Mathematica 11.3 Integration Test Results

Test results for the 1156 problems in "1.1.2.4 (e x)^m (a+b x^2)^p (c+d x^2)^q.m"

Problem 31: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 42 leaves, 3 steps):

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

Result (type 1, 107 leaves):

$$\frac{1}{84} x^2 \left(42 a^5 A+21 a^4 (5 A b+a B) x^2+70 a^3 b (2 A b+a B) x^4+105 a^2 b^2 (A b+a B) x^6+42 a b^3 (A b+2 a B) x^8+7 b^4 (A b+5 a B) x^{10}+6 b^5 B x^{12}\right)$$

Problem 47: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 48 leaves, 3 steps):

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

Result (type 1, 118 leaves):

$$-\frac{1}{84 x^{14}}\left(21 b^5 x^{10} \left(A+2 B x^2\right)+35 a b^4 x^8 \left(2 A+3 B x^2\right)+35 a^2 b^3 x^6 \left(3 A+4 B x^2\right)+21 a^3 b^2 x^4 \left(4 A+5 B x^2\right)+7 a^4 b x^2 \left(5 A+6 B x^2\right)+a^5 \left(6 A+7 B x^2\right)\right)$$

Problem 108: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 11 leaves, 2 steps):

$$-b x+(a+b) \text{ArcTanh}[x]$$

Result (type 3, 28 leaves):

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

Problem 336: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 234 leaves, 6 steps):

$$\frac{b\,x^{1+m}}{4\,a\,(b\,c-a\,d)\,\left(a+b\,x^2\right)^2}+\frac{b\,(b\,c\,(3-m)-a\,d\,(7-m))\,x^{1+m}}{8\,a^2\,(b\,c-a\,d)^2\,\left(a+b\,x^2\right)}+\left(b\,\left(a^2\,d^2\,\left(15-8\,m+m^2\right)-2\,a\,b\,c\,d\,\left(5-6\,m+m^2\right)+b^2\,c^2\,\left(3-4\,m+m^2\right)\right)\,x^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]\right)\Big/\left(8\,a^3\,(b\,c-a\,d)^3\,(1+m)\right)-\frac{d^3\,x^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d\,x^2}{c}\right]}{c\,(b\,c-a\,d)^3\,(1+m)}$$

Result (type 6, 196 leaves):

$$\left(a\,c\,(3+m)\,x^{1+m}\,\text{AppellF1}\left[\frac{1+m}{2},3,1,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((1+m)\,\left(a+b\,x^2\right)^3\,\left(c+d\,x^2\right)\,\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},3,1,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-2\,x^2\,\left(a\,d\,\text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+3\,b\,c\,\text{AppellF1}\left[\frac{3+m}{2},4,1,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 341: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 230 leaves, 6 steps):

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

Result (type 6, 195 leaves):

$$\left(a\,c\,(3+m)\,x^{1+m}\,\text{AppellF1}\left[\frac{1+m}{2},2,2,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((1+m)\,(a+b\,x^2)^2\,(c+d\,x^2)^2\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},2,2,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-4\,x^2\left(a\,d\,\text{AppellF1}\left[\frac{3+m}{2},2,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[\frac{3+m}{2},3,2,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 342: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 325 leaves, 7 steps):

$$\frac{d\,(2\,b\,c+a\,d)\,x^{1+m}}{4\,a\,c\,(b\,c-a\,d)^2\,(c+d\,x^2)^2}+\frac{b\,x^{1+m}}{2\,a\,(b\,c-a\,d)\,(a+b\,x^2)\,(c+d\,x^2)^2}+\frac{d\,\left(4\,b^2\,c^2-a^2\,d^2\,(3-m)+a\,b\,c\,d\,(11-m)\right)\,x^{1+m}}{8\,a\,c^2\,(b\,c-a\,d)^3\,(c+d\,x^2)}-\left(b^3\,(a\,d\,(7-m)-b\,(c-c\,m))\,x^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{b\,x^2}{a}\right]\right)\Big/\left(2\,a^2\,(b\,c-a\,d)^4\,(1+m)\right)+\left(d^2\,\left(b^2\,c^2\,(35-12\,m+m^2)-2\,a\,b\,c\,d\,(7-8\,m+m^2)+a^2\,d^2\,(3-4\,m+m^2)\right)\,x^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{2},\frac{3+m}{2},-\frac{d\,x^2}{c}\right]\right)\Big/\left(8\,c^3\,(b\,c-a\,d)^4\,(1+m)\right)$$

Result (type 6, 197 leaves):

$$\left(a\,c\,(3+m)\,x^{1+m}\,\text{AppellF1}\left[\frac{1+m}{2},2,3,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((1+m)\,(a+b\,x^2)^2\,(c+d\,x^2)^3\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},2,3,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]-2\,x^2\left(3\,a\,d\,\text{AppellF1}\left[\frac{3+m}{2},2,4,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+2\,b\,c\,\text{AppellF1}\left[\frac{3+m}{2},3,3,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 681: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 80 leaves, 6 steps):

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

Result (type 3, 229 leaves):

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

Problem 683: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 113 leaves, 7 steps):

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

Result (type 3, 281 leaves):

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

Problem 690: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 96 leaves, 7 steps):

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

Result (type 3, 271 leaves):

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

Problem 692: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 114 leaves, 7 steps):

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

Result (type 3, 284 leaves):

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

Problem 695: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

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

Optimal (type 3, 144 leaves, 7 steps):

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

Result (type 3, 298 leaves):

$$\frac{1}{210 b^{9/2} d}\left(2 \sqrt{b} \sqrt{c+d x^2} \left(-105 a^3 d^3+15 b^3 \left(c+d x^2\right)^3+35 a^2 b d^2 \left(7 c+d x^2\right)-7 a b^2 d \left(23 c^2+11 c d x^2+3 d^2 x^4\right)\right)+105 a d \left(b c-a d\right)^{5/2} \text{Log}\left[-\frac{2 b^{9/2} \left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\left(b c-a d\right)^{7/2} \left(i a^{3/2}+a \sqrt{b} x\right)}\right]+105 a d \left(b c-a d\right)^{5/2} \text{Log}\left[-\frac{2 b^{9/2} \left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\left(b c-a d\right)^{7/2} \left(-i a^{3/2}+a \sqrt{b} x\right)}\right]\right)$$

Problem 697: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 119 leaves, 6 steps):

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

Result (type 3, 268 leaves):

$$\frac{1}{30 b^{7/2}}\left(2 \sqrt{b} \sqrt{c+d x^2} \left(15 a^2 d^2-5 a b d \left(7 c+d x^2\right)+b^2 \left(23 c^2+11 c d x^2+3 d^2 x^4\right)\right)-15 \left(b c-a d\right)^{5/2} \text{Log}\left[\frac{2 b^{7/2} \left(\sqrt{b} c-i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\left(b c-a d\right)^{7/2} \left(i \sqrt{a}+\sqrt{b} x\right)}\right]-15 \left(b c-a d\right)^{5/2} \text{Log}\left[\frac{2 b^{7/2} \left(\sqrt{b} c+i \sqrt{a} d x+\sqrt{b c-a d} \sqrt{c+d x^2}\right)}{\left(b c-a d\right)^{7/2} \left(-i \sqrt{a}+\sqrt{b} x\right)}\right]\right)$$

Problem 699: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 124 leaves, 8 steps):

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

Result (type 3, 288 leaves):

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

Problem 701: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 144 leaves, 8 steps):

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

Result (type 3, 311 leaves):

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

Problem 706: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 80 leaves, 6 steps):

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

Result (type 3, 229 leaves):

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

Problem 707: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 115 leaves, 7 steps):

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

Result (type 3, 292 leaves):

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

Problem 718: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 107 leaves, 7 steps):

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

Result (type 3, 316 leaves):

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

Problem 720: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 156 leaves, 8 steps):

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

Result (type 3, 355 leaves):

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

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

$$\left.\frac{b^{5/2} \operatorname{Log}\left[\frac{2 a^2 \left(\sqrt{b} c \sqrt{b c-a d}+i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)}{b^{5/2} \left(-i \sqrt{a}+\sqrt{b} x\right)}\right]}{a^2 (b c-a d)^{3/2}}\right)$$

Problem 727: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 145 leaves, 8 steps):

$$-\frac{d}{3 c (b c-a d) \left(c+d x^2\right)^{3/2}}-\frac{d (2 b c-a d)}{c^2 (b c-a d)^2 \sqrt{c+d x^2}}-\frac{\operatorname{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{a c^{5/2}}+\frac{b^{5/2} \operatorname{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{a (b c-a d)^{5/2}}$$

Result (type 3, 365 leaves):

$$\frac{1}{6}\left(\frac{2 d}{c (-b c+a d) \left(c+d x^2\right)^{3/2}}+\frac{6 d (-2 b c+a d)}{c^2 (b c-a d)^2 \sqrt{c+d x^2}}+\frac{6 \operatorname{Log}[x]}{a c^{5/2}}-\frac{6 \operatorname{Log}\left[c+\sqrt{c} \sqrt{c+d x^2}\right]}{a c^{5/2}}+\frac{1}{a (b c-a d)^{5/2}} 3 b^{5/2} \operatorname{Log}\left[-\frac{1}{i \sqrt{a} b^{5/2}+b^3 x} 2 a (b c-a d) \left(\sqrt{b} c \sqrt{b c-a d}-i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)\right]+\frac{1}{a (b c-a d)^{5/2}} 3 b^{5/2} \operatorname{Log}\left[-\left(\left(2 a (b c-a d) \left(\sqrt{b} c \sqrt{b c-a d}+i \sqrt{a} d \sqrt{b c-a d} x+b c \sqrt{c+d x^2}-a d \sqrt{c+d x^2}\right)\right) \Big/ \left(-i \sqrt{a} b^{5/2}+b^3 x\right)\right)\right]\right)$$

Problem 729: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 211 leaves, 9 steps):

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

Result (type 3, 409 leaves):

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

Problem 736: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 119 leaves, 7 steps):

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

Result (type 3, 313 leaves):

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

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

$$\left.\frac{(2\,b\,c-a\,d)\,\text{Log}\left[-\frac{4\,a^2\,\sqrt{b}\,\left(\sqrt{b}\,\,c+i\,\sqrt{a}\,\,d\,x+\sqrt{b\,c-a\,d}\,\,\sqrt{c+d\,x^2}\,\right)}{\sqrt{b\,c-a\,d}\,\,(2\,b\,c-a\,d)\,\left(-i\,\sqrt{a}\,+\sqrt{b}\,\,x\right)}\right]}{\sqrt{b}\,\,\sqrt{b\,c-a\,d}}\right)$$

Problem 738: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

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

Result (type 3, 343 leaves):

$$-\frac{1}{4a^3}\left(\frac{2a\left(a+2bx^2\right)\sqrt{c+dx^2}}{x^2\left(a+bx^2\right)}+\frac{2\left(4bc-ad\right)\mathrm{Log}[x]}{\sqrt{c}}-\frac{2\left(4bc-ad\right)\mathrm{Log}\left[c+\sqrt{c}\sqrt{c+dx^2}\right]}{\sqrt{c}}+\frac{\sqrt{b}\left(4bc-3ad\right)\mathrm{Log}\left[\frac{4a^3\left(\sqrt{b}\,c-i\sqrt{a}\,dx+\sqrt{bc-ad}\sqrt{c+dx^2}\right)}{\sqrt{b}\,(4bc-3ad)\sqrt{bc-ad}\left(i\sqrt{a}+\sqrt{b}\,x\right)}\right]}{\sqrt{bc-ad}}+\frac{\sqrt{b}\left(4bc-3ad\right)\mathrm{Log}\left[\frac{4ia^3\left(\sqrt{b}\,c+i\sqrt{a}\,dx+\sqrt{bc-ad}\sqrt{c+dx^2}\right)}{\sqrt{b}\,(4bc-3ad)\sqrt{bc-ad}\left(\sqrt{a}+i\sqrt{b}\,x\right)}\right]}{\sqrt{bc-ad}}\right)$$

Problem 745: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 129 leaves, 7 steps):

$$\frac{\left(bc-ad\right)\sqrt{c+dx^2}}{2ab\left(a+bx^2\right)}-\frac{c^{3/2}\,\mathrm{ArcTanh}\left[\frac{\sqrt{c+dx^2}}{\sqrt{c}}\right]}{a^2}+\frac{\sqrt{bc-ad}\left(2bc+ad\right)\mathrm{ArcTanh}\left[\frac{\sqrt{b}\sqrt{c+dx^2}}{\sqrt{bc-ad}}\right]}{2a^2b^{3/2}}$$

Result (type 3, 381 leaves):

$$\frac{1}{4a^2}\left(\frac{2a\left(bc-ad\right)\sqrt{c+dx^2}}{b\left(a+bx^2\right)}+4c^{3/2}\,\mathrm{Log}[x]-4c^{3/2}\,\mathrm{Log}\left[c+\sqrt{c}\sqrt{c+dx^2}\right]+\frac{\left(2b^2c^2-abcd-a^2d^2\right)\mathrm{Log}\left[-\frac{4a^2b^{3/2}\left(\sqrt{b}\,c-i\sqrt{a}\,dx+\sqrt{bc-ad}\sqrt{c+dx^2}\right)}{\sqrt{bc-ad}\left(2b^2c^2-abcd-a^2d^2\right)\left(i\sqrt{a}+\sqrt{b}\,x\right)}\right]}{b^{3/2}\sqrt{bc-ad}}+\frac{\left(2b^2c^2-abcd-a^2d^2\right)\mathrm{Log}\left[-\frac{4ia^2b^{3/2}\left(\sqrt{b}\,c+i\sqrt{a}\,dx+\sqrt{bc-ad}\sqrt{c+dx^2}\right)}{\sqrt{bc-ad}\left(2b^2c^2-abcd-a^2d^2\right)\left(\sqrt{a}+i\sqrt{b}\,x\right)}\right]}{b^{3/2}\sqrt{bc-ad}}\right)$$

Problem 747: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

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

Optimal (type 3, 170 leaves, 8 steps):

$$-\frac{(2 b c-a d) \sqrt{c+d x^2}}{2 a^2 \left(a+b x^2\right)}-\frac{c \sqrt{c+d x^2}}{2 a x^2 \left(a+b x^2\right)}+\frac{\sqrt{c} (4 b c-3 a d) \operatorname{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{2 a^3}-\frac{\sqrt{b c-a d} (4 b c-a d) \operatorname{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^3 \sqrt{b}}$$

Result (type 3, 405 leaves):

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

Problem 750: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 198 leaves, 7 steps):

$$\frac{(2 b c-7 a d) (b c-a d) \sqrt{c+d x^2}}{2 b^4}+\frac{(2 b c-7 a d) \left(c+d x^2\right)^{3/2}}{6 b^3}+\frac{(2 b c-7 a d) \left(c+d x^2\right)^{5/2}}{10 b^2 (b c-a d)}+\frac{a \left(c+d x^2\right)^{7/2}}{2 b (b c-a d) \left(a+b x^2\right)}-\frac{(2 b c-7 a d) (b c-a d)^{3/2} \operatorname{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 b^{9/2}}$$

Result (type 3, 332 leaves):

$$\frac{1}{60\,b^{9/2}}\left(2\sqrt{b}\,\sqrt{c+d\,x^2}\right.$$
$$\left(46\,b^2\,c^2-140\,a\,b\,c\,d+90\,a^2\,d^2+2\,b\,d\,(11\,b\,c-10\,a\,d)\,x^2+6\,b^2\,d^2\,x^4+\frac{15\,a\,(b\,c-a\,d)^2}{a+b\,x^2}\right)-$$
$$15\,(2\,b\,c-7\,a\,d)\,(b\,c-a\,d)^{3/2}\,\text{Log}\left[\frac{4\,b^{9/2}\left(\sqrt{b}\,c-i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{(2\,b\,c-7\,a\,d)\,(b\,c-a\,d)^{5/2}\left(i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]-$$
$$\left.15\,(2\,b\,c-7\,a\,d)\,(b\,c-a\,d)^{3/2}\,\text{Log}\left[\frac{4\,b^{9/2}\left(\sqrt{b}\,c+i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{(2\,b\,c-7\,a\,d)\,(b\,c-a\,d)^{5/2}\left(-i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]\right)$$

Problem 752: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 126 leaves, 6 steps):

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

Result (type 3, 289 leaves):

$$\frac{1}{12\,b^{7/2}}\left(-\frac{1}{a+b\,x^2}2\sqrt{b}\,\sqrt{c+d\,x^2}\,\left(3\,(b\,c-a\,d)^2+2\,d\,(-7\,b\,c+6\,a\,d)\,(a+b\,x^2)-2\,b\,d^2\,x^2\,(a+b\,x^2)\right)-\right.$$
$$15\,d\,(b\,c-a\,d)^{3/2}\,\text{Log}\left[\frac{4\,b^{7/2}\left(\sqrt{b}\,c-i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{5\,d\,(b\,c-a\,d)^{5/2}\left(i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]-$$
$$\left.15\,d\,(b\,c-a\,d)^{3/2}\,\text{Log}\left[\frac{4\,b^{7/2}\left(\sqrt{b}\,c+i\,\sqrt{a}\,d\,x+\sqrt{b\,c-a\,d}\,\sqrt{c+d\,x^2}\right)}{5\,d\,(b\,c-a\,d)^{5/2}\left(-i\,\sqrt{a}+\sqrt{b}\,x\right)}\right]\right)$$

Problem 754: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 160 leaves, 8 steps):

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

Result (type 3, 344 leaves):

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

Problem 756: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 180 leaves, 8 steps):

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

Result (type 3, 349 leaves):

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

$$2c^{3/2}(4bc-5ad)\,\mathrm{Log}[x]-2c^{3/2}(4bc-5ad)\,\mathrm{Log}\left[c+\sqrt{c}\sqrt{c+dx^2}\right]+$$

$$\frac{(bc-ad)^{3/2}(4bc+ad)\,\mathrm{Log}\left[\frac{4a^3b^{3/2}\left(\sqrt{b}\,c-i\sqrt{a}\,dx+\sqrt{bc-ad}\sqrt{c+dx^2}\right)}{(bc-ad)^{5/2}(4bc+ad)\left(i\sqrt{a}+\sqrt{b}\,x\right)}\right]}{b^{3/2}}+$$

$$\left.\frac{(bc-ad)^{3/2}(4bc+ad)\,\mathrm{Log}\left[\frac{4a^3b^{3/2}\left(\sqrt{b}\,c+i\sqrt{a}\,dx+\sqrt{bc-ad}\sqrt{c+dx^2}\right)}{(bc-ad)^{5/2}(4bc+ad)\left(-i\sqrt{a}+\sqrt{b}\,x\right)}\right]}{b^{3/2}}\right)$$

Problem 763: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 130 leaves, 7 steps):

$$\frac{b\sqrt{c+dx^2}}{2a\,(bc-ad)\,(a+bx^2)}-\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{c+dx^2}}{\sqrt{c}}\right]}{a^2\sqrt{c}}+\frac{\sqrt{b}\,(2bc-3ad)\,\mathrm{ArcTanh}\left[\frac{\sqrt{b}\sqrt{c+dx^2}}{\sqrt{bc-ad}}\right]}{2a^2\,(bc-ad)^{3/2}}$$

Result (type 3, 360 leaves):

$$\frac{1}{4a^2}\left(-\frac{2ab\sqrt{c+dx^2}}{(-bc+ad)\,(a+bx^2)}+\frac{4\,\mathrm{Log}[x]}{\sqrt{c}}-\frac{4\,\mathrm{Log}\left[c+\sqrt{c}\sqrt{c+dx^2}\right]}{\sqrt{c}}+\frac{1}{(bc-ad)^{3/2}}\sqrt{b}\,(2bc-3ad)\right.$$
$$\mathrm{Log}\left[-\left(\left(4\,i\,a^2\left(\sqrt{b}\,c\sqrt{bc-ad}+i\sqrt{a}\,d\sqrt{bc-ad}\,x+bc\sqrt{c+dx^2}-ad\sqrt{c+dx^2}\right)\right)\right/\right.$$
$$\left.\left.\left(\sqrt{b}\,(2bc-3ad)\left(\sqrt{a}+i\sqrt{b}\,x\right)\right)\right)\right]+\frac{1}{(bc-ad)^{3/2}}\sqrt{b}\,(2bc-3ad)$$
$$\mathrm{Log}\left[\left(4a^2\left(-\sqrt{b}\,c\sqrt{bc-ad}+i\sqrt{a}\,d\sqrt{bc-ad}\,x-bc\sqrt{c+dx^2}+ad\sqrt{c+dx^2}\right)\right)\right/$$
$$\left.\left.\left(\sqrt{b}\,(2bc-3ad)\left(i\sqrt{a}+\sqrt{b}\,x\right)\right)\right]\right)$$

Problem 765: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 185 leaves, 8 steps):

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

Result (type 3, 387 leaves):

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

Problem 772: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 170 leaves, 8 steps):

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

Result (type 3, 406 leaves):

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

Problem 774: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 241 leaves, 9 steps):

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

Result (type 3, 451 leaves):

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

Problem 781: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 225 leaves, 9 steps):

$$\frac{d (3 b c+2 a d)}{6 a c (b c-a d)^2 \left(c+d x^2\right)^{3/2}}+\frac{b}{2 a (b c-a d) \left(a+b x^2\right) \left(c+d x^2\right)^{3/2}}+\frac{d \left(b^2 c^2+6 a b c d-2 a^2 d^2\right)}{2 a c^2 (b c-a d)^3 \sqrt{c+d x^2}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{c+d x^2}}{\sqrt{c}}\right]}{a^2 c^{5/2}}+\frac{b^{5/2} (2 b c-7 a d) \text{ArcTanh}\left[\frac{\sqrt{b} \sqrt{c+d x^2}}{\sqrt{b c-a d}}\right]}{2 a^2 (b c-a d)^{7/2}}$$

Result (type 3, 461 leaves):

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

Problem 783: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 304 leaves, 10 steps):

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

Result (type 3, 489 leaves):

$$\frac{1}{4}\left(\frac{2}{3}\sqrt{c+d x^2}\left(-\frac{3}{a^2 c^3 x^2}+\frac{3 b^4}{a^2(-b c+a d)^3(a+b x^2)}-\frac{2 d^3}{c^2(b c-a d)^2(c+d x^2)^2}+\frac{12 d^3(-2 b c+a d)}{c^3(b c-a d)^3(c+d x^2)}\right)-\frac{2(4 b c+5 a d)\,\mathrm{Log}[x]}{a^3 c^{7/2}}+\frac{2(4 b c+5 a d)\,\mathrm{Log}\left[c+\sqrt{c}\sqrt{c+d x^2}\right]}{a^3 c^{7/2}}-\frac{1}{a^3(b c-a d)^{7/2}}b^{7/2}(4 b c-9 a d)\,\mathrm{Log}\left[\left(4 a^3(b c-a d)^2\left(\sqrt{b}\,c\sqrt{b c-a d}-i\sqrt{a}\,d\sqrt{b c-a d}\,x+b c\sqrt{c+d x^2}-a d\sqrt{c+d x^2}\right)\right)\Big/\left(b^{7/2}(4 b c-9 a d)\left(i\sqrt{a}+\sqrt{b}\,x\right)\right)\right]-\frac{1}{a^3(b c-a d)^{7/2}}b^{7/2}(4 b c-9 a d)\,\mathrm{Log}\left[\left(4 a^3(b c-a d)^2\left(\sqrt{b}\,c\sqrt{b c-a d}+i\sqrt{a}\,d\sqrt{b c-a d}\,x+b c\sqrt{c+d x^2}-a d\sqrt{c+d x^2}\right)\right)\Big/\left(b^{7/2}(4 b c-9 a d)\left(-i\sqrt{a}+\sqrt{b}\,x\right)\right)\right]\right)$$

Problem 785: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 212 leaves, 5 steps):

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

Result (type 4, 159 leaves):

$$\frac{1}{231 b^2\sqrt{a+b x^2}}2 e\sqrt{e x}\left(-(a+b x^2)\left(10 a^2 B-2 a b(11 A+3 B x^2)-3 b^2 x^2(11 A+7 B x^2)\right)+\frac{1}{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}2 i a^2(-11 A b+5 a B)\sqrt{1+\frac{a}{b x^2}}\sqrt{x}\,\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 786: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{e\,x}\,\sqrt{a+b\,x^2}\,\left(A+B\,x^2\right)\,dx$$

Optimal (type 4, 337 leaves, 6 steps):

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

Result (type 4, 234 leaves):

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

Problem 787: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 176 leaves, 4 steps):

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

Result (type 4, 132 leaves):

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

Problem 788: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 333 leaves, 6 steps):

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

Result (type 4, 186 leaves):

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

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

Problem 789: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 172 leaves, 4 steps):

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

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

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

Result (type 4, 120 leaves):

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

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

Problem 790: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 338 leaves, 6 steps):

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

Result (type 4, 217 leaves):

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

Problem 791: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 139 leaves):

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

Problem 792: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 237 leaves):

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

Problem 793: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 187 leaves, 5 steps):

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

Result (type 4, 163 leaves):

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

Problem 794: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 252 leaves, 6 steps):

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

Result (type 4, 178 leaves):

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

Problem 795: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 377 leaves, 7 steps):

$$\frac{4 a (13 A b-3 a B) (e x)^{3/2} \sqrt{a+b x^2}}{195 b e}+\frac{8 a^2 (13 A b-3 a B) \sqrt{e x} \sqrt{a+b x^2}}{195 b^{3/2} \left(\sqrt{a}+\sqrt{b} x\right)}+$$
$$\frac{2 (13 A b-3 a B) (e x)^{3/2} \left(a+b x^2\right)^{3/2}}{117 b e}+\frac{2 B (e x)^{3/2} \left(a+b x^2\right)^{5/2}}{13 b e}-$$
$$\left(8 a^{9/4} (13 A b-3 a B) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/$$
$$\left(195 b^{7/4} \sqrt{a+b x^2}\right)+$$
$$\left(4 a^{9/4} (13 A b-3 a B) \sqrt{e} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/$$
$$\left(195 b^{7/4} \sqrt{a+b x^2}\right)$$

Result (type 4, 214 leaves):

$$\frac{1}{585 b^2 \sqrt{a+b x^2}} 2 \sqrt{x} \sqrt{e x} \left(b \sqrt{x} \left(a+b x^2\right) \left(12 a^2 B+5 b^2 x^2 \left(13 A+9 B x^2\right)+a b \left(143 A+75 B x^2\right)\right)+\right.$$
$$12 a^2 (-13 A b+3 a B) \left(-\left(b+\frac{a}{x^2}\right) \sqrt{x}+\frac{1}{\left(\frac{i \sqrt{a}}{\sqrt{b}}\right)^{3/2}} i a \sqrt{1+\frac{a}{b x^2}}\right.$$
$$\left.\left.\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]\right)\right)\right)$$

Problem 796: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 214 leaves, 5 steps):

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

Result (type 4, 155 leaves):

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

Problem 797: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 367 leaves, 7 steps):

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

Result (type 4, 206 leaves):

$$\frac{1}{15\,(e\,x)^{3/2}}x^{3/2}\left(\frac{2\,\sqrt{a+b\,x^2}\,\left(-45\,a\,A+9\,A\,b\,x^2+11\,a\,B\,x^2+5\,b\,B\,x^4\right)}{3\,\sqrt{x}}-\frac{1}{b\,\sqrt{a+b\,x^2}}8\,a\,\left(9\,A\,b+a\,B\right)\,x\left(-\left(b+\frac{a}{x^2}\right)\,\sqrt{x}+\frac{1}{\left(\frac{i\,\sqrt{a}}{\sqrt{b}}\right)^{3/2}}i\,a\,\sqrt{1+\frac{a}{b\,x^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)$$

Problem 798: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 210 leaves, 5 steps):

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

Result (type 4, 140 leaves):

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

Problem 799: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 365 leaves, 7 steps):

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

Result (type 4, 232 leaves):

$$\left(x \left(2 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(a+b x^2\right) \left(-a A+5 A b x^2+7 a B x^2+b B x^4\right)-24 \sqrt{a} \sqrt{b} (A b+a B) \sqrt{1+\frac{a}{b x^2}} x^{7/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]+24 \sqrt{a} \sqrt{b} (A b+a B) \sqrt{1+\frac{a}{b x^2}} x^{7/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right) \Big/ \left(5 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} (e x)^{7/2} \sqrt{a+b x^2}\right)$$

Problem 800: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 338 leaves, 6 steps):

$$\frac{2\,(9\,A\,b-7\,a\,B)\,e\,(e\,x)^{3/2}\,\sqrt{a+b\,x^2}}{45\,b^2}+\frac{2\,B\,(e\,x)^{7/2}\,\sqrt{a+b\,x^2}}{9\,b\,e}-\frac{2\,a\,(9\,A\,b-7\,a\,B)\,e^2\,\sqrt{e\,x}\,\sqrt{a+b\,x^2}}{15\,b^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)}+$$
$$\left(2\,a^{5/4}\,(9\,A\,b-7\,a\,B)\,e^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(15\,b^{11/4}\,\sqrt{a+b\,x^2}\right)-$$
$$\left(a^{5/4}\,(9\,A\,b-7\,a\,B)\,e^{5/2}\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(15\,b^{11/4}\,\sqrt{a+b\,x^2}\right)$$

Result (type 4, 237 leaves):

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

Problem 801: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 134 leaves):

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

Problem 802: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 299 leaves, 5 steps):

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

Result (type 4, 181 leaves):

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

Problem 803: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{A + B x^2}{\sqrt{e x}\,\sqrt{a + b x^2}}\,dx$$

Optimal (type 4, 139 leaves, 3 steps):

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

Result (type 4, 116 leaves):

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

Problem 804: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 290 leaves, 5 steps):

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

Result (type 4, 193 leaves):

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

Problem 805: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 138 leaves, 3 steps):

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

Result (type 4, 118 leaves):

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

Problem 806: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 342 leaves, 6 steps):

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

Result (type 4, 221 leaves):

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

Problem 807: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 211 leaves, 5 steps):

$$-\frac{(7 A b-9 a B) e (e x)^{5/2}}{7 b^2 \sqrt{a+b x^2}}+\frac{2 B (e x)^{9/2}}{7 b e \sqrt{a+b x^2}}+\frac{5 (7 A b-9 a B) e^3 \sqrt{e x} \sqrt{a+b x^2}}{21 b^3}-\left(5 a^{3/4} (7 A b-9 a B) e^{7/2} \left(\sqrt{a}+\sqrt{b} x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]\right) \Big/ \left(42 b^{13/4} \sqrt{a+b x^2}\right)$$

Result (type 4, 168 leaves):

$$\left(e^3 \sqrt{e x} \left(\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \left(-45 a^2 B + a b \left(35 A - 18 B x^2\right) + 2 b^2 x^2 \left(7 A + 3 B x^2\right)\right) - 5 i a \left(7 A b - 9 a B\right) \sqrt{1 + \frac{a}{b x^2}} \sqrt{x} \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]\right)\right) \Big/ \left(21 \sqrt{\frac{i \sqrt{a}}{\sqrt{b}}} \, b^3 \sqrt{a + b x^2}\right)$$

Problem 808: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 337 leaves, 6 steps):

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

Result (type 4, 229 leaves):

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

Problem 809: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 143 leaves):

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

Problem 810: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 301 leaves, 5 steps):

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

Result (type 4, 216 leaves):

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

Problem 811: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 144 leaves, 3 steps):

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

Result (type 4, 133 leaves):

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

Problem 812: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 333 leaves, 6 steps):

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

Result (type 4, 202 leaves):

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

Problem 813: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 176 leaves, 4 steps):

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

Result (type 4, 146 leaves):

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

Problem 814: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 379 leaves, 7 steps):

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

Result (type 4, 233 leaves):

$$\left(x \left(\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} \left(21 A b^2 x^4+a b x^2 \left(14 A-15 B x^2\right)-2 a^2 \left(A+5 B x^2\right)\right)+3 \sqrt{a} \sqrt{b} (-7 A b+5 a B) x^3 \sqrt{1+\frac{b x^2}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right]-3 \sqrt{a} \sqrt{b} (-7 A b+5 a B) x^3 \sqrt{1+\frac{b x^2}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}}\right], -1\right]\right)\right) \Big/ \left(5 a^3 \sqrt{\frac{i \sqrt{b} x}{\sqrt{a}}} (e x)^{7/2} \sqrt{a+b x^2}\right)$$

Problem 815: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 208 leaves, 5 steps):

$$-\frac{(A b-3 a B)\, e\, (e x)^{5/2}}{3 b^2 \left(a+b x^2\right)^{3/2}}+\frac{2 B (e x)^{9/2}}{3 b e \left(a+b x^2\right)^{3/2}}-\frac{5 (A b-3 a B)\, e^3 \sqrt{e x}}{6 b^3 \sqrt{a+b x^2}}+\left(5 (A b-3 a B)\, e^{7/2} \left(\sqrt{a}+\sqrt{b}\, x\right) \sqrt{\frac{a+b x^2}{\left(\sqrt{a}+\sqrt{b}\, x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} \sqrt{e x}}{a^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(12 a^{1/4} b^{13/4} \sqrt{a+b x^2}\right)$$

Result (type 4, 163 leaves):

$$\frac{1}{6 x^{7/2} \sqrt{a+b x^2}} (e x)^{7/2} \left(\frac{\sqrt{x} \left(15 a^2 B+b^2 x^2 \left(-7 A+4 B x^2\right)+a \left(-5 A b+21 b B x^2\right)\right)}{b^3 \left(a+b x^2\right)}+\frac{5 i (A b-3 a B) \sqrt{1+\frac{a}{b x^2}}\ x\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{a}}{\sqrt{b}}}\ b^3}\right)$$

Problem 816: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 349 leaves, 6 steps):

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

Result (type 4, 249 leaves) :

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

Problem 817: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 163 leaves) :

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

Problem 818: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 344 leaves, 6 steps):

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

Result (type 4, 247 leaves):

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

Problem 819: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 187 leaves, 4 steps):

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

Result (type 4, 164 leaves) :

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

Problem 820: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 377 leaves, 7 steps) :

