqrt{c-d x^2}}{14 b^2}+\frac{e (e x)^{5/2} \left(c-d x^2\right)^{3/2}}{2 b \left(a-b x^2\right)}+$$

$$\frac{c^{1/4} \left(48 b^2 c^2-259 a b c d+231 a^2 d^2\right) e^{7/2} \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{42 b^4 d^{1/4} \sqrt{c-d x^2}}-$$

$$\frac{c^{1/4} (5 b c-11 a d) (b c-a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 b^4 d^{1/4} \sqrt{c-d x^2}}-$$

$$\frac{c^{1/4} (5 b c-11 a d) (b c-a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 b^4 d^{1/4} \sqrt{c-d x^2}}$$

Result (type 6, 392 leaves) :

$$\left((e x)^{7/2} \left(5 \left(c-d x^2\right) \left(77 a^2 d-12 b^2 x^2 \left(-3 c+d x^2\right)-a b \left(57 c+44 d x^2\right)\right)-\left(25 a^2 c^2 (-57 b c+77 a d)\ \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5 a c\ \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c\ \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\ \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$
$$\left(9 a c \left(48 b^2 c^2-259 a b c d+231 a^2 d^2\right) x^2\ \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(9 a c\ \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$\left.\left.\left.2 x^2 \left(2 b c\ \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\ \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(210 b^3 x^3 \left(-a+b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 904: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{5/2} \left(c-d x^2\right)^{3/2}}{\left(a-b x^2\right)^2}\, dx$$

Optimal (type 4, 485 leaves, 16 steps) :

$$-\frac{9\,d\,e\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}{10\,b^2}+\frac{e\,(e\,x)^{3/2}\,\left(c-d\,x^2\right)^{3/2}}{2\,b\,\left(a-b\,x^2\right)}-\frac{3\,c^{3/4}\,d^{1/4}\,(11\,b\,c-15\,a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{10\,b^3\,\sqrt{c-d\,x^2}}+$$
$$\frac{3\,c^{3/4}\,d^{1/4}\,(11\,b\,c-15\,a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{10\,b^3\,\sqrt{c-d\,x^2}}+$$
$$\frac{3\,c^{1/4}\,\left(b^2\,c^2-4\,a\,b\,c\,d+3\,a^2\,d^2\right)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}}-$$
$$\frac{3\,c^{1/4}\,\left(b^2\,c^2-4\,a\,b\,c\,d+3\,a^2\,d^2\right)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 353 leaves) :

$$\left((e\,x)^{5/2}\left(-7\,\left(c-d\,x^2\right)\,\left(5\,b\,c-9\,a\,d+4\,b\,d\,x^2\right)-\left(49\,a\,c^2\,(-5\,b\,c+9\,a\,d)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right/\right.$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(33\,a\,c\,d\,(-11\,b\,c+15\,a\,d)\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(70\,b^2\,\sqrt{c-d\,x^2}\,\left(-a\,x+b\,x^3\right)\right)$$

Problem 905: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{3/2}\,\left(c-d\,x^2\right)^{3/2}}{\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 381 leaves, 11 steps) :

$$-\frac{7\,d\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{6\,b^2}+\frac{e\,\sqrt{e\,x}\,\left(c-d\,x^2\right)^{3/2}}{2\,b\,\left(a-b\,x^2\right)}-\frac{c^{1/4}\,d^{3/4}\,\left(17\,b\,c-21\,a\,d\right)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{6\,b^3\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,\left(b\,c-7\,a\,d\right)\,\left(b\,c-a\,d\right)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,b^3\,d^{1/4}\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,\left(b\,c-7\,a\,d\right)\,\left(b\,c-a\,d\right)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,b^3\,d^{1/4}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 353 leaves) :

$$\Bigg((e\,x)^{3/2}\,\Bigg(-5\,\left(c-d\,x^2\right)\,\left(3\,b\,c-7\,a\,d+4\,b\,d\,x^2\right)-\Bigg(25\,a\,c^2\,\left(-3\,b\,c+7\,a\,d\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(9\,a\,c\,d\,\left(-17\,b\,c+21\,a\,d\right)\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg/\Bigg(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(30\,b^2\,\sqrt{c-d\,x^2}\,\left(-a\,x+b\,x^3\right)\right)$$

Problem 906: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}\,\left(c-d\,x^2\right)^{3/2}}{\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 474 leaves, 15 steps) :

$$\frac{(b c-a d)\,(e x)^{3/2}\sqrt{c-d x^2}}{2 a b e\,(a-b x^2)}-\frac{c^{3/4} d^{1/4}\,(b c-5 a d)\,\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a b^2\sqrt{c-d x^2}}+$$

$$\frac{c^{3/4} d^{1/4}\,(b c-5 a d)\,\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a b^2\sqrt{c-d x^2}}-$$

$$\frac{c^{1/4}\,(b^2 c^2+4 a b c d-5 a^2 d^2)\,\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^{3/2} b^{5/2} d^{1/4}\sqrt{c-d x^2}}+$$

$$\frac{c^{1/4}\,(b^2 c^2+4 a b c d-5 a^2 d^2)\,\sqrt{e}\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^{3/2} b^{5/2} d^{1/4}\sqrt{c-d x^2}}$$

Result (type 6, 428 leaves) :

$$\frac{1}{42 b\,(-a+b x^2)\sqrt{c-d x^2}}x\sqrt{e x}\left(-\left(\left(49 c^2\,(b c+3 a d)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(7 a c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\bigg)+$$
$$\left(33 a c\,\left(a d\,(7 c-2 d x^2)+b c\,(-7 c+6 d x^2)\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$42\,(b c-a d)\,x^2\,(-c+d x^2)\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\bigg)\Big/\left(a\left(11 a c\right.\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 907: Result unnecessarily involves higher level functions.

$$\int\frac{(c-d x^2)^{3/2}}{\sqrt{e x}\,(a-b x^2)^2}\,dx$$

Optimal (type 4, 366 leaves, 10 steps) :

$$\frac{(b c-a d)\sqrt{e x}\,\sqrt{c-d x^2}}{2 a b e\,(a-b x^2)}+\frac{c^{1/4} d^{3/4} (b c+3 a d)\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a b^2\sqrt{e}\,\sqrt{c-d x^2}}+$$

$$\frac{3 c^{1/4} (b c-a d)(b c+a d)\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^2 b^2 d^{1/4}\sqrt{e}\,\sqrt{c-d x^2}}+$$

$$\frac{3 c^{1/4} (b c-a d)(b c+a d)\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^2 b^2 d^{1/4}\sqrt{e}\,\sqrt{c-d x^2}}$$

Result (type 6, 428 leaves) :

$$\Bigg(x\Bigg(-\Bigg(\Bigg(25 c^2 (3 b c+a d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg/$$
$$\Bigg(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Bigg)+$$
$$\Bigg(9 a c\left(a d\left(5 c-2 d x^2\right)+b c\left(-5 c+6 d x^2\right)\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+10 (b c-a d)\,x^2\left(-c+d x^2\right)$$
$$\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Bigg/\Bigg(a\Bigg(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(10 b\sqrt{e x}\left(-a+b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 908: Result unnecessarily involves higher level functions.

$$\int\frac{\left(c-d x^2\right)^{3/2}}{(e x)^{3/2}\left(a-b x^2\right)^2}\,dx$$

Optimal (type 4, 519 leaves, 16 steps) :

$$-\frac{(5bc-ad)\sqrt{c-dx^2}}{2a^2be\sqrt{ex}}+\frac{(bc-ad)\sqrt{c-dx^2}}{2abe\sqrt{ex}\,(a-bx^2)}-\frac{c^{3/4}d^{1/4}(5bc-ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2a^2be^{3/2}\sqrt{c-dx^2}}+$$

$$\frac{c^{3/4}d^{1/4}(5bc-ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2a^2be^{3/2}\sqrt{c-dx^2}}-$$

$$\frac{c^{1/4}(5b^2c^2-4abcd-a^2d^2)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4a^{5/2}b^{3/2}d^{1/4}e^{3/2}\sqrt{c-dx^2}}+$$

$$\frac{c^{1/4}(5b^2c^2-4abcd-a^2d^2)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4a^{5/2}b^{3/2}d^{1/4}e^{3/2}\sqrt{c-dx^2}}$$

Result (type 6, 454 leaves):

$$\Big(x\,\Big(\Big(49\,a\,c^2\,(5bc-9ad)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Big)\Big/$$
$$\Big(7ac\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\Big(2bc\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Big)\Big)+$$
$$\Big(-33ac\,\big(5bcx^2(-7c+6dx^2)+a(28c^2-21cdx^2-6d^2x^4)\big)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+42x^2(c-dx^2)\,\big(5bcx^2-a(4c+dx^2)\big)$$
$$\Big(2bc\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Big)\Big)\Big/\Big(11ac\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+$$
$$2x^2\Big(2bc\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Big)\Big)\Big)\Big)\Big/\Big(42a^2\,(ex)^{3/2}\,(a-bx^2)\,\sqrt{c-dx^2}\Big)$$

Problem 909: Result unnecessarily involves higher level functions.

$$\int\frac{(c-dx^2)^{3/2}}{(ex)^{5/2}\,(a-bx^2)^2}\,dx$$

Optimal (type 4, 412 leaves, 11 steps):

$$-\frac{(7bc-3ad)\sqrt{c-dx^2}}{6a^2be(ex)^{3/2}}+\frac{(bc-ad)\sqrt{c-dx^2}}{2abe(ex)^{3/2}(a-bx^2)}+\frac{c^{1/4}d^{3/4}(7bc-3ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{6a^2be^{5/2}\sqrt{c-dx^2}}+$$

$$\frac{c^{1/4}(bc-ad)(7bc-ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4a^3bd^{1/4}e^{5/2}\sqrt{c-dx^2}}+$$

$$\frac{c^{1/4}(bc-ad)(7bc-ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4a^3bd^{1/4}e^{5/2}\sqrt{c-dx^2}}$$

Result (type 6, 453 leaves) :

$$\Bigg(x\Bigg(\Bigg(25ac^2(21bc-17ad)x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Big/$$
$$\Bigg(5ac\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\Bigg(2bc\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Bigg)+$$
$$\Bigg(-9ac\left(7bcx^2(-5c+6dx^2)+a(20c^2-5cdx^2-18d^2x^4)\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+10x^2(c-dx^2)(-4ac+7bcx^2-3adx^2)$$
$$\Bigg(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Bigg)\Big/\Bigg(9ac\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+$$
$$2x^2\Bigg(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Big/\Bigg(30a^2(ex)^{5/2}(a-bx^2)\sqrt{c-dx^2}\Bigg)$$

Problem 910: Result unnecessarily involves higher level functions.

$$\int\frac{(ex)^{9/2}}{(a-bx^2)^2\sqrt{c-dx^2}}\,dx$$

Optimal (type 4, 484 leaves, 15 steps) :

$$\frac{a\,e^3\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}{2\,b\,(b\,c-a\,d)\,(a-b\,x^2)}+\frac{c^{3/4}\,(4\,b\,c-5\,a\,d)\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,b^2\,d^{3/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{3/4}\,(4\,b\,c-5\,a\,d)\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,b^2\,d^{3/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+$$

$$\frac{\sqrt{a}\,c^{1/4}\,(7\,b\,c-5\,a\,d)\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,b^{5/2}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{\sqrt{a}\,c^{1/4}\,(7\,b\,c-5\,a\,d)\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,b^{5/2}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 414 leaves):

$$\Bigg(a\,(e\,x)^{9/2}\Bigg(\left(49\,a\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\Bigg(11\,c\,(-7\,a\,c+4\,b\,c\,x^2+2\,a\,d\,x^2)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$14\,x^2\,(-c+d\,x^2)\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Big/$$
$$\Bigg(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(14\,b\,(b\,c-a\,d)\,x^3\,(-a+b\,x^2)\,\sqrt{c-d\,x^2}\right)$$

Problem 911: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{7/2}}{(a-b\,x^2)^2\,\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 376 leaves, 10 steps):

$$\frac{a\,e^3\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{2\,b\,(b\,c-a\,d)\,(a-b\,x^2)}+\frac{c^{1/4}\,(4\,b\,c-3\,a\,d)\,e^{7/2}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,b^2\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(5\,b\,c-3\,a\,d)\,e^{7/2}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,b^2\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(5\,b\,c-3\,a\,d)\,e^{7/2}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,b^2\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 414 leaves) :

$$\left(a\,(e\,x)^{7/2}\left(\left(25\,a\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(-9\,c\,(5\,a\,c-4\,b\,c\,x^2-2\,a\,d\,x^2)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.10\,x^2\,(-c+d\,x^2)\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/$$
$$\left.\left.\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/$$
$$\left(10\,b\,(b\,c-a\,d)\,x^3\,(-a+b\,x^2)\,\sqrt{c-d\,x^2}\right)$$

Problem 912: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{5/2}}{(a-b\,x^2)^2\,\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 460 leaves, 15 steps) :

$$\frac{e\,(e\,x)^{3/2}\sqrt{c-d\,x^2}}{2\,(b\,c-a\,d)\,(a-b\,x^2)}-\frac{c^{3/4}\,d^{1/4}\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,b\,(b\,c-a\,d)\sqrt{c-d\,x^2}}+$$

$$\frac{c^{3/4}\,d^{1/4}\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,b\,(b\,c-a\,d)\sqrt{c-d\,x^2}}+\frac{c^{1/4}\,(3\,b\,c-a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\sqrt{a}\,b^{3/2}\,d^{1/4}\,(b\,c-a\,d)\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(3\,b\,c-a\,d)\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\sqrt{a}\,b^{3/2}\,d^{1/4}\,(b\,c-a\,d)\sqrt{c-d\,x^2}}$$

Result (type 6, 325 leaves):

$$\left(e\,(e\,x)^{3/2}\left(7\,c-7\,d\,x^2-\left(49\,a\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(11\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(14\,(-b\,c+a\,d)\,(-a+b\,x^2)\sqrt{c-d\,x^2}\right)$$

Problem 913: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{3/2}}{(a-b\,x^2)^2\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 363 leaves, 10 steps):

$$\frac{e\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{2\,(b\,c-a\,d)\,(a-b\,x^2)}+\frac{c^{1/4}\,d^{3/4}\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,b\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(b\,c+a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,a\,b\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(b\,c+a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,a\,b\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 325 leaves):

$$\left(e\sqrt{e\,x}\left(5\,c-5\,d\,x^2-\left(25\,a\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)-$$
$$\left(9\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10\,(-b\,c+a\,d)\,(-a+b\,x^2)\,\sqrt{c-d\,x^2}\right)$$

Problem 914: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}}{(a-b\,x^2)^2\,\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 464 leaves, 15 steps):

$$\frac{b\,(e\,x)^{3/2}\sqrt{c-d\,x^2}}{2\,a\,(b\,c-a\,d)\,e\,(a-b\,x^2)}-\frac{c^{3/4}\,d^{1/4}\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,a\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+$$

$$\frac{c^{3/4}\,d^{1/4}\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,a\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}-\frac{c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,a^{3/2}\,\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+$$

$$\frac{c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\,a^{3/2}\,\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 335 leaves):

$$\Bigg(x\,\sqrt{e\,x}\,\Bigg(\frac{21\,b\,(c-d\,x^2)}{a}+\Bigg(49\,c\,(b\,c-4\,a\,d)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/$$
$$\Bigg(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)+$$
$$\Bigg(33\,b\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/\Bigg(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(42\,(-b\,c+a\,d)\,(-a+b\,x^2)\,\sqrt{c-d\,x^2}\right)$$

Problem 915: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{e\,x}\,(a-b\,x^2)^2\,\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 367 leaves, 10 steps):

$$\frac{b\sqrt{e x}\sqrt{c-d x^2}}{2 a (b c-a d) e (a-b x^2)}+\frac{c^{1/4} d^{3/4}\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2 a (b c-a d)\sqrt{e}\sqrt{c-d x^2}}+$$

$$\frac{c^{1/4}(3 b c-5 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^2 d^{1/4}(b c-a d)\sqrt{e}\sqrt{c-d x^2}}+$$

$$\frac{c^{1/4}(3 b c-5 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^2 d^{1/4}(b c-a d)\sqrt{e}\sqrt{c-d x^2}}$$

Result (type 6, 336 leaves):

$$\Bigg(x\Bigg(\frac{5 b (c-d x^2)}{a}+\left(25 c (3 b c-4 a d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$
$$\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)-$$
$$\left(9 b c d x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\Bigg(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2$$
$$\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)\Big/\left(10(-b c+a d)\sqrt{e x}(-a+b x^2)\sqrt{c-d x^2}\right)$$

Problem 916: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(e x)^{3/2}(a-b x^2)^2\sqrt{c-d x^2}}\,dx$$

Optimal (type 4, 535 leaves, 16 steps):

$$-\frac{(5 b c-4 a d) \sqrt{c-d x^2}}{2 a^2 c (b c-a d) e \sqrt{e x}}+\frac{b \sqrt{c-d x^2}}{2 a (b c-a d) e \sqrt{e x} \left(a-b x^2\right)}-\frac{d^{1/4} (5 b c-4 a d) \sqrt{1-\frac{d x^2}{c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{2 a^2 c^{1/4} (b c-a d) e^{3/2} \sqrt{c-d x^2}}+$$

$$\frac{d^{1/4} (5 b c-4 a d) \sqrt{1-\frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{2 a^2 c^{1/4} (b c-a d) e^{3/2} \sqrt{c-d x^2}}-\frac{\sqrt{b} c^{1/4} (5 b c-7 a d) \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 a^{5/2} d^{1/4} (b c-a d) e^{3/2} \sqrt{c-d x^2}}+$$

$$\frac{\sqrt{b} c^{1/4} (5 b c-7 a d) \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 a^{5/2} d^{1/4} (b c-a d) e^{3/2} \sqrt{c-d x^2}}$$

Result (type 6, 390 leaves) :

$$\left(x \left(-\frac{21 \left(c-d x^2\right) \left(4 a^2 d+5 b^2 c x^2-4 a b \left(c+d x^2\right)\right)}{c}-\left(49 a \left(5 b^2 c^2-12 a b c d+4 a^2 d^2\right) x^2 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$
$$\left(33 a b d (-5 b c+4 a d) x^4 \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$\left.\left.\left.2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/$$
$$\left(42 a^2 (-b c+a d) (e x)^{3/2} \left(a-b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 917: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(e x)^{5/2} \left(a-b x^2\right)^2 \sqrt{c-d x^2}} \, dx$$

Optimal (type 4, 429 leaves, 11 steps) :

$$-\frac{(7bc-4ad)\sqrt{c-dx^2}}{6a^2c(bc-ad)e(ex)^{3/2}}+\frac{b\sqrt{c-dx^2}}{2a(bc-ad)e(ex)^{3/2}(a-bx^2)}+$$

$$\frac{d^{3/4}(7bc-4ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{6a^2c^{3/4}(bc-ad)e^{5/2}\sqrt{c-dx^2}}+\frac{bc^{1/4}(7bc-9ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4a^3d^{1/4}(bc-ad)e^{5/2}\sqrt{c-dx^2}}+$$

$$\frac{bc^{1/4}(7bc-9ad)\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4a^3d^{1/4}(bc-ad)e^{5/2}\sqrt{c-dx^2}}$$

Result (type 6, 390 leaves) :

$$\left(x\left(-\frac{5(c-dx^2)(4a^2d+7b^2cx^2-4ab(c+dx^2))}{c}+\left(25a(-21b^2c^2+20abcd+4a^2d^2)x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5ac\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\left(2bc\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)+$$
$$\left(9abd(7bc-4ad)x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/$$
$$\left.\left.\left(9ac\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\left(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\right)\right)\Big/$$
$$\left(30a^2(-bc+ad)(ex)^{5/2}(a-bx^2)\sqrt{c-dx^2}\right)$$

Problem 918: Result unnecessarily involves higher level functions.

$$\int\frac{(ex)^{9/2}}{(a-bx^2)^2(c-dx^2)^{3/2}}\,dx$$

Optimal (type 4, 529 leaves, 16 steps) :

$$\frac{(2bc+ad)\,e^3\,(e x)^{3/2}}{2b\,(bc-ad)^2\,\sqrt{c-dx^2}}+\frac{a\,e^3\,(e x)^{3/2}}{2b\,(bc-ad)\,(a-bx^2)\,\sqrt{c-dx^2}}-$$

$$\frac{c^{3/4}\,(2bc+ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2b\,d^{3/4}\,(bc-ad)^2\,\sqrt{c-dx^2}}+\frac{c^{3/4}\,(2bc+ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2b\,d^{3/4}\,(bc-ad)^2\,\sqrt{c-dx^2}}+$$

$$\frac{\sqrt{a}\,c^{1/4}\,(7bc-ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4b^{3/2}\,d^{1/4}\,(bc-ad)^2\,\sqrt{c-dx^2}}-$$

$$\frac{\sqrt{a}\,c^{1/4}\,(7bc-ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4b^{3/2}\,d^{1/4}\,(bc-ad)^2\,\sqrt{c-dx^2}}$$

Result (type 6, 432 leaves) :

$$\left((e x)^{9/2}\left(\left(147\,a^2\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/\left((-a+bx^2)\right.\right.\right.$$
$$\left.\left.\left(7ac\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\left(2bc\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\right)+$$
$$\left(33ac\,(7ac-4bcx^2-2adx^2)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]-14x^2\,(-3ac+2bcx^2+adx^2)\right.$$
$$\left.\left(2bc\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\Big/$$
$$\left((a-bx^2)\left(11ac\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\left(2bc\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+\right.\right.\right.$$
$$\left.\left.\left.\left.\left.ad\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(14\,(bc-ad)^2\,x^3\,\sqrt{c-dx^2}\right)$$

Problem 919: Result unnecessarily involves higher level functions.

$$\int\frac{(e x)^{7/2}}{(a-bx^2)^2\,(c-dx^2)^{3/2}}\,dx$$

Optimal (type 4, 420 leaves, 11 steps) :

$$\frac{(2bc+ad)\,e^3\sqrt{e x}}{2b\,(bc-ad)^2\sqrt{c-dx^2}}+\frac{a\,e^3\sqrt{e x}}{2b\,(bc-ad)\,(a-bx^2)\sqrt{c-dx^2}}+\frac{c^{1/4}\,(2bc+ad)\,e^{7/2}\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2b\,d^{1/4}\,(bc-ad)^2\sqrt{c-dx^2}}-$$

$$\frac{c^{1/4}\,(5bc+ad)\,e^{7/2}\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4b\,d^{1/4}\,(bc-ad)^2\sqrt{c-dx^2}}-$$

$$\frac{c^{1/4}\,(5bc+ad)\,e^{7/2}\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4b\,d^{1/4}\,(bc-ad)^2\sqrt{c-dx^2}}$$

Result (type 6, 422 leaves) :

$$\left((e x)^{7/2}\left(\left(75a^2c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5ac\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\left(2bc\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)+$$
$$\left(-27ac\,(5ac-4bcx^2-2adx^2)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+10x^2\,(-3ac+2bcx^2+adx^2)\right.$$
$$\left.\left(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\Big/\left(9ac\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+\right.$$
$$\left.\left.\left.2x^2\left(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\right)\right)\Big/\left(10\,(bc-ad)^2\,x^3\,(-a+bx^2)\sqrt{c-dx^2}\right)$$

Problem 920: Result unnecessarily involves higher level functions.

$$\int\frac{(e x)^{5/2}}{(a-bx^2)^2\,(c-dx^2)^{3/2}}\,dx$$

Optimal (type 4, 485 leaves, 16 steps) :

$$\frac{3\,d\,e\,(e\,x)^{3/2}}{2\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}+\frac{e\,(e\,x)^{3/2}}{2\,(b\,c-a\,d)\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}-\frac{3\,c^{3/4}\,d^{1/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}+$$

$$\frac{3\,c^{3/4}\,d^{1/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}+\frac{3\,c^{1/4}\,(b\,c+a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}-$$

$$\frac{3\,c^{1/4}\,(b\,c+a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}$$

Result (type 6, 339 leaves):

$$\left(e\,(e\,x)^{3/2}\left(7\,(b\,c+2\,a\,d-3\,b\,d\,x^2)-\left(49\,a\,c\,(b\,c+2\,a\,d)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right/\right.$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(33\,a\,b\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(14\,(b\,c-a\,d)^2\,(a-b\,x^2)\,\sqrt{c-d\,x^2}\right)$$

Problem 921: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{3/2}}{(a-b\,x^2)^2\,(c-d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 391 leaves, 11 steps):

$$\frac{3\,d\,e\,\sqrt{e\,x}}{2\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}+\frac{e\,\sqrt{e\,x}}{2\,(b\,c-a\,d)\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}+\frac{3\,c^{1/4}\,d^{3/4}\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(b\,c+5\,a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}-$$

$$\frac{c^{1/4}\,(b\,c+5\,a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}$$

Result (type 6, 340 leaves):

$$\Bigg((e\,x)^{3/2}\,\Bigg(-5\,(b\,c+2\,a\,d-3\,b\,d\,x^2)+\Big(25\,a\,c\,(b\,c+2\,a\,d)\,\text{AppellF1}\Big[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big/$$
$$\Big(5\,a\,c\,\text{AppellF1}\Big[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+2\,x^2\,\Big(2\,b\,c\,\text{AppellF1}\Big[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+a\,d\,\text{AppellF1}\Big[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big)+$$
$$\Big(27\,a\,b\,c\,d\,x^2\,\text{AppellF1}\Big[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big/\Big(9\,a\,c\,\text{AppellF1}\Big[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+$$
$$2\,x^2\,\Big(2\,b\,c\,\text{AppellF1}\Big[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]+a\,d\,\text{AppellF1}\Big[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\Big]\Big)\Big)\Bigg)\Bigg)\Bigg/\Big(10\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}\,(-a\,x+b\,x^3)\Big)$$

Problem 922: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}}{(a-b\,x^2)^2\,(c-d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 531 leaves, 16 steps):

$$\frac{d\,(b\,c+2\,a\,d)\,(e\,x)^{3/2}}{2\,a\,c\,(b\,c-a\,d)^2\,e\,\sqrt{c-d\,x^2}}+\frac{b\,(e\,x)^{3/2}}{2\,a\,(b\,c-a\,d)\,e\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}-$$

$$\frac{d^{1/4}\,(b\,c+2\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a\,c^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}+\frac{d^{1/4}\,(b\,c+2\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a\,c^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}-$$

$$\frac{\sqrt{b}\,c^{1/4}\,(b\,c-7\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{3/2}\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}+$$

$$\frac{\sqrt{b}\,c^{1/4}\,(b\,c-7\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{3/2}\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}$$

Result (type 6, 482 leaves):

$$\frac{1}{42\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}}$$

$$x\,\sqrt{e\,x}\,\Bigg(-\Bigg(\Bigg(49\,(b^2\,c^2-8\,a\,b\,c\,d-2\,a^2\,d^2)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/\Bigg((-a+b\,x^2)\,\Bigg(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(33\,a\,c\,\left(14\,a^2\,d^2-12\,a\,b\,d^2\,x^2+b^2\,c\,(7\,c-6\,d\,x^2)\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-42\,x^2\,\left(-2\,a^2\,d^2+2\,a\,b\,d^2\,x^2+b^2\,c\,(-c+d\,x^2)\right)$$

$$\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Bigg/\Bigg(a\,c\,(a-b\,x^2)\,\Bigg(11\,a\,c$$

$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)$$

Problem 923: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\sqrt{e\,x}\,(a-b\,x^2)^2\,(c-d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 426 leaves, 11 steps):

$$\frac{d\,(b\,c+2\,a\,d)\,\sqrt{e\,x}}{2\,a\,c\,(b\,c-a\,d)^2\,e\,\sqrt{c-d\,x^2}}+\frac{b\,\sqrt{e\,x}}{2\,a\,(b\,c-a\,d)\,e\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}+$$

$$\frac{d^{3/4}\,(b\,c+2\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a\,c^{3/4}\,(b\,c-a\,d)^2\,\sqrt{e}\,\sqrt{c-d\,x^2}}+\frac{3\,b\,c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^2\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{e}\,\sqrt{c-d\,x^2}}+$$

$$\frac{3\,b\,c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^2\,d^{1/4}\,(b\,c-a\,d)^2\,\sqrt{e}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 472 leaves):

$$\Bigg(x\,\Bigg(\Big(25\,(3\,b^2\,c^2-8\,a\,b\,c\,d+2\,a^2\,d^2)\,\text{AppellF1}\left[\tfrac{1}{4},\tfrac{1}{2},1,\tfrac{5}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]\Big)\Big/$$
$$\Big(5\,a\,c\,\text{AppellF1}\left[\tfrac{1}{4},\tfrac{1}{2},1,\tfrac{5}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]+2\,x^2\,\Big(2\,b\,c\,\text{AppellF1}\left[\tfrac{5}{4},\tfrac{1}{2},2,\tfrac{9}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\tfrac{5}{4},\tfrac{3}{2},1,\tfrac{9}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]\Big)\Big)+$$
$$\Big(9\,a\,c\,(10\,a^2\,d^2-12\,a\,b\,d^2\,x^2+b^2\,c\,(5\,c-6\,d\,x^2))\,\text{AppellF1}\left[\tfrac{5}{4},\tfrac{1}{2},1,\tfrac{9}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]-$$
$$10\,x^2\,(-2\,a^2\,d^2+2\,a\,b\,d^2\,x^2+b^2\,c\,(-c+d\,x^2))\,\Big(2\,b\,c\,\text{AppellF1}\left[\tfrac{9}{4},\tfrac{1}{2},2,\tfrac{13}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\tfrac{9}{4},\tfrac{3}{2},1,\tfrac{13}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]\Big)\Big)\Big/$$
$$\Big(a\,c\,\Big(9\,a\,c\,\text{AppellF1}\left[\tfrac{5}{4},\tfrac{1}{2},1,\tfrac{9}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]+2\,x^2\,\Big(2\,b\,c\,\text{AppellF1}\left[\tfrac{9}{4},\tfrac{1}{2},2,\tfrac{13}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\tfrac{9}{4},\tfrac{3}{2},1,\tfrac{13}{4},\tfrac{d\,x^2}{c},\tfrac{b\,x^2}{a}\right]\Big)\Big)\Big)\Bigg)\Bigg)\Big/\Big(10\,(b\,c-a\,d)^2\,\sqrt{e\,x}\,(a-b\,x^2)\,\sqrt{c-d\,x^2}\Big)$$

Problem 924: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(e\,x)^{3/2}\,(a-b\,x^2)^2\,(c-d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 628 leaves, 17 steps):

$$\frac{d\,(b\,c+2\,a\,d)}{2\,a\,c\,(b\,c-a\,d)^2\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}+\frac{b}{2\,a\,(b\,c-a\,d)\,e\,\sqrt{e\,x}\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}-$$

$$\frac{(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2)\,\sqrt{c-d\,x^2}}{2\,a^2\,c^2\,(b\,c-a\,d)^2\,e\,\sqrt{e\,x}}-\frac{d^{1/4}\,(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a^2\,c^{5/4}\,(b\,c-a\,d)^2\,e^{3/2}\,\sqrt{c-d\,x^2}}+$$

$$\frac{d^{1/4}\,(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a^2\,c^{5/4}\,(b\,c-a\,d)^2\,e^{3/2}\,\sqrt{c-d\,x^2}}-$$

$$\frac{b^{3/2}\,c^{1/4}\,(5\,b\,c-11\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^2\,e^{3/2}\,\sqrt{c-d\,x^2}}+$$

$$\frac{b^{3/2}\,c^{1/4}\,(5\,b\,c-11\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^2\,e^{3/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 476 leaves):

$$\frac{1}{42\,a^2\,c^2\,(b\,c-a\,d)^2\,(e\,x)^{3/2}\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}$$

$$x\left(-21\,\left(2\,a^3\,d^2\,(2\,c-3\,d\,x^2)-5\,b^3\,c^2\,x^2\,(c-d\,x^2)+4\,a\,b^2\,c\,(c^2+c\,d\,x^2-2\,d^2\,x^4)+2\,a^2\,b\,d\,(-4\,c^2+2\,c\,d\,x^2+3\,d^2\,x^4)\right)+\right.$$

$$\left(49\,a\,c\,(5\,b^3\,c^3-16\,a\,b^2\,c^2\,d+8\,a^2\,b\,c\,d^2-6\,a^3\,d^3)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$

$$\left(33\,a\,b\,c\,d\,(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2)\,x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\left.\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 925: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(e\,x)^{5/2}\,(a-b\,x^2)^2\,(c-d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 512 leaves, 12 steps):

$$\frac{d\,(b c+2 a d)}{2 a c\,(b c-a d)^2 e\,(e x)^{3/2}\sqrt{c-d x^2}}+\frac{b}{2 a\,(b c-a d)\,e\,(e x)^{3/2}\,(a-b x^2)\,\sqrt{c-d x^2}}-$$

$$\frac{(7 b^2 c^2-8 a b c d+10 a^2 d^2)\sqrt{c-d x^2}}{6 a^2 c^2\,(b c-a d)^2 e\,(e x)^{3/2}}+\frac{d^{3/4}\,(7 b^2 c^2-8 a b c d+10 a^2 d^2)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{6 a^2 c^{7/4}\,(b c-a d)^2 e^{5/2}\sqrt{c-d x^2}}+$$

$$\frac{b^2 c^{1/4}\,(7 b c-13 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^3 d^{1/4}\,(b c-a d)^2 e^{5/2}\sqrt{c-d x^2}}+$$

$$\frac{b^2 c^{1/4}\,(7 b c-13 a d)\sqrt{1-\frac{d x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4 a^3 d^{1/4}\,(b c-a d)^2 e^{5/2}\sqrt{c-d x^2}}$$

Result (type 6, 476 leaves):

$$\frac{1}{30 a^2 c^2\,(b c-a d)^2\,(e x)^{5/2}\,(a-b x^2)\,\sqrt{c-d x^2}}$$

$$x\left(-5\left(2 a^3 d^2\,(2 c-5 d x^2)-7 b^3 c^2 x^2\,(c-d x^2)+4 a b^2 c\,(c^2+c d x^2-2 d^2 x^4)+2 a^2 b d\,(-4 c^2+2 c d x^2+5 d^2 x^4)\right)+\right.$$

$$\left(25 a c\,(21 b^3 c^3-32 a b^2 c^2 d-8 a^2 b c d^2+10 a^3 d^3)\,x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$

$$\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)-$$

$$\left(9 a b c d\,(7 b^2 c^2-8 a b c d+10 a^2 d^2)\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$

$$\left.\left(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)$$

Problem 926: Result unnecessarily involves higher level functions.

$$\int\frac{(e x)^{9/2}}{(a-b x^2)^2\,(c-d x^2)^{5/2}}\,dx$$

Optimal (type 4, 568 leaves, 17 steps):

$$\frac{(2bc+3ad)\,e^3\,(ex)^{3/2}}{6b\,(bc-ad)^2\,(c-dx^2)^{3/2}}+\frac{a\,e^3\,(ex)^{3/2}}{2b\,(bc-ad)\,(a-bx^2)\,(c-dx^2)^{3/2}}+\frac{(bc+4ad)\,e^3\,(ex)^{3/2}}{2\,(bc-ad)^3\,\sqrt{c-dx^2}}-$$

$$\frac{c^{3/4}\,(bc+4ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,d^{3/4}\,(bc-ad)^3\,\sqrt{c-dx^2}}+\frac{c^{3/4}\,(bc+4ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,d^{3/4}\,(bc-ad)^3\,\sqrt{c-dx^2}}+$$

$$\frac{\sqrt{a}\,c^{1/4}\,(7bc+3ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\sqrt{b}\,d^{1/4}\,(bc-ad)^3\,\sqrt{c-dx^2}}-$$

$$\frac{\sqrt{a}\,c^{1/4}\,(7bc+3ad)\,e^{9/2}\,\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{4\sqrt{b}\,d^{1/4}\,(bc-ad)^3\,\sqrt{c-dx^2}}$$

Result (type 6, 522 leaves) :

$$\frac{1}{42\,(-bc+ad)^3\,x^3\,(a-bx^2)\,\sqrt{c-dx^2}}(ex)^{9/2}\left(\left(49a^2c\,(8bc+7ad)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/\right.$$
$$\left(7ac\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\left(2bc\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)+$$
$$\left(11ac\,\left(7a^2d\,(7c-9dx^2)+2b^2cx^2\,(-16c+9dx^2)+4ab\,(14c^2-25cdx^2+18d^2x^4)\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+\right.$$
$$14x^2\left(a^2d\,(7c-9dx^2)+b^2cx^2\,(-5c+3dx^2)+4ab\,(2c^2-4cdx^2+3d^2x^4)\right)$$
$$\left.\left(2bc\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\Big/\left((-c+dx^2)\left(11ac\right.\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+2x^2\left(2bc\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\right)\right)$$

Problem 927: Result unnecessarily involves higher level functions.

$$\int\frac{(ex)^{7/2}}{(a-bx^2)^2\,(c-dx^2)^{5/2}}\,dx$$

Optimal (type 4, 454 leaves, 12 steps) :

$$\frac{(2 b c+3 a d) e^3 \sqrt{e x}}{6 b (b c-a d)^2 (c-d x^2)^{3/2}}+\frac{a e^3 \sqrt{e x}}{2 b (b c-a d) (a-b x^2) (c-d x^2)^{3/2}}+\frac{5 (b c+2 a d) e^3 \sqrt{e x}}{6 (b c-a d)^3 \sqrt{c-d x^2}}+$$
$$\frac{5 c^{1/4} (b c+2 a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{6 d^{1/4} (b c-a d)^3 \sqrt{c-d x^2}}-\frac{5 c^{1/4} (b c+a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 d^{1/4} (b c-a d)^3 \sqrt{c-d x^2}}-$$
$$\frac{5 c^{1/4} (b c+a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{4 d^{1/4} (b c-a d)^3 \sqrt{c-d x^2}}$$

Result (type 6, 520 leaves) :

$$\left((e x)^{7/2} \left(\left(25 a^2 c (2 b c+a d) \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$
$$\left(9 a c \left(a^2 d (5 c-7 d x^2)+2 b^2 c x^2 (-4 c+3 d x^2)+2 a b (5 c^2-9 c d x^2+6 d^2 x^4)\right) \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$2 x^2 \left(a^2 d (5 c-7 d x^2)+b^2 c x^2 (-7 c+5 d x^2)+2 a b (5 c^2-8 c d x^2+5 d^2 x^4)\right)$$
$$\left.\left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/$$
$$\left((-c+d x^2) \left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.\right.$$
$$\left.\left.\left.\left.\left.a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(6 (-b c+a d)^3 x^3 (a-b x^2) \sqrt{c-d x^2}\right)$$

Problem 928: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{5/2}}{(a-b x^2)^2 (c-d x^2)^{5/2}} \, dx$$

Optimal (type 4, 551 leaves, 17 steps) :

$$\frac{5\,d\,e\,(e\,x)^{3/2}}{6\,(b\,c-a\,d)^2\,(c-d\,x^2)^{3/2}}+\frac{e\,(e\,x)^{3/2}}{2\,(b\,c-a\,d)\,(a-b\,x^2)\,(c-d\,x^2)^{3/2}}+\frac{d\,(4\,b\,c+a\,d)\,e\,(e\,x)^{3/2}}{2\,c\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}-$$

$$\frac{d^{1/4}\,(4\,b\,c+a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,c^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}+\frac{d^{1/4}\,(4\,b\,c+a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,c^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}+$$

$$\frac{\sqrt{b}\,c^{1/4}\,(3\,b\,c+7\,a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,d^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}-$$

$$\frac{\sqrt{b}\,c^{1/4}\,(3\,b\,c+7\,a\,d)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,\sqrt{a}\,d^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}$$

Result (type 6, 568 leaves) :

$$\frac{1}{42\,\sqrt{c-d\,x^2}}\,e\,(e\,x)^{3/2}\left(\left(49\,a\,(3\,b^2\,c^2+11\,a\,b\,c\,d+a^2\,d^2)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((-b\,c+a\,d)^3\,(a-b\,x^2)\right.\right.$$
$$\left.\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(-11\,a\,c\,\left(7\,a^2\,d^2\,(c-3\,d\,x^2)+a\,b\,d\,(77\,c^2-67\,c\,d\,x^2+18\,d^2\,x^4)+b^2\,c\,(21\,c^2-107\,c\,d\,x^2+72\,d^2\,x^4)\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-\right.$$
$$14\,x^2\left(a^2\,d^2\,(c-3\,d\,x^2)+a\,b\,d\,(11\,c^2-10\,c\,d\,x^2+3\,d^2\,x^4)+b^2\,c\,(3\,c^2-17\,c\,d\,x^2+12\,d^2\,x^4)\right)$$
$$\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/$$
$$\left(c\,(b\,c-a\,d)^3\,(-a+b\,x^2)\,(c-d\,x^2)\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 929: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{3/2}}{(a-b\,x^2)^2\,(c-d\,x^2)^{5/2}}\,dx$$

Optimal (type 4, 447 leaves, 12 steps) :

$$\frac{5\,d\,e\,\sqrt{e\,x}}{6\,(b\,c-a\,d)^2\,(c-d\,x^2)^{3/2}}+\frac{e\,\sqrt{e\,x}}{2\,(b\,c-a\,d)\,(a-b\,x^2)\,(c-d\,x^2)^{3/2}}+$$

$$\frac{d\,(14\,b\,c+a\,d)\,e\,\sqrt{e\,x}}{6\,c\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}+\frac{d^{3/4}\,(14\,b\,c+a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{6\,c^{3/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}-$$

$$\frac{b\,c^{1/4}\,(b\,c+9\,a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,d^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}-$$

$$\frac{b\,c^{1/4}\,(b\,c+9\,a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a\,d^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}$$

Result (type 6, 547 leaves) :

$$\frac{1}{30\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}\,\left(-a\,x+b\,x^3\right)}(e\,x)^{3/2}\left(\left(25\,a\,\left(3\,b^2\,c^2+13\,a\,b\,c\,d-a^2\,d^2\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(9\,a\,c\,\left(5\,a^2\,d^2\,(c+d\,x^2)+b^2\,c\,\left(-15\,c^2+109\,c\,d\,x^2-84\,d^2\,x^4\right)+a\,b\,d\,\left(-65\,c^2+51\,c\,d\,x^2-6\,d^2\,x^4\right)\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-\right.$$
$$10\,x^2\,\left(-a^2\,d^2\,(c+d\,x^2)+a\,b\,d\,\left(13\,c^2-10\,c\,d\,x^2+d^2\,x^4\right)+b^2\,c\,\left(3\,c^2-19\,c\,d\,x^2+14\,d^2\,x^4\right)\right)$$
$$\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(c\,(c-d\,x^2)\right.$$
$$\left.\left.\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 930: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}}{(a-b\,x^2)^2\,(c-d\,x^2)^{5/2}}\,dx$$

Optimal (type 4, 625 leaves, 17 steps) :

$$\frac{d\,(3\,b\,c+2\,a\,d)\,(e\,x)^{3/2}}{6\,a\,c\,(b\,c-a\,d)^2\,e\,(c-d\,x^2)^{3/2}}+\frac{b\,(e\,x)^{3/2}}{2\,a\,(b\,c-a\,d)\,e\,(a-b\,x^2)\,(c-d\,x^2)^{3/2}}+$$

$$\frac{d\,(b^2\,c^2+5\,a\,b\,c\,d-a^2\,d^2)\,(e\,x)^{3/2}}{2\,a\,c^2\,(b\,c-a\,d)^3\,e\,\sqrt{c-d\,x^2}}-\frac{d^{1/4}\,(b^2\,c^2+5\,a\,b\,c\,d-a^2\,d^2)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a\,c^{5/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}+$$

$$\frac{d^{1/4}\,(b^2\,c^2+5\,a\,b\,c\,d-a^2\,d^2)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a\,c^{5/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}-$$

$$\frac{b^{3/2}\,c^{1/4}\,(b\,c-11\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{3/2}\,d^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}+$$

$$\frac{b^{3/2}\,c^{1/4}\,(b\,c-11\,a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{3/2}\,d^{1/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}$$

Result (type 6, 626 leaves) :

$$\frac{1}{42\,c^2\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}\,x\,\sqrt{e\,x}\,\Bigg(\Bigg(49\,c\,(b^3\,c^3-12\,a\,b^2\,c^2\,d-5\,a^2\,b\,c\,d^2+a^3\,d^3)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/\Bigg((b\,c-a\,d)^3$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Bigg)+$$
$$\Big(-11\,a\,c\,(2\,a\,b^2\,c\,d^2\,x^2\,(52\,c-45\,d\,x^2)+7\,a^3\,d^3\,(5\,c-3\,d\,x^2)-3\,b^3\,c^2\,(7\,c^2-13\,c\,d\,x^2+6\,d^2\,x^4)+a^2\,b\,d^2\,(-119\,c^2+73\,c\,d\,x^2+18\,d^2\,x^4))$$
$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$14\,x^2\,(3\,b^3\,c^2\,(c-d\,x^2)^2+a^3\,d^3\,(-5\,c+3\,d\,x^2)+a\,b^2\,c\,d^2\,x^2\,(-17\,c+15\,d\,x^2)+a^2\,b\,d^2\,(17\,c^2-10\,c\,d\,x^2-3\,d^2\,x^4))$$
$$\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big)\Bigg/\Bigg(a\,(-b\,c+a\,d)^3\,(-c+d\,x^2)\,\Bigg(11\,a\,c$$
$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Bigg)\Bigg)$$

Problem 931: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\sqrt{e x}\,\left(a-b x^2\right)^2\,\left(c-d x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 514 leaves, 12 steps):

$$\frac{d\,(3 b c+2 a d)\,\sqrt{e x}}{6 a c\,(b c-a d)^2\,e\,\left(c-d x^2\right)^{3/2}}+\frac{b\,\sqrt{e x}}{2 a\,(b c-a d)\,e\,\left(a-b x^2\right)\,\left(c-d x^2\right)^{3/2}}+$$

$$\frac{d\,\left(3 b^2 c^2+17 a b c d-5 a^2 d^2\right)\,\sqrt{e x}}{6 a c^2\,(b c-a d)^3\,e\,\sqrt{c-d x^2}}+\frac{d^{3/4}\,\left(3 b^2 c^2+17 a b c d-5 a^2 d^2\right)\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{6 a c^{7/4}\,(b c-a d)^3\,\sqrt{e}\,\sqrt{c-d x^2}}+$$

$$\frac{b^2 c^{1/4}\,(3 b c-13 a d)\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4 a^2 d^{1/4}\,(b c-a d)^3\,\sqrt{e}\,\sqrt{c-d x^2}}+$$

$$\frac{b^2 c^{1/4}\,(3 b c-13 a d)\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4 a^2 d^{1/4}\,(b c-a d)^3\,\sqrt{e}\,\sqrt{c-d x^2}}$$

