Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "1 Algebraic functions\1.1 Binomial products\1.1.4 Improper"

Test results for the 454 problems in "1.1.4.2 (c x)^m (a x^j+b x^n)^p.m"

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

$$\int \frac{x^5}{x-x^3}\,dx$$

Optimal (type 3, 13 leaves, 4 steps):

$$-x-\frac{x^3}{3}+\text{ArcTanh}[x]$$

Result (type 3, 29 leaves):

$$-x-\frac{x^3}{3}-\frac{1}{2}\text{Log}[1-x]+\frac{1}{2}\text{Log}[1+x]$$

Problem 28: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3}{x-x^3}\,dx$$

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

$$-x+\text{ArcTanh}[x]$$

Result (type 3, 22 leaves):

$$-x-\frac{1}{2}\text{Log}[1-x]+\frac{1}{2}\text{Log}[1+x]$$

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

$$\int \frac{x}{x - x^3} \, dx$$

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

ArcTanh[x]

Result (type 3, 19 leaves):

$$-\frac{1}{2} \text{Log}[1 - x] + \frac{1}{2} \text{Log}[1 + x]$$

Problem 32: Result more than twice size of optimal antiderivative.

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

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

$$-\frac{1}{x} + \text{ArcTanh}[x]$$

Result (type 3, 24 leaves):

$$-\frac{1}{x} - \frac{1}{2} \text{Log}[1 - x] + \frac{1}{2} \text{Log}[1 + x]$$

Problem 34: Result more than twice size of optimal antiderivative.

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

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

$$-\frac{1}{3 x^3} - \frac{1}{x} + \text{ArcTanh}[x]$$

Result (type 3, 31 leaves):

$$-\frac{1}{3 x^3} - \frac{1}{x} - \frac{1}{2} \text{Log}[1 - x] + \frac{1}{2} \text{Log}[1 + x]$$

Problem 38: Result unnecessarily involves imaginary or complex numbers.

$$\int x^3 \sqrt{a x + b x^3}\, dx$$

Optimal (type 4, 163 leaves, 6 steps):

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

Result (type 4, 148 leaves):

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

Problem 39: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 281 leaves, 7 steps):

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

Result (type 4, 184 leaves):

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

Problem 40: Result unnecessarily involves imaginary or complex numbers.

$$\int x\,\sqrt{a\,x+b\,x^3}\,dx$$

Optimal (type 4, 137 leaves, 5 steps):

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

Result (type 4, 137 leaves):

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

Problem 41: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{a\,x+b\,x^3}\,dx$$

Optimal (type 4, 255 leaves, 6 steps):

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

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

Result (type 4, 170 leaves) :

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

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

Problem 42: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a\,x+b\,x^3}}{x}\,dx$$

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

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

Result (type 4, 101 leaves) :

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

Problem 43: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 248 leaves, 6 steps):

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

Result (type 4, 168 leaves):

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

Problem 44: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a x + b x^3}}{x^3} \, dx$$

Optimal (type 4, 116 leaves, 4 steps):

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

Result (type 4, 104 leaves):

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

Problem 45: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a x+b x^3}}{x^4}\,dx$$

Optimal (type 4, 283 leaves, 7 steps):

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

Result (type 4, 192 leaves):

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

Problem 46: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 186 leaves, 7 steps):

$$-\frac{8\,a^3\,\sqrt{a\,x+b\,x^3}}{231\,b^2}+\frac{8\,a^2\,x^2\,\sqrt{a\,x+b\,x^3}}{385\,b}+\frac{4}{55}\,a\,x^4\,\sqrt{a\,x+b\,x^3}+$$

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

Result (type 4, 159 leaves):

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

$$\left(1155\,\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}\,b^2\,\sqrt{x\,\left(a+b\,x^2\right)}\right)$$

Problem 47: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 304 leaves, 8 steps):

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

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

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

Result (type 4, 195 leaves):

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

Problem 48: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 158 leaves, 6 steps):

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

Result (type 4, 148 leaves):

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

Problem 49: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 275 leaves, 7 steps):

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

Result (type 4, 184 leaves):

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

Problem 50: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 134 leaves, 5 steps):

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

Result (type 4, 113 leaves):

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

Problem 51: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 274 leaves, 7 steps):

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

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

Result (type 4, 183 leaves):

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

$$\left.12\,a^{3/2}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]-12\,a^{3/2}\,\sqrt{b}\,x\,\sqrt{1+\frac{b\,x^2}{a}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{b}\,x}{\sqrt{a}}}\right],\,-1\right]\right)$$

Problem 52: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 134 leaves, 5 steps):

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

Result (type 4, 107 leaves):

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

Problem 53: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 277 leaves, 7 steps):

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

Result (type 4, 189 leaves):

$$-\left(\left(2 \left(\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \left(a^2+8 a b x^2+7 b^2 x^4\right)-12 \sqrt{a} b^{3/2} x^3 \sqrt{1+\frac{b x^2}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right]+12 \sqrt{a} b^{3/2} x^3 \sqrt{1+\frac{b x^2}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right]\right)\right) \Big/ \left(5 x^2 \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \sqrt{x \left(a+b x^2\right)}\right)\right)$$

Problem 54: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 137 leaves, 5 steps):

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

Result (type 4, 116 leaves):

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

Problem 55: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 306 leaves, 8 steps):

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

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

Result (type 4, 205 leaves):

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

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

Problem 56: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 163 leaves, 6 steps):

$$-\frac{12\,b\,\sqrt{a\,x+b\,x^3}}{77\,x^4}-\frac{8\,b^2\,\sqrt{a\,x+b\,x^3}}{77\,a\,x^2}-\frac{2\,\left(a\,x+b\,x^3\right)^{3/2}}{11\,x^7}-\frac{4\,b^{11/4}\,\sqrt{x}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{77\,a^{5/4}\,\sqrt{a\,x+b\,x^3}}$$

Result (type 4, 150 leaves):

$$-\left(\left(2\left(\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\left(7a^3+20a^2bx^2+17ab^2x^4+4b^3x^6\right)+4ib^3\sqrt{1+\frac{a}{bx^2}}\,x^{13/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(77a\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,x^5\sqrt{x\left(a+bx^2\right)}\right)\right)$$

Problem 57: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\sqrt{ax+bx^3}}\,dx$$

Optimal (type 4, 140 leaves, 5 steps):

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

Result (type 4, 138 leaves):

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

Problem 58: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^3}{\sqrt{ax+bx^3}}\,dx$$

Optimal (type 4, 258 leaves, 6 steps):

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

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

Result (type 4, 170 leaves):

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

Problem 59: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 116 leaves, 4 steps):

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

Result (type 4, 101 leaves):

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

Problem 60: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x}{\sqrt{a x + b x^3}} \, dx$$

Optimal (type 4, 229 leaves, 5 steps):

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

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

Result (type 4, 108 leaves):

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

Problem 61: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{a x + b x^3}} \, dx$$

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

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

Result (type 4, 85 leaves):

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

Problem 62: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x \sqrt{a x + b x^3}} \, dx$$

Optimal (type 4, 253 leaves, 6 steps):

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

Result (type 4, 170 leaves):

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

Problem 63: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 106 leaves):

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

Problem 64: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^3 \sqrt{a x+b x^3}}\, dx$$

Optimal (type 4, 286 leaves, 7 steps):

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

Result (type 4, 195 leaves):

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

Problem 65: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 161 leaves, 6 steps):

$$-\frac{x^5}{b\sqrt{a x+b x^3}}-\frac{15 a\sqrt{a x+b x^3}}{7 b^3}+\frac{9 x^2\sqrt{a x+b x^3}}{7 b^2}+\frac{15 a^{7/4}\sqrt{x}\left(\sqrt{a}+\sqrt{b}\, x\right)\sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4}\sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{14 b^{13/4}\sqrt{a x+b x^3}}$$

Result (type 4, 137 leaves):

$$\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,x\left(-15a^2-6abx^2+2b^2x^4\right)+15\,i\,a^2\sqrt{1+\frac{a}{bx^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]}{7\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}\,b^3\sqrt{x\left(a+bx^2\right)}}$$

Problem 66: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 279 leaves, 7 steps):

$$-\frac{x^4}{b\sqrt{ax+bx^3}}-\frac{21ax\left(a+bx^2\right)}{5b^{5/2}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{ax+bx^3}}+\frac{7x\sqrt{ax+bx^3}}{5b^2}+\frac{21a^{5/4}\sqrt{x}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{5b^{11/4}\sqrt{ax+bx^3}}-\frac{21a^{5/4}\sqrt{x}\left(\sqrt{a}+\sqrt{b}\,x\right)\sqrt{\frac{a+bx^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{x}}{a^{1/4}}\right],\frac{1}{2}\right]}{10b^{11/4}\sqrt{ax+bx^3}}$$

Result (type 4, 173 leaves):

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

Problem 67: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 137 leaves, 5 steps):

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

Result (type 4, 124 leaves):

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

Problem 68: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 253 leaves, 6 steps):

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

Result (type 4, 161 leaves):

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

Problem 69: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 115 leaves, 4 steps):

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

Result (type 4, 111 leaves):

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

Problem 70: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 254 leaves, 6 steps):

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

Result (type 4, 162 leaves):

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

Problem 71: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 114 leaves, 4 steps):

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

Result (type 4, 110 leaves):

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

Problem 72: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 273 leaves, 7 steps):

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

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

Result (type 4, 174 leaves) :

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

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

Problem 73: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 139 leaves, 5 steps) :

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

Result (type 4, 106 leaves) :

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

Problem 74: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 306 leaves, 8 steps):

$$\frac{1}{a x^2 \sqrt{a x + b x^3}} - \frac{21 b^{3/2} x \left(a + b x^2\right)}{5 a^3 \left(\sqrt{a} + \sqrt{b} x\right) \sqrt{a x + b x^3}} - \frac{7 \sqrt{a x + b x^3}}{5 a^2 x^3} + \frac{21 b \sqrt{a x + b x^3}}{5 a^3 x} + \frac{21 b^{5/4} \sqrt{x} \left(\sqrt{a} + \sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{x}}{a^{1/4}}\right], \frac{1}{2}\right]}{5 a^{11/4} \sqrt{a x + b x^3}} - \frac{21 b^{5/4} \sqrt{x} \left(\sqrt{a} + \sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{x}}{a^{1/4}}\right], \frac{1}{2}\right]}{10 a^{11/4} \sqrt{a x + b x^3}}$$

Result (type 4, 194 leaves):

$$\left(\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \left(-2 a^2 + 14 a b x^2 + 21 b^2 x^4\right) - 21 \sqrt{a} b^{3/2} x^3 \sqrt{1 + \frac{b x^2}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right] + 21 \sqrt{a} b^{3/2} x^3 \sqrt{1 + \frac{b x^2}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right]\right) \Big/ \left(5 a^3 x^2 \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \sqrt{x \left(a + b x^2\right)}\right)$$

Problem 97: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^3}{\sqrt{a x + b x^4}} \, dx$$

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

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

Result (type 4, 174 leaves):

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

Problem 98: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 197 leaves, 3 steps):

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

Result (type 4, 147 leaves):

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

Problem 99: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^3\,\sqrt{a\,x+b\,x^4}}\,dx$$

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

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

Result (type 4, 172 leaves):

$$-\left(\left(-6 (-a)^{1/3} \left(a+b x^3\right)+4 i\, 3^{3/4} b^{4/3} \sqrt{(-1)^{5/6} \left(-1+\frac{(-a)^{1/3}}{b^{1/3} x}\right)}\ x^4 \sqrt{\frac{\frac{(-a)^{2/3}}{b^{2/3}}+\frac{(-a)^{1/3} x}{b^{1/3}}+x^2}{x^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-a)^{1/3}}{b^{1/3} x}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\Big/\left(15 (-a)^{4/3} x^2 \sqrt{x \left(a+b x^3\right)}\right)\right)$$

Problem 100: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^5}{\sqrt{a x+b x^4}}\, dx$$

Optimal (type 4, 503 leaves, 6 steps):

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

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

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

$$\left(16\times 3^{1/4}b^{5/3}\sqrt{\frac{b^{1/3}x\left(a^{1/3}+b^{1/3}x\right)}{\left(a^{1/3}+\left(1+\sqrt{3}\right)b^{1/3}x\right)^2}}\sqrt{a\,x+b\,x^4}\right)$$

Result (type 4, 355 leaves):

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

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

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

Problem 101: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 474 leaves, 5 steps):

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

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

Result (type 4, 333 leaves):

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

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

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

Problem 102: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 497 leaves, 6 steps):

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

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

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

Result (type 4, 334 leaves) :

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

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

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

Problem 131: Result unnecessarily involves higher level functions.

$$\int x^3 \sqrt{b x^{1/3}+a x}\, dx$$

Optimal (type 4, 301 leaves, 11 steps) :

$$-\frac{884\,b^6\,\sqrt{b\,x^{1/3}+a\,x}}{14\,421\,a^6}+\frac{884\,b^5\,x^{2/3}\,\sqrt{b\,x^{1/3}+a\,x}}{24\,035\,a^5}-\frac{6188\,b^4\,x^{4/3}\,\sqrt{b\,x^{1/3}+a\,x}}{216\,315\,a^4}+\frac{476\,b^3\,x^2\,\sqrt{b\,x^{1/3}+a\,x}}{19\,665\,a^3}-\frac{28\,b^2\,x^{8/3}\,\sqrt{b\,x^{1/3}+a\,x}}{1311\,a^2}+$$

$$\frac{4\,b\,x^{10/3}\,\sqrt{b\,x^{1/3}+a\,x}}{207\,a}+\frac{2}{9}\,x^4\,\sqrt{b\,x^{1/3}+a\,x}+\frac{442\,b^{27/4}\,\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\,\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\,\frac{1}{2}\right]}{14\,421\,a^{25/4}\,\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 155 leaves) :

$$\frac{1}{216\,315\,a^6\,\sqrt{b\,x^{1/3}+a\,x}}2\,x^{1/3}\,\Bigg(-6630\,b^7-2652\,a\,b^6\,x^{2/3}+884\,a^2\,b^5\,x^{4/3}-476\,a^3\,b^4\,x^2+308\,a^4\,b^3\,x^{8/3}-$$

$$220\,a^5\,b^2\,x^{10/3}+26\,125\,a^6\,b\,x^4+24\,035\,a^7\,x^{14/3}-6630\,b^7\,\sqrt{1+\frac{b}{a\,x^{2/3}}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{5}{4},\,-\frac{b}{a\,x^{2/3}}\right]\Bigg)$$

Problem 132: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 411 leaves, 11 steps) :

$$\frac{44\,b^5\,\left(b+a\,x^{2/3}\right)\,x^{1/3}}{221\,a^{9/2}\,\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\,\sqrt{b\,x^{1/3}+a\,x}}-\frac{44\,b^4\,x^{1/3}\,\sqrt{b\,x^{1/3}+a\,x}}{663\,a^4}+\frac{220\,b^3\,x\,\sqrt{b\,x^{1/3}+a\,x}}{4641\,a^3}-\frac{60\,b^2\,x^{5/3}\,\sqrt{b\,x^{1/3}+a\,x}}{1547\,a^2}+$$

$$\frac{4\,b\,x^{7/3}\,\sqrt{b\,x^{1/3}+a\,x}}{119\,a}+\frac{2}{7}\,x^3\,\sqrt{b\,x^{1/3}+a\,x}-\frac{44\,b^{21/4}\,\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\,\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\,\frac{1}{2}\right]}{221\,a^{19/4}\,\sqrt{b\,x^{1/3}+a\,x}}+$$

$$\frac{22\,b^{21/4}\,\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\,\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\,\frac{1}{2}\right]}{221\,a^{19/4}\,\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 131 leaves) :

$$\frac{1}{4641\, a^4 \sqrt{b\, x^{1/3}+a\, x}} 2\, x^{2/3} \left(-154\, b^5-44\, a\, b^4\, x^{2/3}+20\, a^2\, b^3\, x^{4/3}-12\, a^3\, b^2\, x^2+741\, a^4\, b\, x^{8/3}+663\, a^5\, x^{10/3}+462\, b^5 \sqrt{1+\frac{b}{a\, x^{2/3}}}\, \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a\, x^{2/3}}\right]\right)$$

Problem 133: Result unnecessarily involves higher level functions.

$$\int x \sqrt{b\, x^{1/3}+a\, x}\, dx$$

Optimal (type 4, 213 leaves, 8 steps):

$$\frac{12\, b^3 \sqrt{b\, x^{1/3}+a\, x}}{77\, a^3}-\frac{36\, b^2\, x^{2/3} \sqrt{b\, x^{1/3}+a\, x}}{385\, a^2}+\frac{4\, b\, x^{4/3} \sqrt{b\, x^{1/3}+a\, x}}{55\, a}+\frac{2}{5}\, x^2 \sqrt{b\, x^{1/3}+a\, x}-\frac{6\, b^{15/4} \left(\sqrt{b}+\sqrt{a}\, x^{1/3}\right) \sqrt{\frac{b+a\, x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\, x^{1/3}\right)^2}}\, x^{1/6}\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{a^{1/4}\, x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{77\, a^{13/4} \sqrt{b\, x^{1/3}+a\, x}}$$

Result (type 5, 118 leaves):

$$\frac{1}{385\, a^3 \sqrt{b\, x^{1/3}+a\, x}} 2\, x^{1/3} \left(30\, b^4+12\, a\, b^3\, x^{2/3}-4\, a^2\, b^2\, x^{4/3}+91\, a^3\, b\, x^2+77\, a^4\, x^{8/3}+30\, b^4 \sqrt{1+\frac{b}{a\, x^{2/3}}}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a\, x^{2/3}}\right]\right)$$