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

Result (type 4, 182 leaves):

$$\left(x\left(\frac{-21\,A\,b^2\,x^4+a^2\,\left(-12\,A+5\,B\,x^2\right)+a\,\left(-35\,A\,b\,x^2+3\,b\,B\,x^4\right)}{a+b\,x^2}+\frac{1}{b}3\,\mathrm{i}\,a\,\left(-7\,A\,b+a\,B\right)\sqrt{\frac{\mathrm{i}\,\sqrt{b}\,x}{\sqrt{a}}}\,\sqrt{1+\frac{b\,x^2}{a}}\,\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]-\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\,\sqrt{b}\,x}{\sqrt{a}}}\right],-1\right]\right)\right)\right)\Big/\left(6\,a^3\,(e\,x)^{3/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 821: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 213 leaves, 5 steps):

$$-\frac{2\,A}{3\,a\,e\,(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{3/2}}-\frac{\left(3\,A\,b-a\,B\right)\,\sqrt{e\,x}}{3\,a^2\,e^3\,\left(a+b\,x^2\right)^{3/2}}-\frac{5\,\left(3\,A\,b-a\,B\right)\,\sqrt{e\,x}}{6\,a^3\,e^3\,\sqrt{a+b\,x^2}}-\left(5\,\left(3\,A\,b-a\,B\right)\,\left(\sqrt{a}+\sqrt{b}\,x\right)\,\sqrt{\frac{a+b\,x^2}{\left(\sqrt{a}+\sqrt{b}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{a^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(12\,a^{13/4}\,b^{1/4}\,e^{5/2}\,\sqrt{a+b\,x^2}\right)$$

Result (type 4, 166 leaves):

$$\left(x^{5/2}\left(\frac{-15\,A\,b^2\,x^4+a^2\,\left(-4\,A+7\,B\,x^2\right)+a\,\left(-21\,A\,b\,x^2+5\,b\,B\,x^4\right)}{a^3\,x^{3/2}\,\left(a+b\,x^2\right)}+\frac{1}{a^3\,\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}5\,\mathrm{i}\,\left(-3\,A\,b+a\,B\right)\,\sqrt{1+\frac{a}{b\,x^2}}\,x\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{a}}{\sqrt{b}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(6\,(e\,x)^{5/2}\,\sqrt{a+b\,x^2}\right)$$

Problem 822: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 288 leaves, 6 steps):

$$\frac{4 c \left(11 a^2 d^2+b c (3 b c-10 a d)\right) e \sqrt{e x} \sqrt{c+d x^2}}{231 d^3}+\frac{2 \left(11 a^2 d^2+b c (3 b c-10 a d)\right) (e x)^{5/2} \sqrt{c+d x^2}}{77 d^2 e}-\frac{2 b (3 b c-10 a d) (e x)^{5/2} \left(c+d x^2\right)^{3/2}}{55 d^2 e}+\frac{2 b^2 (e x)^{9/2} \left(c+d x^2\right)^{3/2}}{15 d e^3}-\left(2 c^{7/4} \left(11 a^2 d^2+b c (3 b c-10 a d)\right) e^{3/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(231 d^{13/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 225 leaves):

$$\left((e x)^{3/2} \left(\frac{1}{5 d^3} 2 \sqrt{x} \left(c+d x^2\right) \left(55 a^2 d^2 \left(2 c+3 d x^2\right)+10 a b d \left(-10 c^2+6 c d x^2+21 d^2 x^4\right)+b^2 \left(30 c^3-18 c^2 d x^2+14 c d^2 x^4+77 d^3 x^6\right)\right)-\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}\, d^3} 4 i c^2 \left(3 b^2 c^2-10 a b c d+11 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}}\ x\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(231 x^{3/2} \sqrt{c+d x^2}\right)$$

Problem 823: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 425 leaves, 7 steps):

$$\frac{2\left(39 a^2 d^2+b c\left(7 b c-26 a d\right)\right)(e x)^{3/2}\sqrt{c+d x^2}}{195 d^2 e}+\frac{4 c\left(39 a^2 d^2+b c\left(7 b c-26 a d\right)\right)\sqrt{e x}\sqrt{c+d x^2}}{195 d^{5/2}\left(\sqrt{c}+\sqrt{d} x\right)}-$$

$$\frac{2 b\left(7 b c-26 a d\right)(e x)^{3/2}\left(c+d x^2\right)^{3/2}}{117 d^2 e}+\frac{2 b^2(e x)^{7/2}\left(c+d x^2\right)^{3/2}}{13 d e^3}-$$

$$\left(4 c^{5/4}\left(39 a^2 d^2+b c\left(7 b c-26 a d\right)\right)\sqrt{e}\left(\sqrt{c}+\sqrt{d} x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(195 d^{11/4}\sqrt{c+d x^2}\right)+$$

$$\left(2 c^{5/4}\left(39 a^2 d^2+b c\left(7 b c-26 a d\right)\right)\sqrt{e}\left(\sqrt{c}+\sqrt{d} x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(195 d^{11/4}\sqrt{c+d x^2}\right)$$

Result (type 4, 282 leaves):

$$\left(2 e\left(d x^2\left(c+d x^2\right)\left(117 a^2 d^2+26 a b d\left(2 c+5 d x^2\right)+b^2\left(-14 c^2+10 c d x^2+45 d^2 x^4\right)\right)+\right.\right.$$

$$\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}6 c\left(7 b^2 c^2-26 a b c d+39 a^2 d^2\right)$$

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

$$\left.\left.\left.\sqrt{d}\sqrt{1+\frac{c}{d x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)\Big/\left(585 d^3\sqrt{e x}\sqrt{c+d x^2}\right)$$

Problem 824: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 244 leaves, 5 steps):

$$\frac{2 \left(5 b^2 c^2-22 a b c d+77 a^2 d^2\right) \sqrt{e x} \sqrt{c+d x^2}}{231 d^2 e}-\frac{2 b \left(5 b c-22 a d\right) \sqrt{e x} \left(c+d x^2\right)^{3/2}}{77 d^2 e}+\frac{2 b^2 (e x)^{5/2} \left(c+d x^2\right)^{3/2}}{11 d e^3}+\left(2 c^{3/4} \left(5 b^2 c^2-22 a b c d+77 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(231 d^{9/4} \sqrt{e} \sqrt{c+d x^2}\right)$$

Result (type 4, 189 leaves):

$$\left(\sqrt{x} \left(\frac{1}{d^2} 2 \sqrt{x} \left(c+d x^2\right) \left(77 a^2 d^2+22 a b d \left(2 c+3 d x^2\right)+b^2 \left(-10 c^2+6 c d x^2+21 d^2 x^4\right)\right)+\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} d^2} 4 i c \left(5 b^2 c^2-22 a b c d+77 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}} x \, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right) \Big/ \left(231 \sqrt{e x} \sqrt{c+d x^2}\right)$$

Problem 825: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 421 leaves, 7 steps):

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

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

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

Result (type 4, 260 leaves):

$$\left(2 x\left(d\left(c+d x^2\right)\left(-45 a^2 d+18 a b d x^2+b^2 x^2\left(2 c+5 d x^2\right)\right)-\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}6\left(b^2 c^2-6 a b c d-15 a^2 d^2\right)\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\left(c+d x^2\right)-\sqrt{c}\sqrt{d}\sqrt{1+\frac{c}{d x^2}}\,x^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]+\sqrt{c}\sqrt{d}\sqrt{1+\frac{c}{d x^2}}\,x^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)\Big/\left(45 d^2\left(e x\right)^{3/2}\sqrt{c+d x^2}\right)$$

Problem 826: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 234 leaves, 5 steps):

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

Result (type 4, 171 leaves):

$$\left(x^{5/2}\left(\frac{2\left(c+d x^2\right)\left(-7 a^2 d+14 a b d x^2+b^2 x^2\left(2 c+3 d x^2\right)\right)}{d x^{3/2}}+\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d}4\,i\left(-b^2 c^2+14 a b c d+7 a^2 d^2\right)\right.\right.$$
$$\left.\left.\sqrt{1+\frac{c}{d x^2}}\;x\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(21\,(e x)^{5/2}\sqrt{c+d x^2}\right)$$

Problem 827: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 421 leaves, 7 steps):

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

Result (type 4, 226 leaves):

$$\frac{1}{5(e x)^{7/2}}x^{7/2}\left(\frac{2\sqrt{c+d x^2}\left(-10 a b c x^2+b^2 c x^4-a^2\left(c+2 d x^2\right)\right)}{c x^{5/2}}-\frac{1}{c d\sqrt{c+d x^2}}4\left(b^2 c^2+10 a b c d+a^2 d^2\right) x\left(-\left(d+\frac{c}{x^2}\right)\sqrt{x}+\frac{1}{\left(\frac{i\sqrt{c}}{\sqrt{d}}\right)^{3/2}}i\, c\sqrt{1+\frac{c}{d x^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)$$

Problem 828: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 213 leaves, 5 steps):

$$\frac{2\left(7 b^2 c^2+a d\,(14 b c-a d)\right)\sqrt{x}\,\sqrt{c+d x^2}}{21 c^2}-\frac{2 a^2\left(c+d x^2\right)^{3/2}}{7 c\,x^{7/2}}-\frac{2 a\,(14 b c-a d)\left(c+d x^2\right)^{3/2}}{21 c^2 x^{3/2}}+\left(2\left(7 b^2 c^2+a d\,(14 b c-a d)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(21 c^{5/4} d^{1/4}\sqrt{c+d x^2}\right)$$

Result (type 4, 160 leaves):

$$\left(2\left(\left(c+d x^2\right)\left(-14 a b c x^2+7 b^2 c x^4-a^2\left(3 c+2 d x^2\right)\right)+\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}2\,i\left(7 b^2 c^2+14 a b c d-a^2 d^2\right)\sqrt{1+\frac{c}{d x^2}}\,x^{9/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(21 c\,x^{7/2}\sqrt{c+d x^2}\right)$$

Problem 829: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 386 leaves, 7 steps):

$$-\frac{2\left(15 b^2 c^2+a d\,(6 b c-a d)\right)\sqrt{c+d x^2}}{15 c^2\sqrt{x}}+\frac{4\sqrt{d}\left(15 b^2 c^2+a d\,(6 b c-a d)\right)\sqrt{x}\,\sqrt{c+d x^2}}{15 c^2\left(\sqrt{c}+\sqrt{d}\,x\right)}-\frac{2 a^2\left(c+d x^2\right)^{3/2}}{9 c\,x^{9/2}}-\frac{2 a\,(6 b c-a d)\left(c+d x^2\right)^{3/2}}{15 c^2 x^{5/2}}-\frac{1}{15 c^{7/4}\sqrt{c+d x^2}}4 d^{1/4}\left(15 b^2 c^2+a d\,(6 b c-a d)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]+\frac{1}{15 c^{7/4}\sqrt{c+d x^2}}2 d^{1/4}\left(15 b^2 c^2+a d\,(6 b c-a d)\right)\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]$$

Result (type 4, 283 leaves):

$$\left(2\left(\left(-c-d x^2\right)\left(5 a^2 c^2+2 a c\left(9 b c+a d\right) x^2+3\left(15 b^2 c^2+12 a b c d-2 a^2 d^2\right) x^4\right)+\right.\right.$$

$$\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}} 6\left(15 b^2 c^2+6 a b c d-a^2 d^2\right) x^4$$

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

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

Problem 830: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 217 leaves, 5 steps):

$$-\frac{2\left(77 b^2 c^2-22 a b c d+5 a^2 d^2\right)\sqrt{c+d x^2}}{231 c^2 x^{3/2}}-\frac{2 a^2\left(c+d x^2\right)^{3/2}}{11 c x^{11/2}}-$$

$$\frac{2 a\left(22 b c-5 a d\right)\left(c+d x^2\right)^{3/2}}{77 c^2 x^{7/2}}+\left(2 d^{3/4}\left(77 b^2 c^2-22 a b c d+5 a^2 d^2\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\right.$$

$$\left.\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(231 c^{9/4}\sqrt{c+d x^2}\right)$$

Result (type 4, 187 leaves):

$$-\frac{1}{231\,c^2\,x^{11/2}}2\,\sqrt{c+d\,x^2}\,\left(77\,b^2\,c^2\,x^4+22\,a\,b\,c\,x^2\,\left(3\,c+2\,d\,x^2\right)+a^2\,\left(21\,c^2+6\,c\,d\,x^2-10\,d^2\,x^4\right)\right)+$$
$$\left(4\,\mathrm{i}\,d\,\left(77\,b^2\,c^2-22\,a\,b\,c\,d+5\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\Big/$$
$$\left(231\,c^2\,\sqrt{\frac{\mathrm{i}\,\sqrt{c}}{\sqrt{d}}}\,\sqrt{c+d\,x^2}\right)$$

Problem 831: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 441 leaves, 8 steps):

$$-\frac{2\,\left(39\,b^2\,c^2-26\,a\,b\,c\,d+7\,a^2\,d^2\right)\,\sqrt{c+d\,x^2}}{195\,c^2\,x^{5/2}}-$$
$$\frac{4\,d\,\left(39\,b^2\,c^2-26\,a\,b\,c\,d+7\,a^2\,d^2\right)\,\sqrt{c+d\,x^2}}{195\,c^3\,\sqrt{x}}+\frac{4\,d^{3/2}\,\left(39\,b^2\,c^2-26\,a\,b\,c\,d+7\,a^2\,d^2\right)\,\sqrt{x}\,\sqrt{c+d\,x^2}}{195\,c^3\,\left(\sqrt{c}+\sqrt{d}\,x\right)}-$$
$$\frac{2\,a^2\,\left(c+d\,x^2\right)^{3/2}}{13\,c\,x^{13/2}}-\frac{2\,a\,\left(26\,b\,c-7\,a\,d\right)\,\left(c+d\,x^2\right)^{3/2}}{117\,c^2\,x^{9/2}}-$$
$$\left(4\,d^{5/4}\,\left(39\,b^2\,c^2-26\,a\,b\,c\,d+7\,a^2\,d^2\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(195\,c^{11/4}\,\sqrt{c+d\,x^2}\right)+$$
$$\left(2\,d^{5/4}\,\left(39\,b^2\,c^2-26\,a\,b\,c\,d+7\,a^2\,d^2\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{x}}{c^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(195\,c^{11/4}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 241 leaves):

$$\left(2\left(\left(-c-d x^2\right)\left(117 b^2 c^2 x^4\left(c+2 d x^2\right)+26 a b c x^2\left(5 c^2+2 c d x^2-6 d^2 x^4\right)+a^2\left(45 c^3+10 c^2 d x^2-14 c d^2 x^4+42 d^3 x^6\right)\right)+\frac{1}{\left(\frac{i \sqrt{d} x}{\sqrt{c}}\right)^{3/2}} 6 i d^2\left(39 b^2 c^2-26 a b c d+7 a^2 d^2\right) x^8 \sqrt{1+\frac{d x^2}{c}}\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right],-1\right]\right)\right)\right) \Big/ \left(585 c^3 x^{13/2} \sqrt{c+d x^2}\right)$$

Problem 832: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 530 leaves, 9 steps):

$$\frac{8\,c^2\,\left(51\,a^2\,d^2+b\,c\,\left(11\,b\,c-42\,a\,d\right)\right)\,e\,\left(e\,x\right)^{3/2}\,\sqrt{c+d\,x^2}}{9945\,d^3}+$$
$$\frac{4\,c\,\left(51\,a^2\,d^2+b\,c\,\left(11\,b\,c-42\,a\,d\right)\right)\,\left(e\,x\right)^{7/2}\,\sqrt{c+d\,x^2}}{1989\,d^2\,e}-$$
$$\frac{8\,c^3\,\left(51\,a^2\,d^2+b\,c\,\left(11\,b\,c-42\,a\,d\right)\right)\,e^2\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{3315\,d^{7/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)}+$$
$$\frac{2\,\left(51\,a^2\,d^2+b\,c\,\left(11\,b\,c-42\,a\,d\right)\right)\,\left(e\,x\right)^{7/2}\,\left(c+d\,x^2\right)^{3/2}}{663\,d^2\,e}-$$
$$\frac{2\,b\,\left(11\,b\,c-42\,a\,d\right)\,\left(e\,x\right)^{7/2}\,\left(c+d\,x^2\right)^{5/2}}{357\,d^2\,e}+\frac{2\,b^2\,\left(e\,x\right)^{11/2}\,\left(c+d\,x^2\right)^{5/2}}{21\,d\,e^3}+$$
$$\left(8\,c^{13/4}\,\left(51\,a^2\,d^2+b\,c\,\left(11\,b\,c-42\,a\,d\right)\right)\,e^{5/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]\right)\Big/\left(3315\,d^{15/4}\,\sqrt{c+d\,x^2}\right)-$$
$$\left(4\,c^{13/4}\,\left(51\,a^2\,d^2+b\,c\,\left(11\,b\,c-42\,a\,d\right)\right)\,e^{5/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]\right)\Big/\left(3315\,d^{15/4}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 304 leaves) :

$$\frac{1}{69615\, d^4\, x^{3/2}\, \sqrt{c+d x^2}}\left(2\,(e x)^{5/2}\left(d\,\sqrt{x}\,\left(c+d x^2\right)\left(357\, a^2 d^2\left(4 c^2+25\, c\, d\, x^2+15\, d^2 x^4\right)+42\, a\, b\, d\left(-28\, c^3+20\, c^2 d\, x^2+285\, c\, d^2 x^4+195\, d^3 x^6\right)+b^2\left(308\, c^4-220\, c^3 d\, x^2+180\, c^2 d^2 x^4+4485\, c\, d^3 x^6+3315\, d^4 x^8\right)\right)+84\, c^3\left(11\, b^2 c^2-42\, a\, b\, c\, d+51\, a^2 d^2\right)\left(-\left(d+\frac{c}{x^2}\right)\sqrt{x}+\frac{1}{\left(\frac{i\sqrt{c}}{\sqrt{d}}\right)^{3/2}}\, i\, c\,\sqrt{1+\frac{c}{d x^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)\right)$$

Problem 833: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 340 leaves, 7 steps):

$$\frac{8\, c^2\left(57\, a^2 d^2+b\, c\,(9\, b\, c-38\, a\, d)\right) e\,\sqrt{e x}\,\sqrt{c+d x^2}}{4389\, d^3}+\frac{4\, c\left(57\, a^2 d^2+b\, c\,(9\, b\, c-38\, a\, d)\right)(e x)^{5/2}\sqrt{c+d x^2}}{1463\, d^2\, e}+\frac{2\left(57\, a^2 d^2+b\, c\,(9\, b\, c-38\, a\, d)\right)(e x)^{5/2}\left(c+d x^2\right)^{3/2}}{627\, d^2\, e}-\frac{2\, b\,(9\, b\, c-38\, a\, d)\,(e x)^{5/2}\left(c+d x^2\right)^{5/2}}{285\, d^2\, e}+\frac{2\, b^2 (e x)^{9/2}\left(c+d x^2\right)^{5/2}}{19\, d\, e^3}-\left(4\, c^{11/4}\left(57\, a^2 d^2+b\, c\,(9\, b\, c-38\, a\, d)\right) e^{3/2}\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(4389\, d^{13/4}\sqrt{c+d x^2}\right)$$

Result (type 4, 259 leaves):

$$\left((e\,x)^{3/2}\left(\frac{1}{5\,d^3}2\,\sqrt{x}\,\left(c+d\,x^2\right)\left(285\,a^2\,d^2\,\left(4\,c^2+13\,c\,d\,x^2+7\,d^2\,x^4\right)+38\,a\,b\,d\,\left(-20\,c^3+12\,c^2\,d\,x^2+119\,c\,d^2\,x^4+77\,d^3\,x^6\right)+3\,b^2\,\left(60\,c^4-36\,c^3\,d\,x^2+28\,c^2\,d^2\,x^4+539\,c\,d^3\,x^6+385\,d^4\,x^8\right)\right)-\frac{1}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,d^3}8\,i\,c^3\,\left(9\,b^2\,c^2-38\,a\,b\,c\,d+57\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(4389\,x^{3/2}\,\sqrt{c+d\,x^2}\right)$$

Problem 834: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 482 leaves, 8 steps):

$$\frac{4\,c\,\left(221\,a^2\,d^2+3\,b\,c\,\left(7\,b\,c-34\,a\,d\right)\right)\,\left(e\,x\right)^{3/2}\,\sqrt{c+d\,x^2}}{3315\,d^2\,e}+\frac{8\,c^2\,\left(221\,a^2\,d^2+3\,b\,c\,\left(7\,b\,c-34\,a\,d\right)\right)\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{3315\,d^{5/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)}+\frac{2\,\left(221\,a^2\,d^2+3\,b\,c\,\left(7\,b\,c-34\,a\,d\right)\right)\,\left(e\,x\right)^{3/2}\,\left(c+d\,x^2\right)^{3/2}}{1989\,d^2\,e}-\frac{2\,b\,\left(7\,b\,c-34\,a\,d\right)\,\left(e\,x\right)^{3/2}\,\left(c+d\,x^2\right)^{5/2}}{221\,d^2\,e}+\frac{2\,b^2\,\left(e\,x\right)^{7/2}\,\left(c+d\,x^2\right)^{5/2}}{17\,d\,e^3}-\left(8\,c^{9/4}\,\left(221\,a^2\,d^2+3\,b\,c\,\left(7\,b\,c-34\,a\,d\right)\right)\,\sqrt{e}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(3315\,d^{11/4}\,\sqrt{c+d\,x^2}\right)+\left(4\,c^{9/4}\,\left(221\,a^2\,d^2+3\,b\,c\,\left(7\,b\,c-34\,a\,d\right)\right)\,\sqrt{e}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(3315\,d^{11/4}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 316 leaves) :

$$\left(2 e \left(d x^2 \left(c + d x^2\right) \left(221 a^2 d^2 \left(11 c + 5 d x^2\right) + 102 a b d \left(4 c^2 + 25 c d x^2 + 15 d^2 x^4\right) + b^2 \left(-84 c^3 + 60 c^2 d x^2 + 855 c d^2 x^4 + 585 d^3 x^6\right)\right) + \frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}} 12 c^2 \left(21 b^2 c^2 - 102 a b c d + 221 a^2 d^2\right) \left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} \left(c + d x^2\right) - \sqrt{c} \sqrt{d} \sqrt{1 + \frac{c}{d x^2}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right] + \sqrt{c} \sqrt{d} \sqrt{1 + \frac{c}{d x^2}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right)\right) \Big/ \left(9945 d^3 \sqrt{e x} \sqrt{c + d x^2}\right)$$

Problem 835: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 286 leaves, 6 steps):

$$\frac{4 c \left(33 a^2 d^2 + b c \left(b c - 6 a d\right)\right) \sqrt{e x} \sqrt{c + d x^2}}{231 d^2 e} + \frac{2 \left(33 a^2 d^2 + b c \left(b c - 6 a d\right)\right) \sqrt{e x} \left(c + d x^2\right)^{3/2}}{231 d^2 e} - \frac{2 b \left(b c - 6 a d\right) \sqrt{e x} \left(c + d x^2\right)^{5/2}}{33 d^2 e} + \frac{2 b^2 (e x)^{5/2} \left(c + d x^2\right)^{5/2}}{15 d e^3} + \left(4 c^{7/4} \left(33 a^2 d^2 + b c \left(b c - 6 a d\right)\right) \left(\sqrt{c} + \sqrt{d} x\right) \sqrt{\frac{c + d x^2}{\left(\sqrt{c} + \sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(231 d^{9/4} \sqrt{e} \sqrt{c + d x^2}\right)$$

Result (type 4, 223 leaves):

$$\left(\sqrt{x}\left(\frac{1}{5 d^2}2\sqrt{x}\left(c+d x^2\right)\left(165 a^2 d^2\left(3 c+d x^2\right)+30 a b d\left(4 c^2+13 c d x^2+7 d^2 x^4\right)+b^2\left(-20 c^3+12 c^2 d x^2+119 c d^2 x^4+77 d^3 x^6\right)\right)+\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\, d^2}8 i c^2\left(b^2 c^2-6 a b c d+33 a^2 d^2\right)\sqrt{1+\frac{c}{d x^2}}\, x \,\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(231\sqrt{e x}\sqrt{c+d x^2}\right)$$

Problem 836: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 476 leaves, 8 steps):

$$-\frac{4\left(3 b^2 c^2-13 a d\left(2 b c+9 a d\right)\right)(e x)^{3/2}\sqrt{c+d x^2}}{195 d e^3}-\frac{8 c\left(3 b^2 c^2-13 a d\left(2 b c+9 a d\right)\right)\sqrt{e x}\sqrt{c+d x^2}}{195 d^{3/2} e^2\left(\sqrt{c}+\sqrt{d}\, x\right)}-\frac{2\left(3 b^2 c^2-13 a d\left(2 b c+9 a d\right)\right)(e x)^{3/2}\left(c+d x^2\right)^{3/2}}{117 c d e^3}-\frac{2 a^2\left(c+d x^2\right)^{5/2}}{c e\sqrt{e x}}+\frac{2 b^2 (e x)^{3/2}\left(c+d x^2\right)^{5/2}}{13 d e^3}+\left(8 c^{5/4}\left(3 b^2 c^2-13 a d\left(2 b c+9 a d\right)\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\,\text{EllipticE}\left[2 \,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(195 d^{7/4} e^{3/2}\sqrt{c+d x^2}\right)-\left(4 c^{5/4}\left(3 b^2 c^2-13 a d\left(2 b c+9 a d\right)\right)\left(\sqrt{c}+\sqrt{d}\, x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\, x\right)^2}}\,\text{EllipticF}\left[2 \,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(195 d^{7/4} e^{3/2}\sqrt{c+d x^2}\right)$$

Result (type 4, 261 leaves):

$$\frac{1}{195\,(e\,x)^{3/2}}x^{3/2}\left(\frac{1}{3\,d\,\sqrt{x}}2\,\sqrt{c+d\,x^2}\,\left(117\,a^2\,d\,\left(-5\,c+d\,x^2\right)+26\,a\,b\,d\,x^2\,\left(11\,c+5\,d\,x^2\right)+3\,b^2\,x^2\,\left(4\,c^2+25\,c\,d\,x^2+15\,d^2\,x^4\right)\right)-\frac{1}{d^2\,\sqrt{c+d\,x^2}}8\,c\,\left(-3\,b^2\,c^2+26\,a\,b\,c\,d+117\,a^2\,d^2\right)\,x\left(-\left(d+\frac{c}{x^2}\right)\,\sqrt{x}+\frac{1}{\left(\frac{i\,\sqrt{c}}{\sqrt{d}}\right)^{3/2}}i\,c\,\sqrt{1+\frac{c}{d\,x^2}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)$$

Problem 837: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 288 leaves, 6 steps):

$$-\frac{4\,\left(3\,b^2\,c^2-11\,a\,d\,\left(6\,b\,c+7\,a\,d\right)\right)\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{231\,d\,e^3}-\frac{2\,\left(3\,b^2\,c^2-11\,a\,d\,\left(6\,b\,c+7\,a\,d\right)\right)\,\sqrt{e\,x}\,\left(c+d\,x^2\right)^{3/2}}{231\,c\,d\,e^3}-\frac{2\,a^2\,\left(c+d\,x^2\right)^{5/2}}{3\,c\,e\,(e\,x)^{3/2}}+\frac{2\,b^2\,\sqrt{e\,x}\,\left(c+d\,x^2\right)^{5/2}}{11\,d\,e^3}-\left(4\,c^{3/4}\,\left(3\,b^2\,c^2-11\,a\,d\,\left(6\,b\,c+7\,a\,d\right)\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(231\,d^{5/4}\,e^{5/2}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 202 leaves):

$$\left(x^{5/2}\left(\frac{1}{d\,x^{3/2}}2\left(c+d\,x^2\right)\left(77\,a^2\,d\left(-c+d\,x^2\right)+66\,a\,b\,d\,x^2\left(3\,c+d\,x^2\right)+3\,b^2\,x^2\left(4\,c^2+13\,c\,d\,x^2+7\,d^2\,x^4\right)\right)+\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d}8\,i\,c\left(-3\,b^2\,c^2+66\,a\,b\,c\,d+77\,a^2\,d^2\right)\sqrt{1+\frac{c}{d\,x^2}}\;x\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(231\,(e\,x)^{5/2}\sqrt{c+d\,x^2}\right)$$

Problem 838: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 468 leaves, 8 steps):

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

Result (type 4, 240 leaves) :

$$\frac{1}{15 (e x)^{7/2}}$$
$$x^{7/2}\left(\frac{1}{3 x^{5/2}}2\sqrt{c+d x^2}\left(18 a b x^2\left(-5 c+d x^2\right)+b^2 x^4\left(11 c+5 d x^2\right)-9 a^2\left(c+7 d x^2\right)\right)-\frac{1}{d\sqrt{c+d x^2}}\right.$$
$$8\left(b^2 c^2+18 a b c d+9 a^2 d^2\right) x\left(-\left(d+\frac{c}{x^2}\right)\sqrt{x}+\frac{1}{\left(\frac{i\sqrt{c}}{\sqrt{d}}\right)^{3/2}} i\, c\sqrt{1+\frac{c}{d x^2}}\right.$$
$$\left.\left.\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\right)$$

Problem 839: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 430 leaves, 7 steps):

$$\frac{2\left(117 a^2 d^2+7 b c (11 b c-26 a d)\right) e (e x)^{3/2} \sqrt{c+d x^2}}{585 d^3}-\frac{2 b (11 b c-26 a d) (e x)^{7/2} \sqrt{c+d x^2}}{117 d^2 e}+\frac{2 b^2 (e x)^{11/2} \sqrt{c+d x^2}}{13 d e^3}-\frac{2 c \left(117 a^2 d^2+7 b c (11 b c-26 a d)\right) e^2 \sqrt{e x} \sqrt{c+d x^2}}{195 d^{7/2} \left(\sqrt{c}+\sqrt{d} x\right)}+\left(2 c^{5/4} \left(117 a^2 d^2+7 b c (11 b c-26 a d)\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(195 d^{15/4} \sqrt{c+d x^2}\right)-\left(c^{5/4} \left(117 a^2 d^2+7 b c (11 b c-26 a d)\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(195 d^{15/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 237 leaves):

$$\left(2 (e x)^{5/2} \left(d \sqrt{x} \left(c+d x^2\right) \left(117 a^2 d^2+26 a b d \left(-7 c+5 d x^2\right)+b^2 \left(77 c^2-55 c d x^2+45 d^2 x^4\right)\right)+3 c \left(77 b^2 c^2-182 a b c d+117 a^2 d^2\right) \left(-\left(d+\frac{c}{x^2}\right) \sqrt{x}+\frac{1}{\left(\frac{i \sqrt{c}}{\sqrt{d}}\right)^{3/2}} i c \sqrt{1+\frac{c}{d x^2}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right)\right)\right) \Big/ \left(585 d^4 x^{3/2} \sqrt{c+d x^2}\right)$$

Problem 840: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 240 leaves, 5 steps):

$$\frac{2\left(77 a^2 d^2+5 b c\,(9 b c-22 a d)\right) e\sqrt{e x}\,\sqrt{c+d x^2}}{231 d^3}-\frac{2 b\,(9 b c-22 a d)\,(e x)^{5/2}\sqrt{c+d x^2}}{77 d^2 e}+\frac{2 b^2\,(e x)^{9/2}\sqrt{c+d x^2}}{11 d e^3}-\left(c^{3/4}\left(77 a^2 d^2+5 b c\,(9 b c-22 a d)\right) e^{3/2}\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(231 d^{13/4}\sqrt{c+d x^2}\right)$$

Result (type 4, 190 leaves):

$$\left((e x)^{3/2}\left(\frac{1}{d^3}2\sqrt{x}\,\left(c+d x^2\right)\left(77 a^2 d^2+22 a b d\left(-5 c+3 d x^2\right)+3 b^2\left(15 c^2-9 c d x^2+7 d^2 x^4\right)\right)-\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}\,d^3}2\,i\,c\left(45 b^2 c^2-110 a b c d+77 a^2 d^2\right)\sqrt{1+\frac{c}{d x^2}}\;x\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(231 x^{3/2}\sqrt{c+d x^2}\right)$$

Problem 841: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 375 leaves, 6 steps):

$$-\frac{2 b (7 b c-18 a d) (e x)^{3/2} \sqrt{c+d x^2}}{45 d^2 e}+\frac{2 b^2 (e x)^{7/2} \sqrt{c+d x^2}}{9 d e^3}+\frac{2 \left(15 a^2 d^2+b c (7 b c-18 a d)\right) \sqrt{e x} \sqrt{c+d x^2}}{15 d^{5/2} \left(\sqrt{c}+\sqrt{d} x\right)}-\left(2 c^{1/4} \left(15 a^2 d^2+b c (7 b c-18 a d)\right) \sqrt{e} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(15 d^{11/4} \sqrt{c+d x^2}\right)+\left(c^{1/4} \left(15 a^2 d^2+b c (7 b c-18 a d)\right) \sqrt{e} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(15 d^{11/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 249 leaves):

$$\left(2 e \left(b d x^2 (c+d x^2) (-7 b c+18 a d+5 b d x^2)+\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}} 3 \left(7 b^2 c^2-18 a b c d+15 a^2 d^2\right) \left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} (c+d x^2)-\sqrt{c} \sqrt{d} \sqrt{1+\frac{c}{d x^2}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]+\sqrt{c} \sqrt{d} \sqrt{1+\frac{c}{d x^2}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right)\right) \Big/ \left(45 d^3 \sqrt{e x} \sqrt{c+d x^2}\right)$$

Problem 842: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 193 leaves, 4 steps):

$$-\frac{2\,b\,\left(5\,b\,c-14\,a\,d\right)\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{21\,d^2\,e}+\frac{2\,b^2\,\left(e\,x\right)^{5/2}\,\sqrt{c+d\,x^2}}{7\,d\,e^3}+\left(\left(5\,b^2\,c^2-14\,a\,b\,c\,d+21\,a^2\,d^2\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(21\,c^{1/4}\,d^{9/4}\,\sqrt{e}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 148 leaves):

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

Problem 843: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 372 leaves, 6 steps):