Result (type 6, 629 leaves):

$$\frac{1}{30 c^2\,\sqrt{e x}\,\left(a-b x^2\right)\,\sqrt{c-d x^2}}\times\left(\left(25 c\,\left(9 b^3 c^3-36 a b^2 c^2 d+17 a^2 b c d^2-5 a^3 d^3\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\middle/\left((b c-a d)^3\right.\right.$$

$$\left.\left.\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+$$

$$\left(-9 a c\,\left(2 a b^2 c d^2 x^2\,\left(56 c-51 d x^2\right)+5 a^3 d^3\,\left(7 c-5 d x^2\right)-3 b^3 c^2\,\left(5 c^2-11 c d x^2+6 d^2 x^4\right)+5 a^2 b d^2\,\left(-19 c^2+9 c d x^2+6 d^2 x^4\right)\right)\,\text{AppellF1}\left[\right.\right.$$

$$\left.\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+10 x^2\,\left(3 b^3 c^2\,\left(c-d x^2\right)^2+a^3 d^3\,\left(-7 c+5 d x^2\right)+a b^2 c d^2 x^2\,\left(-19 c+17 d x^2\right)+a^2 b d^2\,\left(19 c^2-10 c d x^2-5 d^2 x^4\right)\right)$$

$$\left.\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\middle/\left(a\,(-b c+a d)^3\,\left(-c+d x^2\right)\right.$$

$$\left.\left.\left(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 932: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(e\,x)^{3/2}\,\left(a-b\,x^2\right)^2\,\left(c-d\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 735 leaves, 18 steps):

$$\frac{d\,(3\,b\,c+2\,a\,d)}{6\,a\,c\,(b\,c-a\,d)^2\,e\,\sqrt{e\,x}\,\left(c-d\,x^2\right)^{3/2}}+\frac{b}{2\,a\,(b\,c-a\,d)\,e\,\sqrt{e\,x}\,\left(a-b\,x^2\right)\,\left(c-d\,x^2\right)^{3/2}}+$$
$$\frac{d\,\left(3\,b^2\,c^2+19\,a\,b\,c\,d-7\,a^2\,d^2\right)}{6\,a\,c^2\,(b\,c-a\,d)^3\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}-\frac{\left(5\,b^3\,c^3-12\,a\,b^2\,c^2\,d+19\,a^2\,b\,c\,d^2-7\,a^3\,d^3\right)\,\sqrt{c-d\,x^2}}{2\,a^2\,c^3\,(b\,c-a\,d)^3\,e\,\sqrt{e\,x}}-$$
$$\frac{d^{1/4}\,\left(5\,b^3\,c^3-12\,a\,b^2\,c^2\,d+19\,a^2\,b\,c\,d^2-7\,a^3\,d^3\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a^2\,c^{9/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}}+$$
$$\frac{d^{1/4}\,\left(5\,b^3\,c^3-12\,a\,b^2\,c^2\,d+19\,a^2\,b\,c\,d^2-7\,a^3\,d^3\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a^2\,c^{9/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}}-$$
$$\frac{5\,b^{5/2}\,c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}}+$$
$$\frac{5\,b^{5/2}\,c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 582 leaves):

$$\frac{1}{42\,a^2\,c^3\,\left(-b\,c+a\,d\right)^3\,(e\,x)^{3/2}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}}$$
$$\times\left(-\frac{1}{c-d\,x^2}7\,\left(15\,b^4\,c^3\,x^2\,\left(c-d\,x^2\right)^2-12\,a\,b^3\,c^2\,\left(c-d\,x^2\right)^2\,\left(c+3\,d\,x^2\right)+a^4\,d^3\,\left(12\,c^2-35\,c\,d\,x^2+21\,d^2\,x^4\right)-a^3\,b\,d^2\,\left(36\,c^3-83\,c^2\,d\,x^2+22\,c\,d^2\,x^4+21\,d^3\,x^6\right)+a^2\,b^2\,c\,d\,\left(36\,c^3-36\,c^2\,d\,x^2-59\,c\,d^2\,x^4+57\,d^3\,x^6\right)\right)-\right.$$
$$\left(49\,a\,c\,\left(5\,b^4\,c^4-20\,a\,b^3\,c^3\,d+12\,a^2\,b^2\,c^2\,d^2-19\,a^3\,b\,c\,d^3+7\,a^4\,d^4\right)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(33\,a\,b\,c\,d\,\left(-5\,b^3\,c^3+12\,a\,b^2\,c^2\,d-19\,a^2\,b\,c\,d^2+7\,a^3\,d^3\right)\,x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left.\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 933: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(e\,x)^{5/2}\,\left(a-b\,x^2\right)^2\,\left(c-d\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 606 leaves, 13 steps):

$$\frac{d\,(3\,b\,c+2\,a\,d)}{6\,a\,c\,(b\,c-a\,d)^2\,e\,(e\,x)^{3/2}\,\left(c-d\,x^2\right)^{3/2}}+\frac{b}{2\,a\,(b\,c-a\,d)\,e\,(e\,x)^{3/2}\,\left(a-b\,x^2\right)\,\left(c-d\,x^2\right)^{3/2}}+$$
$$\frac{d\,\left(b^2\,c^2+7\,a\,b\,c\,d-3\,a^2\,d^2\right)}{2\,a\,c^2\,(b\,c-a\,d)^3\,e\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}-\frac{\left(7\,b^3\,c^3-12\,a\,b^2\,c^2\,d+35\,a^2\,b\,c\,d^2-15\,a^3\,d^3\right)\,\sqrt{c-d\,x^2}}{6\,a^2\,c^3\,(b\,c-a\,d)^3\,e\,(e\,x)^{3/2}}+$$
$$\frac{d^{3/4}\,\left(7\,b^3\,c^3-12\,a\,b^2\,c^2\,d+35\,a^2\,b\,c\,d^2-15\,a^3\,d^3\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{6\,a^2\,c^{11/4}\,(b\,c-a\,d)^3\,e^{5/2}\,\sqrt{c-d\,x^2}}+$$
$$\frac{b^3\,c^{1/4}\,(7\,b\,c-17\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^3\,d^{1/4}\,(b\,c-a\,d)^3\,e^{5/2}\,\sqrt{c-d\,x^2}}+$$
$$\frac{b^3\,c^{1/4}\,(7\,b\,c-17\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{4\,a^3\,d^{1/4}\,(b\,c-a\,d)^3\,e^{5/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 582 leaves):

$$\frac{1}{30\,a^2\,c^3\,(-b\,c+a\,d)^3\,(e\,x)^{5/2}\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}$$
$$x\left(-\frac{1}{c-d\,x^2}5\left(7\,b^4\,c^3\,x^2\,(c-d\,x^2)^2-4\,a\,b^3\,c^2\,(c-d\,x^2)^2\,(c+3\,d\,x^2)+a^4\,d^3\,(4\,c^2-21\,c\,d\,x^2+15\,d^2\,x^4)-\right.\right.$$
$$\left.a^3\,b\,d^2\,(12\,c^3-45\,c^2\,d\,x^2+14\,c\,d^2\,x^4+15\,d^3\,x^6)+a^2\,b^2\,c\,d\,(12\,c^3-12\,c^2\,d\,x^2-37\,c\,d^2\,x^4+35\,d^3\,x^6)\right)+$$
$$\left(25\,a\,c\,(-21\,b^4\,c^4+44\,a\,b^3\,c^3\,d+12\,a^2\,b^2\,c^2\,d^2-35\,a^3\,b\,c\,d^3+15\,a^4\,d^4)\,x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(9\,a\,b\,c\,d\,(7\,b^3\,c^3-12\,a\,b^2\,c^2\,d+35\,a^2\,b\,c\,d^2-15\,a^3\,d^3)\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left.\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 937: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+b\,x^2}}{x\,\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 3, 92 leaves, 8 steps):

$$-\frac{\sqrt{a}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b\,x^2}}{\sqrt{a}\,\sqrt{c+d\,x^2}}\right]}{\sqrt{c}}+\frac{\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{d}\,\sqrt{a+b\,x^2}}{\sqrt{b}\,\sqrt{c+d\,x^2}}\right]}{\sqrt{d}}$$

Result (type 6, 238 leaves):

$$\left(5\,a\,(b\,c-a\,d)\,(a+b\,x^2)^{3/2}\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(3\,b\,x^2\,\sqrt{c+d\,x^2}\left(5\,a\,(b\,c-a\,d)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]-\right.\right.$$
$$\left.\left.(a+b\,x^2)\left((-2\,b\,c+2\,a\,d)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},2,\frac{7}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{2},1,\frac{7}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 938: Result unnecessarily involves higher level functions and more than twice size of optimal

antiderivative.

$$\int \frac{\sqrt{a+b x^2}}{x^3 \sqrt{c+d x^2}}\,dx$$

Optimal (type 3, 89 leaves, 4 steps):

$$-\frac{\sqrt{a+b x^2}\,\sqrt{c+d x^2}}{2 c x^2}-\frac{(b c-a d)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b x^2}}{\sqrt{a}\,\sqrt{c+d x^2}}\right]}{2 \sqrt{a}\,c^{3/2}}$$

Result (type 6, 188 leaves):

$$\frac{1}{2 c x^2 \sqrt{a+b x^2}\,\sqrt{c+d x^2}}\left(-\left(a+b x^2\right)\left(c+d x^2\right)+\left(2 b d\,(b c-a d)\,x^4\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\right.$$
$$\left.\left(-4 b d x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)$$

Problem 939: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{a+b x^2}}{x^5 \sqrt{c+d x^2}}\,dx$$

Optimal (type 3, 143 leaves, 5 steps):

$$\frac{(b c+3 a d)\,\sqrt{a+b x^2}\,\sqrt{c+d x^2}}{8 a c^2 x^2}-\frac{\left(a+b x^2\right)^{3/2}\sqrt{c+d x^2}}{4 a c x^4}+\frac{(b c-a d)\,(b c+3 a d)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b x^2}}{\sqrt{a}\,\sqrt{c+d x^2}}\right]}{8 a^{3/2} c^{5/2}}$$

Result (type 6, 224 leaves):

$$\left(\left(a+b x^2\right)\left(c+d x^2\right)\left(-2 a c-b c x^2+3 a d x^2\right)+\right.$$
$$\left(2 b d\left(-b^2 c^2-2 a b c d+3 a^2 d^2\right) x^6\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+\right.$$
$$\left.\left.b c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(8 a c^2 x^4 \sqrt{a+b x^2}\,\sqrt{c+d x^2}\right)$$

Problem 940: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4 \sqrt{a+b x^2}}{\sqrt{c+d x^2}}\,dx$$

Optimal (type 4, 343 leaves, 6 steps):

$$\frac{\left(8 b^2 c^2-3 a b c d-2 a^2 d^2\right) x \sqrt{a+b x^2}}{15 b^2 d^2 \sqrt{c+d x^2}}-\frac{(4 b c-a d) x \sqrt{a+b x^2} \sqrt{c+d x^2}}{15 b d^2}+\frac{x^3 \sqrt{a+b x^2} \sqrt{c+d x^2}}{5 d}-$$

$$\frac{\sqrt{c} \left(8 b^2 c^2-3 a b c d-2 a^2 d^2\right) \sqrt{a+b x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{15 b^2 d^{5/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}+\frac{c^{3/2} (4 b c-a d) \sqrt{a+b x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{15 b d^{5/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 246 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d x \left(a+b x^2\right) \left(c+d x^2\right) \left(-4 b c+a d+3 b d x^2\right)+i c \left(-8 b^2 c^2+3 a b c d+2 a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]-\right.$$

$$\left.i c \left(-8 b^2 c^2+7 a b c d+a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right) \Big/ \left(15 b \sqrt{\frac{b}{a}}\, d^3 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 941: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2 \sqrt{a+b x^2}}{\sqrt{c+d x^2}}\, dx$$

Optimal (type 4, 259 leaves, 5 steps):

$$-\frac{(2 b c-a d) x \sqrt{a+b x^2}}{3 b d \sqrt{c+d x^2}}+\frac{x \sqrt{a+b x^2} \sqrt{c+d x^2}}{3 d}+$$

$$\frac{\sqrt{c} (2 b c-a d) \sqrt{a+b x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{3 b d^{3/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}-\frac{c^{3/2} \sqrt{a+b x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{3 d^{3/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 199 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, x\, (a+b x^2)\, (c+d x^2) - i\, c\, (-2 b c + a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right] + 2\, i\, c\, (-b c + a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Big/ \left(3 \sqrt{\frac{b}{a}}\, d^2 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 943: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+b x^2}}{x^4 \sqrt{c+d x^2}}\, dx$$

Optimal (type 4, 307 leaves, 6 steps):

$$\frac{d (b c - 2 a d)\, x \sqrt{a+b x^2}}{3 a c^2 \sqrt{c+d x^2}} - \frac{\sqrt{a+b x^2} \sqrt{c+d x^2}}{3 c x^3} - \frac{(b c - 2 a d) \sqrt{a+b x^2} \sqrt{c+d x^2}}{3 a c^2 x} - \frac{\sqrt{d}\, (b c - 2 a d) \sqrt{a+b x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1 - \frac{b c}{a d}\right]}{3 a c^{3/2} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}} - \frac{b \sqrt{d} \sqrt{a+b x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1 - \frac{b c}{a d}\right]}{3 a \sqrt{c} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}}$$

Result (type 4, 228 leaves):

$$\left(-\frac{(a+b x^2)\, (c+d x^2)\, (a c + b c x^2 - 2 a d x^2)}{a} + i \sqrt{\frac{b}{a}}\, c\, (-b c + 2 a d)\, x^3 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right] + i \sqrt{\frac{b}{a}}\, c\, (b c - a d)\, x^3 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Big/ \left(3 c^2 x^3 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 947: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{(a+b x^2)^{3/2}}{x \sqrt{c+d x^2}}\, dx$$

Optimal (type 3, 133 leaves, 8 steps):

$$\frac{b\sqrt{a+bx^2}\sqrt{c+dx^2}}{2d}-\frac{a^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{a+bx^2}}{\sqrt{a}\sqrt{c+dx^2}}\right]}{\sqrt{c}}-\frac{\sqrt{b}\,(bc-3ad)\,\text{ArcTanh}\left[\frac{\sqrt{d}\sqrt{a+bx^2}}{\sqrt{b}\sqrt{c+dx^2}}\right]}{2d^{3/2}}$$

Result (type 6, 400 leaves) :

$$\frac{1}{2\sqrt{a+bx^2}\sqrt{c+dx^2}}b\left(\left(4a^2dx^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]\right)\Big/\right.$$
$$\left(-4bdx^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]+bc\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]+ad\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]\right)+$$
$$\left(-2ac\left(2ac+bcx^2+5adx^2+2bdx^4\right)\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]+\right.$$
$$\left.x^2\left(a+bx^2\right)\left(c+dx^2\right)\left(ad\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]+bc\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]\right)\right)\Big/$$
$$\left.\left(d\left(-4ac\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]+x^2\left(ad\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]+bc\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]\right)\right)\right)\right)$$

Problem 948: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+bx^2\right)^{3/2}}{x^3\sqrt{c+dx^2}}\,dx$$

Optimal (type 3, 136 leaves, 8 steps) :

$$-\frac{a\sqrt{a+bx^2}\sqrt{c+dx^2}}{2cx^2}-\frac{\sqrt{a}\,(3bc-ad)\,\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{a+bx^2}}{\sqrt{a}\sqrt{c+dx^2}}\right]}{2c^{3/2}}+\frac{b^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{d}\sqrt{a+bx^2}}{\sqrt{b}\sqrt{c+dx^2}}\right]}{\sqrt{d}}$$

Result (type 6, 327 leaves) :

$$\frac{1}{2cx^2\sqrt{a+bx^2}\sqrt{c+dx^2}}$$
$$a\left(-\left(a+bx^2\right)\left(c+dx^2\right)+\left(2bd\,(3bc-ad)\,x^4\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]\right)\Big/\left(-4bdx^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]+\right.\right.$$
$$\left.bc\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]+ad\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{bx^2},-\frac{c}{dx^2}\right]\right)-\left(4b^2c^2x^4\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]\right)\Big/$$
$$\left.\left(-4ac\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]+x^2\left(ad\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]+bc\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{bx^2}{a},-\frac{dx^2}{c}\right]\right)\right)\right)$$

Problem 949: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{3/2}}{x^5 \sqrt{c+d x^2}} \, dx$$

Optimal (type 3, 131 leaves, 5 steps):

$$-\frac{3 (b c-a d) \sqrt{a+b x^2} \sqrt{c+d x^2}}{8 c^2 x^2}-\frac{\left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{4 c x^4}-\frac{3 (b c-a d)^2 \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{a+b x^2}}{\sqrt{a} \sqrt{c+d x^2}}\right]}{8 \sqrt{a} c^{5/2}}$$

Result (type 6, 208 leaves):

$$\left(\left(a+b x^2\right) \left(c+d x^2\right) \left(-2 a c-5 b c x^2+3 a d x^2\right)+\left(6 b d (b c-a d)^2 x^6 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(8 c^2 x^4 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 950: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4 \left(a+b x^2\right)^{3/2}}{\sqrt{c+d x^2}} \, dx$$

Optimal (type 4, 429 leaves, 7 steps):

$$-\frac{2 (2 b c-a d) \left(4 b^2 c^2-4 a b c d-a^2 d^2\right) x \sqrt{a+b x^2}}{35 b^2 d^3 \sqrt{c+d x^2}}+\frac{\left(8 b^2 c^2-11 a b c d+a^2 d^2\right) x \sqrt{a+b x^2} \sqrt{c+d x^2}}{35 b d^3}-\frac{2 (3 b c-4 a d) x^3 \sqrt{a+b x^2} \sqrt{c+d x^2}}{35 d^2}+\frac{b x^5 \sqrt{a+b x^2} \sqrt{c+d x^2}}{7 d}+\frac{2 \sqrt{c} (2 b c-a d) \left(4 b^2 c^2-4 a b c d-a^2 d^2\right) \sqrt{a+b x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{35 b^2 d^{7/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}-\frac{c^{3/2} \left(8 b^2 c^2-11 a b c d+a^2 d^2\right) \sqrt{a+b x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{35 b d^{7/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 305 leaves):

$$\frac{1}{35\,b\,\sqrt{\frac{b}{a}}\,d^4\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,x\,\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)\,\left(a^2\,d^2+a\,b\,d\,\left(-11\,c+8\,d\,x^2\right)+b^2\,\left(8\,c^2-6\,c\,d\,x^2+5\,d^2\,x^4\right)\right)+\right.$$
$$2\,\mathrm{i}\,c\,\left(8\,b^3\,c^3-12\,a\,b^2\,c^2\,d+2\,a^2\,b\,c\,d^2+a^3\,d^3\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\,\frac{a\,d}{b\,c}\right]-$$
$$\left.\mathrm{i}\,c\,\left(16\,b^3\,c^3-32\,a\,b^2\,c^2\,d+15\,a^2\,b\,c\,d^2+a^3\,d^3\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\,\frac{a\,d}{b\,c}\right]\right)$$

Problem 951: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2\,\left(a+b\,x^2\right)^{3/2}}{\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 4, 335 leaves, 6 steps):

$$-\frac{\left(13\,a\,c-\frac{8\,b\,c^2}{d}-\frac{3\,a^2\,d}{b}\right)\,x\,\sqrt{a+b\,x^2}}{15\,d\,\sqrt{c+d\,x^2}}-\frac{2\,\left(2\,b\,c-3\,a\,d\right)\,x\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{15\,d^2}+\frac{b\,x^3\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{5\,d}-$$
$$\frac{\sqrt{c}\,\left(8\,b^2\,c^2-13\,a\,b\,c\,d+3\,a^2\,d^2\right)\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\,1-\frac{b\,c}{a\,d}\right]}{15\,b\,d^{5/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}+\frac{2\,c^{3/2}\,\left(2\,b\,c-3\,a\,d\right)\,\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\,1-\frac{b\,c}{a\,d}\right]}{15\,d^{5/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 245 leaves):

$$\left(\sqrt{\frac{b}{a}}\,d\,x\,\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)\,\left(-4\,b\,c+6\,a\,d+3\,b\,d\,x^2\right)-\mathrm{i}\,c\,\left(8\,b^2\,c^2-13\,a\,b\,c\,d+3\,a^2\,d^2\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\,\frac{a\,d}{b\,c}\right]+\right.$$
$$\left.\mathrm{i}\,c\,\left(8\,b^2\,c^2-17\,a\,b\,c\,d+9\,a^2\,d^2\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\,\frac{a\,d}{b\,c}\right]\right)\Big/\left(15\,\sqrt{\frac{b}{a}}\,d^3\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 952: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b\,x^2\right)^{3/2}}{x^2\,\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 4, 244 leaves, 5 steps):

$$\frac{(b c+a d) x \sqrt{a+b x^2}}{c \sqrt{c+d x^2}}-\frac{a \sqrt{a+b x^2} \sqrt{c+d x^2}}{c x}-\frac{(b c+a d) \sqrt{a+b x^2} \text{ EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{\sqrt{c} \sqrt{d} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}}+\frac{2 b \sqrt{c} \sqrt{a+b x^2} \text{ EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{\sqrt{d} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}}$$

Result (type 4, 206 leaves):

$$\left(-a \sqrt{\frac{b}{a}} d (a+b x^2) (c+d x^2)-i b c (b c+a d) x \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{ EllipticE}\left[i \text{ ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]-i b c (-b c+a d) x \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{ EllipticF}\left[i \text{ ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right) \Big/ \left(\sqrt{\frac{b}{a}} c d x \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 953: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+b x^2)^{3/2}}{x^4 \sqrt{c+d x^2}} \, dx$$

Optimal (type 4, 311 leaves, 6 steps):

$$\frac{2 d (2 b c-a d) x \sqrt{a+b x^2}}{3 c^2 \sqrt{c+d x^2}}-\frac{a \sqrt{a+b x^2} \sqrt{c+d x^2}}{3 c x^3}-\frac{2 (2 b c-a d) \sqrt{a+b x^2} \sqrt{c+d x^2}}{3 c^2 x}-\frac{2 \sqrt{d} (2 b c-a d) \sqrt{a+b x^2} \text{ EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{3 c^{3/2} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}}+\frac{b (3 b c-a d) \sqrt{a+b x^2} \text{ EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{3 a \sqrt{c} \sqrt{d} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}}$$

Result (type 4, 227 leaves):

$$\left(\sqrt{\frac{b}{a}}\left(a+b x^2\right)\left(c+d x^2\right)\left(-a c-4 b c x^2+2 a d x^2\right)+2 i b c(-2 b c+a d) x^3 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]-\right.$$
$$\left.i b c(-b c+a d) x^3 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right) \Big/ \left(3 \sqrt{\frac{b}{a}} c^2 x^3 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 957: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{5/2}}{x \sqrt{c+d x^2}} \, dx$$

Optimal (type 3, 187 leaves, 9 steps):

$$-\frac{b (3 b c-7 a d) \sqrt{a+b x^2} \sqrt{c+d x^2}}{8 d^2}+\frac{b \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{4 d}-\frac{a^{5/2} \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{a+b x^2}}{\sqrt{a} \sqrt{c+d x^2}}\right]}{\sqrt{c}}+\frac{\sqrt{b} \left(3 b^2 c^2-10 a b c d+15 a^2 d^2\right) \text{ArcTanh}\left[\frac{\sqrt{d} \sqrt{a+b x^2}}{\sqrt{b} \sqrt{c+d x^2}}\right]}{8 d^{5/2}}$$

Result (type 6, 357 leaves):

$$\frac{1}{4 \sqrt{a+b x^2} \sqrt{c+d x^2}} \left(\left(8 a^3 b d x^2 \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]\right) \Big/ \right.$$
$$\left(-4 b d x^2 \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2, \frac{1}{2}, \frac{3}{2}, 3, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2, \frac{3}{2}, \frac{1}{2}, 3, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]\right)+$$
$$\frac{1}{2 d^2} b \left(\left(a+b x^2\right)\left(c+d x^2\right)\left(-3 b c+9 a d+2 b d x^2\right)-\left(2 a c \left(3 b^2 c^2-10 a b c d+15 a^2 d^2\right) x^2 \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right) \Big/ \right.$$
$$\left.\left.\left(-4 a c \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]+x^2 \left(a d \text{AppellF1}\left[2, \frac{1}{2}, \frac{3}{2}, 3, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]+b c \text{AppellF1}\left[2, \frac{3}{2}, \frac{1}{2}, 3, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Problem 958: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{5/2}}{x^3 \sqrt{c+d x^2}} \, dx$$

Optimal (type 3, 187 leaves, 9 steps):

$$\frac{b (b c+a d) \sqrt{a+b x^2} \sqrt{c+d x^2}}{2 c d}-\frac{a \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{2 c x^2}-\frac{a^{3/2} (5 b c-a d) \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{a+b x^2}}{\sqrt{a} \sqrt{c+d x^2}}\right]}{2 c^{3/2}}-\frac{b^{3/2} (b c-5 a d) \text{ArcTanh}\left[\frac{\sqrt{d} \sqrt{a+b x^2}}{\sqrt{b} \sqrt{c+d x^2}}\right]}{2 d^{3/2}}$$

Result (type 6, 358 leaves):

$$\left(\left(a+b x^2\right)\left(-a^2 d+b^2 c x^2\right)\left(c+d x^2\right)+\left(2 a^2 b d^2 (5 b c-a d) x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)-\left(2 a b^2 c^2 (-b c+5 a d) x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-4 a c \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(a d \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\Big/\left(2 c d x^2 \sqrt{a+b x^2}\sqrt{c+d x^2}\right)$$

Problem 959: Result unnecessarily involves higher level functions.

$$\int \frac{\left(a+b x^2\right)^{5/2}}{x^5 \sqrt{c+d x^2}} \, dx$$

Optimal (type 3, 192 leaves, 9 steps):

$$-\frac{a (7 b c-3 a d)\sqrt{a+b x^2}\sqrt{c+d x^2}}{8 c^2 x^2}-\frac{a\left(a+b x^2\right)^{3/2}\sqrt{c+d x^2}}{4 c x^4}-\frac{\sqrt{a}\left(15 b^2 c^2-10 a b c d+3 a^2 d^2\right) \text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{a+b x^2}}{\sqrt{a}\sqrt{c+d x^2}}\right]}{8 c^{5/2}}+\frac{b^{5/2} \text{ArcTanh}\left[\frac{\sqrt{d}\sqrt{a+b x^2}}{\sqrt{b}\sqrt{c+d x^2}}\right]}{\sqrt{d}}$$

Result (type 6, 359 leaves):

$$\left(a\left(\left(a+b x^2\right)\left(c+d x^2\right)\left(-2 a c-9 b c x^2+3 a d x^2\right)+\left(2 b d\left(15 b^2 c^2-10 a b c d+3 a^2 d^2\right) x^6 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)-\left(16 b^3 c^3 x^6 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-4 a c \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(a d \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)\Big/\left(8 c^2 x^4 \sqrt{a+b x^2}\sqrt{c+d x^2}\right)$$

Problem 960: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4 \left(a+b x^2\right)^{5/2}}{\sqrt{c+d x^2}} \, dx$$

Optimal (type 4, 553 leaves, 8 steps):

$$\frac{\left(128 b^4 c^4-328 a b^3 c^3 d+243 a^2 b^2 c^2 d^2-25 a^3 b c d^3-10 a^4 d^4\right) x \sqrt{a+b x^2}}{315 b^2 d^4 \sqrt{c+d x^2}}-\frac{\left(64 b^3 c^3-156 a b^2 c^2 d+105 a^2 b c d^2-5 a^3 d^3\right) x \sqrt{a+b x^2} \sqrt{c+d x^2}}{315 b d^4}+$$
$$\frac{\left(48 b^2 c^2-115 a b c d+75 a^2 d^2\right) x^3 \sqrt{a+b x^2} \sqrt{c+d x^2}}{315 d^3}-\frac{4 b (2 b c-3 a d) x^5 \sqrt{a+b x^2} \sqrt{c+d x^2}}{63 d^2}+\frac{b x^5 \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{9 d}-$$
$$\left(\sqrt{c} \left(128 b^4 c^4-328 a b^3 c^3 d+243 a^2 b^2 c^2 d^2-25 a^3 b c d^3-10 a^4 d^4\right) \sqrt{a+b x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]\right) \Big/$$
$$\left(315 b^2 d^{9/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}\right)+\frac{c^{3/2} \left(64 b^3 c^3-156 a b^2 c^2 d+105 a^2 b c d^2-5 a^3 d^3\right) \sqrt{a+b x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{315 b d^{9/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 379 leaves):

$$\frac{1}{315 b \sqrt{\frac{b}{a}}\, d^5 \sqrt{a+b x^2} \sqrt{c+d x^2}}$$
$$\left(\sqrt{\frac{b}{a}}\, d x \left(a+b x^2\right) \left(c+d x^2\right) \left(5 a^3 d^3+15 a^2 b d^2 \left(-7 c+5 d x^2\right)+a b^2 d \left(156 c^2-115 c d x^2+95 d^2 x^4\right)+b^3 \left(-64 c^3+48 c^2 d x^2-40 c d^2 x^4+35 d^3 x^6\right)\right)+\right.$$
$$i c \left(-128 b^4 c^4+328 a b^3 c^3 d-243 a^2 b^2 c^2 d^2+25 a^3 b c d^3+10 a^4 d^4\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]-$$
$$\left. i c \left(-128 b^4 c^4+392 a b^3 c^3 d-399 a^2 b^2 c^2 d^2+130 a^3 b c d^3+5 a^4 d^4\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right)$$

Problem 961: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2 \left(a+b x^2\right)^{5/2}}{\sqrt{c+d x^2}}\, dx$$

Optimal (type 4, 436 leaves, 7 steps):

$$-\frac{\left(48 b^3 c^3-128 a b^2 c^2 d+103 a^2 b c d^2-15 a^3 d^3\right) x \sqrt{a+b x^2}}{105 b d^3 \sqrt{c+d x^2}}+$$

$$\frac{\left(24 b^2 c^2-61 a b c d+45 a^2 d^2\right) x \sqrt{a+b x^2} \sqrt{c+d x^2}}{105 d^3}-\frac{2 b (3 b c-5 a d) x^3 \sqrt{a+b x^2} \sqrt{c+d x^2}}{35 d^2}+\frac{b x^3 \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{7 d}+$$

$$\frac{\sqrt{c} \left(48 b^3 c^3-128 a b^2 c^2 d+103 a^2 b c d^2-15 a^3 d^3\right) \sqrt{a+b x^2} \text{ EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{105 b d^{7/2} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}}-$$

$$\frac{c^{3/2} \left(24 b^2 c^2-61 a b c d+45 a^2 d^2\right) \sqrt{a+b x^2} \text{ EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{105 d^{7/2} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{c+d x^2}}$$

Result (type 4, 306 leaves) :

$$\frac{1}{105 \sqrt{\frac{b}{a}} d^4 \sqrt{a+b x^2} \sqrt{c+d x^2}}\left(\sqrt{\frac{b}{a}} d x \left(a+b x^2\right) \left(c+d x^2\right) \left(45 a^2 d^2+a b d \left(-61 c+45 d x^2\right)+3 b^2 \left(8 c^2-6 c d x^2+5 d^2 x^4\right)\right)-\right.$$

$$i c \left(-48 b^3 c^3+128 a b^2 c^2 d-103 a^2 b c d^2+15 a^3 d^3\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{ EllipticE}\left[i \text{ ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]+$$

$$\left.4 i c \left(-12 b^3 c^3+38 a b^2 c^2 d-41 a^2 b c d^2+15 a^3 d^3\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{ EllipticF}\left[i \text{ ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right)$$

Problem 962: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right)^{5/2}}{x^2 \sqrt{c+d x^2}} \, dx$$

Optimal (type 4, 330 leaves, 6 steps) :

$$\frac{\left(7 a b-\frac{2 b^2 c}{d}+\frac{3 a^2 d}{c}\right) x \sqrt{a+b x^2}}{3 \sqrt{c+d x^2}}+\frac{b (b c+3 a d) x \sqrt{a+b x^2} \sqrt{c+d x^2}}{3 c d}-\frac{a \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{c x}+$$
$$\frac{\left(2 b^2 c^2-7 a b c d-3 a^2 d^2\right) \sqrt{a+b x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{3 \sqrt{c}\ d^{3/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}-\frac{b \sqrt{c} (b c-9 a d) \sqrt{a+b x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{3 d^{3/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 254 leaves):

$$\left(-\sqrt{\frac{b}{a}}\, d \left(a+b x^2\right) \left(3 a^2 d-b^2 c x^2\right) \left(c+d x^2\right)-i b c \left(-2 b^2 c^2+7 a b c d+3 a^2 d^2\right) x \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticE}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]-\right.$$
$$\left.2 i b c \left(b^2 c^2-4 a b c d+3 a^2 d^2\right) x \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]\right)\Big/\left(3 \sqrt{\frac{b}{a}}\, c d^2 x \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 963: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right)^{5/2}}{x^4 \sqrt{c+d x^2}}\, dx$$

Optimal (type 4, 336 leaves, 6 steps):

$$\frac{\left(3 b^2 c^2+7 a b c d-2 a^2 d^2\right) x \sqrt{a+b x^2}}{3 c^2 \sqrt{c+d x^2}}-\frac{2 a (3 b c-a d) \sqrt{a+b x^2} \sqrt{c+d x^2}}{3 c^2 x}-\frac{a \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{3 c x^3}-$$
$$\frac{\left(3 b^2 c^2+7 a b c d-2 a^2 d^2\right) \sqrt{a+b x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{3 c^{3/2} \sqrt{d} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}+\frac{b (9 b c-a d) \sqrt{a+b x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{3 \sqrt{c} \sqrt{d} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}$$

Result (type 4, 261 leaves):

$$\left(a\sqrt{\frac{b}{a}}\,d\,(a+b x^2)\,(c+d x^2)\,(-a c-7 b c x^2+2 a d x^2)+\right.$$

$$i\,b\,c\,(-3 b^2 c^2-7 a b c d+2 a^2 d^2)\,x^3\sqrt{1+\frac{b x^2}{a}}\,\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a d}{b c}\right]-$$

$$\left.i\,b\,c\,(-3 b^2 c^2+2 a b c d+a^2 d^2)\,x^3\sqrt{1+\frac{b x^2}{a}}\,\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a d}{b c}\right]\right)\Big/\left(3\sqrt{\frac{b}{a}}\,c^2 d x^3\sqrt{a+b x^2}\,\sqrt{c+d x^2}\right)$$

Problem 968: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^2\sqrt{2+b x^2}}{\sqrt{3+d x^2}}\,dx$$

Optimal (type 4, 241 leaves, 5 steps):

$$-\frac{2\,(3 b-d)\,x\sqrt{2+b x^2}}{3 b d\sqrt{3+d x^2}}+\frac{x\sqrt{2+b x^2}\,\sqrt{3+d x^2}}{3 d}+$$

$$\frac{2\sqrt{2}\,(3 b-d)\sqrt{2+b x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{3}}\right],1-\frac{3 b}{2 d}\right]}{3 b d^{3/2}\sqrt{\frac{2+b x^2}{3+d x^2}}\,\sqrt{3+d x^2}}-\frac{\sqrt{2}\,\sqrt{2+b x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{3}}\right],1-\frac{3 b}{2 d}\right]}{d^{3/2}\sqrt{\frac{2+b x^2}{3+d x^2}}\,\sqrt{3+d x^2}}$$

Result (type 4, 127 leaves):

$$\frac{1}{3\sqrt{b}\,d^2}$$

$$\left(\sqrt{b}\,d\,x\sqrt{2+b x^2}\,\sqrt{3+d x^2}+2\,i\sqrt{3}\,(3 b-d)\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}}\right],\frac{2 d}{3 b}\right]-2\,i\sqrt{3}\,(3 b-2 d)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}}\right],\frac{2 d}{3 b}\right]\right)$$

Problem 972: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{x\sqrt{a+b x^2}\,\sqrt{c+d x^2}}\,dx$$

Optimal (type 3, 46 leaves, 3 steps):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b x^2}}{\sqrt{a}\,\sqrt{c+d x^2}}\right]}{\sqrt{a}\,\sqrt{c}}$$

Result (type 6, 153 leaves):

$$\left(2\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(\sqrt{a+b x^2}\,\sqrt{c+d x^2}\right.$$
$$\left.\left(-4\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b\,c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)$$

Problem 973: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{x^3\,\sqrt{a+b x^2}\,\sqrt{c+d x^2}}\,dx$$

Optimal (type 3, 91 leaves, 4 steps):

$$-\frac{\sqrt{a+b x^2}\,\sqrt{c+d x^2}}{2\,a\,c\,x^2}+\frac{(b\,c+a\,d)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b x^2}}{\sqrt{a}\,\sqrt{c+d x^2}}\right]}{2\,a^{3/2}\,c^{3/2}}$$

Result (type 6, 192 leaves):

$$\left(-\left(a+b x^2\right)\left(c+d x^2\right)+\left(2\,b\,d\,(b\,c+a\,d)\,x^4\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(4\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]-\right.\right.$$
$$\left.\left.b\,c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]-a\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(2\,a\,c\,x^2\,\sqrt{a+b x^2}\,\sqrt{c+d x^2}\right)$$

Problem 974: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^5\,\sqrt{a+b x^2}\,\sqrt{c+d x^2}}\,dx$$

Optimal (type 3, 149 leaves, 6 steps):

$$-\frac{\sqrt{a+b x^2}\,\sqrt{c+d x^2}}{4\,a\,c\,x^4}+\frac{3\,(b\,c+a\,d)\,\sqrt{a+b x^2}\,\sqrt{c+d x^2}}{8\,a^2\,c^2\,x^2}-\frac{\left(3\,b^2\,c^2+2\,a\,b\,c\,d+3\,a^2\,d^2\right)\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b x^2}}{\sqrt{a}\,\sqrt{c+d x^2}}\right]}{8\,a^{5/2}\,c^{5/2}}$$

Result (type 6, 224 leaves):

$$\left(\left(a+b x^2\right)\left(c+d x^2\right)\left(-2 a c+3 b c x^2+3 a d x^2\right)+\right.$$
$$\left(2 b d\left(3 b^2 c^2+2 a b c d+3 a^2 d^2\right) x^6 \operatorname{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2 \operatorname{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+\right.$$
$$\left.\left. b c \operatorname{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \operatorname{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(8 a^2 c^2 x^4 \sqrt{a+b x^2}\sqrt{c+d x^2}\right)$$

Problem 975: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{a+b x^2}\sqrt{c+d x^2}}\,dx$$

Optimal (type 4, 342 leaves, 6 steps):

$$\frac{\left(8 b^2 c^2+7 a b c d+8 a^2 d^2\right) x \sqrt{a+b x^2}}{15 b^3 d^2 \sqrt{c+d x^2}}-\frac{4\left(b c+a d\right) x \sqrt{a+b x^2}\sqrt{c+d x^2}}{15 b^2 d^2}+\frac{x^3\sqrt{a+b x^2}\sqrt{c+d x^2}}{5 b d}-$$
$$\frac{\sqrt{c}\left(8 b^2 c^2+7 a b c d+8 a^2 d^2\right)\sqrt{a+b x^2}\operatorname{EllipticE}\left[\operatorname{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 b^3 d^{5/2}\sqrt{\frac{c\left(a+b x^2\right)}{a\left(c+d x^2\right)}}\sqrt{c+d x^2}}+\frac{4 c^{3/2}\left(b c+a d\right)\sqrt{a+b x^2}\operatorname{EllipticF}\left[\operatorname{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 b^2 d^{5/2}\sqrt{\frac{c\left(a+b x^2\right)}{a\left(c+d x^2\right)}}\sqrt{c+d x^2}}$$

Result (type 4, 249 leaves):

$$\left(-\sqrt{\frac{b}{a}}\, d x\left(a+b x^2\right)\left(c+d x^2\right)\left(4 b c+4 a d-3 b d x^2\right)-i c\left(8 b^2 c^2+7 a b c d+8 a^2 d^2\right)\sqrt{1+\frac{b x^2}{a}}\sqrt{1+\frac{d x^2}{c}}\operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]+\right.$$
$$\left. i c\left(8 b^2 c^2+3 a b c d+4 a^2 d^2\right)\sqrt{1+\frac{b x^2}{a}}\sqrt{1+\frac{d x^2}{c}}\operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]\right)\Big/\left(15 a^2\left(\frac{b}{a}\right)^{5/2} d^3\sqrt{a+b x^2}\sqrt{c+d x^2}\right)$$

Problem 976: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\sqrt{a+b x^2}\sqrt{c+d x^2}}\,dx$$

Optimal (type 4, 261 leaves, 5 steps):

$$-\frac{2\,(b\,c+a\,d)\,x\,\sqrt{a+b\,x^2}}{3\,b^2\,d\,\sqrt{c+d\,x^2}}+\frac{x\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{3\,b\,d}+\frac{2\,\sqrt{c}\,(b\,c+a\,d)\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,b^2\,d^{3/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}-\frac{c^{3/2}\,\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,b\,d^{3/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 201 leaves):

$$\left(\sqrt{\frac{b}{a}}\,d\,x\,(a+b\,x^2)\,(c+d\,x^2)+2\,i\,c\,(b\,c+a\,d)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-i\,c\,(2\,b\,c+a\,d)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\Big/\left(3\,b\,\sqrt{\frac{b}{a}}\,d^2\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 977: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^2}{\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 4, 116 leaves, 2 steps):

$$\frac{x\,\sqrt{a+b\,x^2}}{b\,\sqrt{c+d\,x^2}}-\frac{\sqrt{c}\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{b\,\sqrt{d}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 122 leaves):

$$-\frac{i\,c\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)}{\sqrt{\frac{b}{a}}\,d\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}$$

Problem 978: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^2\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 4, 153 leaves, 4 steps):

$$\frac{d\,x\,\sqrt{a+b\,x^2}}{a\,c\,\sqrt{c+d\,x^2}}-\frac{\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{a\,c\,x}-\frac{\sqrt{d}\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{a\,\sqrt{c}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 146 leaves):

$$\frac{1}{a\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\left(-\frac{(a+b\,x^2)\,(c+d\,x^2)}{c\,x}-i\,a\,\sqrt{\frac{b}{a}}\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\right)$$

Problem 979: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^4\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 4, 307 leaves, 6 steps):

$$-\frac{2\,d\,(b\,c+a\,d)\,x\,\sqrt{a+b\,x^2}}{3\,a^2\,c^2\,\sqrt{c+d\,x^2}}-\frac{\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{3\,a\,c\,x^3}+\frac{2\,(b\,c+a\,d)\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{3\,a^2\,c^2\,x}+$$
$$\frac{2\,\sqrt{d}\,(b\,c+a\,d)\,\sqrt{a+b\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,a^2\,c^{3/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}-\frac{b\,\sqrt{d}\,\sqrt{a+b\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,a^2\,\sqrt{c}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{c+d\,x^2}}$$

Result (type 4, 229 leaves):

$$\left(\sqrt{\frac{b}{a}}\,(a+b\,x^2)\,(c+d\,x^2)\,(-a\,c+2\,b\,c\,x^2+2\,a\,d\,x^2)+2\,i\,b\,c\,(b\,c+a\,d)\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-\right.$$
$$\left.i\,b\,c\,(2\,b\,c+a\,d)\,x^3\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\Big/\left(3\,a^2\,\sqrt{\frac{b}{a}}\,c^2\,x^3\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 990: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x}{\sqrt{a-b x^2} \sqrt{c+d x^2}} \, dx$$

Optimal (type 3, 47 leaves, 4 steps):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{d} \sqrt{a-b x^2}}{\sqrt{b} \sqrt{c+d x^2}}\right]}{\sqrt{b} \sqrt{d}}$$

Result (type 3, 72 leaves):

$$\frac{i \, \text{Log}\left[2 \sqrt{a-b x^2} \sqrt{c+d x^2}-\frac{i \left(b c-a d+2 b d x^2\right)}{\sqrt{b} \sqrt{d}}\right]}{2 \sqrt{b} \sqrt{d}}$$

Problem 992: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{2+b x^2} \sqrt{3+d x^2}} \, dx$$

Optimal (type 4, 110 leaves, 2 steps):

$$\frac{x \sqrt{2+b x^2}}{b \sqrt{3+d x^2}}-\frac{\sqrt{2} \sqrt{2+b x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} \, x}{\sqrt{3}}\right], 1-\frac{3 b}{2 d}\right]}{b \sqrt{d} \sqrt{\frac{2+b x^2}{3+d x^2}} \sqrt{3+d x^2}}$$

Result (type 4, 72 leaves):

$$-\frac{i \sqrt{3} \left(\text{EllipticE}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{b} \, x}{\sqrt{2}}\right], \frac{2 d}{3 b}\right]-\text{EllipticF}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{b} \, x}{\sqrt{2}}\right], \frac{2 d}{3 b}\right]\right)}{\sqrt{b} \, d}$$

Problem 994: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{4+x^2} \sqrt{c+d x^2}} \, dx$$

Optimal (type 4, 88 leaves, 2 steps):

$$\frac{x\sqrt{c+d\,x^2}}{d\sqrt{4+x^2}}-\frac{\sqrt{c+d\,x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{x}{2}\right],1-\frac{4\,d}{c}\right]}{d\sqrt{4+x^2}\ \sqrt{\frac{c+d\,x^2}{c\,(4+x^2)}}}$$

Result (type 4, 70 leaves):

$$-\frac{i\,c\,\sqrt{1+\frac{d\,x^2}{c}}\ \left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],\frac{4\,d}{c}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],\frac{4\,d}{c}\right]\right)}{d\sqrt{c+d\,x^2}}$$

Problem 1004: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^2}{\sqrt{1+x^2}\ \sqrt{2+3\,x^2}}\,dx$$

Optimal (type 4, 80 leaves, 2 steps):

$$\frac{x\sqrt{2+3\,x^2}}{3\sqrt{1+x^2}}-\frac{\sqrt{2}\ \sqrt{2+3\,x^2}\ \text{EllipticE}\left[\text{ArcTan}[x],-\frac{1}{2}\right]}{3\sqrt{1+x^2}\ \sqrt{\frac{2+3\,x^2}{1+x^2}}}$$

Result (type 4, 34 leaves):

$$-\frac{1}{3}\,i\,\sqrt{2}\ \left(\text{EllipticE}\left[i\,\text{ArcSinh}[x],\frac{3}{2}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}[x],\frac{3}{2}\right]\right)$$

Problem 1005: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^2}{\sqrt{4+x^2}\ \sqrt{2+3\,x^2}}\,dx$$

Optimal (type 4, 82 leaves, 2 steps):

$$\frac{x\sqrt{2+3\,x^2}}{3\sqrt{4+x^2}}-\frac{\sqrt{2}\ \sqrt{2+3\,x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{x}{2}\right],-5\right]}{3\sqrt{4+x^2}\ \sqrt{\frac{2+3\,x^2}{4+x^2}}}$$

Result (type 4, 38 leaves):

$$-\frac{1}{3}\,i\,\sqrt{2}\ \left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],6\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],6\right]\right)$$

Problem 1006: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{2+3x^2}\,\sqrt{1+4x^2}}\,dx$$

Optimal (type 4, 88 leaves, 2 steps):

$$\frac{x\sqrt{2+3x^2}}{3\sqrt{1+4x^2}}-\frac{\sqrt{2+3x^2}\ \text{EllipticE}\left[\text{ArcTan}[2x],\frac{5}{8}\right]}{3\sqrt{2}\sqrt{\frac{2+3x^2}{1+4x^2}}\ \sqrt{1+4x^2}}$$

Result (type 4, 50 leaves):

$$-\frac{i\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\,x\right],\frac{8}{3}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\,x\right],\frac{8}{3}\right]\right)}{4\sqrt{3}}$$

Problem 1007: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2}{\sqrt{1-x^2}\,\sqrt{-1+2x^2}}\,dx$$

Optimal (type 4, 17 leaves, 3 steps):

$$-\frac{1}{2}\,\text{EllipticE}[\text{ArcCos}[x],2]-\frac{1}{2}\,\text{EllipticF}[\text{ArcCos}[x],2]$$

Result (type 4, 37 leaves):

$$\frac{\sqrt{1-2x^2}\ (-\text{EllipticE}[\text{ArcSin}[x],2]+\text{EllipticF}[\text{ArcSin}[x],2])}{2\sqrt{-1+2x^2}}$$

Problem 1008: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 3, 109 leaves, 7 steps):

$$\frac{3}{2}\left(1-x^2\right)^{2/3}+\frac{3}{10}\left(1-x^2\right)^{5/3}+\frac{9\sqrt{3}\ \text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{2\times 2^{2/3}}-\frac{9\,\text{Log}\left[3+x^2\right]}{4\times 2^{2/3}}+\frac{27\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{4\times 2^{2/3}}$$

Result (type 5, 63 leaves):

$$\frac{3\left(6-7x^2+x^4-45\left(\frac{-1+x^2}{3+x^2}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)}{10\left(1-x^2\right)^{1/3}}$$

Problem 1009: Result unnecessarily involves higher level functions.