Problem 134: Result unnecessarily involves higher level functions.

$$\int \sqrt{b\, x^{1/3}+a\, x}\, dx$$

Optimal (type 4, 323 leaves, 8 steps):

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

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

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

Result (type 5, 94 leaves):

$$\frac{2 x^{2/3} \left(2 b^2+7 a b x^{2/3}+5 a^2 x^{4/3}-6 b^2 \sqrt{1+\frac{b}{a x^{2/3}}}\, \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a x^{2/3}}\right]\right)}{15 a \sqrt{b x^{1/3}+a x}}$$

Problem 135: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 71 leaves):

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

Problem 136: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 325 leaves, 8 steps):

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

Result (type 5, 97 leaves):

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

Problem 137: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 188 leaves, 7 steps):

$$-\frac{6\sqrt{b\,x^{1/3}+a\,x}}{11\,x^2}-\frac{12\,a\sqrt{b\,x^{1/3}+a\,x}}{77\,b\,x^{4/3}}+\frac{20\,a^2\sqrt{b\,x^{1/3}+a\,x}}{77\,b^2\,x^{2/3}}+\frac{10\,a^{11/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{77\,b^{9/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 108 leaves):

$$\frac{-42\,b^3-54\,a\,b^2\,x^{2/3}+8\,a^2\,b\,x^{4/3}+20\,a^3\,x^2-20\,a^3\sqrt{1+\frac{b}{a\,x^{2/3}}}\,x^2\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a\,x^{2/3}}\right]}{77\,b^2\,x^{5/3}\sqrt{b\,x^{1/3}+a\,x}}$$

Problem 138: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 413 leaves, 11 steps):

$$-\frac{308\, a^{9/2} \left(b + a\, x^{2/3}\right) x^{1/3}}{1105\, b^4 \left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right) \sqrt{b\, x^{1/3} + a\, x}} - \frac{6 \sqrt{b\, x^{1/3} + a\, x}}{17\, x^3} - \frac{12\, a \sqrt{b\, x^{1/3} + a\, x}}{221\, b\, x^{7/3}} + \frac{44\, a^2 \sqrt{b\, x^{1/3} + a\, x}}{663\, b^2\, x^{5/3}} -$$

$$\frac{308\, a^3 \sqrt{b\, x^{1/3} + a\, x}}{3315\, b^3\, x} + \frac{308\, a^4 \sqrt{b\, x^{1/3} + a\, x}}{1105\, b^4\, x^{1/3}} + \frac{308\, a^{17/4} \left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right) \sqrt{\frac{b + a\, x^{2/3}}{\left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right)^2}}\; x^{1/6}\, \text{EllipticE}\left[2\, \text{ArcTan}\left[\frac{a^{1/4}\, x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{1105\, b^{15/4} \sqrt{b\, x^{1/3} + a\, x}} -$$

$$\frac{154\, a^{17/4} \left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right) \sqrt{\frac{b + a\, x^{2/3}}{\left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right)^2}}\; x^{1/6}\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{a^{1/4}\, x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{1105\, b^{15/4} \sqrt{b\, x^{1/3} + a\, x}}$$

Result (type 5, 136 leaves):

$$-\frac{1}{3315\, b^4\, x^{8/3} \sqrt{b\, x^{1/3} + a\, x}}$$

$$2 \left(585\, b^5 + 675\, a\, b^4\, x^{2/3} - 20\, a^2\, b^3\, x^{4/3} + 44\, a^3\, b^2\, x^2 - 308\, a^4\, b\, x^{8/3} - 462\, a^5\, x^{10/3} + 462\, a^5 \sqrt{1 + \frac{b}{a\, x^{2/3}}}\; x^{10/3}\, \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -\frac{b}{a\, x^{2/3}}\right]\right)$$

Problem 139: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 276 leaves, 10 steps):

$$-\frac{6\sqrt{b x^{1/3}+a x}}{23 x^4}-\frac{12 a \sqrt{b x^{1/3}+a x}}{437 b x^{10/3}}+\frac{68 a^2 \sqrt{b x^{1/3}+a x}}{2185 b^2 x^{8/3}}-\frac{884 a^3 \sqrt{b x^{1/3}+a x}}{24035 b^3 x^2}+\frac{7956 a^4 \sqrt{b x^{1/3}+a x}}{168245 b^4 x^{4/3}}-\frac{2652 a^5 \sqrt{b x^{1/3}+a x}}{33649 b^5 x^{2/3}}-\frac{1326 a^{23/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{33649 b^{21/4} \sqrt{b x^{1/3}+a x}}$$

Result (type 5, 145 leaves):

$$-\left(\left(2 \left(21945 b^6+24255 a b^5 x^{2/3}-308 a^2 b^4 x^{4/3}+476 a^3 b^3 x^2-884 a^4 b^2 x^{8/3}+2652 a^5 b x^{10/3}+6630 a^6 x^4-6630 a^6 \sqrt{1+\frac{b}{a x^{2/3}}} x^4 \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a x^{2/3}}\right]\right)\right)\Big/\left(168245 b^5 x^{11/3} \sqrt{b x^{1/3}+a x}\right)\right)$$

Problem 140: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 298 leaves, 11 steps):

$$\frac{1768 b^6 \sqrt{b x^{1/3}+a x}}{100947 a^5}-\frac{1768 b^5 x^{2/3} \sqrt{b x^{1/3}+a x}}{168245 a^4}+\frac{1768 b^4 x^{4/3} \sqrt{b x^{1/3}+a x}}{216315 a^3}-\frac{136 b^3 x^2 \sqrt{b x^{1/3}+a x}}{19665 a^2}+\frac{8 b^2 x^{8/3} \sqrt{b x^{1/3}+a x}}{1311 a}+\frac{4}{69} b x^{10/3} \sqrt{b x^{1/3}+a x}+\frac{2}{9} x^3 \left(b x^{1/3}+a x\right)^{3/2}-\frac{884 b^{27/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{100947 a^{21/4} \sqrt{b x^{1/3}+a x}}$$

Result (type 5, 155 leaves):

$$\frac{1}{1514205 a^5 \sqrt{b x^{1/3}+a x}} 2 x^{1/3} \left(13260 b^7+5304 a b^6 x^{2/3}-1768 a^2 b^5 x^{4/3}+952 a^3 b^4 x^2-616 a^4 b^3 x^{8/3}+216755 a^5 b^2 x^{10/3}+380380 a^6 b x^4+168245 a^7 x^{14/3}+13260 b^7 \sqrt{1+\frac{b}{a x^{2/3}}} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a x^{2/3}}\right]\right)$$

Problem 141: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 408 leaves, 11 steps):

$$-\frac{88 b^5 \left(b + a x^{2/3}\right) x^{1/3}}{1105 a^{7/2} \left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right) \sqrt{b x^{1/3} + a x}} + \frac{88 b^4 x^{1/3} \sqrt{b x^{1/3} + a x}}{3315 a^3} - \frac{88 b^3 x \sqrt{b x^{1/3} + a x}}{4641 a^2} + \frac{24 b^2 x^{5/3} \sqrt{b x^{1/3} + a x}}{1547 a} +$$

$$\frac{12}{119} b x^{7/3} \sqrt{b x^{1/3} + a x} + \frac{2}{7} x^2 \left(b x^{1/3} + a x\right)^{3/2} + \frac{88 b^{21/4} \left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right) \sqrt{\frac{b + a x^{2/3}}{\left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right)^2}}\, x^{1/6}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{1105 a^{15/4} \sqrt{b x^{1/3} + a x}} -$$

$$\frac{44 b^{21/4} \left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right) \sqrt{\frac{b + a x^{2/3}}{\left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right)^2}}\, x^{1/6}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{1105 a^{15/4} \sqrt{b x^{1/3} + a x}}$$

Result (type 5, 131 leaves):

$$\frac{1}{23\,205 a^3 \sqrt{b x^{1/3} + a x}}$$

$$2 x^{2/3} \left(308 b^5 + 88 a b^4 x^{2/3} - 40 a^2 b^3 x^{4/3} + 4665 a^3 b^2 x^2 + 7800 a^4 b x^{8/3} + 3315 a^5 x^{10/3} - 924 b^5 \sqrt{1 + \frac{b}{a x^{2/3}}}\, \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -\frac{b}{a x^{2/3}}\right]\right)$$

Problem 142: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 208 leaves, 8 steps):

$$-\frac{8 b^3 \sqrt{b x^{1/3} + a x}}{77 a^2} + \frac{24 b^2 x^{2/3} \sqrt{b x^{1/3} + a x}}{385 a} + \frac{12}{55} b x^{4/3} \sqrt{b x^{1/3} + a x} +$$

$$\frac{2}{5} x \left(b x^{1/3} + a x\right)^{3/2} + \frac{4 b^{15/4} \left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right) \sqrt{\frac{b + a x^{2/3}}{\left(\sqrt{b} + \sqrt{a}\, x^{1/3}\right)^2}}\, x^{1/6}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{77 a^{9/4} \sqrt{b x^{1/3} + a x}}$$

Result (type 5, 118 leaves):

$$\frac{1}{385\, a^2 \sqrt{b\, x^{1/3} + a\, x}} 2\, x^{1/3} \left(-20\, b^4 - 8\, a\, b^3\, x^{2/3} + 131\, a^2\, b^2\, x^{4/3} + 196\, a^3\, b\, x^2 + 77\, a^4\, x^{8/3} - 20\, b^4 \sqrt{1 + \frac{b}{a\, x^{2/3}}}\ \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -\frac{b}{a\, x^{2/3}}\right] \right)$$

Problem 143: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 319 leaves, 8 steps):

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

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

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

Result (type 5, 91 leaves):

$$\frac{2\, x^{2/3} \left(11\, b^2 + 16\, a\, b\, x^{2/3} + 5\, a^2\, x^{4/3} + 12\, b^2 \sqrt{1 + \frac{b}{a\, x^{2/3}}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -\frac{b}{a\, x^{2/3}}\right]\right)}{15 \sqrt{b\, x^{1/3} + a\, x}}$$

Problem 144: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 144 leaves, 6 steps):

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

Result (type 5, 82 leaves):

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

Problem 145: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 350 leaves, 9 steps):

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

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

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

Result (type 5, 108 leaves):

$$-\frac{2 \left(5 b^3+16 a b^2 x^{2/3}+23 a^2 b x^{4/3}+12 a^3 x^2-12 a^3 \sqrt{1+\frac{b}{a x^{2/3}}} x^2 \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a x^{2/3}}\right]\right)}{15 b x^{4/3} \sqrt{b x^{1/3}+a x}}$$

Problem 146: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 213 leaves, 8 steps):

$$-\frac{12 a \sqrt{b x^{1/3}+a x}}{55 x^2}-\frac{24 a^2 \sqrt{b x^{1/3}+a x}}{385 b x^{4/3}}+\frac{8 a^3 \sqrt{b x^{1/3}+a x}}{77 b^2 x^{2/3}}-\frac{2 \left(b x^{1/3}+a x\right)^{3/2}}{5 x^3}+\frac{4 a^{15/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{77 b^{9/4} \sqrt{b x^{1/3}+a x}}$$

Result (type 5, 123 leaves):

$$-\frac{1}{385 b^2 x^{7/3} \sqrt{b x^{1/3}+a x}}2 \left(77 b^4+196 a b^3 x^{2/3}+131 a^2 b^2 x^{4/3}-8 a^3 b x^2-20 a^4 x^{8/3}+20 a^4 \sqrt{1+\frac{b}{a x^{2/3}}} x^{8/3} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a x^{2/3}}\right]\right)$$

Problem 147: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 438 leaves, 12 steps):

$$-\frac{88 a^{11/2} \left(b+a x^{2/3}\right) x^{1/3}}{1105 b^4 \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{b x^{1/3}+a x}}-\frac{12 a \sqrt{b x^{1/3}+a x}}{119 x^3}-\frac{24 a^2 \sqrt{b x^{1/3}+a x}}{1547 b x^{7/3}}+\frac{88 a^3 \sqrt{b x^{1/3}+a x}}{4641 b^2 x^{5/3}}-\frac{88 a^4 \sqrt{b x^{1/3}+a x}}{3315 b^3 x}+\frac{88 a^5 \sqrt{b x^{1/3}+a x}}{1105 b^4 x^{1/3}}-\frac{2 \left(b x^{1/3}+a x\right)^{3/2}}{7 x^4}+\frac{88 a^{21/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{1105 b^{15/4} \sqrt{b x^{1/3}+a x}}-\frac{44 a^{21/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{1105 b^{15/4} \sqrt{b x^{1/3}+a x}}$$

Result (type 5, 145 leaves):

$$-\left(\left(2\left(3315 b^6+7800 a b^5 x^{2/3}+4665 a^2 b^4 x^{4/3}-40 a^3 b^3 x^2+88 a^4 b^2 x^{8/3}-616 a^5 b x^{10/3}-924 a^6 x^4+924 a^6 \sqrt{1+\frac{b}{a x^{2/3}}}\, x^4 \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a x^{2/3}}\right]\right)\right)\Big/\left(23205 b^4 x^{10/3} \sqrt{b x^{1/3}+a x}\right)\right)$$

Problem 148: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 301 leaves, 11 steps):

$$-\frac{4 a \sqrt{b x^{1/3}+a x}}{69 x^4}-\frac{8 a^2 \sqrt{b x^{1/3}+a x}}{1311 b x^{10/3}}+\frac{136 a^3 \sqrt{b x^{1/3}+a x}}{19665 b^2 x^{8/3}}-\frac{1768 a^4 \sqrt{b x^{1/3}+a x}}{216315 b^3 x^2}+\frac{1768 a^5 \sqrt{b x^{1/3}+a x}}{168245 b^4 x^{4/3}}-\frac{1768 a^6 \sqrt{b x^{1/3}+a x}}{100947 b^5 x^{2/3}}-\frac{2 \left(b x^{1/3}+a x\right)^{3/2}}{9 x^5}-\frac{884 a^{27/4} \left(\sqrt{b}+\sqrt{a}\, x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\, x^{1/3}\right)^2}}\, x^{1/6} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{100947 b^{21/4} \sqrt{b x^{1/3}+a x}}$$

Result (type 5, 160 leaves):

$$-\left(\left(2\left(168245 b^7+380380 a b^6 x^{2/3}+216755 a^2 b^5 x^{4/3}-616 a^3 b^4 x^2+952 a^4 b^3 x^{8/3}-1768 a^5 b^2 x^{10/3}+5304 a^6 b x^4+13260 a^7 x^{14/3}-13260 a^7 \sqrt{1+\frac{b}{a x^{2/3}}}\, x^{14/3} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a x^{2/3}}\right]\right)\right)\Big/\left(1514205 b^5 x^{13/3} \sqrt{b x^{1/3}+a x}\right)\right)$$

Problem 149: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 304 leaves, 11 steps):

$$\frac{11050\,b^6\sqrt{b\,x^{1/3}+a\,x}}{14421\,a^7}-\frac{2210\,b^5\,x^{2/3}\sqrt{b\,x^{1/3}+a\,x}}{4807\,a^6}+\frac{15470\,b^4\,x^{4/3}\sqrt{b\,x^{1/3}+a\,x}}{43263\,a^5}-\frac{1190\,b^3\,x^2\sqrt{b\,x^{1/3}+a\,x}}{3933\,a^4}+\frac{350\,b^2\,x^{8/3}\sqrt{b\,x^{1/3}+a\,x}}{1311\,a^3}-$$
$$\frac{50\,b\,x^{10/3}\sqrt{b\,x^{1/3}+a\,x}}{207\,a^2}+\frac{2\,x^4\sqrt{b\,x^{1/3}+a\,x}}{9\,a}-\frac{5525\,b^{27/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{14421\,a^{29/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 155 leaves) :

$$\frac{1}{43263\,a^7\sqrt{b\,x^{1/3}+a\,x}}2\,x^{1/3}\left(16575\,b^7+6630\,a\,b^6\,x^{2/3}-2210\,a^2\,b^5\,x^{4/3}+1190\,a^3\,b^4\,x^2-\right.$$
$$\left.770\,a^4\,b^3\,x^{8/3}+550\,a^5\,b^2\,x^{10/3}-418\,a^6\,b\,x^4+4807\,a^7\,x^{14/3}+16575\,b^7\sqrt{1+\frac{b}{a\,x^{2/3}}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 150: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 414 leaves, 11 steps) :

$$-\frac{418\,b^5\left(b+a\,x^{2/3}\right)x^{1/3}}{221\,a^{11/2}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{b\,x^{1/3}+a\,x}}+\frac{418\,b^4\,x^{1/3}\sqrt{b\,x^{1/3}+a\,x}}{663\,a^5}-\frac{2090\,b^3\,x\sqrt{b\,x^{1/3}+a\,x}}{4641\,a^4}+\frac{570\,b^2\,x^{5/3}\sqrt{b\,x^{1/3}+a\,x}}{1547\,a^3}-$$
$$\frac{38\,b\,x^{7/3}\sqrt{b\,x^{1/3}+a\,x}}{119\,a^2}+\frac{2\,x^3\sqrt{b\,x^{1/3}+a\,x}}{7\,a}+\frac{418\,b^{21/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{221\,a^{23/4}\sqrt{b\,x^{1/3}+a\,x}}-$$
$$\frac{209\,b^{21/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{221\,a^{23/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 131 leaves) :

$$\frac{1}{4641\,a^5\,\sqrt{b\,x^{1/3}+a\,x}}\,2\,x^{2/3}\left(1463\,b^5+418\,a\,b^4\,x^{2/3}-190\,a^2\,b^3\,x^{4/3}+114\,a^3\,b^2\,x^2-78\,a^4\,b\,x^{8/3}+663\,a^5\,x^{10/3}-4389\,b^5\,\sqrt{1+\frac{b}{a\,x^{2/3}}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 151: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 216 leaves, 8 steps):

$$-\frac{78\,b^3\,\sqrt{b\,x^{1/3}+a\,x}}{77\,a^4}+\frac{234\,b^2\,x^{2/3}\,\sqrt{b\,x^{1/3}+a\,x}}{385\,a^3}-\frac{26\,b\,x^{4/3}\,\sqrt{b\,x^{1/3}+a\,x}}{55\,a^2}+\frac{2\,x^2\,\sqrt{b\,x^{1/3}+a\,x}}{5\,a}+\frac{39\,b^{15/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{77\,a^{17/4}\,\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 118 leaves):

$$\frac{1}{385\,a^4\,\sqrt{b\,x^{1/3}+a\,x}}\,2\,x^{1/3}\left(-195\,b^4-78\,a\,b^3\,x^{2/3}+26\,a^2\,b^2\,x^{4/3}-14\,a^3\,b\,x^2+77\,a^4\,x^{8/3}-195\,b^4\,\sqrt{1+\frac{b}{a\,x^{2/3}}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 152: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 326 leaves, 8 steps):

$$\frac{14\,b^2\left(b+a\,x^{2/3}\right)x^{1/3}}{5\,a^{5/2}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{b\,x^{1/3}+a\,x}}-\frac{14\,b\,x^{1/3}\sqrt{b\,x^{1/3}+a\,x}}{15\,a^2}+$$

$$\frac{2\,x\sqrt{b\,x^{1/3}+a\,x}}{3\,a}-\frac{14\,b^{9/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{5\,a^{11/4}\sqrt{b\,x^{1/3}+a\,x}}+$$

$$\frac{7\,b^{9/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{5\,a^{11/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 94 leaves):

$$\frac{2\,x^{2/3}\left(-7\,b^2-2\,a\,b\,x^{2/3}+5\,a^2\,x^{4/3}+21\,b^2\sqrt{1+\frac{b}{a\,x^{2/3}}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a\,x^{2/3}}\right]\right)}{15\,a^2\sqrt{b\,x^{1/3}+a\,x}}$$