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

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

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

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

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

Result (type 4, 200 leaves) :

$$\left(2 x \left(d \left(-5 a^2 d+b^2 c x^2\right) \left(c+d x^2\right)+\left(3 b^2 c^2-10 a b c d-5 a^2 d^2\right) x^{3/2}\right.\right.$$

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

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

Problem 844: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 165 leaves):

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

Problem 845: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 387 leaves, 6 steps):

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

Result (type 4, 217 leaves):

$$\frac{1}{5\,(e\,x)^{7/2}}x^{7/2}\left(-\frac{2\,a\,\sqrt{c+d\,x^2}\,\left(10\,b\,c\,x^2+a\,\left(c-3\,d\,x^2\right)\right)}{c^2\,x^{5/2}}-\frac{1}{c^2\,d\,\sqrt{c+d\,x^2}}\right.$$

$$2\,\left(5\,b^2\,c^2+10\,a\,b\,c\,d-3\,a^2\,d^2\right)\,x\,\left(-\left(d+\frac{c}{x^2}\right)\,\sqrt{x}+\frac{1}{\left(\frac{i\,\sqrt{c}}{\sqrt{d}}\right)^{3/2}}i\,c\,\sqrt{1+\frac{c}{d\,x^2}}\right.$$

$$\left.\left.\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],\,-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],\,-1\right]\right)\right)\right)$$

Problem 846: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 193 leaves, 4 steps):

$$-\frac{2\,a^2\,\sqrt{c+d\,x^2}}{7\,c\,e\,(e\,x)^{7/2}}-\frac{2\,a\,\left(14\,b\,c-5\,a\,d\right)\,\sqrt{c+d\,x^2}}{21\,c^2\,e^3\,(e\,x)^{3/2}}+$$

$$\left(\left(21\,b^2\,c^2-14\,a\,b\,c\,d+5\,a^2\,d^2\right)\,\left(\sqrt{c}+\sqrt{d}\,x\right)\,\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\,\frac{1}{2}\right]\right)\bigg/\left(21\,c^{9/4}\,d^{1/4}\,e^{9/2}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 159 leaves):

$$\left(x^{9/2}\left(\frac{2\,a\,\left(c+d\,x^2\right)\,\left(-3\,a\,c-14\,b\,c\,x^2+5\,a\,d\,x^2\right)}{c^2\,x^{7/2}}+\frac{1}{c^2\,\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}2\,i\,\left(21\,b^2\,c^2-14\,a\,b\,c\,d+5\,a^2\,d^2\right)\right.\right.$$

$$\left.\left.\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],\,-1\right]\right)\right)\bigg/\left(21\,(e\,x)^{9/2}\,\sqrt{c+d\,x^2}\right)$$

Problem 847: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 438 leaves, 7 steps):

$$-\frac{2 a^2 \sqrt{c+d x^2}}{9 c e (e x)^{9/2}}-\frac{2 a (18 b c-7 a d) \sqrt{c+d x^2}}{45 c^2 e^3 (e x)^{5/2}}-\frac{2 \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \sqrt{c+d x^2}}{15 c^3 e^5 \sqrt{e x}}+\frac{2 \sqrt{d} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \sqrt{e x} \sqrt{c+d x^2}}{15 c^3 e^6 \left(\sqrt{c}+\sqrt{d} x\right)}-\left(2 d^{1/4} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(15 c^{11/4} e^{11/2} \sqrt{c+d x^2}\right)+\left(d^{1/4} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(15 c^{11/4} e^{11/2} \sqrt{c+d x^2}\right)$$

Result (type 4, 288 leaves):

$$\left(\sqrt{e x} \left(-2 \sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}} \left(c+d x^2\right) \left(45 b^2 c^2 x^4+18 a b c x^2 \left(c-3 d x^2\right)+a^2 \left(5 c^2-7 c d x^2+21 d^2 x^4\right)\right)+6 \sqrt{c} \sqrt{d} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) x^5 \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]-6 \sqrt{c} \sqrt{d} \left(15 b^2 c^2-18 a b c d+7 a^2 d^2\right) x^5 \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]\right)\right) \Big/ \left(45 c^3 e^6 x^5 \sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}} \sqrt{c+d x^2}\right)$$

Problem 848: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 242 leaves, 5 steps):

$$-\frac{2 a^2 \sqrt{c+d x^2}}{11 c e (e x)^{11/2}}-\frac{2 a (22 b c-9 a d) \sqrt{c+d x^2}}{77 c^2 e^3 (e x)^{7/2}}-\frac{2 \left(77 b^2 c^2-5 a d (22 b c-9 a d)\right) \sqrt{c+d x^2}}{231 c^3 e^5 (e x)^{3/2}}-\left(d^{3/4} \left(77 b^2 c^2-5 a d (22 b c-9 a d)\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(231 c^{13/4} e^{13/2} \sqrt{c+d x^2}\right)$$

Result (type 4, 196 leaves):

$$\left(x^{13/2} \left(-\frac{1}{c^3 x^{11/2}} 2 \left(c+d x^2\right) \left(77 b^2 c^2 x^4+22 a b c x^2 \left(3 c-5 d x^2\right)+3 a^2 \left(7 c^2-9 c d x^2+15 d^2 x^4\right)\right)-\frac{1}{c^3 \sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}} 2 i d \left(77 b^2 c^2-110 a b c d+45 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}} x \, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right) \Big/ \left(231 (e x)^{13/2} \sqrt{c+d x^2}\right)$$

Problem 849: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{(b c-a d)^2 (e x)^{9/2}}{c d^2 e \sqrt{c+d x^2}}+\frac{5 \left(117 b^2 c^2-198 a b c d+77 a^2 d^2\right) e^3 \sqrt{e x} \sqrt{c+d x^2}}{231 d^4}-\frac{\left(117 b^2 c^2-198 a b c d+77 a^2 d^2\right) e (e x)^{5/2} \sqrt{c+d x^2}}{77 c d^3}+\frac{2 b^2 (e x)^{9/2} \sqrt{c+d x^2}}{11 d^2 e}-\left(5 c^{3/4} \left(117 b^2 c^2-198 a b c d+77 a^2 d^2\right) e^{7/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(462 d^{17/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 226 leaves):

$$\left(e^3 \sqrt{e x} \left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} \left(77 a^2 d^2 \left(5 c+2 d x^2\right)+66 a b d \left(-15 c^2-6 c d x^2+2 d^2 x^4\right)+3 b^2 \left(195 c^3+78 c^2 d x^2-26 c d^2 x^4+14 d^3 x^6\right)\right)-5 i c \left(117 b^2 c^2-198 a b c d+77 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}} \sqrt{x} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right) \Big/ \left(231 \sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} d^4 \sqrt{c+d x^2}\right)$$

Problem 850: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 436 leaves, 7 steps):

$$\frac{(b c-a d)^2 (e x)^{7/2}}{c d^2 e \sqrt{c+d x^2}}-\frac{\left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e (e x)^{3/2} \sqrt{c+d x^2}}{45 c d^3}+$$

$$\frac{2 b^2 (e x)^{7/2} \sqrt{c+d x^2}}{9 d^2 e}+\frac{\left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e^2 \sqrt{e x} \sqrt{c+d x^2}}{15 d^{7/2} \left(\sqrt{c}+\sqrt{d} x\right)}-$$

$$\left(c^{1/4} \left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(15 d^{15/4} \sqrt{c+d x^2}\right)+$$

$$\left(c^{1/4} \left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(30 d^{15/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 276 leaves):

$$\frac{1}{45 d^4 x^3 \sqrt{c+d x^2}}$$

$$(e x)^{5/2} \left(d x^2 \left(-45 a^2 d^2+18 a b d \left(7 c+2 d x^2\right)+b^2 \left(-77 c^2-22 c d x^2+10 d^2 x^4\right)\right)+\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}\right.$$

$$3 \left(77 b^2 c^2-126 a b c d+45 a^2 d^2\right)$$

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

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

Problem 851: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 245 leaves, 5 steps):

$$\frac{(b\,c-a\,d)^2\,(e\,x)^{5/2}}{c\,d^2\,e\,\sqrt{c+d\,x^2}}-\frac{\left(45\,b^2\,c^2-70\,a\,b\,c\,d+21\,a^2\,d^2\right)\,e\,\sqrt{e\,x}\,\sqrt{c+d\,x^2}}{21\,c\,d^3}+\frac{2\,b^2\,(e\,x)^{5/2}\,\sqrt{c+d\,x^2}}{7\,d^2\,e}+\left(\left(45\,b^2\,c^2-70\,a\,b\,c\,d+21\,a^2\,d^2\right)\,e^{3/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(42\,c^{1/4}\,d^{13/4}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 191 leaves):

$$\left(e\,\sqrt{e\,x}\,\left(\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,\left(-21\,a^2\,d^2+14\,a\,b\,d\,\left(5\,c+2\,d\,x^2\right)-3\,b^2\,\left(15\,c^2+6\,c\,d\,x^2-2\,d^2\,x^4\right)\right)+i\,\left(45\,b^2\,c^2-70\,a\,b\,c\,d+21\,a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,\sqrt{x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(21\,\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,d^3\,\sqrt{c+d\,x^2}\right)$$

Problem 852: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 384 leaves, 6 steps):

$$\frac{(b c-a d)^2 (e x)^{3/2}}{c d^2 e \sqrt{c+d x^2}}+\frac{2 b^2 (e x)^{3/2} \sqrt{c+d x^2}}{5 d^2 e}-\frac{\left(21 b^2 c^2-30 a b c d+5 a^2 d^2\right) \sqrt{e x} \sqrt{c+d x^2}}{5 c d^{5/2} \left(\sqrt{c}+\sqrt{d} x\right)}+$$

$$\left(\left(21 b^2 c^2-30 a b c d+5 a^2 d^2\right) \sqrt{e} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(5 c^{3/4} d^{11/4} \sqrt{c+d x^2}\right)-$$

$$\left(\left(21 b^2 c^2-30 a b c d+5 a^2 d^2\right) \sqrt{e} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(10 c^{3/4} d^{11/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 244 leaves):

$$\left(e \left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}\, d x^2 \left(5 (b c-a d)^2+2 b^2 c \left(c+d x^2\right)\right)-\left(21 b^2 c^2-30 a b c d+5 a^2 d^2\right)\right.\right.$$

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

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

Problem 853: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 193 leaves, 4 steps):

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

Result (type 4, 174 leaves):

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

Problem 854: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 393 leaves, 6 steps):

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

Result (type 4, 250 leaves):

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

Problem 855: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 207 leaves, 4 steps):

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

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

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(6 c^{9/4} d^{5/4} e^{5/2} \sqrt{c+d x^2}\right)$$

Result (type 4, 181 leaves) :

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

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

Problem 856: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 434 leaves, 7 steps) :

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

Result (type 4, 277 leaves):

$$\left(i \left(\sqrt{d} \sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}} \left(5 b^2 c^2 x^4-10 a b c x^2 \left(2 c+3 d x^2\right)+a^2 \left(-2 c^2+14 c d x^2+21 d^2 x^4\right)\right)-\sqrt{c} \left(5 b^2 c^2-30 a b c d+21 a^2 d^2\right) x^3 \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]+\sqrt{c} \left(5 b^2 c^2-30 a b c d+21 a^2 d^2\right) x^3 \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]\right)\right) \Big/ \left(5 c^{7/2} e^2 \left(\frac{i \sqrt{d} x}{\sqrt{c}}\right)^{3/2} (e x)^{3/2} \sqrt{c+d x^2}\right)$$

Problem 857: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{(b c-a d)^2 (e x)^{9/2}}{3 c d^2 e \left(c+d x^2\right)^{3/2}}+\frac{\left(39 b^2 c^2-42 a b c d+7 a^2 d^2\right) e (e x)^{5/2}}{14 c d^3 \sqrt{c+d x^2}}+\frac{2 b^2 (e x)^{9/2}}{7 d^2 e \sqrt{c+d x^2}}-\frac{5 \left(39 b^2 c^2-42 a b c d+7 a^2 d^2\right) e^3 \sqrt{e x} \sqrt{c+d x^2}}{42 c d^4}+\left(5 \left(39 b^2 c^2-42 a b c d+7 a^2 d^2\right) e^{7/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(84 c^{1/4} d^{17/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 222 leaves):

$$\frac{1}{42 x^{7/2} \sqrt{c+d x^2}} (e x)^{7/2} \left(\frac{1}{d^4 \left(c+d x^2\right)} \sqrt{x} \left(-7 a^2 d^2 \left(5 c+7 d x^2\right)+14 a b d \left(15 c^2+21 c d x^2+4 d^2 x^4\right)-b^2 \left(195 c^3+273 c^2 d x^2+52 c d^2 x^4-12 d^3 x^6\right)\right)+\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} d^4} 5 i \left(39 b^2 c^2-42 a b c d+7 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}} x \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)$$

Problem 858: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 442 leaves, 7 steps):

$$\frac{(b c-a d)^2 (e x)^{7/2}}{3 c d^2 e \left(c+d x^2\right)^{3/2}}+\frac{\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e (e x)^{3/2}}{30 c d^3 \sqrt{c+d x^2}}+$$
$$\frac{2 b^2 (e x)^{7/2}}{5 d^2 e \sqrt{c+d x^2}}-\frac{\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e^2 \sqrt{e x} \sqrt{c+d x^2}}{10 c d^{7/2} \left(\sqrt{c}+\sqrt{d} x\right)}+$$
$$\left(\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(10 c^{3/4} d^{15/4} \sqrt{c+d x^2}\right)-$$
$$\left(\left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) e^{5/2} \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(20 c^{3/4} d^{15/4} \sqrt{c+d x^2}\right)$$

Result (type 4, 298 leaves):

$$\left((e x)^{5/2} \left(-d x^2 \left(-5 a^2 d^2 \left(c+3 d x^2\right)+10 a b c d \left(7 c+9 d x^2\right)-b^2 c \left(77 c^2+99 c d x^2+12 d^2 x^4\right)\right)-\right.\right.$$
$$\frac{1}{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}} 3 \left(77 b^2 c^2-70 a b c d+5 a^2 d^2\right) \left(c+d x^2\right)$$
$$\left(\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}} \left(c+d x^2\right)-\sqrt{c} \sqrt{d} \sqrt{1+\frac{c}{d x^2}} x^{3/2} \text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]+\sqrt{c}\right.$$
$$\left.\left.\left.\sqrt{d} \sqrt{1+\frac{c}{d x^2}} x^{3/2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right)\right) \Big/ \left(30 c d^4 x^3 \left(c+d x^2\right)^{3/2}\right)$$

Problem 859: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 248 leaves, 5 steps):

$$\frac{(b\,c-a\,d)^2\,(e\,x)^{5/2}}{3\,c\,d^2\,e\,\left(c+d\,x^2\right)^{3/2}}+\frac{\left(15\,b^2\,c^2-10\,a\,b\,c\,d-a^2\,d^2\right)\,e\,\sqrt{e\,x}}{6\,c\,d^3\,\sqrt{c+d\,x^2}}+\frac{2\,b^2\,(e\,x)^{5/2}}{3\,d^2\,e\,\sqrt{c+d\,x^2}}-\left(\left(15\,b^2\,c^2-10\,a\,b\,c\,d-a^2\,d^2\right)\,e^{3/2}\,\left(\sqrt{c}+\sqrt{d}\,x\right)\sqrt{\frac{c+d\,x^2}{\left(\sqrt{c}+\sqrt{d}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],\frac{1}{2}\right]\right)\Big/\left(12\,c^{5/4}\,d^{13/4}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 204 leaves):

$$\frac{1}{6\,x^{3/2}\,\sqrt{c+d\,x^2}}(e\,x)^{3/2}\left(\frac{1}{c\,d^3\,\left(c+d\,x^2\right)}\sqrt{x}\,\left(a^2\,d^2\,\left(-c+d\,x^2\right)-2\,a\,b\,c\,d\,\left(5\,c+7\,d\,x^2\right)+b^2\,c\,\left(15\,c^2+21\,c\,d\,x^2+4\,d^2\,x^4\right)\right)+\frac{1}{c\,\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}\,d^3}i\,\left(-15\,b^2\,c^2+10\,a\,b\,c\,d+a^2\,d^2\right)\,\sqrt{1+\frac{c}{d\,x^2}}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right],-1\right]\right)$$

Problem 860: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 403 leaves, 6 steps):

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

Result (type 4, 281 leaves) :

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

Problem 861: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 169 leaves) :

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

Problem 862: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 442 leaves, 7 steps) :

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

Result (type 4, 222 leaves):

$$\left(x\left(\frac{1}{c+d x^2}\left(b^2 c^2 x^2\left(c+3 d x^2\right)+2 a b c d x^2\left(5 c+3 d x^2\right)-a^2 d\left(12 c^2+35 c d x^2+21 d^2 x^4\right)\right)-\frac{1}{\left(\frac{i\sqrt{d} x}{\sqrt{c}}\right)^{3/2}}3 i\left(b^2 c^2+2 a b c d-7 a^2 d^2\right) x^2\sqrt{1+\frac{d x^2}{c}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{d} x}{\sqrt{c}}}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{d} x}{\sqrt{c}}}\right],-1\right]\right)\right)\right)\Big/\left(6 c^3 d (e x)^{3/2}\sqrt{c+d x^2}\right)$$

Problem 863: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 258 leaves, 5 steps):

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

Result (type 4, 211 leaves):

$$\left(x^{5/2} \left(\left(b^2 c^2 x^2 \left(-c+d x^2\right)+2 a b c d x^2 \left(7 c+5 d x^2\right)-a^2 d \left(4 c^2+21 c d x^2+15 d^2 x^4\right)\right) \Big/ \left(c^3 d x^{3/2} \left(c+d x^2\right)\right)+\frac{1}{c^3 \sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}\, d} i \left(b^2 c^2+10 a b c d-15 a^2 d^2\right) \sqrt{1+\frac{c}{d x^2}}\, x \,\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{c}}{\sqrt{d}}}}{\sqrt{x}}\right], -1\right]\right)\right) \Big/ \left(6 (e x)^{5/2} \sqrt{c+d x^2}\right)$$

Problem 864: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 489 leaves, 8 steps):

$$-\frac{2 a^2}{5 c e (e x)^{5/2} \left(c+d x^2\right)^{3/2}}-\frac{2 a (10 b c-11 a d)}{5 c^2 e^3 \sqrt{e x} \left(c+d x^2\right)^{3/2}}+\frac{\left(5 b^2 c^2-70 a b c d+77 a^2 d^2\right) (e x)^{3/2}}{15 c^3 e^5 \left(c+d x^2\right)^{3/2}}+\frac{\left(5 b^2 c^2-70 a b c d+77 a^2 d^2\right) (e x)^{3/2}}{10 c^4 e^5 \sqrt{c+d x^2}}-\frac{\left(5 b^2 c^2-70 a b c d+77 a^2 d^2\right) \sqrt{e x} \sqrt{c+d x^2}}{10 c^4 \sqrt{d} e^4 \left(\sqrt{c}+\sqrt{d} x\right)}+\left(\left(5 b^2 c^2-70 a b c d+77 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(10 c^{15/4} d^{3/4} e^{7/2} \sqrt{c+d x^2}\right)-\left(\left(5 b^2 c^2-70 a b c d+77 a^2 d^2\right) \left(\sqrt{c}+\sqrt{d} x\right) \sqrt{\frac{c+d x^2}{\left(\sqrt{c}+\sqrt{d} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], \frac{1}{2}\right]\right) \Big/ \left(20 c^{15/4} d^{3/4} e^{7/2} \sqrt{c+d x^2}\right)$$

Result (type 4, 246 leaves) :

$$\left(x \left(\frac{1}{c+d x^2}\left(5 b^2 c^2 x^4 \left(5 c+3 d x^2\right)-10 a b c x^2 \left(12 c^2+35 c d x^2+21 d^2 x^4\right)+a^2 \left(-12 c^3+132 c^2 d x^2+385 c d^2 x^4+231 d^3 x^6\right)\right)+\frac{1}{d} 3 i c \left(5 b^2 c^2-70 a b c d+77 a^2 d^2\right) x^2 \sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}} \sqrt{1+\frac{d x^2}{c}} \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{d} x}{\sqrt{c}}}\right], -1\right]\right)\right)\right) \Big/ \left(30 c^4 (e x)^{7/2} \sqrt{c+d x^2}\right)$$

Problem 865: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 372 leaves, 11 steps) :

$$\frac{2\left(2\,b\,c-7\,a\,d\right)e^{3}\sqrt{e\,x}\,\sqrt{c-d\,x^{2}}}{21\,b^{2}\,d}-\frac{2\,e\,\left(e\,x\right)^{5/2}\sqrt{c-d\,x^{2}}}{7\,b}-$$
$$\left(2\,c^{1/4}\left(2\,b^{2}\,c^{2}+14\,a\,b\,c\,d-21\,a^{2}\,d^{2}\right)e^{7/2}\sqrt{1-\frac{d\,x^{2}}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(21\,b^{3}\,d^{5/4}\sqrt{c-d\,x^{2}}\right)+\frac{1}{b^{3}\,d^{1/4}\sqrt{c-d\,x^{2}}}$$
$$a\,c^{1/4}\left(b\,c-a\,d\right)e^{7/2}\sqrt{1-\frac{d\,x^{2}}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]+$$
$$\frac{1}{b^{3}\,d^{1/4}\sqrt{c-d\,x^{2}}}a\,c^{1/4}\left(b\,c-a\,d\right)e^{7/2}\sqrt{1-\frac{d\,x^{2}}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]$$

Result (type 6, 382 leaves):

$$\Bigg(2\,\left(e\,x\right)^{7/2}\Bigg(5\left(c-d\,x^{2}\right)\left(2\,b\,c-7\,a\,d-3\,b\,d\,x^{2}\right)+$$
$$\left(25\,a^{2}\,c^{2}\left(-2\,b\,c+7\,a\,d\right)\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]\right)\Big/$$
$$\left(\left(a-b\,x^{2}\right)\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]+2\,x^{2}\left(2\,b\,c\right.\right.\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]\right)\right)\right)-$$
$$\left(9\,a\,c\left(-2\,b^{2}\,c^{2}-14\,a\,b\,c\,d+21\,a^{2}\,d^{2}\right)x^{2}\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]\right)\Big/$$
$$\left(\left(a-b\,x^{2}\right)\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]+\right.\right.$$
$$2\,x^{2}\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]+\right.$$
$$\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^{2}}{c},\frac{b\,x^{2}}{a}\right]\right)\right)\Bigg)\Bigg)\Big/\left(105\,b^{2}\,d\,x^{3}\sqrt{c-d\,x^{2}}\right)$$

Problem 866: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 414 leaves, 15 steps):

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

Result (type 6, 418 leaves):

$$\Bigg(2 e (e x)^{3/2}$$
$$\Bigg(-\Bigg(\Bigg(49 a^2 c^2 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Big/\Bigg(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2 \Bigg(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)+$$
$$\Bigg(11 a c \left(7 a c-9 b c x^2-2 a d x^2+7 b d x^4\right) \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$14 x^2 \left(a-b x^2\right) \left(c-d x^2\right) \Bigg(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Big/$$
$$\Bigg(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \Bigg(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\right.$$
$$\left.\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(35 b \left(-a+b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 867: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 315 leaves, 10 steps):

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

Result (type 6, 418 leaves):

$$\left(2 e \sqrt{e x} \left(-\left(\left(25 a^2 c^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(9 a c \left(5 a c-7 b c x^2-2 a d x^2+5 b d x^4\right) \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+10 x^2 \left(a-b x^2\right) \left(c-d x^2\right) \left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/\left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(15 b \left(-a+b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 868: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 365 leaves, 13 steps):

$$\frac{2 c^{3/4} d^{1/4} \sqrt{e} \sqrt{1-\frac{d x^2}{c}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{b \sqrt{c-d x^2}}-$$

$$\frac{2 c^{3/4} d^{1/4} \sqrt{e} \sqrt{1-\frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{b \sqrt{c-d x^2}}-$$

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

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

Result (type 6, 164 leaves):

$$-\left(\left(14 a c x \sqrt{e x} \sqrt{c-d x^2} \text{AppellF1}\left[\frac{3}{4},-\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right) \Big/ \left(3 \left(a-b x^2\right) \left(-7 a c \text{AppellF1}\left[\frac{3}{4},-\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(-2 b c \text{AppellF1}\left[\frac{7}{4},-\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 869: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{c-d x^2}}{\sqrt{e x} \left(a-b x^2\right)} \, dx$$

Optimal (type 4, 283 leaves, 9 steps):

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

$$\left(c^{1/4} (b c-a d) \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]\right) \Big/ \left(a b d^{1/4} \sqrt{e} \sqrt{c-d x^2}\right)+\frac{c^{1/4} (b c-a d) \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{a b d^{1/4} \sqrt{e} \sqrt{c-d x^2}}$$

Result (type 6, 162 leaves):

$$-\left(\left(10\,a\,c\,x\,\sqrt{c-d\,x^2}\;\text{AppellF1}\left[\frac{1}{4},-\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\sqrt{e\,x}\;\left(a-b\,x^2\right)\left(-5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},-\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(-2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},-\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 870: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 392 leaves, 15 steps):

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

Result (type 6, 337 leaves):

$$\left(2 x \left(-\frac{21 \left(c-d x^2\right)}{a}+\left(49 c \left(b c-2 a d\right) x^2 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right) \left(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)-\left(33 b c d x^4 \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right) \left(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(21 (e x)^{3/2} \sqrt{c-d x^2}\right)$$

Problem 871: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 308 leaves, 10 steps):

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

Result (type 6, 338 leaves):

$$\left(2 x \left(-\frac{5 \left(c-d x^2\right)}{a}+\left(25 c \left(3 b c-2 a d\right) x^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right) \left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(9 b c d x^4 \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right) \left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(15 (e x)^{5/2} \sqrt{c-d x^2}\right)$$

Problem 872: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{c-d x^2}}{(e x)^{7/2} \left(a-b x^2\right)} \, dx$$

Optimal (type 4, 457 leaves, 16 steps):

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

Result (type 6, 381 leaves):

$$\left(2 x \left(-\frac{21 \left(c-d x^2\right) \left(5 b c x^2+a \left(c-2 d x^2\right)\right)}{c}+\left(49 a \left(5 b^2 c^2-10 a b c d+2 a^2 d^2\right) x^4 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right) \left(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(33 a b d \left(5 b c-2 a d\right) x^6 \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right) \left(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(105 a^2 (e x)^{7/2} \sqrt{c-d x^2}\right)$$

Problem 873: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 485 leaves, 16 steps):

$$-\frac{2\,(11\,b\,c-9\,a\,d)\,e\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}{45\,b^2}+\frac{2\,d\,(e\,x)^{7/2}\,\sqrt{c-d\,x^2}}{9\,b\,e}-$$
$$\left(2\,c^{3/4}\,(4\,b^2\,c^2-21\,a\,b\,c\,d+15\,a^2\,d^2)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(15\,b^3\,d^{3/4}\,\sqrt{c-d\,x^2}\right)+$$
$$\left(2\,c^{3/4}\,(4\,b^2\,c^2-21\,a\,b\,c\,d+15\,a^2\,d^2)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(15\,b^3\,d^{3/4}\,\sqrt{c-d\,x^2}\right)-$$
$$\left(\sqrt{a}\,c^{1/4}\,(b\,c-a\,d)^2\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}\right)+$$
$$\left(\sqrt{a}\,c^{1/4}\,(b\,c-a\,d)^2\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}\right)$$

Result (type 6, 378 leaves):

$$\frac{1}{315\,b^2\,\sqrt{c-d\,x^2}}2\,e\,(e\,x)^{3/2}\,\left(-7\,(c-d\,x^2)\,(11\,b\,c-9\,a\,d-5\,b\,d\,x^2)+\right.$$
$$\left(49\,a^2\,c^2\,(-11\,b\,c+9\,a\,d)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left((-a+b\,x^2)\,\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\right.\right.$$
$$\left.\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(33\,a\,c\,(4\,b^2\,c^2-21\,a\,b\,c\,d+15\,a^2\,d^2)\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left((a-b\,x^2)\,\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\right.\right.\right.$$
$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 874: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 372 leaves, 11 steps):

$$-\frac{2 (9 b c-7 a d) e \sqrt{e x} \sqrt{c-d x^2}}{21 b^2}+\frac{2 d (e x)^{5/2} \sqrt{c-d x^2}}{7 b e}-\left(2 c^{1/4} \left(12 b^2 c^2-35 a b c d+21 a^2 d^2\right) e^{3/2} \sqrt{1-\frac{d x^2}{c}} \, \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]\right) \Big/ \left(21 b^3 d^{1/4} \sqrt{c-d x^2}\right)+\frac{1}{b^3 d^{1/4} \sqrt{c-d x^2}} c^{1/4} (b c-a d)^2 e^{3/2} \sqrt{1-\frac{d x^2}{c}} \, \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]+\frac{1}{b^3 d^{1/4} \sqrt{c-d x^2}} c^{1/4} (b c-a d)^2 e^{3/2} \sqrt{1-\frac{d x^2}{c}} \, \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]$$

Result (type 6, 378 leaves):

$$\frac{1}{105 b^2 \sqrt{c-d x^2}} 2 e \sqrt{e x} \left(-5 \left(c-d x^2\right) \left(9 b c-7 a d-3 b d x^2\right)+\left(25 a^2 c^2 (-9 b c+7 a d) \, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right) \Big/ \left(\left(-a+b x^2\right) \left(5 a c \, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \, \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(9 a c \left(12 b^2 c^2-35 a b c d+21 a^2 d^2\right) x^2 \, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right) \Big/ \left(\left(a-b x^2\right) \left(9 a c \, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \, \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \, \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 875: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 421 leaves, 15 steps):

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

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

$$\left(c^{1/4} (b c - a d)^2 \sqrt{e} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]\right) \Big/$$

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

$$\left(c^{1/4} (b c - a d)^2 \sqrt{e} \sqrt{1 - \frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}}, \text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right], -1\right]\right) \Big/$$

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

Result (type 6, 427 leaves) :

$$\left(2 x \sqrt{e x} \left(\left(49 a c^2 (-5 b c + 3 a d) \text{AppellF1}\left[\frac{3}{4}, \frac{1}{2}, 1, \frac{7}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right) \Big/ \right.\right.$$

$$\left(7 a c \text{AppellF1}\left[\frac{3}{4}, \frac{1}{2}, 1, \frac{7}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2\right.$$

$$\left.\left(2 b c \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 2, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{7}{4}, \frac{3}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right) +$$

$$\left(-33 a c d \left(7 a c - 14 b c x^2 - 2 a d x^2 + 7 b d x^4\right) \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] - \right.$$

$$42 d x^2 (a - b x^2) (c - d x^2) \left(2 b c \text{AppellF1}\left[\frac{11}{4}, \frac{1}{2}, 2, \frac{15}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + \right.$$

$$\left.\left. a d \text{AppellF1}\left[\frac{11}{4}, \frac{3}{2}, 1, \frac{15}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right) \Big/$$

$$\left(11 a c \text{AppellF1}\left[\frac{7}{4}, \frac{1}{2}, 1, \frac{11}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right] + 2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4}, \frac{1}{2}, 2, \frac{15}{4}, \frac{d x^2}{c}, \right.\right.\right.$$

$$\left.\left.\left.\left.\left.\frac{b x^2}{a}\right] + a d \text{AppellF1}\left[\frac{11}{4}, \frac{3}{2}, 1, \frac{15}{4}, \frac{d x^2}{c}, \frac{b x^2}{a}\right]\right)\right)\right)\right) \Big/ \left(105 b (-a + b x^2) \sqrt{c - d x^2}\right)$$

Problem 876: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 328 leaves, 10 steps) :

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

$$\left(c^{1/4}\,(b\,c-a\,d)^2\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(c^{1/4}\,(b\,c-a\,d)^2\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 425 leaves):

$$\left(2\,x\left(\left(25\,a\,c^2\,(-3\,b\,c+a\,d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$

$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$

$$\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$

$$\left(d\left(-9\,a\,c\,\left(5\,a\,c-10\,b\,c\,x^2-2\,a\,d\,x^2+5\,b\,d\,x^4\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-\right.\right.$$

$$10\,x^2\,\left(a-b\,x^2\right)\,\left(c-d\,x^2\right)\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$

$$\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\Big/$$

$$\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$

$$\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(15\,b\,\sqrt{e\,x}\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 877: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 417 leaves, 15 steps):

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

Result (type 6, 436 leaves):

$$\left(2 c x \left(\left(49 c (b c-3 a d) x^2 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\right.$$
$$\left.\left.\left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$
$$\left(33 a \left(b c x^2 \left(7 c-6 d x^2\right)+a \left(-7 c^2+7 c d x^2+d^2 x^4\right)\right) \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-\right.$$
$$42 x^2 \left(a-b x^2\right) \left(c-d x^2\right) \left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$\left.\left.a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/\left(a \left(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\right.\right.\right.$$
$$1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$\left.\left.\left.\left.\left.a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(21 (e x)^{3/2} \left(a-b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 878: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 330 leaves, 10 steps):

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

$$\left(c^{1/4} (b c-a d)^2 \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(c^{1/4} (b c-a d)^2 \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 438 leaves):

$$\left(2 c x \left(\left(25 c (3 b c-5 a d) x^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$

$$\left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$

$$\left.\left.2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+$$

$$\left(9 a \left(b c x^2 \left(5 c-6 d x^2\right)+a \left(-5 c^2+5 c d x^2+3 d^2 x^4\right)\right) \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-\right.$$

$$10 x^2 \left(a-b x^2\right) \left(c-d x^2\right)$$

$$\left.\left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/$$

$$\left(a \left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$

$$2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$

$$\left.\left.\left.\left.a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(15 (e x)^{5/2} \left(a-b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 879: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 459 leaves, 16 steps):