$$\int\frac{x^3}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 3, 94 leaves, 6 steps):

$$-\frac{3}{4}\left(1-x^2\right)^{2/3}-\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{2\times 2^{2/3}}+\frac{3\,\text{Log}\left[3+x^2\right]}{4\times 2^{2/3}}-\frac{9\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{4\times 2^{2/3}}$$

Result (type 5, 58 leaves):

$$\frac{3\left(-1+x^2+6\left(\frac{-1+x^2}{3+x^2}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)}{4\left(1-x^2\right)^{1/3}}$$

Problem 1011: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 3, 136 leaves, 10 steps):

$$-\frac{\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{2\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{1+2\left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{2\sqrt{3}}-\frac{\text{Log}[x]}{6}+\frac{\text{Log}\left[3+x^2\right]}{12\times 2^{2/3}}+\frac{1}{4}\text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]-\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{4\times 2^{2/3}}$$

Result (type 6, 111 leaves):

$$-\left(\left(21x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(8\left(1-x^2\right)^{1/3}\left(3+x^2\right)\left(7x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\right)$$

Problem 1012: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^3 \left(1-x^2\right)^{1/3} \left(3+x^2\right)} \, dx$$

Optimal (type 3, 97 leaves, 7 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{6 x^2}+\frac{\text{ArcTan}\left[\frac{1+\left(2-2 x^2\right)^{1/3}}{\sqrt{3}}\right]}{6\times 2^{2/3} \sqrt{3}}-\frac{\text{Log}\left[3+x^2\right]}{36\times 2^{2/3}}+\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{12\times 2^{2/3}}$$

Result (type 6, 115 leaves):

$$\frac{-1+x^2-\frac{2 x^4 \text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]}{\left(3+x^2\right) \left(-6 \text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2 \left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)}}{6 x^2 \left(1-x^2\right)^{1/3}}$$

Problem 1013: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^5 \left(1-x^2\right)^{1/3} \left(3+x^2\right)} \, dx$$

Optimal (type 3, 172 leaves, 12 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{12 x^4}-\frac{\left(1-x^2\right)^{2/3}}{18 x^2}-\frac{\text{ArcTan}\left[\frac{1+\left(2-2 x^2\right)^{1/3}}{\sqrt{3}}\right]}{18\times 2^{2/3} \sqrt{3}}+\frac{\text{ArcTan}\left[\frac{1+2 \left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{9 \sqrt{3}}-\frac{\text{Log}[x]}{27}+\frac{\text{Log}\left[3+x^2\right]}{108\times 2^{2/3}}+\frac{1}{18} \text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]-\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{36\times 2^{2/3}}$$

Result (type 6, 215 leaves):

$$\frac{1}{36 \left(1-x^2\right)^{1/3}}\left(2-\frac{3}{x^4}+\frac{1}{x^2}-\left(4 x^2 \text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$
$$\left(\left(3+x^2\right) \left(-6 \text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2 \left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)\right)-$$
$$\left(21 x^2 \text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/$$
$$\left.\left(\left(3+x^2\right) \left(7 x^2 \text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9 \text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\right)$$

Problem 1014: Result unnecessarily involves higher level functions.

$$\int \frac{x^4}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 4, 536 leaves, 7 steps):

$$-\frac{3}{7}x\left(1-x^2\right)^{2/3}+\frac{54x}{7\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{2\times 2^{2/3}}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{2\times 2^{2/3}}-\frac{3\,\text{ArcTanh}[x]}{2\times 2^{2/3}}+$$

$$\frac{9\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{2\times 2^{2/3}}+\frac{27\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{7x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}-$$

$$\frac{18\sqrt{2}\,3^{3/4}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{7x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 236 leaves):

$$\frac{1}{7\left(1-x^2\right)^{1/3}}3x\left(-1+x^2-\left(27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$

$$\left(\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)+$$

$$\left(30x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/$$

$$\left.\left(\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1015: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 4, 515 leaves, 6 steps):

$$-\frac{3x}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{2\times 2^{2/3}}-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{2\times 2^{2/3}}+\frac{\text{ArcTanh}[x]}{2\times 2^{2/3}}-\frac{3\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{2\times 2^{2/3}}-$$

$$\frac{3\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{2x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}+$$

$$\frac{\sqrt{2}\,3^{3/4}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 120 leaves):

$$-\left(\left(5x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$
$$\left.\left(\left(1-x^2\right)^{1/3}\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1016: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 3, 113 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{2\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{2\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{6\times 2^{2/3}}+\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{2\times 2^{2/3}}$$

Result (type 6, 118 leaves):

$$-\left(\left(9\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(1-x^2\right)^{1/3}\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1017: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 4, 538 leaves, 7 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{3\,x}+\frac{x}{3\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}-\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{6\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{6\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTanh}[x]}{18\times 2^{2/3}}-$$

$$\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{6\times 2^{2/3}}+\frac{\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{2\times 3^{3/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}-$$

$$\frac{\sqrt{2}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 243 leaves):

$$\frac{1}{9\,x\,\left(1-x^2\right)^{1/3}}\left(-3+3\,x^2+\left(54\,x^2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)+\left(5\,x^4\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1018: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^4\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\,dx$$

Optimal (type 4, 556 leaves, 8 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{9\,x^3}-\frac{2\left(1-x^2\right)^{2/3}}{27\,x}+\frac{2\,x}{27\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{18\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{18\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{54\times 2^{2/3}}+\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{18\times 2^{2/3}}+\frac{\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{9\times 3^{3/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}-\frac{2\sqrt{2}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{27\times 3^{1/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 245 leaves):

$$\frac{1}{81\left(1-x^2\right)^{1/3}}\left(-\frac{9}{x^3}+\frac{3}{x}+6x-\left(27\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)+\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1019: Result unnecessarily involves higher level functions.

$$\int\frac{x^7}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)^2}\,dx$$

Optimal (type 3, 133 leaves, 7 steps):

$$-\frac{3x^4\left(1-x^2\right)^{2/3}}{10\left(3+x^2\right)}+\frac{9\left(1-x^2\right)^{2/3}\left(69+14x^2\right)}{40\left(3+x^2\right)}+\frac{99\sqrt{3}\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times 2^{2/3}}-\frac{99\,\text{Log}\left[3+x^2\right]}{16\times 2^{2/3}}+\frac{297\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times 2^{2/3}}$$

Result (type 5, 82 leaves):

$$\frac{3\left(207-165x^2-46x^4+4x^6-495\left(\frac{-1+x^2}{3+x^2}\right)^{1/3}\left(3+x^2\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)}{40\left(1-x^2\right)^{1/3}\left(3+x^2\right)}$$

Problem 1020: Result unnecessarily involves higher level functions.

$$\int\frac{x^5}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)^2}\,dx$$

Optimal (type 3, 116 leaves, 7 steps):

$$-\frac{3}{4}\left(1-x^2\right)^{2/3}-\frac{9\left(1-x^2\right)^{2/3}}{8\left(3+x^2\right)}-\frac{21\sqrt{3}\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times 2^{2/3}}+\frac{21\,\text{Log}\left[3+x^2\right]}{16\times 2^{2/3}}-\frac{63\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times 2^{2/3}}$$

Result (type 5, 77 leaves):

$$\frac{3\left(-9+7x^2+2x^4+21\left(\frac{-1+x^2}{3+x^2}\right)^{1/3}\left(3+x^2\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)}{8\left(1-x^2\right)^{1/3}\left(3+x^2\right)}$$

Problem 1021: Result unnecessarily involves higher level functions.

$$\int \frac{x^3}{\left(1-x^2\right)^{1/3} \left(3+x^2\right)^2} \, dx$$

Optimal (type 3, 101 leaves, 6 steps):

$$\frac{3 \left(1-x^2\right)^{2/3}}{8 \left(3+x^2\right)}+\frac{3 \sqrt{3} \, \text{ArcTan}\left[\frac{1+\left(2-2 x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times 2^{2/3}}-\frac{3 \, \text{Log}\left[3+x^2\right]}{16\times 2^{2/3}}+\frac{9 \, \text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times 2^{2/3}}$$

Result (type 5, 70 leaves):

$$-\frac{3 \left(-1+x^2+3 \left(\frac{-1+x^2}{3+x^2}\right)^{1/3} \left(3+x^2\right) \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)}{8 \left(1-x^2\right)^{1/3} \left(3+x^2\right)}$$

Problem 1022: Result unnecessarily involves higher level functions.

$$\int \frac{x}{\left(1-x^2\right)^{1/3} \left(3+x^2\right)^2} \, dx$$

Optimal (type 3, 101 leaves, 6 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{8 \left(3+x^2\right)}+\frac{\text{ArcTan}\left[\frac{1+\left(2-2 x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times 2^{2/3} \sqrt{3}}-\frac{\text{Log}\left[3+x^2\right]}{48\times 2^{2/3}}+\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times 2^{2/3}}$$

Result (type 5, 70 leaves):

$$\frac{-1+x^2-\left(\frac{-1+x^2}{3+x^2}\right)^{1/3} \left(3+x^2\right) \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]}{8 \left(1-x^2\right)^{1/3} \left(3+x^2\right)}$$

Problem 1023: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x \left(1-x^2\right)^{1/3} \left(3+x^2\right)^2} \, dx$$

Optimal (type 3, 158 leaves, 11 steps):

$$\frac{\left(1-x^2\right)^{2/3}}{24 \left(3+x^2\right)}-\frac{5 \, \text{ArcTan}\left[\frac{1+\left(2-2 x^2\right)^{1/3}}{\sqrt{3}}\right]}{24\times 2^{2/3} \sqrt{3}}+\frac{\text{ArcTan}\left[\frac{1+2 \left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{6 \sqrt{3}}-\frac{\text{Log}[x]}{18}+\frac{5 \, \text{Log}\left[3+x^2\right]}{144\times 2^{2/3}}+\frac{1}{12} \text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]-\frac{5 \, \text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{48\times 2^{2/3}}$$

Result (type 6, 205 leaves):

$$\frac{1}{24\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\left(1-x^2+\left(2\,x^2\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(-6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)-\left(21\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(7\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)$$

Problem 1024: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^3\left(1-x^2\right)^{1/3}\left(3+x^2\right)^2}\,dx$$

Optimal (type 3, 183 leaves, 12 steps):

$$-\frac{5\left(1-x^2\right)^{2/3}}{72\left(3+x^2\right)}-\frac{\left(1-x^2\right)^{2/3}}{6\,x^2\left(3+x^2\right)}+\frac{\text{ArcTan}\left[\frac{1+\left(2-2\,x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTan}\left[\frac{1+2\left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{18\sqrt{3}}+\frac{\text{Log}[x]}{54}-\frac{\text{Log}\left[3+x^2\right]}{48\times 2^{2/3}}-\frac{1}{36}\text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]+\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times 2^{2/3}}$$

Result (type 6, 213 leaves):

$$\frac{1}{72\,x^2\left(1-x^2\right)^{1/3}\left(3+x^2\right)}\left(-12+7\,x^2+5\,x^4+\left(10\,x^4\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(-\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)+\left(21\,x^4\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(7\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)$$

Problem 1025: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^5\left(1-x^2\right)^{1/3}\left(3+x^2\right)^2}\,dx$$

Optimal (type 3, 208 leaves, 13 steps):

$$\frac{\left(1-x^2\right)^{2/3}}{216\left(3+x^2\right)}-\frac{\left(1-x^2\right)^{2/3}}{12\,x^4\left(3+x^2\right)}-\frac{\left(1-x^2\right)^{2/3}}{36\,x^2\left(3+x^2\right)}-\frac{13\,\text{ArcTan}\left[\frac{1+\left(2-2\,x^2\right)^{1/3}}{\sqrt{3}}\right]}{216\times2^{2/3}\sqrt{3}}+$$

$$\frac{\text{ArcTan}\left[\frac{1+2\left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{18\sqrt{3}}-\frac{\text{Log}[x]}{54}+\frac{13\,\text{Log}\left[3+x^2\right]}{1296\times2^{2/3}}+\frac{1}{36}\text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]-\frac{13\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{432\times2^{2/3}}$$

Result (type 6, 234 leaves):

$$\frac{1}{216\left(1-x^2\right)^{1/3}}\left(-\frac{18-12\,x^2-7\,x^4+x^6}{3\,x^4+x^6}+\left(2\,x^2\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$
$$\left(\left(3+x^2\right)\left(-6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)\right)-$$
$$\left(63\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/$$
$$\left.\left(\left(3+x^2\right)\left(7\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\right)$$

Problem 1026: Result unnecessarily involves higher level functions.

$$\int\frac{x^4}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)^2}\,dx$$

Optimal (type 4, 543 leaves, 7 steps):

$$\frac{3\,x\,\left(1-x^2\right)^{2/3}}{8\,\left(3+x^2\right)}-\frac{27\,x}{8\,\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}-\frac{5\,\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{8\times 2^{2/3}}-\frac{5\,\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}\,\left(1-2^{1/3}\,\left(1-x^2\right)^{1/3}\right)}{x}\right]}{8\times 2^{2/3}}+\frac{5\,\text{ArcTanh}[x]}{8\times 2^{2/3}}-$$

$$\frac{15\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\,\left(1-x^2\right)^{1/3}}\right]}{8\times 2^{2/3}}-\frac{27\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,\left(1-\left(1-x^2\right)^{1/3}\right)\,\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\,\sqrt{3}\right]}{16\,x\,\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}+$$

$$\frac{9\times 3^{3/4}\,\left(1-\left(1-x^2\right)^{1/3}\right)\,\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\,\sqrt{3}\right]}{4\,\sqrt{2}\,x\,\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 231 leaves):

$$\frac{1}{8\,\left(1-x^2\right)^{1/3}\,\left(3+x^2\right)}3\,x\,\left(1-x^2+\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\right/$$
$$\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\,\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+$$
$$\left(15\,x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/$$
$$\left.\left(15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\,\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)$$

Problem 1027: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(1-x^2\right)^{1/3}\,\left(3+x^2\right)^2}\,dx$$

Optimal (type 4, 543 leaves, 7 steps):

$$-\frac{x\left(1-x^2\right)^{2/3}}{8\left(3+x^2\right)}+\frac{x}{8\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{8\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{8\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{24\times 2^{2/3}}+$$

$$\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{8\times 2^{2/3}}+\frac{3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{16x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}-$$

$$\frac{\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{4\sqrt{2}\,3^{1/4}x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 231 leaves):

$$\frac{1}{24\left(1-x^2\right)^{1/3}\left(3+x^2\right)}x\left(-3+3x^2+\left(27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+$$
$$\left(5x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/$$
$$\left.\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)$$

Problem 1028: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(1-x^2\right)^{1/3}\left(3+x^2\right)^2}\,dx$$

Optimal (type 4, 543 leaves, 7 steps):

$$\frac{x\left(1-x^2\right)^{2/3}}{24\left(3+x^2\right)}-\frac{x}{24\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{8\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{8\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{24\times 2^{2/3}}+$$

$$\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{8\times 2^{2/3}}-\frac{\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{16\times 3^{3/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}+$$

$$\frac{\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{12\sqrt{2}\,3^{1/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 231 leaves):

$$\frac{1}{72\left(1-x^2\right)^{1/3}\left(3+x^2\right)}x\left(3-3x^2+\left(189\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+$$
$$\left(5x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/$$
$$\left.\left(15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)$$

Problem 1029: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\left(1-x^2\right)^{1/3}\left(3+x^2\right)^2}\,dx$$

Optimal (type 4, 563 leaves, 8 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{8 x}+\frac{\left(1-x^2\right)^{2/3}}{24 x \left(3+x^2\right)}+\frac{x}{8 \left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}-\frac{7 \text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{72\times 2^{2/3} \sqrt{3}}-\frac{7 \text{ArcTan}\left[\frac{\sqrt{3} \left(1-2^{1/3} \left(1-x^2\right)^{1/3}\right)}{x}\right]}{72\times 2^{2/3} \sqrt{3}}+\frac{7 \text{ArcTanh}[x]}{216\times 2^{2/3}}-$$

$$\frac{7 \text{ArcTanh}\left[\frac{x}{1+2^{1/3} \left(1-x^2\right)^{1/3}}\right]}{72\times 2^{2/3}}+\frac{3^{1/4} \sqrt{2+\sqrt{3}} \left(1-\left(1-x^2\right)^{1/3}\right) \sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{16 x \sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}-$$

$$\frac{\left(1-\left(1-x^2\right)^{1/3}\right) \sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4 \sqrt{3}\right]}{4 \sqrt{2}\, 3^{1/4} x \sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 241 leaves):

$$\frac{1}{24 x \left(1-x^2\right)^{1/3} \left(3+x^2\right)}\left(-8+5 x^2+3 x^4+\left(69 x^2 \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$
$$\left(-9 \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2 x^2 \left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+$$
$$\left(5 x^4 \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/$$
$$\left.\left(-15 \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2 x^2 \left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)$$

Problem 1030: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^4 \left(1-x^2\right)^{1/3} \left(3+x^2\right)^2} \, dx$$

Optimal (type 4, 581 leaves, 9 steps):

$$-\frac{11\left(1-x^2\right)^{2/3}}{216\,x^3}+\frac{11\left(1-x^2\right)^{2/3}}{648\,x}+\frac{\left(1-x^2\right)^{2/3}}{24\,x^3\left(3+x^2\right)}-\frac{11\,x}{648\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{11\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{216\times 2^{2/3}\sqrt{3}}+\frac{11\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{216\times 2^{2/3}\sqrt{3}}-\frac{11\,\text{ArcTanh}[x]}{648\times 2^{2/3}}+$$

$$\frac{11\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{216\times 2^{2/3}}-\frac{11\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{432\times 3^{3/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}+$$

$$\frac{11\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]}{324\sqrt{2}\,3^{1/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}}$$

Result (type 6, 246 leaves):

$$\left(-216+216\,x^2+33\,x^4-33\,x^6+\left(2079\,x^4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\right.$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+$$
$$\left(55\,x^6\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\right.$$
$$\left.\left.2\,x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\Big/\left(1944\,x^3\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1031: Result unnecessarily involves higher level functions.

$$\int\frac{x^7}{\left(2-3\,x^2\right)^{1/4}\left(4-3\,x^2\right)}\,dx$$

Optimal (type 3, 136 leaves, 10 steps):

$$\frac{56}{243}\left(2-3\,x^2\right)^{3/4}-\frac{16}{567}\left(2-3\,x^2\right)^{7/4}+\frac{2}{891}\left(2-3\,x^2\right)^{11/4}+\frac{32}{81}\times 2^{1/4}\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3\,x^2}}{2^{3/4}\left(2-3\,x^2\right)^{1/4}}\right]+\frac{32}{81}\times 2^{1/4}\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3\,x^2}}{2^{3/4}\left(2-3\,x^2\right)^{1/4}}\right]$$

Result (type 5, 76 leaves):

$$-\frac{2\left(-3424+4056x^2+1242x^4+567x^6-14784\left(\frac{2-3x^2}{4-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{2}{4-3x^2}\right]\right)}{18711\left(2-3x^2\right)^{1/4}}$$

Problem 1032: Result unnecessarily involves higher level functions.

$$\int\frac{x^5}{\left(2-3x^2\right)^{1/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 3, 121 leaves, 7 steps):

$$\frac{4}{27}\left(2-3x^2\right)^{3/4}-\frac{2}{189}\left(2-3x^2\right)^{7/4}+\frac{8}{27}\times 2^{1/4}\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]+\frac{8}{27}\times 2^{1/4}\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]$$

Result (type 5, 71 leaves):

$$-\frac{2\left(-24+30x^2+9x^4-112\left(\frac{2-3x^2}{4-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{2}{4-3x^2}\right]\right)}{189\left(2-3x^2\right)^{1/4}}$$

Problem 1033: Result unnecessarily involves higher level functions.

$$\int\frac{x^3}{\left(2-3x^2\right)^{1/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 3, 106 leaves, 4 steps):

$$\frac{2}{27}\left(2-3x^2\right)^{3/4}+\frac{2}{9}\times 2^{1/4}\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]+\frac{2}{9}\times 2^{1/4}\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]$$

Result (type 5, 66 leaves):

$$\frac{4-6x^2+24\left(\frac{2-3x^2}{4-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{2}{4-3x^2}\right]}{27\left(2-3x^2\right)^{1/4}}$$

Problem 1035: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x\left(2-3x^2\right)^{1/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 3, 145 leaves, 8 steps):

$$\frac{\text{ArcTan}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{4\times 2^{1/4}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3x^2}}{2^{3/4}(2-3x^2)^{1/4}}\right]}{4\times 2^{3/4}}-\frac{\text{ArcTanh}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{4\times 2^{1/4}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3x^2}}{2^{3/4}(2-3x^2)^{1/4}}\right]}{4\times 2^{3/4}}$$

Result (type 6, 140 leaves):

$$\left(54\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\Big/\left(5\,(2-3x^2)^{1/4}\,(-4+3x^2)\left(27\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+2\left(8\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\right)\right)$$

Problem 1036: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^3\,(2-3x^2)^{1/4}\,(4-3x^2)}\,dx$$

Optimal (type 3, 163 leaves, 14 steps):

$$-\frac{(2-3x^2)^{3/4}}{16\,x^2}+\frac{9\,\text{ArcTan}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{32\times 2^{1/4}}+\frac{3\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3x^2}}{2^{3/4}(2-3x^2)^{1/4}}\right]}{16\times 2^{3/4}}-\frac{9\,\text{ArcTanh}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{32\times 2^{1/4}}+\frac{3\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3x^2}}{2^{3/4}(2-3x^2)^{1/4}}\right]}{16\times 2^{3/4}}$$

Result (type 6, 263 leaves):

$$\frac{1}{80\,x^2\,(2-3x^2)^{1/4}}\left(-10+15x^2+\left(180\,x^4\,\text{AppellF1}\left[1,\frac{1}{4},1,2,\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left((-4+3x^2)\left(16\,\text{AppellF1}\left[1,\frac{1}{4},1,2,\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[2,\frac{1}{4},2,3,\frac{3x^2}{2},\frac{3x^2}{4}\right]+\text{AppellF1}\left[2,\frac{5}{4},1,3,\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)+\left(972\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\Big/\left((-4+3x^2)\left(27\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+2\left(8\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\right)\right)\right)$$

Problem 1037: Result unnecessarily involves higher level functions.

$$\int\frac{x^4}{(2-3x^2)^{1/4}\,(4-3x^2)}\,dx$$

Optimal (type 4, 164 leaves, 6 steps):

$$\frac{2}{45}x\left(2-3x^2\right)^{3/4}+\frac{4\times 2^{1/4}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{9\sqrt{3}}+\frac{4\times 2^{1/4}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{9\sqrt{3}}-\frac{16\times 2^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{15\sqrt{3}}$$

Result (type 6, 273 leaves):

$$\frac{1}{45\left(2-3x^2\right)^{1/4}}2x\left(2-3x^2+\left(32\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\right.$$
$$\left(\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)-$$
$$\left(240x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/$$
$$\left.\left(\left(-4+3x^2\right)\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1038: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(2-3x^2\right)^{1/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 4, 148 leaves, 4 steps):

$$\frac{2^{1/4}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{3\sqrt{3}}+\frac{2^{1/4}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{3\sqrt{3}}-\frac{2\times 2^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{3\sqrt{3}}$$

Result (type 6, 140 leaves):

$$-\left(\left(20x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(3\left(2-3x^2\right)^{1/4}\left(-4+3x^2\right)\right.\right.$$
$$\left.\left.\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1039: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(2-3x^2\right)^{1/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 3, 120 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2-\sqrt{2}\sqrt{2-3x^2}}{2^{1/4}\sqrt{3}\,x\,(2-3x^2)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{3}}+\frac{\text{ArcTanh}\left[\frac{2+\sqrt{2}\sqrt{2-3x^2}}{2^{1/4}\sqrt{3}\,x\,(2-3x^2)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{3}}$$

Result (type 6, 135 leaves):

$$-\left(\left(4\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(\left(2-3x^2\right)^{1/4}\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1040: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\left(2-3x^2\right)^{1/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 4, 166 leaves, 5 steps):

$$-\frac{\left(2-3x^2\right)^{3/4}}{8x}+\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,(2-3x^2)^{1/4}}\right]}{8\times 2^{3/4}}+\frac{\sqrt{3}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,(2-3x^2)^{1/4}}\right]}{8\times 2^{3/4}}-\frac{\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{4\times 2^{3/4}}$$

Result (type 6, 152 leaves):

$$\frac{-2+3x^2-\frac{30x^4\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]}{\left(-4+3x^2\right)\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)}}{8x\left(2-3x^2\right)^{1/4}}$$

Problem 1041: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^4\left(2-3x^2\right)^{1/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 4, 184 leaves, 8 steps):

$$-\frac{\left(2-3x^2\right)^{3/4}}{24x^3}-\frac{3\left(2-3x^2\right)^{3/4}}{16x}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,(2-3x^2)^{1/4}}\right]}{32\times 2^{3/4}}+\frac{3\sqrt{3}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,(2-3x^2)^{1/4}}\right]}{32\times 2^{3/4}}-\frac{3\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{8\times 2^{3/4}}$$

Result (type 6, 156 leaves):

$$\frac{1}{8}\left(2-3x^2\right)^{3/4}\left(-\frac{2+9x^2}{6x^3}+\left(9\,x\,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},-\frac{3}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]-3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1042: Result unnecessarily involves higher level functions.

$$\int \frac{x^7}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 78 leaves, 7 steps):

$$\frac{14}{243}\left(-1+3x^2\right)^{3/4}+\frac{8}{567}\left(-1+3x^2\right)^{7/4}+\frac{2}{891}\left(-1+3x^2\right)^{11/4}+\frac{8}{81}\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{8}{81}\,\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 74 leaves):

$$\frac{2\left(-428+1014x^2+621x^4+567x^6-1848\left(\frac{1-3x^2}{2-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2-3x^2}\right]\right)}{18\,711\left(-1+3x^2\right)^{1/4}}$$

Problem 1043: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 63 leaves, 7 steps):

$$\frac{2}{27}\left(-1+3x^2\right)^{3/4}+\frac{2}{189}\left(-1+3x^2\right)^{7/4}+\frac{4}{27}\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{4}{27}\,\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 69 leaves):

$$\frac{2\left(-6+15x^2+9x^4-28\left(\frac{1-3x^2}{2-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2-3x^2}\right]\right)}{189\left(-1+3x^2\right)^{1/4}}$$

Problem 1044: Result unnecessarily involves higher level functions.

$$\int \frac{x^3}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 48 leaves, 6 steps):

$$\frac{2}{27}\left(-1+3x^2\right)^{3/4}+\frac{2}{9}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{2}{9}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 34 leaves):

$$\frac{2}{27}\left(-1+3x^2\right)^{3/4}\left(1-2\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{7}{4},-1+3x^2\right]\right)$$

Problem 1046: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 173 leaves, 16 steps):

$$\frac{1}{2}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]+\frac{\text{ArcTan}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{2\sqrt{2}}-\frac{\text{ArcTan}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{2\sqrt{2}}-\frac{1}{2}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{\text{Log}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{4\sqrt{2}}+\frac{\text{Log}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{4\sqrt{2}}$$

Result (type 6, 137 leaves):

$$-\left(\left(54x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\Big/\left(5\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}\left(27x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+8\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\right)\right)$$

Problem 1047: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^3\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 191 leaves, 17 steps):

$$-\frac{\left(-1+3x^2\right)^{3/4}}{4x^2}+\frac{3}{4}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]+\frac{9\,\text{ArcTan}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{8\sqrt{2}}-\frac{9\,\text{ArcTan}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{8\sqrt{2}}-\frac{3}{4}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{9\,\text{Log}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{16\sqrt{2}}+\frac{9\,\text{Log}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{16\sqrt{2}}$$

Result (type 6, 252 leaves):

$$\frac{1}{20\,x^2\,\left(-1+3\,x^2\right)^{1/4}}\left(5-15\,x^2-\left(90\,x^4\,\text{AppellF1}\left[1,\frac{1}{4},1,2,3\,x^2,\frac{3\,x^2}{2}\right]\right)\Big/\right.$$
$$\left(\left(-2+3\,x^2\right)\left(8\,\text{AppellF1}\left[1,\frac{1}{4},1,2,3\,x^2,\frac{3\,x^2}{2}\right]+3\,x^2\left(2\,\text{AppellF1}\left[2,\frac{1}{4},2,3,3\,x^2,\frac{3\,x^2}{2}\right]+\text{AppellF1}\left[2,\frac{5}{4},1,3,3\,x^2,\frac{3\,x^2}{2}\right]\right)\right)\right)-$$
$$\left(486\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3\,x^2},\frac{2}{3\,x^2}\right]\right)\Big/$$
$$\left.\left(\left(-2+3\,x^2\right)\left(27\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3\,x^2},\frac{2}{3\,x^2}\right]+8\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{1}{3\,x^2},\frac{2}{3\,x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{1}{3\,x^2},\frac{2}{3\,x^2}\right]\right)\right)\right)$$

Problem 1048: Result unnecessarily involves higher level functions.

$$\int\frac{x^4}{\left(-2+3\,x^2\right)\left(-1+3\,x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 244 leaves, 12 steps):

$$\frac{2}{45}\,x\left(-1+3\,x^2\right)^{3/4}+\frac{8\,x\left(-1+3\,x^2\right)^{1/4}}{15\left(1+\sqrt{-1+3\,x^2}\right)}-\frac{1}{9}\sqrt{\frac{2}{3}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3\,x^2\right)^{1/4}}\right]-$$
$$\frac{1}{9}\sqrt{\frac{2}{3}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3\,x^2\right)^{1/4}}\right]-\frac{8\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3\,x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\left(-1+3\,x^2\right)^{1/4}\right],\frac{1}{2}\right]}{15\,\sqrt{3}\,x}+$$
$$\frac{4\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3\,x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3\,x^2\right)^{1/4}\right],\frac{1}{2}\right]}{15\,\sqrt{3}\,x}$$

Result (type 6, 257 leaves):

$$\frac{1}{45\left(-1+3x^2\right)^{1/4}} 2x\left(-1+3x^2-\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\right.$$
$$\left(\left(-2+3x^2\right)\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)+$$
$$\left(60x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/$$
$$\left.\left(\left(-2+3x^2\right)\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)\right)$$

Problem 1049: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 224 leaves, 7 steps):

$$\frac{2x\left(-1+3x^2\right)^{1/4}}{3\left(1+\sqrt{-1+3x^2}\right)}-\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{3\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{3\sqrt{6}}-\frac{2\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{3\sqrt{3}\,x}+$$
$$\frac{\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{3\sqrt{3}\,x}$$

Result (type 6, 132 leaves):

$$\left(10x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(3\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}\right.$$
$$\left.\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1050: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 3, 61 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{2\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{2\sqrt{6}}$$

Result (type 6, 127 leaves):

$$\left(2\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/$$
$$\left(\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1051: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 246 leaves, 8 steps):

$$-\frac{\left(-1+3x^2\right)^{3/4}}{2x}+\frac{3x\left(-1+3x^2\right)^{1/4}}{2\left(1+\sqrt{-1+3x^2}\right)}-\frac{1}{4}\sqrt{\frac{3}{2}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-$$
$$\frac{1}{4}\sqrt{\frac{3}{2}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-\frac{\sqrt{3}\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{2x}+$$
$$\frac{\sqrt{3}\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{4x}$$

Result (type 6, 144 leaves):

$$\frac{1-3x^2+\frac{15x^4\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]}{\left(-2+3x^2\right)\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)}}{2x\left(-1+3x^2\right)^{1/4}}$$

Problem 1052: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^4\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}}\,dx$$

Optimal (type 4, 264 leaves, 14 steps):

$$-\frac{\left(-1+3x^2\right)^{3/4}}{6x^3}-\frac{3\left(-1+3x^2\right)^{3/4}}{2x}+\frac{9x\left(-1+3x^2\right)^{1/4}}{2\left(1+\sqrt{-1+3x^2}\right)}-\frac{3}{8}\sqrt{\frac{3}{2}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-$$
$$\frac{3}{8}\sqrt{\frac{3}{2}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-\frac{3\sqrt{3}\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{2x}+$$
$$\frac{3\sqrt{3}\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{4x}$$

Result (type 6, 148 leaves):

$$\frac{1}{2}\left(-1+3x^2\right)^{3/4}\left(-\frac{1+9x^2}{3x^3}+\left(9x\,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\right.$$
$$\left.\left(\left(-2+3x^2\right)\left(2\,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},-\frac{3}{4},2,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]-3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)\right)$$

Problem 1053: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(2+3x^2\right)^{3/4}\left(4+3x^2\right)}\,dx$$

Optimal (type 3, 129 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{2\times2^{3/4}+2\times2^{1/4}\sqrt{2+3x^2}}{2\sqrt{3}\,x\left(2+3x^2\right)^{1/4}}\right]}{3\times2^{1/4}\sqrt{3}}+\frac{\text{ArcTanh}\left[\frac{2\times2^{3/4}-2\times2^{1/4}\sqrt{2+3x^2}}{2\sqrt{3}\,x\left(2+3x^2\right)^{1/4}}\right]}{3\times2^{1/4}\sqrt{3}}$$

Result (type 6, 142 leaves):

$$-\left(\left(20\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]\right)\Big/\left(3\,\left(2+3\,x^2\right)^{3/4}\,\left(4+3\,x^2\right)\right.\right.$$
$$\left.\left.\left(-20\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]+3\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{3\,x^2}{2},-\frac{3\,x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1054: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(2-3\,x^2\right)^{3/4}\,\left(4-3\,x^2\right)}\,dx$$

Optimal (type 3, 120 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2-\sqrt{2}\,\sqrt{2-3\,x^2}}{2^{1/4}\,\sqrt{3}\,x\,\left(2-3\,x^2\right)^{1/4}}\right]}{3\times 2^{1/4}\,\sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{2+\sqrt{2}\,\sqrt{2-3\,x^2}}{2^{1/4}\,\sqrt{3}\,x\,\left(2-3\,x^2\right)^{1/4}}\right]}{3\times 2^{1/4}\,\sqrt{3}}$$

Result (type 6, 142 leaves):

$$-\left(\left(20\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\Big/\left(3\,\left(2-3\,x^2\right)^{3/4}\,\left(-4+3\,x^2\right)\right.\right.$$
$$\left.\left.\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+3\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1055: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(2+b\,x^2\right)^{3/4}\,\left(4+b\,x^2\right)}\,dx$$

Optimal (type 3, 124 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{2\times 2^{3/4}+2\times 2^{1/4}\,\sqrt{2+b\,x^2}}{2\,\sqrt{b}\,x\,\left(2+b\,x^2\right)^{1/4}}\right]}{2^{1/4}\,b^{3/2}}+\frac{\text{ArcTanh}\left[\frac{2\times 2^{3/4}-2\times 2^{1/4}\,\sqrt{2+b\,x^2}}{2\,\sqrt{b}\,x\,\left(2+b\,x^2\right)^{1/4}}\right]}{2^{1/4}\,b^{3/2}}$$

Result (type 6, 150 leaves):

$$-\left(\left(20\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]\right)\Big/\left(3\,\left(2+b\,x^2\right)^{3/4}\,\left(4+b\,x^2\right)\right.\right.$$
$$\left.\left.\left(-20\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]+b\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b\,x^2}{2},-\frac{b\,x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1056: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(2-b x^2\right)^{3/4} \left(4-b x^2\right)} \, dx$$

Optimal (type 3, 119 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2-\sqrt{2} \sqrt{2-b x^2}}{2^{1/4} \sqrt{b} x \left(2-b x^2\right)^{1/4}}\right]}{2^{1/4} b^{3/2}}-\frac{\text{ArcTanh}\left[\frac{2+\sqrt{2} \sqrt{2-b x^2}}{2^{1/4} \sqrt{b} x \left(2-b x^2\right)^{1/4}}\right]}{2^{1/4} b^{3/2}}$$

Result (type 6, 151 leaves):

$$-\left(\left(20 x^3 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]\right)\Big/\left(3 \left(2-b x^2\right)^{3/4} \left(-4+b x^2\right) \left(20 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]+b x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]+3 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1057: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(a+3 x^2\right)^{3/4} \left(2 a+3 x^2\right)} \, dx$$

Optimal (type 3, 120 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{a^{3/4} \left(1+\frac{\sqrt{a+3 x^2}}{\sqrt{a}}\right)}{\sqrt{3} x \left(a+3 x^2\right)^{1/4}}\right]}{3 \sqrt{3} a^{1/4}}+\frac{\text{ArcTanh}\left[\frac{a^{3/4} \left(1-\frac{\sqrt{a+3 x^2}}{\sqrt{a}}\right)}{\sqrt{3} x \left(a+3 x^2\right)^{1/4}}\right]}{3 \sqrt{3} a^{1/4}}$$

Result (type 6, 162 leaves):

$$-\left(\left(10 a x^3 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]\right)\Big/\left(3 \left(a+3 x^2\right)^{3/4} \left(2 a+3 x^2\right) \left(-10 a \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]+3 x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]+3 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{3 x^2}{a},-\frac{3 x^2}{2 a}\right]\right)\right)\right)\right)$$

Problem 1058: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(a-3 x^2\right)^{3/4} \left(2 a-3 x^2\right)} \, dx$$

Optimal (type 3, 120 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{a^{3/4}\left(1-\frac{\sqrt{a-3x^2}}{\sqrt{a}}\right)}{\sqrt{3}\,x\,(a-3x^2)^{1/4}}\right]}{3\sqrt{3}\,a^{1/4}}-\frac{\text{ArcTanh}\left[\frac{a^{3/4}\left(1+\frac{\sqrt{a-3x^2}}{\sqrt{a}}\right)}{\sqrt{3}\,x\,(a-3x^2)^{1/4}}\right]}{3\sqrt{3}\,a^{1/4}}$$

Result (type 6, 162 leaves):

$$-\left(\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]\right)\Big/\left(3\,(a-3x^2)^{3/4}\,(-2a+3x^2)\left(10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]\right)\right)\right)\right)$$

Problem 1059: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{(a+b\,x^2)^{3/4}\,(2a+b\,x^2)}\,dx$$

Optimal (type 3, 115 leaves, 1 step):

$$-\frac{\text{ArcTan}\left[\frac{a^{3/4}\left(1+\frac{\sqrt{a+b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a+b x^2)^{1/4}}\right]}{a^{1/4}\,b^{3/2}}+\frac{\text{ArcTanh}\left[\frac{a^{3/4}\left(1-\frac{\sqrt{a+b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a+b x^2)^{1/4}}\right]}{a^{1/4}\,b^{3/2}}$$

Result (type 6, 171 leaves):

$$\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]\right)\Big/\left(3\,(a+b x^2)^{3/4}\,(2a+b x^2)\left(10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]-b x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{b x^2}{2a}\right]\right)\right)\right)$$

Problem 1060: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{(a-b\,x^2)^{3/4}\,(2a-b\,x^2)}\,dx$$

Optimal (type 3, 119 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{a^{3/4}\left(1-\frac{\sqrt{a-b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a-b x^2)^{1/4}}\right]}{a^{1/4}\,b^{3/2}}-\frac{\text{ArcTanh}\left[\frac{a^{3/4}\left(1+\frac{\sqrt{a-b x^2}}{\sqrt{a}}\right)}{\sqrt{b}\,x\,(a-b x^2)^{1/4}}\right]}{a^{1/4}\,b^{3/2}}$$

Result (type 6, 168 leaves):

$$\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]\right)\Big/\left(3\,\left(a-b\,x^2\right)^{3/4}\,\left(2\,a-b\,x^2\right)\left(10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]+b\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]\right)\right)\right)$$

Problem 1061: Result unnecessarily involves higher level functions.

$$\int \frac{x^7}{\left(2-3\,x^2\right)^{3/4}\,\left(4-3\,x^2\right)}\,dx$$

Optimal (type 3, 188 leaves, 20 steps):

$$\frac{56}{81}\left(2-3\,x^2\right)^{1/4}-\frac{16}{405}\left(2-3\,x^2\right)^{5/4}+\frac{2}{729}\left(2-3\,x^2\right)^{9/4}-\frac{16}{81}\times 2^{3/4}\,\text{ArcTan}\left[1+\left(4-6\,x^2\right)^{1/4}\right]+\frac{16}{81}\times 2^{3/4}\,\text{ArcTan}\left[1-2^{1/4}\,\left(2-3\,x^2\right)^{1/4}\right]+\frac{8}{81}\times 2^{3/4}\,\text{Log}\left[\sqrt{2}-2^{3/4}\,\left(2-3\,x^2\right)^{1/4}+\sqrt{2-3\,x^2}\right]-\frac{8}{81}\times 2^{3/4}\,\text{Log}\left[\sqrt{2}+2^{3/4}\,\left(2-3\,x^2\right)^{1/4}+\sqrt{2-3\,x^2}\right]$$

Result (type 5, 76 leaves):

$$-\frac{2\,\left(-2272+3096\,x^2+378\,x^4+135\,x^6-960\,\left(\frac{2-3\,x^2}{4-3\,x^2}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{2}{4-3\,x^2}\right]\right)}{3645\,\left(2-3\,x^2\right)^{3/4}}$$

Problem 1062: Result unnecessarily involves higher level functions.

$$\int \frac{x^5}{\left(2-3\,x^2\right)^{3/4}\,\left(4-3\,x^2\right)}\,dx$$

Optimal (type 3, 173 leaves, 17 steps):

$$\frac{4}{9}\left(2-3\,x^2\right)^{1/4}-\frac{2}{135}\left(2-3\,x^2\right)^{5/4}-\frac{4}{27}\times 2^{3/4}\,\text{ArcTan}\left[1+\left(4-6\,x^2\right)^{1/4}\right]+\frac{4}{27}\times 2^{3/4}\,\text{ArcTan}\left[1-2^{1/4}\,\left(2-3\,x^2\right)^{1/4}\right]+\frac{2}{27}\times 2^{3/4}\,\text{Log}\left[\sqrt{2}-2^{3/4}\,\left(2-3\,x^2\right)^{1/4}+\sqrt{2-3\,x^2}\right]-\frac{2}{27}\times 2^{3/4}\,\text{Log}\left[\sqrt{2}+2^{3/4}\,\left(2-3\,x^2\right)^{1/4}+\sqrt{2-3\,x^2}\right]$$

Result (type 5, 74 leaves):

$$-\frac{2\,\left(3\,\left(-56+78\,x^2+9\,x^4\right)-80\,\left(\frac{2-3\,x^2}{4-3\,x^2}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{2}{4-3\,x^2}\right]\right)}{405\,\left(2-3\,x^2\right)^{3/4}}$$

Problem 1063: Result unnecessarily involves higher level functions.

$$\int \frac{x^3}{\left(2-3 x^2\right)^{3/4} \left(4-3 x^2\right)} \, dx$$

Optimal (type 3, 158 leaves, 14 steps):

$$\frac{2}{9} \left(2-3 x^2\right)^{1/4}-\frac{1}{9} \times 2^{3/4} \text{ArcTan}\left[1+\left(4-6 x^2\right)^{1/4}\right]+\frac{1}{9} \times 2^{3/4} \text{ArcTan}\left[1-2^{1/4} \left(2-3 x^2\right)^{1/4}\right]+\frac{\text{Log}\left[\sqrt{2}-2^{3/4} \left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]}{9\times 2^{1/4}}-\frac{\text{Log}\left[\sqrt{2}+2^{3/4} \left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]}{9\times 2^{1/4}}$$

Result (type 5, 66 leaves):

$$-\frac{2 \left(-6+9 x^2-4 \left(\frac{2-3 x^2}{4-3 x^2}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{2}{4-3 x^2}\right]\right)}{27 \left(2-3 x^2\right)^{3/4}}$$

Problem 1065: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x \left(2-3 x^2\right)^{3/4} \left(4-3 x^2\right)} \, dx$$

Optimal (type 3, 197 leaves, 18 steps):

$$-\frac{\text{ArcTan}\left[\frac{\left(2-3 x^2\right)^{1/4}}{2^{1/4}}\right]}{4\times 2^{3/4}}-\frac{\text{ArcTan}\left[1+\left(4-6 x^2\right)^{1/4}\right]}{8\times 2^{1/4}}+\frac{\text{ArcTan}\left[1-2^{1/4} \left(2-3 x^2\right)^{1/4}\right]}{8\times 2^{1/4}}-\frac{\text{ArcTanh}\left[\frac{\left(2-3 x^2\right)^{1/4}}{2^{1/4}}\right]}{4\times 2^{3/4}}+\frac{\text{Log}\left[\sqrt{2}-2^{3/4} \left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]}{16\times 2^{1/4}}-\frac{\text{Log}\left[\sqrt{2}+2^{3/4} \left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]}{16\times 2^{1/4}}$$

Result (type 6, 139 leaves):

$$\left(66 x^2 \text{AppellF1}\left[\frac{7}{4},\frac{3}{4},1,\frac{11}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]\right) \Big/ \left(7 \left(2-3 x^2\right)^{3/4} \left(-4+3 x^2\right) \left(33 x^2 \text{AppellF1}\left[\frac{7}{4},\frac{3}{4},1,\frac{11}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]+16 \text{AppellF1}\left[\frac{11}{4},\frac{3}{4},2,\frac{15}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]+6 \text{AppellF1}\left[\frac{11}{4},\frac{7}{4},1,\frac{15}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]\right)\right)$$

Problem 1066: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^3 \left(2-3 x^2\right)^{3/4} \left(4-3 x^2\right)} \, dx$$

Optimal (type 3, 215 leaves, 24 steps):

$$-\frac{\left(2-3 x^2\right)^{1/4}}{16 x^2}-\frac{15 \operatorname{ArcTan}\left[\frac{\left(2-3 x^2\right)^{1/4}}{2^{1/4}}\right]}{32\times 2^{3/4}}-\frac{3 \operatorname{ArcTan}\left[1+\left(4-6 x^2\right)^{1/4}\right]}{32\times 2^{1/4}}+\frac{3 \operatorname{ArcTan}\left[1-2^{1/4}\left(2-3 x^2\right)^{1/4}\right]}{32\times 2^{1/4}}-\frac{15 \operatorname{ArcTanh}\left[\frac{\left(2-3 x^2\right)^{1/4}}{2^{1/4}}\right]}{32\times 2^{3/4}}+\frac{3 \operatorname{Log}\left[\sqrt{2}-2^{3/4}\left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]}{64\times 2^{1/4}}-\frac{3 \operatorname{Log}\left[\sqrt{2}+2^{3/4}\left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]}{64\times 2^{1/4}}$$

Result (type 6, 136 leaves):

$$\left(90 \operatorname{AppellF1}\left[\frac{11}{4},\frac{3}{4},1,\frac{15}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]\right)\Big/\left(11\left(2-3 x^2\right)^{3/4}\left(-4+3 x^2\right)\left(45 x^2 \operatorname{AppellF1}\left[\frac{11}{4},\frac{3}{4},1,\frac{15}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]+16 \operatorname{AppellF1}\left[\frac{15}{4},\frac{3}{4},2,\frac{19}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]+6 \operatorname{AppellF1}\left[\frac{15}{4},\frac{7}{4},1,\frac{19}{4},\frac{2}{3 x^2},\frac{4}{3 x^2}\right]\right)\right)$$

Problem 1067: Result unnecessarily involves higher level functions.

$$\int \frac{x^6}{\left(2-3 x^2\right)^{3/4}\left(4-3 x^2\right)}\,dx$$

Optimal (type 4, 182 leaves, 11 steps):

$$\frac{80}{567} x \left(2-3 x^2\right)^{1/4}+\frac{2}{63} x^3\left(2-3 x^2\right)^{1/4}+\frac{8\times 2^{3/4} \operatorname{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3 x^2}}{\sqrt{3}\, x\left(2-3 x^2\right)^{1/4}}\right]}{27\sqrt{3}}-\frac{8\times 2^{3/4} \operatorname{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3 x^2}}{\sqrt{3}\, x\left(2-3 x^2\right)^{1/4}}\right]}{27\sqrt{3}}-\frac{160\times 2^{3/4} \operatorname{EllipticF}\left[\frac{1}{2} \operatorname{ArcSin}\left[\sqrt{\frac{3}{2}}\, x\right],2\right]}{567\sqrt{3}}$$