Problem 153: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 73 leaves):

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

Problem 154: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 294 leaves, 7 steps):

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

Result (type 5, 74 leaves):

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

Problem 155: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 163 leaves, 6 steps):

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

Result (type 5, 97 leaves):

$$\frac{-6\,b^2+4\,a\,b\,x^{2/3}+10\,a^2\,x^{4/3}-10\,a^2\sqrt{1+\frac{b}{a\,x^{2/3}}}\;x^{4/3}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a\,x^{2/3}}\right]}{7\,b^2\,x\sqrt{b\,x^{1/3}+a\,x}}$$

Problem 156: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 388 leaves, 10 steps):

$$-\frac{154\,a^{7/2}\left(b+a\,x^{2/3}\right)x^{1/3}}{65\,b^4\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{b\,x^{1/3}+a\,x}}-\frac{6\sqrt{b\,x^{1/3}+a\,x}}{13\,b\,x^{7/3}}+\frac{22\,a\sqrt{b\,x^{1/3}+a\,x}}{39\,b^2\,x^{5/3}}-\frac{154\,a^2\sqrt{b\,x^{1/3}+a\,x}}{195\,b^3\,x}+\frac{154\,a^3\sqrt{b\,x^{1/3}+a\,x}}{65\,b^4\,x^{1/3}}+\frac{154\,a^{13/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{65\,b^{15/4}\sqrt{b\,x^{1/3}+a\,x}}-\frac{77\,a^{13/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{65\,b^{15/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 121 leaves):

$$\frac{1}{195\,b^4\,x^2\sqrt{b\,x^{1/3}+a\,x}}\left(-90\,b^4+20\,a\,b^3\,x^{2/3}-44\,a^2\,b^2\,x^{4/3}+308\,a^3\,b\,x^2+462\,a^4\,x^{8/3}-462\,a^4\sqrt{1+\frac{b}{a\,x^{2/3}}}\,x^{8/3}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 157: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 251 leaves, 9 steps):

$$-\frac{6\sqrt{b\,x^{1/3}+a\,x}}{19\,b\,x^{10/3}}+\frac{34\,a\sqrt{b\,x^{1/3}+a\,x}}{95\,b^2\,x^{8/3}}-\frac{442\,a^2\sqrt{b\,x^{1/3}+a\,x}}{1045\,b^3\,x^2}+\frac{3978\,a^3\sqrt{b\,x^{1/3}+a\,x}}{7315\,b^4\,x^{4/3}}-\frac{1326\,a^4\sqrt{b\,x^{1/3}+a\,x}}{1463\,b^5\,x^{2/3}}-\frac{663\,a^{19/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{1463\,b^{21/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 134 leaves):

$$\frac{1}{7315\,b^5\,x^3\sqrt{b\,x^{1/3}+a\,x}}\left(-2310\,b^5+308\,a\,b^4\,x^{2/3}-476\,a^2\,b^3\,x^{4/3}+884\,a^3\,b^2\,x^2-2652\,a^4\,b\,x^{8/3}-6630\,a^5\,x^{10/3}+6630\,a^5\sqrt{1+\frac{b}{a\,x^{2/3}}}\,x^{10/3}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 158: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 437 leaves, 12 steps):

$$-\frac{4807\,b^5\left(b+a\,x^{2/3}\right)x^{1/3}}{221\,a^{13/2}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{b\,x^{1/3}+a\,x}}-\frac{3\,x^4}{a\,\sqrt{b\,x^{1/3}+a\,x}}+\frac{4807\,b^4\,x^{1/3}\,\sqrt{b\,x^{1/3}+a\,x}}{663\,a^6}-\frac{24\,035\,b^3\,x\,\sqrt{b\,x^{1/3}+a\,x}}{4641\,a^5}+\frac{6555\,b^2\,x^{5/3}\,\sqrt{b\,x^{1/3}+a\,x}}{1547\,a^4}-$$
$$\frac{437\,b\,x^{7/3}\,\sqrt{b\,x^{1/3}+a\,x}}{119\,a^3}+\frac{23\,x^3\,\sqrt{b\,x^{1/3}+a\,x}}{7\,a^2}+\frac{4807\,b^{21/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{221\,a^{27/4}\,\sqrt{b\,x^{1/3}+a\,x}}-$$
$$\frac{4807\,b^{21/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{442\,a^{27/4}\,\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 131 leaves):

$$\frac{1}{4641\,a^6\,\sqrt{b\,x^{1/3}+a\,x}}x^{2/3}\left(33\,649\,b^5+9614\,a\,b^4\,x^{2/3}-4370\,a^2\,b^3\,x^{4/3}+\right.$$
$$\left.2622\,a^3\,b^2\,x^2-1794\,a^4\,b\,x^{8/3}+1326\,a^5\,x^{10/3}-100\,947\,b^5\,\sqrt{1+\frac{b}{a\,x^{2/3}}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 159: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 239 leaves, 9 steps):

$$-\frac{3 x^3}{a \sqrt{b x^{1/3}+a x}}-\frac{663 b^3 \sqrt{b x^{1/3}+a x}}{77 a^5}+\frac{1989 b^2 x^{2/3} \sqrt{b x^{1/3}+a x}}{385 a^4}-\frac{221 b x^{4/3} \sqrt{b x^{1/3}+a x}}{55 a^3}+$$

$$\frac{17 x^2 \sqrt{b x^{1/3}+a x}}{5 a^2}+\frac{663 b^{15/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{154 a^{21/4} \sqrt{b x^{1/3}+a x}}$$

Result (type 5, 118 leaves):

$$\frac{1}{385 a^5 \sqrt{b x^{1/3}+a x}}$$

$$x^{1/3} \left(-3315 b^4-1326 a b^3 x^{2/3}+442 a^2 b^2 x^{4/3}-238 a^3 b x^2+154 a^4 x^{8/3}-3315 b^4 \sqrt{1+\frac{b}{a x^{2/3}}} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -\frac{b}{a x^{2/3}}\right]\right)$$

Problem 160: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 349 leaves, 9 steps):

$$\frac{77 b^2 \left(b+a x^{2/3}\right) x^{1/3}}{5 a^{7/2} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{b x^{1/3}+a x}}-\frac{3 x^2}{a \sqrt{b x^{1/3}+a x}}-\frac{77 b x^{1/3} \sqrt{b x^{1/3}+a x}}{15 a^3}+$$

$$\frac{11 x \sqrt{b x^{1/3}+a x}}{3 a^2}-\frac{77 b^{9/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{5 a^{15/4} \sqrt{b x^{1/3}+a x}}+$$

$$\frac{77 b^{9/4} \left(\sqrt{b}+\sqrt{a} x^{1/3}\right) \sqrt{\frac{b+a x^{2/3}}{\left(\sqrt{b}+\sqrt{a} x^{1/3}\right)^2}} x^{1/6} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{a^{1/4} x^{1/6}}{b^{1/4}}\right], \frac{1}{2}\right]}{10 a^{15/4} \sqrt{b x^{1/3}+a x}}$$

Result (type 5, 94 leaves):

$$\frac{x^{2/3} \left(-77 b^2-22 a b x^{2/3}+10 a^2 x^{4/3}+231 b^2 \sqrt{1+\frac{b}{a x^{2/3}}} \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -\frac{b}{a x^{2/3}}\right]\right)}{15 a^3 \sqrt{b x^{1/3}+a x}}$$

Problem 161: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 149 leaves, 6 steps):

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

Result (type 5, 76 leaves):

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

Problem 162: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 296 leaves, 7 steps):

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

Result (type 5, 65 leaves):

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

Problem 163: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 158 leaves, 6 steps):

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

Result (type 5, 81 leaves):

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

Problem 164: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 383 leaves, 10 steps):

$$-\frac{3}{b\,x^{4/3}\sqrt{b\,x^{1/3}+a\,x}}+\frac{77\,a^{5/2}\left(b+a\,x^{2/3}\right)x^{1/3}}{5\,b^4\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{b\,x^{1/3}+a\,x}}-\frac{11\sqrt{b\,x^{1/3}+a\,x}}{3\,b^2\,x^{5/3}}+\frac{77\,a\sqrt{b\,x^{1/3}+a\,x}}{15\,b^3\,x}-$$

$$\frac{77\,a^2\sqrt{b\,x^{1/3}+a\,x}}{5\,b^4\,x^{1/3}}-\frac{77\,a^{9/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{5\,b^{15/4}\sqrt{b\,x^{1/3}+a\,x}}+$$

$$\frac{77\,a^{9/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{10\,b^{15/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 108 leaves):

$$\frac{1}{15\,b^4\,x^{4/3}\,\sqrt{b\,x^{1/3}+a\,x}}\left(-10\,b^3+22\,a\,b^2\,x^{2/3}-154\,a^2\,b\,x^{4/3}-231\,a^3\,x^2+231\,a^3\,\sqrt{1+\frac{b}{a\,x^{2/3}}}\;x^2\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 165: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 246 leaves, 9 steps):

$$\frac{3}{b\,x^{7/3}\,\sqrt{b\,x^{1/3}+a\,x}}-\frac{17\,\sqrt{b\,x^{1/3}+a\,x}}{5\,b^2\,x^{8/3}}+\frac{221\,a\,\sqrt{b\,x^{1/3}+a\,x}}{55\,b^3\,x^2}-\frac{1989\,a^2\,\sqrt{b\,x^{1/3}+a\,x}}{385\,b^4\,x^{4/3}}+$$

$$\frac{663\,a^3\,\sqrt{b\,x^{1/3}+a\,x}}{77\,b^5\,x^{2/3}}+\frac{663\,a^{15/4}\,\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\;x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{154\,b^{21/4}\,\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 123 leaves):

$$\frac{1}{385\,b^5\,x^{7/3}\,\sqrt{b\,x^{1/3}+a\,x}}$$

$$\left(-154\,b^4+238\,a\,b^3\,x^{2/3}-442\,a^2\,b^2\,x^{4/3}+1326\,a^3\,b\,x^2+3315\,a^4\,x^{8/3}-3315\,a^4\,\sqrt{1+\frac{b}{a\,x^{2/3}}}\;x^{8/3}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-\frac{b}{a\,x^{2/3}}\right]\right)$$

Problem 166: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 471 leaves, 13 steps):

$$\frac{3}{b\,x^{10/3}\sqrt{b\,x^{1/3}+a\,x}}-\frac{4807\,a^{11/2}\left(b+a\,x^{2/3}\right)x^{1/3}}{221\,b^7\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{b\,x^{1/3}+a\,x}}-\frac{23\sqrt{b\,x^{1/3}+a\,x}}{7\,b^2\,x^{11/3}}+\frac{437\,a\sqrt{b\,x^{1/3}+a\,x}}{119\,b^3\,x^3}-\frac{6555\,a^2\sqrt{b\,x^{1/3}+a\,x}}{1547\,b^4\,x^{7/3}}+\frac{24\,035\,a^3\sqrt{b\,x^{1/3}+a\,x}}{4641\,b^5\,x^{5/3}}-$$

$$\frac{4807\,a^4\sqrt{b\,x^{1/3}+a\,x}}{663\,b^6\,x}+\frac{4807\,a^5\sqrt{b\,x^{1/3}+a\,x}}{221\,b^7\,x^{1/3}}+\frac{4807\,a^{21/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{221\,b^{27/4}\sqrt{b\,x^{1/3}+a\,x}}-$$

$$\frac{4807\,a^{21/4}\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)\sqrt{\frac{b+a\,x^{2/3}}{\left(\sqrt{b}+\sqrt{a}\,x^{1/3}\right)^2}}\,x^{1/6}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{a^{1/4}\,x^{1/6}}{b^{1/4}}\right],\frac{1}{2}\right]}{442\,b^{27/4}\sqrt{b\,x^{1/3}+a\,x}}$$

Result (type 5, 145 leaves):

$$\frac{1}{4641\,b^7\,x^{10/3}\sqrt{b\,x^{1/3}+a\,x}}\Bigg(-1326\,b^6+1794\,a\,b^5\,x^{2/3}-2622\,a^2\,b^4\,x^{4/3}+4370\,a^3\,b^3\,x^2-$$

$$9614\,a^4\,b^2\,x^{8/3}+67\,298\,a^5\,b\,x^{10/3}+100\,947\,a^6\,x^4-100\,947\,a^6\sqrt{1+\frac{b}{a\,x^{2/3}}}\,x^4\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-\frac{b}{a\,x^{2/3}}\right]\Bigg)$$

Problem 281: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 70 leaves, 2 steps):

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

Result (type 5, 58 leaves):

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

Problem 289: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\sqrt{a\,x^2+b\,x^5}}\,dx$$

Optimal (type 4, 238 leaves, 3 steps):

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

Result (type 4, 165 leaves):

$$\frac{1}{15\left(-b\right)^{4/3}\sqrt{x^2\left(a+b x^3\right)}}\left(-6\left(-b\right)^{1/3} x^2\left(a+b x^3\right)+\right.$$

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

Problem 290: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 212 leaves, 2 steps):

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

Result (type 4, 141 leaves):

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

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

Problem 291: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 243 leaves, 3 steps):

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

Result (type 4, 171 leaves):

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

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

Problem 292: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 514 leaves, 5 steps):

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

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

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

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

Result (type 4, 228 leaves) :

$$\frac{1}{21\,b\,\sqrt{x^2\,(a+b\,x^3)}}2\,x\left(3\,x^2\,(a+b\,x^3)-\frac{1}{(-b)^{2/3}}4\,(-1)^{1/6}\,3^{3/4}\,a^{5/3}\sqrt{\frac{(-1)^{5/6}\left(-a^{1/3}+(-b)^{1/3}\,x\right)}{a^{1/3}}}\sqrt{1+\frac{(-b)^{1/3}\,x}{a^{1/3}}+\frac{(-b)^{2/3}\,x^2}{a^{2/3}}}\right.$$

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

Problem 293: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 484 leaves, 4 steps) :

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

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

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

Result (type 4, 202 leaves) :

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

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

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

Problem 294: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 510 leaves, 5 steps) :

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

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

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

Result (type 4, 225 leaves):

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

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

Problem 295: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{13/2}}{\sqrt{a\,x^2+b\,x^5}}\,dx$$

Optimal (type 4, 265 leaves, 5 steps):

$$-\frac{7\,a\,\sqrt{a\,x^2+b\,x^5}}{20\,b^2\,\sqrt{x}}+\frac{x^{5/2}\,\sqrt{a\,x^2+b\,x^5}}{5\,b}+\frac{7\,a^{5/3}\,x^{3/2}\,\left(a^{1/3}+b^{1/3}\,x\right)\,\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(a^{1/3}+\left(1+\sqrt{3}\right)\,b^{1/3}\,x\right)^2}}\,\,\text{EllipticF}\left[\text{ArcCos}\left[\frac{a^{1/3}+\left(1-\sqrt{3}\right)\,b^{1/3}\,x}{a^{1/3}+\left(1+\sqrt{3}\right)\,b^{1/3}\,x}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]}{40\times3^{1/4}\,b^2\,\sqrt{\frac{b^{1/3}\,x\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(a^{1/3}+\left(1+\sqrt{3}\right)\,b^{1/3}\,x\right)^2}}\,\,\sqrt{a\,x^2+b\,x^5}}$$