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

Result (type 6, 380 leaves):

$$\Bigg(2 x \Bigg(-21 \left(c-d x^2\right) \left(5 b c x^2+a \left(c-7 d x^2\right)\right)+$$
$$\left(49 a c \left(5 b^2 c^2-15 a b c d+12 a^2 d^2\right) x^4\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$
$$\Bigg(\left(a-b x^2\right) \Bigg(7 a c\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \Bigg(2 b c\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\right.$$
$$\left.2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\, \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)+$$
$$\left(33 a b c d (5 b c-7 a d) x^6\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$
$$\Bigg(\left(a-b x^2\right) \Bigg(11 a c\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2 \Bigg(2 b c\, \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d\, \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(105 a^2 (e x)^{7/2} \sqrt{c-d x^2}\right)$$

Problem 880: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{7/2}}{\left(a-b x^2\right) \sqrt{c-d x^2}}\, dx$$

Optimal (type 4, 305 leaves, 10 steps):

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

Result (type 6, 423 leaves):

$$\Big(2 (e x)^{7/2} \Big(\Big(25 a^2 c^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big/\Big(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \Big(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big)+\Big(-9 a c \left(5 a c-4 b c x^2-2 a d x^2+5 b d x^4\right) \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-10 x^2 \left(a-b x^2\right) \left(c-d x^2\right) \Big(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big)\Big/\Big(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \Big(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big)\Big)\Big)\Big/\Big(15 b d x^3 \left(-a+b x^2\right) \sqrt{c-d x^2}\Big)$$

Problem 881: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 349 leaves, 13 steps):

$$-\frac{2\, c^{3/4}\, e^{5/2}\, \sqrt{1-\frac{d\, x^2}{c}}\; \text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\, \sqrt{e\, x}}{c^{1/4}\, \sqrt{e}}\right],\, -1\right]}{b\, d^{3/4}\, \sqrt{c-d\, x^2}} + \frac{2\, c^{3/4}\, e^{5/2}\, \sqrt{1-\frac{d\, x^2}{c}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\, \sqrt{e\, x}}{c^{1/4}\, \sqrt{e}}\right],\, -1\right]}{b\, d^{3/4}\, \sqrt{c-d\, x^2}} - \frac{\sqrt{a}\, c^{1/4}\, e^{5/2}\, \sqrt{1-\frac{d\, x^2}{c}}\; \text{EllipticPi}\left[-\frac{\sqrt{b}\, \sqrt{c}}{\sqrt{a}\, \sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\, \sqrt{e\, x}}{c^{1/4}\, \sqrt{e}}\right],\, -1\right]}{b^{3/2}\, d^{1/4}\, \sqrt{c-d\, x^2}} + \frac{\sqrt{a}\, c^{1/4}\, e^{5/2}\, \sqrt{1-\frac{d\, x^2}{c}}\; \text{EllipticPi}\left[\frac{\sqrt{b}\, \sqrt{c}}{\sqrt{a}\, \sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\, \sqrt{e\, x}}{c^{1/4}\, \sqrt{e}}\right],\, -1\right]}{b^{3/2}\, d^{1/4}\, \sqrt{c-d\, x^2}}$$

Result (type 6, 165 leaves):

$$-\left(\left(22\, a\, c\, x\, (e\, x)^{5/2}\, \text{AppellF1}\left[\frac{7}{4},\, \frac{1}{2},\, 1,\, \frac{11}{4},\, \frac{d\, x^2}{c},\, \frac{b\, x^2}{a}\right]\right)\Big/ \left(7\, \left(-a+b\, x^2\right)\, \sqrt{c-d\, x^2}\, \left(11\, a\, c\, \text{AppellF1}\left[\frac{7}{4},\, \frac{1}{2},\, 1,\, \frac{11}{4},\, \frac{d\, x^2}{c},\, \frac{b\, x^2}{a}\right] + 2\, x^2\, \left(2\, b\, c\, \text{AppellF1}\left[\frac{11}{4},\, \frac{1}{2},\, 2,\, \frac{15}{4},\, \frac{d\, x^2}{c},\, \frac{b\, x^2}{a}\right] + a\, d\, \text{AppellF1}\left[\frac{11}{4},\, \frac{3}{2},\, 1,\, \frac{15}{4},\, \frac{d\, x^2}{c},\, \frac{b\, x^2}{a}\right]\right)\right)\right)\right)$$

Problem 882: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 261 leaves, 9 steps):

$$-\frac{2\, c^{1/4}\, e^{3/2}\, \sqrt{1-\frac{d\, x^2}{c}}\; \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\, \sqrt{e\, x}}{c^{1/4}\, \sqrt{e}}\right],\, -1\right]}{b\, d^{1/4}\, \sqrt{c-d\, x^2}} + \frac{c^{1/4}\, e^{3/2}\, \sqrt{1-\frac{d\, x^2}{c}}\; \text{EllipticPi}\left[-\frac{\sqrt{b}\, \sqrt{c}}{\sqrt{a}\, \sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\, \sqrt{e\, x}}{c^{1/4}\, \sqrt{e}}\right],\, -1\right]}{b\, d^{1/4}\, \sqrt{c-d\, x^2}} + \frac{c^{1/4}\, e^{3/2}\, \sqrt{1-\frac{d\, x^2}{c}}\; \text{EllipticPi}\left[\frac{\sqrt{b}\, \sqrt{c}}{\sqrt{a}\, \sqrt{d}},\, \text{ArcSin}\left[\frac{d^{1/4}\, \sqrt{e\, x}}{c^{1/4}\, \sqrt{e}}\right],\, -1\right]}{b\, d^{1/4}\, \sqrt{c-d\, x^2}}$$

Result (type 6, 165 leaves):

$$-\left(\left(18\,a\,c\,x\,(e\,x)^{3/2}\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(5\,\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\,\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 883: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}}{\left(a-b\,x^2\right)\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 203 leaves, 6 steps):

$$-\frac{c^{1/4}\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{\sqrt{a}\,\sqrt{b}\,d^{1/4}\sqrt{c-d\,x^2}}+\frac{c^{1/4}\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{\sqrt{a}\,\sqrt{b}\,d^{1/4}\sqrt{c-d\,x^2}}$$

Result (type 6, 165 leaves):

$$-\left(\left(14\,a\,c\,x\,\sqrt{e\,x}\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(3\,\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\,\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 884: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 188 leaves, 6 steps):

$$\frac{c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,d^{1/4}\sqrt{e}\,\sqrt{c-d\,x^2}}+\frac{c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,d^{1/4}\sqrt{e}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 163 leaves):

$$-\left(\left(10\,a\,c\,x\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\bigg/\left(\sqrt{e\,x}\,\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\,\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 885: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 379 leaves, 15 steps):

$$-\frac{2\sqrt{c-d\,x^2}}{a\,c\,e\sqrt{e\,x}}-\frac{2\,d^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,c^{1/4}\,e^{3/2}\sqrt{c-d\,x^2}}+\frac{2\,d^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a\,c^{1/4}\,e^{3/2}\sqrt{c-d\,x^2}}-\frac{\sqrt{b}\,c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{3/2}\,d^{1/4}\,e^{3/2}\sqrt{c-d\,x^2}}+\frac{\sqrt{b}\,c^{1/4}\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{3/2}\,d^{1/4}\,e^{3/2}\sqrt{c-d\,x^2}}$$

Result (type 6, 338 leaves):

$$\left(2\,x\left(-\frac{21\left(c-d\,x^2\right)}{a\,c}+\left(49\left(b\,c-a\,d\right)x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\bigg/\left(\left(a-b\,x^2\right)\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)-\left(33\,b\,d\,x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\bigg/\left(\left(-a+b\,x^2\right)\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\right)\bigg/\left(21\,(e\,x)^{3/2}\sqrt{c-d\,x^2}\right)$$

Problem 886: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 297 leaves, 10 steps):

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

Result (type 6, 338 leaves):

$$\left(2 x \left(-\frac{5 \left(c-d x^2\right)}{a c}+\left(25 (3 b c+a d) x^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(a-b x^2\right) \left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+\left(9 b d x^4 \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right) \left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(15 (e x)^{5/2} \sqrt{c-d x^2}\right)$$

Problem 887: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 444 leaves, 16 steps):

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

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

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

$$\frac{b^{3/2} c^{1/4} \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2} d^{1/4} e^{7/2} \sqrt{c-d x^2}}+$$

$$\frac{b^{3/2} c^{1/4} \sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{a^{5/2} d^{1/4} e^{7/2} \sqrt{c-d x^2}}$$

Result (type 6, 383 leaves) :

$$\Bigg(2 x \Bigg(-21 (c-d x^2) (5 b c x^2+a (c+3 d x^2))+\Big(49 a c (5 b^2 c^2-5 a b c d-3 a^2 d^2) x^4 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big/$$
$$\Big((a-b x^2) \Big(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \Big(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big)\Big)+$$
$$\Big(33 a b c d (5 b c+3 a d) x^6 \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big/\Big((a-b x^2) \Big(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2 \Big(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Big)\Big)\Big)\Bigg)\Bigg)\Big/\Big(105 a^2 c^2 (e x)^{7/2} \sqrt{c-d x^2}\Big)$$

Problem 888: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 444 leaves, 15 steps) :

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

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

$$\frac{a^{3/2}\,c^{1/4}\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^{3/2}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+$$

$$\frac{a^{3/2}\,c^{1/4}\,e^{9/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{b^{3/2}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 424 leaves):

$$\Bigg(c\,(e\,x)^{9/2}\,\Bigg(\left(49\,a^2\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(\left(-a+b\,x^2\right)\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\Bigg(11\,a\,\left(7\,a\,c-4\,b\,c\,x^2-2\,a\,d\,x^2\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-$$
$$14\,x^2\left(-a+b\,x^2\right)\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Big/$$
$$\Bigg(\left(a-b\,x^2\right)\Bigg(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(7\,d\,(-b\,c+a\,d)\,x^3\,\sqrt{c-d\,x^2}\right)$$

Problem 889: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 338 leaves, 10 steps):

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

$$\frac{a\, c^{1/4}\, e^{7/2}\, \sqrt{1-\frac{d\, x^2}{c}}\, \text{EllipticPi}\left[-\frac{\sqrt{b}\, \sqrt{c}}{\sqrt{a}\, \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e\, x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{b\, d^{1/4}\, (b\, c-a\, d)\, \sqrt{c-d\, x^2}}+$$

$$\frac{a\, c^{1/4}\, e^{7/2}\, \sqrt{1-\frac{d\, x^2}{c}}\, \text{EllipticPi}\left[\frac{\sqrt{b}\, \sqrt{c}}{\sqrt{a}\, \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e\, x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{b\, d^{1/4}\, (b\, c-a\, d)\, \sqrt{c-d\, x^2}}$$

Result (type 6, 424 leaves):

$$\left(c\, (e\, x)^{7/2} \left(\left(25\, a^2\, c\, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\Big/\left(\left(-a+b\, x^2\right) \left(5\, a\, c\, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+2\, x^2 \left(2\, b\, c\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\right)\right)+\left(9\, a\, \left(5\, a\, c-4\, b\, c\, x^2-2\, a\, d\, x^2\right) \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]-10\, x^2 \left(-a+b\, x^2\right) \left(2\, b\, c\, \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\right)\Big/\left(\left(a-b\, x^2\right) \left(9\, a\, c\, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+2\, x^2 \left(2\, b\, c\, \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+a\, d\, \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(5\, d\, (-b\, c+a\, d)\, x^3 \sqrt{c-d\, x^2}\right)$$

Problem 890: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 414 leaves, 15 steps):

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

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

$$\frac{\sqrt{a}\,c^{1/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}+$$

$$\frac{\sqrt{a}\,c^{1/4}\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{\sqrt{b}\,d^{1/4}\,(b\,c-a\,d)\,\sqrt{c-d\,x^2}}$$

Result (type 6, 327 leaves):

$$\Bigg(e\,(e\,x)^{3/2}\Bigg(7+\Bigg(49\,a^2\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/$$
$$\Bigg(\left(-a+b\,x^2\right)\Bigg(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\right.$$
$$\left.\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)+$$
$$\Bigg(11\,a\,b\,c\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg/\Bigg(\left(a-b\,x^2\right)\Bigg(11\,a\,c\,\text{AppellF1}\left[\right.$$
$$\left.\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\left(7\,(-b\,c+a\,d)\,\sqrt{c-d\,x^2}\right)$$

Problem 891: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 314 leaves, 10 steps):

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

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

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

Result (type 6, 328 leaves):

$$\left(e\sqrt{e\,x}\left(5+\left(25\,a^2\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(\left(-a+b\,x^2\right)\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\right.\right.\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(9\,a\,b\,c\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(-a+b\,x^2\right)\right.$$
$$\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\right.\right.\right.$$
$$\left.\left.\left.\left.\left.\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(5\left(-b\,c+a\,d\right)\sqrt{c-d\,x^2}\right)$$

Problem 892: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 420 leaves, 15 steps):

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

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

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

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

Result (type 6, 356 leaves):

$$\frac{1}{21\,\sqrt{c-d\,x^2}}x\,\sqrt{e\,x}\,\left(-\frac{21\,d}{b\,c^2-a\,c\,d}-\left(49\,a\,(2\,b\,c+a\,d)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.$$
$$\left(\left(-b\,c+a\,d\right)\,\left(a-b\,x^2\right)\,\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\right.\right.$$
$$\left.\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(33\,a\,b\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(\left(-b\,c+a\,d\right)\,\left(a-b\,x^2\right)\,\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\right.\right.\right.$$
$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 893: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 328 leaves, 10 steps):

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

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

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

Result (type 6, 357 leaves):

$$\frac{1}{5\sqrt{e x}\,\sqrt{c-d x^2}}x\left(-\frac{5 d}{b c^2-a c d}+\left(25 a\,(-2 b c+a d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.$$
$$\left((-b c+a d)\,(a-b x^2)\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\right.\right.$$
$$\left.\left.\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+$$
$$\left(9 a b d x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left((-b c+a d)\,(-a+b x^2)\right.$$
$$\left(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\right.$$
$$\left.\left.\left.\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 894: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 493 leaves, 16 steps):

$$-\frac{d}{c\,(b\,c-a\,d)\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}-\frac{(2\,b\,c-3\,a\,d)\,\sqrt{c-d\,x^2}}{a\,c^2\,(b\,c-a\,d)\,e\,\sqrt{e\,x}}-$$

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

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

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

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

Result (type 6, 401 leaves):

$$\left(x\left(\left(49\,c\,\left(2\,b^2\,c^2-2\,a\,b\,c\,d+3\,a^2\,d^2\right)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left((b\,c-a\,d)\,\left(a-b\,x^2\right)\,\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\right.\right.\right.\right.$$
$$\left.\left.\left.\left.2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+\frac{1}{-b\,c+a\,d}$$
$$3\left(\frac{14\,b\,c\,\left(c-d\,x^2\right)}{a}+7\,d\,\left(-2\,c+3\,d\,x^2\right)+\left(11\,b\,c\,d\,(-2\,b\,c+3\,a\,d)\,x^4\,\text{AppellF1}\left[\frac{7}{4},\right.\right.\right.$$
$$\left.\left.\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(\left(a-b\,x^2\right)\,\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\right)\right)\Big/\left(21\,c^2\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}\right)$$

Problem 895: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 397 leaves, 11 steps):

$$-\frac{d}{c\,(b\,c-a\,d)\,e\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}-\frac{(2\,b\,c-5\,a\,d)\,\sqrt{c-d\,x^2}}{3\,a\,c^2\,(b\,c-a\,d)\,e\,(e\,x)^{3/2}}+$$

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

$$\frac{b^2\,c^{1/4}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a^2\,d^{1/4}\,(b\,c-a\,d)\,e^{5/2}\,\sqrt{c-d\,x^2}}+$$

$$\frac{b^2\,c^{1/4}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{a^2\,d^{1/4}\,(b\,c-a\,d)\,e^{5/2}\,\sqrt{c-d\,x^2}}$$

Result (type 6, 413 leaves) :

$$\left(x\left(\frac{10\,b\,c\,(c-d\,x^2)+5\,a\,d\,(-2\,c+5\,d\,x^2)}{a\,(-b\,c+a\,d)}-\right.\right.$$
$$\left(25\,c\,(6\,b^2\,c^2+2\,a\,b\,c\,d-5\,a^2\,d^2)\,x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left((b\,c-a\,d)\,(-a+b\,x^2)\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\right.\right.\right.$$
$$\left.\left.\left.\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(9\,b\,c\,d\,(2\,b\,c-5\,a\,d)\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left((b\,c-a\,d)\,(-a+b\,x^2)\right.$$
$$\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\right.\right.\right.$$
$$\left.\left.\left.\left.\left.\left.\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(15\,c^2\,(e\,x)^{5/2}\,\sqrt{c-d\,x^2}\right)$$

Problem 896: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 362 leaves, 11 steps) :

$$\frac{7 e^3 \sqrt{e x} \sqrt{c-d x^2}}{6 b^2}+\frac{e (e x)^{5/2} \sqrt{c-d x^2}}{2 b \left(a-b x^2\right)}+$$
$$\frac{c^{1/4} (8 b c-21 a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]}{6 b^3 d^{1/4} \sqrt{c-d x^2}}-$$
$$\left(c^{1/4} (5 b c-7 a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[-\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4 b^3 d^{1/4} \sqrt{c-d x^2}\right)-$$
$$\left(c^{1/4} (5 b c-7 a d) e^{7/2} \sqrt{1-\frac{d x^2}{c}} \text{EllipticPi}\left[\frac{\sqrt{b} \sqrt{c}}{\sqrt{a} \sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4} \sqrt{e x}}{c^{1/4} \sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4 b^3 d^{1/4} \sqrt{c-d x^2}\right)$$

Result (type 6, 426 leaves):

$$\Bigg((e x)^{7/2}$$
$$\Bigg(\Bigg(175 a^2 c^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Big/\Bigg(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2 \left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)+$$
$$\Bigg(-9 a c \left(7 a \left(5 c-2 d x^2\right)+4 b x^2 \left(-7 c+5 d x^2\right)\right) \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-$$
$$10 x^2 \left(7 a-4 b x^2\right) \left(c-d x^2\right)$$
$$\left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Bigg)\Big/$$
$$\Bigg(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \Bigg(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(30 b^2 x^3 \left(-a+b x^2\right) \sqrt{c-d x^2}\right)$$

Problem 897: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 413 leaves, 15 steps):

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

$$\frac{5\,c^{3/4}\,d^{1/4}\,e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,b^2\sqrt{c-d\,x^2}}+$$

$$\left(c^{1/4}\left(3\,b\,c-5\,a\,d\right)e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(c^{1/4}\left(3\,b\,c-5\,a\,d\right)e^{5/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 318 leaves):

$$\left(e\,(e\,x)^{3/2}\left(-7\,c+7\,d\,x^2+\left(49\,a\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\right.$$
$$\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)-$$
$$\left(55\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\right.\right.\right.$$
$$\left.\left.\left.\left.\left.\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(14\,b\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\right)$$

Problem 898: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 328 leaves, 10 steps):

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

Result (type 6, 318 leaves):

$$\left(e\sqrt{e\,x}\,\left(-5\,c+5\,d\,x^2+\right.\right.$$
$$\left(25\,a\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)-$$
$$\left(27\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10\,b\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 899: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 417 leaves, 15 steps):

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

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

$$\left(c^{1/4}\,(b\,c+a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(c^{1/4}\,(b\,c+a\,d)\,\sqrt{e}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 317 leaves):

$$\Bigg(x\,\sqrt{e\,x}\,\Bigg(-\frac{21\,\left(c-d\,x^2\right)}{a}-$$

$$\left(49\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\Bigg(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2$$

$$\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)-$$

$$\left(33\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\Bigg(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\right.$$

$$\left.\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(42\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 900: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{c-d\,x^2}}{\sqrt{e\,x}\,\left(a-b\,x^2\right)^2}\,dx$$

Optimal (type 4, 335 leaves, 10 steps):

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

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

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

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

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

Result (type 6, 317 leaves):

$$\left(x\left(-\frac{5\left(c-d\,x^2\right)}{a}-\right.\right.$$

$$\left(75\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$

$$\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$

$$\left(9\,c\,d\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$

$$\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10\,\sqrt{e\,x}\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 901: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 444 leaves, 16 steps):

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

$$\frac{5\,c^{3/4}\,d^{1/4}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{2\,a^2\,e^{3/2}\,\sqrt{c-d\,x^2}}-$$

$$\left(c^{1/4}\,\left(5\,b\,c-3\,a\,d\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(c^{1/4}\,\left(5\,b\,c-3\,a\,d\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 340 leaves):

$$\left(x\,\left(21\,\left(4\,a-5\,b\,x^2\right)\,\left(-c+d\,x^2\right)+\left(49\,a\,c\,\left(5\,b\,c-8\,a\,d\right)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$

$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\right.$$

$$\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$

$$\left(165\,a\,b\,c\,d\,x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\right.$$

$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$

$$\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(42\,a^2\,\left(e\,x\right)^{3/2}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 902: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 355 leaves, 11 steps):

$$-\frac{7\sqrt{c-d x^2}}{6 a^2 e (e x)^{3/2}}+\frac{\sqrt{c-d x^2}}{2 a e (e x)^{3/2}\left(a-b x^2\right)}+\frac{7 c^{1/4} d^{3/4}\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{6 a^2 e^{5/2}\sqrt{c-d x^2}}+$$
$$\left(c^{1/4}(7 b c-5 a d)\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4 a^3 d^{1/4} e^{5/2}\sqrt{c-d x^2}\right)+$$
$$\left(c^{1/4}(7 b c-5 a d)\sqrt{1-\frac{d x^2}{c}}\ \text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4 a^3 d^{1/4} e^{5/2}\sqrt{c-d x^2}\right)$$

Result (type 6, 361 leaves):

$$\left(x\left(\frac{5\left(4 a-7 b x^2\right)\left(-c+d x^2\right)}{a-b x^2}+\left(25 a c (21 b c-8 a d) x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(\left(a-b x^2\right)\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\right.\right.\right.$$
$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+$$
$$\left(63 a b c d x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-a+b x^2\right)\right.$$
$$\left(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\right.\right.\right.$$
$$\left.\left.\left.\left.\left.\left.\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(30 a^2 (e x)^{5/2}\sqrt{c-d x^2}\right)$$

Problem 903: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 429 leaves, 12 steps):

$$\frac{(57\,b\,c-77\,a\,d)\,e^3\sqrt{e\,x}\,\sqrt{c-d\,x^2}}{42\,b^3}-\frac{11\,d\,e\,(e\,x)^{5/2}\sqrt{c-d\,x^2}}{14\,b^2}+\frac{e\,(e\,x)^{5/2}\left(c-d\,x^2\right)^{3/2}}{2\,b\left(a-b\,x^2\right)}+$$
$$\left(c^{1/4}\left(48\,b^2\,c^2-259\,a\,b\,c\,d+231\,a^2\,d^2\right)e^{7/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Bigg/$$
$$\left(42\,b^4\,d^{1/4}\sqrt{c-d\,x^2}\right)-$$
$$\left(c^{1/4}\,(5\,b\,c-11\,a\,d)\,(b\,c-a\,d)\,e^{7/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Bigg/$$
$$\left(4\,b^4\,d^{1/4}\sqrt{c-d\,x^2}\right)-$$
$$\left(c^{1/4}\,(5\,b\,c-11\,a\,d)\,(b\,c-a\,d)\,e^{7/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Bigg/$$
$$\left(4\,b^4\,d^{1/4}\sqrt{c-d\,x^2}\right)$$

Result (type 6, 392 leaves):

$$\Bigg((e\,x)^{7/2}\Bigg(5\left(c-d\,x^2\right)\left(77\,a^2\,d-12\,b^2\,x^2\left(-3\,c+d\,x^2\right)-a\,b\left(57\,c+44\,d\,x^2\right)\right)-$$
$$\left(25\,a^2\,c^2\,(-57\,b\,c+77\,a\,d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg/$$
$$\Bigg(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)+$$
$$\left(9\,a\,c\left(48\,b^2\,c^2-259\,a\,b\,c\,d+231\,a^2\,d^2\right)x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg/$$
$$\Bigg(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\left(210\,b^3\,x^3\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\right)$$

Problem 904: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 485 leaves, 16 steps):

$$-\frac{9\,d\,e\,(e\,x)^{3/2}\,\sqrt{c-d\,x^2}}{10\,b^2}+\frac{e\,(e\,x)^{3/2}\,\left(c-d\,x^2\right)^{3/2}}{2\,b\,\left(a-b\,x^2\right)}-\frac{1}{10\,b^3\,\sqrt{c-d\,x^2}}3\,c^{3/4}\,d^{1/4}\,\left(11\,b\,c-15\,a\,d\right)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]+\frac{1}{10\,b^3\,\sqrt{c-d\,x^2}}3\,c^{3/4}\,d^{1/4}\,\left(11\,b\,c-15\,a\,d\right)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]+\left(3\,c^{1/4}\,\left(b^2\,c^2-4\,a\,b\,c\,d+3\,a^2\,d^2\right)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/\left(4\,\sqrt{a}\,b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}\right)-\left(3\,c^{1/4}\,\left(b^2\,c^2-4\,a\,b\,c\,d+3\,a^2\,d^2\right)\,e^{5/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/\left(4\,\sqrt{a}\,b^{7/2}\,d^{1/4}\,\sqrt{c-d\,x^2}\right)$$

Result (type 6, 353 leaves):

$$\left((e\,x)^{5/2}\,\left(-7\,\left(c-d\,x^2\right)\,\left(5\,b\,c-9\,a\,d+4\,b\,d\,x^2\right)-\left(49\,a\,c^2\,\left(-5\,b\,c+9\,a\,d\right)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+\left(33\,a\,c\,d\,\left(-11\,b\,c+15\,a\,d\right)\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(70\,b^2\,\sqrt{c-d\,x^2}\,\left(-a\,x+b\,x^3\right)\right)$$

Problem 905: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 381 leaves, 11 steps):

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

$$c^{1/4}\,d^{3/4}\,\left(17\,b\,c-21\,a\,d\right)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]-$$

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

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

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

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

Result (type 6, 353 leaves):

$$\Bigg((e\,x)^{3/2}\,\Bigg(-5\,\left(c-d\,x^2\right)\,\left(3\,b\,c-7\,a\,d+4\,b\,d\,x^2\right)-$$

$$\left(25\,a\,c^2\,\left(-3\,b\,c+7\,a\,d\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\Bigg(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)+$$

$$\left(9\,a\,c\,d\,\left(-17\,b\,c+21\,a\,d\right)\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\Bigg(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(30\,b^2\,\sqrt{c-d\,x^2}\,\left(-a\,x+b\,x^3\right)\right)$$

Problem 906: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 474 leaves, 15 steps):

$$\frac{(b c-a d)\,(e x)^{3/2}\sqrt{c-d x^2}}{2 a b e\,(a-b x^2)}-$$

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

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

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

Result (type 6, 428 leaves):

$$\Bigg(x\sqrt{e x}$$
$$\Bigg(-\Bigg(\Bigg(49 c^2\,(b c+3 a d)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Big/\Bigg(7 a c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\Bigg(2 b c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)+$$
$$\Bigg(33 a c\left(a d\left(7 c-2 d x^2\right)+b c\left(-7 c+6 d x^2\right)\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$42\,(b c-a d)\,x^2\left(-c+d x^2\right)\Bigg(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Big/$$
$$\Bigg(a\Bigg(11 a c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$2 x^2\Bigg(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(42 b\left(-a+b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 907: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 366 leaves, 10 steps):

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

Result (type 6, 428 leaves):

$$\left(x\left(-\left(\left(25 c^2(3 b c+a d)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.\right.$$
$$\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+$$
$$\left(9 a c\left(a d\left(5 c-2 d x^2\right)+b c\left(-5 c+6 d x^2\right)\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$10(b c-a d)\,x^2\left(-c+d x^2\right)$$
$$\left.\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/$$
$$\left(a\left(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$
$$2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$\left.\left.\left.\left.a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10 b\sqrt{e x}\left(-a+b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 908: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 519 leaves, 16 steps):

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

Result (type 6, 454 leaves):

$$\Bigg(x\,\Bigg(\Bigg(49\,a\,c^2\,\left(5\,b\,c-9\,a\,d\right)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Big/$$

$$\Bigg(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2$$

$$\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)+$$

$$\Bigg(-33\,a\,c\,\left(5\,b\,c\,x^2\,\left(-7\,c+6\,d\,x^2\right)+a\,\left(28\,c^2-21\,c\,d\,x^2-6\,d^2\,x^4\right)\right)$$

$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$42\,x^2\,\left(c-d\,x^2\right)\,\left(5\,b\,c\,x^2-a\,\left(4\,c+d\,x^2\right)\right)\,\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Big/\Bigg(11\,a\,c$$

$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(42\,a^2\,\left(e\,x\right)^{3/2}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 909: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 412 leaves, 11 steps):

$$-\frac{\left(7\,b\,c-3\,a\,d\right)\,\sqrt{c-d\,x^2}}{6\,a^2\,b\,e\,\left(e\,x\right)^{3/2}}+\frac{\left(b\,c-a\,d\right)\,\sqrt{c-d\,x^2}}{2\,a\,b\,e\,\left(e\,x\right)^{3/2}\,\left(a-b\,x^2\right)}+$$

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

$$\left(c^{1/4}\,\left(b\,c-a\,d\right)\,\left(7\,b\,c-a\,d\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(c^{1/4}\,\left(b\,c-a\,d\right)\,\left(7\,b\,c-a\,d\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 453 leaves):

$$\left(x\left(\left(25\, a\, c^2\,(21\, b\, c-17\, a\, d)\, x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\Big/\left(5\, a\, c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+2\, x^2\left(2\, b\, c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+a\, d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\right)+\left(-9\, a\, c\left(7\, b\, c\, x^2\left(-5\, c+6\, d\, x^2\right)+a\left(20\, c^2-5\, c\, d\, x^2-18\, d^2\, x^4\right)\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+10\, x^2\left(c-d\, x^2\right)\left(-4\, a\, c+7\, b\, c\, x^2-3\, a\, d\, x^2\right)\left(2\, b\, c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+a\, d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\right)\Big/\left(9\, a\, c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+2\, x^2\left(2\, b\, c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]+a\, d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\, x^2}{c},\frac{b\, x^2}{a}\right]\right)\right)\right)\right)\Big/\left(30\, a^2\,(e\, x)^{5/2}\left(a-b\, x^2\right)\sqrt{c-d\, x^2}\right)$$

Problem 910: Result unnecessarily involves higher level functions.

$$\int\frac{(e\, x)^{9/2}}{\left(a-b\, x^2\right)^2\sqrt{c-d\, x^2}}\, dx$$

Optimal (type 4, 484 leaves, 15 steps):

$$\frac{a\, e^3\,(e\, x)^{3/2}\sqrt{c-d\, x^2}}{2\, b\,(b\, c-a\, d)\left(a-b\, x^2\right)}+\frac{c^{3/4}\,(4\, b\, c-5\, a\, d)\, e^{9/2}\sqrt{1-\frac{d\, x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\, x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\, b^2\, d^{3/4}\,(b\, c-a\, d)\sqrt{c-d\, x^2}}-\frac{c^{3/4}\,(4\, b\, c-5\, a\, d)\, e^{9/2}\sqrt{1-\frac{d\, x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\, x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\, b^2\, d^{3/4}\,(b\, c-a\, d)\sqrt{c-d\, x^2}}+\left(\sqrt{a}\, c^{1/4}\,(7\, b\, c-5\, a\, d)\, e^{9/2}\sqrt{1-\frac{d\, x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\, x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/\left(4\, b^{5/2}\, d^{1/4}\,(b\, c-a\, d)\sqrt{c-d\, x^2}\right)-\left(\sqrt{a}\, c^{1/4}\,(7\, b\, c-5\, a\, d)\, e^{9/2}\sqrt{1-\frac{d\, x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\, x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/\left(4\, b^{5/2}\, d^{1/4}\,(b\, c-a\, d)\sqrt{c-d\, x^2}\right)$$

Result (type 6, 414 leaves):

$$\left(a\,(e\,x)^{9/2}\left(\left(49\,a\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+\left(11\,c\,\left(-7\,a\,c+4\,b\,c\,x^2+2\,a\,d\,x^2\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+14\,x^2\left(-c+d\,x^2\right)\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(14\,b\,(b\,c-a\,d)\,x^3\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\right)$$

Problem 911: Result unnecessarily involves higher level functions.

$$\int\frac{(e\,x)^{7/2}}{\left(a-b\,x^2\right)^2\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 376 leaves, 10 steps):

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

Result (type 6, 414 leaves):

$$\left(a\,(e\,x)^{7/2}\left(\left(25\,a\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\middle/\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+\left(-9\,c\,\left(5\,a\,c-4\,b\,c\,x^2-2\,a\,d\,x^2\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+10\,x^2\left(-c+d\,x^2\right)\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\middle/\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\middle/\left(10\,b\,(b\,c-a\,d)\,x^3\,\left(-a+b\,x^2\right)\sqrt{c-d\,x^2}\right)$$

Problem 912: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 460 leaves, 15 steps):

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

Result (type 6, 325 leaves):

$$\left(e\,(e\,x)^{3/2}\left(7\,c-7\,d\,x^2-\left(49\,a\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+\left(11\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(14\,(-b\,c+a\,d)\,(-a+b\,x^2)\,\sqrt{c-d\,x^2}\right)$$

Problem 913: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 363 leaves, 10 steps):

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

Result (type 6, 325 leaves):

$$\left(e\sqrt{e\,x}\left(5\,c-5\,d\,x^2-\left(25\,a\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)-\left(9\,a\,c\,d\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10\,(-b\,c+a\,d)\,(-a+b\,x^2)\sqrt{c-d\,x^2}\right)$$

Problem 914: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{e\,x}}{\left(a-b\,x^2\right)^2\sqrt{c-d\,x^2}}\,dx$$

Optimal (type 4, 464 leaves, 15 steps):

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

Result (type 6, 335 leaves):

$$\left(x\sqrt{e\,x}\left(\frac{21\,b\,\left(c-d\,x^2\right)}{a}+\left(49\,c\,\left(b\,c-4\,a\,d\right)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+\left(33\,b\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(42\,\left(-b\,c+a\,d\right)\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 915: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 367 leaves, 10 steps):