Result (type 6, 282 leaves):

$$\frac{1}{567\left(2-3 x^2\right)^{3/4}} 2 x\left(80-102 x^2-27 x^4+\left(1280 \operatorname{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/\left(\left(-4+3 x^2\right)\left(4 \operatorname{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+x^2\left(2 \operatorname{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+3 \operatorname{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)-\left(4960 x^2 \operatorname{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/\left(\left(-4+3 x^2\right)\left(20 \operatorname{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+6 x^2 \operatorname{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+9 x^2 \operatorname{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)$$

Problem 1068: Result unnecessarily involves higher level functions.

$$\int \frac{x^4}{\left(2-3 x^2\right)^{3/4} \left(4-3 x^2\right)} \, dx$$

Optimal (type 4, 164 leaves, 8 steps):

$$\frac{2}{27} x \left(2-3 x^2\right)^{1/4}+\frac{2\times 2^{3/4} \text{ArcTan}\left[\frac{2^{3/4}-2^{1/4} \sqrt{2-3 x^2}}{\sqrt{3} x \left(2-3 x^2\right)^{1/4}}\right]}{9 \sqrt{3}}-\frac{2\times 2^{3/4} \text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4} \sqrt{2-3 x^2}}{\sqrt{3} x \left(2-3 x^2\right)^{1/4}}\right]}{9 \sqrt{3}}-\frac{4\times 2^{3/4} \text{EllipticF}\left[\frac{1}{2} \text{ArcSin}\left[\sqrt{\frac{3}{2}} x\right],2\right]}{27 \sqrt{3}}$$

Result (type 6, 277 leaves):

$$\frac{1}{27 \left(2-3 x^2\right)^{3/4}} 2 x \left(2-3 x^2+\left(32 \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/\right.$$
$$\left(\left(-4+3 x^2\right) \left(4 \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+x^2 \left(2 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+3 \text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)-$$
$$\left(160 x^2 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/$$
$$\left.\left(\left(-4+3 x^2\right) \left(20 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+6 x^2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+9 x^2 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)$$

Problem 1069: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(2-3 x^2\right)^{3/4} \left(4-3 x^2\right)} \, dx$$

Optimal (type 3, 120 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2-\sqrt{2} \sqrt{2-3 x^2}}{2^{1/4} \sqrt{3} x \left(2-3 x^2\right)^{1/4}}\right]}{3\times 2^{1/4} \sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{2+\sqrt{2} \sqrt{2-3 x^2}}{2^{1/4} \sqrt{3} x \left(2-3 x^2\right)^{1/4}}\right]}{3\times 2^{1/4} \sqrt{3}}$$

Result (type 6, 142 leaves):

$$-\left(\left(20 x^3 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/\left(3 \left(2-3 x^2\right)^{3/4} \left(-4+3 x^2\right)\right.\right.$$
$$\left.\left.\left(20 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+3 x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+3 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1070: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(2-3x^2\right)^{3/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 4, 148 leaves, 3 steps):

$$\frac{\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{4\times 2^{1/4}\sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{4\times 2^{1/4}\sqrt{3}}+\frac{\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{2\times 2^{1/4}\sqrt{3}}$$

Result (type 6, 137 leaves):

$$-\left(\left(4\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(\left(2-3x^2\right)^{3/4}\left(-4+3x^2\right)\right.\right.$$
$$\left.\left.\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1071: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^2\left(2-3x^2\right)^{3/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 4, 166 leaves, 7 steps):

$$-\frac{\left(2-3x^2\right)^{1/4}}{8\,x}+\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{16\times 2^{1/4}}-\frac{\sqrt{3}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{16\times 2^{1/4}}+\frac{\sqrt{3}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{4\times 2^{1/4}}$$

Result (type 6, 140 leaves):

$$\left(4\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(x\left(2-3x^2\right)^{3/4}\left(-4+3x^2\right)\right.$$
$$\left.\left(4\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},2,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{1}{2},\frac{7}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)$$

Problem 1072: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^4\left(2-3x^2\right)^{3/4}\left(4-3x^2\right)}\,dx$$

Optimal (type 4, 184 leaves, 10 steps):

$$-\frac{\left(2-3x^2\right)^{1/4}}{24x^3}-\frac{\left(2-3x^2\right)^{1/4}}{4x}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{64\times 2^{1/4}}-\frac{3\sqrt{3}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{64\times 2^{1/4}}+\frac{11\sqrt{3}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{32\times 2^{1/4}}$$

Result (type 6, 142 leaves):

$$-\left(\left(4\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(3x^3\left(2-3x^2\right)^{3/4}\left(-4+3x^2\right)\right.\right.$$
$$\left.\left.\left(-4\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},2,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[-\frac{1}{2},\frac{7}{4},1,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1073: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{x^2}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 61 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{3\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{3\sqrt{6}}$$

Result (type 6, 134 leaves):

$$\left(10x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(3\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}\right.$$
$$\left.\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1074: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{x^2}{\left(-2-3x^2\right)\left(-1-3x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 61 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1-3x^2\right)^{1/4}}\right]}{3\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1-3x^2\right)^{1/4}}\right]}{3\sqrt{6}}$$

Result (type 6, 134 leaves):

$$\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-3x^2,-\frac{3x^2}{2}\right]\right)\Big/\left(3\left(-1-3x^2\right)^{3/4}\left(2+3x^2\right)\left(-10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-3x^2,-\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-3x^2,-\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-3x^2,-\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1075: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(-2+b\,x^2\right)\left(-1+b\,x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 72 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\left(-1+b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{3/2}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\left(-1+b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{3/2}}$$

Result (type 6, 138 leaves):

$$\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},b\,x^2,\frac{b\,x^2}{2}\right]\right)\Big/\left(3\left(-2+b\,x^2\right)\left(-1+b\,x^2\right)^{3/4}\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},b\,x^2,\frac{b\,x^2}{2}\right]+b\,x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},b\,x^2,\frac{b\,x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},b\,x^2,\frac{b\,x^2}{2}\right]\right)\right)\right)$$

Problem 1076: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(-2-b\,x^2\right)\left(-1-b\,x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 74 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\left(-1-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{3/2}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{2}\left(-1-b\,x^2\right)^{1/4}}\right]}{\sqrt{2}\,b^{3/2}}$$

Result (type 6, 143 leaves):

$$\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]\right)\Big/\left(3\,\left(-1-b\,x^2\right)^{3/4}\,\left(2+b\,x^2\right)\right.$$
$$\left.\left(-10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]+b\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]\right)\right)\right)$$

Problem 1077: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(-2\,a+3\,x^2\right)\,\left(-a+3\,x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 85 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a+3\,x^2\right)^{1/4}}\right]}{3\,\sqrt{6}\,a^{1/4}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a+3\,x^2\right)^{1/4}}\right]}{3\,\sqrt{6}\,a^{1/4}}$$

Result (type 6, 164 leaves):

$$\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]\right)\Big/\left(3\,\left(-2\,a+3\,x^2\right)\,\left(-a+3\,x^2\right)^{3/4}\right.$$
$$\left.\left(10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]+3\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3\,x^2}{a},\frac{3\,x^2}{2\,a}\right]\right)\right)\right)$$

Problem 1078: Result unnecessarily involves higher level functions.

$$\int\frac{x^2}{\left(-2\,a-3\,x^2\right)\,\left(-a-3\,x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 85 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a-3\,x^2\right)^{1/4}}\right]}{3\,\sqrt{6}\,a^{1/4}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{a^{1/4}\,\left(-a-3\,x^2\right)^{1/4}}\right]}{3\,\sqrt{6}\,a^{1/4}}$$

Result (type 6, 164 leaves):

$$\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]\right)\Big/\left(3\,\left(-a-3\,x^2\right)^{3/4}\,\left(2\,a+3\,x^2\right)\right.$$
$$\left.\left(-10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]+3\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{3\,x^2}{a},-\frac{3\,x^2}{2\,a}\right]\right)\right)\right)$$

Problem 1079: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(-2 a+b x^2\right) \left(-a+b x^2\right)^{3/4}} \, dx$$

Optimal (type 3, 96 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4} \left(-a+b x^2\right)^{1/4}}\right]}{\sqrt{2}\, a^{1/4} b^{3/2}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4} \left(-a+b x^2\right)^{1/4}}\right]}{\sqrt{2}\, a^{1/4} b^{3/2}}$$

Result (type 6, 169 leaves):

$$-\left(\left(10 a x^3 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]\right)\Big/\left(3 \left(2 a-b x^2\right) \left(-a+b x^2\right)^{3/4}\right.\right.$$
$$\left.\left.\left(10 a \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]+b x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]+3 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]\right)\right)\right)\right)$$

Problem 1080: Result unnecessarily involves higher level functions.

$$\int \frac{x^2}{\left(-2 a-b x^2\right) \left(-a-b x^2\right)^{3/4}} \, dx$$

Optimal (type 3, 98 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4} \left(-a-b x^2\right)^{1/4}}\right]}{\sqrt{2}\, a^{1/4} b^{3/2}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\, x}{\sqrt{2}\, a^{1/4} \left(-a-b x^2\right)^{1/4}}\right]}{\sqrt{2}\, a^{1/4} b^{3/2}}$$

Result (type 6, 174 leaves):

$$-\left(\left(10 a x^3 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]\right)\Big/\left(3 \left(-a-b x^2\right)^{3/4} \left(2 a+b x^2\right)\right.\right.$$
$$\left.\left.\left(10 a \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]-b x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]+3 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]\right)\right)\right)\right)$$

Problem 1081: Result unnecessarily involves higher level functions.

$$\int \frac{x^7}{\left(-2+3 x^2\right) \left(-1+3 x^2\right)^{3/4}} \, dx$$

Optimal (type 3, 78 leaves, 7 steps):

$$\frac{14}{81}\left(-1+3x^2\right)^{1/4}+\frac{8}{405}\left(-1+3x^2\right)^{5/4}+\frac{2}{729}\left(-1+3x^2\right)^{9/4}-\frac{8}{81}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{8}{81}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 74 leaves):

$$\frac{2\left(-284+774x^2+189x^4+135x^6-120\left(\frac{1-3x^2}{2-3x^2}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2-3x^2}\right]\right)}{3645\left(-1+3x^2\right)^{3/4}}$$

Problem 1082: Result unnecessarily involves higher level functions.

$$\int\frac{x^5}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 63 leaves, 7 steps):

$$\frac{2}{9}\left(-1+3x^2\right)^{1/4}+\frac{2}{135}\left(-1+3x^2\right)^{5/4}-\frac{4}{27}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{4}{27}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 69 leaves):

$$\frac{2\left(-42+117x^2+27x^4-20\left(\frac{1-3x^2}{2-3x^2}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2-3x^2}\right]\right)}{405\left(-1+3x^2\right)^{3/4}}$$

Problem 1083: Result unnecessarily involves higher level functions.

$$\int\frac{x^3}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 48 leaves, 6 steps):

$$\frac{2}{9}\left(-1+3x^2\right)^{1/4}-\frac{2}{9}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{2}{9}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 34 leaves):

$$\frac{2}{9}\left(-1+3x^2\right)^{1/4}\left(1-2\,\text{Hypergeometric2F1}\left[\frac{1}{4},1,\frac{5}{4},-1+3x^2\right]\right)$$

Problem 1085: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 173 leaves, 16 steps):

$$-\frac{1}{2}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]+\frac{\text{ArcTan}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{2\sqrt{2}}-\frac{\text{ArcTan}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{2\sqrt{2}}-\frac{1}{2}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]+\frac{\text{Log}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{4\sqrt{2}}-\frac{\text{Log}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{4\sqrt{2}}$$

Result (type 6, 139 leaves):

$$-\left(\left(66x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{4},1,\frac{11}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\Big/\left(7\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}\left(33x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{4},1,\frac{11}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+8\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{4},2,\frac{15}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+3\,\text{AppellF1}\left[\frac{11}{4},\frac{7}{4},1,\frac{15}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\right)\right)$$

Problem 1086: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^3\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 191 leaves, 17 steps):

$$-\frac{\left(-1+3x^2\right)^{1/4}}{4x^2}-\frac{3}{4}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]+\frac{15\,\text{ArcTan}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{8\sqrt{2}}-\frac{15\,\text{ArcTan}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{8\sqrt{2}}-\frac{3}{4}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]+\frac{15\,\text{Log}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{16\sqrt{2}}-\frac{15\,\text{Log}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{16\sqrt{2}}$$

Result (type 6, 136 leaves):

$$-\left(\left(90\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{4},1,\frac{15}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\Big/\left(11\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}\left(45x^2\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{4},1,\frac{15}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+8\,\text{AppellF1}\left[\frac{15}{4},\frac{3}{4},2,\frac{19}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+3\,\text{AppellF1}\left[\frac{15}{4},\frac{7}{4},1,\frac{19}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\right)\right)$$

Problem 1087: Result unnecessarily involves higher level functions.

$$\int\frac{x^6}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 165 leaves, 15 steps):

$$\frac{40}{567}x\left(-1+3x^2\right)^{1/4}+\frac{2}{63}x^3\left(-1+3x^2\right)^{1/4}+\frac{2}{27}\sqrt{\frac{2}{3}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-$$
$$\frac{2}{27}\sqrt{\frac{2}{3}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]+\frac{40\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{567\sqrt{3}\,x}$$

Result (type 6, 266 leaves):

$$\frac{1}{567\left(-1+3x^2\right)^{3/4}}2x\left(-20+51x^2+27x^4-\left(80\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\right.$$
$$\left(\left(-2+3x^2\right)\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)+$$
$$\left(620x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/$$
$$\left.\left(\left(-2+3x^2\right)\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+6x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+9x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1088: Result unnecessarily involves higher level functions.

$$\int\frac{x^4}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 147 leaves, 11 steps):

$$\frac{2}{27}x\left(-1+3x^2\right)^{1/4}+\frac{1}{9}\sqrt{\frac{2}{3}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-\frac{1}{9}\sqrt{\frac{2}{3}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]+$$
$$\frac{2\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{27\sqrt{3}\,x}$$

Result (type 6, 261 leaves):

$$\frac{1}{27\left(-1+3x^2\right)^{3/4}}2x\left(-1+3x^2-\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\right.$$
$$\left(\left(-2+3x^2\right)\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)+$$
$$\left(40x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/$$
$$\left.\left(\left(-2+3x^2\right)\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+6x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+9x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1089: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{x^2}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 61 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{3\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{3\sqrt{6}}$$

Result (type 6, 134 leaves):

$$\left(10x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(3\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}\right.$$
$$\left.\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1090: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 127 leaves, 4 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{2\sqrt{6}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]}{2\sqrt{6}}-\frac{\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{2\sqrt{3}\,x}$$

Result (type 6, 129 leaves):

$$\left(2\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3\,x^2,\frac{3\,x^2}{2}\right]\right)\Big/\left(\left(-2+3\,x^2\right)\left(-1+3\,x^2\right)^{3/4}\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3\,x^2,\frac{3\,x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},3\,x^2,\frac{3\,x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},3\,x^2,\frac{3\,x^2}{2}\right]\right)\right)\right)$$

Problem 1091: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^2\left(-2+3\,x^2\right)\left(-1+3\,x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 149 leaves, 9 steps):

$$-\frac{\left(-1+3\,x^2\right)^{1/4}}{2\,x}+\frac{1}{4}\sqrt{\frac{3}{2}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3\,x^2\right)^{1/4}}\right]-\frac{1}{4}\sqrt{\frac{3}{2}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3\,x^2\right)^{1/4}}\right]-\frac{\sqrt{3}\,\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3\,x^2}\right)^2}}\left(1+\sqrt{-1+3\,x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3\,x^2\right)^{1/4}\right],\frac{1}{2}\right]}{2\,x}$$

Result (type 6, 132 leaves):

$$-\left(\left(2\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},3\,x^2,\frac{3\,x^2}{2}\right]\right)\Big/\left(x\left(-2+3\,x^2\right)\left(-1+3\,x^2\right)^{3/4}\left(2\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},3\,x^2,\frac{3\,x^2}{2}\right]+3\,x^2\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},2,\frac{3}{2},3\,x^2,\frac{3\,x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{1}{2},\frac{7}{4},1,\frac{3}{2},3\,x^2,\frac{3\,x^2}{2}\right]\right)\right)\right)\right)$$

Problem 1092: Result unnecessarily involves higher level functions.

$$\int\frac{1}{x^4\left(-2+3\,x^2\right)\left(-1+3\,x^2\right)^{3/4}}\,dx$$

Optimal (type 4, 165 leaves, 13 steps):

$$-\frac{\left(-1+3x^2\right)^{1/4}}{6x^3}-\frac{2\left(-1+3x^2\right)^{1/4}}{x}+\frac{3}{8}\sqrt{\frac{3}{2}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-$$

$$\frac{3}{8}\sqrt{\frac{3}{2}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-\frac{11\sqrt{3}\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]}{8x}$$

Result (type 6, 134 leaves):

$$\left(2\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(3x^3\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}\right.$$
$$\left.\left(-2\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},2,\frac{1}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[-\frac{1}{2},\frac{7}{4},1,\frac{1}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1093: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{5/2}\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 173 leaves, 7 steps):

$$\frac{(8bc-7ad)\,e\,(e\,x)^{3/2}\left(a+b\,x^2\right)^{1/4}}{16b^2}+\frac{d\,(e\,x)^{7/2}\left(a+b\,x^2\right)^{1/4}}{4be}+$$
$$\frac{3a(8bc-7ad)\,e^{5/2}\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\left(a+b\,x^2\right)^{1/4}}\right]}{32b^{11/4}}-\frac{3a(8bc-7ad)\,e^{5/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\left(a+b\,x^2\right)^{1/4}}\right]}{32b^{11/4}}$$

Result (type 5, 97 leaves):

$$\frac{1}{16b^2\left(a+b\,x^2\right)^{3/4}}e\,(e\,x)^{3/2}\left(-\left(a+b\,x^2\right)\left(7ad-4b\left(2c+d\,x^2\right)\right)+a(-8bc+7ad)\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1094: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{3/4}}\,dx$$

Optimal (type 3, 136 leaves, 6 steps):

$$\frac{d\,(e\,x)^{3/2}\,(a+b\,x^2)^{1/4}}{2\,b\,e}-\frac{(4\,b\,c-3\,a\,d)\,\sqrt{e}\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\,(a+b\,x^2)^{1/4}}\right]}{4\,b^{7/4}}+\frac{(4\,b\,c-3\,a\,d)\,\sqrt{e}\,\text{ArcTanh}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\,(a+b\,x^2)^{1/4}}\right]}{4\,b^{7/4}}$$

Result (type 5, 80 leaves):

$$\frac{x\,\sqrt{e\,x}\,\left(3\,d\,(a+b\,x^2)+(4\,b\,c-3\,a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{6\,b\,(a+b\,x^2)^{3/4}}$$

Problem 1095: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{3/2}\,(a+b\,x^2)^{3/4}}\,dx$$

Optimal (type 3, 113 leaves, 6 steps):

$$-\frac{2\,c\,(a+b\,x^2)^{1/4}}{a\,e\,\sqrt{e\,x}}-\frac{d\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\,(a+b\,x^2)^{1/4}}\right]}{b^{3/4}\,e^{3/2}}+\frac{d\,\text{ArcTanh}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\,(a+b\,x^2)^{1/4}}\right]}{b^{3/4}\,e^{3/2}}$$

Result (type 5, 77 leaves):

$$\frac{x\,\left(-6\,c\,(a+b\,x^2)+2\,a\,d\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,a\,(e\,x)^{3/2}\,(a+b\,x^2)^{3/4}}$$

Problem 1099: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{7/2}\,(c+d\,x^2)}{(a+b\,x^2)^{3/4}}\,dx$$

Optimal (type 4, 180 leaves, 8 steps):

$$-\frac{a\,(10\,b\,c-9\,a\,d)\,e^3\,\sqrt{e\,x}\,(a+b\,x^2)^{1/4}}{12\,b^3}+\frac{(10\,b\,c-9\,a\,d)\,e\,(e\,x)^{5/2}\,(a+b\,x^2)^{1/4}}{30\,b^2}+$$
$$\frac{d\,(e\,x)^{9/2}\,(a+b\,x^2)^{1/4}}{5\,b\,e}-\frac{a^{3/2}\,(10\,b\,c-9\,a\,d)\,e^2\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(e\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{12\,b^{5/2}\,(a+b\,x^2)^{3/4}}$$

Result (type 5, 123 leaves):

$$\frac{1}{60\, b^3\, \left(a+b\, x^2\right)^{3/4}} e^3\, \sqrt{e\, x}\, \left(\left(a+b\, x^2\right)\, \left(45\, a^2\, d+4\, b^2\, x^2\, \left(5\, c+3\, d\, x^2\right)-2\, a\, b\, \left(25\, c+9\, d\, x^2\right)\right)+5\, a^2\, \left(10\, b\, c-9\, a\, d\right)\, \left(1+\frac{b\, x^2}{a}\right)^{3/4}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\, x^2}{a}\right]\right)$$

Problem 1100: Result unnecessarily involves higher level functions.

$$\int \frac{(e\, x)^{3/2}\, \left(c+d\, x^2\right)}{\left(a+b\, x^2\right)^{3/4}}\, dx$$

Optimal (type 4, 139 leaves, 7 steps):

$$\frac{(6\, b\, c-5\, a\, d)\, e\, \sqrt{e\, x}\, \left(a+b\, x^2\right)^{1/4}}{6\, b^2}+\frac{d\, (e\, x)^{5/2}\, \left(a+b\, x^2\right)^{1/4}}{3\, b\, e}+\frac{\sqrt{a}\, (6\, b\, c-5\, a\, d)\, \left(1+\frac{a}{b\, x^2}\right)^{3/4}\, (e\, x)^{3/2}\, \text{EllipticF}\left[\frac{1}{2}\, \text{ArcCot}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right],2\right]}{6\, b^{3/2}\, \left(a+b\, x^2\right)^{3/4}}$$

Result (type 5, 97 leaves):

$$\frac{1}{6\, b^2\, \left(a+b\, x^2\right)^{3/4}} e\, \sqrt{e\, x}\, \left(-\left(a+b\, x^2\right)\, \left(5\, a\, d-2\, b\, \left(3\, c+d\, x^2\right)\right)+a\, (-6\, b\, c+5\, a\, d)\, \left(1+\frac{b\, x^2}{a}\right)^{3/4}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\, x^2}{a}\right]\right)$$

Problem 1101: Result unnecessarily involves higher level functions.

$$\int \frac{c+d\, x^2}{\sqrt{e\, x}\, \left(a+b\, x^2\right)^{3/4}}\, dx$$

Optimal (type 4, 102 leaves, 6 steps):

$$\frac{d\, \sqrt{e\, x}\, \left(a+b\, x^2\right)^{1/4}}{b\, e}-\frac{(2\, b\, c-a\, d)\, \left(1+\frac{a}{b\, x^2}\right)^{3/4}\, (e\, x)^{3/2}\, \text{EllipticF}\left[\frac{1}{2}\, \text{ArcCot}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\, \sqrt{b}\, e^2\, \left(a+b\, x^2\right)^{3/4}}$$

Result (type 5, 77 leaves):

$$\frac{d\, x\, \left(a+b\, x^2\right)+(2\, b\, c-a\, d)\, x\, \left(1+\frac{b\, x^2}{a}\right)^{3/4}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\, x^2}{a}\right]}{b\, \sqrt{e\, x}\, \left(a+b\, x^2\right)^{3/4}}$$

Problem 1102: Result unnecessarily involves higher level functions.

$$\int \frac{c+d\, x^2}{(e\, x)^{5/2}\, \left(a+b\, x^2\right)^{3/4}}\, dx$$

Optimal (type 4, 107 leaves, 6 steps):

$$-\frac{2 c \left(a+b x^2\right)^{1/4}}{3 a e (e x)^{3/2}}+\frac{2 \sqrt{b} (2 b c-3 a d) \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{3 a^{3/2} e^4 \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 84 leaves):

$$\frac{x \left(-2 c \left(a+b x^2\right)+2 (-2 b c+3 a d) x^2 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)}{3 a (e x)^{5/2} \left(a+b x^2\right)^{3/4}}$$

Problem 1103: Result unnecessarily involves higher level functions.

$$\int \frac{c+d x^2}{(e x)^{9/2} \left(a+b x^2\right)^{3/4}} \, dx$$

Optimal (type 4, 144 leaves, 7 steps):

$$-\frac{2 c \left(a+b x^2\right)^{1/4}}{7 a e (e x)^{7/2}}+\frac{2 (6 b c-7 a d) \left(a+b x^2\right)^{1/4}}{21 a^2 e^3 (e x)^{3/2}}-\frac{4 b^{3/2} (6 b c-7 a d) \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{21 a^{5/2} e^6 \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 107 leaves):

$$-\frac{1}{21 a^2 e^5 x^4 \left(a+b x^2\right)^{3/4}} 2 \sqrt{e x} \left(\left(a+b x^2\right) \left(3 a c-6 b c x^2+7 a d x^2\right)+2 b (-6 b c+7 a d) x^4 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)$$

Problem 1104: Result unnecessarily involves higher level functions.

$$\int \frac{c+d x^2}{(e x)^{13/2} \left(a+b x^2\right)^{3/4}} \, dx$$

Optimal (type 4, 182 leaves, 8 steps):

$$-\frac{2 c \left(a+b x^2\right)^{1/4}}{11 a e (e x)^{11/2}}+\frac{2 (10 b c-11 a d) \left(a+b x^2\right)^{1/4}}{77 a^2 e^3 (e x)^{7/2}}-\frac{4 b (10 b c-11 a d) \left(a+b x^2\right)^{1/4}}{77 a^3 e^5 (e x)^{3/2}}+$$
$$\frac{8 b^{5/2} (10 b c-11 a d) \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{77 a^{7/2} e^8 \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 132 leaves):

$$\frac{1}{77\,a^3\,e^7\,x^6\,\left(a+b\,x^2\right)^{3/4}}\sqrt{e\,x}\left(-2\,\left(a+b\,x^2\right)\,\left(20\,b^2\,c\,x^4-2\,a\,b\,x^2\,\left(5\,c+11\,d\,x^2\right)+a^2\,\left(7\,c+11\,d\,x^2\right)\right)+8\,b^2\,\left(-10\,b\,c+11\,a\,d\right)\,x^6\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1105: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{3/2}\,\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{5/4}}\,dx$$

Optimal (type 3, 171 leaves, 7 steps):

$$-\frac{(4\,b\,c-5\,a\,d)\,e\,\sqrt{e\,x}}{2\,b^2\,\left(a+b\,x^2\right)^{1/4}}+\frac{d\,(e\,x)^{5/2}}{2\,b\,e\,\left(a+b\,x^2\right)^{1/4}}+\frac{(4\,b\,c-5\,a\,d)\,e^{3/2}\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{9/4}}+\frac{(4\,b\,c-5\,a\,d)\,e^{3/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{9/4}}$$

Result (type 5, 84 leaves):

$$\frac{e\,\sqrt{e\,x}\,\left(-4\,b\,c+5\,a\,d+b\,d\,x^2+(4\,b\,c-5\,a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)}{2\,b^2\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 1106: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{\sqrt{e\,x}\,\left(a+b\,x^2\right)^{5/4}}\,dx$$

Optimal (type 3, 122 leaves, 6 steps):

$$\frac{2\,(b\,c-a\,d)\,\sqrt{e\,x}}{a\,b\,e\,\left(a+b\,x^2\right)^{1/4}}+\frac{d\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{5/4}\,\sqrt{e}}+\frac{d\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{5/4}\,\sqrt{e}}$$

Result (type 5, 71 leaves):

$$\frac{2\,x\,\left(b\,c-a\,d+a\,d\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)}{a\,b\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 1110: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{9/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{5/4}} \, dx$$

Optimal (type 4, 180 leaves, 6 steps):

$$-\frac{7 a (10 b c-11 a d) e^3 (e x)^{3/2}}{60 b^3 \left(a+b x^2\right)^{1/4}}+\frac{(10 b c-11 a d) e (e x)^{7/2}}{30 b^2 \left(a+b x^2\right)^{1/4}}+\frac{d (e x)^{11/2}}{5 b e \left(a+b x^2\right)^{1/4}}-\frac{7 a^{3/2} (10 b c-11 a d) e^4 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{e x} \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{20 b^{7/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 111 leaves):

$$\frac{1}{30 b^3 \left(a+b x^2\right)^{1/4}} e^3 (e x)^{3/2} \left(-77 a^2 d+a b \left(70 c-11 d x^2\right)+2 b^2 x^2 \left(5 c+3 d x^2\right)+7 a (-10 b c+11 a d) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^2}{a}\right]\right)$$

Problem 1111: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{5/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{5/4}} \, dx$$

Optimal (type 4, 142 leaves, 5 steps):

$$\frac{(6 b c-7 a d) e (e x)^{3/2}}{6 b^2 \left(a+b x^2\right)^{1/4}}+\frac{d (e x)^{7/2}}{3 b e \left(a+b x^2\right)^{1/4}}+\frac{\sqrt{a} (6 b c-7 a d) e^2 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{e x} \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{2 b^{5/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 84 leaves):

$$\frac{e (e x)^{3/2} \left(-6 b c+7 a d+b d x^2+(6 b c-7 a d) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^2}{a}\right]\right)}{3 b^2 \left(a+b x^2\right)^{1/4}}$$

Problem 1112: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{e x} \left(c+d x^2\right)}{\left(a+b x^2\right)^{5/4}} \, dx$$

Optimal (type 4, 99 leaves, 4 steps):

$$\frac{d\,(e\,x)^{3/2}}{b\,e\,\left(a+b\,x^2\right)^{1/4}}-\frac{(2\,b\,c-3\,a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\;\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{\sqrt{a}\,b^{3/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 81 leaves):

$$\frac{2\,x\,\sqrt{e\,x}\,\left(3\,b\,c-3\,a\,d+(-2\,b\,c+3\,a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,a\,b\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 1113: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 103 leaves, 4 steps):

$$-\frac{2\,c}{a\,e\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}+\frac{2\,(2\,b\,c-a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\;\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{a^{3/2}\,\sqrt{b}\,e^2\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 93 leaves):

$$\frac{x\,\left(-6\,\left(2\,b\,c\,x^2+a\,\left(c-d\,x^2\right)\right)-4\,(-2\,b\,c+a\,d)\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,a^2\,(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{1/4}}$$

Problem 1114: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{7/2}\,\left(a+b\,x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 144 leaves, 5 steps):

$$-\frac{2\,c}{5\,a\,e\,(e\,x)^{5/2}\,\left(a+b\,x^2\right)^{1/4}}+\frac{2\,(6\,b\,c-5\,a\,d)}{5\,a^2\,e^3\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}-\frac{4\,\sqrt{b}\,(6\,b\,c-5\,a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\;\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5\,a^{5/2}\,e^4\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 114 leaves):

$$\frac{1}{15\,a^3\,(e\,x)^{7/2}\,\left(a+b\,x^2\right)^{1/4}}$$
$$x\left(72\,b^2\,c\,x^4-6\,a^2\,\left(c+5\,d\,x^2\right)+12\,a\,b\,\left(3\,c\,x^2-5\,d\,x^4\right)+8\,b\,\left(-6\,b\,c+5\,a\,d\right)\,x^4\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1115: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{11/2}\,\left(a+b\,x^2\right)^{5/4}}\,dx$$

Optimal (type 4, 182 leaves, 6 steps):

$$-\frac{2\,c}{9\,a\,e\,(e\,x)^{9/2}\,\left(a+b\,x^2\right)^{1/4}}+\frac{2\,\left(10\,b\,c-9\,a\,d\right)}{45\,a^2\,e^3\,(e\,x)^{5/2}\,\left(a+b\,x^2\right)^{1/4}}-$$
$$\frac{4\,b\,\left(10\,b\,c-9\,a\,d\right)}{15\,a^3\,e^5\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}+\frac{8\,b^{3/2}\,\left(10\,b\,c-9\,a\,d\right)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{15\,a^{7/2}\,e^6\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 143 leaves):

$$-\frac{1}{45\,a^4\,e^6\,x^5\,\left(a+b\,x^2\right)^{1/4}}2\,\sqrt{e\,x}\,\left(120\,b^3\,c\,x^6+12\,a\,b^2\,x^4\,\left(5\,c-9\,d\,x^2\right)+\right.$$
$$\left.a^3\,\left(5\,c+9\,d\,x^2\right)-2\,a^2\,b\,x^2\,\left(5\,c+27\,d\,x^2\right)+8\,b^2\,\left(-10\,b\,c+9\,a\,d\right)\,x^6\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1116: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{5/2}\,\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{7/4}}\,dx$$

Optimal (type 3, 184 leaves, 7 steps):

$$\frac{2\,\left(b\,c-a\,d\right)\,(e\,x)^{7/2}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/4}}-\frac{\left(4\,b\,c-7\,a\,d\right)\,e\,(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{1/4}}{6\,a\,b^2}-\frac{\left(4\,b\,c-7\,a\,d\right)\,e^{5/2}\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{11/4}}+\frac{\left(4\,b\,c-7\,a\,d\right)\,e^{5/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{11/4}}$$

Result (type 5, 85 leaves):

$$\frac{e\,(e\,x)^{3/2}\,\left(-4\,b\,c+7\,a\,d+3\,b\,d\,x^2+\left(4\,b\,c-7\,a\,d\right)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{6\,b^2\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 1117: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{e\,x}\,\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{7/4}}\,dx$$

Optimal (type 3, 125 leaves, 6 steps):

$$\frac{2\,(b\,c-a\,d)\,(e\,x)^{3/2}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/4}}-\frac{d\,\sqrt{e}\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{7/4}}+\frac{d\,\sqrt{e}\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{b^{7/4}}$$

Result (type 5, 73 leaves):

$$\frac{2\,x\,\sqrt{e\,x}\,\left(b\,c-a\,d+a\,d\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,a\,b\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 1121: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^{7/2}\,\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{7/4}}\,dx$$

Optimal (type 4, 192 leaves, 8 steps):

$$\frac{2\,(b\,c-a\,d)\,(e\,x)^{9/2}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/4}}+\frac{5\,(2\,b\,c-3\,a\,d)\,e^3\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}{6\,b^3}-$$

$$\frac{(2\,b\,c-3\,a\,d)\,e\,(e\,x)^{5/2}\,\left(a+b\,x^2\right)^{1/4}}{3\,a\,b^2}+\frac{5\,\sqrt{a}\,(2\,b\,c-3\,a\,d)\,e^2\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(e\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{6\,b^{5/2}\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 110 leaves):

$$\frac{1}{6\,b^3\,\left(a+b\,x^2\right)^{3/4}}e^3\,\sqrt{e\,x}\,\left(-15\,a^2\,d+a\,b\,\left(10\,c-9\,d\,x^2\right)+2\,b^2\,x^2\,\left(3\,c+d\,x^2\right)+5\,a\,(-2\,b\,c+3\,a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1122: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^{3/2}\,\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{7/4}}\,dx$$

Optimal (type 4, 152 leaves, 7 steps):

$$\frac{2\,(b\,c-a\,d)\,(e\,x)^{5/2}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/4}}-\frac{(2\,b\,c-5\,a\,d)\,e\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}{3\,a\,b^2}-\frac{(2\,b\,c-5\,a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(e\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{3\,\sqrt{a}\,b^{3/2}\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 85 leaves):

$$\frac{e\,\sqrt{e\,x}\,\left(-2\,b\,c+5\,a\,d+3\,b\,d\,x^2+(2\,b\,c-5\,a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,b^2\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 1123: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{\sqrt{e\,x}\,\left(a+b\,x^2\right)^{7/4}}\,dx$$

Optimal (type 4, 116 leaves, 6 steps):

$$\frac{2\,(b\,c-a\,d)\,\sqrt{e\,x}}{3\,a\,b\,e\,\left(a+b\,x^2\right)^{3/4}}-\frac{2\,(2\,b\,c+a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(e\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{3\,a^{3/2}\,\sqrt{b}\,e^2\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 79 leaves):

$$\frac{2\,x\,\left(b\,c-a\,d+(2\,b\,c+a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,a\,b\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 1124: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{5/2}\,\left(a+b\,x^2\right)^{7/4}}\,dx$$

Optimal (type 4, 144 leaves, 7 steps):

$$-\frac{2\,c}{3\,a\,e\,(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{3/4}}-\frac{2\,(2\,b\,c-a\,d)\,\sqrt{e\,x}}{3\,a^2\,e^3\,\left(a+b\,x^2\right)^{3/4}}+\frac{4\,\sqrt{b}\,(2\,b\,c-a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{3/4}\,(e\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{3\,a^{5/2}\,e^4\,\left(a+b\,x^2\right)^{3/4}}$$

Result (type 5, 91 leaves):

$$\frac{x\,\left(-2\,a\,c-4\,b\,c\,x^2+2\,a\,d\,x^2+4\,(-2\,b\,c+a\,d)\,x^2\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)}{3\,a^2\,(e\,x)^{5/2}\,\left(a+b\,x^2\right)^{3/4}}$$

Problem 1125: Result unnecessarily involves higher level functions.

$$\int \frac{c+d x^2}{(e x)^{9/2} \left(a+b x^2\right)^{7/4}} \, dx$$

Optimal (type 4, 181 leaves, 8 steps):

$$-\frac{2 c}{7 a e (e x)^{7/2} \left(a+b x^2\right)^{3/4}}-\frac{2 (10 b c-7 a d)}{21 a^2 e^3 (e x)^{3/2} \left(a+b x^2\right)^{3/4}}+\frac{4 (10 b c-7 a d) \left(a+b x^2\right)^{1/4}}{21 a^3 e^3 (e x)^{3/2}}-\frac{8 b^{3/2} (10 b c-7 a d) \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{21 a^{7/2} e^6 \left(a+b x^2\right)^{3/4}}$$

Result (type 5, 121 leaves):

$$\frac{1}{21 a^3 e^5 x^4 \left(a+b x^2\right)^{3/4}} \sqrt{e x} \left(40 b^2 c x^4+4 a b x^2 \left(5 c-7 d x^2\right)-2 a^2 \left(3 c+7 d x^2\right)+8 b (10 b c-7 a d) x^4 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)$$

Problem 1126: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{7/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{9/4}} \, dx$$

Optimal (type 3, 221 leaves, 8 steps):

$$\frac{2 (b c-a d) (e x)^{9/2}}{5 a b e \left(a+b x^2\right)^{5/4}}-\frac{(4 b c-9 a d) e^3 \sqrt{e x}}{2 b^3 \left(a+b x^2\right)^{1/4}}-\frac{(4 b c-9 a d) e (e x)^{5/2}}{10 a b^2 \left(a+b x^2\right)^{1/4}}+\frac{(4 b c-9 a d) e^{7/2} \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{\sqrt{e} \left(a+b x^2\right)^{1/4}}\right]}{4 b^{13/4}}+\frac{(4 b c-9 a d) e^{7/2} \text{ArcTanh}\left[\frac{b^{1/4} \sqrt{e x}}{\sqrt{e} \left(a+b x^2\right)^{1/4}}\right]}{4 b^{13/4}}$$

Result (type 5, 116 leaves):

$$\frac{1}{10 b^3 \left(a+b x^2\right)^{5/4}} e^3 \sqrt{e x} \left(45 a^2 d+b^2 x^2 \left(-24 c+5 d x^2\right)+a b \left(-20 c+54 d x^2\right)+5 (4 b c-9 a d) \left(a+b x^2\right) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)$$

Problem 1127: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{3/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{9/4}} \, dx$$

Optimal (type 3, 149 leaves, 7 steps):

$$\frac{2 (b c-a d) (e x)^{5/2}}{5 a b e \left(a+b x^2\right)^{5/4}}-\frac{2 d e \sqrt{e x}}{b^2 \left(a+b x^2\right)^{1/4}}+\frac{d e^{3/2} \operatorname{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{\sqrt{e} \left(a+b x^2\right)^{1/4}}\right]}{b^{9/4}}+\frac{d e^{3/2} \operatorname{ArcTanh}\left[\frac{b^{1/4} \sqrt{e x}}{\sqrt{e} \left(a+b x^2\right)^{1/4}}\right]}{b^{9/4}}$$

Result (type 5, 96 leaves):

$$\frac{2 e \sqrt{e x} \left(-5 a^2 d+b^2 c x^2-6 a b d x^2+5 a d \left(a+b x^2\right) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{b x^2}{a}\right]\right)}{5 a b^2 \left(a+b x^2\right)^{5/4}}$$

Problem 1132: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{13/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{9/4}} \, dx$$

Optimal (type 4, 230 leaves, 7 steps):

$$\frac{2 (b c-a d) (e x)^{15/2}}{5 a b e \left(a+b x^2\right)^{5/4}}-\frac{77 a (2 b c-3 a d) e^5 (e x)^{3/2}}{60 b^4 \left(a+b x^2\right)^{1/4}}+\frac{11 (2 b c-3 a d) e^3 (e x)^{7/2}}{30 b^3 \left(a+b x^2\right)^{1/4}}-$$
$$\frac{(2 b c-3 a d) e (e x)^{11/2}}{5 a b^2 \left(a+b x^2\right)^{1/4}}-\frac{77 a^{3/2} (2 b c-3 a d) e^6 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{e x} \operatorname{EllipticE}\left[\frac{1}{2} \operatorname{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{20 b^{9/2} \left(a+b x^2\right)^{1/4}}$$

Result (type 5, 139 leaves):

$$\frac{1}{30 b^4 \left(a+b x^2\right)^{5/4}} e^5 (e x)^{3/2} \left(-231 a^3 d+a b^2 x^2 \left(176 c-15 d x^2\right)+22 a^2 b \left(7 c-12 d x^2\right)+\right.$$
$$\left.2 b^3 x^4 \left(5 c+3 d x^2\right)+77 a (-2 b c+3 a d) \left(a+b x^2\right) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^2}{a}\right]\right)$$

Problem 1133: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{9/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{9/4}} \, dx$$

Optimal (type 4, 192 leaves, 6 steps):

$$\frac{2\,(b\,c-a\,d)\,(e\,x)^{11/2}}{5\,a\,b\,e\,(a+b\,x^2)^{5/4}}+\frac{7\,(6\,b\,c-11\,a\,d)\,e^3\,(e\,x)^{3/2}}{30\,b^3\,(a+b\,x^2)^{1/4}}-\frac{(6\,b\,c-11\,a\,d)\,e\,(e\,x)^{7/2}}{15\,a\,b^2\,(a+b\,x^2)^{1/4}}+\frac{7\,\sqrt{a}\,(6\,b\,c-11\,a\,d)\,e^4\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{10\,b^{7/2}\,(a+b\,x^2)^{1/4}}$$

Result (type 5, 116 leaves):

$$\frac{1}{15\,b^3\,(a+b\,x^2)^{5/4}}\,e^3\,(e\,x)^{3/2}\left(77\,a^2\,d+b^2\,x^2\,(-48\,c+5\,d\,x^2)+a\,b\,(-42\,c+88\,d\,x^2)+7\,(6\,b\,c-11\,a\,d)\,(a+b\,x^2)\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1134: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{5/2}\,(c+d\,x^2)}{(a+b\,x^2)^{9/4}}\,dx$$

Optimal (type 4, 155 leaves, 5 steps):

$$\frac{2\,(b\,c-a\,d)\,(e\,x)^{7/2}}{5\,a\,b\,e\,(a+b\,x^2)^{5/4}}-\frac{(2\,b\,c-7\,a\,d)\,e\,(e\,x)^{3/2}}{5\,a\,b^2\,(a+b\,x^2)^{1/4}}-\frac{3\,(2\,b\,c-7\,a\,d)\,e^2\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5\,\sqrt{a}\,b^{5/2}\,(a+b\,x^2)^{1/4}}$$

Result (type 5, 107 leaves):

$$\frac{1}{5\,a\,b^2\,(a+b\,x^2)^{5/4}}2\,e\,(e\,x)^{3/2}\left(-7\,a^2\,d+3\,b^2\,c\,x^2+2\,a\,b\,(c-4\,d\,x^2)+(-2\,b\,c+7\,a\,d)\,(a+b\,x^2)\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1135: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}\,(c+d\,x^2)}{(a+b\,x^2)^{9/4}}\,dx$$

Optimal (type 4, 114 leaves, 4 steps):

$$\frac{2\,(b\,c-a\,d)\,(e\,x)^{3/2}}{5\,a\,b\,e\,(a+b\,x^2)^{5/4}}-\frac{2\,(2\,b\,c+3\,a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5\,a^{3/2}\,b^{3/2}\,(a+b\,x^2)^{1/4}}$$

Result (type 5, 111 leaves):

$$-\frac{1}{15\,a^2\,b\,\left(a+b\,x^2\right)^{5/4}}2\,\sqrt{e\,x}\,\left(-3\,x\,\left(2\,a^2\,d+2\,b^2\,c\,x^2+3\,a\,b\,\left(c+d\,x^2\right)\right)+2\,\left(2\,b\,c+3\,a\,d\right)\,x\,\left(a+b\,x^2\right)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1136: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{9/4}}\,dx$$

Optimal (type 4, 142 leaves, 5 steps):

$$-\frac{2\,c}{a\,e\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{5/4}}-\frac{2\,(6\,b\,c-a\,d)\,(e\,x)^{3/2}}{5\,a^2\,e^3\,\left(a+b\,x^2\right)^{5/4}}+\frac{4\,(6\,b\,c-a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5\,a^{5/2}\,\sqrt{b}\,e^2\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 120 leaves):

$$\frac{1}{15\,a^3\,(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{5/4}}x\,\left(-72\,b^2\,c\,x^4-6\,a^2\,\left(5\,c-3\,d\,x^2\right)+12\,a\,b\,x^2\,\left(-9\,c+d\,x^2\right)-8\,(-6\,b\,c+a\,d)\,x^2\,\left(a+b\,x^2\right)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1137: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{7/2}\,\left(a+b\,x^2\right)^{9/4}}\,dx$$

Optimal (type 4, 181 leaves, 6 steps):

$$-\frac{2\,c}{5\,a\,e\,(e\,x)^{5/2}\,\left(a+b\,x^2\right)^{5/4}}-\frac{2\,(2\,b\,c-a\,d)}{5\,a^2\,e^3\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{5/4}}+\frac{12\,(2\,b\,c-a\,d)}{5\,a^3\,e^3\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}-\frac{24\,\sqrt{b}\,(2\,b\,c-a\,d)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{5\,a^{7/2}\,e^4\,\left(a+b\,x^2\right)^{1/4}}$$

Result (type 5, 140 leaves):

$$\frac{1}{5 a^4 (e x)^{7/2} (a+b x^2)^{5/4}} x \left(48 b^3 c x^6 - 24 a b^2 x^4 (-3 c + d x^2) - 2 a^3 (c + 5 d x^2) - 4 a^2 b x^2 (-5 c + 9 d x^2) + 16 b (-2 b c + a d) x^4 (a + b x^2) \left(1 + \frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, -\frac{b x^2}{a}\right]\right)$$

Problem 1138: Result unnecessarily involves higher level functions.

$$\int \frac{c + d x^2}{(e x)^{11/2} (a + b x^2)^{9/4}} \, dx$$

Optimal (type 4, 219 leaves, 7 steps):

$$-\frac{2 c}{9 a e (e x)^{9/2} (a+b x^2)^{5/4}} - \frac{2 (14 b c - 9 a d)}{45 a^2 e^3 (e x)^{5/2} (a+b x^2)^{5/4}} + \frac{4 (14 b c - 9 a d)}{45 a^3 e^3 (e x)^{5/2} (a+b x^2)^{1/4}} - \frac{8 b (14 b c - 9 a d)}{15 a^4 e^5 \sqrt{e x} (a+b x^2)^{1/4}} + \frac{16 b^{3/2} (14 b c - 9 a d) \left(1 + \frac{a}{b x^2}\right)^{1/4} \sqrt{e x} \, \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]}{15 a^{9/2} e^6 (a+b x^2)^{1/4}}$$