Result (type 4, 194 leaves):

$$\left(x^{3/2}\left(-3\,(-a)^{1/3}\left(7a^2+3abx^3-4b^2x^6\right)-7\,i\,3^{3/4}a^2b^{1/3}\sqrt{(-1)^{5/6}\left(-1+\frac{(-a)^{1/3}}{b^{1/3}x}\right)}\;x\right.\right.$$

$$\left.\left.\sqrt{\frac{\frac{(-a)^{2/3}}{b^{2/3}}+\frac{(-a)^{1/3}x}{b^{1/3}}+x^2}{x^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-a)^{1/3}}{b^{1/3}x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\right)\Big/\left(60\,(-a)^{1/3}b^2\sqrt{x^2\left(a+bx^3\right)}\right)$$

Problem 296: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{11/2}}{\sqrt{a x^2+b x^5}}\,dx$$

Optimal (type 4, 525 leaves, 6 steps):

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

$$\frac{5\times 3^{1/4}a^{4/3}x^{3/2}\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(a^{1/3}+\left(1+\sqrt{3}\right)b^{1/3}x\right)^2}}\;\text{EllipticE}\left[\text{ArcCos}\left[\frac{a^{1/3}+\left(1-\sqrt{3}\right)b^{1/3}x}{a^{1/3}+\left(1+\sqrt{3}\right)b^{1/3}x}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]}{8\,b^{5/3}\sqrt{\frac{b^{1/3}x\left(a^{1/3}+b^{1/3}x\right)}{\left(a^{1/3}+\left(1+\sqrt{3}\right)b^{1/3}x\right)^2}}\sqrt{ax^2+bx^5}}+$$

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

$$\left(16\times 3^{1/4}b^{5/3}\sqrt{\frac{b^{1/3}x\left(a^{1/3}+b^{1/3}x\right)}{\left(a^{1/3}+\left(1+\sqrt{3}\right)b^{1/3}x\right)^2}}\sqrt{ax^2+bx^5}\right)$$

Result (type 4, 362 leaves):

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

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

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

Problem 298: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{7/2}}{\sqrt{a\,x^2+b\,x^5}}\,dx$$

Optimal (type 4, 237 leaves, 4 steps):

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

Result (type 4, 178 leaves):

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

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

Problem 299: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 492 leaves, 5 steps):

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

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

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

Result (type 4, 340 leaves):

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

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

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

Problem 301: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 203 leaves, 3 steps):

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

Result (type 4, 151 leaves):

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

Problem 302: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 519 leaves, 6 steps):

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

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

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

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

Result (type 4, 341 leaves) :

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

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

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

Problem 304: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 235 leaves, 4 steps) :

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

Result (type 4, 176 leaves) :

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

Problem 305: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^{7/2}\sqrt{a x^2+b x^5}}\,dx$$

Optimal (type 4, 555 leaves, 7 steps) :

$$-\frac{8\left(1+\sqrt{3}\right) b^{4/3} x^{3/2}\left(a+b x^3\right)}{7 a^2\left(a^{1/3}+\left(1+\sqrt{3}\right) b^{1/3} x\right)\sqrt{a x^2+b x^5}}-\frac{2\sqrt{a x^2+b x^5}}{7 a x^{9/2}}+\frac{8 b\sqrt{a x^2+b x^5}}{7 a^2 x^{3/2}}+$$

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

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

Result (type 4, 369 leaves) :

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

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

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

Problem 307: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^{11/2}\,\sqrt{a\,x^2+b\,x^5}}\,dx$$

Optimal (type 4, 265 leaves, 5 steps) :

$$-\frac{2\,\sqrt{a\,x^2+b\,x^5}}{11\,a\,x^{13/2}}+\frac{16\,b\,\sqrt{a\,x^2+b\,x^5}}{55\,a^2\,x^{7/2}}+\frac{16\,b^2\,x^{3/2}\,\left(a^{1/3}+b^{1/3}\,x\right)\,\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(a^{1/3}+\left(1+\sqrt{3}\right)\,b^{1/3}\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcCos}\left[\frac{a^{1/3}+\left(1-\sqrt{3}\right)\,b^{1/3}\,x}{a^{1/3}+\left(1+\sqrt{3}\right)\,b^{1/3}\,x}\right],\,\frac{1}{4}\,\left(2+\sqrt{3}\right)\right]}{55\times 3^{1/4}\,a^{7/3}\,\sqrt{\frac{b^{1/3}\,x\,\left(a^{1/3}+b^{1/3}\,x\right)}{\left(a^{1/3}+\left(1+\sqrt{3}\right)\,b^{1/3}\,x\right)^2}}\,\sqrt{a\,x^2+b\,x^5}}$$

Result (type 4, 190 leaves) :

$$\left(6\,(-a)^{1/3}\,\left(-5\,a^2+3\,a\,b\,x^3+8\,b^2\,x^6\right)-32\,\mathrm{i}\,3^{3/4}\,b^{7/3}\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-a)^{1/3}}{b^{1/3}\,x}\right)}\;x^7\right.$$

$$\left.\sqrt{\frac{\frac{(-a)^{2/3}}{b^{2/3}}+\frac{(-a)^{1/3}\,x}{b^{1/3}}+x^2}{x^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-a)^{1/3}}{b^{1/3}\,x}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(165\,(-a)^{7/3}\,x^{9/2}\,\sqrt{x^2\,\left(a+b\,x^3\right)}\right)$$

Problem 328: Result more than twice size of optimal antiderivative.

$$\int \left(a\,x+b\,x^{14}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b\,x^{13}\right)^{13}}{169\,b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12}\,x^{13}}{13}+\frac{6}{13}\,a^{11}\,b\,x^{26}+\frac{22}{13}\,a^{10}\,b^2\,x^{39}+\frac{55}{13}\,a^9\,b^3\,x^{52}+\frac{99}{13}\,a^8\,b^4\,x^{65}+\frac{132}{13}\,a^7\,b^5\,x^{78}+$$
$$\frac{132}{13}\,a^6\,b^6\,x^{91}+\frac{99}{13}\,a^5\,b^7\,x^{104}+\frac{55}{13}\,a^4\,b^8\,x^{117}+\frac{22}{13}\,a^3\,b^9\,x^{130}+\frac{6}{13}\,a^2\,b^{10}\,x^{143}+\frac{1}{13}\,a\,b^{11}\,x^{156}+\frac{b^{12}\,x^{169}}{169}$$

Problem 329: Result more than twice size of optimal antiderivative.

$$\int x^{12}\,\left(a\,x+b\,x^{26}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b\,x^{25}\right)^{13}}{325\,b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12}\,x^{25}}{25}+\frac{6}{25}\,a^{11}\,b\,x^{50}+\frac{22}{25}\,a^{10}\,b^2\,x^{75}+\frac{11}{5}\,a^9\,b^3\,x^{100}+\frac{99}{25}\,a^8\,b^4\,x^{125}+\frac{132}{25}\,a^7\,b^5\,x^{150}+$$
$$\frac{132}{25}\,a^6\,b^6\,x^{175}+\frac{99}{25}\,a^5\,b^7\,x^{200}+\frac{11}{5}\,a^4\,b^8\,x^{225}+\frac{22}{25}\,a^3\,b^9\,x^{250}+\frac{6}{25}\,a^2\,b^{10}\,x^{275}+\frac{1}{25}\,a\,b^{11}\,x^{300}+\frac{b^{12}\,x^{325}}{325}$$

Problem 330: Result more than twice size of optimal antiderivative.

$$\int x^{24}\left(a x+b x^{38}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{37}}{37}+\frac{6}{37} a^{11} b x^{74}+\frac{22}{37} a^{10} b^2 x^{111}+\frac{55}{37} a^9 b^3 x^{148}+\frac{99}{37} a^8 b^4 x^{185}+\frac{132}{37} a^7 b^5 x^{222}+\frac{132}{37} a^6 b^6 x^{259}+\frac{99}{37} a^5 b^7 x^{296}+\frac{55}{37} a^4 b^8 x^{333}+\frac{22}{37} a^3 b^9 x^{370}+\frac{6}{37} a^2 b^{10} x^{407}+\frac{1}{37} a b^{11} x^{444}+\frac{b^{12} x^{481}}{481}$$

Problem 332: Result more than twice size of optimal antiderivative.

$$\int\left(a x+b x^{14}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b x^{13}\right)^{13}}{169 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{13}}{13}+\frac{6}{13} a^{11} b x^{26}+\frac{22}{13} a^{10} b^2 x^{39}+\frac{55}{13} a^9 b^3 x^{52}+\frac{99}{13} a^8 b^4 x^{65}+\frac{132}{13} a^7 b^5 x^{78}+\frac{132}{13} a^6 b^6 x^{91}+\frac{99}{13} a^5 b^7 x^{104}+\frac{55}{13} a^4 b^8 x^{117}+\frac{22}{13} a^3 b^9 x^{130}+\frac{6}{13} a^2 b^{10} x^{143}+\frac{1}{13} a b^{11} x^{156}+\frac{b^{12} x^{169}}{169}$$

Problem 333: Result more than twice size of optimal antiderivative.

$$\int\left(a x^2+b x^{27}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b x^{25}\right)^{13}}{325 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{25}}{25}+\frac{6}{25} a^{11} b x^{50}+\frac{22}{25} a^{10} b^2 x^{75}+\frac{11}{5} a^9 b^3 x^{100}+\frac{99}{25} a^8 b^4 x^{125}+\frac{132}{25} a^7 b^5 x^{150}+$$
$$\frac{132}{25} a^6 b^6 x^{175}+\frac{99}{25} a^5 b^7 x^{200}+\frac{11}{5} a^4 b^8 x^{225}+\frac{22}{25} a^3 b^9 x^{250}+\frac{6}{25} a^2 b^{10} x^{275}+\frac{1}{25} a b^{11} x^{300}+\frac{b^{12} x^{325}}{325}$$

Problem 334: Result more than twice size of optimal antiderivative.

$$\int \left(a x^3+b x^{40}\right)^{12} \, dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{37}}{37}+\frac{6}{37} a^{11} b x^{74}+\frac{22}{37} a^{10} b^2 x^{111}+\frac{55}{37} a^9 b^3 x^{148}+\frac{99}{37} a^8 b^4 x^{185}+\frac{132}{37} a^7 b^5 x^{222}+$$
$$\frac{132}{37} a^6 b^6 x^{259}+\frac{99}{37} a^5 b^7 x^{296}+\frac{55}{37} a^4 b^8 x^{333}+\frac{22}{37} a^3 b^9 x^{370}+\frac{6}{37} a^2 b^{10} x^{407}+\frac{1}{37} a b^{11} x^{444}+\frac{b^{12} x^{481}}{481}$$

Problem 335: Result more than twice size of optimal antiderivative.

$$\int \left(a x^m+b x^{1+13 m}\right)^{12} \, dx$$

Optimal (type 3, 27 leaves, 2 steps):

$$\frac{\left(a+b x^{1+12 m}\right)^{13}}{13 b \left(1+12 m\right)}$$

Result (type 3, 193 leaves):

$$\frac{1}{13+156 m} x^{1+12 m} \left(13 a^{12}+78 a^{11} b x^{1+12 m}+286 a^{10} b^2 x^{2+24 m}+715 a^9 b^3 x^{3+36 m}+1287 a^8 b^4 x^{4+48 m}+1716 a^7 b^5 x^{5+60 m}+\right.$$
$$\left.1716 a^6 b^6 x^{6+72 m}+1287 a^5 b^7 x^{7+84 m}+715 a^4 b^8 x^{8+96 m}+286 a^3 b^9 x^{9+108 m}+78 a^2 b^{10} x^{10+120 m}+13 a b^{11} x^{11+132 m}+b^{12} x^{12+144 m}\right)$$

Problem 336: Result more than twice size of optimal antiderivative.

$$\int \left(a x^m+b x^{1+6 m}\right)^5 \, dx$$

Optimal (type 3, 27 leaves, 2 steps):

$$\frac{\left(a+b\,x^{1+5\,m}\right)^{6}}{6\,b\,\left(1+5\,m\right)}$$

Result (type 3, 88 leaves) :

$$\frac{x^{1+5\,m}\,\left(6\,a^{5}+15\,a^{4}\,b\,x^{1+5\,m}+20\,a^{3}\,b^{2}\,x^{2+10\,m}+15\,a^{2}\,b^{3}\,x^{3+15\,m}+6\,a\,b^{4}\,x^{4+20\,m}+b^{5}\,x^{5+25\,m}\right)}{6+30\,m}$$

Problem 348: Result more than twice size of optimal antiderivative.

$$\int x^{p}\,\left(a\,x^{n}+b\,x^{1+13\,n+p}\right)^{12}\,dx$$

Optimal (type 3, 29 leaves, 2 steps) :

$$\frac{\left(a+b\,x^{1+12\,n+p}\right)^{13}}{13\,b\,\left(1+12\,n+p\right)}$$

Result (type 3, 232 leaves) :

$$\frac{1}{13\,\left(1+12\,n+p\right)}x^{1+12\,n+p}\,\left(13\,a^{12}+78\,a^{11}\,b\,x^{1+12\,n+p}+286\,a^{3}\,b^{9}\,x^{9\,(1+12\,n+p)}+78\,a^{2}\,b^{10}\,x^{10\,(1+12\,n+p)}+13\,a\,b^{11}\,x^{11\,(1+12\,n+p)}+b^{12}\,x^{12\,(1+12\,n+p)}+286\,a^{10}\,b^{2}\,x^{2+24\,n+2\,p}+\right.$$
$$\left.715\,a^{9}\,b^{3}\,x^{3+36\,n+3\,p}+1287\,a^{8}\,b^{4}\,x^{4+48\,n+4\,p}+1716\,a^{7}\,b^{5}\,x^{5+60\,n+5\,p}+1716\,a^{6}\,b^{6}\,x^{6+72\,n+6\,p}+1287\,a^{5}\,b^{7}\,x^{7+84\,n+7\,p}+715\,a^{4}\,b^{8}\,x^{8+96\,n+8\,p}\right)$$

Problem 349: Result more than twice size of optimal antiderivative.

$$\int x^{12}\,\left(a+b\,x^{13}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 1 step) :

$$\frac{\left(a+b\,x^{13}\right)^{13}}{169\,b}$$

Result (type 1, 160 leaves) :

$$\frac{a^{12}\,x^{13}}{13}+\frac{6}{13}\,a^{11}\,b\,x^{26}+\frac{22}{13}\,a^{10}\,b^{2}\,x^{39}+\frac{55}{13}\,a^{9}\,b^{3}\,x^{52}+\frac{99}{13}\,a^{8}\,b^{4}\,x^{65}+\frac{132}{13}\,a^{7}\,b^{5}\,x^{78}+$$
$$\frac{132}{13}\,a^{6}\,b^{6}\,x^{91}+\frac{99}{13}\,a^{5}\,b^{7}\,x^{104}+\frac{55}{13}\,a^{4}\,b^{8}\,x^{117}+\frac{22}{13}\,a^{3}\,b^{9}\,x^{130}+\frac{6}{13}\,a^{2}\,b^{10}\,x^{143}+\frac{1}{13}\,a\,b^{11}\,x^{156}+\frac{b^{12}\,x^{169}}{169}$$

Problem 350: Result more than twice size of optimal antiderivative.

$$\int x^{12}\left(a x+b x^{26}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b x^{25}\right)^{13}}{325 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{25}}{25}+\frac{6}{25} a^{11} b x^{50}+\frac{22}{25} a^{10} b^2 x^{75}+\frac{11}{5} a^9 b^3 x^{100}+\frac{99}{25} a^8 b^4 x^{125}+\frac{132}{25} a^7 b^5 x^{150}+\frac{132}{25} a^6 b^6 x^{175}+\frac{99}{25} a^5 b^7 x^{200}+\frac{11}{5} a^4 b^8 x^{225}+\frac{22}{25} a^3 b^9 x^{250}+\frac{6}{25} a^2 b^{10} x^{275}+\frac{1}{25} a b^{11} x^{300}+\frac{b^{12} x^{325}}{325}$$

Problem 351: Result more than twice size of optimal antiderivative.

$$\int x^{12}\left(a x^2+b x^{39}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{37}}{37}+\frac{6}{37} a^{11} b x^{74}+\frac{22}{37} a^{10} b^2 x^{111}+\frac{55}{37} a^9 b^3 x^{148}+\frac{99}{37} a^8 b^4 x^{185}+\frac{132}{37} a^7 b^5 x^{222}+\frac{132}{37} a^6 b^6 x^{259}+\frac{99}{37} a^5 b^7 x^{296}+\frac{55}{37} a^4 b^8 x^{333}+\frac{22}{37} a^3 b^9 x^{370}+\frac{6}{37} a^2 b^{10} x^{407}+\frac{1}{37} a b^{11} x^{444}+\frac{b^{12} x^{481}}{481}$$

Problem 352: Result more than twice size of optimal antiderivative.

$$\int x^{24}\left(a+b x^{25}\right)^{12}\,dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^{25}\right)^{13}}{325 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{25}}{25}+\frac{6}{25} a^{11} b x^{50}+\frac{22}{25} a^{10} b^2 x^{75}+\frac{11}{5} a^9 b^3 x^{100}+\frac{99}{25} a^8 b^4 x^{125}+\frac{132}{25} a^7 b^5 x^{150}+\frac{132}{25} a^6 b^6 x^{175}+\frac{99}{25} a^5 b^7 x^{200}+\frac{11}{5} a^4 b^8 x^{225}+\frac{22}{25} a^3 b^9 x^{250}+\frac{6}{25} a^2 b^{10} x^{275}+\frac{1}{25} a b^{11} x^{300}+\frac{b^{12} x^{325}}{325}$$

Problem 353: Result more than twice size of optimal antiderivative.

$$\int x^{24} \left(a x+b x^{38}\right)^{12} \, dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{37}}{37}+\frac{6}{37} a^{11} b x^{74}+\frac{22}{37} a^{10} b^2 x^{111}+\frac{55}{37} a^9 b^3 x^{148}+\frac{99}{37} a^8 b^4 x^{185}+\frac{132}{37} a^7 b^5 x^{222}+\frac{132}{37} a^6 b^6 x^{259}+\frac{99}{37} a^5 b^7 x^{296}+\frac{55}{37} a^4 b^8 x^{333}+\frac{22}{37} a^3 b^9 x^{370}+\frac{6}{37} a^2 b^{10} x^{407}+\frac{1}{37} a b^{11} x^{444}+\frac{b^{12} x^{481}}{481}$$

Problem 354: Result more than twice size of optimal antiderivative.

$$\int x^{36} \left(a+b x^{37}\right)^{12} \, dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{\left(a+b x^{37}\right)^{13}}{481 b}$$

Result (type 1, 160 leaves):

$$\frac{a^{12} x^{37}}{37}+\frac{6}{37} a^{11} b x^{74}+\frac{22}{37} a^{10} b^2 x^{111}+\frac{55}{37} a^9 b^3 x^{148}+\frac{99}{37} a^8 b^4 x^{185}+\frac{132}{37} a^7 b^5 x^{222}+\frac{132}{37} a^6 b^6 x^{259}+\frac{99}{37} a^5 b^7 x^{296}+\frac{55}{37} a^4 b^8 x^{333}+\frac{22}{37} a^3 b^9 x^{370}+\frac{6}{37} a^2 b^{10} x^{407}+\frac{1}{37} a b^{11} x^{444}+\frac{b^{12} x^{481}}{481}$$

Problem 378: Unable to integrate problem.