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

Result (type 6, 336 leaves):

$$\left(x\left(\frac{5\,b\,\left(c-d\,x^2\right)}{a}+\left(25\,c\,\left(3\,b\,c-4\,a\,d\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)-\right.$$
$$\left(9\,b\,c\,d\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/$$
$$\left(10\,\left(-b\,c+a\,d\right)\,\sqrt{e\,x}\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 916: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 535 leaves, 16 steps):

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

Result (type 6, 390 leaves):

$$\left(x\left(-\frac{21\left(c-d x^2\right)\left(4 a^2 d+5 b^2 c x^2-4 a b\left(c+d x^2\right)\right)}{c}-\left(49 a\left(5 b^2 c^2-12 a b c d+4 a^2 d^2\right) x^2 \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(7 a c \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+\left(33 a b d\left(-5 b c+4 a d\right) x^4 \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(11 a c \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(42 a^2\left(-b c+a d\right)(e x)^{3/2}\left(a-b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 917: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 429 leaves, 11 steps):

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

Result (type 6, 390 leaves):

$$\left(x\left(-\frac{5\left(c-d x^2\right)\left(4 a^2 d+7 b^2 c x^2-4 a b\left(c+d x^2\right)\right)}{c}+\right.\right.$$
$$\left(25 a\left(-21 b^2 c^2+20 a b c d+4 a^2 d^2\right) x^2 \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$
$$\left(5 a c \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$
$$\left.2 x^2\left(2 b c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$
$$\left(9 a b d (7 b c-4 a d) x^4 \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/$$
$$\left(9 a c \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$
$$\left.\left.\left.\left.a d \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/$$
$$\left(30 a^2(-b c+a d)(e x)^{5/2}\left(a-b x^2\right)\sqrt{c-d x^2}\right)$$

Problem 918: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 529 leaves, 16 steps):

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

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

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

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

Result (type 6, 432 leaves):

$$\Bigg((e\,x)^{9/2}\Bigg(\Bigg(147\,a^2\,c^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Big/$$
$$\Bigg((-a+b\,x^2)\Bigg(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\right.$$
$$\left.\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)+$$
$$\Bigg(33\,a\,c\,(7\,a\,c-4\,b\,c\,x^2-2\,a\,d\,x^2)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-$$
$$14\,x^2\,(-3\,a\,c+2\,b\,c\,x^2+a\,d\,x^2)\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Big/$$
$$\Bigg((a-b\,x^2)\Bigg(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$2\,x^2\Bigg(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$
$$a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(14\,(b\,c-a\,d)^2\,x^3\,\sqrt{c-d\,x^2}\right)$$

Problem 919: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 420 leaves, 11 steps):

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

Result (type 6, 422 leaves):

$$\left((e\,x)^{7/2}\left(\left(75\,a^2\,c^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+\left(-27\,a\,c\,\left(5\,a\,c-4\,b\,c\,x^2-2\,a\,d\,x^2\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+10\,x^2\,\left(-3\,a\,c+2\,b\,c\,x^2+a\,d\,x^2\right)\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10\,(b\,c-a\,d)^2\,x^3\,\left(-a+b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 920: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 485 leaves, 16 steps):

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

Result (type 6, 339 leaves):

$$\left(e\,(e\,x)^{3/2}\,\left(7\,\left(b\,c+2\,a\,d-3\,b\,d\,x^2\right)-\left(49\,a\,c\,\left(b\,c+2\,a\,d\right)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\right.$$
$$\left.\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$
$$\left(33\,a\,b\,c\,d\,x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\right.$$
$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\Big/\left(14\,\left(b\,c-a\,d\right)^2\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}\right)$$

Problem 921: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 391 leaves, 11 steps):

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

Result (type 6, 340 leaves):

$$\left((e x)^{3/2} \left(-5 \left(b c+2 a d-3 b d x^2\right)+\left(25 a c (b c+2 a d) \, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(5 a c \, \text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \, \text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+\left(27 a b c d x^2 \, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(9 a c \, \text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2 \left(2 b c \, \text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d \, \text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\Big/\left(10 (b c-a d)^2 \sqrt{c-d x^2} \left(-a x+b x^3\right)\right)$$

Problem 922: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 531 leaves, 16 steps):

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

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

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

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

Result (type 6, 482 leaves):

$$\left(x\,\sqrt{e\,x}\,\left(-\left(\left(49\,(b^2\,c^2-8\,a\,b\,c\,d-2\,a^2\,d^2)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.\right.\right.$$
$$\left(\left(-a+b\,x^2\right)\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\left.2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)+$$
$$\left(33\,a\,c\,\left(14\,a^2\,d^2-12\,a\,b\,d^2\,x^2+b^2\,c\,(7\,c-6\,d\,x^2)\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-\right.$$
$$42\,x^2\left(-2\,a^2\,d^2+2\,a\,b\,d^2\,x^2+b^2\,c\,(-c+d\,x^2)\right)\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/$$
$$\left(a\,c\,(a-b\,x^2)\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.\right.$$
$$2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$
$$\left.\left.\left.\left.\left.a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(42\,(b\,c-a\,d)^2\,\sqrt{c-d\,x^2}\right)$$

Problem 923: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 426 leaves, 11 steps):

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

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

$$\left(3 b c^{1/4}\,(b c-3 a d)\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(3 b c^{1/4}\,(b c-3 a d)\,\sqrt{1-\frac{d x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 472 leaves):

$$\left(x\left(\left(25\left(3 b^2 c^2-8 a b c d+2 a^2 d^2\right)\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.\right.$$

$$\left(5 a c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$

$$\left.2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)+$$

$$\left(9 a c\left(10 a^2 d^2-12 a b d^2 x^2+b^2 c\left(5 c-6 d x^2\right)\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-\right.$$

$$10 x^2\left(-2 a^2 d^2+2 a b d^2 x^2+b^2 c\left(-c+d x^2\right)\right)$$

$$\left.\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/$$

$$\left(a c\left(9 a c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$

$$2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\frac{13}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(10\,(b c-a d)^2\,\sqrt{e x}\,\left(a-b x^2\right)\,\sqrt{c-d x^2}\right)$$

Problem 924: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 628 leaves, 17 steps):

$$\frac{d\,(b\,c+2\,a\,d)}{2\,a\,c\,(b\,c-a\,d)^2\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}+\frac{b}{2\,a\,(b\,c-a\,d)\,e\,\sqrt{e\,x}\,\left(a-b\,x^2\right)\sqrt{c-d\,x^2}}-\frac{\left(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2\right)\sqrt{c-d\,x^2}}{2\,a^2\,c^2\,(b\,c-a\,d)^2\,e\,\sqrt{e\,x}}-$$
$$\left(d^{1/4}\left(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2\right)\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(2\,a^2\,c^{5/4}\,(b\,c-a\,d)^2\,e^{3/2}\sqrt{c-d\,x^2}\right)+$$
$$\left(d^{1/4}\left(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2\right)\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(2\,a^2\,c^{5/4}\,(b\,c-a\,d)^2\,e^{3/2}\sqrt{c-d\,x^2}\right)-$$
$$\left(b^{3/2}\,c^{1/4}\,(5\,b\,c-11\,a\,d)\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^2\,e^{3/2}\sqrt{c-d\,x^2}\right)+$$
$$\left(b^{3/2}\,c^{1/4}\,(5\,b\,c-11\,a\,d)\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^2\,e^{3/2}\sqrt{c-d\,x^2}\right)$$

Result (type 6, 476 leaves):

$$\frac{1}{42\,a^2\,c^2\,\left(b\,c-a\,d\right)^2\,\left(e\,x\right)^{3/2}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}}$$
$$x\,\left(-21\,\left(2\,a^3\,d^2\,\left(2\,c-3\,d\,x^2\right)-5\,b^3\,c^2\,x^2\,\left(c-d\,x^2\right)+4\,a\,b^2\,c\,\left(c^2+c\,d\,x^2-2\,d^2\,x^4\right)+2\,a^2\,b\,d\,\left(-4\,c^2+2\,c\,d\,x^2+3\,d^2\,x^4\right)\right)+\right.$$
$$\left(49\,a\,c\,\left(5\,b^3\,c^3-16\,a\,b^2\,c^2\,d+8\,a^2\,b\,c\,d^2-6\,a^3\,d^3\right)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(33\,a\,b\,c\,d\,\left(5\,b^2\,c^2-8\,a\,b\,c\,d+6\,a^2\,d^2\right)\,x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left.\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 925: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 512 leaves, 12 steps):

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

$$\frac{b}{2\,a\,(b\,c-a\,d)\,e\,(e\,x)^{3/2}\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}-\frac{(7\,b^2\,c^2-8\,a\,b\,c\,d+10\,a^2\,d^2)\,\sqrt{c-d\,x^2}}{6\,a^2\,c^2\,(b\,c-a\,d)^2\,e\,(e\,x)^{3/2}}+$$

$$\left(d^{3/4}\,(7\,b^2\,c^2-8\,a\,b\,c\,d+10\,a^2\,d^2)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

$$\left(6\,a^2\,c^{7/4}\,(b\,c-a\,d)^2\,e^{5/2}\,\sqrt{c-d\,x^2}\right)+$$

$$\left(b^2\,c^{1/4}\,(7\,b\,c-13\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(b^2\,c^{1/4}\,(7\,b\,c-13\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 476 leaves):

$$\frac{1}{30\,a^2\,c^2\,(b\,c-a\,d)^2\,(e\,x)^{5/2}\,(a-b\,x^2)\,\sqrt{c-d\,x^2}}$$

$$x\,\Bigg(-5\,\big(2\,a^3\,d^2\,(2\,c-5\,d\,x^2)-7\,b^3\,c^2\,x^2\,(c-d\,x^2)+4\,a\,b^2\,c\,(c^2+c\,d\,x^2-2\,d^2\,x^4)+$$

$$2\,a^2\,b\,d\,(-4\,c^2+2\,c\,d\,x^2+5\,d^2\,x^4)\big)+$$

$$\left(25\,a\,c\,(21\,b^3\,c^3-32\,a\,b^2\,c^2\,d-8\,a^2\,b\,c\,d^2+10\,a^3\,d^3)\,x^2\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\Bigg(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)-$$

$$\left(9\,a\,b\,c\,d\,(7\,b^2\,c^2-8\,a\,b\,c\,d+10\,a^2\,d^2)\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/$$

$$\Bigg(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Bigg)\Bigg)$$

Problem 926: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^{9/2}}{\left(a-b\,x^2\right)^2\left(c-d\,x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 568 leaves, 17 steps):

$$\frac{(2\,b\,c+3\,a\,d)\,e^3\,(e\,x)^{3/2}}{6\,b\,(b\,c-a\,d)^2\left(c-d\,x^2\right)^{3/2}}+\frac{a\,e^3\,(e\,x)^{3/2}}{2\,b\,(b\,c-a\,d)\left(a-b\,x^2\right)\left(c-d\,x^2\right)^{3/2}}+$$
$$\frac{(b\,c+4\,a\,d)\,e^3\,(e\,x)^{3/2}}{2\,(b\,c-a\,d)^3\sqrt{c-d\,x^2}}-\frac{c^{3/4}\,(b\,c+4\,a\,d)\,e^{9/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,d^{3/4}\,(b\,c-a\,d)^3\sqrt{c-d\,x^2}}+$$
$$\frac{c^{3/4}\,(b\,c+4\,a\,d)\,e^{9/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]}{2\,d^{3/4}\,(b\,c-a\,d)^3\sqrt{c-d\,x^2}}+$$
$$\left(\sqrt{a}\;c^{1/4}\,(7\,b\,c+3\,a\,d)\,e^{9/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\;\sqrt{c}}{\sqrt{a}\;\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4\sqrt{b}\;d^{1/4}\,(b\,c-a\,d)^3\sqrt{c-d\,x^2}\right)-$$
$$\left(\sqrt{a}\;c^{1/4}\,(7\,b\,c+3\,a\,d)\,e^{9/2}\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\;\sqrt{c}}{\sqrt{a}\;\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e\,x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4\sqrt{b}\;d^{1/4}\,(b\,c-a\,d)^3\sqrt{c-d\,x^2}\right)$$

Result (type 6, 522 leaves):

$$\frac{1}{42\left(-b c+a d\right)^3 x^3\left(a-b x^2\right)\sqrt{c-d x^2}}$$
$$(e x)^{9/2}\left(\left(49 a^2 c\left(8 b c+7 a d\right)\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\right.$$
$$\left(7 a c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\right.$$
$$\left.\left.\left(2 b c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+$$
$$\left(11 a c\left(7 a^2 d\left(7 c-9 d x^2\right)+2 b^2 c x^2\left(-16 c+9 d x^2\right)+4 a b\left(14 c^2-25 c d x^2+18 d^2 x^4\right)\right)\right.$$
$$\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+$$
$$14 x^2\left(a^2 d\left(7 c-9 d x^2\right)+b^2 c x^2\left(-5 c+3 d x^2\right)+4 a b\left(2 c^2-4 c d x^2+3 d^2 x^4\right)\right)\left(2 b c\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/$$
$$\left(\left(-c+d x^2\right)\left(11 a c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\left.\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 927: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 454 leaves, 12 steps):

$$\frac{(2bc+3ad)\,e^3\sqrt{ex}}{6b\,(bc-ad)^2\,(c-dx^2)^{3/2}}+\frac{a\,e^3\sqrt{ex}}{2b\,(bc-ad)\,(a-bx^2)\,(c-dx^2)^{3/2}}+$$

$$\frac{5\,(bc+2ad)\,e^3\sqrt{ex}}{6\,(bc-ad)^3\sqrt{c-dx^2}}+\frac{5\,c^{1/4}\,(bc+2ad)\,e^{7/2}\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]}{6\,d^{1/4}\,(bc-ad)^3\sqrt{c-dx^2}}-$$

$$\left(5\,c^{1/4}\,(bc+ad)\,e^{7/2}\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$

$$\left(4\,d^{1/4}\,(bc-ad)^3\sqrt{c-dx^2}\right)-$$

$$\left(5\,c^{1/4}\,(bc+ad)\,e^{7/2}\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$

$$\left(4\,d^{1/4}\,(bc-ad)^3\sqrt{c-dx^2}\right)$$

Result (type 6, 520 leaves) :

$$\left((ex)^{7/2}\left(\left(25\,a^2\,c\,(2bc+ad)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/\right.\right.$$

$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+\right.$$

$$\left.2x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)+$$

$$\left(9\,a\,c\,\left(a^2\,d\,(5c-7dx^2)+2\,b^2\,c\,x^2\,(-4c+3dx^2)+2\,a\,b\,(5c^2-9cdx^2+6d^2x^4)\right)\right)$$

$$\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+$$

$$2x^2\,\left(a^2\,d\,(5c-7dx^2)+b^2\,c\,x^2\,(-7c+5dx^2)+2\,a\,b\,(5c^2-8cdx^2+5d^2x^4)\right)$$

$$\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\Big/$$

$$\left((-c+dx^2)\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+\right.\right.$$

$$2x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\right)\right)\right)\Big/\left(6\,(-bc+ad)^3\,x^3\,(a-bx^2)\sqrt{c-dx^2}\right)$$

Problem 928: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 551 leaves, 17 steps):

$$\frac{5\,d\,e\,(e\,x)^{3/2}}{6\,(b\,c-a\,d)^2\,(c-d\,x^2)^{3/2}}+\frac{e\,(e\,x)^{3/2}}{2\,(b\,c-a\,d)\,(a-b\,x^2)\,(c-d\,x^2)^{3/2}}+$$

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

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

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

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

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

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

Result (type 6, 568 leaves):

$$\frac{1}{42\sqrt{c-d x^2}} e\,(e x)^{3/2}$$

$$\left(\left(49 a\left(3 b^2 c^2+11 a b c d+a^2 d^2\right) \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\Big/\left(\left(-b c+a d\right)^3\left(a-b x^2\right)\right.\right.$$

$$\left(7 a c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$

$$\left.\left.\left.a d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)+$$

$$\left(-11 a c\left(7 a^2 d^2\left(c-3 d x^2\right)+a b d\left(77 c^2-67 c d x^2+18 d^2 x^4\right)+\right.\right.$$

$$\left.b^2 c\left(21 c^2-107 c d x^2+72 d^2 x^4\right)\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]-$$

$$14 x^2\left(a^2 d^2\left(c-3 d x^2\right)+a b d\left(11 c^2-10 c d x^2+3 d^2 x^4\right)+b^2 c\left(3 c^2-17 c d x^2+12 d^2 x^4\right)\right)$$

$$\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$

$$\left.\left.a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\Big/$$

$$\left(c\left(b c-a d\right)^3\left(-a+b x^2\right)\left(c-d x^2\right)\left(11 a c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.\right.$$

$$2 x^2\left(2 b c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]+\right.$$

$$\left.\left.\left.\left.a d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d x^2}{c},\frac{b x^2}{a}\right]\right)\right)\right)\right)$$

Problem 929: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 447 leaves, 12 steps):

$$\frac{5\,d\,e\,\sqrt{e\,x}}{6\,(b\,c-a\,d)^2\,(c-d\,x^2)^{3/2}}+\frac{e\,\sqrt{e\,x}}{2\,(b\,c-a\,d)\,(a-b\,x^2)\,(c-d\,x^2)^{3/2}}+\frac{d\,(14\,b\,c+a\,d)\,e\,\sqrt{e\,x}}{6\,c\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}+$$

$$\frac{d^{3/4}\,(14\,b\,c+a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]}{6\,c^{3/4}\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}}-$$

$$\left(b\,c^{1/4}\,(b\,c+9\,a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(b\,c^{1/4}\,(b\,c+9\,a\,d)\,e^{3/2}\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 547 leaves) :

$$\frac{1}{30\,(b\,c-a\,d)^3\,\sqrt{c-d\,x^2}\,(-a\,x+b\,x^3)}$$

$$(e\,x)^{3/2}\left(\left(25\,a\,(3\,b^2\,c^2+13\,a\,b\,c\,d-a^2\,d^2)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.$$

$$\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$

$$\left.2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$

$$\left(9\,a\,c\,\left(5\,a^2\,d^2\,(c+d\,x^2)+b^2\,c\,(-15\,c^2+109\,c\,d\,x^2-84\,d^2\,x^4)+a\,b\,d\,(-65\,c^2+51\,c\,d\,x^2-6\,d^2\,x^4)\right)\right.$$

$$\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]-$$

$$10\,x^2\,\left(-a^2\,d^2\,(c+d\,x^2)+a\,b\,d\,(13\,c^2-10\,c\,d\,x^2+d^2\,x^4)+b^2\,c\,(3\,c^2-19\,c\,d\,x^2+14\,d^2\,x^4)\right)$$

$$\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/$$

$$\left(c\,(c-d\,x^2)\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\right.\right.\right.$$

$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 930: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 625 leaves, 17 steps):

$$\frac{d\left(3bc+2ad\right)(ex)^{3/2}}{6ac\left(bc-ad\right)^2 e\left(c-dx^2\right)^{3/2}}+\frac{b\,(ex)^{3/2}}{2a\left(bc-ad\right)e\left(a-bx^2\right)\left(c-dx^2\right)^{3/2}}+\frac{d\left(b^2c^2+5abcd-a^2d^2\right)(ex)^{3/2}}{2ac^2\left(bc-ad\right)^3 e\sqrt{c-dx^2}}-$$

$$\left(d^{1/4}\left(b^2c^2+5abcd-a^2d^2\right)\sqrt{e}\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\bigg/$$

$$\left(2ac^{5/4}\left(bc-ad\right)^3\sqrt{c-dx^2}\right)+$$

$$\left(d^{1/4}\left(b^2c^2+5abcd-a^2d^2\right)\sqrt{e}\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\bigg/$$

$$\left(2ac^{5/4}\left(bc-ad\right)^3\sqrt{c-dx^2}\right)-$$

$$\left(b^{3/2}c^{1/4}\left(bc-11ad\right)\sqrt{e}\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\bigg/$$

$$\left(4a^{3/2}d^{1/4}\left(bc-ad\right)^3\sqrt{c-dx^2}\right)+$$

$$\left(b^{3/2}c^{1/4}\left(bc-11ad\right)\sqrt{e}\sqrt{1-\frac{dx^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\sqrt{c}}{\sqrt{a}\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{ex}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\bigg/$$

$$\left(4a^{3/2}d^{1/4}\left(bc-ad\right)^3\sqrt{c-dx^2}\right)$$

Result (type 6, 626 leaves):

$$\frac{1}{42\,c^2\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}}$$

$$x\,\sqrt{e\,x}\,\left(\left(49\,c\,\left(b^3\,c^3-12\,a\,b^2\,c^2\,d-5\,a^2\,b\,c\,d^2+a^3\,d^3\right)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.$$

$$\left(\left(b\,c-a\,d\right)^3\,\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\right.\right.\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$

$$\left(-11\,a\,c\,\left(2\,a\,b^2\,c\,d^2\,x^2\,\left(52\,c-45\,d\,x^2\right)+7\,a^3\,d^3\,\left(5\,c-3\,d\,x^2\right)-3\,b^3\,c^2\,\left(7\,c^2-13\,c\,d\,x^2+6\,d^2\,x^4\right)+\right.\right.$$

$$\left.a^2\,b\,d^2\,\left(-119\,c^2+73\,c\,d\,x^2+18\,d^2\,x^4\right)\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$14\,x^2\,\left(3\,b^3\,c^2\,\left(c-d\,x^2\right)^2+a^3\,d^3\,\left(-5\,c+3\,d\,x^2\right)+a\,b^2\,c\,d^2\,x^2\,\left(-17\,c+15\,d\,x^2\right)+\right.$$

$$\left.a^2\,b\,d^2\,\left(17\,c^2-10\,c\,d\,x^2-3\,d^2\,x^4\right)\right)\,\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+\right.$$

$$\left.\left.a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/$$

$$\left(a\,\left(-b\,c+a\,d\right)^3\,\left(-c+d\,x^2\right)\,\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\,\text{AppellF1}\left[\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 931: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 514 leaves, 12 steps):

$$\frac{d\,(3\,b\,c+2\,a\,d)\,\sqrt{e\,x}}{6\,a\,c\,(b\,c-a\,d)^2\,e\,\left(c-d\,x^2\right)^{3/2}}+\frac{b\,\sqrt{e\,x}}{2\,a\,(b\,c-a\,d)\,e\,\left(a-b\,x^2\right)\,\left(c-d\,x^2\right)^{3/2}}+\frac{d\,\left(3\,b^2\,c^2+17\,a\,b\,c\,d-5\,a^2\,d^2\right)\,\sqrt{e\,x}}{6\,a\,c^2\,(b\,c-a\,d)^3\,e\,\sqrt{c-d\,x^2}}+$$

$$\left(d^{3/4}\,\left(3\,b^2\,c^2+17\,a\,b\,c\,d-5\,a^2\,d^2\right)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

$$\left(6\,a\,c^{7/4}\,(b\,c-a\,d)^3\,\sqrt{e}\,\sqrt{c-d\,x^2}\right)+$$

$$\left(b^2\,c^{1/4}\,(3\,b\,c-13\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

$$\left(b^2\,c^{1/4}\,(3\,b\,c-13\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\,\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$

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

Result (type 6, 629 leaves):

$$\frac{1}{30\,c^2\,\sqrt{e\,x}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}}$$

$$\times\left(\left(25\,c\,\left(9\,b^3\,c^3-36\,a\,b^2\,c^2\,d+17\,a^2\,b\,c\,d^2-5\,a^3\,d^3\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\right.$$

$$\left((b\,c-a\,d)^3\,\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\right.\right.$$

$$\left.\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)+$$

$$\left(-9\,a\,c\,\left(2\,a\,b^2\,c\,d^2\,x^2\,\left(56\,c-51\,d\,x^2\right)+5\,a^3\,d^3\,\left(7\,c-5\,d\,x^2\right)-3\,b^3\,c^2\,\left(5\,c^2-11\,c\,d\,x^2+6\,d^2\,x^4\right)+\right.\right.$$

$$\left.5\,a^2\,b\,d^2\,\left(-19\,c^2+9\,c\,d\,x^2+6\,d^2\,x^4\right)\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+$$

$$10\,x^2\,\left(3\,b^3\,c^2\,\left(c-d\,x^2\right)^2+a^3\,d^3\,\left(-7\,c+5\,d\,x^2\right)+a\,b^2\,c\,d^2\,x^2\,\left(-19\,c+17\,d\,x^2\right)+\right.$$

$$\left.a^2\,b\,d^2\,\left(19\,c^2-10\,c\,d\,x^2-5\,d^2\,x^4\right)\right)$$

$$\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\Big/$$

$$\left(a\,(-b\,c+a\,d)^3\,\left(-c+d\,x^2\right)\,\left(9\,a\,c\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\,\left(2\,b\,c\right.\right.\right.$$

$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)\right)$$

Problem 932: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 735 leaves, 18 steps):

$$\frac{d\,(3\,b\,c+2\,a\,d)}{6\,a\,c\,(b\,c-a\,d)^2\,e\,\sqrt{e\,x}\,\left(c-d\,x^2\right)^{3/2}}+\frac{b}{2\,a\,(b\,c-a\,d)\,e\,\sqrt{e\,x}\,\left(a-b\,x^2\right)\,\left(c-d\,x^2\right)^{3/2}}+$$
$$\frac{d\,\left(3\,b^2\,c^2+19\,a\,b\,c\,d-7\,a^2\,d^2\right)}{6\,a\,c^2\,(b\,c-a\,d)^3\,e\,\sqrt{e\,x}\,\sqrt{c-d\,x^2}}-\frac{\left(5\,b^3\,c^3-12\,a\,b^2\,c^2\,d+19\,a^2\,b\,c\,d^2-7\,a^3\,d^3\right)\,\sqrt{c-d\,x^2}}{2\,a^2\,c^3\,(b\,c-a\,d)^3\,e\,\sqrt{e\,x}}-$$
$$\left(d^{1/4}\,\left(5\,b^3\,c^3-12\,a\,b^2\,c^2\,d+19\,a^2\,b\,c\,d^2-7\,a^3\,d^3\right)\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(2\,a^2\,c^{9/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}\right)+$$
$$\left(d^{1/4}\,\left(5\,b^3\,c^3-12\,a\,b^2\,c^2\,d+19\,a^2\,b\,c\,d^2-7\,a^3\,d^3\right)\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(2\,a^2\,c^{9/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}\right)-$$
$$\left(5\,b^{5/2}\,c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}\right)+$$
$$\left(5\,b^{5/2}\,c^{1/4}\,(b\,c-3\,a\,d)\,\sqrt{1-\frac{d\,x^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\,\sqrt{e\,x}}{c^{1/4}\,\sqrt{e}}\right],-1\right]\right)\Big/$$
$$\left(4\,a^{5/2}\,d^{1/4}\,(b\,c-a\,d)^3\,e^{3/2}\,\sqrt{c-d\,x^2}\right)$$

Result (type 6, 582 leaves):

$$\frac{1}{42\,a^2\,c^3\,\left(-b\,c+a\,d\right)^3\,\left(e\,x\right)^{3/2}\,\left(a-b\,x^2\right)\,\sqrt{c-d\,x^2}}$$
$$x\,\left(-\frac{1}{c-d\,x^2}7\,\left(15\,b^4\,c^3\,x^2\,\left(c-d\,x^2\right)^2-12\,a\,b^3\,c^2\,\left(c-d\,x^2\right)^2\,\left(c+3\,d\,x^2\right)+a^4\,d^3\,\left(12\,c^2-35\,c\,d\,x^2+21\,d^2\,x^4\right)-a^3\,b\,d^2\,\left(36\,c^3-83\,c^2\,d\,x^2+22\,c\,d^2\,x^4+21\,d^3\,x^6\right)+a^2\,b^2\,c\,d\,\left(36\,c^3-36\,c^2\,d\,x^2-59\,c\,d^2\,x^4+57\,d^3\,x^6\right)\right)-\right.$$
$$\left(49\,a\,c\,\left(5\,b^4\,c^4-20\,a\,b^3\,c^3\,d+12\,a^2\,b^2\,c^2\,d^2-19\,a^3\,b\,c\,d^3+7\,a^4\,d^4\right)\,x^2\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(7\,a\,c\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left(2\,b\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)+$$
$$\left(33\,a\,b\,c\,d\,\left(-5\,b^3\,c^3+12\,a\,b^2\,c^2\,d-19\,a^2\,b\,c\,d^2+7\,a^3\,d^3\right)\,x^4\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\Big/\left(11\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},1,\frac{11}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+2\,x^2\left.\left(2\,b\,c\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},2,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},1,\frac{15}{4},\frac{d\,x^2}{c},\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 933: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 606 leaves, 13 steps):

$$\frac{d\left(3bc+2ad\right)}{6ac\left(bc-ad\right)^2 e\,(e x)^{3/2}\left(c-dx^2\right)^{3/2}}+\frac{b}{2a\left(bc-ad\right)e\,(e x)^{3/2}\left(a-bx^2\right)\left(c-dx^2\right)^{3/2}}+$$

$$\frac{d\left(b^2c^2+7abcd-3a^2d^2\right)}{2ac^2\left(bc-ad\right)^3 e\,(e x)^{3/2}\sqrt{c-dx^2}}-\frac{\left(7b^3c^3-12ab^2c^2d+35a^2bcd^2-15a^3d^3\right)\sqrt{c-dx^2}}{6a^2c^3\left(bc-ad\right)^3 e\,(e x)^{3/2}}+$$

$$\left(d^{3/4}\left(7b^3c^3-12ab^2c^2d+35a^2bcd^2-15a^3d^3\right)\sqrt{1-\frac{dx^2}{c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/\left(6a^2c^{11/4}\left(bc-ad\right)^3 e^{5/2}\sqrt{c-dx^2}\right)+$$

$$\left(b^3c^{1/4}\left(7bc-17ad\right)\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[-\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$

$$\left(4a^3d^{1/4}\left(bc-ad\right)^3 e^{5/2}\sqrt{c-dx^2}\right)+$$

$$\left(b^3c^{1/4}\left(7bc-17ad\right)\sqrt{1-\frac{dx^2}{c}}\;\text{EllipticPi}\left[\frac{\sqrt{b}\,\sqrt{c}}{\sqrt{a}\,\sqrt{d}},\text{ArcSin}\left[\frac{d^{1/4}\sqrt{e x}}{c^{1/4}\sqrt{e}}\right],-1\right]\right)\Big/$$

$$\left(4a^3d^{1/4}\left(bc-ad\right)^3 e^{5/2}\sqrt{c-dx^2}\right)$$

Result (type 6, 582 leaves):

$$\frac{1}{30a^2c^3\left(-bc+ad\right)^3(e x)^{5/2}\left(a-bx^2\right)\sqrt{c-dx^2}}$$

$$x\left(-\frac{1}{c-dx^2}5\left(7b^4c^3x^2\left(c-dx^2\right)^2-4ab^3c^2\left(c-dx^2\right)^2\left(c+3dx^2\right)+\right.\right.$$

$$a^4d^3\left(4c^2-21cdx^2+15d^2x^4\right)-a^3bd^2\left(12c^3-45c^2dx^2+14cd^2x^4+15d^3x^6\right)+$$

$$\left.a^2b^2cd\left(12c^3-12c^2dx^2-37cd^2x^4+35d^3x^6\right)\right)+$$

$$\left(25ac\left(-21b^4c^4+44ab^3c^3d+12a^2b^2c^2d^2-35a^3bcd^3+15a^4d^4\right)x^2\right.$$

$$\left.\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/\left(5ac\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},1,\frac{5}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+\right.$$

$$\left.2x^2\left(2bc\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},2,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)+$$

$$\left(9abcd\left(7b^3c^3-12ab^2c^2d+35a^2bcd^2-15a^3d^3\right)x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\Big/$$

$$\left(9ac\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},1,\frac{9}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+\right.$$

$$\left.\left.2x^2\left(2bc\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},2,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]+ad\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},1,\frac{13}{4},\frac{dx^2}{c},\frac{bx^2}{a}\right]\right)\right)\right)$$

Problem 937: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 92 leaves, 8 steps):

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

Result (type 6, 238 leaves):

$$\left(5 a (b c-a d) \left(a+b x^2\right)^{3/2} \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\frac{d \left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]\right)\Big/$$
$$\left(3 b x^2 \sqrt{c+d x^2} \left(5 a (b c-a d) \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\frac{d \left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]-\right.\right.$$
$$\left(a+b x^2\right) \left((-2 b c+2 a d) \text{AppellF1}\left[\frac{5}{2},\frac{1}{2},2,\frac{7}{2},\frac{d \left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]+\right.$$
$$\left.\left.\left.a d \text{AppellF1}\left[\frac{5}{2},\frac{3}{2},1,\frac{7}{2},\frac{d \left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]\right)\right)\right)$$

Problem 938: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 89 leaves, 4 steps):

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

Result (type 6, 188 leaves):

$$\left(-\left(a+b x^2\right) \left(c+d x^2\right)+\left(2 b d (b c-a d) x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\right.$$
$$\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+\right.$$
$$\left.\left.a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(2 c x^2 \sqrt{a+b x^2}\ \sqrt{c+d x^2}\right)$$

Problem 939: Result unnecessarily involves higher level functions.