Result (type 5, 171 leaves):

$$-\frac{1}{45 a^5 e^6 x^5 (a+b x^2)^{5/4}} 2 \sqrt{e x} \left(336 b^4 c x^8 + 4 a^2 b^2 x^4 (35 c - 81 d x^2) + 72 a b^3 x^6 (7 c - 3 d x^2) + a^4 (5 c + 9 d x^2) - 2 a^3 b x^2 (7 c + 45 d x^2) + 16 b^2 (-14 b c + 9 a d) x^6 (a + b x^2) \left(1 + \frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{7}{4}, -\frac{b x^2}{a}\right]\right)$$

Problem 1139: Result more than twice size of optimal antiderivative.

$$\int (e x)^m (a + b x^2)^p (c + d x^2)^q \, dx$$

Optimal (type 6, 101 leaves, 3 steps):

$$\frac{(e x)^{1+m} (a+b x^2)^p \left(1 + \frac{b x^2}{a}\right)^{-p} (c + d x^2)^q \left(1 + \frac{d x^2}{c}\right)^{-q} \text{AppellF1}\left[\frac{1+m}{2}, -p, -q, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]}{e (1+m)}$$

Result (type 6, 218 leaves):

$$\left(a\,c\,(3+m)\,x\,(e\,x)^m\,(a+b\,x^2)^p\,(c+d\,x^2)^q\,\text{AppellF1}\left[\frac{1+m}{2},-p,-q,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/$$
$$\left((1+m)\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},-p,-q,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.$$
$$\left.\left.2\,x^2\left(b\,c\,p\,\text{AppellF1}\left[\frac{3+m}{2},1-p,-q,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{3+m}{2},-p,1-q,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 1140: Result more than twice size of optimal antiderivative.

$$\int x^4\,(a+b\,x^2)^p\,(c+d\,x^2)^q\,dx$$

Optimal (type 6, 84 leaves, 3 steps):

$$\frac{1}{5}\,x^5\,(a+b\,x^2)^p\left(1+\frac{b\,x^2}{a}\right)^{-p}(c+d\,x^2)^q\left(1+\frac{d\,x^2}{c}\right)^{-q}\text{AppellF1}\left[\frac{5}{2},-p,-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 176 leaves):

$$\left(7\,a\,c\,x^5\,(a+b\,x^2)^p\,(c+d\,x^2)^q\,\text{AppellF1}\left[\frac{5}{2},-p,-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(5\left(7\,a\,c\,\text{AppellF1}\left[\frac{5}{2},-p,-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.$$
$$\left.\left.2\,x^2\left(b\,c\,p\,\text{AppellF1}\left[\frac{7}{2},1-p,-q,\frac{9}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{7}{2},-p,1-q,\frac{9}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 1141: Result more than twice size of optimal antiderivative.

$$\int x^2\,(a+b\,x^2)^p\,(c+d\,x^2)^q\,dx$$

Optimal (type 6, 84 leaves, 3 steps):

$$\frac{1}{3}\,x^3\,(a+b\,x^2)^p\left(1+\frac{b\,x^2}{a}\right)^{-p}(c+d\,x^2)^q\left(1+\frac{d\,x^2}{c}\right)^{-q}\text{AppellF1}\left[\frac{3}{2},-p,-q,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 174 leaves):

$$\left(5\,a\,c\,x^3\,(a+b\,x^2)^p\,(c+d\,x^2)^q\,\text{AppellF1}\left[\frac{3}{2},-p,-q,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(15\,a\,c\,\text{AppellF1}\left[\frac{3}{2},-p,-q,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.$$
$$\left.6\,x^2\left(b\,c\,p\,\text{AppellF1}\left[\frac{5}{2},1-p,-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{5}{2},-p,1-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)$$

Problem 1142: Result more than twice size of optimal antiderivative.

$$\int \left(a+b x^2\right)^p \left(c+d x^2\right)^q \, dx$$

Optimal (type 6, 79 leaves, 3 steps):

$$x \left(a+b x^2\right)^p \left(1+\frac{b x^2}{a}\right)^{-p} \left(c+d x^2\right)^q \left(1+\frac{d x^2}{c}\right)^{-q} \text{AppellF1}\left[\frac{1}{2},-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]$$

Result (type 6, 172 leaves):

$$\left(3 a c x \left(a+b x^2\right)^p \left(c+d x^2\right)^q \text{AppellF1}\left[\frac{1}{2},-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/ \left(3 a c \text{AppellF1}\left[\frac{1}{2},-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+2 x^2 \left(b c p \text{AppellF1}\left[\frac{3}{2},1-p,-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d q \text{AppellF1}\left[\frac{3}{2},-p,1-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)$$

Problem 1143: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^2\right)^p \left(c+d x^2\right)^q}{x^2} \, dx$$

Optimal (type 6, 82 leaves, 3 steps):

$$-\frac{\left(a+b x^2\right)^p \left(1+\frac{b x^2}{a}\right)^{-p} \left(c+d x^2\right)^q \left(1+\frac{d x^2}{c}\right)^{-q} \text{AppellF1}\left[-\frac{1}{2},-p,-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]}{x}$$

Result (type 6, 171 leaves):

$$-\left(\left(a c \left(a+b x^2\right)^p \left(c+d x^2\right)^q \text{AppellF1}\left[-\frac{1}{2},-p,-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/ \left(a c x \text{AppellF1}\left[-\frac{1}{2},-p,-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+2 x^3 \left(b c p \text{AppellF1}\left[\frac{1}{2},1-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d q \text{AppellF1}\left[\frac{1}{2},-p,1-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 1144: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^2\right)^p \left(c+d x^2\right)^q}{x^4} \, dx$$

Optimal (type 6, 84 leaves, 3 steps):

$$-\frac{\left(a+b x^2\right)^p \left(1+\frac{b x^2}{a}\right)^{-p} \left(c+d x^2\right)^q \left(1+\frac{d x^2}{c}\right)^{-q} \text{AppellF1}\left[-\frac{3}{2},-p,-q,-\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]}{3 x^3}$$

Result (type 6, 173 leaves):

$$\left(a\,c\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[-\frac{3}{2},\,-p,\,-q,\,-\frac{1}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\bigg/\left(-3\,a\,c\,x^3\,\text{AppellF1}\left[-\frac{3}{2},\,-p,\,-q,\,-\frac{1}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+6\,x^5\,\left(b\,c\,p\,\text{AppellF1}\left[-\frac{1}{2},\,1-p,\,-q,\,\frac{1}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[-\frac{1}{2},\,-p,\,1-q,\,\frac{1}{2},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)$$

Problem 1145: Result unnecessarily involves higher level functions.

$$\int x^5\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,dx$$

Optimal (type 5, 242 leaves, 5 steps):

$$-\frac{\left(b\,c\,(2+p)+a\,d\,(2+q)\right)\,\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^{1+q}}{2\,b^2\,d^2\,(2+p+q)\,(3+p+q)}+\frac{x^2\,\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^{1+q}}{2\,b\,d\,(3+p+q)}+\left(\left(b^2\,c^2\,\left(2+3\,p+p^2\right)+2\,a\,b\,c\,d\,(1+p)\,(1+q)+a^2\,d^2\,\left(2+3\,q+q^2\right)\right)\,\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^q\,\left(\frac{b\,\left(c+d\,x^2\right)}{b\,c-a\,d}\right)^{-q}\,\text{Hypergeometric2F1}\left[1+p,\,-q,\,2+p,\,-\frac{d\,\left(a+b\,x^2\right)}{b\,c-a\,d}\right]\right)\bigg/\left(2\,b^3\,d^2\,(1+p)\,(2+p+q)\,(3+p+q)\right)$$

Result (type 6, 160 leaves):

$$\left(2\,a\,c\,x^6\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[3,\,-p,\,-q,\,4,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\bigg/\left(3\,\left(4\,a\,c\,\text{AppellF1}\left[3,\,-p,\,-q,\,4,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+b\,c\,p\,x^2\,\text{AppellF1}\left[4,\,1-p,\,-q,\,5,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+a\,d\,q\,x^2\,\text{AppellF1}\left[4,\,-p,\,1-q,\,5,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)$$

Problem 1146: Result unnecessarily involves higher level functions.

$$\int x^3\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,dx$$

Optimal (type 5, 146 leaves, 4 steps):

$$\frac{\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^{1+q}}{2\,b\,d\,(2+p+q)}-\frac{1}{2\,b^2\,d\,(1+p)\,(2+p+q)}\left(b\,c\,(1+p)+a\,d\,(1+q)\right)\,\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^q\,\left(\frac{b\,\left(c+d\,x^2\right)}{b\,c-a\,d}\right)^{-q}\,\text{Hypergeometric2F1}\left[1+p,\,-q,\,2+p,\,-\frac{d\,\left(a+b\,x^2\right)}{b\,c-a\,d}\right]$$

Result (type 6, 159 leaves):

$$\left(3\,a\,c\,x^4\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[2,\,-p,\,-q,\,3,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Big/\left(4\,\left(3\,a\,c\,\text{AppellF1}\left[2,\,-p,\,-q,\,3,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+x^2\,\left(b\,c\,p\,\text{AppellF1}\left[3,\,1-p,\,-q,\,4,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[3,\,-p,\,1-q,\,4,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 1148: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q}{x}\,dx$$

Optimal (type 6, 97 leaves, 3 steps):

$$-\frac{\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^q\,\left(\frac{b\,\left(c+d\,x^2\right)}{b\,c-a\,d}\right)^{-q}\,\text{AppellF1}\left[1+p,\,-q,\,1,\,2+p,\,-\frac{d\,\left(a+b\,x^2\right)}{b\,c-a\,d},\,\frac{a+b\,x^2}{a}\right]}{2\,a\,\left(1+p\right)}$$

Result (type 6, 225 leaves):

$$\left(b\,d\,\left(-1+p+q\right)\,x^2\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[-p-q,\,-p,\,-q,\,1-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\Big/\left(2\,\left(p+q\right)\,\left(b\,d\,\left(-1+p+q\right)\,x^2\,\text{AppellF1}\left[-p-q,\,-p,\,-q,\,1-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-a\,d\,p\,\text{AppellF1}\left[1-p-q,\,1-p,\,-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-b\,c\,q\,\text{AppellF1}\left[1-p-q,\,-p,\,1-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 1149: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q}{x^3}\,dx$$

Optimal (type 6, 98 leaves, 3 steps):

$$\frac{b\,\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^q\,\left(\frac{b\,\left(c+d\,x^2\right)}{b\,c-a\,d}\right)^{-q}\,\text{AppellF1}\left[1+p,\,-q,\,2,\,2+p,\,-\frac{d\,\left(a+b\,x^2\right)}{b\,c-a\,d},\,\frac{a+b\,x^2}{a}\right]}{2\,a^2\,\left(1+p\right)}$$

Result (type 6, 225 leaves):

$$\left(b\,d\,(-2+p+q)\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[1-p-q,\,-p,\,-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\Big/\left(2\,(-1+p+q)\,\left(b\,d\,(-2+p+q)\,x^2\,\text{AppellF1}\left[1-p-q,\,-p,\,-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-a\,d\,p\,\text{AppellF1}\left[2-p-q,\,1-p,\,-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-b\,c\,q\,\text{AppellF1}\left[2-p-q,\,-p,\,1-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 1150: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q}{x^5}\,dx$$

Optimal (type 6, 100 leaves, 3 steps):

$$-\frac{b^2\,\left(a+b\,x^2\right)^{1+p}\,\left(c+d\,x^2\right)^q\,\left(\frac{b\,\left(c+d\,x^2\right)}{b\,c-a\,d}\right)^{-q}\,\text{AppellF1}\left[1+p,\,-q,\,3,\,2+p,\,-\frac{d\,\left(a+b\,x^2\right)}{b\,c-a\,d},\,\frac{a+b\,x^2}{a}\right]}{2\,a^3\,(1+p)}$$

Result (type 6, 228 leaves):

$$\left(b\,d\,(-3+p+q)\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[2-p-q,\,-p,\,-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\Big/\left(2\,(-2+p+q)\,x^2\,\left(b\,d\,(-3+p+q)\,x^2\,\text{AppellF1}\left[2-p-q,\,-p,\,-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-a\,d\,p\,\text{AppellF1}\left[3-p-q,\,1-p,\,-q,\,4-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-b\,c\,q\,\text{AppellF1}\left[3-p-q,\,-p,\,1-q,\,4-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 1154: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q}{\sqrt{e\,x}}\,dx$$

Optimal (type 6, 89 leaves, 3 steps):

$$\frac{2\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^p\,\left(1+\frac{b\,x^2}{a}\right)^{-p}\,\left(c+d\,x^2\right)^q\,\left(1+\frac{d\,x^2}{c}\right)^{-q}\,\text{AppellF1}\left[\frac{1}{4},\,-p,\,-q,\,\frac{5}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]}{e}$$

Result (type 6, 179 leaves):

$$\left(10\,a\,c\,x\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[\frac{1}{4},\,-p,\,-q,\,\frac{5}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Big/\left(\sqrt{e\,x}\,\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\,-p,\,-q,\,\frac{5}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+4\,x^2\,\left(b\,c\,p\,\text{AppellF1}\left[\frac{5}{4},\,1-p,\,-q,\,\frac{9}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{5}{4},\,-p,\,1-q,\,\frac{9}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 1155: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^2\right)^p \left(c+d x^2\right)^q}{(e x)^{3/2}} \, dx$$

Optimal (type 6, 89 leaves, 3 steps):

$$-\frac{2 \left(a+b x^2\right)^p \left(1+\frac{b x^2}{a}\right)^{-p} \left(c+d x^2\right)^q \left(1+\frac{d x^2}{c}\right)^{-q} \text{AppellF1}\left[-\frac{1}{4},-p,-q,\frac{3}{4},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]}{e \sqrt{e x}}$$

Result (type 6, 179 leaves):

$$-\left(\left(6 a c x \left(a+b x^2\right)^p \left(c+d x^2\right)^q \text{AppellF1}\left[-\frac{1}{4},-p,-q,\frac{3}{4},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/ \left((e x)^{3/2} \left(3 a c \text{AppellF1}\left[-\frac{1}{4},-p,-q,\frac{3}{4},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+ 4 x^2 \left(b c p \text{AppellF1}\left[\frac{3}{4},1-p,-q,\frac{7}{4},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d q \text{AppellF1}\left[\frac{3}{4},-p,1-q,\frac{7}{4},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)$$

Test results for the 115 problems in "1.1.2.5 (a+b x^2)^p (c+d x^2)^q (e+f x^2)^r.m"

Problem 23: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(a+b x^2\right) \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2} \, dx$$

Optimal (type 4, 544 leaves, 7 steps):

$$-\frac{\left(7 a d f \left(2 d^2 e^2-7 c d e f-3 c^2 f^2\right)-b \left(8 d^3 e^3-19 c d^2 e^2 f+9 c^2 d e f^2-6 c^3 f^3\right)\right) x \sqrt{c+d x^2}}{105 d^2 f^2 \sqrt{e+f x^2}}+$$
$$\frac{\left(7 a d f (d e+3 c f)-b \left(4 d^2 e^2-6 c d e f+6 c^2 f^2\right)\right) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{105 d f^2}+$$
$$\frac{(b d e-2 b c f+7 a d f) x \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}{35 d f}+\frac{b x \left(c+d x^2\right)^{5/2} \sqrt{e+f x^2}}{7 d}+$$
$$\left(\sqrt{e} \left(7 a d f \left(2 d^2 e^2-7 c d e f-3 c^2 f^2\right)-b \left(8 d^3 e^3-19 c d^2 e^2 f+9 c^2 d e f^2-6 c^3 f^3\right)\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]\right) \Big/$$
$$\left(105 d^2 f^{5/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}\right)-\frac{e^{3/2} \left(7 a d f (d e-9 c f)-b \left(4 d^2 e^2-9 c d e f-3 c^2 f^2\right)\right) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{105 d f^{5/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 373 leaves):

$$\frac{1}{105\, d \sqrt{\frac{d}{c}}\, f^3 \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

$$\left(\sqrt{\frac{d}{c}}\, f x \left(c+d x^2\right) \left(e+f x^2\right) \left(7 a d f \left(6 c f+d \left(e+3 f x^2\right)\right)+b \left(3 c^2 f^2+3 c d f \left(3 e+8 f x^2\right)+d^2 \left(-4 e^2+3 e f x^2+15 f^2 x^4\right)\right)\right)+i\, e\right.$$

$$\left(7 a d f \left(2 d^2 e^2-7 c d e f-3 c^2 f^2\right)+b \left(-8 d^3 e^3+19 c d^2 e^2 f-9 c^2 d e f^2+6 c^3 f^3\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]-$$

$$\left. i\, e \left(-d e+c f\right) \left(-14 a d f \left(d e-3 c f\right)+b \left(8 d^2 e^2-15 c d e f+3 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)$$

Problem 24: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(a+b x^2\right) \sqrt{c+d x^2} \sqrt{e+f x^2}\, dx$$

Optimal (type 4, 381 leaves, 6 steps):

$$\frac{\left(5 a d f \left(d e+c f\right)-2 b \left(d^2 e^2-c d e f+c^2 f^2\right)\right) x \sqrt{c+d x^2}}{15 d^2 f \sqrt{e+f x^2}}+\frac{\left(b d e-2 b c f+5 a d f\right) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{15 d f}+$$

$$\frac{b x \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}{5 d}-\frac{\sqrt{e} \left(5 a d f \left(d e+c f\right)-2 b \left(d^2 e^2-c d e f+c^2 f^2\right)\right) \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{15 d^2 f^{3/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}-$$

$$\frac{e^{3/2} \left(b d e+b c f-10 a d f\right) \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{15 d f^{3/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 267 leaves):

$$\left(\sqrt{\frac{d}{c}}\, f\, x\, (c+d x^2)\, (e+f x^2)\, (b c f+5 a d f+b d (e+3 f x^2))+\right.$$
$$i\, e\, (-5 a d f (d e+c f)+2 b (d^2 e^2-c d e f+c^2 f^2))\, \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]-$$
$$\left. i\, e\, (-d e+c f)\, (-2 b d e+b c f+5 a d f)\, \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right) \Big/ \left(15 d \sqrt{\frac{d}{c}}\, f^2 \sqrt{c+d x^2}\, \sqrt{e+f x^2}\right)$$

Problem 25: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+b x^2)\sqrt{e+f x^2}}{\sqrt{c+d x^2}}\, dx$$

Optimal (type 4, 283 leaves, 5 steps):

$$\frac{(b d e-2 b c f+3 a d f)\, x \sqrt{c+d x^2}}{3 d^2 \sqrt{e+f x^2}}+\frac{b x \sqrt{c+d x^2}\, \sqrt{e+f x^2}}{3 d}-$$
$$\frac{\sqrt{e}\, (b d e-2 b c f+3 a d f)\, \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{3 d^2 \sqrt{f}\, \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}}\, \sqrt{e+f x^2}}-\frac{(b c-3 a d)\, e^{3/2} \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{3 c d \sqrt{f}\, \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}}\, \sqrt{e+f x^2}}$$

Result (type 4, 212 leaves):

$$\left(b \sqrt{\frac{d}{c}}\, f\, x\, (c+d x^2)\, (e+f x^2)+i\, e\, (-b d e+2 b c f-3 a d f)\, \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]-\right.$$
$$\left. i\, b\, e\, (-d e+c f)\, \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right) \Big/ \left(3 d \sqrt{\frac{d}{c}}\, f \sqrt{c+d x^2}\, \sqrt{e+f x^2}\right)$$

Problem 26: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+b x^2)\sqrt{e+f x^2}}{(c+d x^2)^{3/2}}\, dx$$

Optimal (type 4, 271 leaves, 5 steps):

$$\frac{(2bc-ad)\,f\,x\,\sqrt{c+dx^2}}{c\,d^2\,\sqrt{e+fx^2}}-\frac{(bc-ad)\,x\,\sqrt{e+fx^2}}{c\,d\,\sqrt{c+dx^2}}-\frac{(2bc-ad)\,\sqrt{e}\,\sqrt{f}\,\sqrt{c+dx^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{de}{cf}\right]}{c\,d^2\,\sqrt{\frac{e\,(c+dx^2)}{c\,(e+fx^2)}}\,\sqrt{e+fx^2}}+\frac{b\,e^{3/2}\,\sqrt{c+dx^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{de}{cf}\right]}{c\,d\,\sqrt{f}\,\sqrt{\frac{e\,(c+dx^2)}{c\,(e+fx^2)}}\,\sqrt{e+fx^2}}$$

Result (type 4, 192 leaves):

$$\left(-i\,(2bc-ad)\,e\,\sqrt{1+\frac{dx^2}{c}}\,\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{cf}{de}\right]-(bc-ad)\left(\sqrt{\frac{d}{c}}\,x\,(e+fx^2)-i\,e\,\sqrt{1+\frac{dx^2}{c}}\,\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{cf}{de}\right]\right)\right)\Big/\left(c^2\left(\frac{d}{c}\right)^{3/2}\sqrt{c+dx^2}\,\sqrt{e+fx^2}\right)$$

Problem 27: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+bx^2)\,\sqrt{e+fx^2}}{(c+dx^2)^{5/2}}\,dx$$

Optimal (type 4, 274 leaves, 4 steps):

$$-\frac{(bc-ad)\,x\,\sqrt{e+fx^2}}{3\,c\,d\,(c+dx^2)^{3/2}}+\frac{(d\,(bc+2ad)\,e-c\,(2bc+ad)\,f)\,\sqrt{e+fx^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{cf}{de}\right]}{3\,c^{3/2}\,d^{3/2}\,(de-cf)\,\sqrt{c+dx^2}\,\sqrt{\frac{c\,(e+fx^2)}{e\,(c+dx^2)}}}+\frac{(bc-ad)\,e^{3/2}\,\sqrt{f}\,\sqrt{c+dx^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{de}{cf}\right]}{3\,c^2\,d\,(de-cf)\,\sqrt{\frac{e\,(c+dx^2)}{c\,(e+fx^2)}}\,\sqrt{e+fx^2}}$$

Result (type 4, 297 leaves):

$$\frac{1}{3\,c^3\left(\frac{d}{c}\right)^{3/2}(-d\,e+c\,f)\,(c+d\,x^2)^{3/2}\sqrt{e+f\,x^2}}\left(\sqrt{\frac{d}{c}}\;x\,(e+f\,x^2)\,\left(a\,d\,(-3\,c\,d\,e+2\,c^2\,f-2\,d^2\,e\,x^2+c\,d\,f\,x^2)+b\,c\,(c^2\,f-d^2\,e\,x^2+2\,c\,d\,f\,x^2)\right)+\right.$$
$$i\,e\,\left(a\,d\,(-2\,d\,e+c\,f)+b\,c\,(-d\,e+2\,c\,f)\right)(c+d\,x^2)\sqrt{1+\frac{d\,x^2}{c}}\sqrt{1+\frac{f\,x^2}{e}}\;\mathrm{EllipticE}\left[i\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]-$$
$$\left.i\,(b\,c+2\,a\,d)\,e\,(-d\,e+c\,f)\,(c+d\,x^2)\sqrt{1+\frac{d\,x^2}{c}}\sqrt{1+\frac{f\,x^2}{e}}\;\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]\right)$$

Problem 28: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+b\,x^2)\sqrt{e+f\,x^2}}{(c+d\,x^2)^{7/2}}\,dx$$

Optimal (type 4, 385 leaves, 5 steps):

$$-\frac{(b\,c-a\,d)\,x\sqrt{e+f\,x^2}}{5\,c\,d\,(c+d\,x^2)^{5/2}}+\frac{\left(a\,d\,(4\,d\,e-3\,c\,f)+b\,c\,(d\,e-2\,c\,f)\right)x\sqrt{e+f\,x^2}}{15\,c^2\,d\,(d\,e-c\,f)\,(c+d\,x^2)^{3/2}}+$$
$$\left(\left(2\,b\,c\,(d^2\,e^2-c\,d\,e\,f+c^2\,f^2)+a\,d\,(8\,d^2\,e^2-13\,c\,d\,e\,f+3\,c^2\,f^2)\right)\sqrt{e+f\,x^2}\;\mathrm{EllipticE}\left[\mathrm{ArcTan}\left[\frac{\sqrt{d}\;x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]\right)\Big/$$
$$\left(15\,c^{5/2}\,d^{3/2}\,(d\,e-c\,f)^2\sqrt{c+d\,x^2}\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}\right)-\frac{e^{3/2}\sqrt{f}\,\left(2\,a\,d\,(2\,d\,e-3\,c\,f)+b\,c\,(d\,e+c\,f)\right)\sqrt{c+d\,x^2}\;\mathrm{EllipticF}\left[\mathrm{ArcTan}\left[\frac{\sqrt{f}\;x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{15\,c^3\,d\,(d\,e-c\,f)^2\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\sqrt{e+f\,x^2}}$$

Result (type 4, 379 leaves):

$$\frac{1}{15\, c^4 \left(\frac{d}{c}\right)^{3/2} (d e - c f)^2 \left(c + d x^2\right)^{5/2} \sqrt{e + f x^2}} \left(-\sqrt{\frac{d}{c}}\, x \left(e + f x^2\right) \left(3 c^2 (b c - a d) (d e - c f)^2 - c (d e - c f) \left(a d (4 d e - 3 c f) + b c (d e - 2 c f)\right) \left(c + d x^2\right) - \left(2 b c \left(d^2 e^2 - c d e f + c^2 f^2\right) + a d \left(8 d^2 e^2 - 13 c d e f + 3 c^2 f^2\right)\right) \left(c + d x^2\right)^2\right) + i\, e \left(c + d x^2\right)^2 \sqrt{1 + \frac{d x^2}{c}} \sqrt{1 + \frac{f x^2}{e}} \left(\left(2 b c \left(d^2 e^2 - c d e f + c^2 f^2\right) + a d \left(8 d^2 e^2 - 13 c d e f + 3 c^2 f^2\right)\right) \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - (-d e + c f) \left(b c (-2 d e + c f) + a d (-8 d e + 9 c f)\right) \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\right)$$

Problem 29: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(a + b x^2\right) \sqrt{c + d x^2} \left(e + f x^2\right)^{3/2} dx$$

Optimal (type 4, 543 leaves, 7 steps):

$$\frac{\left(7 a d f \left(3 d^2 e^2 + 7 c d e f - 2 c^2 f^2\right) - b \left(6 d^3 e^3 - 9 c d^2 e^2 f + 19 c^2 d e f^2 - 8 c^3 f^3\right)\right) x \sqrt{c + d x^2}}{105\, d^3 f \sqrt{e + f x^2}} + \frac{\left(14 a d f (3 d e - c f) + b \left(3 d^2 e^2 - 15 c d e f + 8 c^2 f^2\right)\right) x \sqrt{c + d x^2} \sqrt{e + f x^2}}{105\, d^2 f} + \frac{(3 b d e - 4 b c f + 7 a d f)\, x \left(c + d x^2\right)^{3/2} \sqrt{e + f x^2}}{35\, d^2} + \frac{b x \left(c + d x^2\right)^{3/2} \left(e + f x^2\right)^{3/2}}{7 d} - \left(\sqrt{e} \left(7 a d f \left(3 d^2 e^2 + 7 c d e f - 2 c^2 f^2\right) - b \left(6 d^3 e^3 - 9 c d^2 e^2 f + 19 c^2 d e f^2 - 8 c^3 f^3\right)\right) \sqrt{c + d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1 - \frac{d e}{c f}\right]\right) \Big/ \left(105\, d^3 f^{3/2} \sqrt{\frac{e \left(c + d x^2\right)}{c \left(e + f x^2\right)}} \sqrt{e + f x^2}\right) + \frac{e^{3/2} \left(7 a d f (9 d e - c f) - b \left(3 d^2 e^2 + 9 c d e f - 4 c^2 f^2\right)\right) \sqrt{c + d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1 - \frac{d e}{c f}\right]}{105\, d^2 f^{3/2} \sqrt{\frac{e \left(c + d x^2\right)}{c \left(e + f x^2\right)}} \sqrt{e + f x^2}}$$

Result (type 4, 372 leaves):

$$\frac{1}{105\, c^2 \left(\frac{d}{c}\right)^{5/2} f^2 \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

$$\left(-\sqrt{\frac{d}{c}}\, f x \left(c+d x^2\right) \left(e+f x^2\right) \left(4 b c^2 f^2-3 b c d f \left(3 e+f x^2\right)-7 a d f \left(6 d e+c f+3 d f x^2\right)-3 b d^2 \left(e^2+8 e f x^2+5 f^2 x^4\right)\right)-i e\right.$$

$$\left(7 a d f \left(3 d^2 e^2+7 c d e f-2 c^2 f^2\right)+b \left(-6 d^3 e^3+9 c d^2 e^2 f-19 c^2 d e f^2+8 c^3 f^3\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]+$$

$$\left. i e \left(-d e+c f\right) \left(-7 a d f \left(3 d e+c f\right)+b \left(6 d^2 e^2-6 c d e f+4 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)$$

Problem 30: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right) \left(e+f x^2\right)^{3/2}}{\sqrt{c+d x^2}}\, dx$$

Optimal (type 4, 400 leaves, 6 steps):

$$\frac{\left(10 a d f \left(2 d e-c f\right)+b \left(3 d^2 e^2-13 c d e f+8 c^2 f^2\right)\right) x \sqrt{c+d x^2}}{15 d^3 \sqrt{e+f x^2}}+\frac{\left(3 b d e-4 b c f+5 a d f\right) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{15 d^2}+$$

$$\frac{b x \sqrt{c+d x^2} \left(e+f x^2\right)^{3/2}}{5 d}-\frac{\sqrt{e} \left(10 a d f \left(2 d e-c f\right)+b \left(3 d^2 e^2-13 c d e f+8 c^2 f^2\right)\right) \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{15 d^3 \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}+$$

$$\frac{e^{3/2} \left(5 a d \left(3 d e-c f\right)-b \left(6 c d e-4 c^2 f\right)\right) \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{15 c d^2 \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 275 leaves):

$$\left(-\sqrt{\frac{d}{c}}\, f\, x\, (c+d x^2)\, (e+f x^2)\, (4 b c f-5 a d f-3 b d\, (2 e+f x^2))-\right.$$
$$i\, e\, (10 a d f\, (2 d e-c f)+b\, (3 d^2 e^2-13 c d e f+8 c^2 f^2))\, \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]+$$
$$\left. i\, e\, (-d e+c f)\, (-3 b d e+4 b c f-5 a d f)\, \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right) \Big/ \left(15 c^2 \left(\frac{d}{c}\right)^{5/2} f\, \sqrt{c+d x^2}\, \sqrt{e+f x^2}\right)$$

Problem 31: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+b x^2)\, (e+f x^2)^{3/2}}{(c+d x^2)^{3/2}}\, dx$$

Optimal (type 4, 369 leaves, 6 steps):

$$\frac{f\, (b c\, (7 d e-8 c f)-3 a d\, (d e-2 c f))\, x\, \sqrt{c+d x^2}}{3 c d^3\, \sqrt{e+f x^2}}+\frac{(4 b c-3 a d)\, f\, x\, \sqrt{c+d x^2}\, \sqrt{e+f x^2}}{3 c d^2}-$$
$$\frac{(b c-a d)\, x\, (e+f x^2)^{3/2}}{c d\, \sqrt{c+d x^2}}-\frac{\sqrt{e}\, \sqrt{f}\, (b c\, (7 d e-8 c f)-3 a d\, (d e-2 c f))\, \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{3 c d^3\, \sqrt{\frac{e\, (c+d x^2)}{c\, (e+f x^2)}}\, \sqrt{e+f x^2}}+$$
$$\frac{e^{3/2}\, (3 b d e-4 b c f+3 a d f)\, \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{3 c d^2\, \sqrt{f}\, \sqrt{\frac{e\, (c+d x^2)}{c\, (e+f x^2)}}\, \sqrt{e+f x^2}}$$

Result (type 4, 248 leaves):

$$\frac{1}{3\,d^3\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}\sqrt{\frac{d}{c}}\left(\sqrt{\frac{d}{c}}\,x\,\left(e+f\,x^2\right)\,\left(3\,a\,d\,\left(d\,e-c\,f\right)+b\,c\,\left(-3\,d\,e+4\,c\,f+d\,f\,x^2\right)\right)+i\,e\,\left(3\,a\,d\,\left(d\,e-2\,c\,f\right)+b\,c\,\left(-7\,d\,e+8\,c\,f\right)\right)\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\right.$$

$$\left.\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-i\,\left(4\,b\,c-3\,a\,d\right)\,e\,\left(-d\,e+c\,f\right)\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)$$

Problem 32: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b\,x^2\right)\,\left(e+f\,x^2\right)^{3/2}}{\left(c+d\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 373 leaves, 6 steps):

$$-\frac{f\,\left(b\,c\,\left(d\,e-8\,c\,f\right)+2\,a\,d\,\left(d\,e+c\,f\right)\right)\,x\,\sqrt{c+d\,x^2}}{3\,c^2\,d^3\,\sqrt{e+f\,x^2}}+\frac{\left(b\,c\,\left(d\,e-4\,c\,f\right)+a\,d\,\left(2\,d\,e+c\,f\right)\right)\,x\,\sqrt{e+f\,x^2}}{3\,c^2\,d^2\,\sqrt{c+d\,x^2}}-$$

$$\frac{\left(b\,c-a\,d\right)\,x\,\left(e+f\,x^2\right)^{3/2}}{3\,c\,d\,\left(c+d\,x^2\right)^{3/2}}+\frac{\sqrt{e}\,\sqrt{f}\,\left(b\,c\,\left(d\,e-8\,c\,f\right)+2\,a\,d\,\left(d\,e+c\,f\right)\right)\,\sqrt{c+d\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{3\,c^2\,d^3\,\sqrt{\frac{e\,\left(c+d\,x^2\right)}{c\,\left(e+f\,x^2\right)}}\,\sqrt{e+f\,x^2}}+$$

$$\frac{\left(4\,b\,c-a\,d\right)\,e^{3/2}\,\sqrt{f}\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{3\,c^2\,d^2\,\sqrt{\frac{e\,\left(c+d\,x^2\right)}{c\,\left(e+f\,x^2\right)}}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 296 leaves):

$$\frac{1}{3 d^4 \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}\left(\frac{d}{c}\right)^{3/2} \left(\sqrt{\frac{d}{c}}\, x \left(e+f x^2\right) \left(b c \left(-4 c^2 f+d^2 e x^2-5 c d f x^2\right)+a d \left(c^2 f+2 d^2 e x^2+c d \left(3 e+2 f x^2\right)\right)\right)-\right.$$

$$i e \left(-2 a d (d e+c f)+b c (-d e+8 c f)\right) \left(c+d x^2\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]+$$

$$\left. i e \left(-a d (2 d e+c f)+b c (-d e+4 c f)\right) \left(c+d x^2\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]\right)$$

Problem 33: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right) \left(e+f x^2\right)^{3/2}}{\left(c+d x^2\right)^{7/2}} \, dx$$

Optimal (type 4, 376 leaves, 5 steps):

$$\frac{\left(d (b c+4 a d) e-c (4 b c+a d) f\right) x \sqrt{e+f x^2}}{15 c^2 d^2 \left(c+d x^2\right)^{3/2}}-\frac{(b c-a d)\, x \left(e+f x^2\right)^{3/2}}{5 c d \left(c+d x^2\right)^{5/2}}+$$

$$\left(\left(b c \left(2 d^2 e^2+3 c d e f-8 c^2 f^2\right)+a d \left(8 d^2 e^2-3 c d e f-2 c^2 f^2\right)\right) \sqrt{e+f x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],1-\frac{c f}{d e}\right]\right)\Big/$$

$$\left(15 c^{5/2} d^{5/2} (d e-c f) \sqrt{c+d x^2} \sqrt{\frac{c \left(e+f x^2\right)}{e \left(c+d x^2\right)}}\right)-\frac{e^{3/2} \sqrt{f}\, \left(b c (d e-4 c f)+a d (4 d e-c f)\right) \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{15 c^3 d^2 (d e-c f) \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 382 leaves):

$$\frac{1}{15\,c^2\,d^3\,(d\,e-c\,f)\,(c+d\,x^2)^{5/2}\,\sqrt{e+f\,x^2}}$$
$$\sqrt{\frac{d}{c}}\left(-\sqrt{\frac{d}{c}}\,x\,(e+f\,x^2)\left(3\,c^2\,(b\,c-a\,d)\,(d\,e-c\,f)^2-c\,(d\,e-c\,f)\,(b\,c\,(d\,e-7\,c\,f)+2\,a\,d\,(2\,d\,e+c\,f))\,(c+d\,x^2)+\right.\right.$$
$$\left.(a\,d\,(-8\,d^2\,e^2+3\,c\,d\,e\,f+2\,c^2\,f^2)+b\,c\,(-2\,d^2\,e^2-3\,c\,d\,e\,f+8\,c^2\,f^2))\,(c+d\,x^2)^2\right)-$$
$$i\,e\,(c+d\,x^2)^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\left((a\,d\,(-8\,d^2\,e^2+3\,c\,d\,e\,f+2\,c^2\,f^2)+b\,c\,(-2\,d^2\,e^2-3\,c\,d\,e\,f+8\,c^2\,f^2))\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+\right.$$
$$\left.\left.(d\,e-c\,f)\,(a\,d\,(8\,d\,e+c\,f)+2\,b\,c\,(d\,e+2\,c\,f))\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)$$

Problem 34: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+b\,x^2)\,(e+f\,x^2)^{3/2}}{(c+d\,x^2)^{9/2}}\,dx$$

Optimal (type 4, 531 leaves, 6 steps):

$$\frac{(d\,(b\,c+6\,a\,d)\,e-c\,(4\,b\,c+3\,a\,d)\,f)\,x\,\sqrt{e+f\,x^2}}{35\,c^2\,d^2\,(c+d\,x^2)^{5/2}}+$$
$$\frac{(b\,c\,(4\,d^2\,e^2+c\,d\,e\,f-8\,c^2\,f^2)+3\,a\,d\,(8\,d^2\,e^2-5\,c\,d\,e\,f-2\,c^2\,f^2))\,x\,\sqrt{e+f\,x^2}}{105\,c^3\,d^2\,(d\,e-c\,f)\,(c+d\,x^2)^{3/2}}-\frac{(b\,c-a\,d)\,x\,(e+f\,x^2)^{3/2}}{7\,c\,d\,(c+d\,x^2)^{7/2}}+$$
$$\left((6\,a\,d\,(8\,d^3\,e^3-12\,c\,d^2\,e^2\,f+2\,c^2\,d\,e\,f^2+c^3\,f^3)+b\,c\,(8\,d^3\,e^3-5\,c\,d^2\,e^2\,f-5\,c^2\,d\,e\,f^2+8\,c^3\,f^3))\,\sqrt{e+f\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]\right)\bigg/$$
$$\left(105\,c^{7/2}\,d^{5/2}\,(d\,e-c\,f)^2\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}\right)-$$
$$\left(e^{3/2}\,\sqrt{f}\,(3\,a\,d\,(8\,d^2\,e^2-11\,c\,d\,e\,f+c^2\,f^2)+2\,b\,c\,(2\,d^2\,e^2-c\,d\,e\,f+2\,c^2\,f^2))\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]\right)\bigg/$$
$$\left(105\,c^4\,d^2\,(d\,e-c\,f)^2\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}\right)$$

Result (type 4, 545 leaves) :

$$\frac{1}{105\,c^3\,d^3\,\left(d\,e-c\,f\right)^2\,\left(c+d\,x^2\right)^{7/2}\,\sqrt{e+f\,x^2}}\sqrt{\frac{d}{c}}\,\left(-\sqrt{\frac{d}{c}}\;x\,\left(e+f\,x^2\right)\,\left(15\,c^3\,\left(b\,c-a\,d\right)\,\left(d\,e-c\,f\right)^3-3\,c^2\,\left(d\,e-c\,f\right)^2\,\left(b\,c\,\left(d\,e-9\,c\,f\right)+2\,a\,d\,\left(3\,d\,e+c\,f\right)\right)\,\left(c+d\,x^2\right)-\right.\right.$$
$$c\,\left(d\,e-c\,f\right)\,\left(b\,c\,\left(4\,d^2\,e^2+c\,d\,e\,f-8\,c^2\,f^2\right)+3\,a\,d\,\left(8\,d^2\,e^2-5\,c\,d\,e\,f-2\,c^2\,f^2\right)\right)\,\left(c+d\,x^2\right)^2-$$
$$\left.\left(6\,a\,d\,\left(8\,d^3\,e^3-12\,c\,d^2\,e^2\,f+2\,c^2\,d\,e\,f^2+c^3\,f^3\right)+b\,c\,\left(8\,d^3\,e^3-5\,c\,d^2\,e^2\,f-5\,c^2\,d\,e\,f^2+8\,c^3\,f^3\right)\right)\,\left(c+d\,x^2\right)^3\right)+\mathrm{i}\,e\,\left(c+d\,x^2\right)^3\,\sqrt{1+\frac{d\,x^2}{c}}$$
$$\sqrt{1+\frac{f\,x^2}{e}}\,\left(\left(6\,a\,d\,\left(8\,d^3\,e^3-12\,c\,d^2\,e^2\,f+2\,c^2\,d\,e\,f^2+c^3\,f^3\right)+b\,c\,\left(8\,d^3\,e^3-5\,c\,d^2\,e^2\,f-5\,c^2\,d\,e\,f^2+8\,c^3\,f^3\right)\right)\,\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\right.\right.$$
$$\left.\left.\left.\frac{c\,f}{d\,e}\right]-\left(-d\,e+c\,f\right)\,\left(3\,a\,d\,\left(-16\,d^2\,e^2+16\,c\,d\,e\,f+c^2\,f^2\right)+b\,c\,\left(-8\,d^2\,e^2+c\,d\,e\,f+4\,c^2\,f^2\right)\right)\,\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]\right)\right)$$

Problem 35: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)^{5/2}}{\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 551 leaves, 7 steps) :

$$\frac{\left(7 a d f \left(8 d^2 e^2-23 c d e f+23 c^2 f^2\right)-b \left(48 d^3 e^3-128 c d^2 e^2 f+103 c^2 d e f^2-15 c^3 f^3\right)\right) x \sqrt{c+d x^2}}{105 d f^3 \sqrt{e+f x^2}}-$$

$$\frac{\left(28 a d f (d e-2 c f)-b \left(24 d^2 e^2-43 c d e f+15 c^2 f^2\right)\right) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{105 f^3}-$$

$$\frac{(6 b d e-5 b c f-7 a d f) x \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}{35 f^2}+\frac{b x \left(c+d x^2\right)^{5/2} \sqrt{e+f x^2}}{7 f}-$$

$$\left(\sqrt{e} \left(7 a d f \left(8 d^2 e^2-23 c d e f+23 c^2 f^2\right)-b \left(48 d^3 e^3-128 c d^2 e^2 f+103 c^2 d e f^2-15 c^3 f^3\right)\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]\right)\Big/$$

$$\left(105 d f^{7/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}\right)+$$

$$\left(\sqrt{e} \left(7 a f \left(4 d^2 e^2-11 c d e f+15 c^2 f^2\right)-b e \left(24 d^2 e^2-61 c d e f+45 c^2 f^2\right)\right) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]\right)\Big/$$

$$\left(105 f^{7/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}\right)$$

Result (type 4, 386 leaves) :

$$\frac{1}{105 \sqrt{\frac{d}{c}} f^4 \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

$$\left(\sqrt{\frac{d}{c}} f x \left(c+d x^2\right) \left(e+f x^2\right) \left(7 a d f \left(-4 d e+11 c f+3 d f x^2\right)+b \left(45 c^2 f^2+c d f \left(-61 e+45 f x^2\right)+3 d^2 \left(8 e^2-6 e f x^2+5 f^2 x^4\right)\right)\right)-\right.$$

$$i e \left(7 a d f \left(8 d^2 e^2-23 c d e f+23 c^2 f^2\right)+b \left(-48 d^3 e^3+128 c d^2 e^2 f-103 c^2 d e f^2+15 c^3 f^3\right)\right)$$

$$\sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]+i (-d e+c f)$$

$$\left.\left(4 b e \left(12 d^2 e^2-26 c d e f+15 c^2 f^2\right)-7 a f \left(8 d^2 e^2-19 c d e f+15 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]\right)$$

Problem 36: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right) \left(c+d x^2\right)^{3/2}}{\sqrt{e+f x^2}} \, dx$$

Optimal (type 4, 396 leaves, 6 steps):

$$-\frac{\left(10 a d f (d e-2 c f)-b \left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)\right) x \sqrt{c+d x^2}}{15 d f^2 \sqrt{e+f x^2}}-\frac{(4 b d e-3 b c f-5 a d f) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{15 f^2}+$$
$$\frac{b x \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}{5 f}+\frac{\sqrt{e} \left(10 a d f (d e-2 c f)-b \left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{15 d f^{5/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}-$$
$$\frac{\sqrt{e} \left(5 a f (d e-3 c f)-b \left(4 d e^2-6 c e f\right)\right) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{15 f^{5/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 279 leaves):

$$\frac{1}{15 \sqrt{\frac{d}{c}} f^3 \sqrt{c+d x^2} \sqrt{e+f x^2}}\left(\sqrt{\frac{d}{c}} f x \left(c+d x^2\right) \left(e+f x^2\right) \left(5 a d f+b \left(-4 d e+6 c f+3 d f x^2\right)\right)-\right.$$
$$i e \left(-10 a d f (d e-2 c f)+b \left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right],\frac{c f}{d e}\right]+$$
$$\left.i (-d e+c f) (5 a f (2 d e-3 c f)+b e (-8 d e+9 c f)) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right],\frac{c f}{d e}\right]\right)$$

Problem 37: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right) \sqrt{c+d x^2}}{\sqrt{e+f x^2}} \, dx$$

Optimal (type 4, 282 leaves, 5 steps):

$$-\frac{(2bde-bcf-3adf)\,x\sqrt{c+dx^2}}{3df\sqrt{e+fx^2}}+\frac{bx\sqrt{c+dx^2}\,\sqrt{e+fx^2}}{3f}+\frac{\sqrt{e}\,(2bde-bcf-3adf)\sqrt{c+dx^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{de}{cf}\right]}{3df^{3/2}\sqrt{\frac{e(c+dx^2)}{c(e+fx^2)}}\sqrt{e+fx^2}}-\frac{\sqrt{e}\,(be-3af)\sqrt{c+dx^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{de}{cf}\right]}{3f^{3/2}\sqrt{\frac{e(c+dx^2)}{c(e+fx^2)}}\sqrt{e+fx^2}}$$

Result (type 4, 215 leaves):

$$\left(b\sqrt{\frac{d}{c}}\,fx\,(c+dx^2)\,(e+fx^2)-i\,e\,(-2bde+bcf+3adf)\sqrt{1+\frac{dx^2}{c}}\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{cf}{de}\right]+i\,(2be-3af)\,(-de+cf)\sqrt{1+\frac{dx^2}{c}}\sqrt{1+\frac{fx^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{cf}{de}\right]\right)\Bigg/\left(3\sqrt{\frac{d}{c}}\,f^2\sqrt{c+dx^2}\,\sqrt{e+fx^2}\right)$$

Problem 38: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+bx^2}{\sqrt{c+dx^2}\,\sqrt{e+fx^2}}\,dx$$

Optimal (type 4, 206 leaves, 4 steps):

$$\frac{bx\sqrt{c+dx^2}}{d\sqrt{e+fx^2}}-\frac{b\sqrt{e}\,\sqrt{c+dx^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{de}{cf}\right]}{d\sqrt{f}\sqrt{\frac{e(c+dx^2)}{c(e+fx^2)}}\sqrt{e+fx^2}}+\frac{a\sqrt{e}\,\sqrt{c+dx^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{de}{cf}\right]}{c\sqrt{f}\sqrt{\frac{e(c+dx^2)}{c(e+fx^2)}}\sqrt{e+fx^2}}$$