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

Optimal (type 3, 117 leaves, 5 steps):

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

Result (type 8, 25 leaves):

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

Problem 380: Unable to integrate problem.

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

Optimal (type 3, 122 leaves, 5 steps):

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

Result (type 8, 25 leaves):

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

Problem 392: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 37 leaves, 2 steps):

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

Result (type 3, 78 leaves):

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

Problem 396: Result more than twice size of optimal antiderivative.

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

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

$$-\frac{2 \operatorname{ArcTanh}\left[\frac{\sqrt{a}}{x \sqrt{\frac{a}{x^2}+b x^n}}\right]}{\sqrt{a} \; c^2 \; (2+n)}$$

Result (type 3, 81 leaves):

$$\frac{2 \sqrt{a + b x^{2+n}} \left(\operatorname{Log}\left[x^{\frac{2+n}{2}}\right] - \operatorname{Log}\left[a + \sqrt{a} \; \sqrt{a + b x^{2+n}}\right]\right)}{\sqrt{a} \; c^2 \; (2+n) \; x \sqrt{\frac{a}{x^2} + b x^n}}$$

Problem 409: Unable to integrate problem.

$$\int \frac{1}{\sqrt{\frac{a+b x^5}{x^3}}} \, dx$$

Optimal (type 3, 32 leaves, 3 steps):

$$\frac{2 \operatorname{ArcTanh}\left[\frac{\sqrt{b} \; x}{\sqrt{\frac{a}{x^3}+b x^2}}\right]}{5 \sqrt{b}}$$

Result (type 8, 17 leaves):

$$\int \frac{1}{\sqrt{\frac{a+b x^5}{x^3}}} \, dx$$

Problem 410: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 37 leaves, 3 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x}{\sqrt{b\,x^2+a\,x^{2-n}}}\right]}{\sqrt{b}\,n}$$

Result (type 3, 76 leaves):

$$\frac{2\,x^{\frac{2-n}{2}}\,\sqrt{a+b\,x^n}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,x^{n/2}}{\sqrt{a+b\,x^n}}\right]}{\sqrt{b}\,n\,\sqrt{x^{2-n}\left(a+b\,x^n\right)}}$$

Problem 413: Unable to integrate problem.

$$\int \frac{1}{\sqrt{\frac{a-b\,x^5}{x^3}}}\,dx$$

Optimal (type 3, 33 leaves, 3 steps):

$$\frac{2\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{\frac{a}{x^3}-b\,x^2}}\right]}{5\,\sqrt{b}}$$

Result (type 8, 18 leaves):

$$\int \frac{1}{\sqrt{\frac{a-b\,x^5}{x^3}}}\,dx$$

Problem 415: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 37 leaves, 3 steps):

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

Result (type 3, 78 leaves):

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

Problem 416: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 37 leaves, 3 steps):

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

Result (type 3, 78 leaves):

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

Problem 417: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 37 leaves, 3 steps):

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

Result (type 3, 78 leaves):

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

Problem 418: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 38 leaves, 3 steps):

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

Result (type 3, 80 leaves):

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

Problem 419: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 38 leaves, 3 steps):

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

Result (type 3, 80 leaves):

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

Problem 420: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 38 leaves, 3 steps):

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

Result (type 3, 80 leaves):

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

Problem 421: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 107 leaves, 3 steps):

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

Result (type 5, 218 leaves):

$$\left(2\,(c\,x)^m\left((2+4j+2m-n)\,x^{-m}\left(a\,x^j+b\,x^n\right)\left(a\,(2-j+2m+4n)\,x^{1+j+m}+b\,(2+2j+2m+n)\,x^{1+m+n}\right)+\right.\right.$$
$$\left.\left.3\,a^2\,(j-n)^2\,x^{1+2j}\,\sqrt{1+\frac{a\,x^{j-n}}{b}}\;\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{2+4j+2m-n}{2j-2n},\,\frac{2+6j+2m-3n}{2j-2n},\,-\frac{a\,x^{j-n}}{b}\right]\right)\right)\Big/$$
$$\left((2+4j+2m-n)\,(2+2j+2m+n)\,(2+2m+3n)\,\sqrt{a\,x^j+b\,x^n}\right)$$

Problem 437: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 988 leaves, 11 steps):

$$-\frac{45\,a^2\left(a+2\,b\,x^{1/3}\right)\left(-\frac{b\left(a\,x^{1/3}+b\,x^{2/3}\right)}{a^2}\right)^{1/3}}{14\times 2^{1/3}\,b^3\left(1-\sqrt{3}-2^{2/3}\left(-\frac{b\left(a+b\,x^{1/3}\right)x^{1/3}}{a^2}\right)^{1/3}\right)\left(a\,x^{1/3}+b\,x^{2/3}\right)^{1/3}}-\frac{45\,a\left(a+b\,x^{1/3}\right)x^{1/3}}{28\,b^2\left(a\,x^{1/3}+b\,x^{2/3}\right)^{1/3}}+\frac{9\left(a+b\,x^{1/3}\right)x^{2/3}}{7\,b\left(a\,x^{1/3}+b\,x^{2/3}\right)^{1/3}}-$$

$$\left(45\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^4\left(1-2^{2/3}\left(-\frac{b\left(a+b\,x^{1/3}\right)x^{1/3}}{a^2}\right)^{1/3}\right)\sqrt{\frac{1+2^{2/3}\left(-\frac{b\left(a+b\,x^{1/3}\right)x^{1/3}}{a^2}\right)^{1/3}+2\times 2^{1/3}\left(-\frac{b\left(a+b\,x^{1/3}\right)x^{1/3}}{a^2}\right)^{2/3}}{\left(1-\sqrt{3}-2^{2/3}\left(-\frac{b\left(a+b\,x^{1/3}\right)x^{1/3}}{a^2}\right)^{1/3}\right)^2}}\right.$$

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

$$\left(28\times 2^{1/3}\,b^3\sqrt{-\frac{1-2^{2/3}\left(-\frac{b\left(a+b\,x^{1/3}\right)x^{1/3}}{a^2}\right)^{1/3}}{\left(1-\sqrt{3}-2^{2/3}\left(-\frac{b\left(a+b\,x^{1/3}\right)x^{1/3}}{a^2}\right)^{1/3}\right)^2}}\;\left(a+2\,b\,x^{1/3}\right)\left(a\,x^{1/3}+b\,x^{2/3}\right)^{1/3}\right)+$$

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

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

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

Result (type 5, 99 leaves) :

$$\frac{9\left(-5 a^2 x^{1/3}-a b x^{2/3}+4 b^2 x+5 a^2\left(1+\frac{b x^{1/3}}{a}\right)^{1/3} x^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},-\frac{b x^{1/3}}{a}\right]\right)}{28 b^2\left(\left(a+b x^{1/3}\right) x^{1/3}\right)^{1/3}}$$

Problem 438: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 487 leaves, 9 steps) :

$$-\frac{18\,a\,\left(a+b\,x^{1/3}\right)\,x^{1/3}}{5\,b^2\,\left(a\,x^{1/3}+b\,x^{2/3}\right)^{2/3}}+\frac{9\,\left(a+b\,x^{1/3}\right)\,x^{2/3}}{5\,b\,\left(a\,x^{1/3}+b\,x^{2/3}\right)^{2/3}}+$$

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

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

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

Result (type 5, 98 leaves):

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

Problem 453: Result more than twice size of optimal antiderivative.

$$\int x^{-1+n-p\,(1+q)}\,\left(a\,x^n+b\,x^p\right)^q\,dx$$

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

$$\frac{x^{-p\,(1+q)}\,\left(a\,x^n+b\,x^p\right)^{1+q}}{a\,(n-p)\,(1+q)}$$

Result (type 3, 100 leaves):

$$\frac{x^{-p\,(1+q)}\,\left(1+\frac{a\,x^{n-p}}{b}\right)^{-q}\,\left(a\,x^n+b\,x^p\right)^q\,\left(a\,x^n\,\left(1+\frac{a\,x^{n-p}}{b}\right)^q+b\,x^p\,\left(-1+\left(1+\frac{a\,x^{n-p}}{b}\right)^q\right)\right)}{a\,(n-p)\,(1+q)}$$

Test results for the 298 problems in "1.1.4.3 (e x)^m (a x^j+b x^k)^p (c+d x^n)^q.m"

Problem 220: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 243 leaves, 7 steps):

$$\frac{4 b^2 (3 b B - 5 A c) \sqrt{b x^2 + c x^4}}{231 c^3 \sqrt{x}} - \frac{4 b (3 b B - 5 A c) x^{3/2} \sqrt{b x^2 + c x^4}}{385 c^2} - \frac{2 (3 b B - 5 A c) x^{7/2} \sqrt{b x^2 + c x^4}}{55 c} + \frac{2 B x^{3/2} \left(b x^2 + c x^4\right)^{3/2}}{15 c} - \frac{2 b^{11/4} (3 b B - 5 A c) x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{231 c^{13/4} \sqrt{b x^2 + c x^4}}$$

Result (type 4, 177 leaves):

$$\frac{1}{1155 c^3} 2 \sqrt{x^2 \left(b + c x^2\right)} \left(\frac{30 b^3 B + 2 b c^2 x^2 \left(15 A + 7 B x^2\right) - 2 b^2 c \left(25 A + 9 B x^2\right) + 7 c^3 x^4 \left(15 A + 11 B x^2\right)}{\sqrt{x}} + \frac{10\, i\, b^3 (-3 b B + 5 A c) \sqrt{1 + \frac{b}{c x^2}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \left(b + c x^2\right)}\right)$$

Problem 221: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 369 leaves, 8 steps):

$$\frac{4 b^2 (7 b B - 13 A c) x^{3/2} (b + c x^2)}{195 c^{5/2} \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{b x^2 + c x^4}} - \frac{4 b (7 b B - 13 A c) \sqrt{x} \sqrt{b x^2 + c x^4}}{585 c^2} - \frac{2 (7 b B - 13 A c) x^{5/2} \sqrt{b x^2 + c x^4}}{117 c} +$$

$$\frac{2 B \sqrt{x} (b x^2 + c x^4)^{3/2}}{13 c} - \frac{4 b^{9/4} (7 b B - 13 A c) x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{195 c^{11/4} \sqrt{b x^2 + c x^4}} +$$

$$\frac{2 b^{9/4} (7 b B - 13 A c) x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{195 c^{11/4} \sqrt{b x^2 + c x^4}}$$

Result (type 4, 273 leaves):

$$\frac{1}{195 x} \sqrt{x^2 (b + c x^2)} \left(\frac{2 x^{3/2} \left(-14 b^2 B + 2 b c (13 A + 5 B x^2) + 5 c^2 x^2 (13 A + 9 B x^2)\right)}{3 c^2} + \frac{1}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^3 \sqrt{x} (b + c x^2)} 4 b^2 (7 b B - 13 A c) \left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} (b + c x^2) - \right.\right.$$

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

Problem 222: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{x} (A + B x^2) \sqrt{b x^2 + c x^4}\, dx$$

Optimal (type 4, 204 leaves, 6 steps):

$$-\frac{4 b (5 b B - 11 A c) \sqrt{b x^2 + c x^4}}{231 c^2 \sqrt{x}} - \frac{2 (5 b B - 11 A c) x^{3/2} \sqrt{b x^2 + c x^4}}{77 c} +$$

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

Result (type 4, 159 leaves):

$$\frac{1}{231}\sqrt{x^2\left(b+c x^2\right)}\left(\frac{-20 b^2 B+4 b c\left(11 A+3 B x^2\right)+6 c^2 x^2\left(11 A+7 B x^2\right)}{c^2 \sqrt{x}}+\frac{4 i b^2 (5 b B-11 A c) \sqrt{1+\frac{b}{c x^2}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^2\left(b+c x^2\right)}\right)$$

Problem 223: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 326 leaves, 7 steps):

$$-\frac{4 b (b B-3 A c) x^{3/2}\left(b+c x^2\right)}{15 c^{3/2}\left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}-\frac{2 (b B-3 A c) \sqrt{x} \sqrt{b x^2+c x^4}}{15 c}+$$

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

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

Result (type 4, 247 leaves):

$$\frac{1}{15 x}\sqrt{x^2\left(b+c x^2\right)}\left(\frac{2 x^{3/2}\left(2 b B+9 A c+5 B c x^2\right)}{3 c}-\frac{1}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^2 \sqrt{x}\left(b+c x^2\right)} 4 b (b B-3 A c)\left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\left(b+c x^2\right)-\right.\right.$$

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

Problem 224: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 165 leaves, 5 steps):

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

Result (type 4, 134 leaves):

$$\frac{1}{21} \sqrt{x^2 \left(b+c x^2\right)} \left(\frac{2 \left(2 b B+7 A c+3 B c x^2\right)}{c \sqrt{x}}-\frac{4 i b (b B-7 A c) \sqrt{1+\frac{b}{c x^2}} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} c \left(b+c x^2\right)}\right)$$

Problem 225: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 323 leaves, 7 steps):

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

Result (type 4, 218 leaves):

$$\frac{1}{5x}\sqrt{x^2\left(b+c x^2\right)}\left(\frac{2\left(2 b B+5 A c+B c x^2\right)}{c\sqrt{x}}+\frac{4\,\mathrm{i}\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}\left(b B+5 A c\right)\sqrt{1+\frac{b}{c x^2}}\;x\,\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{b+c x^2}-\frac{4\,\mathrm{i}\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}\left(b B+5 A c\right)\sqrt{1+\frac{b}{c x^2}}\;x\,\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{b+c x^2}\right)$$

Problem 226: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(A+B x^2\right)\sqrt{b x^2+c x^4}}{x^{7/2}}\,dx$$

Optimal (type 4, 163 leaves, 5 steps):

$$\frac{2\left(b B+A c\right)\sqrt{b x^2+c x^4}}{3 b\sqrt{x}}-\frac{2 A\left(b x^2+c x^4\right)^{3/2}}{3 b x^{9/2}}+\frac{2\left(b B+A c\right)x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\mathrm{EllipticF}\left[2\,\mathrm{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{3 b^{1/4} c^{1/4}\sqrt{b x^2+c x^4}}$$

Result (type 4, 119 leaves):

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

Problem 227: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(A+B x^2\right)\sqrt{b x^2+c x^4}}{x^{9/2}}\,dx$$

Optimal (type 4, 328 leaves, 7 steps):

$$\frac{4\sqrt{c}\,(5bB+Ac)\,x^{3/2}\,(b+c x^2)}{5b\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b x^2+c x^4}}-\frac{2\,(5bB+Ac)\sqrt{b x^2+c x^4}}{5b\,x^{3/2}}-\frac{2A\,(b x^2+c x^4)^{3/2}}{5b\,x^{11/2}}-\frac{4c^{1/4}\,(5bB+Ac)\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{5b^{3/4}\sqrt{b x^2+c x^4}}+\frac{2c^{1/4}\,(5bB+Ac)\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{5b^{3/4}\sqrt{b x^2+c x^4}}$$

Result (type 4, 219 leaves):

$$\left(2\left(\sqrt{b}\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,(-A+5Bx^2)\,(b+c x^2)-2\sqrt{c}\,(5bB+Ac)\sqrt{1+\frac{b}{c x^2}}\,x^{7/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]+2\sqrt{c}\,(5bB+Ac)\sqrt{1+\frac{b}{c x^2}}\,x^{7/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(5\sqrt{b}\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,x^{3/2}\sqrt{x^2\,(b+c x^2)}\right)$$

Problem 228: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(A+Bx^2)\sqrt{b x^2+c x^4}}{x^{11/2}}\,dx$$

Optimal (type 4, 167 leaves, 5 steps):

$$-\frac{2\,(7bB-Ac)\sqrt{b x^2+c x^4}}{21b\,x^{5/2}}-\frac{2A\,(b x^2+c x^4)^{3/2}}{7b\,x^{13/2}}+\frac{2c^{3/4}\,(7bB-Ac)\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{21b^{5/4}\sqrt{b x^2+c x^4}}$$