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

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

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

Result (type 6, 224 leaves):

$$\left(\left(a+b x^2\right) \left(c+d x^2\right) \left(-2 a c-b c x^2+3 a d x^2\right)+\left(2 b d \left(-b^2 c^2-2 a b c d+3 a^2 d^2\right) x^6 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(8 a c^2 x^4 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 940: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 343 leaves, 6 steps):

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

Result (type 4, 246 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, x\, \left(a+b\,x^2\right)\left(c+d\,x^2\right)\left(-4\,b\,c+a\,d+3\,b\,d\,x^2\right)+\right.$$
$$i\,c\left(-8\,b^2\,c^2+3\,a\,b\,c\,d+2\,a^2\,d^2\right)\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-$$
$$\left.i\,c\left(-8\,b^2\,c^2+7\,a\,b\,c\,d+a^2\,d^2\right)\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\Bigg/$$
$$\left(15\,b\,\sqrt{\frac{b}{a}}\,d^3\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 941: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 259 leaves, 5 steps):

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

Result (type 4, 199 leaves):

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

Problem 943: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 307 leaves, 6 steps):

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

Result (type 4, 228 leaves):

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

Problem 947: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 133 leaves, 8 steps):

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

Result (type 6, 400 leaves):

$$\left(b\left(\left(4 a^2 d x^2\, \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]\right) \Big/\right.\right.$$
$$\left(-4 b d x^2\, \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]+\right.$$
$$\left. b c\, \text{AppellF1}\left[2, \frac{1}{2}, \frac{3}{2}, 3, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]+a d\, \text{AppellF1}\left[2, \frac{3}{2}, \frac{1}{2}, 3, -\frac{a}{b x^2}, -\frac{c}{d x^2}\right]\right)+$$
$$\left(-2 a c\left(2 a c+b c x^2+5 a d x^2+2 b d x^4\right) \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]+\right.$$
$$x^2\left(a+b x^2\right)\left(c+d x^2\right)$$
$$\left.\left.\left(a d\, \text{AppellF1}\left[2, \frac{1}{2}, \frac{3}{2}, 3, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]+b c\, \text{AppellF1}\left[2, \frac{3}{2}, \frac{1}{2}, 3, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right) \Big/$$
$$\left(d\left(-4 a c\, \text{AppellF1}\left[1, \frac{1}{2}, \frac{1}{2}, 2, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]+\right.\right.$$
$$x^2\left(a d\, \text{AppellF1}\left[2, \frac{1}{2}, \frac{3}{2}, 3, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]+\right.$$
$$\left.\left.\left.\left.b c\, \text{AppellF1}\left[2, \frac{3}{2}, \frac{1}{2}, 3, -\frac{b x^2}{a}, -\frac{d x^2}{c}\right]\right)\right)\right)\right) \Big/ \left(2 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 948: Result unnecessarily involves higher level functions and more

than twice size of optimal antiderivative.

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

Optimal (type 3, 136 leaves, 8 steps):

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

Result (type 6, 327 leaves):

$$\left(a\left(-\left(a+b x^2\right)\left(c+d x^2\right)+\left(2 b d (3 b c-a d) x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right/\right.$$
$$\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+\right.$$
$$\left.b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)-$$
$$\left(4 b^2 c^2 x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/$$
$$\left(-4 a c \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(a d \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.\right.$$
$$\left.\left.\left.\left.b c \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)\right)\Big/\left(2 c x^2 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 949: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 131 leaves, 5 steps):

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

Result (type 6, 208 leaves):

$$\left(\left(a+b x^2\right)\left(c+d x^2\right)\left(-2 a c-5 b c x^2+3 a d x^2\right)+\right.$$
$$\left(6 b d (b c-a d)^2 x^6 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/$$
$$\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+\right.$$
$$\left.\left.a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(8 c^2 x^4 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 950: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 429 leaves, 7 steps):

$$-\frac{2 (2 b c-a d) \left(4 b^2 c^2-4 a b c d-a^2 d^2\right) x \sqrt{a+b x^2}}{35 b^2 d^3 \sqrt{c+d x^2}}+\frac{\left(8 b^2 c^2-11 a b c d+a^2 d^2\right) x \sqrt{a+b x^2} \sqrt{c+d x^2}}{35 b d^3}-\frac{2 (3 b c-4 a d) x^3 \sqrt{a+b x^2} \sqrt{c+d x^2}}{35 d^2}+\frac{b x^5 \sqrt{a+b x^2} \sqrt{c+d x^2}}{7 d}+\left(2 \sqrt{c} (2 b c-a d) \left(4 b^2 c^2-4 a b c d-a^2 d^2\right) \sqrt{a+b x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]\right) \Big/ \left(35 b^2 d^{7/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}\right)-\left(c^{3/2} \left(8 b^2 c^2-11 a b c d+a^2 d^2\right) \sqrt{a+b x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]\right) \Big/ \left(35 b d^{7/2} \sqrt{\frac{c \left(a+b x^2\right)}{a \left(c+d x^2\right)}} \sqrt{c+d x^2}\right)$$

Result (type 4, 305 leaves):

$$\frac{1}{35 b \sqrt{\frac{b}{a}} d^4 \sqrt{a+b x^2} \sqrt{c+d x^2}}\left(\sqrt{\frac{b}{a}} d x \left(a+b x^2\right) \left(c+d x^2\right) \left(a^2 d^2+a b d \left(-11 c+8 d x^2\right)+b^2 \left(8 c^2-6 c d x^2+5 d^2 x^4\right)\right)+2 i c \left(8 b^3 c^3-12 a b^2 c^2 d+2 a^2 b c d^2+a^3 d^3\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \, \text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]-i c \left(16 b^3 c^3-32 a b^2 c^2 d+15 a^2 b c d^2+a^3 d^3\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right)$$

Problem 951: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{\left(13 a c - \frac{8 b c^2}{d} - \frac{3 a^2 d}{b}\right) x \sqrt{a + b x^2}}{15 d \sqrt{c + d x^2}} - \frac{2 \left(2 b c - 3 a d\right) x \sqrt{a + b x^2} \sqrt{c + d x^2}}{15 d^2} + \frac{b x^3 \sqrt{a + b x^2} \sqrt{c + d x^2}}{5 d} - \left(\sqrt{c} \left(8 b^2 c^2 - 13 a b c d + 3 a^2 d^2\right) \sqrt{a + b x^2} \, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1 - \frac{b c}{a d}\right]\right) \Big/ \left(15 b d^{5/2} \sqrt{\frac{c \left(a + b x^2\right)}{a \left(c + d x^2\right)}} \sqrt{c + d x^2}\right) + \frac{2 c^{3/2} \left(2 b c - 3 a d\right) \sqrt{a + b x^2} \, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1 - \frac{b c}{a d}\right]}{15 d^{5/2} \sqrt{\frac{c \left(a + b x^2\right)}{a \left(c + d x^2\right)}} \sqrt{c + d x^2}}$$

Result (type 4, 245 leaves):

$$\left(\sqrt{\frac{b}{a}} d x \left(a + b x^2\right) \left(c + d x^2\right) \left(-4 b c + 6 a d + 3 b d x^2\right) - i c \left(8 b^2 c^2 - 13 a b c d + 3 a^2 d^2\right) \sqrt{1 + \frac{b x^2}{a}} \sqrt{1 + \frac{d x^2}{c}} \, \text{EllipticE}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right] + i c \left(8 b^2 c^2 - 17 a b c d + 9 a^2 d^2\right) \sqrt{1 + \frac{b x^2}{a}} \sqrt{1 + \frac{d x^2}{c}} \, \text{EllipticF}\left[i \, \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right) \Big/ \left(15 \sqrt{\frac{b}{a}} d^3 \sqrt{a + b x^2} \sqrt{c + d x^2}\right)$$

Problem 952: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 244 leaves, 5 steps):

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

Result (type 4, 206 leaves) :

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

Problem 953: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 311 leaves, 6 steps) :

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

Result (type 4, 227 leaves):

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

Problem 957: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 187 leaves, 9 steps):

$$-\frac{b\,\left(3\,b\,c-7\,a\,d\right)\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{8\,d^2}+\frac{b\,\left(a+b\,x^2\right)^{3/2}\,\sqrt{c+d\,x^2}}{4\,d}-\frac{a^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b\,x^2}}{\sqrt{a}\,\sqrt{c+d\,x^2}}\right]}{\sqrt{c}}+\frac{\sqrt{b}\,\left(3\,b^2\,c^2-10\,a\,b\,c\,d+15\,a^2\,d^2\right)\,\text{ArcTanh}\left[\frac{\sqrt{d}\,\sqrt{a+b\,x^2}}{\sqrt{b}\,\sqrt{c+d\,x^2}}\right]}{8\,d^{5/2}}$$

Result (type 6, 357 leaves):

$$\left(\left(8\,a^3\,b\,d\,x^2\,\text{AppellF1}\left[1,\,\frac{1}{2},\,\frac{1}{2},\,2,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\bigg/\left(-4\,b\,d\,x^2\,\text{AppellF1}\left[1,\,\frac{1}{2},\,\frac{1}{2},\,2,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]+b\,c\,\text{AppellF1}\left[2,\,\frac{1}{2},\,\frac{3}{2},\,3,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]+a\,d\,\text{AppellF1}\left[2,\,\frac{3}{2},\,\frac{1}{2},\,3,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)+\frac{1}{2\,d^2}b\,\left(\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)\,\left(-3\,b\,c+9\,a\,d+2\,b\,d\,x^2\right)-\left(2\,a\,c\,\left(3\,b^2\,c^2-10\,a\,b\,c\,d+15\,a^2\,d^2\right)\,x^2\,\text{AppellF1}\left[1,\,\frac{1}{2},\,\frac{1}{2},\,2,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\bigg/\left(-4\,a\,c\,\text{AppellF1}\left[1,\,\frac{1}{2},\,\frac{1}{2},\,2,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+x^2\,\left(a\,d\,\text{AppellF1}\left[2,\,\frac{1}{2},\,\frac{3}{2},\,3,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+b\,c\,\text{AppellF1}\left[2,\,\frac{3}{2},\,\frac{1}{2},\,3,\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)\bigg/\left(4\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 958: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 187 leaves, 9 steps):

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

Result (type 6, 358 leaves):

$$\Bigg(\left(a+b x^2\right)\left(-a^2 d+b^2 c x^2\right)\left(c+d x^2\right)+\left(2 a^2 b d^2\,(5 b c-a d)\,x^4\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)-\left(2 a b^2 c^2\,(-b c+5 a d)\,x^4\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-4 a c\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+x^2\left(a d\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\Bigg)\Big/\left(2 c d x^2\sqrt{a+b x^2}\,\sqrt{c+d x^2}\right)$$

Problem 959: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 192 leaves, 9 steps):

$$-\frac{a\,(7 b c-3 a d)\sqrt{a+b x^2}\,\sqrt{c+d x^2}}{8 c^2 x^2}-\frac{a\left(a+b x^2\right)^{3/2}\sqrt{c+d x^2}}{4 c x^4}-\frac{\sqrt{a}\,\left(15 b^2 c^2-10 a b c d+3 a^2 d^2\right)\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{a+b x^2}}{\sqrt{a}\,\sqrt{c+d x^2}}\right]}{8 c^{5/2}}+\frac{b^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{d}\,\sqrt{a+b x^2}}{\sqrt{b}\,\sqrt{c+d x^2}}\right]}{\sqrt{d}}$$

Result (type 6, 359 leaves):

$$\left(a\left(\left(a+b\,x^2\right)\left(c+d\,x^2\right)\left(-2\,a\,c-9\,b\,c\,x^2+3\,a\,d\,x^2\right)+\right.\right.$$

$$\left(2\,b\,d\left(15\,b^2\,c^2-10\,a\,b\,c\,d+3\,a^2\,d^2\right)x^6\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\Big/$$

$$\left(-4\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+\right.$$

$$\left.b\,c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+a\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)-$$

$$\left(16\,b^3\,c^3\,x^6\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/$$

$$\left(-4\,a\,c\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+x^2\left(a\,d\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+\right.\right.$$

$$\left.\left.\left.\left.b\,c\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)\Big/\left(8\,c^2\,x^4\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}\right)$$

Problem 960: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 553 leaves, 8 steps):

$$\left(\left(128\,b^4\,c^4-328\,a\,b^3\,c^3\,d+243\,a^2\,b^2\,c^2\,d^2-25\,a^3\,b\,c\,d^3-10\,a^4\,d^4\right)x\,\sqrt{a+b\,x^2}\right)\Big/$$

$$\left(315\,b^2\,d^4\,\sqrt{c+d\,x^2}\right)-\frac{\left(64\,b^3\,c^3-156\,a\,b^2\,c^2\,d+105\,a^2\,b\,c\,d^2-5\,a^3\,d^3\right)x\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{315\,b\,d^4}+$$

$$\frac{\left(48\,b^2\,c^2-115\,a\,b\,c\,d+75\,a^2\,d^2\right)x^3\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{315\,d^3}-$$

$$\frac{4\,b\left(2\,b\,c-3\,a\,d\right)x^5\,\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}{63\,d^2}+\frac{b\,x^5\left(a+b\,x^2\right)^{3/2}\sqrt{c+d\,x^2}}{9\,d}-$$

$$\left(\sqrt{c}\left(128\,b^4\,c^4-328\,a\,b^3\,c^3\,d+243\,a^2\,b^2\,c^2\,d^2-25\,a^3\,b\,c\,d^3-10\,a^4\,d^4\right)\sqrt{a+b\,x^2}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]\right)\Big/\left(315\,b^2\,d^{9/2}\,\sqrt{\frac{c\left(a+b\,x^2\right)}{a\left(c+d\,x^2\right)}}\,\sqrt{c+d\,x^2}\right)+$$

$$\left(c^{3/2}\left(64\,b^3\,c^3-156\,a\,b^2\,c^2\,d+105\,a^2\,b\,c\,d^2-5\,a^3\,d^3\right)\sqrt{a+b\,x^2}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]\right)\Big/\left(315\,b\,d^{9/2}\,\sqrt{\frac{c\left(a+b\,x^2\right)}{a\left(c+d\,x^2\right)}}\,\sqrt{c+d\,x^2}\right)$$

Result (type 4, 379 leaves):

$$\frac{1}{315\, b\, \sqrt{\frac{b}{a}}\, d^5 \sqrt{a+b x^2}\, \sqrt{c+d x^2}} \left(\sqrt{\frac{b}{a}}\, d\, x\, (a+b x^2)\, (c+d x^2)\, \left(5 a^3 d^3 + 15 a^2 b d^2 (-7 c + 5 d x^2) + a b^2 d \left(156 c^2 - 115 c d x^2 + 95 d^2 x^4\right) + b^3 \left(-64 c^3 + 48 c^2 d x^2 - 40 c d^2 x^4 + 35 d^3 x^6\right)\right) + i\, c \left(-128 b^4 c^4 + 328 a b^3 c^3 d - 243 a^2 b^2 c^2 d^2 + 25 a^3 b c d^3 + 10 a^4 d^4\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right] - i\, c \left(-128 b^4 c^4 + 392 a b^3 c^3 d - 399 a^2 b^2 c^2 d^2 + 130 a^3 b c d^3 + 5 a^4 d^4\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right)$$

Problem 961: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 436 leaves, 7 steps):

$$-\frac{\left(48 b^3 c^3 - 128 a b^2 c^2 d + 103 a^2 b c d^2 - 15 a^3 d^3\right) x \sqrt{a+b x^2}}{105\, b\, d^3 \sqrt{c+d x^2}} + \frac{\left(24 b^2 c^2 - 61 a b c d + 45 a^2 d^2\right) x \sqrt{a+b x^2}\, \sqrt{c+d x^2}}{105\, d^3} - \frac{2 b\, (3 b c - 5 a d)\, x^3 \sqrt{a+b x^2}\, \sqrt{c+d x^2}}{35\, d^2} + \frac{b x^3 \left(a+b x^2\right)^{3/2} \sqrt{c+d x^2}}{7\, d} + \left(\sqrt{c}\, \left(48 b^3 c^3 - 128 a b^2 c^2 d + 103 a^2 b c d^2 - 15 a^3 d^3\right) \sqrt{a+b x^2}\, \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]\right) \Big/ \left(105\, b\, d^{7/2} \sqrt{\frac{c\, (a+b x^2)}{a\, (c+d x^2)}}\, \sqrt{c+d x^2}\right) - \left(c^{3/2} \left(24 b^2 c^2 - 61 a b c d + 45 a^2 d^2\right) \sqrt{a+b x^2}\, \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]\right) \Big/ \left(105\, d^{7/2} \sqrt{\frac{c\, (a+b x^2)}{a\, (c+d x^2)}}\, \sqrt{c+d x^2}\right)$$

Result (type 4, 306 leaves):

$$\frac{1}{105\sqrt{\frac{b}{a}}\,d^4\sqrt{a+b\,x^2}\,\sqrt{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,x\,\left(a+b\,x^2\right)\,\left(c+d\,x^2\right)\,\left(45\,a^2\,d^2+a\,b\,d\,\left(-61\,c+45\,d\,x^2\right)+3\,b^2\,\left(8\,c^2-6\,c\,d\,x^2+5\,d^2\,x^4\right)\right)-\right.$$

$$\mathbb{i}\,c\,\left(-48\,b^3\,c^3+128\,a\,b^2\,c^2\,d-103\,a^2\,b\,c\,d^2+15\,a^3\,d^3\right)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}$$

$$\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+4\,\mathbb{i}\,c\,\left(-12\,b^3\,c^3+38\,a\,b^2\,c^2\,d-41\,a^2\,b\,c\,d^2+15\,a^3\,d^3\right)$$

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

Problem 962: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 330 leaves, 6 steps):

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

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

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

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

Result (type 4, 254 leaves):

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

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

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

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

Problem 963: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 336 leaves, 6 steps):

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

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

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

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

Result (type 4, 261 leaves):

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

Problem 968: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 241 leaves, 5 steps):

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

Result (type 4, 127 leaves):

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

Problem 972: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 46 leaves, 3 steps):

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

Result (type 6, 153 leaves):

$$\left(2 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(\sqrt{a+b x^2}\,\sqrt{c+d x^2}\,\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)$$

Problem 973: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 91 leaves, 4 steps):

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

Result (type 6, 192 leaves):

$$\left(-(a+b x^2)(c+d x^2)+\left(2 b d (b c+a d) x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]-b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]-a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(2 a c x^2\sqrt{a+b x^2}\,\sqrt{c+d x^2}\right)$$

Problem 974: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 149 leaves, 6 steps):

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

Result (type 6, 224 leaves):

$$\left(\left(a+b x^2\right)\left(c+d x^2\right)\left(-2 a c+3 b c x^2+3 a d x^2\right)+\left(2 b d\left(3 b^2 c^2+2 a b c d+3 a^2 d^2\right) x^6 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\Big/\left(8 a^2 c^2 x^4 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 975: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^6}{\sqrt{a+b x^2} \sqrt{c+d x^2}} \, dx$$

Optimal (type 4, 342 leaves, 6 steps):

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

Result (type 4, 249 leaves):

$$\left(-\sqrt{\frac{b}{a}} d x \left(a+b x^2\right)\left(c+d x^2\right)\left(4 b c+4 a d-3 b d x^2\right)-i c\left(8 b^2 c^2+7 a b c d+8 a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right],\frac{a d}{b c}\right]+i c\left(8 b^2 c^2+3 a b c d+4 a^2 d^2\right) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right],\frac{a d}{b c}\right]\right)\Big/\left(15 a^2 \left(\frac{b}{a}\right)^{5/2} d^3 \sqrt{a+b x^2} \sqrt{c+d x^2}\right)$$

Problem 976: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 261 leaves, 5 steps):

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

Result (type 4, 201 leaves):

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

Problem 977: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 116 leaves, 2 steps):

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

Result (type 4, 122 leaves):

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

Problem 978: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 146 leaves):

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

Problem 979: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 307 leaves, 6 steps):

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

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

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

Result (type 4, 229 leaves) :

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

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

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

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

Problem 990: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 47 leaves, 4 steps) :

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{d} \sqrt{a-b x^2}}{\sqrt{b} \sqrt{c+d x^2}}\right]}{\sqrt{b} \sqrt{d}}$$

Result (type 3, 72 leaves) :

$$\frac{\mathrm{i} \text{Log}\left[2 \sqrt{a-b x^2} \sqrt{c+d x^2}-\frac{\mathrm{i} (b c-a d+2 b d x^2)}{\sqrt{b} \sqrt{d}}\right]}{2 \sqrt{b} \sqrt{d}}$$

Problem 992: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 110 leaves, 2 steps):

$$\frac{x\sqrt{2+b x^2}}{b\sqrt{3+d x^2}}-\frac{\sqrt{2}\,\sqrt{2+b x^2}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{3}}\right],1-\frac{3 b}{2 d}\right]}{b\sqrt{d}\,\sqrt{\frac{2+b x^2}{3+d x^2}}\,\sqrt{3+d x^2}}$$

Result (type 4, 72 leaves):

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

Problem 994: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{4+x^2}\,\sqrt{c+d x^2}}\,dx$$

Optimal (type 4, 88 leaves, 2 steps):

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

Result (type 4, 70 leaves):

$$-\frac{1}{d\sqrt{c+d x^2}}\,i\,c\,\sqrt{1+\frac{d x^2}{c}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],\frac{4 d}{c}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],\frac{4 d}{c}\right]\right)$$

Problem 1004: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 80 leaves, 2 steps):

$$\frac{x\sqrt{2+3 x^2}}{3\sqrt{1+x^2}}-\frac{\sqrt{2}\,\sqrt{2+3 x^2}\,\text{EllipticE}\left[\text{ArcTan}[x],-\frac{1}{2}\right]}{3\sqrt{1+x^2}\,\sqrt{\frac{2+3 x^2}{1+x^2}}}$$

Result (type 4, 34 leaves):

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

Problem 1005: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 82 leaves, 2 steps):

$$\frac{x\,\sqrt{2+3\,x^2}}{3\,\sqrt{4+x^2}}-\frac{\sqrt{2}\ \sqrt{2+3\,x^2}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{x}{2}\right],\,-5\right]}{3\,\sqrt{4+x^2}\ \sqrt{\frac{2+3\,x^2}{4+x^2}}}$$

Result (type 4, 38 leaves):

$$-\frac{1}{3}\,i\,\sqrt{2}\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],\,6\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{x}{2}\right],\,6\right]\right)$$

Problem 1006: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 2 steps):

$$\frac{x\,\sqrt{2+3\,x^2}}{3\,\sqrt{1+4\,x^2}}-\frac{\sqrt{2+3\,x^2}\ \text{EllipticE}\left[\text{ArcTan}[2\,x],\,\frac{5}{8}\right]}{3\,\sqrt{2}\ \sqrt{\frac{2+3\,x^2}{1+4\,x^2}}\ \sqrt{1+4\,x^2}}$$

Result (type 4, 50 leaves):

$$-\frac{1}{4\,\sqrt{3}}\,i\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\ x\right],\,\frac{8}{3}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\ x\right],\,\frac{8}{3}\right]\right)$$

Problem 1007: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 17 leaves, 3 steps):

$$-\frac{1}{2}\,\text{EllipticE}[\text{ArcCos}[x],\,2]-\frac{1}{2}\,\text{EllipticF}[\text{ArcCos}[x],\,2]$$

Result (type 4, 37 leaves):

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

Problem 1008: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 109 leaves, 7 steps):

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

Result (type 5, 63 leaves):

$$\frac{3\left(6-7x^2+x^4-45\left(\frac{-1+x^2}{3+x^2}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)}{10\left(1-x^2\right)^{1/3}}$$

Problem 1009: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 94 leaves, 6 steps):

$$-\frac{3}{4}\left(1-x^2\right)^{2/3}-\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{2\times 2^{2/3}}+\frac{3\,\text{Log}\left[3+x^2\right]}{4\times 2^{2/3}}-\frac{9\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{4\times 2^{2/3}}$$

Result (type 5, 58 leaves):

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

Problem 1011: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 136 leaves, 10 steps):

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

Result (type 6, 111 leaves):

$$-\left(\left(21\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(8\,\left(1-x^2\right)^{1/3}\,\left(3+x^2\right)\,\left(7\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\right)$$

Problem 1012: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 97 leaves, 7 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{6\,x^2}+\frac{\text{ArcTan}\left[\frac{1+\left(2-2\,x^2\right)^{1/3}}{\sqrt{3}}\right]}{6\times 2^{2/3}\,\sqrt{3}}-\frac{\text{Log}\left[3+x^2\right]}{36\times 2^{2/3}}+\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{12\times 2^{2/3}}$$

Result (type 6, 115 leaves):

$$\frac{1}{6\,x^2\,\left(1-x^2\right)^{1/3}}\left(-1+x^2-\left(2\,x^4\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\,\left(-6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\,\left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1013: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 172 leaves, 12 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{12\,x^4}-\frac{\left(1-x^2\right)^{2/3}}{18\,x^2}-\frac{\text{ArcTan}\left[\frac{1+\left(2-2\,x^2\right)^{1/3}}{\sqrt{3}}\right]}{18\times 2^{2/3}\,\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{1+2\,\left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{9\,\sqrt{3}}-\frac{\text{Log}[x]}{27}+\frac{\text{Log}\left[3+x^2\right]}{108\times 2^{2/3}}+\frac{1}{18}\,\text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]-\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{36\times 2^{2/3}}$$

Result (type 6, 215 leaves):

$$\frac{1}{36\left(1-x^2\right)^{1/3}}\left(2-\frac{3}{x^4}+\frac{1}{x^2}-\left(4\,x^2\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)\right)-\left(21\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(\left(3+x^2\right)\left(7\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\right)$$

Problem 1014: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 536 leaves, 7 steps):

$$-\frac{3}{7}x\left(1-x^2\right)^{2/3}+\frac{54\,x}{7\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{2\times 2^{2/3}}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{2\times 2^{2/3}}-\frac{3\,\text{ArcTanh}[x]}{2\times 2^{2/3}}+\frac{9\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{2\times 2^{2/3}}+\left(27\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(7\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)-\left(18\sqrt{2}\,3^{3/4}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(7\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 236 leaves):

$$\frac{1}{7\left(1-x^2\right)^{1/3}}3x\left(-1+x^2-\left(27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)+\left(30x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1015: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 515 leaves, 6 steps):

$$-\frac{3x}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{2\times2^{2/3}}-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{2\times2^{2/3}}+\frac{\text{ArcTanh}[x]}{2\times2^{2/3}}-\frac{3\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{2\times2^{2/3}}-\left(3\times3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(2x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)+\left(\sqrt{2}\,3^{3/4}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 120 leaves):

$$-\left(\left(5x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(1-x^2\right)^{1/3}\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1016: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 113 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{2\times 2^{2/3} \sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3} \left(1-2^{1/3} \left(1-x^2\right)^{1/3}\right)}{x}\right]}{2\times 2^{2/3} \sqrt{3}}-\frac{\text{ArcTanh}[x]}{6\times 2^{2/3}}+\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3} \left(1-x^2\right)^{1/3}}\right]}{2\times 2^{2/3}}$$

Result (type 6, 118 leaves):

$$-\left(\left(9 x \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(1-x^2\right)^{1/3} \left(3+x^2\right) \left(-9 \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2 x^2 \left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1017: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 538 leaves, 7 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{3 x}+\frac{x}{3 \left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}-\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{6\times 2^{2/3} \sqrt{3}}-\frac{\text{ArcTan}\left[\frac{\sqrt{3} \left(1-2^{1/3} \left(1-x^2\right)^{1/3}\right)}{x}\right]}{6\times 2^{2/3} \sqrt{3}}+\frac{\text{ArcTanh}[x]}{18\times 2^{2/3}}-\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3} \left(1-x^2\right)^{1/3}}\right]}{6\times 2^{2/3}}+$$

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

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

Result (type 6, 243 leaves) :

$$\frac{1}{9\,x\,\left(1-x^2\right)^{1/3}}\left(-3+3\,x^2+\left(54\,x^2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)+\left(5\,x^4\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1018: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 556 leaves, 8 steps) :

$$-\frac{\left(1-x^2\right)^{2/3}}{9\,x^3}-\frac{2\left(1-x^2\right)^{2/3}}{27\,x}+\frac{2\,x}{27\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{18\times2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{18\times2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{54\times2^{2/3}}+\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{18\times2^{2/3}}+\left(\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(9\times3^{3/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)-\left(2\sqrt{2}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(27\times3^{1/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 245 leaves) :

$$\frac{1}{81\left(1-x^2\right)^{1/3}}\left(-\frac{9}{x^3}+\frac{3}{x}+6x-\left(27x\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)+\left(10x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)$$

Problem 1019: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 133 leaves, 7 steps):

$$-\frac{3x^4\left(1-x^2\right)^{2/3}}{10\left(3+x^2\right)}+\frac{9\left(1-x^2\right)^{2/3}\left(69+14x^2\right)}{40\left(3+x^2\right)}+\frac{99\sqrt{3}\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times2^{2/3}}-\frac{99\,\text{Log}\left[3+x^2\right]}{16\times2^{2/3}}+\frac{297\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times2^{2/3}}$$

Result (type 5, 82 leaves):

$$\left(3\left(207-165x^2-46x^4+4x^6-495\left(\frac{-1+x^2}{3+x^2}\right)^{1/3}\left(3+x^2\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)\right)\Big/\left(40\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1020: Result unnecessarily involves higher level functions.

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

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

$$-\frac{3}{4}\left(1-x^2\right)^{2/3}-\frac{9\left(1-x^2\right)^{2/3}}{8\left(3+x^2\right)}-\frac{21\sqrt{3}\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times2^{2/3}}+\frac{21\,\text{Log}\left[3+x^2\right]}{16\times2^{2/3}}-\frac{63\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times2^{2/3}}$$

Result (type 5, 77 leaves):

$$\left(3\left(-9+7x^2+2x^4+21\left(\frac{-1+x^2}{3+x^2}\right)^{1/3}\left(3+x^2\right)\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{4}{3+x^2}\right]\right)\right)\Big/\left(8\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1021: Result unnecessarily involves higher level functions.

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

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

$$\frac{3\left(1-x^2\right)^{2/3}}{8\left(3+x^2\right)}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times 2^{2/3}}-\frac{3\,\text{Log}\left[3+x^2\right]}{16\times 2^{2/3}}+\frac{9\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times 2^{2/3}}$$

Result (type 5, 70 leaves):

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

Problem 1022: Result unnecessarily involves higher level functions.