Result (type 4, 131 leaves):

$$-\left(\left(i\sqrt{1+\frac{dx^2}{c}}\sqrt{1+\frac{fx^2}{e}}\left(be\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{cf}{de}\right]+(-be+af)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{cf}{de}\right]\right)\right)\Bigg/\left(\sqrt{\frac{d}{c}}\,f\sqrt{c+dx^2}\,\sqrt{e+fx^2}\right)\right)$$

Problem 39: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b x^2}{\left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}\,dx$$

Optimal (type 4, 209 leaves, 3 steps):

$$-\frac{(b c-a d) \sqrt{e+f x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],1-\frac{c f}{d e}\right]}{\sqrt{c} \sqrt{d}\, (d e-c f) \sqrt{c+d x^2} \sqrt{\frac{c \left(e+f x^2\right)}{e \left(c+d x^2\right)}}}+\frac{\sqrt{e}\, (b e-a f) \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{c \sqrt{f}\, (d e-c f) \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 206 leaves):

$$\left(\sqrt{\frac{d}{c}} \left(\sqrt{\frac{d}{c}}\, (b c-a d)\, x \left(e+f x^2\right)+i\, (b c-a d)\, e \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]-\right.\right.$$
$$\left.\left. i\, a\, (-d e+c f) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]\right)\right) \Big/ \left(d\, (-d e+c f) \sqrt{c+d x^2} \sqrt{e+f x^2}\right)$$

Problem 40: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b x^2}{\left(c+d x^2\right)^{5/2} \sqrt{e+f x^2}}\,dx$$

Optimal (type 4, 284 leaves, 4 steps):

$$-\frac{(b c-a d)\, x \sqrt{e+f x^2}}{3 c\, (d e-c f) \left(c+d x^2\right)^{3/2}}+\frac{(2 a d\, (d e-2 c f)+b c\, (d e+c f)) \sqrt{e+f x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],1-\frac{c f}{d e}\right]}{3 c^{3/2} \sqrt{d}\, (d e-c f)^2 \sqrt{c+d x^2} \sqrt{\frac{c \left(e+f x^2\right)}{e \left(c+d x^2\right)}}}-$$
$$\frac{\sqrt{e} \sqrt{f}\, (2 b c e+a d e-3 a c f) \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 c^2 (d e-c f)^2 \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 302 leaves):

$$\frac{1}{3 c^2 \sqrt{\frac{d}{c}} (d e - c f)^2 (c + d x^2)^{3/2} \sqrt{e + f x^2}} \left(\sqrt{\frac{d}{c}}\, x (e + f x^2) \left(b c (2 c^2 f + d^2 e x^2 + c d f x^2) + a d (-5 c^2 f + 2 d^2 e x^2 + c d (3 e - 4 f x^2))\right) + \right.$$

$$i e (2 a d (d e - 2 c f) + b c (d e + c f)) (c + d x^2) \sqrt{1 + \frac{d x^2}{c}} \sqrt{1 + \frac{f x^2}{e}} \, \text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] +$$

$$\left. i (-d e + c f) (b c e + 2 a d e - 3 a c f) (c + d x^2) \sqrt{1 + \frac{d x^2}{c}} \sqrt{1 + \frac{f x^2}{e}} \, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)$$

Problem 41: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a + b x^2}{(c + d x^2)^{7/2} \sqrt{e + f x^2}} \, dx$$

Optimal (type 4, 401 leaves, 5 steps):

$$-\frac{(b c - a d) x \sqrt{e + f x^2}}{5 c (d e - c f) (c + d x^2)^{5/2}} + \frac{(4 a d (d e - 2 c f) + b c (d e + 3 c f)) x \sqrt{e + f x^2}}{15 c^2 (d e - c f)^2 (c + d x^2)^{3/2}} +$$

$$\left(\left(b c (2 d^2 e^2 - 7 c d e f - 3 c^2 f^2) + a d (8 d^2 e^2 - 23 c d e f + 23 c^2 f^2)\right) \sqrt{e + f x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1 - \frac{c f}{d e}\right]\right) \Big/$$

$$\left(15 c^{5/2} \sqrt{d} (d e - c f)^3 \sqrt{c + d x^2} \sqrt{\frac{c (e + f x^2)}{e (c + d x^2)}}\right) -$$

$$\left(\sqrt{e} \sqrt{f} \left(b c e (d e - 9 c f) + a (4 d^2 e^2 - 11 c d e f + 15 c^2 f^2)\right) \sqrt{c + d x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1 - \frac{d e}{c f}\right]\right) \Big/$$

$$\left(15 c^3 (d e - c f)^3 \sqrt{\frac{e (c + d x^2)}{c (e + f x^2)}} \sqrt{e + f x^2}\right)$$

Result (type 4, 393 leaves):

$$\frac{1}{15\,c^3\sqrt{\frac{d}{c}}\,(d\,e-c\,f)^3\,(c+d\,x^2)^{5/2}\sqrt{e+f\,x^2}}$$

$$\Bigg(-\sqrt{\frac{d}{c}}\,x\,(e+f\,x^2)\,\Big(3\,c^2\,(b\,c-a\,d)\,(d\,e-c\,f)^2+c\,(-d\,e+c\,f)\,(4\,a\,d\,(d\,e-2\,c\,f)+b\,c\,(d\,e+3\,c\,f))\,(c+d\,x^2)+$$

$$(a\,d\,(-8\,d^2\,e^2+23\,c\,d\,e\,f-23\,c^2\,f^2)+b\,c\,(-2\,d^2\,e^2+7\,c\,d\,e\,f+3\,c^2\,f^2))\,(c+d\,x^2)^2\Big)-\mathrm{i}\,(c+d\,x^2)^2\sqrt{1+\frac{d\,x^2}{c}}$$

$$\sqrt{1+\frac{f\,x^2}{e}}\,\Bigg(e\,(a\,d\,(-8\,d^2\,e^2+23\,c\,d\,e\,f-23\,c^2\,f^2)+b\,c\,(-2\,d^2\,e^2+7\,c\,d\,e\,f+3\,c^2\,f^2))\,\mathrm{EllipticE}\Big[\mathrm{i}\,\mathrm{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]+$$

$$(d\,e-c\,f)\,(2\,b\,c\,e\,(d\,e-3\,c\,f)+a\,(8\,d^2\,e^2-19\,c\,d\,e\,f+15\,c^2\,f^2))\,\mathrm{EllipticF}\Big[\mathrm{i}\,\mathrm{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]\Bigg)\Bigg)$$

Problem 42: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+b\,x^2)\,(c+d\,x^2)^{5/2}}{(e+f\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 501 leaves, 7 steps) :

$$-\frac{\left(5 a f\left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)-2 b e\left(24 d^2 e^2-44 c d e f+19 c^2 f^2\right)\right) x \sqrt{c+d x^2}}{15 e f^3 \sqrt{e+f x^2}}-\frac{(b e-a f) x\left(c+d x^2\right)^{5/2}}{e f \sqrt{e+f x^2}}-$$
$$\frac{d\left(b e(24 d e-23 c f)-5 a f(4 d e-3 c f)\right) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{15 e f^3}+\frac{d(6 b e-5 a f) x\left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}{5 e f^2}+$$
$$\left(\left(5 a f\left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)-2 b e\left(24 d^2 e^2-44 c d e f+19 c^2 f^2\right)\right) \sqrt{c+d x^2}\ \mathrm{EllipticE}\left[\mathrm{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]\right) \Big/$$
$$\left(15 \sqrt{e}\, f^{7/2} \sqrt{\frac{e\left(c+d x^2\right)}{c\left(e+f x^2\right)}} \sqrt{e+f x^2}\right)-$$
$$\left(\sqrt{e}\left(10 a d f(2 d e-3 c f)-b\left(24 d^2 e^2-41 c d e f+15 c^2 f^2\right)\right) \sqrt{c+d x^2}\ \mathrm{EllipticF}\left[\mathrm{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]\right) \Big/$$
$$\left(15 f^{7/2} \sqrt{\frac{e\left(c+d x^2\right)}{c\left(e+f x^2\right)}} \sqrt{e+f x^2}\right)$$

Result (type 4, 369 leaves) :

$$\frac{1}{15 \sqrt{\frac{d}{c}}\, e f^4 \sqrt{c+d x^2} \sqrt{e+f x^2}}$$
$$\left(\sqrt{\frac{d}{c}}\, f x\left(c+d x^2\right)\left(5 a f\left(-6 c d e f+3 c^2 f^2+d^2 e\left(4 e+f x^2\right)\right)+b e\left(-15 c^2 f^2+c d f\left(41 e+11 f x^2\right)-3 d^2\left(8 e^2+2 e f x^2-f^2 x^4\right)\right)\right)-\right.$$
$$i d e\left(-5 a f\left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)+2 b e\left(24 d^2 e^2-44 c d e f+19 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\ \mathrm{EllipticE}\left[i\, \mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]-$$
$$\left.i e(-d e+c f)\left(5 a d f(-8 d e+9 c f)+b\left(48 d^2 e^2-64 c d e f+15 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\ \mathrm{EllipticF}\left[i\, \mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)$$

Problem 43: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right)\left(c+d x^2\right)^{3/2}}{\left(e+f x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 358 leaves, 6 steps) :

$$-\frac{\left(b e \left(8 d e-7 c f\right)-3 a f \left(2 d e-c f\right)\right) x \sqrt{c+d x^2}}{3 e f^2 \sqrt{e+f x^2}}-\frac{\left(b e-a f\right) x \left(c+d x^2\right)^{3/2}}{e f \sqrt{e+f x^2}}+$$

$$\frac{d \left(4 b e-3 a f\right) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{3 e f^2}+\frac{\left(b e \left(8 d e-7 c f\right)-3 a f \left(2 d e-c f\right)\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 \sqrt{e} f^{5/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}-$$

$$\frac{\sqrt{e} \left(4 b d e-3 b c f-3 a d f\right) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 f^{5/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 260 leaves) :

$$\left(\sqrt{\frac{d}{c}} f x \left(c+d x^2\right) \left(3 a f \left(-d e+c f\right)+b e \left(4 d e-3 c f+d f x^2\right)\right)-\right.$$

$$i d e \left(-3 a f \left(-2 d e+c f\right)+b e \left(-8 d e+7 c f\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right],\frac{c f}{d e}\right]-$$

$$\left.i e \left(-d e+c f\right) \left(-8 b d e+3 b c f+6 a d f\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right],\frac{c f}{d e}\right]\right)\Big/\left(3 \sqrt{\frac{d}{c}} e f^3 \sqrt{c+d x^2} \sqrt{e+f x^2}\right)$$

Problem 44: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+b x^2\right) \sqrt{c+d x^2}}{\left(e+f x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 258 leaves, 5 steps) :

$$-\frac{\left(b e-a f\right) x \sqrt{c+d x^2}}{e f \sqrt{e+f x^2}}+\frac{\left(2 b e-a f\right) x \sqrt{c+d x^2}}{e f \sqrt{e+f x^2}}-$$

$$\frac{\left(2 b e-a f\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{\sqrt{e} f^{3/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}+\frac{b \sqrt{e} \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{f^{3/2} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 208 leaves) :

$$\left(\sqrt{\frac{d}{c}}\, f\,(-b e+a f)\, x\,(c+d x^2)-i\, d e\,(2 b e-a f)\,\sqrt{1+\frac{d x^2}{c}}\,\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c f}{d e}\right]-\right.$$
$$\left.i\, e\,(-2 b d e+b c f+a d f)\,\sqrt{1+\frac{d x^2}{c}}\,\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c f}{d e}\right]\right)\Big/\left(\sqrt{\frac{d}{c}}\, e f^2\,\sqrt{c+d x^2}\,\sqrt{e+f x^2}\right)$$

Problem 45: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b x^2}{\sqrt{c+d x^2}\,(e+f x^2)^{3/2}}\,dx$$

Optimal (type 4, 209 leaves, 3 steps):

$$\frac{(b e-a f)\,\sqrt{c+d x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{\sqrt{e}\,\sqrt{f}\,(d e-c f)\,\sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}}\,\sqrt{e+f x^2}}-\frac{(b c-a d)\,\sqrt{e}\,\sqrt{c+d x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{c\,\sqrt{f}\,(d e-c f)\,\sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}}\,\sqrt{e+f x^2}}$$

Result (type 4, 212 leaves):

$$\left(\sqrt{\frac{d}{c}}\, f\,(-b e+a f)\, x\,(c+d x^2)-i\, d e\,(b e-a f)\,\sqrt{1+\frac{d x^2}{c}}\,\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c f}{d e}\right]-\right.$$
$$\left.i\, b e\,(-d e+c f)\,\sqrt{1+\frac{d x^2}{c}}\,\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c f}{d e}\right]\right)\Big/\left(\sqrt{\frac{d}{c}}\, e f\,(-d e+c f)\,\sqrt{c+d x^2}\,\sqrt{e+f x^2}\right)$$

Problem 46: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b x^2}{(c+d x^2)^{3/2}\,(e+f x^2)^{3/2}}\,dx$$

Optimal (type 4, 272 leaves, 4 steps):

$$-\frac{(b c-a d) x}{c (d e-c f) \sqrt{c+d x^2} \sqrt{e+f x^2}}-\frac{\sqrt{f} (2 b c e-a d e-a c f) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{c \sqrt{e} (d e-c f)^2 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}+$$
$$\frac{\sqrt{e} (b d e+b c f-2 a d f) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{c \sqrt{f} (d e-c f)^2 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}$$

Result (type 4, 262 leaves) :

$$\left(\sqrt{\frac{d}{c}} \left(\sqrt{\frac{d}{c}} x \left(a \left(c^2 f^2+c d f^2 x^2+d^2 e \left(e+f x^2\right)\right)-b c e \left(c f+d \left(e+2 f x^2\right)\right)\right)-\right.\right.$$
$$i d e (2 b c e-a (d e+c f)) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]-$$
$$\left.\left. i (b c-a d) e (-d e+c f) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]\right)\right) \Big/ \left(d e (d e-c f)^2 \sqrt{c+d x^2} \sqrt{e+f x^2}\right)$$

Problem 47: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b x^2}{\left(c+d x^2\right)^{5/2} \left(e+f x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 375 leaves, 5 steps) :

$$-\frac{(b c-a d) x}{3 c (d e-c f) \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}+\frac{(2 a d (d e-3 c f)+b c (d e+3 c f)) x}{3 c^2 (d e-c f)^2 \sqrt{c+d x^2} \sqrt{e+f x^2}}+$$
$$\frac{\sqrt{f} \left(b c e (d e+7 c f)+a \left(2 d^2 e^2-7 c d e f-3 c^2 f^2\right)\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{3 c^2 \sqrt{e} (d e-c f)^3 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}-$$
$$\frac{\sqrt{e} \sqrt{f} (a d (d e-9 c f)+b c (5 d e+3 c f)) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{3 c^2 (d e-c f)^3 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}$$

Result (type 4, 428 leaves):

$$\frac{1}{3\,c^2\sqrt{\frac{d}{c}}\,e\,(-d\,e+c\,f)^3\,(c+d\,x^2)^{3/2}\sqrt{e+f\,x^2}}\Bigg(\sqrt{\frac{d}{c}}\,x\,\Big(-b\,c\,e\,\big(3\,c^3\,f^2+d^3\,e\,x^2\,(e+f\,x^2)+c\,d^2\,f\,x^2\,(4\,e+7\,f\,x^2)+c^2\,d\,f\,(5\,e+11\,f\,x^2)\big)+ a\,\big(3\,c^4\,f^3+6\,c^3\,d\,f^3\,x^2-2\,d^4\,e^2\,x^2\,(e+f\,x^2)+c^2\,d^2\,f\,(8\,e^2+8\,e\,f\,x^2+3\,f^2\,x^4)+c\,d^3\,e\,(-3\,e^2+4\,e\,f\,x^2+7\,f^2\,x^4)\big)\Big)- i\,d\,e\,\big(b\,c\,e\,(d\,e+7\,c\,f)+a\,(2\,d^2\,e^2-7\,c\,d\,e\,f-3\,c^2\,f^2)\big)\,(c+d\,x^2)\sqrt{1+\frac{d\,x^2}{c}}\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]- i\,e\,(-d\,e+c\,f)\,\big(2\,a\,d\,(d\,e-3\,c\,f)+b\,c\,(d\,e+3\,c\,f)\big)\,(c+d\,x^2)\sqrt{1+\frac{d\,x^2}{c}}\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]\Bigg)$$

Problem 48: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x^2}{\sqrt{a+b\,x^2}\,(c+d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 209 leaves, 3 steps):

$$-\frac{(d\,e-c\,f)\sqrt{a+b\,x^2}\,\text{EllipticE}\Big[\text{ArcTan}\Big[\frac{\sqrt{d}\,x}{\sqrt{c}}\Big],1-\frac{b\,c}{a\,d}\Big]}{\sqrt{c}\,\sqrt{d}\,(b\,c-a\,d)\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\sqrt{c+d\,x^2}}+\frac{\sqrt{c}\,(b\,e-a\,f)\sqrt{a+b\,x^2}\,\text{EllipticF}\Big[\text{ArcTan}\Big[\frac{\sqrt{d}\,x}{\sqrt{c}}\Big],1-\frac{b\,c}{a\,d}\Big]}{a\,\sqrt{d}\,(b\,c-a\,d)\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\sqrt{c+d\,x^2}}$$

Result (type 4, 212 leaves):

$$\Bigg(\sqrt{\frac{b}{a}}\,d\,(d\,e-c\,f)\,x\,(a+b\,x^2)-i\,b\,c\,(-d\,e+c\,f)\sqrt{1+\frac{b\,x^2}{a}}\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{b}{a}}\,x\Big],\frac{a\,d}{b\,c}\Big]- i\,c\,(-b\,c+a\,d)\,f\sqrt{1+\frac{b\,x^2}{a}}\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{b}{a}}\,x\Big],\frac{a\,d}{b\,c}\Big]\Bigg)\Bigg/\Bigg(\sqrt{\frac{b}{a}}\,c\,d\,(-b\,c+a\,d)\sqrt{a+b\,x^2}\sqrt{c+d\,x^2}\Bigg)$$

Problem 49: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x^2}{\sqrt{a-b\,x^2}\,(c+d\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 247 leaves, 8 steps):

$$\frac{(d e-c f)\, x \sqrt{a-b x^2}}{c\, (b c+a d)\, \sqrt{c+d x^2}}+\frac{\sqrt{a}\, \sqrt{b}\, (d e-c f)\, \sqrt{1-\frac{b x^2}{a}}\, \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right],-\frac{a d}{b c}\right]}{c\, d\, (b c+a d)\, \sqrt{a-b x^2}\, \sqrt{1+\frac{d x^2}{c}}}+$$

$$\frac{\sqrt{a}\, f\, \sqrt{1-\frac{b x^2}{a}}\, \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right],-\frac{a d}{b c}\right]}{\sqrt{b}\, d\, \sqrt{a-b x^2}\, \sqrt{c+d x^2}}$$

Result (type 4, 220 leaves):

$$\left(\sqrt{-\frac{b}{a}}\, d\, (d e-c f)\, x\, \left(a-b x^2\right)+\mathrm{i}\, b\, c\, (-d e+c f)\, \sqrt{1-\frac{b x^2}{a}}\, \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[\mathrm{i}\, \text{ArcSinh}\left[\sqrt{-\frac{b}{a}}\, x\right],-\frac{a d}{b c}\right]-\right.$$

$$\left.\mathrm{i}\, c\, (b c+a d)\, f\, \sqrt{1-\frac{b x^2}{a}}\, \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\sqrt{-\frac{b}{a}}\, x\right],-\frac{a d}{b c}\right]\right)\Big/\left(\sqrt{-\frac{b}{a}}\, c\, d\, (b c+a d)\, \sqrt{a-b x^2}\, \sqrt{c+d x^2}\right)$$

Problem 50: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+f x^2}{\sqrt{a+b x^2}\, \left(c-d x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 237 leaves, 8 steps):

$$\frac{(d e+c f)\, x \sqrt{a+b x^2}}{c\, (b c+a d)\, \sqrt{c-d x^2}}-\frac{(d e+c f)\, \sqrt{a+b x^2}\, \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],-\frac{b c}{a d}\right]}{\sqrt{c}\, \sqrt{d}\, (b c+a d)\, \sqrt{1+\frac{b x^2}{a}}\, \sqrt{c-d x^2}}+\frac{e\, \sqrt{1+\frac{b x^2}{a}}\, \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],-\frac{b c}{a d}\right]}{\sqrt{c}\, \sqrt{d}\, \sqrt{a+b x^2}\, \sqrt{c-d x^2}}$$

Result (type 4, 213 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, (d e+c f)\, x\, (a+b x^2)-i\, b\, c\, (d e+c f) \sqrt{1+\frac{b x^2}{a}} \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],-\frac{a d}{b c}\right]+\right.$$

$$\left.i\, c\, (b c+a d)\, f \sqrt{1+\frac{b x^2}{a}} \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],-\frac{a d}{b c}\right]\right)\Big/\left(\sqrt{\frac{b}{a}}\, c\, d\, (b c+a d) \sqrt{a+b x^2} \sqrt{c-d x^2}\right)$$

Problem 51: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+f x^2}{\sqrt{a-b x^2}\, (c-d x^2)^{3/2}}\, dx$$

Optimal (type 4, 242 leaves, 8 steps):

$$-\frac{(d e+c f)\, x \sqrt{a-b x^2}}{c\, (b c-a d) \sqrt{c-d x^2}}+\frac{(d e+c f) \sqrt{a-b x^2} \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],\frac{b c}{a d}\right]}{\sqrt{c} \sqrt{d}\, (b c-a d) \sqrt{1-\frac{b x^2}{a}} \sqrt{c-d x^2}}+\frac{e \sqrt{1-\frac{b x^2}{a}} \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],\frac{b c}{a d}\right]}{\sqrt{c} \sqrt{d} \sqrt{a-b x^2} \sqrt{c-d x^2}}$$

Result (type 4, 221 leaves):

$$\left(\sqrt{-\frac{b}{a}}\, d\, (d e+c f)\, x\, (a-b x^2)+i\, b\, c\, (d e+c f) \sqrt{1-\frac{b x^2}{a}} \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{-\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]+\right.$$

$$\left.i\, c\, (-b c+a d)\, f \sqrt{1-\frac{b x^2}{a}} \sqrt{1-\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{-\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]\right)\Big/\left(\sqrt{-\frac{b}{a}}\, c\, d\, (-b c+a d) \sqrt{a-b x^2} \sqrt{c-d x^2}\right)$$

Problem 52: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b x^2}{\sqrt{2+d x^2} \sqrt{3+f x^2}}\, dx$$

Optimal (type 4, 191 leaves, 4 steps):

$$\frac{b x \sqrt{2+d x^2}}{d \sqrt{3+f x^2}}-\frac{\sqrt{2}\, b \sqrt{2+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{3}}\right],1-\frac{3 d}{2 f}\right]}{d \sqrt{f} \sqrt{\frac{2+d x^2}{3+f x^2}} \sqrt{3+f x^2}}+\frac{a \sqrt{2+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{3}}\right],1-\frac{3 d}{2 f}\right]}{\sqrt{2} \sqrt{f} \sqrt{\frac{2+d x^2}{3+f x^2}} \sqrt{3+f x^2}}$$

Result (type 4, 81 leaves):

$$-\frac{i \left(3 b \,\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{d}\, x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right] + (-3 b + a f)\, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{d}\, x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]\right)}{\sqrt{3}\, \sqrt{d}\, f}$$

Problem 53: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a + b x^2\right) \sqrt{2 + d x^2}}{\sqrt{3 + f x^2}} \, dx$$

Optimal (type 4, 262 leaves, 5 steps):

$$-\frac{(6 b d - 2 b f - 3 a d f)\, x \sqrt{2 + d x^2}}{3 d f \sqrt{3 + f x^2}} + \frac{b x \sqrt{2 + d x^2}\, \sqrt{3 + f x^2}}{3 f} + \frac{\sqrt{2}\, (6 b d - 2 b f - 3 a d f)\, \sqrt{2 + d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{3}}\right], 1 - \frac{3 d}{2 f}\right]}{3 d f^{3/2} \sqrt{\frac{2 + d x^2}{3 + f x^2}}\, \sqrt{3 + f x^2}} - \frac{\sqrt{2}\, (b - a f)\, \sqrt{2 + d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{3}}\right], 1 - \frac{3 d}{2 f}\right]}{f^{3/2} \sqrt{\frac{2 + d x^2}{3 + f x^2}}\, \sqrt{3 + f x^2}}$$

Result (type 4, 142 leaves):

$$\frac{1}{3 \sqrt{d}\, f^2}\left(b \sqrt{d}\, f x \sqrt{2 + d x^2}\, \sqrt{3 + f x^2} + i \sqrt{3}\, (6 b d - 2 b f - 3 a d f)\, \text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{d}\, x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right] + i \sqrt{3}\, (3 d - 2 f)\, (-2 b + a f)\, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{d}\, x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]\right)$$

Problem 54: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(a + b x^2\right) \sqrt{2 + d x^2}\, \sqrt{3 + f x^2} \, dx$$

Optimal (type 4, 356 leaves, 6 steps):

$$\frac{\left(5 a d f (3 d+2 f)-2 b\left(9 d^2-6 d f+4 f^2\right)\right) x \sqrt{2+d x^2}}{15 d^2 f \sqrt{3+f x^2}}+\frac{(3 b d-4 b f+5 a d f) x \sqrt{2+d x^2} \sqrt{3+f x^2}}{15 d f}+$$

$$\frac{b x\left(2+d x^2\right)^{3/2} \sqrt{3+f x^2}}{5 d}-\frac{\sqrt{2}\left(5 a d f (3 d+2 f)-2 b\left(9 d^2-6 d f+4 f^2\right)\right) \sqrt{2+d x^2} \operatorname{EllipticE}\left[\operatorname{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{3}}\right], 1-\frac{3 d}{2 f}\right]}{15 d^2 f^{3/2} \sqrt{\frac{2+d x^2}{3+f x^2}} \sqrt{3+f x^2}}-$$

$$\frac{\sqrt{2}(3 b d+2 b f-10 a d f) \sqrt{2+d x^2} \operatorname{EllipticF}\left[\operatorname{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{3}}\right], 1-\frac{3 d}{2 f}\right]}{5 d f^{3/2} \sqrt{\frac{2+d x^2}{3+f x^2}} \sqrt{3+f x^2}}$$

Result (type 4, 186 leaves):

$$\frac{1}{15 d^{3/2} f^2}\left(\sqrt{d} f x \sqrt{2+d x^2} \sqrt{3+f x^2}\left(2 b f+5 a d f+3 b d\left(1+f x^2\right)\right)+\right.$$

$$i \sqrt{3}\left(-5 a d f(3 d+2 f)+2 b\left(9 d^2-6 d f+4 f^2\right)\right) \operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]+$$

$$\left.i \sqrt{3}(3 d-2 f)(-6 b d+2 b f+5 a d f) \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]\right)$$

Problem 55: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{-b-\sqrt{b^2-4 a c}+2 c x^2}{\sqrt{1+\frac{2 c x^2}{-b-\sqrt{b^2-4 a c}}} \sqrt{1+\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}}} \, dx$$

Optimal (type 4, 113 leaves, 2 steps):

$$-\frac{\sqrt{b-\sqrt{b^2-4 a c}}\left(b+\sqrt{b^2-4 a c}\right) \operatorname{EllipticE}\left[\operatorname{ArcSin}\left[\frac{\sqrt{2} \sqrt{c} x}{\sqrt{b-\sqrt{b^2-4 a c}}}\right], \frac{b-\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}}\right]}{\sqrt{2} \sqrt{c}}$$

Result (type 4, 104 leaves):

$$-2 i \sqrt{2} a \sqrt{\frac{c}{-b+\sqrt{b^2-4 a c}}} \operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{-b+\sqrt{b^2-4 a c}}} x\right], \frac{b-\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}}\right]$$

Problem 56: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{b-\sqrt{b^2-4 a c}+2 c x^2}{\sqrt{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}} \sqrt{1+\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}}} \, dx$$

Optimal (type 4, 526 leaves, 5 steps):

$$\frac{\left(b-\sqrt{b^2-4 a c}\right) x \sqrt{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}}}{\sqrt{1+\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}}}-\frac{\left(b-\sqrt{b^2-4 a c}\right) \sqrt{b+\sqrt{b^2-4 a c}} \sqrt{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{2} \sqrt{c} x}{\sqrt{b+\sqrt{b^2-4 a c}}}\right],-\frac{2 \sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]}{\sqrt{2} \sqrt{c} \sqrt{\frac{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}}{1+\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}}} \sqrt{1+\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}}}+$$

$$\frac{\left(b-\sqrt{b^2-4 a c}\right) \sqrt{b+\sqrt{b^2-4 a c}} \sqrt{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{2} \sqrt{c} x}{\sqrt{b+\sqrt{b^2-4 a c}}}\right],-\frac{2 \sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]}{\sqrt{2} \sqrt{c} \sqrt{\frac{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}}{1+\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}}} \sqrt{1+\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}}}$$

Result (type 4, 203 leaves):

$$-\frac{1}{\sqrt{2} \sqrt{\frac{c}{b-\sqrt{b^2-4 a c}}}} i \left(\left(b+\sqrt{b^2-4 a c}\right) \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b-\sqrt{b^2-4 a c}}} x\right],\frac{b-\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}}\right]-\right.$$

$$\left.2 \sqrt{b^2-4 a c} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b-\sqrt{b^2-4 a c}}} x\right],\frac{b-\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}}\right]\right)$$

Problem 64: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(c+d x^2\right)^{5/2} \sqrt{e+f x^2}}{a+b x^2} \, dx$$

Optimal (type 4, 608 leaves, 14 steps):

$$\frac{d\left(7 c e-\frac{2 d e^2}{f}+\frac{3 c^2 f}{d}\right) x \sqrt{c+d x^2}}{15 b \sqrt{e+f x^2}}+\frac{(b c-a d)(b d e+4 b c f-3 a d f) x \sqrt{c+d x^2}}{3 b^3 \sqrt{e+f x^2}}+$$

$$\frac{d(b c-a d) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{3 b^2}-\frac{2 d(d e-3 c f) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{15 b f}+\frac{d^2 x \sqrt{c+d x^2}\left(e+f x^2\right)^{3/2}}{5 b f}-$$

$$\left(\sqrt{e}\left(15 a^2 d^2 f^2-5 a b d f(d e+7 c f)+b^2\left(-2 d^2 e^2+12 c d e f+23 c^2 f^2\right)\right) \sqrt{c+d x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]\right) \Big/$$

$$\left(15 b^3 f^{3/2} \sqrt{\frac{e\left(c+d x^2\right)}{c\left(e+f x^2\right)}} \sqrt{e+f x^2}\right)+\frac{d e^{3/2}\left(-40 a b c d f+15 a^2 d^2 f+b^2 c(-d e+34 c f)\right) \sqrt{c+d x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{15 b^3 c f^{3/2} \sqrt{\frac{e\left(c+d x^2\right)}{c\left(e+f x^2\right)}} \sqrt{e+f x^2}}+$$

$$\frac{(b c-a d)^3 e^{3/2} \sqrt{c+d x^2}\ \text{EllipticPi}\left[1-\frac{b e}{a f}, \text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{a b^3 c \sqrt{f} \sqrt{\frac{e\left(c+d x^2\right)}{c\left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 456 leaves) :

$$\frac{1}{15 a b^4 \sqrt{\frac{d}{c}}\, f^2 \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

$$\left(-i\, a b d e\left(15 a^2 d^2 f^2-5 a b d f(d e+7 c f)+b^2\left(-2 d^2 e^2+12 c d e f+23 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\ \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]-\right.$$

$$i\, a\left(45 a^2 b c d^2 f^3-15 a^3 d^3 f^3+5 a b^2 d f\left(d^2 e^2-c d e f-9 c^2 f^2\right)+b^3\left(2 d^3 e^3-13 c d^2 e^2 f+11 c^2 d e f^2+15 c^3 f^3\right)\right) \sqrt{1+\frac{d x^2}{c}}$$

$$\sqrt{1+\frac{f x^2}{e}}\ \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]+f\left(a b^2 d \sqrt{\frac{d}{c}}\, x\left(c+d x^2\right)\left(e+f x^2\right)\left(11 b c f-5 a d f+b d\left(e+3 f x^2\right)\right)-\right.$$

$$\left.\left.15\, i\,(b c-a d)^3 f(b e-a f) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\ \text{EllipticPi}\left[\frac{b c}{a d}, i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\right)$$

Problem 65: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}{a+b x^2}\, dx$$

Optimal (type 4, 400 leaves, 7 steps):

$$\frac{(b d e+4 b c f-3 a d f)\, x \sqrt{c+d x^2}}{3 b^2 \sqrt{e+f x^2}}+\frac{d x \sqrt{c+d x^2}\, \sqrt{e+f x^2}}{3 b}-\frac{\sqrt{e}\, (b d e+4 b c f-3 a d f) \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 b^2 \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}}\, \sqrt{e+f x^2}}+$$

$$\frac{d\, (5 b c-3 a d)\, e^{3/2} \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 b^2 c \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}}\, \sqrt{e+f x^2}}+\frac{(b c-a d)^2 e^{3/2} \sqrt{c+d x^2}\, \text{EllipticPi}\left[1-\frac{b e}{a f},\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{a b^2 c \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}}\, \sqrt{e+f x^2}}$$

Result (type 4, 346 leaves):

$$\frac{1}{3 a b^3 \sqrt{\frac{d}{c}}\, f \sqrt{c+d x^2}\, \sqrt{e+f x^2}}\left(-i a b d e\, (b d e+4 b c f-3 a d f) \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]-\right.$$

$$i a \left(-6 a b c d f^2+3 a^2 d^2 f^2+b^2 \left(-d^2 e^2+c d e f+3 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]+$$

$$\left. f \left(a b^2 d \sqrt{\frac{d}{c}}\, x \left(c+d x^2\right) \left(e+f x^2\right)-3 i (b c-a d)^2 (b e-a f) \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticPi}\left[\frac{b c}{a d},i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]\right)\right)$$

Problem 66: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{c+d x^2}\, \sqrt{e+f x^2}}{a+b x^2}\, dx$$

Optimal (type 4, 321 leaves, 6 steps):

$$\frac{f\,x\,\sqrt{c+d\,x^2}}{b\,\sqrt{e+f\,x^2}}-\frac{\sqrt{e}\,\sqrt{f}\,\sqrt{c+d\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{b\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+$$

$$\frac{d\,e^{3/2}\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{b\,c\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{(b\,c-a\,d)\,e^{3/2}\,\sqrt{c+d\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,e}{a\,f},\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{a\,b\,c\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 184 leaves):

$$-\left(\left(i\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\left(a\,b\,d\,e\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+(b\,c-a\,d)\right.\right.\right.$$

$$\left.\left.\left.\left(a\,f\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+(b\,e-a\,f)\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)\right)\Big/\left(a\,b^2\,\sqrt{\frac{d}{c}}\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}\right)\right)$$

Problem 67: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{e+f\,x^2}}{(a+b\,x^2)\,\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 4, 102 leaves, 1 step):

$$\frac{e^{3/2}\,\sqrt{c+d\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,e}{a\,f},\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{a\,c\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 143 leaves):

$$-\left(\left(i\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\left(a\,f\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+(b\,e-a\,f)\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)\Big/\right.$$

$$\left.\left(a\,b\,\sqrt{\frac{d}{c}}\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}\right)\right)$$

Problem 68: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{e+f x^2}}{\left(a+b x^2\right) \left(c+d x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 209 leaves, 3 steps):

$$-\frac{\sqrt{d} \sqrt{e+f x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{c f}{d e}\right]}{\sqrt{c} (b c-a d) \sqrt{c+d x^2} \sqrt{\frac{c (e+f x^2)}{e (c+d x^2)}}}+\frac{b e^{3/2} \sqrt{c+d x^2} \, \text{EllipticPi}\left[1-\frac{b e}{a f}, \text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{a c (b c-a d) \sqrt{f} \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}$$

Result (type 4, 347 leaves):

$$\frac{1}{a d (-b c+a d) \sqrt{c+d x^2} \sqrt{e+f x^2}} \sqrt{\frac{d}{c}} \left(a d \sqrt{\frac{d}{c}} e x+a d \sqrt{\frac{d}{c}} f x^3+i a d e \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]+i a (-d e+c f) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]+i b c e \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticPi}\left[\frac{b c}{a d}, i \, \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]-i a c f \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticPi}\left[\frac{b c}{a d}, i \, \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]\right)$$

Problem 69: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{e+f x^2}}{\left(a+b x^2\right) \left(c+d x^2\right)^{5/2}} \, dx$$

Optimal (type 4, 401 leaves, 6 steps):

$$-\frac{d\,x\,\sqrt{e+f\,x^2}}{3\,c\,(b\,c-a\,d)\,(c+d\,x^2)^{3/2}}-\frac{\sqrt{d}\,(b\,c\,(5\,d\,e-4\,c\,f)-a\,d\,(2\,d\,e-c\,f))\,\sqrt{e+f\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{3\,c^{3/2}\,(b\,c-a\,d)^2\,(d\,e-c\,f)\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}+$$

$$\frac{d\,e^{3/2}\,\sqrt{f}\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{3\,c^2\,(b\,c-a\,d)\,(d\,e-c\,f)\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{b^2\,e^{3/2}\,\sqrt{c+d\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,e}{a\,f},\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{a\,c\,(b\,c-a\,d)^2\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 427 leaves) :

$$\frac{1}{3\,a\,c^2\,\sqrt{\frac{d}{c}}\,(b\,c-a\,d)^2\,(-d\,e+c\,f)\,(c+d\,x^2)^{3/2}\,\sqrt{e+f\,x^2}}$$

$$\Bigg(a\,c\left(\frac{d}{c}\right)^{3/2}x\,(e+f\,x^2)\,\left(b\,c\,(6\,c\,d\,e-5\,c^2\,f+5\,d^2\,e\,x^2-4\,c\,d\,f\,x^2)+a\,d\,(-3\,c\,d\,e+2\,c^2\,f-2\,d^2\,e\,x^2+c\,d\,f\,x^2)\right)-$$

$$i\,a\,d\,e\,(a\,d\,(2\,d\,e-c\,f)+b\,c\,(-5\,d\,e+4\,c\,f))\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$i\,a\,(-d\,e+c\,f)\,(2\,a\,d^2\,e+b\,c\,(-5\,d\,e+3\,c\,f))\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$3\,i\,b\,c^2\,(b\,e-a\,f)\,(-d\,e+c\,f)\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\Bigg)$$

Problem 70: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{e+f\,x^2}}{(a+b\,x^2)\,(c+d\,x^2)^{7/2}}\,dx$$

Optimal (type 4, 630 leaves, 9 steps) :

$$-\frac{d\,x\,\sqrt{e+f\,x^2}}{5\,c\,(b\,c-a\,d)\,(c+d\,x^2)^{5/2}}-\frac{d\,(b\,c\,(9\,d\,e-8\,c\,f)-a\,d\,(4\,d\,e-3\,c\,f))\,x\,\sqrt{e+f\,x^2}}{15\,c^2\,(b\,c-a\,d)^2\,(d\,e-c\,f)\,(c+d\,x^2)^{3/2}}-\frac{b^2\,\sqrt{d}\,\sqrt{e+f\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{\sqrt{c}\,(b\,c-a\,d)^3\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}+$$

$$\left(\sqrt{d}\,\left(a\,d\,(8\,d^2\,e^2-13\,c\,d\,e\,f+3\,c^2\,f^2)-2\,b\,c\,(9\,d^2\,e^2-14\,c\,d\,e\,f+4\,c^2\,f^2)\right)\,\sqrt{e+f\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]\right)\Big/$$

$$\left(15\,c^{5/2}\,(b\,c-a\,d)^2\,(d\,e-c\,f)^2\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}\right)+$$

$$\frac{d\,e^{3/2}\,\sqrt{f}\,(b\,c\,(9\,d\,e-11\,c\,f)-2\,a\,d\,(2\,d\,e-3\,c\,f))\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{15\,c^3\,(b\,c-a\,d)^2\,(d\,e-c\,f)^2\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+$$

$$\frac{b^3\,e^{3/2}\,\sqrt{c+d\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,e}{a\,f},\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{a\,c\,(b\,c-a\,d)^3\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 584 leaves) :

$$\frac{1}{15\, a\, c^3 \sqrt{\frac{d}{c}}\, (b\, c - a\, d)^3\, (d\, e - c\, f)^2\, (c + d\, x^2)^{5/2} \sqrt{e + f\, x^2}}$$

$$\Bigg(-a\, d \sqrt{\frac{d}{c}}\, x\, (e + f\, x^2)\, \Big(3\, c^2\, (b\, c - a\, d)^2\, (d\, e - c\, f)^2 + c\, (b\, c - a\, d)\, (-d\, e + c\, f)\, (a\, d\, (4\, d\, e - 3\, c\, f) + b\, c\, (-9\, d\, e + 8\, c\, f))\, (c + d\, x^2) +$$

$$\big(a\, b\, c\, d\, (-26\, d^2\, e^2 + 41\, c\, d\, e\, f - 11\, c^2\, f^2) + a^2\, d^2\, (8\, d^2\, e^2 - 13\, c\, d\, e\, f + 3\, c^2\, f^2) + b^2\, c^2\, (33\, d^2\, e^2 - 58\, c\, d\, e\, f + 23\, c^2\, f^2)\big)\, (c + d\, x^2)^2\Big) -$$

$$i\, (c + d\, x^2)^2 \sqrt{1 + \frac{d\, x^2}{c}} \sqrt{1 + \frac{f\, x^2}{e}}\, \Bigg(a\, d\, e\, \big(a\, b\, c\, d\, (-26\, d^2\, e^2 + 41\, c\, d\, e\, f - 11\, c^2\, f^2) + a^2\, d^2\, (8\, d^2\, e^2 - 13\, c\, d\, e\, f + 3\, c^2\, f^2) +$$

$$b^2\, c^2\, (33\, d^2\, e^2 - 58\, c\, d\, e\, f + 23\, c^2\, f^2)\big)\, \text{EllipticE}\Big[i\, \text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\, x\Big], \frac{c\, f}{d\, e}\Big] -$$

$$(d\, e - c\, f)\, \Bigg(-a\, \big(2\, a\, b\, c\, d^2\, e\, (13\, d\, e - 14\, c\, f) + a^2\, d^3\, e\, (-8\, d\, e + 9\, c\, f) + b^2\, c^2\, (-33\, d^2\, e^2 + 49\, c\, d\, e\, f - 15\, c^2\, f^2)\big)$$

$$\text{EllipticF}\Big[i\, \text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\, x\Big], \frac{c\, f}{d\, e}\Big] + 15\, b^2\, c^3\, (b\, e - a\, f)\, (-d\, e + c\, f)\, \text{EllipticPi}\Big[\frac{b\, c}{a\, d}, i\, \text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\, x\Big], \frac{c\, f}{d\, e}\Big]\Bigg)\Bigg)\Bigg)$$

Problem 71: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(c + d\, x^2)^{3/2}\, (e + f\, x^2)^{3/2}}{a + b\, x^2}\, dx$$

Optimal (type 4, 659 leaves, 14 steps):

$$\frac{(b c-a d)^2 f^2 x \sqrt{c+d x^2}}{b^3 d \sqrt{e+f x^2}}+\frac{2 (b c-a d) f (2 d e-c f) x \sqrt{c+d x^2}}{3 b^2 d \sqrt{e+f x^2}}+\frac{\left(3 d^2 e^2+7 c d e f-2 c^2 f^2\right) x \sqrt{c+d x^2}}{15 b d \sqrt{e+f x^2}}+$$

$$\frac{(b c-a d) f x \sqrt{c+d x^2} \sqrt{e+f x^2}}{3 b^2}+\frac{2 (3 d e-c f) x \sqrt{c+d x^2} \sqrt{e+f x^2}}{15 b}+\frac{f x \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}}{5 b}-$$

$$\left(\sqrt{e} \left(15 a^2 d^2 f^2-20 a b d f (d e+c f)+3 b^2 \left(d^2 e^2+9 c d e f+c^2 f^2\right)\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]\right) \Big/$$

$$\left(15 b^3 d \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}\right)+\frac{e^{3/2} \left(15 a^2 d^2 f+3 b^2 c (8 d e+3 c f)-5 a b d (3 d e+5 c f)\right) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{15 b^3 c \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}+$$

$$\frac{(b c-a d)^2 e^{3/2} (b e-a f) \sqrt{c+d x^2} \text{EllipticPi}\left[1-\frac{b e}{a f}, \text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{a b^3 c \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 445 leaves):

$$\frac{1}{15 a b^4 \sqrt{\frac{d}{c}} f \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

$$\left(-\text{i} a b e \left(15 a^2 d^2 f^2-20 a b d f (d e+c f)+3 b^2 \left(d^2 e^2+9 c d e f+c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticE}\left[\text{i} \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]-\right.$$

$$\text{i} a \left(-15 a^3 d^2 f^3+15 a^2 b d f^2 (d e+2 c f)-3 b^3 e \left(d^2 e^2+c d e f-7 c^2 f^2\right)+5 a b^2 f \left(d^2 e^2-7 c d e f-3 c^2 f^2\right)\right) \sqrt{1+\frac{d x^2}{c}}$$

$$\sqrt{1+\frac{f x^2}{e}} \text{EllipticF}\left[\text{i} \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]+f \left(a b^2 \sqrt{\frac{d}{c}} x \left(c+d x^2\right) \left(e+f x^2\right) \left(-5 a d f+3 b \left(2 d e+2 c f+d f x^2\right)\right)-\right.$$

$$\left.\left.15 \text{i} (b c-a d)^2 (b e-a f)^2 \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticPi}\left[\frac{b c}{a d}, \text{i} \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]\right)\right)$$

Problem 72: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{c+d x^2}\,\left(e+f x^2\right)^{3/2}}{a+b x^2}\,dx$$

Optimal (type 4, 403 leaves, 7 steps):

$$\frac{f\,(4 b d e+b c f-3 a d f)\,x\,\sqrt{c+d x^2}}{3 b^2 d\,\sqrt{e+f x^2}}+\frac{f x\,\sqrt{c+d x^2}\,\sqrt{e+f x^2}}{3 b}-\frac{\sqrt{e}\,\sqrt{f}\,(4 b d e+b c f-3 a d f)\,\sqrt{c+d x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 b^2 d\,\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\,\sqrt{e+f x^2}}+$$

$$\frac{\sqrt{e}\,\sqrt{f}\,(5 b e-3 a f)\,\sqrt{c+d x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 b^2\,\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\,\sqrt{e+f x^2}}+\frac{c^{3/2}\,(b e-a f)^2\,\sqrt{e+f x^2}\,\text{EllipticPi}\left[1-\frac{b c}{a d},\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c f}{d e}\right]}{a b^2\,\sqrt{d}\,e\,\sqrt{c+d x^2}\,\sqrt{\frac{c\,(e+f x^2)}{e\,(c+d x^2)}}}$$

Result (type 4, 739 leaves):

$$\frac{1}{3\,a\,b^3\sqrt{\frac{d}{c}}\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}\left(a\,b^2\,c\,\sqrt{\frac{d}{c}}\,e\,f\,x+a\,b^2\,d\,\sqrt{\frac{d}{c}}\,e\,f\,x^3+a\,b^2\,c\,\sqrt{\frac{d}{c}}\,f^2\,x^3+\right.$$

$$a\,b^2\,d\,\sqrt{\frac{d}{c}}\,f^2\,x^5-\mathrm{i}\,a\,b\,e\,(4\,b\,d\,e+b\,c\,f-3\,a\,d\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$\mathrm{i}\,a\,\left(3\,a^2\,d\,f^2-3\,a\,b\,f\,(d\,e+c\,f)+b^2\,e\,(-d\,e+4\,c\,f)\right)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$3\,\mathrm{i}\,b^3\,c\,e^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+3\,\mathrm{i}\,a\,b^2\,d\,e^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+6\,\mathrm{i}\,a\,b^2\,c\,e\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$6\,\mathrm{i}\,a^2\,b\,d\,e\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-3\,\mathrm{i}\,a^2\,b\,c\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\left.\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+3\,\mathrm{i}\,a^3\,d\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)$$