Result (type 4, 138 leaves):

$$\frac{1}{21}\sqrt{x^2\left(b+c x^2\right)}\left(-\frac{2\left(3 A b+7 b B x^2+2 A c x^2\right)}{b x^{9/2}}+\frac{4 \mathrm{i} c (7 b B-A c) \sqrt{1+\frac{b}{c x^2}}\, \text{EllipticF}\left[\mathrm{i} \,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{b \sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}\left(b+c x^2\right)}\right)$$

Problem 229: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(A+B x^2\right) \sqrt{b x^2+c x^4}}{x^{13/2}} \, dx$$

Optimal (type 4, 369 leaves, 8 steps):

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

Result (type 4, 241 leaves):

$$-\left(\left(2\left(\sqrt{\frac{\mathrm{i}\sqrt{c}\, x}{\sqrt{b}}}\left(b+c x^2\right)\left(9 b B x^2\left(b+2 c x^2\right)+A\left(5 b^2+2 b c x^2-6 c^2 x^4\right)\right)-\right.\right.\right.$$
$$6 \sqrt{b}\, c^{3/2} (3 b B-A c) x^5 \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticE}\left[\mathrm{i} \,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}\, x}{\sqrt{b}}}\right],-1\right]+$$
$$\left.\left.\left.6 \sqrt{b}\, c^{3/2} (3 b B-A c) x^5 \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticF}\left[\mathrm{i} \,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}\, x}{\sqrt{b}}}\right],-1\right]\right)\right) \Big/ \left(45 b^2 x^{7/2} \sqrt{\frac{\mathrm{i}\sqrt{c}\, x}{\sqrt{b}}} \sqrt{x^2\left(b+c x^2\right)}\right)\right)$$

Problem 230: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(A+B x^2\right) \sqrt{b x^2+c x^4}}{x^{15/2}}\, dx$$

Optimal (type 4, 204 leaves, 6 steps):

$$-\frac{2 (11 b B-5 A c) \sqrt{b x^2+c x^4}}{77 b x^{9/2}}-\frac{4 c (11 b B-5 A c) \sqrt{b x^2+c x^4}}{231 b^2 x^{5/2}}-\frac{2 A \left(b x^2+c x^4\right)^{3/2}}{11 b x^{17/2}}-\frac{2 c^{7/4} (11 b B-5 A c)\, x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{231 b^{9/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 158 leaves):

$$\frac{1}{231 b^2} 2 \sqrt{x^2 \left(b+c x^2\right)} \left(\frac{-11 b B x^2 \left(3 b+2 c x^2\right)+A \left(-21 b^2-6 b c x^2+10 c^2 x^4\right)}{x^{13/2}}+\frac{2 i c^2 (-11 b B+5 A c) \sqrt{1+\frac{b}{c x^2}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, \left(b+c x^2\right)}\right)$$

Problem 231: Result unnecessarily involves imaginary or complex numbers.

$$\int x^{7/2} \left(A+B x^2\right) \left(b x^2+c x^4\right)^{3/2} dx$$

Optimal (type 4, 486 leaves, 11 steps):

$$\frac{88\,b^5\,(3\,b\,B-5\,A\,c)\,x^{3/2}\,(b+c\,x^2)}{16575\,c^{9/2}\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{b\,x^2+c\,x^4}}-\frac{88\,b^4\,(3\,b\,B-5\,A\,c)\,\sqrt{x}\,\sqrt{b\,x^2+c\,x^4}}{49725\,c^4}+\frac{88\,b^3\,(3\,b\,B-5\,A\,c)\,x^{5/2}\,\sqrt{b\,x^2+c\,x^4}}{69615\,c^3}-$$

$$\frac{8\,b^2\,(3\,b\,B-5\,A\,c)\,x^{9/2}\,\sqrt{b\,x^2+c\,x^4}}{7735\,c^2}-\frac{4\,b\,(3\,b\,B-5\,A\,c)\,x^{13/2}\,\sqrt{b\,x^2+c\,x^4}}{595\,c}-\frac{2\,(3\,b\,B-5\,A\,c)\,x^{9/2}\,(b\,x^2+c\,x^4)^{3/2}}{105\,c}+$$

$$\frac{2\,B\,x^{5/2}\,(b\,x^2+c\,x^4)^{5/2}}{25\,c}-\frac{88\,b^{21/4}\,(3\,b\,B-5\,A\,c)\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{16575\,c^{19/4}\,\sqrt{b\,x^2+c\,x^4}}+$$

$$\frac{44\,b^{21/4}\,(3\,b\,B-5\,A\,c)\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{16575\,c^{19/4}\,\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 332 leaves) :

$$\frac{1}{348075\,c^5\,x^3\,(b+c\,x^2)^2}$$

$$2\,\left(x^2\,(b+c\,x^2)\right)^{3/2}\left(\frac{1}{\sqrt{x}}(b+c\,x^2)\,\left(2772\,b^6\,B-924\,b^5\,c\,(5\,A+B\,x^2)+220\,b^4\,c^2\,x^2\,(7\,A+3\,B\,x^2)+36\,b^2\,c^4\,x^6\,(25\,A+13\,B\,x^2)+663\,c^6\,x^{10}\,(25\,A+21\,B\,x^2)-\right.\right.$$

$$\left.20\,b^3\,c^3\,x^4\,(55\,A+27\,B\,x^2)+39\,b\,c^5\,x^8\,(575\,A+459\,B\,x^2)\right)+924\,i\,b^5\,\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\,c\,(3\,b\,B-5\,A\,c)\,\sqrt{1+\frac{b}{c\,x^2}}\,x$$

$$\left.\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]-924\,i\,b^5\,\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\,c\,(3\,b\,B-5\,A\,c)\,\sqrt{1+\frac{b}{c\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 232: Result unnecessarily involves imaginary or complex numbers.

$$\int x^{5/2}\,(A+B\,x^2)\,(b\,x^2+c\,x^4)^{3/2}\,dx$$

Optimal (type 4, 321 leaves, 9 steps) :

$$-\frac{24\,b^4\,(13\,b\,B-23\,A\,c)\,\sqrt{b\,x^2+c\,x^4}}{33\,649\,c^4\,\sqrt{x}}+\frac{72\,b^3\,(13\,b\,B-23\,A\,c)\,x^{3/2}\,\sqrt{b\,x^2+c\,x^4}}{168\,245\,c^3}-\frac{8\,b^2\,(13\,b\,B-23\,A\,c)\,x^{7/2}\,\sqrt{b\,x^2+c\,x^4}}{24\,035\,c^2}-\frac{4\,b\,(13\,b\,B-23\,A\,c)\,x^{11/2}\,\sqrt{b\,x^2+c\,x^4}}{2185\,c}-\frac{2\,(13\,b\,B-23\,A\,c)\,x^{7/2}\,(b\,x^2+c\,x^4)^{3/2}}{437\,c}+\frac{2\,B\,x^{3/2}\,(b\,x^2+c\,x^4)^{5/2}}{23\,c}+\frac{12\,b^{19/4}\,(13\,b\,B-23\,A\,c)\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]}{33\,649\,c^{17/4}\,\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 219 leaves) :

$$\frac{1}{168\,245\,c^4}\,2\,\sqrt{x^2\,(b+c\,x^2)}\left(\frac{1}{\sqrt{x}}\left(-780\,b^5\,B+28\,b^2\,c^3\,x^4\,(23\,A+11\,B\,x^2)+385\,c^5\,x^8\,(23\,A+19\,B\,x^2)+12\,b^4\,c\,(115\,A+39\,B\,x^2)-4\,b^3\,c^2\,x^2\,(207\,A+91\,B\,x^2)+77\,b\,c^4\,x^6\,(161\,A+125\,B\,x^2)\right)+\frac{60\,i\,b^5\,(13\,b\,B-23\,A\,c)\,\sqrt{1+\frac{b}{c\,x^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],\,-1\right]}{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\,(b+c\,x^2)}\right)$$

Problem 233: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 447 leaves, 10 steps) :

$$-\frac{8 b^4 (11 b B-21 A c) x^{3/2} (b+c x^2)}{3315 c^{7/2} (\sqrt{b}+\sqrt{c} x) \sqrt{b x^2+c x^4}}+\frac{8 b^3 (11 b B-21 A c) \sqrt{x} \sqrt{b x^2+c x^4}}{9945 c^3}-\frac{8 b^2 (11 b B-21 A c) x^{5/2} \sqrt{b x^2+c x^4}}{13923 c^2}-\frac{4 b (11 b B-21 A c) x^{9/2} \sqrt{b x^2+c x^4}}{1547 c}-\frac{2 (11 b B-21 A c) x^{5/2} (b x^2+c x^4)^{3/2}}{357 c}+\frac{2 B \sqrt{x} (b x^2+c x^4)^{5/2}}{21 c}+\frac{8 b^{17/4} (11 b B-21 A c) x (\sqrt{b}+\sqrt{c} x) \sqrt{\frac{b+c x^2}{(\sqrt{b}+\sqrt{c} x)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{3315 c^{15/4} \sqrt{b x^2+c x^4}}-\frac{4 b^{17/4} (11 b B-21 A c) x (\sqrt{b}+\sqrt{c} x) \sqrt{\frac{b+c x^2}{(\sqrt{b}+\sqrt{c} x)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{3315 c^{15/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 313 leaves):

$$\frac{1}{69615 c^4 x^3 (b+c x^2)^2} 2 (x^2 (b+c x^2))^{3/2} \left(c x^{3/2} (b+c x^2) (28 b^3 (11 b B-21 A c)-20 b^2 c (11 b B-21 A c) x^2+45 b c^2 (4 b B+133 A c) x^4+195 c^3 (23 b B+21 A c) x^6+3315 B c^4 x^8)-\frac{1}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \sqrt{x}} 84 b^4 (11 b B-21 A c) \left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} (b+c x^2)-\sqrt{b} \sqrt{c} \sqrt{1+\frac{b}{c x^2}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]+\sqrt{b} \sqrt{c} \sqrt{1+\frac{b}{c x^2}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right)\right)$$

Problem 234: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{x} (A+B x^2) (b x^2+c x^4)^{3/2} \, dx$$

Optimal (type 4, 282 leaves, 8 steps):

$$\frac{8 b^3 (9 b B-19 A c) \sqrt{b x^2+c x^4}}{4389 c^3 \sqrt{x}}-\frac{8 b^2 (9 b B-19 A c) x^{3/2} \sqrt{b x^2+c x^4}}{7315 c^2}-\frac{4 b (9 b B-19 A c) x^{7/2} \sqrt{b x^2+c x^4}}{1045 c}-$$

$$\frac{2 (9 b B-19 A c) x^{3/2} \left(b x^2+c x^4\right)^{3/2}}{285 c}+\frac{2 B \left(b x^2+c x^4\right)^{5/2}}{19 c \sqrt{x}}-\frac{4 b^{15/4} (9 b B-19 A c) x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{4389 c^{13/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 198 leaves):

$$\frac{1}{21945 c^3} 2 \sqrt{x^2 \left(b+c x^2\right)} \left(\frac{1}{\sqrt{x}} \left(180 b^4 B+12 b^2 c^2 x^2 \left(19 A+7 B x^2\right)+77 c^4 x^6 \left(19 A+15 B x^2\right)-4 b^3 c \left(95 A+27 B x^2\right)+7 b c^3 x^4 \left(323 A+231 B x^2\right)\right)+\right.$$

$$\left.\frac{20 i b^4 (-9 b B+19 A c) \sqrt{1+\frac{b}{c x^2}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \left(b+c x^2\right)}\right)$$

Problem 235: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 408 leaves, 9 steps):

$$\frac{8\,b^3\,(7\,b\,B-17\,A\,c)\,x^{3/2}\,(b+c\,x^2)}{1105\,c^{5/2}\,(\sqrt{b}+\sqrt{c}\,x)\,\sqrt{b\,x^2+c\,x^4}}-\frac{8\,b^2\,(7\,b\,B-17\,A\,c)\,\sqrt{x}\,\sqrt{b\,x^2+c\,x^4}}{3315\,c^2}-\frac{4\,b\,(7\,b\,B-17\,A\,c)\,x^{5/2}\,\sqrt{b\,x^2+c\,x^4}}{663\,c}-$$

$$\frac{2\,(7\,b\,B-17\,A\,c)\,\sqrt{x}\,(b\,x^2+c\,x^4)^{3/2}}{221\,c}+\frac{2\,B\,(b\,x^2+c\,x^4)^{5/2}}{17\,c\,x^{3/2}}-\frac{8\,b^{13/4}\,(7\,b\,B-17\,A\,c)\,x\,(\sqrt{b}+\sqrt{c}\,x)\,\sqrt{\frac{b+c\,x^2}{(\sqrt{b}+\sqrt{c}\,x)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{1105\,c^{11/4}\,\sqrt{b\,x^2+c\,x^4}}+$$

$$\frac{4\,b^{13/4}\,(7\,b\,B-17\,A\,c)\,x\,(\sqrt{b}+\sqrt{c}\,x)\,\sqrt{\frac{b+c\,x^2}{(\sqrt{b}+\sqrt{c}\,x)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{1105\,c^{11/4}\,\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 303 leaves) :

$$\frac{1}{1105\,x^3}\left(x^2\,(b+c\,x^2)\right)^{3/2}\left(\frac{2\,x^{3/2}\,\left(-28\,b^3\,B+4\,b^2\,c\,(17\,A+5\,B\,x^2)+15\,c^3\,x^4\,(17\,A+13\,B\,x^2)+5\,b\,c^2\,x^2\,(85\,A+57\,B\,x^2)\right)}{3\,c^2\,(b+c\,x^2)}+\right.$$

$$\left(8\,b^3\,(7\,b\,B-17\,A\,c)\left(\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\,(b+c\,x^2)-\sqrt{b}\,\sqrt{c}\,\sqrt{1+\frac{b}{c\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]+\right.\right.$$

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

Problem 236: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 239 leaves, 7 steps) :

$$-\frac{8 b^2 (b B-3 A c) \sqrt{b x^2+c x^4}}{231 c^2 \sqrt{x}}-\frac{4 b (b B-3 A c) x^{3/2} \sqrt{b x^2+c x^4}}{77 c}-\frac{2 (b B-3 A c) \left(b x^2+c x^4\right)^{3/2}}{33 c \sqrt{x}}+$$
$$\frac{2 B \left(b x^2+c x^4\right)^{5/2}}{15 c x^{5/2}}+\frac{4 b^{11/4} (b B-3 A c) x \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{231 c^{9/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 174 leaves) :

$$\frac{1}{1155 c^2}2 \sqrt{x^2 \left(b+c x^2\right)} \left(\frac{-20 b^3 B+12 b^2 c \left(5 A+B x^2\right)+7 c^3 x^4 \left(15 A+11 B x^2\right)+b c^2 x^2 \left(195 A+119 B x^2\right)}{\sqrt{x}}+\right.$$
$$\left.\frac{20 i b^3 (b B-3 A c) \sqrt{1+\frac{b}{c x^2}} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \left(b+c x^2\right)}\right)$$

Problem 237: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 369 leaves, 8 steps) :

$$-\frac{8 b^2 (3 b B-13 A c) x^{3/2} (b+c x^2)}{195 c^{3/2} (\sqrt{b}+\sqrt{c} x) \sqrt{b x^2+c x^4}}-\frac{4 b (3 b B-13 A c) \sqrt{x} \sqrt{b x^2+c x^4}}{195 c}-\frac{2 (3 b B-13 A c) (b x^2+c x^4)^{3/2}}{117 c x^{3/2}}+$$

$$\frac{2 B (b x^2+c x^4)^{5/2}}{13 c x^{7/2}}+\frac{8 b^{9/4} (3 b B-13 A c) x (\sqrt{b}+\sqrt{c} x) \sqrt{\frac{b+c x^2}{(\sqrt{b}+\sqrt{c} x)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{195 c^{7/4} \sqrt{b x^2+c x^4}}-$$

$$\frac{4 b^{9/4} (3 b B-13 A c) x (\sqrt{b}+\sqrt{c} x) \sqrt{\frac{b+c x^2}{(\sqrt{b}+\sqrt{c} x)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{195 c^{7/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 281 leaves):

$$\frac{1}{195 x^3}$$

$$(x^2 (b+c x^2))^{3/2} \left(\frac{2 x^{3/2} (12 b^2 B+5 c^2 x^2 (13 A+9 B x^2)+b c (143 A+75 B x^2))}{3 c (b+c x^2)}-\left(8 b^2 (3 b B-13 A c) \left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} (b+c x^2)-\sqrt{b} \sqrt{c} \sqrt{1+\frac{b}{c x^2}} x^{3/2}\right.\right.\right.$$

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

Problem 238: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 201 leaves, 6 steps):

$$-\frac{4 b (b B-11 A c) \sqrt{b x^2+c x^4}}{77 c \sqrt{x}}-\frac{2 (b B-11 A c) (b x^2+c x^4)^{3/2}}{77 c x^{5/2}}+$$

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

Result (type 4, 153 leaves):

$$\frac{2\sqrt{x^2\left(b+c x^2\right)}\left(\frac{4 b^2 B+c^2 x^2\left(11 A+7 B x^2\right)+b c\left(33 A+13 B x^2\right)}{\sqrt{x}}-\frac{4 i b^2 (b B-11 A c)\sqrt{1+\frac{b}{c x^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\left(b+c x^2\right)}\right)}{77 c}$$

Problem 239: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(A+B x^2\right)\left(b x^2+c x^4\right)^{3/2}}{x^{9/2}}\,dx$$