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

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

$$-\frac{\left(1-x^2\right)^{2/3}}{8\left(3+x^2\right)}+\frac{\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times 2^{2/3}\sqrt{3}}-\frac{\text{Log}\left[3+x^2\right]}{48\times 2^{2/3}}+\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times 2^{2/3}}$$

Result (type 5, 70 leaves):

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

Problem 1023: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 158 leaves, 11 steps):

$$\frac{\left(1-x^2\right)^{2/3}}{24\left(3+x^2\right)}-\frac{5\,\text{ArcTan}\left[\frac{1+\left(2-2x^2\right)^{1/3}}{\sqrt{3}}\right]}{24\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{1+2\left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{6\sqrt{3}}-\frac{\text{Log}[x]}{18}+\frac{5\,\text{Log}\left[3+x^2\right]}{144\times 2^{2/3}}+\frac{1}{12}\text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]-\frac{5\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{48\times 2^{2/3}}$$

Result (type 6, 205 leaves):

$$\left(1-x^2+\left(2\,x^2\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(-6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)-\left(21\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(7\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\Big/\left(24\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1024: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 183 leaves, 12 steps):

$$-\frac{5\left(1-x^2\right)^{2/3}}{72\left(3+x^2\right)}-\frac{\left(1-x^2\right)^{2/3}}{6\,x^2\left(3+x^2\right)}+\frac{\text{ArcTan}\left[\frac{1+\left(2-2\,x^2\right)^{1/3}}{\sqrt{3}}\right]}{8\times2^{2/3}\sqrt{3}}-\frac{\text{ArcTan}\left[\frac{1+2\left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{18\sqrt{3}}+\frac{\text{Log}[x]}{54}-\frac{\text{Log}\left[3+x^2\right]}{48\times2^{2/3}}-\frac{1}{36}\text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]+\frac{\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{16\times2^{2/3}}$$

Result (type 6, 213 leaves):

$$\left(-12+7\,x^2+5\,x^4+\left(10\,x^4\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(-\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)+\left(21\,x^4\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(7\,x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\Big/\left(72\,x^2\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1025: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 208 leaves, 13 steps):

$$\frac{\left(1-x^2\right)^{2/3}}{216\left(3+x^2\right)}-\frac{\left(1-x^2\right)^{2/3}}{12 x^4\left(3+x^2\right)}-\frac{\left(1-x^2\right)^{2/3}}{36 x^2\left(3+x^2\right)}-\frac{13\,\text{ArcTan}\left[\frac{1+\left(2-2 x^2\right)^{1/3}}{\sqrt{3}}\right]}{216\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{1+2\left(1-x^2\right)^{1/3}}{\sqrt{3}}\right]}{18\sqrt{3}}-\frac{\text{Log}[x]}{54}+\frac{13\,\text{Log}\left[3+x^2\right]}{1296\times 2^{2/3}}+\frac{1}{36}\text{Log}\left[1-\left(1-x^2\right)^{1/3}\right]-\frac{13\,\text{Log}\left[2^{2/3}-\left(1-x^2\right)^{1/3}\right]}{432\times 2^{2/3}}$$

Result (type 6, 234 leaves):

$$\frac{1}{216\left(1-x^2\right)^{1/3}}\left(-\frac{18-12 x^2-7 x^4+x^6}{3 x^4+x^6}+\left(2 x^2\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]\right)\Big/\left(\left(3+x^2\right)\left(-6\,\text{AppellF1}\left[1,\frac{1}{3},1,2,x^2,-\frac{x^2}{3}\right]+x^2\left(\text{AppellF1}\left[2,\frac{1}{3},2,3,x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[2,\frac{4}{3},1,3,x^2,-\frac{x^2}{3}\right]\right)\right)\right)-\left(63 x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\Big/\left(\left(3+x^2\right)\left(7 x^2\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{3},1,\frac{7}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]-9\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{3},2,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]+\text{AppellF1}\left[\frac{7}{3},\frac{4}{3},1,\frac{10}{3},\frac{1}{x^2},-\frac{3}{x^2}\right]\right)\right)\right)$$

Problem 1026: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 543 leaves, 7 steps):

$$\frac{3 x\left(1-x^2\right)^{2/3}}{8\left(3+x^2\right)}-\frac{27 x}{8\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}-\frac{5\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{8\times 2^{2/3}}-\frac{5\sqrt{3}\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{8\times 2^{2/3}}+\frac{5\,\text{ArcTanh}[x]}{8\times 2^{2/3}}-\frac{15\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{8\times 2^{2/3}}-\left(27\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(16 x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)+\left(9\times 3^{3/4}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(4\sqrt{2}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 231 leaves):

$$\left(3 x \left(1-x^2+\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2 x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+\left(15 x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2 x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)\Big/\left(8\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1027: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 543 leaves, 7 steps):

$$-\frac{x\left(1-x^2\right)^{2/3}}{8\left(3+x^2\right)}+\frac{x}{8\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{8\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{8\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{24\times 2^{2/3}}+\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{8\times 2^{2/3}}+\left(3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(16 x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)-\left(\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(4\sqrt{2}\,3^{1/4}x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 231 leaves):

$$\left(x\left(-3+3x^2+\left(27\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+\left(5x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)\Big/\left(24\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1028: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 543 leaves, 7 steps):

$$\frac{x\left(1-x^2\right)^{2/3}}{24\left(3+x^2\right)}-\frac{x}{24\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{8\times 2^{2/3}\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{8\times 2^{2/3}\sqrt{3}}-\frac{\text{ArcTanh}[x]}{24\times 2^{2/3}}+\frac{\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{8\times 2^{2/3}}-\left(\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(16\times 3^{3/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)+\left(\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(12\sqrt{2}\,3^{1/4}\,x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 231 leaves):

$$\left(x\left(3-3x^2+\left(189\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+\right.\right.\right.$$
$$\left.2x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+$$
$$\left(5x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\right.$$
$$\left.\left.\left.2x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\right)\Big/\left(72\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1029: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 563 leaves, 8 steps):

$$-\frac{\left(1-x^2\right)^{2/3}}{8x}+\frac{\left(1-x^2\right)^{2/3}}{24x\left(3+x^2\right)}+\frac{x}{8\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}-\frac{7\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{72\times2^{2/3}\sqrt{3}}-$$
$$\frac{7\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{72\times2^{2/3}\sqrt{3}}+\frac{7\,\text{ArcTanh}[x]}{216\times2^{2/3}}-\frac{7\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{72\times2^{2/3}}+$$
$$\left(3^{1/4}\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(16x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)-$$
$$\left(\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],\right.\right.$$
$$\left.\left.-7+4\sqrt{3}\right]\right)\Big/\left(4\sqrt{2}\,3^{1/4}x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 241 leaves):

$$\left(-8+5x^2+3x^4+\left(69x^2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(-9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+\left(5x^4\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2x^2\left(\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]-\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\Big/\left(24x\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1030: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 581 leaves, 9 steps):

$$-\frac{11\left(1-x^2\right)^{2/3}}{216x^3}+\frac{11\left(1-x^2\right)^{2/3}}{648x}+\frac{\left(1-x^2\right)^{2/3}}{24x^3\left(3+x^2\right)}-\frac{11x}{648\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)}+\frac{11\,\text{ArcTan}\left[\frac{\sqrt{3}}{x}\right]}{216\times 2^{2/3}\sqrt{3}}+\frac{11\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1-2^{1/3}\left(1-x^2\right)^{1/3}\right)}{x}\right]}{216\times 2^{2/3}\sqrt{3}}-\frac{11\,\text{ArcTanh}[x]}{648\times 2^{2/3}}+\frac{11\,\text{ArcTanh}\left[\frac{x}{1+2^{1/3}\left(1-x^2\right)^{1/3}}\right]}{216\times 2^{2/3}}-\left(11\sqrt{2+\sqrt{3}}\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(432\times 3^{3/4}x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)+\left(11\left(1-\left(1-x^2\right)^{1/3}\right)\sqrt{\frac{1+\left(1-x^2\right)^{1/3}+\left(1-x^2\right)^{2/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-\left(1-x^2\right)^{1/3}}{1-\sqrt{3}-\left(1-x^2\right)^{1/3}}\right],-7+4\sqrt{3}\right]\right)\Big/\left(324\sqrt{2}\,3^{1/4}x\sqrt{-\frac{1-\left(1-x^2\right)^{1/3}}{\left(1-\sqrt{3}-\left(1-x^2\right)^{1/3}\right)^2}}\right)$$

Result (type 6, 246 leaves):

$$\left(-216+216\,x^2+33\,x^4-33\,x^6+\left(2079\,x^4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(-\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\right)+\left(55\,x^6\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]\right)\Big/\left(15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},1,\frac{5}{2},x^2,-\frac{x^2}{3}\right]+2\,x^2\left(-\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},2,\frac{7}{2},x^2,-\frac{x^2}{3}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},1,\frac{7}{2},x^2,-\frac{x^2}{3}\right]\right)\right)\right)\Big/\left(1944\,x^3\left(1-x^2\right)^{1/3}\left(3+x^2\right)\right)$$

Problem 1031: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 136 leaves, 10 steps):

$$\frac{56}{243}\left(2-3\,x^2\right)^{3/4}-\frac{16}{567}\left(2-3\,x^2\right)^{7/4}+\frac{2}{891}\left(2-3\,x^2\right)^{11/4}+\frac{32}{81}\times 2^{1/4}\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3\,x^2}}{2^{3/4}\left(2-3\,x^2\right)^{1/4}}\right]+\frac{32}{81}\times 2^{1/4}\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3\,x^2}}{2^{3/4}\left(2-3\,x^2\right)^{1/4}}\right]$$

Result (type 5, 76 leaves):

$$-\left(\left(2\left(-3424+4056\,x^2+1242\,x^4+567\,x^6-14784\left(\frac{2-3\,x^2}{4-3\,x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{2}{4-3\,x^2}\right]\right)\right)\Big/\left(18711\left(2-3\,x^2\right)^{1/4}\right)\right)$$

Problem 1032: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 121 leaves, 7 steps):

$$\frac{4}{27}\left(2-3\,x^2\right)^{3/4}-\frac{2}{189}\left(2-3\,x^2\right)^{7/4}+\frac{8}{27}\times 2^{1/4}\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3\,x^2}}{2^{3/4}\left(2-3\,x^2\right)^{1/4}}\right]+\frac{8}{27}\times 2^{1/4}\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3\,x^2}}{2^{3/4}\left(2-3\,x^2\right)^{1/4}}\right]$$

Result (type 5, 71 leaves):

$$-\frac{1}{189\left(2-3\,x^2\right)^{1/4}}2\left(-24+30\,x^2+9\,x^4-112\left(\frac{2-3\,x^2}{4-3\,x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{2}{4-3\,x^2}\right]\right)$$

Problem 1033: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 106 leaves, 4 steps):

$$\frac{2}{27}\left(2-3x^2\right)^{3/4}+\frac{2}{9}\times 2^{1/4}\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]+\frac{2}{9}\times 2^{1/4}\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]$$

Result (type 5, 66 leaves):

$$\frac{4-6x^2+24\left(\frac{2-3x^2}{4-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{2}{4-3x^2}\right]}{27\left(2-3x^2\right)^{1/4}}$$

Problem 1035: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 145 leaves, 8 steps):

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

Result (type 6, 140 leaves):

$$\left(54x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\Big/$$
$$\left(5\left(2-3x^2\right)^{1/4}\left(-4+3x^2\right)\left(27x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+\right.\right.$$
$$\left.\left.2\left(8\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\right)\right)$$

Problem 1036: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 163 leaves, 14 steps):

$$-\frac{\left(2-3x^2\right)^{3/4}}{16x^2}+\frac{9\,\text{ArcTan}\left[\frac{\left(2-3x^2\right)^{1/4}}{2^{1/4}}\right]}{32\times 2^{1/4}}+$$
$$\frac{3\,\text{ArcTan}\left[\frac{\sqrt{2}-\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]}{16\times 2^{3/4}}-\frac{9\,\text{ArcTanh}\left[\frac{\left(2-3x^2\right)^{1/4}}{2^{1/4}}\right]}{32\times 2^{1/4}}+\frac{3\,\text{ArcTanh}\left[\frac{\sqrt{2}+\sqrt{2-3x^2}}{2^{3/4}\left(2-3x^2\right)^{1/4}}\right]}{16\times 2^{3/4}}$$

Result (type 6, 263 leaves):

$$\frac{1}{80\,x^2\,\left(2-3\,x^2\right)^{1/4}}\left(-10+15\,x^2+\left(180\,x^4\,\text{AppellF1}\left[1,\frac{1}{4},1,2,\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\Big/\left(\left(-4+3\,x^2\right)\left(16\,\text{AppellF1}\left[1,\frac{1}{4},1,2,\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+3\,x^2\left(2\,\text{AppellF1}\left[2,\frac{1}{4},2,3,\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+\text{AppellF1}\left[2,\frac{5}{4},1,3,\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\right)\right)+\left(972\,x^4\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3\,x^2},\frac{4}{3\,x^2}\right]\right)\Big/\left(\left(-4+3\,x^2\right)\left(27\,x^2\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{2}{3\,x^2},\frac{4}{3\,x^2}\right]+2\left(8\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{2}{3\,x^2},\frac{4}{3\,x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{2}{3\,x^2},\frac{4}{3\,x^2}\right]\right)\right)\right)\right)$$

Problem 1037: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 164 leaves, 6 steps):

$$\frac{2}{45}\,x\,\left(2-3\,x^2\right)^{3/4}+\frac{4\times 2^{1/4}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\,\sqrt{2-3\,x^2}}{\sqrt{3}\,x\,\left(2-3\,x^2\right)^{1/4}}\right]}{9\,\sqrt{3}}+\frac{4\times 2^{1/4}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\,\sqrt{2-3\,x^2}}{\sqrt{3}\,x\,\left(2-3\,x^2\right)^{1/4}}\right]}{9\,\sqrt{3}}-\frac{16\times 2^{1/4}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{15\,\sqrt{3}}$$

Result (type 6, 273 leaves):

$$\frac{1}{45\,\left(2-3\,x^2\right)^{1/4}}2\,x\left(2-3\,x^2+\left(32\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\Big/\left(\left(-4+3\,x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\right)\right)-\left(240\,x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\Big/\left(\left(-4+3\,x^2\right)\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+3\,x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},\frac{3\,x^2}{2},\frac{3\,x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1038: Result unnecessarily involves higher level functions.

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

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

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

Result (type 6, 140 leaves):

$$-\left(\left(20 x^3 \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/\left(3 \left(2-3 x^2\right)^{1/4} \left(-4+3 x^2\right) \left(20 \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+3 x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1039: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

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

Result (type 6, 135 leaves):

$$-\left(\left(4 x \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/\left(\left(2-3 x^2\right)^{1/4} \left(-4+3 x^2\right) \left(4 \text{AppellF1}\left[\frac{1}{2},\frac{1}{4},1,\frac{3}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+x^2 \left(2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{4},2,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+\text{AppellF1}\left[\frac{3}{2},\frac{5}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1040: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 166 leaves, 5 steps):

$$-\frac{\left(2-3x^2\right)^{3/4}}{8x}+\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{8\times 2^{3/4}}+\frac{\sqrt{3}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{8\times 2^{3/4}}-\frac{\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{4\times 2^{3/4}}$$

Result (type 6, 152 leaves):

$$\frac{1}{8x\left(2-3x^2\right)^{1/4}}\left(-2+3x^2-\left(30x^4\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(\left(-4+3x^2\right)\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1041: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 184 leaves, 8 steps):

$$-\frac{\left(2-3x^2\right)^{3/4}}{24x^3}-\frac{3\left(2-3x^2\right)^{3/4}}{16x}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{32\times 2^{3/4}}+\frac{3\sqrt{3}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{32\times 2^{3/4}}-\frac{3\sqrt{3}\,\text{EllipticE}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{8\times 2^{3/4}}$$

Result (type 6, 156 leaves):

$$\frac{1}{8}\left(2-3x^2\right)^{3/4}\left(-\frac{2+9x^2}{6x^3}+\left(9x\,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},-\frac{3}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]-3\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1042: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 78 leaves, 7 steps):

$$\frac{14}{243}\left(-1+3x^2\right)^{3/4}+\frac{8}{567}\left(-1+3x^2\right)^{7/4}+\frac{2}{891}\left(-1+3x^2\right)^{11/4}+$$
$$\frac{8}{81}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{8}{81}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 74 leaves):

$$\left(2\left(-428+1014x^2+621x^4+567x^6-1848\left(\frac{1-3x^2}{2-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2-3x^2}\right]\right)\right)\Big/$$
$$\left(18711\left(-1+3x^2\right)^{1/4}\right)$$

Problem 1043: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 63 leaves, 7 steps):

$$\frac{2}{27}\left(-1+3x^2\right)^{3/4}+\frac{2}{189}\left(-1+3x^2\right)^{7/4}+\frac{4}{27}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{4}{27}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 69 leaves):

$$\frac{1}{189\left(-1+3x^2\right)^{1/4}}2\left(-6+15x^2+9x^4-28\left(\frac{1-3x^2}{2-3x^2}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2-3x^2}\right]\right)$$

Problem 1044: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 48 leaves, 6 steps):

$$\frac{2}{27}\left(-1+3x^2\right)^{3/4}+\frac{2}{9}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{2}{9}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]$$

Result (type 5, 34 leaves):

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

Problem 1046: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 173 leaves, 16 steps):

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

Result (type 6, 137 leaves):

$$-\left(\left(54x^2\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\Big/\left(5\left(-2+3x^2\right)\left(-1+3x^2\right)^{1/4}\left(27x^2\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+8\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\right)\right)$$

Problem 1047: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 191 leaves, 17 steps):

$$-\frac{\left(-1+3x^2\right)^{3/4}}{4x^2}+\frac{3}{4}\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right]+\frac{9\,\text{ArcTan}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{8\sqrt{2}}-\frac{9\,\text{ArcTan}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}\right]}{8\sqrt{2}}-\frac{3}{4}\text{ArcTanh}\left[\left(-1+3x^2\right)^{1/4}\right]-\frac{9\,\text{Log}\left[1-\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{16\sqrt{2}}+\frac{9\,\text{Log}\left[1+\sqrt{2}\left(-1+3x^2\right)^{1/4}+\sqrt{-1+3x^2}\right]}{16\sqrt{2}}$$

Result (type 6, 252 leaves):

$$\left(5-15x^2-\left(90x^4\text{AppellF1}\left[1,\frac{1}{4},1,2,3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(\left(-2+3x^2\right)\left(8\text{AppellF1}\left[1,\frac{1}{4},1,2,3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\text{AppellF1}\left[2,\frac{1}{4},2,3,3x^2,\frac{3x^2}{2}\right]+\text{AppellF1}\left[2,\frac{5}{4},1,3,3x^2,\frac{3x^2}{2}\right]\right)\right)\right)-\left(486x^4\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\Big/\left(\left(-2+3x^2\right)\left(27x^2\text{AppellF1}\left[\frac{5}{4},\frac{1}{4},1,\frac{9}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+8\text{AppellF1}\left[\frac{9}{4},\frac{1}{4},2,\frac{13}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]+\text{AppellF1}\left[\frac{9}{4},\frac{5}{4},1,\frac{13}{4},\frac{1}{3x^2},\frac{2}{3x^2}\right]\right)\right)\right)\Big/\left(20x^2\left(-1+3x^2\right)^{1/4}\right)$$

Problem 1048: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 244 leaves, 12 steps):

$$\frac{2}{45} x \left(-1+3 x^2\right)^{3/4}+\frac{8 x \left(-1+3 x^2\right)^{1/4}}{15 \left(1+\sqrt{-1+3 x^2}\right)}-$$

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

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

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

Result (type 6, 257 leaves):

$$\frac{1}{45 \left(-1+3 x^2\right)^{1/4}} 2 x \left(-1+3 x^2-\right.$$

$$\left(4 \, \text{AppellF1}\left[\frac{1}{2}, \frac{1}{4}, 1, \frac{3}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right) \Big/ \left(\left(-2+3 x^2\right) \left(2 \, \text{AppellF1}\left[\frac{1}{2}, \frac{1}{4}, 1, \frac{3}{2}, 3 x^2, \frac{3 x^2}{2}\right]+\right.\right.$$

$$\left.\left.\left. x^2 \left(2 \, \text{AppellF1}\left[\frac{3}{2}, \frac{1}{4}, 2, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2}, \frac{5}{4}, 1, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right)\right)\right)+$$

$$\left(60 x^2 \, \text{AppellF1}\left[\frac{3}{2}, \frac{1}{4}, 1, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right) \Big/$$

$$\left(\left(-2+3 x^2\right) \left(10 \, \text{AppellF1}\left[\frac{3}{2}, \frac{1}{4}, 1, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right]+\right.\right.$$

$$\left.\left.\left. 3 x^2 \left(2 \, \text{AppellF1}\left[\frac{5}{2}, \frac{1}{4}, 2, \frac{7}{2}, 3 x^2, \frac{3 x^2}{2}\right]+\text{AppellF1}\left[\frac{5}{2}, \frac{5}{4}, 1, \frac{7}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right)\right)\right)\right)$$

Problem 1049: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 224 leaves, 7 steps):

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

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

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

Result (type 6, 132 leaves):

$$\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{4},\,1,\,\frac{5}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]\right)\Big/$$
$$\left(3\,\left(-2+3\,x^2\right)\,\left(-1+3\,x^2\right)^{1/4}\,\left(10\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{4},\,1,\,\frac{5}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]+\right.\right.$$
$$\left.\left.3\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\,\frac{1}{4},\,2,\,\frac{7}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]+\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{4},\,1,\,\frac{7}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]\right)\right)\right)$$

Problem 1050: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 6, 127 leaves):

$$\left(2\,x\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{4},\,1,\,\frac{3}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]\right)\Big/$$
$$\left(\left(-2+3\,x^2\right)\,\left(-1+3\,x^2\right)^{1/4}\,\left(2\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{4},\,1,\,\frac{3}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]+\right.\right.$$
$$\left.\left.x^2\,\left(2\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{4},\,2,\,\frac{5}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]+\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{4},\,1,\,\frac{5}{2},\,3\,x^2,\,\frac{3\,x^2}{2}\right]\right)\right)\right)$$

Problem 1051: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 246 leaves, 8 steps):

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

Result (type 6, 144 leaves):

$$\frac{1}{2x\left(-1+3x^2\right)^{1/4}}\left(1-3x^2+\left(15x^4\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(\left(-2+3x^2\right)\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+\text{AppellF1}\left[\frac{5}{2},\frac{5}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)\right)$$

Problem 1052: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 264 leaves, 14 steps):

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

Result (type 6, 148 leaves):

$$\frac{1}{2}\left(-1+3 x^2\right)^{3/4}\left(-\frac{1+9 x^2}{3 x^3}+\left(9 x \,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},3 x^2,\frac{3 x^2}{2}\right]\right)\Big/\left(\left(-2+3 x^2\right)\left(2 \,\text{AppellF1}\left[\frac{1}{2},-\frac{3}{4},1,\frac{3}{2},3 x^2,\frac{3 x^2}{2}\right]+x^2\left(2 \,\text{AppellF1}\left[\frac{3}{2},-\frac{3}{4},2,\frac{5}{2},3 x^2,\frac{3 x^2}{2}\right]-3 \,\text{AppellF1}\left[\frac{3}{2},\frac{1}{4},1,\frac{5}{2},3 x^2,\frac{3 x^2}{2}\right]\right)\right)\right)\right)$$

Problem 1053: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 129 leaves, 1 step):

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

Result (type 6, 142 leaves):

$$-\left(\left(20 x^3 \,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3 x^2}{2},-\frac{3 x^2}{4}\right]\right)\Big/\left(3\left(2+3 x^2\right)^{3/4}\left(4+3 x^2\right)\left(-20 \,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3 x^2}{2},-\frac{3 x^2}{4}\right]+3 x^2\left(2 \,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{3 x^2}{2},-\frac{3 x^2}{4}\right]+3 \,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{3 x^2}{2},-\frac{3 x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1054: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

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

Result (type 6, 142 leaves):

$$-\left(\left(20 x^3 \,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\Big/\left(3\left(2-3 x^2\right)^{3/4}\left(-4+3 x^2\right)\left(20 \,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+3 x^2\left(2 \,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]+3 \,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3 x^2}{2},\frac{3 x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1055: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 124 leaves, 1 step):

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

Result (type 6, 150 leaves):

$$-\left(\left(20 x^3 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{2},-\frac{b x^2}{4}\right]\right)\Big/\left(3 \left(2+b x^2\right)^{3/4} \left(4+b x^2\right) \left(-20 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{2},-\frac{b x^2}{4}\right]+b x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{2},-\frac{b x^2}{4}\right]+3 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{2},-\frac{b x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1056: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 119 leaves, 1 step):

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

Result (type 6, 151 leaves):

$$-\left(\left(20 x^3 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]\right)\Big/\left(3 \left(2-b x^2\right)^{3/4} \left(-4+b x^2\right) \left(20 \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]+b x^2 \left(2 \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]+3 \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{b x^2}{2},\frac{b x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1057: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

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

Result (type 6, 162 leaves):

$$-\left(\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3x^2}{a},-\frac{3x^2}{2a}\right]\right)\Big/\left(3\left(a+3x^2\right)^{3/4}\left(2a+3x^2\right)\left(-10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{3x^2}{a},-\frac{3x^2}{2a}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{3x^2}{a},-\frac{3x^2}{2a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{3x^2}{a},-\frac{3x^2}{2a}\right]\right)\right)\right)\right)$$

Problem 1058: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

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

Result (type 6, 162 leaves):

$$-\left(\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]\right)\Big/\left(3\left(a-3x^2\right)^{3/4}\left(-2a+3x^2\right)\left(10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3x^2}{a},\frac{3x^2}{2a}\right]\right)\right)\right)\right)$$

Problem 1059: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 115 leaves, 1 step):

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

Result (type 6, 171 leaves):

$$\left(10\, a\, x^3 \,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]\right) \Big/ \left(3 \left(a+b x^2\right)^{3/4} \left(2 a+b x^2\right) \left(10\, a\, \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]-b x^2 \left(2\, \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]+3\, \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b x^2}{a},-\frac{b x^2}{2 a}\right]\right)\right)\right)$$

Problem 1060: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 119 leaves, 1 step):

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

Result (type 6, 168 leaves):

$$\left(10\, a\, x^3 \,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]\right) \Big/ \left(3 \left(a-b x^2\right)^{3/4} \left(2 a-b x^2\right) \left(10\, a\, \text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]+b x^2 \left(2\, \text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]+3\, \text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{b x^2}{a},\frac{b x^2}{2 a}\right]\right)\right)\right)$$

Problem 1061: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 188 leaves, 20 steps):

$$\frac{56}{81} \left(2-3 x^2\right)^{1/4}-\frac{16}{405} \left(2-3 x^2\right)^{5/4}+\frac{2}{729} \left(2-3 x^2\right)^{9/4}-\frac{16}{81}\times 2^{3/4}\, \text{ArcTan}\left[1+\left(4-6 x^2\right)^{1/4}\right]+\frac{16}{81}\times 2^{3/4}\, \text{ArcTan}\left[1-2^{1/4} \left(2-3 x^2\right)^{1/4}\right]+\frac{8}{81}\times 2^{3/4}\, \text{Log}\left[\sqrt{2}-2^{3/4} \left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]-\frac{8}{81}\times 2^{3/4}\, \text{Log}\left[\sqrt{2}+2^{3/4} \left(2-3 x^2\right)^{1/4}+\sqrt{2-3 x^2}\right]$$

Result (type 5, 76 leaves):

$$-\frac{1}{3645 \left(2-3 x^2\right)^{3/4}} 2 \left(-2272+3096 x^2+378 x^4+135 x^6-960 \left(\frac{2-3 x^2}{4-3 x^2}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{2}{4-3 x^2}\right]\right)$$

Problem 1062: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 173 leaves, 17 steps):

$$\frac{4}{9}\left(2-3x^2\right)^{1/4}-\frac{2}{135}\left(2-3x^2\right)^{5/4}-\frac{4}{27}\times 2^{3/4}\,\text{ArcTan}\left[1+\left(4-6x^2\right)^{1/4}\right]+\frac{4}{27}\times 2^{3/4}\,\text{ArcTan}\left[1-2^{1/4}\left(2-3x^2\right)^{1/4}\right]+\frac{2}{27}\times 2^{3/4}\,\text{Log}\left[\sqrt{2}-2^{3/4}\left(2-3x^2\right)^{1/4}+\sqrt{2-3x^2}\right]-\frac{2}{27}\times 2^{3/4}\,\text{Log}\left[\sqrt{2}+2^{3/4}\left(2-3x^2\right)^{1/4}+\sqrt{2-3x^2}\right]$$

Result (type 5, 74 leaves):

$$-\frac{1}{405\left(2-3x^2\right)^{3/4}}2\left(3\left(-56+78x^2+9x^4\right)-80\left(\frac{2-3x^2}{4-3x^2}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{2}{4-3x^2}\right]\right)$$

Problem 1063: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 158 leaves, 14 steps):

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

Result (type 5, 66 leaves):

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

Problem 1065: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 197 leaves, 18 steps):

$$-\frac{\text{ArcTan}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{4\times 2^{3/4}}-\frac{\text{ArcTan}\left[1+(4-6x^2)^{1/4}\right]}{8\times 2^{1/4}}+\frac{\text{ArcTan}\left[1-2^{1/4}(2-3x^2)^{1/4}\right]}{8\times 2^{1/4}}-\frac{\text{ArcTanh}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{4\times 2^{3/4}}+\frac{\text{Log}\left[\sqrt{2}-2^{3/4}(2-3x^2)^{1/4}+\sqrt{2-3x^2}\right]}{16\times 2^{1/4}}-\frac{\text{Log}\left[\sqrt{2}+2^{3/4}(2-3x^2)^{1/4}+\sqrt{2-3x^2}\right]}{16\times 2^{1/4}}$$

Result (type 6, 139 leaves):

$$\left(66x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{4},1,\frac{11}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\Big/\left(7(2-3x^2)^{3/4}(-4+3x^2)\left(33x^2\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{4},1,\frac{11}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+16\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{4},2,\frac{15}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+6\,\text{AppellF1}\left[\frac{11}{4},\frac{7}{4},1,\frac{15}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\right)$$

Problem 1066: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 215 leaves, 24 steps):

$$-\frac{(2-3x^2)^{1/4}}{16x^2}-\frac{15\,\text{ArcTan}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{32\times 2^{3/4}}-\frac{3\,\text{ArcTan}\left[1+(4-6x^2)^{1/4}\right]}{32\times 2^{1/4}}+\frac{3\,\text{ArcTan}\left[1-2^{1/4}(2-3x^2)^{1/4}\right]}{32\times 2^{1/4}}-\frac{15\,\text{ArcTanh}\left[\frac{(2-3x^2)^{1/4}}{2^{1/4}}\right]}{32\times 2^{3/4}}+\frac{3\,\text{Log}\left[\sqrt{2}-2^{3/4}(2-3x^2)^{1/4}+\sqrt{2-3x^2}\right]}{64\times 2^{1/4}}-\frac{3\,\text{Log}\left[\sqrt{2}+2^{3/4}(2-3x^2)^{1/4}+\sqrt{2-3x^2}\right]}{64\times 2^{1/4}}$$

Result (type 6, 136 leaves):

$$\left(90\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{4},1,\frac{15}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\Big/\left(11(2-3x^2)^{3/4}(-4+3x^2)\left(45x^2\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{4},1,\frac{15}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+16\,\text{AppellF1}\left[\frac{15}{4},\frac{3}{4},2,\frac{19}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]+6\,\text{AppellF1}\left[\frac{15}{4},\frac{7}{4},1,\frac{19}{4},\frac{2}{3x^2},\frac{4}{3x^2}\right]\right)\right)$$

Problem 1067: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 182 leaves, 11 steps):

$$\frac{80}{567}x\left(2-3x^2\right)^{1/4}+\frac{2}{63}x^3\left(2-3x^2\right)^{1/4}+\frac{8\times 2^{3/4}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{27\sqrt{3}}-$$
$$\frac{8\times 2^{3/4}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{27\sqrt{3}}-\frac{160\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{567\sqrt{3}}$$

Result (type 6, 282 leaves):

$$\frac{1}{567\left(2-3x^2\right)^{3/4}}2x\left(80-102x^2-27x^4+\left(1280\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\right.$$
$$\left(\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\right.\right.$$
$$\left.\left.x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)-$$
$$\left(4960x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/$$
$$\left(\left(-4+3x^2\right)\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+\right.\right.$$
$$\left.\left.\left.6x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+9x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)$$

Problem 1068: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 164 leaves, 8 steps):

$$\frac{2}{27}x\left(2-3x^2\right)^{1/4}+\frac{2\times 2^{3/4}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{9\sqrt{3}}-$$
$$\frac{2\times 2^{3/4}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{9\sqrt{3}}-\frac{4\times 2^{3/4}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{27\sqrt{3}}$$

Result (type 6, 277 leaves):

$$\frac{1}{27\left(2-3x^2\right)^{3/4}}2x\left(2-3x^2+\left(32\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\bigg/\left(\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)-\left(160x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\bigg/\left(\left(-4+3x^2\right)\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+6x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+9x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)$$

Problem 1069: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 120 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{2-\sqrt{2}\,\sqrt{2-3x^2}}{2^{1/4}\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{3\times2^{1/4}\sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{2+\sqrt{2}\,\sqrt{2-3x^2}}{2^{1/4}\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{3\times2^{1/4}\sqrt{3}}$$

Result (type 6, 142 leaves):

$$-\left(\left(20x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\bigg/\left(3\left(2-3x^2\right)^{3/4}\left(-4+3x^2\right)\left(20\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1070: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 148 leaves, 3 steps):

$$\frac{\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{4\times2^{1/4}\sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\,\left(2-3x^2\right)^{1/4}}\right]}{4\times2^{1/4}\sqrt{3}}+\frac{\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{2\times2^{1/4}\sqrt{3}}$$

Result (type 6, 137 leaves):

$$-\left(\left(4\,x\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(\left(2-3x^2\right)^{3/4}\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1071: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 166 leaves, 7 steps):

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

Result (type 6, 140 leaves):

$$\left(4\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(x\left(2-3x^2\right)^{3/4}\left(-4+3x^2\right)\left(4\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},2,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[\frac{1}{2},\frac{7}{4},1,\frac{3}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)$$

Problem 1072: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 184 leaves, 10 steps):

$$-\frac{\left(2-3x^2\right)^{1/4}}{24x^3}-\frac{\left(2-3x^2\right)^{1/4}}{4x}+\frac{3\sqrt{3}\,\text{ArcTan}\left[\frac{2^{3/4}-2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{64\times 2^{1/4}}-\frac{3\sqrt{3}\,\text{ArcTanh}\left[\frac{2^{3/4}+2^{1/4}\sqrt{2-3x^2}}{\sqrt{3}\,x\left(2-3x^2\right)^{1/4}}\right]}{64\times 2^{1/4}}+\frac{11\sqrt{3}\,\text{EllipticF}\left[\frac{1}{2}\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],2\right]}{32\times 2^{1/4}}$$

Result (type 6, 142 leaves):

$$-\left(\left(4\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\Big/\left(3x^3\left(2-3x^2\right)^{3/4}\left(-4+3x^2\right)\left(-4\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3x^2\left(2\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},2,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]+3\,\text{AppellF1}\left[-\frac{1}{2},\frac{7}{4},1,\frac{1}{2},\frac{3x^2}{2},\frac{3x^2}{4}\right]\right)\right)\right)\right)$$

Problem 1073: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 6, 134 leaves):

$$\left(10x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(3\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1074: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 6, 134 leaves):

$$\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]\right)\Big/\left(3\,\left(-1-3\,x^2\right)^{3/4}\,\left(2+3\,x^2\right)\,\left(-10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]+3\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-3\,x^2,-\frac{3\,x^2}{2}\right]\right)\right)\right)$$

Problem 1075: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 72 leaves, 1 step):

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

Result (type 6, 138 leaves):

$$\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},b\,x^2,\frac{b\,x^2}{2}\right]\right)\Big/\left(3\,\left(-2+b\,x^2\right)\,\left(-1+b\,x^2\right)^{3/4}\,\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},b\,x^2,\frac{b\,x^2}{2}\right]+b\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},b\,x^2,\frac{b\,x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},b\,x^2,\frac{b\,x^2}{2}\right]\right)\right)\right)$$

Problem 1076: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 74 leaves, 1 step):

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

Result (type 6, 143 leaves):

$$\left(10\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]\right)\Big/\left(3\,\left(-1-b\,x^2\right)^{3/4}\,\left(2+b\,x^2\right)\,\left(-10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]+b\,x^2\,\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-b\,x^2,-\frac{b\,x^2}{2}\right]\right)\right)\right)$$

Problem 1077: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 85 leaves, 1 step):

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

Result (type 6, 164 leaves):

$$\left(10 a x^3 \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, 1, \frac{5}{2}, \frac{3 x^2}{a}, \frac{3 x^2}{2 a}\right]\right) \Big/ \left(3 \left(-2 a+3 x^2\right) \left(-a+3 x^2\right)^{3/4} \left(10 a \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, 1, \frac{5}{2}, \frac{3 x^2}{a}, \frac{3 x^2}{2 a}\right] + 3 x^2 \left(2 \text{AppellF1}\left[\frac{5}{2}, \frac{3}{4}, 2, \frac{7}{2}, \frac{3 x^2}{a}, \frac{3 x^2}{2 a}\right] + 3 \text{AppellF1}\left[\frac{5}{2}, \frac{7}{4}, 1, \frac{7}{2}, \frac{3 x^2}{a}, \frac{3 x^2}{2 a}\right]\right)\right)\right)$$

Problem 1078: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 85 leaves, 1 step):

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

Result (type 6, 164 leaves):

$$\left(10 a x^3 \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, 1, \frac{5}{2}, -\frac{3 x^2}{a}, -\frac{3 x^2}{2 a}\right]\right) \Big/ \left(3 \left(-a-3 x^2\right)^{3/4} \left(2 a+3 x^2\right) \left(-10 a \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, 1, \frac{5}{2}, -\frac{3 x^2}{a}, -\frac{3 x^2}{2 a}\right] + 3 x^2 \left(2 \text{AppellF1}\left[\frac{5}{2}, \frac{3}{4}, 2, \frac{7}{2}, -\frac{3 x^2}{a}, -\frac{3 x^2}{2 a}\right] + 3 \text{AppellF1}\left[\frac{5}{2}, \frac{7}{4}, 1, \frac{7}{2}, -\frac{3 x^2}{a}, -\frac{3 x^2}{2 a}\right]\right)\right)\right)$$

Problem 1079: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 96 leaves, 1 step):