Problem 73: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(e+f\,x^2\right)^{3/2}}{\left(a+b\,x^2\right)\,\sqrt{c+d\,x^2}}\,dx$$

Optimal (type 4, 328 leaves, 6 steps) :

$$\frac{f^2 x \sqrt{c+d x^2}}{b d \sqrt{e+f x^2}}-\frac{\sqrt{e}\, f^{3/2} \sqrt{c+d x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{b d \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}+$$

$$\frac{e^{3/2} \sqrt{f} \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{b c \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}+\frac{e^{3/2} (b e-a f) \sqrt{c+d x^2}\, \text{EllipticPi}\left[1-\frac{b e}{a f},\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{a b c \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 184 leaves) :

$$-\left(\left(i \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \left(a b e f\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]+(b e-a f)\right.\right.\right.$$
$$\left.\left.\left.\left(a f\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]+(b e-a f)\, \text{EllipticPi}\left[\frac{b c}{a d},i\, \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]\right)\right)\right)\Big/\left(a b^2 \sqrt{\frac{d}{c}} \sqrt{c+d x^2} \sqrt{e+f x^2}\right)\right)$$

Problem 74: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(e+f x^2\right)^{3/2}}{\left(a+b x^2\right) \left(c+d x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 224 leaves, 3 steps) :

$$-\frac{(d e-c f) \sqrt{e+f x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],1-\frac{c f}{d e}\right]}{\sqrt{c} \sqrt{d} (b c-a d) \sqrt{c+d x^2} \sqrt{\frac{c \left(e+f x^2\right)}{e \left(c+d x^2\right)}}}+\frac{e^{3/2} (b e-a f) \sqrt{c+d x^2}\, \text{EllipticPi}\left[1-\frac{b e}{a f},\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{a c (b c-a d) \sqrt{f} \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 4, 492 leaves) :

$$\frac{1}{a\,b\,d\,(-b\,c+a\,d)\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}$$

$$\sqrt{\frac{d}{c}}\,\Bigg(a\,b\,d\,\sqrt{\frac{d}{c}}\,e^2\,x-a\,b\,c\,\sqrt{\frac{d}{c}}\,e\,f\,x+a\,b\,d\,\sqrt{\frac{d}{c}}\,e\,f\,x^3-a\,b\,c\,\sqrt{\frac{d}{c}}\,f^2\,x^3-\mathrm{i}\,a\,b\,e\,(-d\,e+c\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+\mathrm{i}\,a\,(-a\,c\,f^2+b\,e\,(-d\,e+2\,c\,f))\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+$$

$$\mathrm{i}\,b^2\,c\,e^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-2\,\mathrm{i}\,a\,b\,c\,e\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+\mathrm{i}\,a^2\,c\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\Bigg)$$

Problem 75: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(e+f\,x^2)^{3/2}}{(a+b\,x^2)\,(c+d\,x^2)^{5/2}}\,dx$$

Optimal (type 4, 391 leaves, 6 steps):

$$-\frac{(d\,e-c\,f)\,x\,\sqrt{e+f\,x^2}}{3\,c\,(b\,c-a\,d)\,(c+d\,x^2)^{3/2}}-\frac{(b\,c\,(5\,d\,e-c\,f)-2\,a\,d\,(d\,e+c\,f))\,\sqrt{e+f\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{3\,c^{3/2}\,\sqrt{d}\,(b\,c-a\,d)^2\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}+$$

$$\frac{e^{3/2}\,\sqrt{f}\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{3\,c^2\,(b\,c-a\,d)\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{b\,e^{3/2}\,(b\,e-a\,f)\,\sqrt{c+d\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,e}{a\,f},\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{a\,c\,(b\,c-a\,d)^2\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 999 leaves):

$$\frac{1}{3\,a\,c^2\,\sqrt{\frac{d}{c}}\,(b\,c-a\,d)^2\,(c+d\,x^2)^{3/2}\,\sqrt{e+f\,x^2}}$$

$$\left(3\,a^2\,c\,d^2\,\sqrt{\frac{d}{c}}\,e^2\,x-6\,a\,b\,c^3\,\left(\frac{d}{c}\right)^{3/2}\,e^2\,x+2\,a\,b\,c^3\,\sqrt{\frac{d}{c}}\,e\,f\,x+a^2\,c^3\,\left(\frac{d}{c}\right)^{3/2}\,e\,f\,x-5\,a\,b\,c\,d^2\,\sqrt{\frac{d}{c}}\,e^2\,x^3+2\,a^2\,d^3\,\sqrt{\frac{d}{c}}\,e^2\,x^3+5\,a^2\,c\,d^2\,\sqrt{\frac{d}{c}}\,e\,f\,x^3-\right.$$

$$5\,a\,b\,c^3\,\left(\frac{d}{c}\right)^{3/2}\,e\,f\,x^3+2\,a\,b\,c^3\,\sqrt{\frac{d}{c}}\,f^2\,x^3+a^2\,c^3\,\left(\frac{d}{c}\right)^{3/2}\,f^2\,x^3-5\,a\,b\,c\,d^2\,\sqrt{\frac{d}{c}}\,e\,f\,x^5+2\,a^2\,d^3\,\sqrt{\frac{d}{c}}\,e\,f\,x^5+2\,a^2\,c\,d^2\,\sqrt{\frac{d}{c}}\,f^2\,x^5+$$

$$a\,b\,c^3\,\left(\frac{d}{c}\right)^{3/2}\,f^2\,x^5+i\,a\,e\,(b\,c\,(-5\,d\,e+c\,f)+2\,a\,d\,(d\,e+c\,f))\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$i\,a\,(-d\,e+c\,f)\,(5\,b\,c\,e-2\,a\,d\,e-3\,a\,c\,f)\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$3\,i\,b^2\,c^3\,e^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+6\,i\,a\,b\,c^3\,e\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-3\,i\,a^2\,c^3\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$3\,i\,b^2\,c^2\,d\,e^2\,x^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+6\,i\,a\,b\,c^2\,d\,e\,f\,x^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\left.\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-3\,i\,a^2\,c^2\,d\,f^2\,x^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)$$

Problem 76: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(e+f\,x^2)^{3/2}}{(a+b\,x^2)\,(c+d\,x^2)^{7/2}}\,dx$$

Optimal (type 4, 639 leaves, 9 steps):

$$-\frac{(d e-c f)\, x \sqrt{e+f x^2}}{5 c\, (b c-a d)\, (c+d x^2)^{5/2}}-\frac{(3 b c\, (3 d e-c f)-2 a d\, (2 d e+c f))\, x \sqrt{e+f x^2}}{15 c^2\, (b c-a d)^2\, (c+d x^2)^{3/2}}-\frac{b \sqrt{d}\, (b e-a f) \sqrt{e+f x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1-\frac{c f}{d e}\right]}{\sqrt{c}\, (b c-a d)^3 \sqrt{c+d x^2} \sqrt{\frac{c (e+f x^2)}{e (c+d x^2)}}}+$$

$$\left((a d\, (8 d^2 e^2-3 c d e f-2 c^2 f^2)-3 b c\, (6 d^2 e^2-6 c d e f+c^2 f^2)) \sqrt{e+f x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1-\frac{c f}{d e}\right]\right) \Big/$$

$$\left(15 c^{5/2} \sqrt{d}\, (b c-a d)^2\, (d e-c f) \sqrt{c+d x^2} \sqrt{\frac{c\, (e+f x^2)}{e\, (c+d x^2)}}\right)+$$

$$\frac{e^{3/2} \sqrt{f}\, (3 b c\, (3 d e-2 c f)-a d\, (4 d e-c f)) \sqrt{c+d x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{15 c^3\, (b c-a d)^2\, (d e-c f) \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}+$$

$$\frac{b^2 e^{3/2}\, (b e-a f) \sqrt{c+d x^2}\, \text{EllipticPi}\left[1-\frac{b e}{a f}, \text{ArcTan}\left[\frac{\sqrt{f}\, x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{a c\, (b c-a d)^3 \sqrt{f} \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}$$

Result (type 4, 570 leaves) :

$$\frac{1}{15\,a\,c^3\,\sqrt{\frac{d}{c}}\,(b\,c-a\,d)^3\,(d\,e-c\,f)\,\left(c+d\,x^2\right)^{5/2}\,\sqrt{e+f\,x^2}}$$

$$\left(-a\,\sqrt{\frac{d}{c}}\,x\,\left(e+f\,x^2\right)\,\left(3\,c^2\,(b\,c-a\,d)^2\,(d\,e-c\,f)^2+c\,(b\,c-a\,d)\,(-d\,e+c\,f)\,(3\,b\,c\,(-3\,d\,e+c\,f)+2\,a\,d\,(2\,d\,e+c\,f))\,\left(c+d\,x^2\right)+\right.\right.$$

$$\left.\left(a^2\,d^2\,\left(8\,d^2\,e^2-3\,c\,d\,e\,f-2\,c^2\,f^2\right)+3\,b^2\,c^2\,\left(11\,d^2\,e^2-11\,c\,d\,e\,f+c^2\,f^2\right)+2\,a\,b\,c\,d\,\left(-13\,d^2\,e^2+3\,c\,d\,e\,f+7\,c^2\,f^2\right)\right)\,\left(c+d\,x^2\right)^2\right)+i\,\left(c+d\,x^2\right)^2$$

$$\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\left(a\,e\,\left(-3\,b^2\,c^2\,\left(11\,d^2\,e^2-11\,c\,d\,e\,f+c^2\,f^2\right)+a^2\,d^2\,\left(-8\,d^2\,e^2+3\,c\,d\,e\,f+2\,c^2\,f^2\right)-2\,a\,b\,c\,d\,\left(-13\,d^2\,e^2+3\,c\,d\,e\,f+7\,c^2\,f^2\right)\right)\right.$$

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+(d\,e-c\,f)\,\left(a\,\left(3\,b^2\,c^2\,e\,(11\,d\,e-8\,c\,f)+a^2\,d^2\,e\,(8\,d\,e+c\,f)+a\,b\,c\,\left(-26\,d^2\,e^2-7\,c\,d\,e\,f+15\,c^2\,f^2\right)\right)\right.$$

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-15\,b\,c^3\,(b\,e-a\,f)^2\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)\right)$$

Problem 77: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(c+d\,x^2\right)^{5/2}}{\left(a+b\,x^2\right)\,\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 621 leaves, 12 steps) :

$$\frac{d\,(b\,c-a\,d)\,x\,\sqrt{c+d\,x^2}}{b^2\,\sqrt{e+f\,x^2}}-\frac{2\,d\,(d\,e-2\,c\,f)\,x\,\sqrt{c+d\,x^2}}{3\,b\,f\,\sqrt{e+f\,x^2}}+\frac{d^2\,x\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}{3\,b\,f}-\frac{d\,(b\,c-a\,d)\,\sqrt{e}\,\sqrt{c+d\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{b^2\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+$$

$$\frac{2\,d\,\sqrt{e}\,(d\,e-2\,c\,f)\,\sqrt{c+d\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{3\,b\,f^{3/2}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{d\,(b\,c-a\,d)\,\sqrt{e}\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{b^2\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}-$$

$$\frac{d\,\sqrt{e}\,(d\,e-3\,c\,f)\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{3\,b\,f^{3/2}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{c^{3/2}\,(b\,c-a\,d)^2\,\sqrt{e+f\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,c}{a\,d},\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{a\,b^2\,\sqrt{d}\,e\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}$$

Result (type 4, 350 leaves):

$$\frac{1}{3\,a\,b^3\,\sqrt{\frac{d}{c}}\,f^2\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}\left(-i\,a\,b\,d^2\,e\,(-2\,b\,d\,e+7\,b\,c\,f-3\,a\,d\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-\right.$$

$$i\,a\,d\,\left(3\,a^2\,d^2\,f^2+3\,a\,b\,d\,f\,(d\,e-3\,c\,f)+b^2\,(2\,d^2\,e^2-8\,c\,d\,e\,f+9\,c^2\,f^2)\right)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+$$

$$\left.f\left(a\,b^2\,c\,d\,\left(\frac{d}{c}\right)^{3/2}x\,(c+d\,x^2)\,(e+f\,x^2)-3\,i\,(b\,c-a\,d)^3\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)$$

Problem 78: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(c+d\,x^2)^{3/2}}{(a+b\,x^2)\,\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 319 leaves, 6 steps):

$$\frac{d\,x\,\sqrt{c+d\,x^2}}{b\,\sqrt{e+f\,x^2}}-\frac{d\,\sqrt{e}\,\sqrt{c+d\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{b\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+$$

$$\frac{d\,\sqrt{e}\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{b\,\sqrt{f}\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{c^{3/2}\,(b\,c-a\,d)\,\sqrt{e+f\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,c}{a\,d},\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{a\,b\,\sqrt{d}\,e\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}$$

Result (type 4, 197 leaves):

$$-\left(\left(i\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\left(a\,b\,d^2\,e\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-a\,d\,(b\,d\,e-2\,b\,c\,f+a\,d\,f)\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+\right.\right.\right.$$
$$\left.\left.\left.(b\,c-a\,d)^2\,f\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)\Big/\left(a\,b^2\,\sqrt{\frac{d}{c}}\,f\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}\right)\right)$$

Problem 79: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{c+d\,x^2}}{(a+b\,x^2)\,\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 102 leaves, 1 step):

$$\frac{c^{3/2}\,\sqrt{e+f\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,c}{a\,d},\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{a\,\sqrt{d}\,e\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}$$

Result (type 4, 143 leaves):

$$-\left(\left(i\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\left(a\,d\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+(b\,c-a\,d)\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)\Big/\right.$$
$$\left.\left(a\,b\,\sqrt{\frac{d}{c}}\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}\right)\right)$$

Problem 80: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+b x^2\right) \sqrt{c+d x^2} \sqrt{e+f x^2}} \, dx$$

Optimal (type 4, 100 leaves, 3 steps):

$$\frac{\sqrt{-c} \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticPi}\left[\frac{b c}{a d}, \text{ArcSin}\left[\frac{\sqrt{d} x}{\sqrt{-c}}\right], \frac{c f}{d e}\right]}{a \sqrt{d} \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

Result (type 4, 101 leaves):

$$-\frac{i \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticPi}\left[\frac{b c}{a d}, i \, \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]}{a \sqrt{\frac{d}{c}} \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

Problem 81: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+b x^2\right) \left(c+d x^2\right)^{3/2} \sqrt{e+f x^2}} \, dx$$

Optimal (type 4, 344 leaves, 5 steps):

$$-\frac{d^{3/2} \sqrt{e+f x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{c f}{d e}\right]}{\sqrt{c} (b c-a d) (d e-c f) \sqrt{c+d x^2} \sqrt{\frac{c \left(e+f x^2\right)}{e \left(c+d x^2\right)}}} - \frac{d \sqrt{e} (b d e-2 b c f+a d f) \sqrt{c+d x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{c (b c-a d)^2 \sqrt{f} (d e-c f) \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}} + \frac{b^2 c^{3/2} \sqrt{e+f x^2} \, \text{EllipticPi}\left[1-\frac{b c}{a d}, \text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{c f}{d e}\right]}{a \sqrt{d} (b c-a d)^2 e \sqrt{c+d x^2} \sqrt{\frac{c \left(e+f x^2\right)}{e \left(c+d x^2\right)}}}$$

Result (type 4, 365 leaves):

$$\frac{1}{a\,d\,(-b\,c+a\,d)\,(d\,e-c\,f)\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}$$

$$\sqrt{\frac{d}{c}}\left(a\,c\,d\left(\frac{d}{c}\right)^{3/2}e\,x+a\,c\,d\left(\frac{d}{c}\right)^{3/2}f\,x^3+\mathrm{i}\,a\,d^2\,e\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+\right.$$

$$\mathrm{i}\,a\,d\,(-d\,e+c\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+\mathrm{i}\,b\,c\,d\,e\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\left.\mathrm{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-\mathrm{i}\,b\,c^2\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\mathrm{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)$$

Problem 82: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{(a+b\,x^2)\,(c+d\,x^2)^{5/2}\,\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 435 leaves, 8 steps):

$$-\frac{d^2\,x\,\sqrt{e+f\,x^2}}{3\,c\,(b\,c-a\,d)\,(d\,e-c\,f)\,(c+d\,x^2)^{3/2}}-\frac{d^{3/2}\,(b\,c\,(5\,d\,e-7\,c\,f)-2\,a\,d\,(d\,e-2\,c\,f))\,\sqrt{e+f\,x^2}\,\mathrm{EllipticE}\left[\mathrm{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{3\,c^{3/2}\,(b\,c-a\,d)^2\,(d\,e-c\,f)^2\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}-$$

$$\frac{d\,\sqrt{e}\,\sqrt{f}\,(a\,d\,(d\,e-3\,c\,f)-2\,b\,c\,(2\,d\,e-3\,c\,f))\,\sqrt{c+d\,x^2}\,\mathrm{EllipticF}\left[\mathrm{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{3\,c^2\,(b\,c-a\,d)^2\,(d\,e-c\,f)^2\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+$$

$$\frac{b^2\,\sqrt{-c}\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\mathrm{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{-c}}\right],\frac{c\,f}{d\,e}\right]}{a\,\sqrt{d}\,(b\,c-a\,d)^2\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 433 leaves):

$$\frac{1}{3\,a\,c^2\,\sqrt{\frac{d}{c}}\,(b\,c-a\,d)^2\,(d\,e-c\,f)^2\,(c+d\,x^2)^{3/2}\,\sqrt{e+f\,x^2}}$$

$$\Bigg(a\,c\,d\left(\frac{d}{c}\right)^{3/2}x\,(e+f\,x^2)\,\left(b\,c\,(-6\,c\,d\,e+8\,c^2\,f-5\,d^2\,e\,x^2+7\,c\,d\,f\,x^2)+a\,d\,(-5\,c^2\,f+2\,d^2\,e\,x^2+c\,d\,(3\,e-4\,f\,x^2))\right)+$$

$$i\,a\,d^2\,e\,(2\,a\,d\,(d\,e-2\,c\,f)+b\,c\,(-5\,d\,e+7\,c\,f))\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+$$

$$i\,a\,d\,(-d\,e+c\,f)\,(a\,d\,(2\,d\,e-3\,c\,f)+b\,c\,(-5\,d\,e+6\,c\,f))\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$3\,i\,b^2\,c^2\,(d\,e-c\,f)^2\,(c+d\,x^2)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\Bigg)$$

Problem 83: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(c+d\,x^2)^{5/2}}{(a+b\,x^2)\,(e+f\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 980 leaves, 14 steps):

$$\frac{(b c-a d)\,(b d e+4 b c f-3 a d f)\,x\,\sqrt{c+d x^2}}{3 b\,(b e-a f)^2\,\sqrt{e+f x^2}}+\frac{\left(b e\,\left(6 d^2 e^2-7 c d e f-c^2 f^2\right)-a f\,\left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)\right)\,x\,\sqrt{c+d x^2}}{3 e f\,(b e-a f)^2\,\sqrt{e+f x^2}}+$$

$$\frac{(d e-c f)\,x\,\left(c+d x^2\right)^{3/2}}{e\,(b e-a f)\,\sqrt{e+f x^2}}+\frac{d\,(b c-a d)\,x\,\sqrt{c+d x^2}\,\sqrt{e+f x^2}}{3\,(b e-a f)^2}+\frac{d\,\left(a f\,(4 d e-3 c f)-b e\,(3 d e-2 c f)\right)\,x\,\sqrt{c+d x^2}\,\sqrt{e+f x^2}}{3 e f\,(b e-a f)^2}-$$

$$\frac{(b c-a d)\,\sqrt{e}\,(b d e+4 b c f-3 a d f)\,\sqrt{c+d x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 b\,\sqrt{f}\,(b e-a f)^2\,\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\,\sqrt{e+f x^2}}-$$

$$\left(\left(b e\,\left(6 d^2 e^2-7 c d e f-c^2 f^2\right)-a f\,\left(8 d^2 e^2-13 c d e f+3 c^2 f^2\right)\right)\,\sqrt{c+d x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]\right)\Big/$$

$$\left(3\,\sqrt{e}\,f^{3/2}\,(b e-a f)^2\,\sqrt{\frac{e\,\left(c+d x^2\right)}{c\,\left(e+f x^2\right)}}\,\sqrt{e+f x^2}\right)+\frac{d\,(5 b c-3 a d)\,(b c-a d)\,e^{3/2}\,\sqrt{c+d x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 b c\,\sqrt{f}\,(b e-a f)^2\,\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\,\sqrt{e+f x^2}}-$$

$$\frac{\sqrt{e}\,\left(2 a d f\,(2 d e-3 c f)-b\,\left(3 d^2 e^2-2 c d e f-3 c^2 f^2\right)\right)\,\sqrt{c+d x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{3 f^{3/2}\,(b e-a f)^2\,\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\,\sqrt{e+f x^2}}+$$

$$\frac{(b c-a d)^3\,e^{3/2}\,\sqrt{c+d x^2}\,\text{EllipticPi}\left[1-\frac{b e}{a f},\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{a b c\,\sqrt{f}\,(b e-a f)^2\,\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\,\sqrt{e+f x^2}}$$

Result (type 4, 352 leaves) :

$$\frac{1}{a\,b^2\sqrt{\frac{d}{c}}\,e\,f^2\,(b\,e-a\,f)\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}$$

$$\Bigg(-i\,a\,b\,d\,e\,\left(-a\,d^2\,e\,f+b\,\left(2\,d^2\,e^2-2\,c\,d\,e\,f+c^2\,f^2\right)\right)\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]-$$

$$i\,a\,d^2\,e\,(b\,e-a\,f)\,(-2\,b\,d\,e+3\,b\,c\,f-a\,d\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]-$$

$$f\,\Bigg(a\,b^2\,\sqrt{\frac{d}{c}}\,(d\,e-c\,f)^2\,x\,\left(c+d\,x^2\right)+i\,(b\,c-a\,d)^3\,e\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\Big[\frac{b\,c}{a\,d},\,i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]\Bigg)\Bigg)$$

Problem 84: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(c+d\,x^2\right)^{3/2}}{\left(a+b\,x^2\right)\,\left(e+f\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 223 leaves, 3 steps):

$$\frac{(d\,e-c\,f)\,\sqrt{c+d\,x^2}\,\text{EllipticE}\Big[\text{ArcTan}\Big[\frac{\sqrt{f}\,x}{\sqrt{e}}\Big],1-\frac{d\,e}{c\,f}\Big]}{\sqrt{e}\,\sqrt{f}\,(b\,e-a\,f)\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{c^{3/2}\,(b\,c-a\,d)\,\sqrt{e+f\,x^2}\,\text{EllipticPi}\Big[1-\frac{b\,c}{a\,d},\text{ArcTan}\Big[\frac{\sqrt{d}\,x}{\sqrt{c}}\Big],1-\frac{c\,f}{d\,e}\Big]}{a\,\sqrt{d}\,e\,(b\,e-a\,f)\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}$$

Result (type 4, 304 leaves):

$$\Bigg(a\,b\,\sqrt{\frac{d}{c}}\,f\,(d\,e-c\,f)\,x\,\left(c+d\,x^2\right)-i\,a\,b\,d\,e\,(-d\,e+c\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]-$$

$$i\,a\,d^2\,e\,(b\,e-a\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]-$$

$$i\,(b\,c-a\,d)^2\,e\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\Big[\frac{b\,c}{a\,d},\,i\,\text{ArcSinh}\Big[\sqrt{\frac{d}{c}}\,x\Big],\frac{c\,f}{d\,e}\Big]\Bigg)\Bigg/\left(a\,b\,\sqrt{\frac{d}{c}}\,e\,f\,(b\,e-a\,f)\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}\right)$$

Problem 85: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{c+d x^2}}{\left(a+b x^2\right) \left(e+f x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 209 leaves, 3 steps):

$$-\frac{\sqrt{f} \sqrt{c+d x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{\sqrt{e} (b e-a f) \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}+\frac{b c^{3/2} \sqrt{e+f x^2} \, \text{EllipticPi}\left[1-\frac{b c}{a d}, \text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{c f}{d e}\right]}{a \sqrt{d} e (b e-a f) \sqrt{c+d x^2} \sqrt{\frac{c (e+f x^2)}{e (c+d x^2)}}}$$

Result (type 4, 207 leaves):

$$\left(-a \sqrt{\frac{d}{c}} f x \left(c+d x^2\right)-i a d e \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]-\right.$$
$$\left. i (b c-a d) e \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \, \text{EllipticPi}\left[\frac{b c}{a d}, i \, \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]\right) \Big/ \left(a \sqrt{\frac{d}{c}} e (b e-a f) \sqrt{c+d x^2} \sqrt{e+f x^2}\right)$$

Problem 86: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+b x^2\right) \sqrt{c+d x^2} \left(e+f x^2\right)^{3/2}} \, dx$$

Optimal (type 4, 344 leaves, 5 steps):

$$\frac{f^{3/2} \sqrt{c+d x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{\sqrt{e} (b e-a f) (d e-c f) \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}-$$
$$\frac{\sqrt{e} \sqrt{f} (2 b d e-b c f-a d f) \sqrt{c+d x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{c (b e-a f)^2 (d e-c f) \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}+\frac{b^2 e^{3/2} \sqrt{c+d x^2} \, \text{EllipticPi}\left[1-\frac{b e}{a f}, \text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{a c \sqrt{f} (b e-a f)^2 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}$$

Result (type 4, 221 leaves):

$$\left(-a\sqrt{\frac{d}{c}}\,f^2\,x\,(c+d\,x^2)-\mathrm{i}\,a\,d\,e\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-\mathrm{i}\,b\,e\,(-d\,e+c\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\Big/\left(a\sqrt{\frac{d}{c}}\,e\,(-b\,e+a\,f)\,(d\,e-c\,f)\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}\right)$$

Problem 87: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{(a+b\,x^2)\,(c+d\,x^2)^{3/2}\,(e+f\,x^2)^{3/2}}\,dx$$

Optimal (type 4, 539 leaves, 8 steps):

$$-\frac{d^2\,x}{c\,(b\,c-a\,d)\,(d\,e-c\,f)\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}-\frac{b^2\,\sqrt{f}\,\sqrt{c+d\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{(b\,c-a\,d)^2\,\sqrt{e}\,(b\,e-a\,f)\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}-\frac{d\,\sqrt{f}\,(2\,b\,c^2\,f-a\,d\,(d\,e+c\,f))\,\sqrt{c+d\,x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{c\,(b\,c-a\,d)^2\,\sqrt{e}\,(d\,e-c\,f)^2\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}-\frac{d^2\,\sqrt{e}\,(b\,d\,e-3\,b\,c\,f+2\,a\,d\,f)\,\sqrt{c+d\,x^2}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\,x}{\sqrt{e}}\right],1-\frac{d\,e}{c\,f}\right]}{c\,(b\,c-a\,d)^2\,\sqrt{f}\,(d\,e-c\,f)^2\,\sqrt{\frac{e\,(c+d\,x^2)}{c\,(e+f\,x^2)}}\,\sqrt{e+f\,x^2}}+\frac{b^3\,c^{3/2}\,\sqrt{e+f\,x^2}\,\text{EllipticPi}\left[1-\frac{b\,c}{a\,d},\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{c\,f}{d\,e}\right]}{a\,\sqrt{d}\,(b\,c-a\,d)^2\,e\,(b\,e-a\,f)\,\sqrt{c+d\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}}$$

Result (type 4, 1284 leaves):

$$\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}\left(-\frac{d^3\,x}{c\,(b\,c-a\,d)\,(-d\,e+c\,f)^2\,(c+d\,x^2)}-\frac{f^3\,x}{e\,(b\,e-a\,f)\,(d\,e-c\,f)^2\,(e+f\,x^2)}\right)-\frac{1}{c\,(b\,c-a\,d)\,e\,(b\,e-a\,f)\,(-d\,e+c\,f)^2\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}$$

$$\sqrt{(c+d\,x^2)\,(e+f\,x^2)}\,\left(\left(\mathrm{i}\,b\,d^3\,e^3\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)\right)\Big/\right.$$

$$\left(\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right)-$$

$$\left(\mathrm{i}\, a\, d^3 e^2 f\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]\right)\right)\Big/$$

$$\left(\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right)+\left(\mathrm{i}\, b\, c^2 d\, e\, f^2\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\right.$$

$$\left.\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]\right)\right)\Big/\left(\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right)-$$

$$\left(\mathrm{i}\, a\, c\, d^2 e\, f^2\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]\right)\right)\Big/$$

$$\left(\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right)+\frac{\mathrm{i}\, b\, c\, d^2 e^2 f\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]}{\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}}+$$

$$\frac{\mathrm{i}\, b\, c^2 d\, e\, f^2\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]}{\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}}-\frac{2\,\mathrm{i}\, a\, c\, d^2 e\, f^2\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]}{\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}}+$$

$$\frac{\mathrm{i}\, b^2 c\, d^2 e^3\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticPi}\left[\frac{b c}{a d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right],\frac{c f}{d e}\right]}{a\sqrt{\frac{d}{c}}\sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}}-$$

$$\frac{2\,i\,b^2\,c^2\,d\,e^2\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\;\text{EllipticPi}\left[\frac{b\,c}{a\,d},\,i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\,\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}+$$

$$\left.\frac{i\,b^2\,c^3\,e\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\;\text{EllipticPi}\left[\frac{b\,c}{a\,d},\,i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\,\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}\right)$$

Problem 88: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)^{5/2}\,\left(e+f\,x^2\right)^{3/2}}\,dx$$

Optimal (type 4, 814 leaves, 11 steps):

$$-\frac{d^2 x}{3 c (b c-a d) (d e-c f) (c+d x^2)^{3/2} \sqrt{e+f x^2}}-\frac{d^2 (b c (5 d e-9 c f)-2 a d (d e-3 c f)) x}{3 c^2 (b c-a d)^2 (d e-c f)^2 \sqrt{c+d x^2} \sqrt{e+f x^2}}+\frac{b^2 f^{3/2} \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{(b c-a d)^2 \sqrt{e} (b e-a f) (d e-c f) \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}-$$

$$\left(d \sqrt{f} \left(b c (5 d^2 e^2-7 c d e f-6 c^2 f^2)-a d (2 d^2 e^2-7 c d e f-3 c^2 f^2)\right) \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]\right) \Big/$$

$$\left(3 c^2 (b c-a d)^2 \sqrt{e} (d e-c f)^3 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}\right)-\frac{b^2 \sqrt{e} \sqrt{f} (2 b d e-b c f-a d f) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{c (b c-a d)^2 (b e-a f)^2 (d e-c f) \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}+$$

$$\frac{d^2 \sqrt{e} \sqrt{f} (b c (7 d e-15 c f)-a d (d e-9 c f)) \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{3 c^2 (b c-a d)^2 (d e-c f)^3 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}+$$

$$\frac{b^4 e^{3/2} \sqrt{c+d x^2} \text{EllipticPi}\left[1-\frac{b e}{a f}, \text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{a c (b c-a d)^2 \sqrt{f} (b e-a f)^2 \sqrt{\frac{e (c+d x^2)}{c (e+f x^2)}} \sqrt{e+f x^2}}$$

Result (type 4, 2744 leaves) :

$$\sqrt{c+d x^2} \sqrt{e+f x^2} \left(-\frac{d^3 x}{3 c (b c-a d) (-d e+c f)^2 (c+d x^2)^2}-\frac{d^3 (-5 b c d e+2 a d^2 e+10 b c^2 f-7 a c d f) x}{3 c^2 (b c-a d)^2 (-d e+c f)^3 (c+d x^2)}+\frac{f^4 x}{e (b e-a f) (d e-c f)^3 (e+f x^2)}\right)+$$

$$\frac{1}{3 c^2 (b c-a d)^2 e (b e-a f) (-d e+c f)^3 \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

$$\sqrt{(c+d x^2) (e+f x^2)} \left(\left(5 i b^2 c d^4 e^4 \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}} x\right], \frac{c f}{d e}\right]\right)\right) \Big/\right.$$

$$\left(\sqrt{\frac{d}{c}} \sqrt{(c+d x^2) (e+f x^2)}\right)-\left(2 i a b d^5 e^4 \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\right.$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\bigg) \bigg/ \left(\sqrt{\frac{d}{c}}\, \sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right) -$$

$$\left(10\, i\, b^2 c^2 d^3 e^3 f \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\right) \bigg/$$

$$\left(\sqrt{\frac{d}{c}}\, \sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right) + \left(2\, i\, a\, b\, c\, d^4 e^3 f \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\right.$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\bigg) \bigg/ \left(\sqrt{\frac{d}{c}}\, \sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right) +$$

$$\left(2\, i\, a^2 d^5 e^3 f \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\right) \bigg/$$

$$\left(\sqrt{\frac{d}{c}}\, \sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right) + \left(10\, i\, a\, b\, c^2 d^3 e^2 f^2 \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\right.$$

$$\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\bigg) \bigg/ \left(\sqrt{\frac{d}{c}}\, \sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right) -$$

$$\left(7\, i\, a^2 c\, d^4 e^2 f^2 \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\right) \bigg/$$

$$\left(\sqrt{\frac{d}{c}}\, \sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right) -$$

$$\left(3\, i\, b^2 c^4 d\, e\, f^3 \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\, \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right] - \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{d}{c}}\, x\right], \frac{c f}{d e}\right]\right)\right) \bigg/$$

$$\left(\sqrt{\frac{d}{c}}\, \sqrt{\left(c+d x^2\right)\left(e+f x^2\right)}\right) + \left(6\, i\, a\, b\, c^3 d^2 e\, f^3 \sqrt{1+\frac{d x^2}{c}}\, \sqrt{1+\frac{f x^2}{e}}\right.$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]\right)\Bigg)\Bigg/\left(\sqrt{\frac{d}{c}}\;\sqrt{\left(c+d\,x^2\right)\left(e+f\,x^2\right)}\right)-$$

$$\left(3\,\mathrm{i}\,a^2\,c^2\,d^3\,e\,f^3\,\sqrt{1+\frac{d\,x^2}{c}}\;\sqrt{1+\frac{f\,x^2}{e}}\;\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]\right)\right)\Bigg/$$

$$\left(\sqrt{\frac{d}{c}}\;\sqrt{\left(c+d\,x^2\right)\left(e+f\,x^2\right)}\right)+\frac{4\,\mathrm{i}\,b^2\,c^2\,d^3\,e^3\,f\,\sqrt{1+\frac{d\,x^2}{c}}\;\sqrt{1+\frac{f\,x^2}{e}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\;\sqrt{\left(c+d\,x^2\right)\left(e+f\,x^2\right)}}-$$

$$\frac{\mathrm{i}\,a\,b\,c\,d^4\,e^3\,f\,\sqrt{1+\frac{d\,x^2}{c}}\;\sqrt{1+\frac{f\,x^2}{e}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\;\sqrt{\left(c+d\,x^2\right)\left(e+f\,x^2\right)}}-$$

$$\frac{9\,\mathrm{i}\,b^2\,c^3\,d^2\,e^2\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\;\sqrt{1+\frac{f\,x^2}{e}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\;\sqrt{\left(c+d\,x^2\right)\left(e+f\,x^2\right)}}+$$

$$\frac{2\,\mathrm{i}\,a\,b\,c^2\,d^3\,e^2\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\;\sqrt{1+\frac{f\,x^2}{e}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\;\sqrt{\left(c+d\,x^2\right)\left(e+f\,x^2\right)}}+$$

$$\frac{\mathrm{i}\,a^2\,c\,d^4\,e^2\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\;\sqrt{1+\frac{f\,x^2}{e}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\;x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\;\sqrt{\left(c+d\,x^2\right)\left(e+f\,x^2\right)}}-$$

$$\frac{3\,\mathrm{i}\,b^2\,c^4\,d\,e\,f^3\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}+$$

$$\frac{15\,\mathrm{i}\,a\,b\,c^3\,d^2\,e\,f^3\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}-$$

$$\frac{9\,\mathrm{i}\,a^2\,c^2\,d^3\,e\,f^3\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}+$$

$$\frac{3\,\mathrm{i}\,b^3\,c^2\,d^3\,e^4\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}-$$

$$\frac{9\,\mathrm{i}\,b^3\,c^3\,d^2\,e^3\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}+$$

$$\frac{9\,\mathrm{i}\,b^3\,c^4\,d\,e^2\,f^2\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}-$$

$$\left.\frac{3\,\mathrm{i}\,b^3\,c^5\,e\,f^3\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}\,\sqrt{\left(c+d\,x^2\right)\,\left(e+f\,x^2\right)}}\right)$$

Problem 89: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(1+x^2\right)^{3/2} \sqrt{2+x^2}}{a+b x^2} \, dx$$

Optimal (type 4, 242 leaves, 7 steps):

$$-\frac{(a-2 b) x \sqrt{2+x^2}}{b^2 \sqrt{1+x^2}}+\frac{x \sqrt{1+x^2} \sqrt{2+x^2}}{3 b}+\frac{\sqrt{2} (a-2 b) \sqrt{2+x^2} \text{EllipticE}\left[\text{ArcTan}[x], \frac{1}{2}\right]}{b^2 \sqrt{1+x^2} \sqrt{\frac{2+x^2}{1+x^2}}}-$$

$$\frac{(3 a-7 b) \sqrt{2+x^2} \text{EllipticF}\left[\text{ArcTan}[x], \frac{1}{2}\right]}{3 \sqrt{2} b^2 \sqrt{1+x^2} \sqrt{\frac{2+x^2}{1+x^2}}}+\frac{(a-2 b) (a-b) \sqrt{2+x^2} \text{EllipticPi}\left[1-\frac{b}{a}, \text{ArcTan}[x], \frac{1}{2}\right]}{\sqrt{2} a b^2 \sqrt{1+x^2} \sqrt{\frac{2+x^2}{1+x^2}}}$$

Result (type 4, 204 leaves):

$$\frac{1}{3 a b^3}\left(a b^2 x \sqrt{1+x^2} \sqrt{2+x^2}+3 i a (a-2 b) b \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{x}{\sqrt{2}}\right], 2\right]-\right.$$

$$i a \left(3 a^2-9 a b+7 b^2\right) \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{x}{\sqrt{2}}\right], 2\right]+3 i a^3 \text{EllipticPi}\left[\frac{2 b}{a}, i \text{ArcSinh}\left[\frac{x}{\sqrt{2}}\right], 2\right]-$$

$$\left.12 i a^2 b \text{EllipticPi}\left[\frac{2 b}{a}, i \text{ArcSinh}\left[\frac{x}{\sqrt{2}}\right], 2\right]+15 i a b^2 \text{EllipticPi}\left[\frac{2 b}{a}, i \text{ArcSinh}\left[\frac{x}{\sqrt{2}}\right], 2\right]-6 i b^3 \text{EllipticPi}\left[\frac{2 b}{a}, i \text{ArcSinh}\left[\frac{x}{\sqrt{2}}\right], 2\right]\right)$$

Problem 90: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{1+x^2} \sqrt{2+x^2}}{a+b x^2} \, dx$$

Optimal (type 4, 192 leaves, 6 steps):

$$\frac{x \sqrt{2+x^2}}{b \sqrt{1+x^2}}-\frac{\sqrt{2} \sqrt{2+x^2} \text{EllipticE}\left[\text{ArcTan}[x], \frac{1}{2}\right]}{b \sqrt{1+x^2} \sqrt{\frac{2+x^2}{1+x^2}}}+\frac{\sqrt{2+x^2} \text{EllipticF}\left[\text{ArcTan}[x], \frac{1}{2}\right]}{\sqrt{2} b \sqrt{1+x^2} \sqrt{\frac{2+x^2}{1+x^2}}}-\frac{(a-2 b) \sqrt{2+x^2} \text{EllipticPi}\left[1-\frac{b}{a}, \text{ArcTan}[x], \frac{1}{2}\right]}{\sqrt{2} a b \sqrt{1+x^2} \sqrt{\frac{2+x^2}{1+x^2}}}$$

Result (type 4, 71 leaves):

$$\frac{1}{\sqrt{2} a b^2} i \left(-2 a b \text{EllipticE}\left[i \text{ArcSinh}[x], \frac{1}{2}\right]+(a-b) \left(a \text{EllipticF}\left[i \text{ArcSinh}[x], \frac{1}{2}\right]-(a-2 b) \text{EllipticPi}\left[\frac{b}{a}, i \text{ArcSinh}[x], \frac{1}{2}\right]\right)\right)$$

Problem 91: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{2+x^2}}{\sqrt{1+x^2}\,\left(a+b\,x^2\right)}\,dx$$

Optimal (type 4, 58 leaves, 1 step):

$$\frac{2\,\sqrt{1+x^2}\;\text{EllipticPi}\left[1-\frac{2\,b}{a},\,\text{ArcTan}\left[\frac{x}{\sqrt{2}}\right],\,-1\right]}{a\,\sqrt{\frac{1+x^2}{2+x^2}}\,\sqrt{2+x^2}}$$

Result (type 4, 50 leaves):

$$-\frac{i\,\left(a\,\text{EllipticF}\left[i\,\text{ArcSinh}[x],\,\frac{1}{2}\right]-(a-2\,b)\,\text{EllipticPi}\left[\frac{b}{a},\,i\,\text{ArcSinh}[x],\,\frac{1}{2}\right]\right)}{\sqrt{2}\,a\,b}$$

Problem 92: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{2+x^2}}{\left(1+x^2\right)^{3/2}\,\left(a+b\,x^2\right)}\,dx$$

Optimal (type 4, 121 leaves, 3 steps):

$$\frac{\sqrt{2}\,\sqrt{2+x^2}\;\text{EllipticE}\left[\text{ArcTan}[x],\,\frac{1}{2}\right]}{(a-b)\,\sqrt{1+x^2}\,\sqrt{\frac{2+x^2}{1+x^2}}}-\frac{2\,b\,\sqrt{1+x^2}\;\text{EllipticPi}\left[1-\frac{2\,b}{a},\,\text{ArcTan}\left[\frac{x}{\sqrt{2}}\right],\,-1\right]}{a\,(a-b)\,\sqrt{\frac{1+x^2}{2+x^2}}\,\sqrt{2+x^2}}$$

Result (type 4, 122 leaves):

$$\frac{1}{2\,a-2\,b}\left(\frac{2\,x\,\sqrt{2+x^2}}{\sqrt{1+x^2}}+2\,i\,\sqrt{2}\;\text{EllipticE}\left[i\,\text{ArcSinh}[x],\,\frac{1}{2}\right]-i\,\sqrt{2}\;\text{EllipticF}\left[i\,\text{ArcSinh}[x],\,\frac{1}{2}\right]-\right.$$
$$\left.i\,\sqrt{2}\;\text{EllipticPi}\left[\frac{b}{a},\,i\,\text{ArcSinh}[x],\,\frac{1}{2}\right]+\frac{2\,i\,\sqrt{2}\,b\,\text{EllipticPi}\left[\frac{b}{a},\,i\,\text{ArcSinh}[x],\,\frac{1}{2}\right]}{a}\right)$$

Problem 93: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{2+x^2}}{\left(1+x^2\right)^{5/2}\left(a+b\,x^2\right)}\,dx$$

Optimal (type 4, 215 leaves, 6 steps):

$$\frac{x\sqrt{2+x^2}}{3\,(a-b)\,\left(1+x^2\right)^{3/2}}+\frac{\sqrt{2}\,(a-2\,b)\,\sqrt{2+x^2}\;\text{EllipticE}\!\left[\text{ArcTan}[x],\frac{1}{2}\right]}{(a-b)^2\sqrt{1+x^2}\,\sqrt{\frac{2+x^2}{1+x^2}}}-$$

$$\frac{\sqrt{2}\,\sqrt{2+x^2}\;\text{EllipticF}\!\left[\text{ArcTan}[x],\frac{1}{2}\right]}{3\,(a-b)\,\sqrt{1+x^2}\,\sqrt{\frac{2+x^2}{1+x^2}}}+\frac{2\,b^2\sqrt{1+x^2}\;\text{EllipticPi}\!\left[1-\frac{2\,b}{a},\text{ArcTan}\!\left[\frac{x}{\sqrt{2}}\right],-1\right]}{a\,(a-b)^2\sqrt{\frac{1+x^2}{2+x^2}}\,\sqrt{2+x^2}}$$

Result (type 4, 357 leaves):

$$\frac{1}{6\,a\,(a-b)^2\left(1+x^2\right)^2}\Bigg(8\,a^2\,x\sqrt{1+x^2}\,\sqrt{2+x^2}-14\,a\,b\,x\sqrt{1+x^2}\,\sqrt{2+x^2}+6\,a^2\,x^3\sqrt{1+x^2}\,\sqrt{2+x^2}-12\,a\,b\,x^3\sqrt{1+x^2}\,\sqrt{2+x^2}+$$

$$6\,i\sqrt{2}\,a\,(a-2\,b)\left(1+x^2\right)^2\text{EllipticE}\!\left[i\,\text{ArcSinh}[x],\frac{1}{2}\right]-i\sqrt{2}\,a\,(4\,a-7\,b)\left(1+x^2\right)^2\text{EllipticF}\!\left[i\,\text{ArcSinh}[x],\frac{1}{2}\right]+$$

$$3\,i\sqrt{2}\,a\,b\,\text{EllipticPi}\!\left[\frac{b}{a},i\,\text{ArcSinh}[x],\frac{1}{2}\right]-6\,i\sqrt{2}\,b^2\,\text{EllipticPi}\!\left[\frac{b}{a},i\,\text{ArcSinh}[x],\frac{1}{2}\right]+$$

$$6\,i\sqrt{2}\,a\,b\,x^2\,\text{EllipticPi}\!\left[\frac{b}{a},i\,\text{ArcSinh}[x],\frac{1}{2}\right]-12\,i\sqrt{2}\,b^2\,x^2\,\text{EllipticPi}\!\left[\frac{b}{a},i\,\text{ArcSinh}[x],\frac{1}{2}\right]+$$

$$3\,i\sqrt{2}\,a\,b\,x^4\,\text{EllipticPi}\!\left[\frac{b}{a},i\,\text{ArcSinh}[x],\frac{1}{2}\right]-6\,i\sqrt{2}\,b^2\,x^4\,\text{EllipticPi}\!\left[\frac{b}{a},i\,\text{ArcSinh}[x],\frac{1}{2}\right]\Bigg)$$

Problem 94: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{2+d\,x^2}\,\sqrt{3+f\,x^2}}{a+b\,x^2}\,dx$$

Optimal (type 4, 298 leaves, 6 steps):

$$\frac{f x \sqrt{2+d x^2}}{b \sqrt{3+f x^2}}-\frac{\sqrt{2} \sqrt{f} \sqrt{2+d x^2} \text{ EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{3}}\right], 1-\frac{3 d}{2 f}\right]}{b \sqrt{\frac{2+d x^2}{3+f x^2}} \sqrt{3+f x^2}}+$$

$$\frac{3 d \sqrt{2+d x^2} \text{ EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{3}}\right], 1-\frac{3 d}{2 f}\right]}{\sqrt{2} b \sqrt{f} \sqrt{\frac{2+d x^2}{3+f x^2}} \sqrt{3+f x^2}}+\frac{3 (2 b-a d) \sqrt{2+d x^2} \text{ EllipticPi}\left[1-\frac{3 b}{a f}, \text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{3}}\right], 1-\frac{3 d}{2 f}\right]}{\sqrt{2} a b \sqrt{f} \sqrt{\frac{2+d x^2}{3+f x^2}} \sqrt{3+f x^2}}$$