Optimal (type 4, 356 leaves, 8 steps):

$$\frac{8 b (b B+9 A c) x^{3/2}\left(b+c x^2\right)}{15\sqrt{c}\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b x^2+c x^4}}+\frac{4}{15}(b B+9 A c)\sqrt{x}\sqrt{b x^2+c x^4}+\frac{2 (b B+9 A c)\left(b x^2+c x^4\right)^{3/2}}{9 b x^{3/2}}-$$

$$\frac{2 A\left(b x^2+c x^4\right)^{5/2}}{b x^{11/2}}-\frac{8 b^{5/4}(b B+9 A c)\, x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{15 c^{3/4}\sqrt{b x^2+c x^4}}+$$

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

Result (type 4, 249 leaves):

$$\left(2\sqrt{x}\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\left(b+c x^2\right)\left(12 b^2 B+c^2 x^2\left(9 A+5 B x^2\right)+b c\left(63 A+11 B x^2\right)\right)-\right.\right.$$

$$12 b^{3/2}\sqrt{c}\,(b B+9 A c)\sqrt{1+\frac{b}{c x^2}}\, x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]+$$

$$\left.\left.12 b^{3/2}\sqrt{c}\,(b B+9 A c)\sqrt{1+\frac{b}{c x^2}}\, x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(45\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,c\sqrt{x^2\left(b+c x^2\right)}\right)$$

Problem 240: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 200 leaves, 6 steps):

$$\frac{4 (3 b B+7 A c) \sqrt{b x^2+c x^4}}{21 \sqrt{x}}+\frac{2 (3 b B+7 A c) \left(b x^2+c x^4\right)^{3/2}}{21 b x^{5/2}}-\frac{2 A \left(b x^2+c x^4\right)^{5/2}}{3 b x^{13/2}}+$$
$$\frac{4 b^{3/4} (3 b B+7 A c) x \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{21 c^{1/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 138 leaves):

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

Problem 241: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(A+B x^2\right) \left(b x^2+c x^4\right)^{3/2}}{x^{13/2}} \, dx$$

Optimal (type 4, 354 leaves, 8 steps):

$$\frac{24 \sqrt{c} (b B+A c) x^{3/2} \left(b+c x^2\right)}{5 \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{b x^2+c x^4}}+\frac{12 c (b B+A c) \sqrt{x} \sqrt{b x^2+c x^4}}{5 b}-\frac{2 (b B+A c) \left(b x^2+c x^4\right)^{3/2}}{b x^{7/2}}-$$
$$\frac{2 A \left(b x^2+c x^4\right)^{5/2}}{5 b x^{15/2}}-\frac{24 b^{1/4} c^{1/4} (b B+A c) x \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{5 \sqrt{b x^2+c x^4}}+$$
$$\frac{12 b^{1/4} c^{1/4} (b B+A c) x \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{5 \sqrt{b x^2+c x^4}}$$

Result (type 4, 232 leaves):

$$\left(2\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\left(b+c x^2\right)\left(-A b+7 b B x^2+5 A c x^2+B c x^4\right)-12\sqrt{b}\sqrt{c}\left(b B+A c\right)\sqrt{1+\frac{b}{c x^2}}\,x^{7/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]+12\sqrt{b}\sqrt{c}\left(b B+A c\right)\sqrt{1+\frac{b}{c x^2}}\,x^{7/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(5\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,x^{3/2}\sqrt{x^2\left(b+c x^2\right)}\right)$$

Problem 242: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(A+B x^2\right)\left(b x^2+c x^4\right)^{3/2}}{x^{15/2}}\,dx$$

Optimal (type 4, 204 leaves, 6 steps):

$$\frac{4 c\left(7 b B+3 A c\right)\sqrt{b x^2+c x^4}}{21 b\sqrt{x}}-\frac{2\left(7 b B+3 A c\right)\left(b x^2+c x^4\right)^{3/2}}{21 b x^{9/2}}-\frac{2 A\left(b x^2+c x^4\right)^{5/2}}{7 b x^{17/2}}+\frac{4 c^{3/4}\left(7 b B+3 A c\right) x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{21 b^{1/4}\sqrt{b x^2+c x^4}}$$

Result (type 4, 139 leaves):

$$\frac{2}{21}\sqrt{x^2\left(b+c x^2\right)}\left(\frac{7 B x^2\left(-b+c x^2\right)-3 A\left(b+3 c x^2\right)}{x^{9/2}}+\frac{4 i c\left(7 b B+3 A c\right)\sqrt{1+\frac{b}{c x^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\left(b+c x^2\right)}\right)$$

Problem 243: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(A+B x^2\right)\left(b x^2+c x^4\right)^{3/2}}{x^{17/2}}\,dx$$

Optimal (type 4, 364 leaves, 8 steps):

$$\frac{8 c^{3/2} (9 b B + A c) x^{3/2} (b + c x^2)}{15 b \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{b x^2 + c x^4}} - \frac{4 c (9 b B + A c) \sqrt{b x^2 + c x^4}}{15 b x^{3/2}} - \frac{2 (9 b B + A c) (b x^2 + c x^4)^{3/2}}{45 b x^{11/2}} -$$

$$\frac{2 A (b x^2 + c x^4)^{5/2}}{9 b x^{19/2}} - \frac{8 c^{5/4} (9 b B + A c) x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{15 b^{3/4} \sqrt{b x^2 + c x^4}} +$$

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

Result (type 4, 236 leaves):

$$-\left(\left(2 \left(\sqrt{b} \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} (b + c x^2) \left(9 B x^2 (b - 5 c x^2) + A (5 b + 11 c x^2)\right) + 12 c^{3/2} (9 b B + A c) \sqrt{1 + \frac{b}{c x^2}}\, x^{11/2}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right] - \right.\right.\right.$$

$$\left.\left.\left. 12 c^{3/2} (9 b B + A c) \sqrt{1 + \frac{b}{c x^2}}\, x^{11/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right)\right) \middle/ \left(45 \sqrt{b} \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, x^{7/2} \sqrt{x^2 (b + c x^2)}\right)\right)$$

Problem 244: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{13/2} (A + B x^2)}{\sqrt{b x^2 + c x^4}}\, dx$$

Optimal (type 4, 243 leaves, 7 steps):

$$-\frac{2 b^2 (13 b B - 15 A c) \sqrt{b x^2 + c x^4}}{77 c^4 \sqrt{x}} + \frac{6 b (13 b B - 15 A c) x^{3/2} \sqrt{b x^2 + c x^4}}{385 c^3} - \frac{2 (13 b B - 15 A c) x^{7/2} \sqrt{b x^2 + c x^4}}{165 c^2} +$$

$$\frac{2 B x^{11/2} \sqrt{b x^2 + c x^4}}{15 c} + \frac{b^{11/4} (13 b B - 15 A c) x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{77 c^{17/4} \sqrt{b x^2 + c x^4}}$$

Result (type 4, 196 leaves):

$$\left(-2\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\, x^{3/2}\left(b+c x^2\right)\left(195 b^3 B-7 c^3 x^4\left(15 A+11 B x^2\right)-9 b^2 c\left(25 A+13 B x^2\right)+b c^2 x^2\left(135 A+91 B x^2\right)\right)-\right.$$

$$\left.30\, i\, b^3\left(-13 b B+15 A c\right)\sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\Big/\left(1155\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\, c^4\sqrt{x^2\left(b+c x^2\right)}\right)$$

Problem 245: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 369 leaves, 8 steps):

$$-\frac{14 b^2\left(11 b B-13 A c\right) x^{3/2}\left(b+c x^2\right)}{195 c^{7/2}\left(\sqrt{b}+\sqrt{c}\, x\right)\sqrt{b x^2+c x^4}}+\frac{14 b\left(11 b B-13 A c\right)\sqrt{x}\sqrt{b x^2+c x^4}}{585 c^3}-\frac{2\left(11 b B-13 A c\right) x^{5/2}\sqrt{b x^2+c x^4}}{117 c^2}+$$

$$\frac{2 B x^{9/2}\sqrt{b x^2+c x^4}}{13 c}+\frac{14 b^{9/4}\left(11 b B-13 A c\right) x\left(\sqrt{b}+\sqrt{c}\, x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{195 c^{15/4}\sqrt{b x^2+c x^4}}-$$

$$\frac{7 b^{9/4}\left(11 b B-13 A c\right) x\left(\sqrt{b}+\sqrt{c}\, x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{195 c^{15/4}\sqrt{b x^2+c x^4}}$$

Result (type 4, 264 leaves):

$$\frac{1}{585\,c^4\sqrt{x^2\left(b+c\,x^2\right)}}\left(2\,x\left(c\,x^{3/2}\left(b+c\,x^2\right)\left(77\,b^2\,B+5\,c^2\,x^2\left(13\,A+9\,B\,x^2\right)-b\,c\left(91\,A+55\,B\,x^2\right)\right)-\frac{1}{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\sqrt{x}}21\,b^2\left(11\,b\,B-13\,A\,c\right)\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\left(b+c\,x^2\right)-\sqrt{b}\,\sqrt{c}\,\sqrt{1+\frac{b}{c\,x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]+\sqrt{b}\,\sqrt{c}\,\sqrt{1+\frac{b}{c\,x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)$$

Problem 246: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{9/2}\left(A+B\,x^2\right)}{\sqrt{b\,x^2+c\,x^4}}\,dx$$

Optimal (type 4, 204 leaves, 6 steps):

$$\frac{10\,b\left(9\,b\,B-11\,A\,c\right)\sqrt{b\,x^2+c\,x^4}}{231\,c^3\sqrt{x}}-\frac{2\left(9\,b\,B-11\,A\,c\right)x^{3/2}\sqrt{b\,x^2+c\,x^4}}{77\,c^2}+\frac{2\,B\,x^{7/2}\sqrt{b\,x^2+c\,x^4}}{11\,c}-\frac{5\,b^{7/4}\left(9\,b\,B-11\,A\,c\right)x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{231\,c^{13/4}\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 176 leaves):

$$\left(2\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,x^{3/2}\left(b+c\,x^2\right)\left(45\,b^2\,B+3\,c^2\,x^2\left(11\,A+7\,B\,x^2\right)-b\,c\left(55\,A+27\,B\,x^2\right)\right)+10\,i\,b^2\left(-9\,b\,B+11\,A\,c\right)\sqrt{1+\frac{b}{c\,x^2}}\,x^2\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\Bigg/\left(231\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,c^3\sqrt{x^2\left(b+c\,x^2\right)}\right)$$

Problem 247: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{7/2}\left(A+B x^2\right)}{\sqrt{b x^2+c x^4}}\,dx$$

Optimal (type 4, 330 leaves, 7 steps):

$$\frac{2 b (7 b B-9 A c) x^{3/2} \left(b+c x^2\right)}{15 c^{5/2} \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}-\frac{2 (7 b B-9 A c) \sqrt{x} \sqrt{b x^2+c x^4}}{45 c^2}+$$

$$\frac{2 B x^{5/2} \sqrt{b x^2+c x^4}}{9 c}-\frac{2 b^{5/4} (7 b B-9 A c) x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{15 c^{11/4} \sqrt{b x^2+c x^4}}+$$

$$\frac{b^{5/4} (7 b B-9 A c) x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{15 c^{11/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 237 leaves):

$$\frac{1}{45 c^3 \sqrt{x^2 \left(b+c x^2\right)}}\left(2 \sqrt{x} \left(b+c x^2\right) \left(21 b^2 B+c^2 x^2 \left(9 A+5 B x^2\right)-b c \left(27 A+7 B x^2\right)\right)+\right.$$

$$6\, i\, b \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c\, (7 b B-9 A c) \sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]-$$

$$\left.6\, i\, b \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c\, (7 b B-9 A c) \sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 248: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 167 leaves, 5 steps):

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

Result (type 4, 151 leaves):

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

$$\left(21\,\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\,c^2\,\sqrt{x^2\,\left(b+c\,x^2\right)}\right)$$

Problem 249: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 293 leaves, 6 steps):

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

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

Result (type 4, 209 leaves):

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

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

Problem 250: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{x}\,(A+B\,x^2)}{\sqrt{b\,x^2+c\,x^4}}\,dx$$

Optimal (type 4, 130 leaves, 4 steps):

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

Result (type 4, 134 leaves):

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

Problem 251: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{\sqrt{x}\,\sqrt{b\,x^2+c\,x^4}}\,dx$$

Optimal (type 4, 281 leaves, 6 steps):

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

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

Result (type 4, 191 leaves):

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

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

Problem 252: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{x^{3/2}\,\sqrt{b\,x^2+c\,x^4}}\,dx$$

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

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

Result (type 4, 119 leaves):

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

Problem 253: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{A+B x^2}{x^{5/2} \sqrt{b x^2+c x^4}} \, dx$$

Optimal (type 4, 332 leaves, 7 steps):

$$\frac{2 \sqrt{c} \left(5 b B-3 A c\right) x^{3/2} \left(b+c x^2\right)}{5 b^2 \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{b x^2+c x^4}}-\frac{2 A \sqrt{b x^2+c x^4}}{5 b x^{7/2}}-\frac{2 \left(5 b B-3 A c\right) \sqrt{b x^2+c x^4}}{5 b^2 x^{3/2}}-$$

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

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

Result (type 4, 222 leaves):

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

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

$$\left.b^2 x^{3/2} \sqrt{\frac{i \sqrt{c} x}{\sqrt{b}}} \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 254: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{A+B x^2}{x^{7/2} \sqrt{b x^2+c x^4}} \, dx$$

Optimal (type 4, 167 leaves, 5 steps):

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

Result (type 4, 156 leaves) :

$$\left(-2 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \left(b+c x^2\right) \left(3 A b+7 b B x^2-5 A c x^2\right)+2 i c (-7 b B+5 A c) \sqrt{1+\frac{b}{c x^2}} x^{9/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right) \Bigg/ \left(21 b^2 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} x^{5/2} \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 255: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{A+B x^2}{x^{9/2} \sqrt{b x^2+c x^4}} \, dx$$

Optimal (type 4, 369 leaves, 8 steps) :

$$-\frac{2 c^{3/2} (9 b B-7 A c) x^{3/2} \left(b+c x^2\right)}{15 b^3 \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{b x^2+c x^4}}-\frac{2 A \sqrt{b x^2+c x^4}}{9 b x^{11/2}}-\frac{2 (9 b B-7 A c) \sqrt{b x^2+c x^4}}{45 b^2 x^{7/2}}+$$

$$\frac{2 c (9 b B-7 A c) \sqrt{b x^2+c x^4}}{15 b^3 x^{3/2}}+\frac{2 c^{5/4} (9 b B-7 A c) x \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{15 b^{11/4} \sqrt{b x^2+c x^4}}-$$

$$\frac{c^{5/4} (9 b B-7 A c) x \left(\sqrt{b}+\sqrt{c} x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{15 b^{11/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 242 leaves) :

$$\left(2\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\,(b+c\,x^2)\,\left(-9\,b\,B\,x^2\,(b-3\,c\,x^2)+A\,(-5\,b^2+7\,b\,c\,x^2-21\,c^2\,x^4)\right)-\right.$$
$$6\sqrt{b}\,c^{3/2}\,(9\,b\,B-7\,A\,c)\,x^5\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+$$
$$\left.6\sqrt{b}\,c^{3/2}\,(9\,b\,B-7\,A\,c)\,x^5\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\Bigg/\left(45\,b^3\,x^{7/2}\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\,\sqrt{x^2\,(b+c\,x^2)}\right)$$

Problem 256: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,x^2}{x^{11/2}\sqrt{b\,x^2+c\,x^4}}\,dx$$

Optimal (type 4, 204 leaves, 6 steps):

$$-\frac{2\,A\sqrt{b\,x^2+c\,x^4}}{11\,b\,x^{13/2}}-\frac{2\,(11\,b\,B-9\,A\,c)\sqrt{b\,x^2+c\,x^4}}{77\,b^2\,x^{9/2}}+\frac{10\,c\,(11\,b\,B-9\,A\,c)\sqrt{b\,x^2+c\,x^4}}{231\,b^3\,x^{5/2}}+$$
$$\frac{5\,c^{7/4}\,(11\,b\,B-9\,A\,c)\,x\,(\sqrt{b}+\sqrt{c}\,x)\sqrt{\frac{b+c\,x^2}{(\sqrt{b}+\sqrt{c}\,x)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{231\,b^{13/4}\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 181 leaves):

$$\left(-2\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,(b+c\,x^2)\,\left(11\,b\,B\,x^2\,(3\,b-5\,c\,x^2)+3\,A\,(7\,b^2-9\,b\,c\,x^2+15\,c^2\,x^4)\right)-\right.$$
$$\left.10\,i\,c^2\,(-11\,b\,B+9\,A\,c)\sqrt{1+\frac{b}{c\,x^2}}\,x^{13/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\Bigg/\left(231\,b^3\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,x^{9/2}\sqrt{x^2\,(b+c\,x^2)}\right)$$

Problem 257: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{17/2} \left(A + B x^2\right)}{\left(b x^2 + c x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 251 leaves, 7 steps):

$$-\frac{(b B - A c) x^{15/2}}{b c \sqrt{b x^2 + c x^4}} + \frac{15 b (13 b B - 11 A c) \sqrt{b x^2 + c x^4}}{77 c^4 \sqrt{x}} - \frac{9 (13 b B - 11 A c) x^{3/2} \sqrt{b x^2 + c x^4}}{77 c^3} + \frac{(13 b B - 11 A c) x^{7/2} \sqrt{b x^2 + c x^4}}{11 b c^2} - \frac{15 b^{7/4} (13 b B - 11 A c) x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}} \, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{154 c^{17/4} \sqrt{b x^2 + c x^4}}$$

Result (type 4, 189 leaves):

$$\left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \, x^{3/2} \left(195 b^3 B + 2 c^3 x^4 \left(11 A + 7 B x^2\right) - 2 b c^2 x^2 \left(33 A + 13 B x^2\right) + b^2 \left(-165 A c + 78 B c x^2\right)\right) + 15 i b^2 (-13 b B + 11 A c) \sqrt{1 + \frac{b}{c x^2}} \, x^2 \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right) \Bigg/ \left(77 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \, c^4 \sqrt{x^2 \left(b + c x^2\right)}\right)$$

Problem 258: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{15/2} \left(A + B x^2\right)}{\left(b x^2 + c x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 377 leaves, 8 steps):

$$-\frac{(b B-A c)\, x^{13/2}}{b\, c\, \sqrt{b x^2+c x^4}}+\frac{7 b\, (11 b B-9 A c)\, x^{3/2}\, (b+c x^2)}{15\, c^{7/2}\, \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}-\frac{7\, (11 b B-9 A c)\, \sqrt{x}\, \sqrt{b x^2+c x^4}}{45\, c^3}+$$

$$\frac{(11 b B-9 A c)\, x^{5/2}\, \sqrt{b x^2+c x^4}}{9\, b\, c^2}-\frac{7\, b^{5/4}\, (11 b B-9 A c)\, x\, \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{15\, c^{15/4}\, \sqrt{b x^2+c x^4}}+$$

$$\frac{7\, b^{5/4}\, (11 b B-9 A c)\, x\, \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{30\, c^{15/4}\, \sqrt{b x^2+c x^4}}$$

Result (type 4, 263 leaves) :

$$\left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, \sqrt{x}\, \left(231 b^3 B-7 b^2 c\, (27 A-22 B x^2)+2 c^3 x^4\, (9 A+5 B x^2)-2 b c^2 x^2\, (63 A+11 B x^2)\right)+\right.$$

$$21 b^{3/2} \sqrt{c}\, (-11 b B+9 A c)\, \sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]-$$

$$\left.21 b^{3/2} \sqrt{c}\, (-11 b B+9 A c)\, \sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right) \Big/ \left(45 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^4\, \sqrt{x^2\, (b+c x^2)}\right)$$

Problem 259: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 214 leaves, 6 steps) :

$$-\frac{(b B-A c)\, x^{11/2}}{b c \sqrt{b x^2+c x^4}}-\frac{5 (9 b B-7 A c) \sqrt{b x^2+c x^4}}{21 c^3 \sqrt{x}}+\frac{(9 b B-7 A c)\, x^{3/2} \sqrt{b x^2+c x^4}}{7 b c^2}+$$

$$\frac{5 b^{3/4} (9 b B-7 A c)\, x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{42 c^{13/4} \sqrt{b x^2+c x^4}}$$

Result (type 4, 165 leaves) :

$$\left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, x^{3/2} \left(-45 b^2 B+b c \left(35 A-18 B x^2\right)+2 c^2 x^2 \left(7 A+3 B x^2\right)\right)-5 i b (-9 b B+7 A c) \sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right) \Big/$$

$$\left(21 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^3 \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 260: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 340 leaves, 7 steps) :

$$-\frac{(b B-A c)\, x^{9/2}}{b c \sqrt{b x^2+c x^4}}-\frac{3 (7 b B-5 A c)\, x^{3/2} \left(b+c x^2\right)}{5 c^{5/2} \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}+\frac{(7 b B-5 A c) \sqrt{x} \sqrt{b x^2+c x^4}}{5 b c^2}+$$

$$\frac{3 b^{1/4} (7 b B-5 A c)\, x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]}{5 c^{11/4} \sqrt{b x^2+c x^4}}-$$

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

Result (type 4, 240 leaves) :

$$\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\sqrt{x}\left(-21 b^2 B+b c\left(15 A-14 B x^2\right)+2 c^2 x^2\left(5 A+B x^2\right)\right)-3\sqrt{b}\sqrt{c}\left(-7 b B+5 A c\right)\sqrt{1+\frac{b}{c x^2}}\, x^2\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]+\right.$$

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

Problem 261: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{9/2}\left(A+B x^2\right)}{\left(b x^2+c x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 178 leaves, 5 steps):

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

Result (type 4, 142 leaves):

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

Problem 262: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{7/2}\left(A+B x^2\right)}{\left(b x^2+c x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 299 leaves, 6 steps):

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

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

Result (type 4, 213 leaves):

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

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

Problem 263: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 137 leaves, 4 steps):

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

Result (type 4, 132 leaves):

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

Problem 264: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 318 leaves, 7 steps):

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

Result (type 4, 203 leaves):

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

Problem 265: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 167 leaves, 5 steps):

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

Result (type 4, 147 leaves):

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

Problem 266: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 368 leaves, 8 steps):

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

$$\frac{3\left(5\,b\,B-7\,A\,c\right)\sqrt{b\,x^2+c\,x^4}}{5\,b^3\,x^{3/2}}-\frac{3\,c^{1/4}\left(5\,b\,B-7\,A\,c\right)x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{5\,b^{11/4}\sqrt{b\,x^2+c\,x^4}}+$$

$$\frac{3\,c^{1/4}\left(5\,b\,B-7\,A\,c\right)x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]}{10\,b^{11/4}\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 236 leaves):

$$\left(\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(-5\,b\,B\,x^2\left(2\,b+3\,c\,x^2\right)+A\left(-2\,b^2+14\,b\,c\,x^2+21\,c^2\,x^4\right)\right)+3\sqrt{b}\,\sqrt{c}\left(5\,b\,B-7\,A\,c\right)x^3\sqrt{1+\frac{c\,x^2}{b}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]-\right.$$

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

Problem 267: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 203 leaves, 6 steps):

$$-\frac{2\,A}{7\,b\,x^{5/2}\,\sqrt{b\,x^2+c\,x^4}}+\frac{7\,b\,B-9\,A\,c}{7\,b^2\,\sqrt{x}\,\sqrt{b\,x^2+c\,x^4}}-\frac{5\,(7\,b\,B-9\,A\,c)\,\sqrt{b\,x^2+c\,x^4}}{21\,b^3\,x^{5/2}}-$$
$$\frac{5\,c^{3/4}\,(7\,b\,B-9\,A\,c)\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]}{42\,b^{13/4}\,\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 170 leaves):

$$\left(\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\,\left(-7\,b\,B\,x^2\,\left(2\,b+5\,c\,x^2\right)+A\,\left(-6\,b^2+18\,b\,c\,x^2+45\,c^2\,x^4\right)\right)+5\,i\,c\,(-7\,b\,B+9\,A\,c)\,\sqrt{1+\frac{b}{c\,x^2}}\,x^{9/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],\,-1\right]\right)\Big/$$
$$\left(21\,b^3\,\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\,x^{5/2}\,\sqrt{x^2\,\left(b+c\,x^2\right)}\right)$$

Problem 268: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 405 leaves, 9 steps):

$$-\frac{2\,A}{9\,b\,x^{7/2}\,\sqrt{b\,x^2+c\,x^4}}+\frac{9\,b\,B-11\,A\,c}{9\,b^2\,x^{3/2}\,\sqrt{b\,x^2+c\,x^4}}-\frac{7\,c^{3/2}\,(9\,b\,B-11\,A\,c)\,x^{3/2}\,\left(b+c\,x^2\right)}{15\,b^4\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{b\,x^2+c\,x^4}}-\frac{7\,(9\,b\,B-11\,A\,c)\,\sqrt{b\,x^2+c\,x^4}}{45\,b^3\,x^{7/2}}+$$
$$\frac{7\,c\,(9\,b\,B-11\,A\,c)\,\sqrt{b\,x^2+c\,x^4}}{15\,b^4\,x^{3/2}}+\frac{7\,c^{5/4}\,(9\,b\,B-11\,A\,c)\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]}{15\,b^{15/4}\,\sqrt{b\,x^2+c\,x^4}}-$$
$$\frac{7\,c^{5/4}\,(9\,b\,B-11\,A\,c)\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]}{30\,b^{15/4}\,\sqrt{b\,x^2+c\,x^4}}$$

Result (type 4, 259 leaves):

$$\left(\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(9\,b\,B\,x^2\left(-2\,b^2+14\,b\,c\,x^2+21\,c^2\,x^4\right)-A\left(10\,b^3-22\,b^2\,c\,x^2+154\,b\,c^2\,x^4+231\,c^3\,x^6\right)\right)-\right.$$

$$21\sqrt{b}\,c^{3/2}\,(9\,b\,B-11\,A\,c)\,x^5\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+$$

$$\left.21\sqrt{b}\,c^{3/2}\,(9\,b\,B-11\,A\,c)\,x^5\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\Big/\left(45\,b^4\,x^{7/2}\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\sqrt{x^2\left(b+c\,x^2\right)}\right)$$

Problem 276: Result more than twice size of optimal antiderivative.

$$\int (e\,x)^m\,(c+d\,x^n)^q\,\left(a\,x^j+b\,x^{j+n}\right)^p\,dx$$

Optimal (type 6, 113 leaves, 4 steps):

$$\frac{1}{1+m+j\,p}x\,(e\,x)^m\left(1+\frac{b\,x^n}{a}\right)^{-p}(c+d\,x^n)^q\left(1+\frac{d\,x^n}{c}\right)^{-q}\left(a\,x^j+b\,x^{j+n}\right)^p\,\text{AppellF1}\left[\frac{1+m+j\,p}{n},-p,-q,\frac{1+m+n+j\,p}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]$$

Result (type 6, 267 leaves):

$$\left(a\,c\,(1+m+n+j\,p)\,x\,(e\,x)^m\left(x^j\,(a+b\,x^n)\right)^p(c+d\,x^n)^q\,\text{AppellF1}\left[\frac{1+m+j\,p}{n},-p,-q,\frac{1+m+n+j\,p}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\Big/$$

$$\left((1+m+j\,p)\left(a\,c\,(1+m+n+j\,p)\,\text{AppellF1}\left[\frac{1+m+j\,p}{n},-p,-q,\frac{1+m+n+j\,p}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+\right.\right.$$

$$n\,x^n\left(b\,c\,p\,\text{AppellF1}\left[\frac{1+m+n+j\,p}{n},1-p,-q,\frac{1+m+2\,n+j\,p}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+\right.$$

$$\left.\left.\left.a\,d\,q\,\text{AppellF1}\left[\frac{1+m+n+j\,p}{n},-p,1-q,\frac{1+m+2\,n+j\,p}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\right)\right)$$

Problem 277: Result more than twice size of optimal antiderivative.

$$\int (e\,x)^{7/4}\,(c+d\,x^n)^q\,\left(a\,x^j+b\,x^{j+n}\right)^{5/3}\,dx$$

Optimal (type 6, 129 leaves, 4 steps):

$$\frac{1}{(33+20\,j)\left(1+\frac{b\,x^n}{a}\right)^{2/3}}12\,a\,e\,x^{2+j}\,(e\,x)^{3/4}\,(c+d\,x^n)^q\left(1+\frac{d\,x^n}{c}\right)^{-q}\left(a\,x^j+b\,x^{j+n}\right)^{2/3}\,\text{AppellF1}\left[\frac{33+20\,j}{12\,n},-\frac{5}{3},-q,\frac{33+20\,j+12\,n}{12\,n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]$$

Result (type 6, 580 leaves):

$$\frac{1}{33+20j+12n} 12\,a\,c\,x^{1+j}\,(e\,x)^{7/4}\,\left(x^j\,(a+b\,x^n)\right)^{2/3}\,(c+d\,x^n)^q \left(\left(a\,(33+20j+12n)^2\,\text{AppellF1}\left[\frac{33+20j}{12n},-\frac{2}{3},-q,\frac{\frac{11}{4}+\frac{5j}{3}+n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\Big/\left((33+20j)\left(a\,c\,(33+20j+12n)\,\text{AppellF1}\left[\frac{33+20j}{12n},-\frac{2}{3},-q,\frac{33+20j+12n}{12n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+4\,n\,x^n\left(3\,a\,d\,q\,\text{AppellF1}\left[\frac{33+20j+12n}{12n},-\frac{2}{3},1-q,\frac{33+20j+24n}{12n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+2\,b\,c\,\text{AppellF1}\left[\frac{33+20j+12n}{12n},\frac{1}{3},-q,\frac{33+20j+24n}{12n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\right)\right)+\left(b\,(33+20j+24n)\,x^n\,\text{AppellF1}\left[\frac{33+20j+12n}{12n},-\frac{2}{3},-q,\frac{33+20j+24n}{12n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\Big/\left(a\,c\,(33+20j+24n)\,\text{AppellF1}\left[\frac{33+20j+12n}{12n},-\frac{2}{3},-q,\frac{33+20j+24n}{12n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+4\,n\,x^n\left(3\,a\,d\,q\,\text{AppellF1}\left[\frac{33+20j+24n}{12n},-\frac{2}{3},1-q,\frac{33+20j+36n}{12n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+2\,b\,c\,\text{AppellF1}\left[\frac{33+20j+24n}{12n},\frac{1}{3},-q,\frac{33+20j+36n}{12n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\right)\right)$$

Problem 282: Unable to integrate problem.

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

Optimal (type 5, 54 leaves, 4 steps):

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

Result (type 8, 27 leaves):

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

Problem 284: Unable to integrate problem.

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

Optimal (type 6, 64 leaves, 4 steps):

$$\frac{\left(a+\frac{b}{x}\right)^n \left(1+\frac{b}{a\,x}\right)^{-n} x^m\,\text{AppellF1}\left[-m,\,-n,\,1,\,1-m,\,-\frac{b}{a\,x},\,-\frac{c}{d\,x}\right]}{d\,m}$$

Result (type 8, 22 leaves) :

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

Problem 285: Unable to integrate problem.

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

Optimal (type 5, 195 leaves, 7 steps) :

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

Result (type 8, 22 leaves) :

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

Problem 286: Unable to integrate problem.

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

Optimal (type 5, 131 leaves, 6 steps) :

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

Result (type 8, 20 leaves) :

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

Problem 287: Unable to integrate problem.

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

Optimal (type 5, 101 leaves, 5 steps):

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

Result (type 8, 19 leaves):

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

Problem 288: Unable to integrate problem.

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

Optimal (type 5, 54 leaves, 3 steps):

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

Result (type 8, 22 leaves):

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

Problem 289: Unable to integrate problem.

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

Optimal (type 5, 84 leaves, 4 steps):

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

Result (type 8, 22 leaves):

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

Problem 290: Unable to integrate problem.

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

Optimal (type 5, 115 leaves, 5 steps):

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

Result (type 8, 22 leaves):

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

Problem 291: Unable to integrate problem.

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

Optimal (type 5, 207 leaves, 5 steps):

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

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

Result (type 8, 22 leaves):

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

Problem 292: Unable to integrate problem.

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

Optimal (type 6, 73 leaves, 4 steps):

$$-\frac{\left(a+\frac{b}{x}\right)^n \left(1+\frac{b}{a\,x}\right)^{-n} x^{-1+m}\,\text{AppellF1}\left[1-m,-n,2,2-m,-\frac{b}{a\,x},-\frac{c}{d\,x}\right]}{d^2\,(1-m)}$$

Result (type 8, 22 leaves):

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

Problem 293: Unable to integrate problem.

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

Optimal (type 5, 202 leaves, 7 steps):

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

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

Result (type 8, 22 leaves):

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

Problem 294: Unable to integrate problem.

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

Optimal (type 5, 150 leaves, 6 steps):

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

Result (type 8, 20 leaves):

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

Problem 295: Unable to integrate problem.

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

Optimal (type 5, 56 leaves, 3 steps):

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

Result (type 8, 19 leaves):

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

Problem 296: Unable to integrate problem.

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

Optimal (type 5, 105 leaves, 4 steps):

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

Result (type 8, 22 leaves):

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

Problem 297: Unable to integrate problem.

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

Optimal (type 5, 133 leaves, 5 steps):

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

Result (type 8, 22 leaves):

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

Problem 298: Unable to integrate problem.

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

Optimal (type 5, 217 leaves, 5 steps):

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

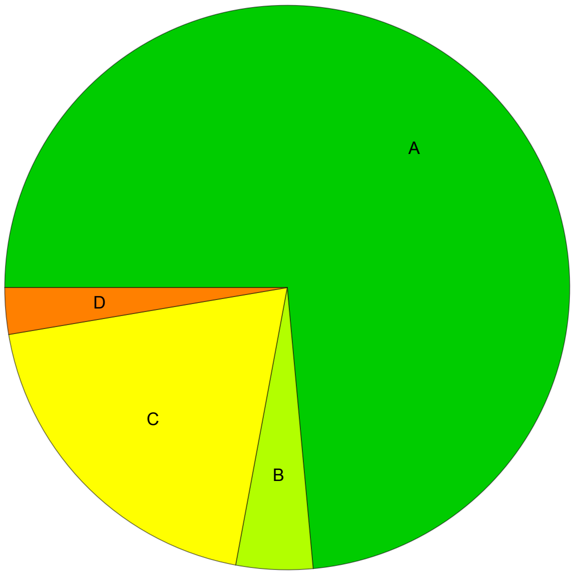
$$\frac{\left(a+\frac{b}{x}\right)^{1+n}}{b\,c\,(2+n)\left(d+\frac{c}{x}\right)x^2}+\frac{d^2\,(3\,a\,c-b\,d\,(3+n))\left(a+\frac{b}{x}\right)^{1+n}\,\text{Hypergeometric2F1}\left[1,\,1+n,\,2+n,\,\frac{c\left(a+\frac{b}{x}\right)}{a\,c-b\,d}\right]}{c^3\,(a\,c-b\,d)^2\,(1+n)}$$

Result (type 8, 22 leaves) :

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

Summary of Integration Test Results

752 integration problems



A - 553 optimal antiderivatives

B - 33 more than twice size of optimal antiderivatives

C - 146 unnecessarily complex antiderivatives

D - 20 unable to integrate problems

E - 0 integration timeouts