Result (type 4, 134 leaves):

$$\frac{1}{\sqrt{3} a b^2 \sqrt{d}} i \left(-3 a b d \text{ EllipticE}\left[i \text{ ArcSinh}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]+\right.$$
$$\left.(-2 b+a d) \left(a f \text{ EllipticF}\left[i \text{ ArcSinh}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]+(3 b-a f) \text{ EllipticPi}\left[\frac{2 b}{a d}, i \text{ ArcSinh}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]\right)\right)$$

Problem 95: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{2+d x^2}}{\left(a+b x^2\right) \sqrt{3+f x^2}} \, dx$$

Optimal (type 4, 93 leaves, 1 step):

$$\frac{2 \sqrt{3+f x^2} \text{ EllipticPi}\left[1-\frac{2 b}{a d}, \text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], 1-\frac{2 f}{3 d}\right]}{\sqrt{3} a \sqrt{d} \sqrt{2+d x^2} \sqrt{\frac{3+f x^2}{2+d x^2}}}$$

Result (type 4, 94 leaves):

$$-\frac{i \left(a d \text{ EllipticF}\left[i \text{ ArcSinh}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]+(2 b-a d) \text{ EllipticPi}\left[\frac{2 b}{a d}, i \text{ ArcSinh}\left[\frac{\sqrt{d} x}{\sqrt{2}}\right], \frac{2 f}{3 d}\right]\right)}{\sqrt{3} a b \sqrt{d}}$$

Problem 96: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+b x^2\right) \sqrt{2+d x^2} \sqrt{3+f x^2}} \, dx$$

Optimal (type 4, 49 leaves, 1 step):

$$\frac{\text{EllipticPi}\left[\frac{2b}{ad}, \text{ArcSin}\left[\frac{\sqrt{-d}\,x}{\sqrt{2}}\right], \frac{2f}{3d}\right]}{\sqrt{3}\,a\,\sqrt{-d}}$$

Result (type 4, 52 leaves):

$$-\frac{i\,\text{EllipticPi}\left[\frac{2b}{ad}, i\,\text{ArcSinh}\left[\frac{\sqrt{d}\,x}{\sqrt{2}}\right], \frac{2f}{3d}\right]}{\sqrt{3}\,a\,\sqrt{d}}$$

Problem 99: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}{\left(a+b\,x^2\right)^2}\,dx$$

Optimal (type 4, 359 leaves, 11 steps):

$$\frac{x\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}{2a\left(a+b\,x^2\right)}+\frac{\sqrt{c}\,\sqrt{d}\,\sqrt{1-\frac{d\,x^2}{c}}\,\sqrt{e+f\,x^2}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right], -\frac{c\,f}{d\,e}\right]}{2\,a\,b\sqrt{c-d\,x^2}\,\sqrt{1+\frac{f\,x^2}{e}}}-$$

$$\frac{\sqrt{c}\,\sqrt{d}\,\left(b\,e+a\,f\right)\sqrt{1-\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right], -\frac{c\,f}{d\,e}\right]}{2\,a\,b^2\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}+$$

$$\frac{\sqrt{c}\,\left(b^2\,c\,e+a^2\,d\,f\right)\sqrt{1-\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[-\frac{b\,c}{a\,d}, \text{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right], -\frac{c\,f}{d\,e}\right]}{2\,a^2\,b^2\sqrt{d}\,\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 422 leaves):

$$\frac{1}{2a\sqrt{c-dx^2}\sqrt{e+fx^2}}\left(\frac{c\,e\,x}{a+b\,x^2}-\frac{d\,e\,x^3}{a+b\,x^2}+\frac{c\,f\,x^3}{a+b\,x^2}-\frac{d\,f\,x^5}{a+b\,x^2}+\frac{i\,c\sqrt{-\frac{d}{c}}\;e\sqrt{1-\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\;x\right],-\frac{c f}{d e}\right]}{b}-\right.$$

$$\frac{i\,c\sqrt{-\frac{d}{c}}\;(b\,e+a\,f)\sqrt{1-\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\;x\right],-\frac{c f}{d e}\right]}{b^2}+$$

$$\frac{i\,d\,e\sqrt{1-\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\;\text{EllipticPi}\left[-\frac{b c}{a d},i\,\text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\;x\right],-\frac{c f}{d e}\right]}{a\left(-\frac{d}{c}\right)^{3/2}}+$$

$$\left.\frac{i\,a\,c\sqrt{-\frac{d}{c}}\;f\sqrt{1-\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\;\text{EllipticPi}\left[-\frac{b c}{a d},i\,\text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\;x\right],-\frac{c f}{d e}\right]}{b^2}\right)$$

Problem 100: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{c+d\,x^2}\;\sqrt{e+f\,x^2}}{\left(a+b\,x^2\right)^2}\,dx$$

Optimal (type 4, 381 leaves, 8 steps):

$$-\frac{f\,x\sqrt{c+d\,x^2}}{2\,a\,b\sqrt{e+f\,x^2}}+\frac{x\sqrt{c+d\,x^2}\;\sqrt{e+f\,x^2}}{2\,a\left(a+b\,x^2\right)}+\frac{\sqrt{e}\;\sqrt{f}\;\sqrt{c+d\,x^2}\;\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f}\;x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{2\,a\,b\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\;\sqrt{e+f\,x^2}}+$$

$$\frac{d\sqrt{e}\;\sqrt{f}\;\sqrt{c+d\,x^2}\;\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f}\;x}{\sqrt{e}}\right],1-\frac{d e}{c f}\right]}{2\,b^2\,c\sqrt{\frac{e\,(c+d x^2)}{c\,(e+f x^2)}}\;\sqrt{e+f\,x^2}}+\frac{\sqrt{-c}\;\left(b^2\,c\,e-a^2\,d\,f\right)\sqrt{1+\frac{d x^2}{c}}\;\sqrt{1+\frac{f x^2}{e}}\;\text{EllipticPi}\left[\frac{b c}{a d},\text{ArcSin}\left[\frac{\sqrt{d}\;x}{\sqrt{-c}}\right],\frac{c f}{d e}\right]}{2\,a^2\,b^2\sqrt{d}\;\sqrt{c+d\,x^2}\;\sqrt{e+f\,x^2}}$$

Result (type 4, 401 leaves):

$$\frac{1}{2\,a\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}\left(\frac{c\,e\,x}{a+b\,x^2}+\frac{d\,e\,x^3}{a+b\,x^2}+\frac{c\,f\,x^3}{a+b\,x^2}+\frac{d\,f\,x^5}{a+b\,x^2}+\right.$$

$$\frac{\mathrm{i}\,c\,\sqrt{\frac{d}{c}}\,e\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{b}-\frac{\mathrm{i}\,c\,\sqrt{\frac{d}{c}}\,(b\,e+a\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{b^2}-$$

$$\left.\frac{\mathrm{i}\,c\,e\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}}+\frac{\mathrm{i}\,a\,c\,\sqrt{\frac{d}{c}}\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{b^2}\right)$$

Problem 101: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\left(a+b\,x^2\right)^2\,\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 426 leaves, 11 steps):

$$\frac{b^2\,x\,\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}{2\,a\,(b\,c+a\,d)\,(b\,e-a\,f)\,\left(a+b\,x^2\right)}+\frac{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1-\frac{d\,x^2}{c}}\,\sqrt{e+f\,x^2}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],-\frac{c\,f}{d\,e}\right]}{2\,a\,(b\,c+a\,d)\,(b\,e-a\,f)\,\sqrt{c-d\,x^2}\,\sqrt{1+\frac{f\,x^2}{e}}}-$$

$$\frac{\sqrt{c}\,\sqrt{d}\,\sqrt{1-\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],-\frac{c\,f}{d\,e}\right]}{2\,a\,(b\,c+a\,d)\,\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}+$$

$$\frac{\sqrt{c}\,\left(b^2\,c\,e-3\,a^2\,d\,f+a\,b\,(2\,d\,e-2\,c\,f)\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[-\frac{b\,c}{a\,d},\text{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],-\frac{c\,f}{d\,e}\right]}{2\,a^2\,\sqrt{d}\,(b\,c+a\,d)\,(b\,e-a\,f)\,\sqrt{c-d\,x^2}\,\sqrt{e+f\,x^2}}$$

Result (type 4, 773 leaves):

$$-\frac{b^2 x \sqrt{c-d x^2} \sqrt{e+f x^2}}{2 a (b c+a d) (-b e+a f) (a+b x^2)}+\frac{1}{2 a (b c+a d) (-b e+a f) \sqrt{c-d x^2} \sqrt{e+f x^2}}$$

$$\sqrt{(c-d x^2)(e+f x^2)} \left(\left(\mathbb{i}\, b d e \sqrt{1-\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \left(\text{EllipticE}\left[\mathbb{i}\, \text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\, x\right], -\frac{c f}{d e}\right]-\text{EllipticF}\left[\mathbb{i}\, \text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\, x\right], -\frac{c f}{d e}\right]\right)\right)\Big/\right.$$

$$\left(\sqrt{-\frac{d}{c}} \sqrt{(c-d x^2)(e+f x^2)}\right)+\frac{\mathbb{i}\, a d f \sqrt{1-\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticF}\left[\mathbb{i}\, \text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\, x\right], -\frac{c f}{d e}\right]}{\sqrt{-\frac{d}{c}} \sqrt{(c-d x^2)(e+f x^2)}}+$$

$$\frac{\mathbb{i}\, b^2 c e \sqrt{1-\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticPi}\left[-\frac{b c}{a d}, \mathbb{i}\, \text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\, x\right], -\frac{c f}{d e}\right]}{a \sqrt{-\frac{d}{c}} \sqrt{(c-d x^2)(e+f x^2)}}+$$

$$\frac{2 \mathbb{i}\, b d e \sqrt{1-\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticPi}\left[-\frac{b c}{a d}, \mathbb{i}\, \text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\, x\right], -\frac{c f}{d e}\right]}{\sqrt{-\frac{d}{c}} \sqrt{(c-d x^2)(e+f x^2)}}-$$

$$\frac{2 \mathbb{i}\, b c f \sqrt{1-\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticPi}\left[-\frac{b c}{a d}, \mathbb{i}\, \text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\, x\right], -\frac{c f}{d e}\right]}{\sqrt{-\frac{d}{c}} \sqrt{(c-d x^2)(e+f x^2)}}-$$

$$\left.\frac{3 \mathbb{i}\, a d f \sqrt{1-\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}}\, \text{EllipticPi}\left[-\frac{b c}{a d}, \mathbb{i}\, \text{ArcSinh}\left[\sqrt{-\frac{d}{c}}\, x\right], -\frac{c f}{d e}\right]}{\sqrt{-\frac{d}{c}} \sqrt{(c-d x^2)(e+f x^2)}}\right)$$

Problem 102: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+b x^2\right)^2 \sqrt{c+d x^2} \sqrt{e+f x^2}} \, dx$$

Optimal (type 4, 485 leaves, 8 steps):

$$-\frac{b f x \sqrt{c+d x^2}}{2 a (b c-a d) (b e-a f) \sqrt{e+f x^2}}+\frac{b^2 x \sqrt{c+d x^2} \sqrt{e+f x^2}}{2 a (b c-a d) (b e-a f) \left(a+b x^2\right)}+$$
$$\frac{b \sqrt{e} \sqrt{f} \sqrt{c+d x^2} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{2 a (b c-a d) (b e-a f) \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}-\frac{d \sqrt{e} \sqrt{f} \sqrt{c+d x^2} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{f} x}{\sqrt{e}}\right], 1-\frac{d e}{c f}\right]}{2 c (b c-a d) (b e-a f) \sqrt{\frac{e \left(c+d x^2\right)}{c \left(e+f x^2\right)}} \sqrt{e+f x^2}}+$$
$$\frac{\sqrt{-c} \left(b^2 c e+3 a^2 d f-2 a b (d e+c f)\right) \sqrt{1+\frac{d x^2}{c}} \sqrt{1+\frac{f x^2}{e}} \text{EllipticPi}\left[\frac{b c}{a d}, \text{ArcSin}\left[\frac{\sqrt{d} x}{\sqrt{-c}}\right], \frac{c f}{d e}\right]}{2 a^2 \sqrt{d} (b c-a d) (b e-a f) \sqrt{c+d x^2} \sqrt{e+f x^2}}$$

Result (type 4, 587 leaves):

$$\frac{1}{2\,a\,(-b\,c+a\,d)\,(-b\,e+a\,f)\,\sqrt{c+d\,x^2}\,\sqrt{e+f\,x^2}}\left(\frac{b^2\,c\,e\,x}{a+b\,x^2}+\frac{b^2\,d\,e\,x^3}{a+b\,x^2}+\frac{b^2\,c\,f\,x^3}{a+b\,x^2}+\frac{b^2\,d\,f\,x^5}{a+b\,x^2}+i\,b\,c\,\sqrt{\frac{d}{c}}\,e\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-\right.$$

$$i\,c\,\sqrt{\frac{d}{c}}\,(b\,e-a\,f)\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]-$$

$$\frac{i\,b^2\,c\,e\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{a\,\sqrt{\frac{d}{c}}}+2\,i\,b\,c\,\sqrt{\frac{d}{c}}\,e\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}$$

$$\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]+\frac{2\,i\,b\,c\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]}{\sqrt{\frac{d}{c}}}-$$

$$\left.3\,i\,a\,c\,\sqrt{\frac{d}{c}}\,f\,\sqrt{1+\frac{d\,x^2}{c}}\,\sqrt{1+\frac{f\,x^2}{e}}\,\text{EllipticPi}\left[\frac{b\,c}{a\,d},i\,\text{ArcSinh}\left[\sqrt{\frac{d}{c}}\,x\right],\frac{c\,f}{d\,e}\right]\right)$$

Problem 104: Unable to integrate problem.

$$\int\frac{\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 545 leaves, 7 steps) :

$$\frac{d\,x\,\sqrt{a+b\,x^2}\,\sqrt{e+f\,x^2}}{2\,f\,\sqrt{c+d\,x^2}}-\frac{\sqrt{e}\,\sqrt{d\,e-c\,f}\,\sqrt{a+b\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{d\,e-c\,f}\,x}{\sqrt{e}\,\sqrt{c+d\,x^2}}\right],-\frac{(b\,c-a\,d)\,e}{a\,(d\,e-c\,f)}\right]}{2\,f\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{e+f\,x^2}}+$$

$$\frac{b\,\sqrt{e}\,(d\,e-c\,f)\,\sqrt{c+d\,x^2}\,\sqrt{\frac{a\,(e+f\,x^2)}{e\,(a+b\,x^2)}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{b\,e-a\,f}\,x}{\sqrt{e}\,\sqrt{a+b\,x^2}}\right],\frac{(b\,c-a\,d)\,e}{c\,(b\,e-a\,f)}\right]}{2\,d\,f\,\sqrt{b\,e-a\,f}\,\sqrt{\frac{a\,(c+d\,x^2)}{c\,(a+b\,x^2)}}\,\sqrt{e+f\,x^2}}-$$

$$\frac{c\,\sqrt{e}\,(b\,d\,e-b\,c\,f-a\,d\,f)\,\sqrt{a+b\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}\,\text{EllipticPi}\left[\frac{d\,e}{d\,e-c\,f},\text{ArcSin}\left[\frac{\sqrt{d\,e-c\,f}\,x}{\sqrt{e}\,\sqrt{c+d\,x^2}}\right],-\frac{(b\,c-a\,d)\,e}{a\,(d\,e-c\,f)}\right]}{2\,a\,d\,f\,\sqrt{d\,e-c\,f}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{e+f\,x^2}}$$

Result (type 8, 36 leaves):

$$\int\frac{\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{\sqrt{e+f\,x^2}}\,dx$$

Problem 105: Unable to integrate problem.

$$\int\frac{\sqrt{c+d\,x^2}}{\sqrt{a+b\,x^2}\,\sqrt{e+f\,x^2}}\,dx$$

Optimal (type 4, 163 leaves, 2 steps):

$$\frac{c\,\sqrt{e}\,\sqrt{a+b\,x^2}\,\sqrt{\frac{c\,(e+f\,x^2)}{e\,(c+d\,x^2)}}\,\text{EllipticPi}\left[\frac{d\,e}{d\,e-c\,f},\text{ArcSin}\left[\frac{\sqrt{d\,e-c\,f}\,x}{\sqrt{e}\,\sqrt{c+d\,x^2}}\right],-\frac{(b\,c-a\,d)\,e}{a\,(d\,e-c\,f)}\right]}{a\,\sqrt{d\,e-c\,f}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{e+f\,x^2}}$$

Result (type 8, 36 leaves):

$$\int\frac{\sqrt{c+d\,x^2}}{\sqrt{a+b\,x^2}\,\sqrt{e+f\,x^2}}\,dx$$

Problem 106: Unable to integrate problem.

$$\int \frac{\sqrt{c+d x^2}}{\left(a+b x^2\right)^{3/2} \sqrt{e+f x^2}}\, dx$$

Optimal (type 4, 148 leaves, 2 steps):

$$\frac{\sqrt{e} \sqrt{c+d x^2} \sqrt{\frac{a \left(e+f x^2\right)}{e \left(a+b x^2\right)}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{b e-a f}\ x}{\sqrt{e} \sqrt{a+b x^2}}\right], \frac{(b c-a d) e}{c (b e-a f)}\right]}{a \sqrt{b e-a f} \sqrt{\frac{a \left(c+d x^2\right)}{c \left(a+b x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 8, 36 leaves):

$$\int \frac{\sqrt{c+d x^2}}{\left(a+b x^2\right)^{3/2} \sqrt{e+f x^2}}\, dx$$

Problem 108: Unable to integrate problem.

$$\int \frac{\sqrt{a+b x^2} \sqrt{c+d x^2}}{\left(e+f x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 484 leaves, 8 steps):

$$-\frac{(d e-c f)\, x \sqrt{a+b x^2}}{e f \sqrt{c+d x^2} \sqrt{e+f x^2}}+\frac{\sqrt{c} \sqrt{d e-c f} \sqrt{a+b x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d e-c f}\ x}{\sqrt{c} \sqrt{e+f x^2}}\right], -\frac{(b c-a d) e}{a (d e-c f)}\right]}{e f \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}-$$

$$\frac{c^{3/2} (b e-a f) \sqrt{a+b x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d e-c f}\ x}{\sqrt{c} \sqrt{e+f x^2}}\right], -\frac{(b c-a d) e}{a (d e-c f)}\right]}{a e f \sqrt{d e-c f} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}}+$$

$$\frac{b c \sqrt{e} \sqrt{a+b x^2} \sqrt{\frac{c \left(e+f x^2\right)}{e \left(c+d x^2\right)}}\ \text{EllipticPi}\left[\frac{d e}{d e-c f}, \text{ArcSin}\left[\frac{\sqrt{d e-c f}\ x}{\sqrt{e} \sqrt{c+d x^2}}\right], -\frac{(b c-a d) e}{a (d e-c f)}\right]}{a f \sqrt{d e-c f} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{e+f x^2}}$$

Result (type 8, 36 leaves):

$$\int \frac{\sqrt{a+b x^2}\ \sqrt{c+d x^2}}{\left(e+f x^2\right)^{3/2}}\, dx$$

Problem 109: Unable to integrate problem.

$$\int \frac{\sqrt{c+d x^2}}{\sqrt{a+b x^2}\ \left(e+f x^2\right)^{3/2}}\, dx$$

Optimal (type 4, 319 leaves, 5 steps):

$$\frac{(d e-c f)\ x \sqrt{a+b x^2}}{e\ (b e-a f)\ \sqrt{c+d x^2}\ \sqrt{e+f x^2}}-\frac{\sqrt{c}\ \sqrt{d e-c f}\ \sqrt{a+b x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d e-c f}\ x}{\sqrt{c}\ \sqrt{e+f x^2}}\right],-\frac{(b c-a d)\ e}{a\ (d e-c f)}\right]}{e\ (b e-a f)\ \sqrt{\frac{c\ (a+b x^2)}{a\ (c+d x^2)}}\ \sqrt{c+d x^2}}+$$

$$\frac{c^{3/2}\ \sqrt{a+b x^2}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d e-c f}\ x}{\sqrt{c}\ \sqrt{e+f x^2}}\right],-\frac{(b c-a d)\ e}{a\ (d e-c f)}\right]}{a\ e\ \sqrt{d e-c f}\ \sqrt{\frac{c\ (a+b x^2)}{a\ (c+d x^2)}}\ \sqrt{c+d x^2}}$$

Result (type 8, 36 leaves):

$$\int \frac{\sqrt{c+d x^2}}{\sqrt{a+b x^2}\ \left(e+f x^2\right)^{3/2}}\, dx$$

Problem 111: Unable to integrate problem.

$$\int \frac{\sqrt{c+d x^2}\ \sqrt{e+f x^2}}{\sqrt{a+b x^2}}\, dx$$

Optimal (type 4, 541 leaves, 7 steps):

$$\frac{x\sqrt{c+dx^2}\,\sqrt{e+fx^2}}{2\sqrt{a+bx^2}}-\frac{\sqrt{c}\,\sqrt{bc-ad}\,\sqrt{\frac{a\,(c+dx^2)}{c\,(a+bx^2)}}\,\sqrt{e+fx^2}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{bc-ad}\,x}{\sqrt{c}\,\sqrt{a+bx^2}}\right],\frac{c\,(be-af)}{(bc-ad)\,e}\right]}{2\,b\,\sqrt{c+dx^2}\,\sqrt{\frac{a\,(e+fx^2)}{e\,(a+bx^2)}}}+$$

$$\frac{(bc-ad)\,\sqrt{e}\,(2\,be-af)\,\sqrt{c+dx^2}\,\sqrt{\frac{a\,(e+fx^2)}{e\,(a+bx^2)}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{be-af}\,x}{\sqrt{e}\,\sqrt{a+bx^2}}\right],\frac{(bc-ad)\,e}{c\,(be-af)}\right]}{2\,b^2\,c\,\sqrt{be-af}\,\sqrt{\frac{a\,(c+dx^2)}{c\,(a+bx^2)}}\,\sqrt{e+fx^2}}-$$

$$\frac{a\,(adf-b\,(de+cf))\,\sqrt{c+dx^2}\,\sqrt{\frac{a\,(e+fx^2)}{e\,(a+bx^2)}}\,\text{EllipticPi}\left[\frac{bc}{bc-ad},\text{ArcSin}\left[\frac{\sqrt{bc-ad}\,x}{\sqrt{c}\,\sqrt{a+bx^2}}\right],\frac{c\,(be-af)}{(bc-ad)\,e}\right]}{2\,b^2\,\sqrt{c}\,\sqrt{bc-ad}\,\sqrt{\frac{a\,(c+dx^2)}{c\,(a+bx^2)}}\,\sqrt{e+fx^2}}$$

Result (type 8, 36 leaves) :

$$\int\frac{\sqrt{c+dx^2}\,\sqrt{e+fx^2}}{\sqrt{a+bx^2}}\,dx$$

Problem 113: Unable to integrate problem.

$$\int\frac{\sqrt{a+bx^2}}{\sqrt{c+dx^2}\,\sqrt{e+fx^2}}\,dx$$

Optimal (type 4, 159 leaves, 2 steps) :

$$\frac{a\sqrt{c+dx^2}\,\sqrt{\frac{a\,(e+fx^2)}{e\,(a+bx^2)}}\,\text{EllipticPi}\left[\frac{bc}{bc-ad},\text{ArcSin}\left[\frac{\sqrt{bc-ad}\,x}{\sqrt{c}\,\sqrt{a+bx^2}}\right],\frac{c\,(be-af)}{(bc-ad)\,e}\right]}{\sqrt{c}\,\sqrt{bc-ad}\,\sqrt{\frac{a\,(c+dx^2)}{c\,(a+bx^2)}}\,\sqrt{e+fx^2}}$$

Result (type 8, 36 leaves) :

$$\int\frac{\sqrt{a+bx^2}}{\sqrt{c+dx^2}\,\sqrt{e+fx^2}}\,dx$$

Test results for the 51 problems in "1.1.2.6 (g x)^m (a+b x^2)^p (c+d x^2)^q (e+f x^2)^r.m"

Problem 28: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^m \left(A + B x^2\right)}{\left(a + b x^2\right)^2 \left(c + d x^2\right)} \, dx$$

Optimal (type 5, 206 leaves, 5 steps):

$$\frac{(A b - a B) (e x)^{1+m}}{2 a (b c - a d) e \left(a + b x^2\right)} + \frac{1}{2 a^2 (b c - a d)^2 e (1 + m)} \left(A b (b c (1 - m) - a d (3 - m)) + a B (a d (1 - m) + b c (1 + m))\right) (e x)^{1+m} \text{Hypergeometric2F1}\left[1, \frac{1+m}{2}, \frac{3+m}{2}, -\frac{b x^2}{a}\right] - \frac{d (B c - A d) (e x)^{1+m} \text{Hypergeometric2F1}\left[1, \frac{1+m}{2}, \frac{3+m}{2}, -\frac{d x^2}{c}\right]}{c (b c - a d)^2 e (1 + m)}$$

Result (type 6, 377 leaves):

$$\left(a c x (e x)^m \left(\left(A (3 + m)^2 \text{AppellF1}\left[\frac{1+m}{2}, 2, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right) \Big/ \left((1 + m) \left(a c (3 + m) \text{AppellF1}\left[\frac{1+m}{2}, 2, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] - 2 x^2 \left(a d \text{AppellF1}\left[\frac{3+m}{2}, 2, 2, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + 2 b c \text{AppellF1}\left[\frac{3+m}{2}, 3, 1, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right) + \left(B (5 + m) x^2 \text{AppellF1}\left[\frac{3+m}{2}, 2, 1, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right) \Big/ \left(a c (5 + m) \text{AppellF1}\left[\frac{3+m}{2}, 2, 1, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] - 2 x^2 \left(a d \text{AppellF1}\left[\frac{5+m}{2}, 2, 2, \frac{7+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + 2 b c \text{AppellF1}\left[\frac{5+m}{2}, 3, 1, \frac{7+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right)\right) \Big/ \left((3 + m) \left(a + b x^2\right)^2 \left(c + d x^2\right)\right)$$

Problem 29: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^m \left(A + B x^2\right)}{\left(a + b x^2\right)^3 \left(c + d x^2\right)} \, dx$$

Optimal (type 5, 342 leaves, 6 steps):

$$\frac{(A b-a B)\ (e x)^{1+m}}{4 a\ (b c-a d)\ e\ (a+b x^2)^2}+\frac{(A b\ (b c\ (3-m)-a d\ (7-m))+a B\ (a d\ (3-m)+b c\ (1+m)))\ (e x)^{1+m}}{8 a^2\ (b c-a d)^2 e\ (a+b x^2)}+\frac{1}{8 a^3\ (b c-a d)^3 e\ (1+m)}$$
$$(A b\ (a^2 d^2\ (15-8 m+m^2)-2 a b c d\ (5-6 m+m^2)+b^2 c^2\ (3-4 m+m^2))+a B\ (b^2 c^2\ (1-m^2)-2 a b c d\ (3+2 m-m^2)-a^2 d^2\ (3-4 m+m^2)))$$
$$(e x)^{1+m}\ \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b x^2}{a}\right]+\frac{d^2\ (B c-A d)\ (e x)^{1+m}\ \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d x^2}{c}\right]}{c\ (b c-a d)^3 e\ (1+m)}$$

Result (type 6, 377 leaves):

$$\left(a c x\ (e x)^m \left(\left(A\ (3+m)^2 \text{AppellF1}\left[\frac{1+m}{2},3,1,\frac{3+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left((1+m)\ \left(a c\ (3+m)\ \text{AppellF1}\left[\frac{1+m}{2},3,1,\frac{3+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-\right.\right.\right.\right.$$
$$\left.\left.2 x^2\left(a d\,\text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c\,\text{AppellF1}\left[\frac{3+m}{2},4,1,\frac{5+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)+$$
$$\left(B\ (5+m)\ x^2 \text{AppellF1}\left[\frac{3+m}{2},3,1,\frac{5+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(a c\ (5+m)\ \text{AppellF1}\left[\frac{3+m}{2},3,1,\frac{5+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]-2 x^2\right.$$
$$\left.\left.\left.\left(a d\,\text{AppellF1}\left[\frac{5+m}{2},3,2,\frac{7+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+3 b c\,\text{AppellF1}\left[\frac{5+m}{2},4,1,\frac{7+m}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)\Big/\left((3+m)\ (a+b x^2)^3\ (c+d x^2)\right)$$

Problem 34: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^m\ (A+B x^2)}{(a+b x^2)\ (c+d x^2)^2}\, dx$$

Optimal (type 5, 205 leaves, 5 steps):

$$\frac{(B c-A d)\ (e x)^{1+m}}{2 c\ (b c-a d)\ e\ (c+d x^2)}+\frac{b\ (A b-a B)\ (e x)^{1+m}\ \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b x^2}{a}\right]}{a\ (b c-a d)^2 e\ (1+m)}+\frac{1}{2 c^2\ (b c-a d)^2 e\ (1+m)}$$
$$(b c\ (B c\ (1-m)-A d\ (3-m))+a d\ (A d\ (1-m)+B c\ (1+m)))\ (e x)^{1+m}\ \text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d x^2}{c}\right]$$

Result (type 6, 377 leaves):

$$\left(a c x\ (e x)^m \left(\left(A\ (3+m)^2 \text{AppellF1}\left[\frac{1+m}{2},2,1,\frac{3+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]\right)\Big/\left((1+m)\ \left(a c\ (3+m)\ \text{AppellF1}\left[\frac{1+m}{2},2,1,\frac{3+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]-\right.\right.\right.\right.$$
$$\left.\left.2 x^2\left(b c\,\text{AppellF1}\left[\frac{3+m}{2},2,2,\frac{5+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]+2 a d\,\text{AppellF1}\left[\frac{3+m}{2},3,1,\frac{5+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]\right)\right)\right)+$$
$$\left(B\ (5+m)\ x^2 \text{AppellF1}\left[\frac{3+m}{2},2,1,\frac{5+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]\right)\Big/\left(a c\ (5+m)\ \text{AppellF1}\left[\frac{3+m}{2},2,1,\frac{5+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]-2 x^2\right.$$
$$\left.\left.\left.\left(b c\,\text{AppellF1}\left[\frac{5+m}{2},2,2,\frac{7+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]+2 a d\,\text{AppellF1}\left[\frac{5+m}{2},3,1,\frac{7+m}{2},-\frac{d x^2}{c},-\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left((3+m)\ (a+b x^2)\ (c+d x^2)^2\right)$$

Problem 35: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^m \left(A+B\,x^2\right)}{\left(a+b\,x^2\right)^2 \left(c+d\,x^2\right)^2}\,dx$$

Optimal (type 5, 304 leaves, 6 steps):

$$\frac{d\,(A\,b\,c-2\,a\,B\,c+a\,A\,d)\,(e\,x)^{1+m}}{2\,a\,c\,(b\,c-a\,d)^2\,e\,\left(c+d\,x^2\right)}+\frac{(A\,b-a\,B)\,(e\,x)^{1+m}}{2\,a\,(b\,c-a\,d)\,e\,\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)}+\frac{1}{2\,a^2\,(b\,c-a\,d)^3\,e\,(1+m)}$$
$$b\,(A\,b\,(b\,c\,(1-m)-a\,d\,(5-m))+a\,B\,(a\,d\,(3-m)+b\,c\,(1+m)))\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]-$$
$$\frac{1}{2\,c^2\,(b\,c-a\,d)^3\,e\,(1+m)}d\,(b\,c\,(B\,c\,(3-m)-A\,d\,(5-m))+a\,d\,(A\,d\,(1-m)+B\,c\,(1+m)))\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 375 leaves):

$$\left(a\,c\,x\,(e\,x)^m\,\left(\left(A\,(3+m)^2\,\text{AppellF1}\left[\frac{1+m}{2},2,2,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((1+m)\,\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},2,2,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-\right.\right.\right.\right.$$
$$\left.\left.\left.4\,x^2\,\left(a\,d\,\text{AppellF1}\left[\frac{3+m}{2},2,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)+$$
$$\left(B\,(5+m)\,x^2\,\text{AppellF1}\left[\frac{3+m}{2},2,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(a\,c\,(5+m)\,\text{AppellF1}\left[\frac{3+m}{2},2,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-4\,x^2\right.$$
$$\left.\left.\left.\left(a\,d\,\text{AppellF1}\left[\frac{5+m}{2},2,3,\frac{7+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{5+m}{2},3,2,\frac{7+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)\Big/\left((3+m)\,\left(a+b\,x^2\right)^2\,\left(c+d\,x^2\right)^2\right)$$

Problem 36: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^m \left(A+B\,x^2\right)}{\left(a+b\,x^2\right)^3 \left(c+d\,x^2\right)^2}\,dx$$

Optimal (type 5, 491 leaves, 7 steps):

$$-\frac{d\,(A\,(4\,a^2\,d^2-b^2\,c^2\,(3-m)+a\,b\,c\,d\,(11-m))-a\,B\,c\,(a\,d\,(11-m)+b\,c\,(1+m)))\,(e\,x)^{1+m}}{8\,a^2\,c\,(b\,c-a\,d)^3\,e\,(c+d\,x^2)}+$$

$$\frac{(A\,b-a\,B)\,(e\,x)^{1+m}}{4\,a\,(b\,c-a\,d)\,e\,(a+b\,x^2)^2\,(c+d\,x^2)}+\frac{(A\,b\,(b\,c\,(3-m)-a\,d\,(9-m))+a\,B\,(a\,d\,(5-m)+b\,c\,(1+m)))\,(e\,x)^{1+m}}{8\,a^2\,(b\,c-a\,d)^2\,e\,(a+b\,x^2)\,(c+d\,x^2)}+\frac{1}{8\,a^3\,(b\,c-a\,d)^4\,e\,(1+m)}$$

$$b\,(a\,B\,(b^2\,c^2\,(1-m^2)-2\,a\,b\,c\,d\,(5+4\,m-m^2)-a^2\,d^2\,(15-8\,m+m^2))+A\,b\,(a^2\,d^2\,(35-12\,m+m^2)-2\,a\,b\,c\,d\,(7-8\,m+m^2)+b^2\,c^2\,(3-4\,m+m^2)))$$

$$(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]+\frac{1}{2\,c^2\,(b\,c-a\,d)^4\,e\,(1+m)}$$

$$d^2\,(b\,c\,(B\,c\,(5-m)-A\,d\,(7-m))+a\,d\,(A\,d\,(1-m)+B\,c\,(1+m)))\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 379 leaves):

$$\Bigg(a\,c\,x\,(e\,x)^m\,\Bigg(\Bigg(A\,(3+m)^2\,\text{AppellF1}\left[\frac{1+m}{2},3,2,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Bigg)\Bigg/\Bigg((1+m)\,\Bigg(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},3,2,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-$$

$$2\,x^2\,\Bigg(2\,a\,d\,\text{AppellF1}\left[\frac{3+m}{2},3,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{3+m}{2},4,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(B\,(5+m)\,x^2\,\text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Bigg)\Bigg/\Bigg(a\,c\,(5+m)\,\text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-$$

$$2\,x^2\,\Bigg(2\,a\,d\,\text{AppellF1}\left[\frac{5+m}{2},3,3,\frac{7+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{5+m}{2},4,2,\frac{7+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\Bigg((3+m)\,(a+b$$

$$x^2)^3\,(c+d\,x^2)^2\Bigg)$$

Problem 41: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^m\,(A+B\,x^2)}{(a+b\,x^2)\,(c+d\,x^2)^3}\,dx$$

Optimal (type 5, 333 leaves, 6 steps):

$$\frac{(B\,c-A\,d)\,(e\,x)^{1+m}}{4\,c\,(b\,c-a\,d)\,e\,(c+d\,x^2)^2}+\frac{(b\,c\,(B\,c\,(3-m)-A\,d\,(7-m))+a\,d\,(A\,d\,(3-m)+B\,c\,(1+m)))\,(e\,x)^{1+m}}{8\,c^2\,(b\,c-a\,d)^2\,e\,(c+d\,x^2)}+$$

$$\frac{b^2\,(A\,b-a\,B)\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]}{a\,(b\,c-a\,d)^3\,e\,(1+m)}+\frac{1}{8\,c^3\,(b\,c-a\,d)^3\,e\,(1+m)}$$

$$(b^2\,c^2\,(B\,c\,(1-m)-A\,d\,(5-m))\,(3-m)-a^2\,d^2\,(1-m)\,(A\,d\,(3-m)+B\,c\,(1+m))+2\,a\,b\,c\,d\,(B\,c\,(3+2\,m-m^2)+A\,d\,(5-6\,m+m^2)))$$

$$(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 377 leaves):

$$\left(a\,c\,x\,(e\,x)^m\left(\left(A\,(3+m)^2\,\text{AppellF1}\left[\frac{1+m}{2},3,1,\frac{3+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]\right)\Big/\left((1+m)\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},3,1,\frac{3+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]-2\,x^2\left(b\,c\,\text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]+3\,a\,d\,\text{AppellF1}\left[\frac{3+m}{2},4,1,\frac{5+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]\right)\right)\right)+\left(B\,(5+m)\,x^2\,\text{AppellF1}\left[\frac{3+m}{2},3,1,\frac{5+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]\right)\Big/\left(a\,c\,(5+m)\,\text{AppellF1}\left[\frac{3+m}{2},3,1,\frac{5+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]-2\,x^2\left(b\,c\,\text{AppellF1}\left[\frac{5+m}{2},3,2,\frac{7+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]+3\,a\,d\,\text{AppellF1}\left[\frac{5+m}{2},4,1,\frac{7+m}{2},-\frac{d\,x^2}{c},-\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left((3+m)\,(a+b\,x^2)\,(c+d\,x^2)^3\right)$$

Problem 42: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^m\,(A+B\,x^2)}{(a+b\,x^2)^2\,(c+d\,x^2)^3}\,dx$$

Optimal (type 5, 452 leaves, 7 steps):

$$\frac{d\,(2\,A\,b\,c-3\,a\,B\,c+a\,A\,d)\,(e\,x)^{1+m}}{4\,a\,c\,(b\,c-a\,d)^2\,e\,(c+d\,x^2)^2}+\frac{(A\,b-a\,B)\,(e\,x)^{1+m}}{2\,a\,(b\,c-a\,d)\,e\,(a+b\,x^2)\,(c+d\,x^2)^2}+\frac{d\,\left(A\,\left(4\,b^2\,c^2-a^2\,d^2\,(3-m)+a\,b\,c\,d\,(11-m)\right)-a\,B\,c\,\left(b\,c\,(11-m)+a\,d\,(1+m)\right)\right)\,(e\,x)^{1+m}}{8\,a\,c^2\,(b\,c-a\,d)^3\,e\,(c+d\,x^2)}+\frac{1}{2\,a^2\,(b\,c-a\,d)^4\,e\,(1+m)}b^2\,\left(A\,b\,\left(b\,c\,(1-m)-a\,d\,(7-m)\right)+a\,B\,\left(a\,d\,(5-m)+b\,c\,(1+m)\right)\right)\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]-\frac{1}{8\,c^3\,(b\,c-a\,d)^4\,e\,(1+m)}d\,\left(b^2\,c^2\,\left(B\,c\,(3-m)-A\,d\,(7-m)\right)\,(5-m)-a^2\,d^2\,(1-m)\,\left(A\,d\,(3-m)+B\,c\,(1+m)\right)+2\,a\,b\,c\,d\,\left(B\,c\,(5+4\,m-m^2)+A\,d\,(7-8\,m+m^2)\right)\right)\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 379 leaves):

$$\left(a\,c\,x\,(e\,x)^m\left(\left(A\,(3+m)^2\,\text{AppellF1}\left[\frac{1+m}{2},2,3,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((1+m)\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},2,3,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-\right.\right.\right.\right.$$

$$\left.\left.\left.2\,x^2\left(3\,a\,d\,\text{AppellF1}\left[\frac{3+m}{2},2,4,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+2\,b\,c\,\text{AppellF1}\left[\frac{3+m}{2},3,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)+$$

$$\left(B\,(5+m)\,x^2\,\text{AppellF1}\left[\frac{3+m}{2},2,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(a\,c\,(5+m)\,\text{AppellF1}\left[\frac{3+m}{2},2,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-\right.$$

$$\left.\left.\left.2\,x^2\left(3\,a\,d\,\text{AppellF1}\left[\frac{5+m}{2},2,4,\frac{7+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+2\,b\,c\,\text{AppellF1}\left[\frac{5+m}{2},3,3,\frac{7+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)\Big/\left((3+m)\left(a+b\right.\right.$$

$$\left.\left.x^2\right)^2\left(c+d\,x^2\right)^3\right)$$

Problem 43: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^m\left(A+B\,x^2\right)}{\left(a+b\,x^2\right)^3\left(c+d\,x^2\right)^3}\,dx$$

Optimal (type 5, 665 leaves, 8 steps):

$$-\frac{d\left(A\left(2\,a^2\,d^2-b^2\,c^2\,(3-m)+a\,b\,c\,d\,(13-m)\right)-a\,B\,c\,\left(a\,d\,(11-m)+b\,c\,(1+m)\right)\right)(e\,x)^{1+m}}{8\,a^2\,c\,(b\,c-a\,d)^3\,e\,\left(c+d\,x^2\right)^2}+$$

$$\frac{(A\,b-a\,B)\,(e\,x)^{1+m}}{4\,a\,(b\,c-a\,d)\,e\,\left(a+b\,x^2\right)^2\left(c+d\,x^2\right)^2}+\frac{\left(A\,b\,\left(b\,c\,(3-m)-a\,d\,(11-m)\right)+a\,B\,\left(a\,d\,(7-m)+b\,c\,(1+m)\right)\right)(e\,x)^{1+m}}{8\,a^2\,(b\,c-a\,d)^2\,e\,\left(a+b\,x^2\right)\left(c+d\,x^2\right)^2}+$$

$$\left(d\left(A\,(b\,c+a\,d)\left(b^2\,c^2\,(3-m)+a^2\,d^2\,(3-m)-2\,a\,b\,c\,d\,(9-m)\right)+a\,B\,c\,\left(2\,a\,b\,c\,d\,(11-m)+b^2\,c^2\,(1+m)+a^2\,d^2\,(1+m)\right)\right)(e\,x)^{1+m}\right)\Big/$$

$$\left(8\,a^2\,c^2\,(b\,c-a\,d)^4\,e\,\left(c+d\,x^2\right)\right)+\frac{1}{8\,a^3\,(b\,c-a\,d)^5\,e\,(1+m)}$$

$$b^2\left(a\,B\left(b^2\,c^2\left(1-m^2\right)-2\,a\,b\,c\,d\left(7+6\,m-m^2\right)-a^2\,d^2\left(35-12\,m+m^2\right)\right)+A\,b\left(a^2\,d^2\left(63-16\,m+m^2\right)-2\,a\,b\,c\,d\left(9-10\,m+m^2\right)+b^2\,c^2\left(3-4\,m+m^2\right)\right)\right)$$

$$(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]+\frac{1}{8\,c^3\,(b\,c-a\,d)^5\,e\,(1+m)}$$

$$d^2\left(b^2\,c^2\,\left(B\,c\,(5-m)-A\,d\,(9-m)\right)(7-m)-a^2\,d^2\,(1-m)\,\left(A\,d\,(3-m)+B\,c\,(1+m)\right)+2\,a\,b\,c\,d\left(B\,c\left(7+6\,m-m^2\right)+A\,d\left(9-10\,m+m^2\right)\right)\right)$$

$$(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 375 leaves):

$$\left(a c x (e x)^m \left(\left(A (3+m)^2 \text{AppellF1}\left[\frac{1+m}{2}, 3, 3, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right) \Big/ \left((1+m) \left(a c (3+m) \text{AppellF1}\left[\frac{1+m}{2}, 3, 3, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] - 6 x^2 \left(a d \text{AppellF1}\left[\frac{3+m}{2}, 3, 4, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + b c \text{AppellF1}\left[\frac{3+m}{2}, 4, 3, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right) + \left(B (5+m) x^2 \text{AppellF1}\left[\frac{3+m}{2}, 3, 3, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right) \Big/ \left(a c (5+m) \text{AppellF1}\left[\frac{3+m}{2}, 3, 3, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] - 6 x^2 \left(a d \text{AppellF1}\left[\frac{5+m}{2}, 3, 4, \frac{7+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + b c \text{AppellF1}\left[\frac{5+m}{2}, 4, 3, \frac{7+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right)\right) \Big/ \left((3+m) \left(a+b x^2\right)^3 \left(c+d x^2\right)^3\right)$$

Problem 47: Result more than twice size of optimal antiderivative.

$$\int \frac{(e x)^m \left(a+b x^2\right)^p \left(A+B x^2\right)}{c+d x^2} \, dx$$

Optimal (type 6, 162 leaves, 6 steps):

$$-\frac{(B c - A d) (e x)^{1+m} \left(a+b x^2\right)^p \left(1+\frac{b x^2}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+m}{2}, -p, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]}{c d e (1+m)} + \frac{B (e x)^{1+m} \left(a+b x^2\right)^p \left(1+\frac{b x^2}{a}\right)^{-p} \text{Hypergeometric2F1}\left[\frac{1+m}{2}, -p, \frac{3+m}{2}, -\frac{b x^2}{a}\right]}{d e (1+m)}$$

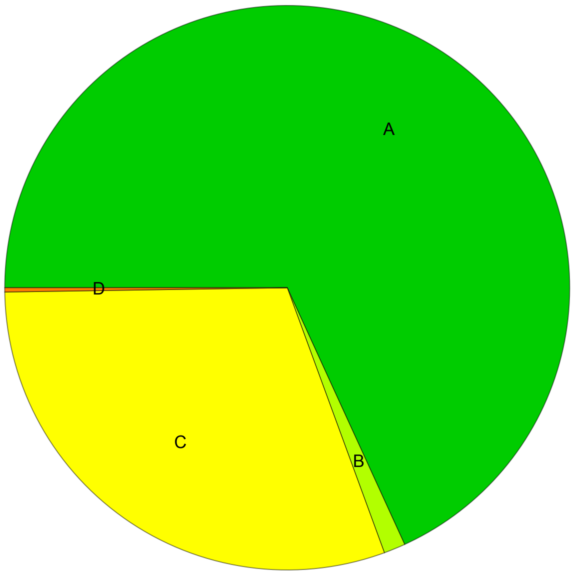
Result (type 6, 446 leaves):

$$\left(x (e x)^m \left(a+b x^2\right)^p \left(-a B c^2 (3+m) \text{AppellF1}\left[\frac{1+m}{2}, -p, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + a A c d (3+m) \text{AppellF1}\left[\frac{1+m}{2}, -p, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + B \left(1+\frac{b x^2}{a}\right)^{-p} \left(c+d x^2\right) \left(a c (3+m) \text{AppellF1}\left[\frac{1+m}{2}, -p, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + 2 x^2 \left(b c p \text{AppellF1}\left[\frac{3+m}{2}, 1-p, 1, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] - a d \text{AppellF1}\left[\frac{3+m}{2}, -p, 2, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right) \text{Hypergeometric2F1}\left[\frac{1+m}{2}, -p, \frac{3+m}{2}, -\frac{b x^2}{a}\right]\right)\right) \Big/ \left(d (1+m) \left(c+d x^2\right) \left(a c (3+m) \text{AppellF1}\left[\frac{1+m}{2}, -p, 1, \frac{3+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] + 2 x^2 \left(b c p \text{AppellF1}\left[\frac{3+m}{2}, 1-p, 1, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right] - a d \text{AppellF1}\left[\frac{3+m}{2}, -p, 2, \frac{5+m}{2}, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right)$$

Test results for the 174 problems in "1.1.2.8 P(x) (c x)^m (a+b x^2)^p.m"

Summary of Integration Test Results

2916 integration problems



A - 1988 optimal antiderivatives

B - 36 more than twice size of optimal antiderivatives

C - 885 unnecessarily complex antiderivatives

D - 7 unable to integrate problems

E - 0 integration timeouts