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

Result (type 6, 169 leaves):

$$-\left(\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]\right)\Big/\left(3\,\left(2\,a-b\,x^2\right)\,\left(-a+b\,x^2\right)^{3/4}\left(10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]+b\,x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},\frac{b\,x^2}{a},\frac{b\,x^2}{2\,a}\right]\right)\right)\right)\right)$$

Problem 1080: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 98 leaves, 1 step):

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

Result (type 6, 174 leaves):

$$-\left(\left(10\,a\,x^3\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{2\,a}\right]\right)\Big/\left(3\,\left(-a-b\,x^2\right)^{3/4}\left(2\,a+b\,x^2\right)\left(10\,a\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{2\,a}\right]-b\,x^2\left(2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{2\,a}\right]+3\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{b\,x^2}{2\,a}\right]\right)\right)\right)\right)$$

Problem 1081: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 78 leaves, 7 steps):

$$\frac{14}{81}\left(-1+3\,x^2\right)^{1/4}+\frac{8}{405}\left(-1+3\,x^2\right)^{5/4}+\frac{2}{729}\left(-1+3\,x^2\right)^{9/4}-\frac{8}{81}\,\text{ArcTan}\left[\left(-1+3\,x^2\right)^{1/4}\right]-\frac{8}{81}\,\text{ArcTanh}\left[\left(-1+3\,x^2\right)^{1/4}\right]$$

Result (type 5, 74 leaves):

$$\left(2\left(-284+774\,x^2+189\,x^4+135\,x^6-120\left(\frac{1-3\,x^2}{2-3\,x^2}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2-3\,x^2}\right]\right)\right)\Big/\left(3645\,\left(-1+3\,x^2\right)^{3/4}\right)$$

Problem 1082: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 63 leaves, 7 steps):

$$\frac{2}{9} \left(-1+3 x^2\right)^{1/4}+\frac{2}{135} \left(-1+3 x^2\right)^{5/4}-\frac{4}{27} \text{ArcTan}\left[\left(-1+3 x^2\right)^{1/4}\right]-\frac{4}{27} \text{ArcTanh}\left[\left(-1+3 x^2\right)^{1/4}\right]$$

Result (type 5, 69 leaves):

$$\frac{1}{405 \left(-1+3 x^2\right)^{3/4}} 2 \left(-42+117 x^2+27 x^4-20 \left(\frac{1-3 x^2}{2-3 x^2}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2-3 x^2}\right]\right)$$

Problem 1083: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 48 leaves, 6 steps):

$$\frac{2}{9} \left(-1+3 x^2\right)^{1/4}-\frac{2}{9} \text{ArcTan}\left[\left(-1+3 x^2\right)^{1/4}\right]-\frac{2}{9} \text{ArcTanh}\left[\left(-1+3 x^2\right)^{1/4}\right]$$

Result (type 5, 34 leaves):

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

Problem 1085: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 173 leaves, 16 steps):

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

Result (type 6, 139 leaves):

$$-\left(\left(66\, x^2\, \text{AppellF1}\left[\frac{7}{4}, \frac{3}{4}, 1, \frac{11}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]\right)\Big/\left(7\, \left(-2+3\, x^2\right)\, \left(-1+3\, x^2\right)^{3/4}\, \left(33\, x^2\, \text{AppellF1}\left[\frac{7}{4}, \frac{3}{4}, 1, \frac{11}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]+8\, \text{AppellF1}\left[\frac{11}{4}, \frac{3}{4}, 2, \frac{15}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]+3\, \text{AppellF1}\left[\frac{11}{4}, \frac{7}{4}, 1, \frac{15}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]\right)\right)\right)$$

Problem 1086: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 191 leaves, 17 steps):

$$-\frac{\left(-1+3\, x^2\right)^{1/4}}{4\, x^2}-\frac{3}{4}\, \text{ArcTan}\left[\left(-1+3\, x^2\right)^{1/4}\right]+\frac{15\, \text{ArcTan}\left[1-\sqrt{2}\, \left(-1+3\, x^2\right)^{1/4}\right]}{8\, \sqrt{2}}-\frac{15\, \text{ArcTan}\left[1+\sqrt{2}\, \left(-1+3\, x^2\right)^{1/4}\right]}{8\, \sqrt{2}}-\frac{3}{4}\, \text{ArcTanh}\left[\left(-1+3\, x^2\right)^{1/4}\right]+\frac{15\, \text{Log}\left[1-\sqrt{2}\, \left(-1+3\, x^2\right)^{1/4}+\sqrt{-1+3\, x^2}\right]}{16\, \sqrt{2}}-\frac{15\, \text{Log}\left[1+\sqrt{2}\, \left(-1+3\, x^2\right)^{1/4}+\sqrt{-1+3\, x^2}\right]}{16\, \sqrt{2}}$$

Result (type 6, 136 leaves):

$$-\left(\left(90\, \text{AppellF1}\left[\frac{11}{4}, \frac{3}{4}, 1, \frac{15}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]\right)\Big/\left(11\, \left(-2+3\, x^2\right)\, \left(-1+3\, x^2\right)^{3/4}\, \left(45\, x^2\, \text{AppellF1}\left[\frac{11}{4}, \frac{3}{4}, 1, \frac{15}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]+8\, \text{AppellF1}\left[\frac{15}{4}, \frac{3}{4}, 2, \frac{19}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]+3\, \text{AppellF1}\left[\frac{15}{4}, \frac{7}{4}, 1, \frac{19}{4}, \frac{1}{3\, x^2}, \frac{2}{3\, x^2}\right]\right)\right)\right)$$

Problem 1087: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 165 leaves, 15 steps):

$$\frac{40}{567}\, x\, \left(-1+3\, x^2\right)^{1/4}+\frac{2}{63}\, x^3\, \left(-1+3\, x^2\right)^{1/4}+\frac{2}{27}\, \sqrt{\frac{2}{3}}\, \text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\, x}{\left(-1+3\, x^2\right)^{1/4}}\right]-\frac{2}{27}\, \sqrt{\frac{2}{3}}\, \text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\, x}{\left(-1+3\, x^2\right)^{1/4}}\right]+\frac{1}{567\, \sqrt{3}\, x}$$
$$40\, \sqrt{\frac{x^2}{\left(1+\sqrt{-1+3\, x^2}\right)^2}}\, \left(1+\sqrt{-1+3\, x^2}\right)\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\left(-1+3\, x^2\right)^{1/4}\right], \frac{1}{2}\right]$$

Result (type 6, 266 leaves):

$$\frac{1}{567\left(-1+3x^2\right)^{3/4}}2x\left(-20+51x^2+27x^4-\left(80\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(\left(-2+3x^2\right)\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)+\left(620x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(\left(-2+3x^2\right)\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+6x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+9x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1088: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 147 leaves, 11 steps):

$$\frac{2}{27}x\left(-1+3x^2\right)^{1/4}+\frac{1}{9}\sqrt{\frac{2}{3}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]-\frac{1}{9}\sqrt{\frac{2}{3}}\,\text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}}\,x}{\left(-1+3x^2\right)^{1/4}}\right]+\frac{1}{27\sqrt{3}\,x}2\sqrt{\frac{x^2}{\left(1+\sqrt{-1+3x^2}\right)^2}}\left(1+\sqrt{-1+3x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(-1+3x^2\right)^{1/4}\right],\frac{1}{2}\right]$$

Result (type 6, 261 leaves):

$$\frac{1}{27\left(-1+3x^2\right)^{3/4}}2x\left(-1+3x^2-\left(4\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(\left(-2+3x^2\right)\left(2\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{4},1,\frac{3}{2},3x^2,\frac{3x^2}{2}\right]+x^2\left(2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},2,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)+\left(40x^2\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/\left(\left(-2+3x^2\right)\left(10\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{4},1,\frac{5}{2},3x^2,\frac{3x^2}{2}\right]+6x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{4},2,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]+9x^2\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{4},1,\frac{7}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1089: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 6, 134 leaves):

$$\left(10 x^3 \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, 1, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right) \Big/ \left(3 \left(-2+3 x^2\right) \left(-1+3 x^2\right)^{3/4} \left(10 \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, 1, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right] + 3 x^2 \left(2 \text{AppellF1}\left[\frac{5}{2}, \frac{3}{4}, 2, \frac{7}{2}, 3 x^2, \frac{3 x^2}{2}\right] + 3 \text{AppellF1}\left[\frac{5}{2}, \frac{7}{4}, 1, \frac{7}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right)\right)\right)$$

Problem 1090: Result unnecessarily involves higher level functions.

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

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

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

Result (type 6, 129 leaves):

$$\left(2 x \text{AppellF1}\left[\frac{1}{2}, \frac{3}{4}, 1, \frac{3}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right) \Big/ \left(\left(-2+3 x^2\right) \left(-1+3 x^2\right)^{3/4} \left(2 \text{AppellF1}\left[\frac{1}{2}, \frac{3}{4}, 1, \frac{3}{2}, 3 x^2, \frac{3 x^2}{2}\right] + x^2 \left(2 \text{AppellF1}\left[\frac{3}{2}, \frac{3}{4}, 2, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right] + 3 \text{AppellF1}\left[\frac{3}{2}, \frac{7}{4}, 1, \frac{5}{2}, 3 x^2, \frac{3 x^2}{2}\right]\right)\right)\right)$$

Problem 1091: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 149 leaves, 9 steps):

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

Result (type 6, 132 leaves):

$$-\left(\left(2 \text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},3 x^2,\frac{3 x^2}{2}\right]\right)\Big/\left(x \left(-2+3 x^2\right) \left(-1+3 x^2\right)^{3/4} \left(2 \text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},1,\frac{1}{2},3 x^2,\frac{3 x^2}{2}\right]+3 x^2 \left(2 \text{AppellF1}\left[\frac{1}{2},\frac{3}{4},2,\frac{3}{2},3 x^2,\frac{3 x^2}{2}\right]+3 \text{AppellF1}\left[\frac{1}{2},\frac{7}{4},1,\frac{3}{2},3 x^2,\frac{3 x^2}{2}\right]\right)\right)\right)\right)$$

Problem 1092: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 165 leaves, 13 steps):

$$-\frac{\left(-1+3 x^2\right)^{1/4}}{6 x^3}-\frac{2 \left(-1+3 x^2\right)^{1/4}}{x}+\frac{3}{8} \sqrt{\frac{3}{2}} \text{ArcTan}\left[\frac{\sqrt{\frac{3}{2}} x}{\left(-1+3 x^2\right)^{1/4}}\right]-\frac{3}{8} \sqrt{\frac{3}{2}} \text{ArcTanh}\left[\frac{\sqrt{\frac{3}{2}} x}{\left(-1+3 x^2\right)^{1/4}}\right]-\frac{1}{8 x}11 \sqrt{3} \sqrt{\frac{x^2}{\left(1+\sqrt{-1+3 x^2}\right)^2}} \left(1+\sqrt{-1+3 x^2}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\left(-1+3 x^2\right)^{1/4}\right],\frac{1}{2}\right]$$

Result (type 6, 134 leaves):

$$\left(2\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},3x^2,\frac{3x^2}{2}\right]\right)\Big/$$
$$\left(3x^3\left(-2+3x^2\right)\left(-1+3x^2\right)^{3/4}\left(-2\,\text{AppellF1}\left[-\frac{3}{2},\frac{3}{4},1,-\frac{1}{2},3x^2,\frac{3x^2}{2}\right]+\right.\right.$$
$$\left.\left.3x^2\left(2\,\text{AppellF1}\left[-\frac{1}{2},\frac{3}{4},2,\frac{1}{2},3x^2,\frac{3x^2}{2}\right]+3\,\text{AppellF1}\left[-\frac{1}{2},\frac{7}{4},1,\frac{1}{2},3x^2,\frac{3x^2}{2}\right]\right)\right)\right)$$

Problem 1093: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 173 leaves, 7 steps):

$$\frac{(8bc-7ad)\,e\,(e\,x)^{3/2}\left(a+b\,x^2\right)^{1/4}}{16\,b^2}+\frac{d\,(e\,x)^{7/2}\left(a+b\,x^2\right)^{1/4}}{4\,b\,e}+$$
$$\frac{3a\,(8bc-7ad)\,e^{5/2}\,\text{ArcTan}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{32\,b^{11/4}}-\frac{3a\,(8bc-7ad)\,e^{5/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{32\,b^{11/4}}$$

Result (type 5, 97 leaves):

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

Problem 1094: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 136 leaves, 6 steps):

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

Result (type 5, 80 leaves):

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

Problem 1095: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 113 leaves, 6 steps):

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

Result (type 5, 77 leaves):

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

Problem 1099: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 180 leaves, 8 steps):

$$-\frac{a (10 b c - 9 a d) e^3 \sqrt{e x} \left(a + b x^2\right)^{1/4}}{12 b^3} + \frac{(10 b c - 9 a d) e (e x)^{5/2} \left(a + b x^2\right)^{1/4}}{30 b^2} + \frac{d (e x)^{9/2} \left(a + b x^2\right)^{1/4}}{5 b e} - \left(a^{3/2} (10 b c - 9 a d) e^2 \left(1 + \frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \operatorname{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]\right) \Big/ \left(12 b^{5/2} \left(a + b x^2\right)^{3/4}\right)$$

Result (type 5, 123 leaves):

$$\frac{1}{60 b^3 \left(a + b x^2\right)^{3/4}} e^3 \sqrt{e x} \left(\left(a + b x^2\right) \left(45 a^2 d + 4 b^2 x^2 \left(5 c + 3 d x^2\right) - 2 a b \left(25 c + 9 d x^2\right)\right) + 5 a^2 (10 b c - 9 a d) \left(1 + \frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^2}{a}\right]\right)$$

Problem 1100: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 139 leaves, 7 steps):

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

Result (type 5, 97 leaves):

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

Problem 1101: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 77 leaves):

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

Problem 1102: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 107 leaves, 6 steps):

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

Result (type 5, 84 leaves):

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

Problem 1103: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 144 leaves, 7 steps):

$$-\frac{2 c \left(a+b x^2\right)^{1/4}}{7 a e (e x)^{7/2}}+\frac{2 (6 b c-7 a d) \left(a+b x^2\right)^{1/4}}{21 a^2 e^3 (e x)^{3/2}}-\left(4 b^{3/2} (6 b c-7 a d) \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]\right) \Big/ \left(21 a^{5/2} e^6 \left(a+b x^2\right)^{3/4}\right)$$

Result (type 5, 107 leaves):

$$-\left(\left(2 \sqrt{e x} \left(\left(a+b x^2\right) \left(3 a c-6 b c x^2+7 a d x^2\right)+2 b (-6 b c+7 a d) x^4 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^2}{a}\right]\right)\right) \Big/ \left(21 a^2 e^5 x^4 \left(a+b x^2\right)^{3/4}\right)\right)$$

Problem 1104: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 182 leaves, 8 steps):

$$-\frac{2 c \left(a+b x^2\right)^{1/4}}{11 a e (e x)^{11/2}}+\frac{2 (10 b c-11 a d) \left(a+b x^2\right)^{1/4}}{77 a^2 e^3 (e x)^{7/2}}-\frac{4 b (10 b c-11 a d) \left(a+b x^2\right)^{1/4}}{77 a^3 e^5 (e x)^{3/2}}+\left(8 b^{5/2} (10 b c-11 a d) \left(1+\frac{a}{b x^2}\right)^{3/4} (e x)^{3/2} \text{EllipticF}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right], 2\right]\right) \Big/ \left(77 a^{7/2} e^8 \left(a+b x^2\right)^{3/4}\right)$$

Result (type 5, 132 leaves):

$$\left(\sqrt{e x} \left(-2 \left(a+b x^2\right) \left(20 b^2 c x^4-2 a b x^2 \left(5 c+11 d x^2\right)+a^2 \left(7 c+11 d x^2\right)\right)+8 b^2 (-10 b c+11 a d) x^6 \left(1+\frac{b x^2}{a}\right)^{3/4} \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, -\frac{b x^2}{a}\right]\right)\right) \Big/ \left(77 a^3 e^7 x^6 \left(a+b x^2\right)^{3/4}\right)$$

Problem 1105: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 171 leaves, 7 steps):

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

Result (type 5, 84 leaves):

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

Problem 1106: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 122 leaves, 6 steps):

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

Result (type 5, 71 leaves):

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

Problem 1110: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{9/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{5/4}} \, dx$$

Optimal (type 4, 180 leaves, 6 steps):

$$-\frac{7 a (10 b c-11 a d) e^3 (e x)^{3/2}}{60 b^3 \left(a+b x^2\right)^{1/4}}+\frac{(10 b c-11 a d) e (e x)^{7/2}}{30 b^2 \left(a+b x^2\right)^{1/4}}+\frac{d (e x)^{11/2}}{5 b e \left(a+b x^2\right)^{1/4}}-\left(7 a^{3/2} (10 b c-11 a d) e^4 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{e x} \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]\right)\Big/\left(20 b^{7/2} \left(a+b x^2\right)^{1/4}\right)$$

Result (type 5, 111 leaves):

$$\frac{1}{30\, b^3\, \left(a+b\, x^2\right)^{1/4}} e^3\, (e\, x)^{3/2} \left(-77\, a^2\, d+a\, b\, \left(70\, c-11\, d\, x^2\right)+2\, b^2\, x^2\, \left(5\, c+3\, d\, x^2\right)+ 7\, a\, \left(-10\, b\, c+11\, a\, d\right)\, \left(1+\frac{b\, x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\, x^2}{a}\right]\right)$$

Problem 1111: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 142 leaves, 5 steps):

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

Result (type 5, 84 leaves):

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

Problem 1112: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 81 leaves):

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

Problem 1113: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 93 leaves):

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

Problem 1114: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 144 leaves, 5 steps):

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

Result (type 5, 114 leaves):

$$\left(x\,\left(72\,b^2\,c\,x^4-6\,a^2\,\left(c+5\,d\,x^2\right)+12\,a\,b\,\left(3\,c\,x^2-5\,d\,x^4\right)+8\,b\,\left(-6\,b\,c+5\,a\,d\right)\,x^4\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{3}{4},\,\frac{7}{4},\,-\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(15\,a^3\,\left(e\,x\right)^{7/2}\,\left(a+b\,x^2\right)^{1/4}\right)$$

Problem 1115: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 182 leaves, 6 steps):

$$-\frac{2\,c}{9\,a\,e\,\left(e\,x\right)^{9/2}\,\left(a+b\,x^2\right)^{1/4}}+\frac{2\,\left(10\,b\,c-9\,a\,d\right)}{45\,a^2\,e^3\,\left(e\,x\right)^{5/2}\,\left(a+b\,x^2\right)^{1/4}}-\frac{4\,b\,\left(10\,b\,c-9\,a\,d\right)}{15\,a^3\,e^5\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^{1/4}}+\left(8\,b^{3/2}\,\left(10\,b\,c-9\,a\,d\right)\,\left(1+\frac{a}{b\,x^2}\right)^{1/4}\,\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],\,2\right]\right)\Big/\left(15\,a^{7/2}\,e^6\,\left(a+b\,x^2\right)^{1/4}\right)$$

Result (type 5, 143 leaves):

$$-\left(\left(2\sqrt{e\,x}\left(120\,b^3\,c\,x^6+12\,a\,b^2\,x^4\left(5\,c-9\,d\,x^2\right)+a^3\left(5\,c+9\,d\,x^2\right)-2\,a^2\,b\,x^2\left(5\,c+27\,d\,x^2\right)+8\,b^2\left(-10\,b\,c+9\,a\,d\right)\,x^6\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(45\,a^4\,e^6\,x^5\left(a+b\,x^2\right)^{1/4}\right)\right)$$

Problem 1116: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 184 leaves, 7 steps):

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

Result (type 5, 85 leaves):

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

Problem 1117: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 125 leaves, 6 steps):

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

Result (type 5, 73 leaves):

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

Problem 1121: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 192 leaves, 8 steps):

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

Result (type 5, 110 leaves):

$$\frac{1}{6\,b^3\,\left(a+b\,x^2\right)^{3/4}}e^3\,\sqrt{e\,x}\,\left(-15\,a^2\,d+a\,b\,\left(10\,c-9\,d\,x^2\right)+2\,b^2\,x^2\,\left(3\,c+d\,x^2\right)+5\,a\,(-2\,b\,c+3\,a\,d)\,\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1122: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 152 leaves, 7 steps):

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

Result (type 5, 85 leaves):

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

Problem 1123: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 116 leaves, 6 steps):

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

Result (type 5, 79 leaves):

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

Problem 1124: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 144 leaves, 7 steps):

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

Result (type 5, 91 leaves):

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

Problem 1125: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{9/2}\,\left(a+b\,x^2\right)^{7/4}}\,dx$$

Optimal (type 4, 181 leaves, 8 steps):

$$-\frac{2\,c}{7\,a\,e\,(e\,x)^{7/2}\,\left(a+b\,x^2\right)^{3/4}}-\frac{2\,\left(10\,b\,c-7\,a\,d\right)}{21\,a^2\,e^3\,(e\,x)^{3/2}\,\left(a+b\,x^2\right)^{3/4}}+\frac{4\,\left(10\,b\,c-7\,a\,d\right)\left(a+b\,x^2\right)^{1/4}}{21\,a^3\,e^3\,(e\,x)^{3/2}}-\left(8\,b^{3/2}\,\left(10\,b\,c-7\,a\,d\right)\left(1+\frac{a}{b\,x^2}\right)^{3/4}(e\,x)^{3/2}\,\text{EllipticF}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]\right)\Big/\left(21\,a^{7/2}\,e^6\,\left(a+b\,x^2\right)^{3/4}\right)$$

Result (type 5, 121 leaves):

$$\left(\sqrt{e\,x}\,\left(40\,b^2\,c\,x^4+4\,a\,b\,x^2\left(5\,c-7\,d\,x^2\right)-2\,a^2\left(3\,c+7\,d\,x^2\right)+8\,b\,\left(10\,b\,c-7\,a\,d\right)x^4\left(1+\frac{b\,x^2}{a}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(21\,a^3\,e^5\,x^4\,\left(a+b\,x^2\right)^{3/4}\right)$$

Problem 1126: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^{7/2}\,\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{9/4}}\,dx$$

Optimal (type 3, 221 leaves, 8 steps):

$$\frac{2\,(b\,c-a\,d)\,(e\,x)^{9/2}}{5\,a\,b\,e\,\left(a+b\,x^2\right)^{5/4}}-\frac{(4\,b\,c-9\,a\,d)\,e^3\,\sqrt{e\,x}}{2\,b^3\,\left(a+b\,x^2\right)^{1/4}}-\frac{(4\,b\,c-9\,a\,d)\,e\,(e\,x)^{5/2}}{10\,a\,b^2\,\left(a+b\,x^2\right)^{1/4}}+\frac{(4\,b\,c-9\,a\,d)\,e^{7/2}\,\text{ArcTan}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{13/4}}+\frac{(4\,b\,c-9\,a\,d)\,e^{7/2}\,\text{ArcTanh}\left[\frac{b^{1/4}\,\sqrt{e\,x}}{\sqrt{e}\,\left(a+b\,x^2\right)^{1/4}}\right]}{4\,b^{13/4}}$$

Result (type 5, 116 leaves):

$$\frac{1}{10\,b^3\,\left(a+b\,x^2\right)^{5/4}}e^3\,\sqrt{e\,x}\,\left(45\,a^2\,d+b^2\,x^2\,\left(-24\,c+5\,d\,x^2\right)+a\,b\,\left(-20\,c+54\,d\,x^2\right)+5\,(4\,b\,c-9\,a\,d)\,\left(a+b\,x^2\right)\,\left(1+\frac{b\,x^2}{a}\right)^{1/4}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},-\frac{b\,x^2}{a}\right]\right)$$

Problem 1127: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 149 leaves, 7 steps):

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

Result (type 5, 96 leaves):

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

Problem 1132: Result unnecessarily involves higher level functions.

$$\int \frac{(e\,x)^{13/2}\,\left(c+d\,x^2\right)}{\left(a+b\,x^2\right)^{9/4}}\,dx$$

Optimal (type 4, 230 leaves, 7 steps):

$$\frac{2 (b c-a d) (e x)^{15/2}}{5 a b e \left(a+b x^2\right)^{5/4}}-\frac{77 a (2 b c-3 a d) e^5 (e x)^{3/2}}{60 b^4 \left(a+b x^2\right)^{1/4}}+\frac{11 (2 b c-3 a d) e^3 (e x)^{7/2}}{30 b^3 \left(a+b x^2\right)^{1/4}}-\frac{(2 b c-3 a d) e (e x)^{11/2}}{5 a b^2 \left(a+b x^2\right)^{1/4}}-\left(77 a^{3/2} (2 b c-3 a d) e^6 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{e x}\ \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b}\ x}{\sqrt{a}}\right],2\right]\right)\Big/\left(20 b^{9/2} \left(a+b x^2\right)^{1/4}\right)$$

Result (type 5, 139 leaves):

$$\frac{1}{30 b^4 \left(a+b x^2\right)^{5/4}} e^5 (e x)^{3/2} \left(-231 a^3 d+a b^2 x^2 \left(176 c-15 d x^2\right)+22 a^2 b \left(7 c-12 d x^2\right)+2 b^3 x^4 \left(5 c+3 d x^2\right)+77 a (-2 b c+3 a d) \left(a+b x^2\right) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^2}{a}\right]\right)$$

Problem 1133: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 192 leaves, 6 steps):

$$\frac{2 (b c-a d) (e x)^{11/2}}{5 a b e \left(a+b x^2\right)^{5/4}}+\frac{7 (6 b c-11 a d) e^3 (e x)^{3/2}}{30 b^3 \left(a+b x^2\right)^{1/4}}-\frac{(6 b c-11 a d) e (e x)^{7/2}}{15 a b^2 \left(a+b x^2\right)^{1/4}}+\left(7 \sqrt{a} (6 b c-11 a d) e^4 \left(1+\frac{a}{b x^2}\right)^{1/4} \sqrt{e x}\ \text{EllipticE}\left[\frac{1}{2} \text{ArcCot}\left[\frac{\sqrt{b}\ x}{\sqrt{a}}\right],2\right]\right)\Big/\left(10 b^{7/2} \left(a+b x^2\right)^{1/4}\right)$$

Result (type 5, 116 leaves):

$$\frac{1}{15 b^3 \left(a+b x^2\right)^{5/4}} e^3 (e x)^{3/2} \left(77 a^2 d+b^2 x^2 \left(-48 c+5 d x^2\right)+a b \left(-42 c+88 d x^2\right)+7 (6 b c-11 a d) \left(a+b x^2\right) \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b x^2}{a}\right]\right)$$

Problem 1134: Result unnecessarily involves higher level functions.

$$\int \frac{(e x)^{5/2} \left(c+d x^2\right)}{\left(a+b x^2\right)^{9/4}} \, dx$$

Optimal (type 4, 155 leaves, 5 steps):

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

Result (type 5, 107 leaves):

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

Problem 1135: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 111 leaves):

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

Problem 1136: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 142 leaves, 5 steps):

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

Result (type 5, 120 leaves):

$$\left(x\left(-72\,b^2\,c\,x^4-6\,a^2\left(5\,c-3\,d\,x^2\right)+12\,a\,b\,x^2\left(-9\,c+d\,x^2\right)-8\left(-6\,b\,c+a\,d\right)x^2\left(a+b\,x^2\right)\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(15\,a^3\,(e\,x)^{3/2}\left(a+b\,x^2\right)^{5/4}\right)$$

Problem 1137: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{7/2}\left(a+b\,x^2\right)^{9/4}}\,dx$$

Optimal (type 4, 181 leaves, 6 steps):

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

Result (type 5, 140 leaves):

$$\left(x\left(48\,b^3\,c\,x^6-24\,a\,b^2\,x^4\left(-3\,c+d\,x^2\right)-2\,a^3\left(c+5\,d\,x^2\right)-4\,a^2\,b\,x^2\left(-5\,c+9\,d\,x^2\right)+16\,b\left(-2\,b\,c+a\,d\right)x^4\left(a+b\,x^2\right)\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(5\,a^4\,(e\,x)^{7/2}\left(a+b\,x^2\right)^{5/4}\right)$$

Problem 1138: Result unnecessarily involves higher level functions.

$$\int\frac{c+d\,x^2}{(e\,x)^{11/2}\left(a+b\,x^2\right)^{9/4}}\,dx$$

Optimal (type 4, 219 leaves, 7 steps):

$$-\frac{2\,c}{9\,a\,e\,(e\,x)^{9/2}\left(a+b\,x^2\right)^{5/4}}-\frac{2\left(14\,b\,c-9\,a\,d\right)}{45\,a^2\,e^3\,(e\,x)^{5/2}\left(a+b\,x^2\right)^{5/4}}+\frac{4\left(14\,b\,c-9\,a\,d\right)}{45\,a^3\,e^3\,(e\,x)^{5/2}\left(a+b\,x^2\right)^{1/4}}-\frac{8\,b\left(14\,b\,c-9\,a\,d\right)}{15\,a^4\,e^5\,\sqrt{e\,x}\left(a+b\,x^2\right)^{1/4}}+\left(16\,b^{3/2}\left(14\,b\,c-9\,a\,d\right)\left(1+\frac{a}{b\,x^2}\right)^{1/4}\sqrt{e\,x}\,\text{EllipticE}\left[\frac{1}{2}\,\text{ArcCot}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]\right)\Big/\left(15\,a^{9/2}\,e^6\left(a+b\,x^2\right)^{1/4}\right)$$

Result (type 5, 171 leaves):

$$-\left(\left(2\sqrt{e\,x}\left(336\,b^4\,c\,x^8+4\,a^2\,b^2\,x^4\left(35\,c-81\,d\,x^2\right)+72\,a\,b^3\,x^6\left(7\,c-3\,d\,x^2\right)+a^4\left(5\,c+9\,d\,x^2\right)-2\,a^3\,b\,x^2\left(7\,c+45\,d\,x^2\right)+16\,b^2\left(-14\,b\,c+9\,a\,d\right)x^6\left(a+b\,x^2\right)\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{3}{4},\frac{7}{4},-\frac{b\,x^2}{a}\right]\right)\right)\Big/\left(45\,a^5\,e^6\,x^5\left(a+b\,x^2\right)^{5/4}\right)\right)$$

Problem 1139: Result more than twice size of optimal antiderivative.

$$\int(e\,x)^m\left(a+b\,x^2\right)^p\left(c+d\,x^2\right)^q\,dx$$

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

$$\frac{1}{e\,(1+m)}(e\,x)^{1+m}\left(a+b\,x^2\right)^p\left(1+\frac{b\,x^2}{a}\right)^{-p}\left(c+d\,x^2\right)^q\left(1+\frac{d\,x^2}{c}\right)^{-q}\text{AppellF1}\left[\frac{1+m}{2},-p,-q,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 218 leaves):

$$\left(a\,c\,(3+m)\,x\,(e\,x)^m\left(a+b\,x^2\right)^p\left(c+d\,x^2\right)^q\text{AppellF1}\left[\frac{1+m}{2},-p,-q,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left((1+m)\left(a\,c\,(3+m)\,\text{AppellF1}\left[\frac{1+m}{2},-p,-q,\frac{3+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+2\,x^2\left(b\,c\,p\,\text{AppellF1}\left[\frac{3+m}{2},1-p,-q,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{3+m}{2},-p,1-q,\frac{5+m}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 1140: Result more than twice size of optimal antiderivative.

$$\int x^4\left(a+b\,x^2\right)^p\left(c+d\,x^2\right)^q\,dx$$

Optimal (type 6, 84 leaves, 3 steps):

$$\frac{1}{5}x^5\left(a+b\,x^2\right)^p\left(1+\frac{b\,x^2}{a}\right)^{-p}\left(c+d\,x^2\right)^q\left(1+\frac{d\,x^2}{c}\right)^{-q}\text{AppellF1}\left[\frac{5}{2},-p,-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]$$

Result (type 6, 176 leaves):

$$\left(7\,a\,c\,x^5\left(a+b\,x^2\right)^p\left(c+d\,x^2\right)^q\text{AppellF1}\left[\frac{5}{2},-p,-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\Big/\left(5\left(7\,a\,c\,\text{AppellF1}\left[\frac{5}{2},-p,-q,\frac{7}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+2\,x^2\left(b\,c\,p\,\text{AppellF1}\left[\frac{7}{2},1-p,-q,\frac{9}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{7}{2},-p,1-q,\frac{9}{2},-\frac{b\,x^2}{a},-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 1141: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 84 leaves, 3 steps):

$$\frac{1}{3} x^3 \left(a+b x^2\right)^p \left(1+\frac{b x^2}{a}\right)^{-p} \left(c+d x^2\right)^q \left(1+\frac{d x^2}{c}\right)^{-q} \text{AppellF1}\left[\frac{3}{2},-p,-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]$$

Result (type 6, 174 leaves):

$$\left(5 a c x^3 \left(a+b x^2\right)^p \left(c+d x^2\right)^q \text{AppellF1}\left[\frac{3}{2},-p,-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/ \left(15 a c \text{AppellF1}\left[\frac{3}{2},-p,-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right] + 6 x^2 \left(b c p \text{AppellF1}\left[\frac{5}{2},1-p,-q,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right] + a d q \text{AppellF1}\left[\frac{5}{2},-p,1-q,\frac{7}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)$$

Problem 1142: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 79 leaves, 3 steps):

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

Result (type 6, 172 leaves):

$$\left(3 a c x \left(a+b x^2\right)^p \left(c+d x^2\right)^q \text{AppellF1}\left[\frac{1}{2},-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right) \Big/ \left(3 a c \text{AppellF1}\left[\frac{1}{2},-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right] + 2 x^2 \left(b c p \text{AppellF1}\left[\frac{3}{2},1-p,-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right] + a d q \text{AppellF1}\left[\frac{3}{2},-p,1-q,\frac{5}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)$$

Problem 1143: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 82 leaves, 3 steps):

$$-\frac{1}{x}\left(a+b x^2\right)^p\left(1+\frac{b x^2}{a}\right)^{-p}\left(c+d x^2\right)^q\left(1+\frac{d x^2}{c}\right)^{-q}\text{AppellF1}\left[-\frac{1}{2},-p,-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]$$

Result (type 6, 171 leaves):

$$-\left(\left(a c\left(a+b x^2\right)^p\left(c+d x^2\right)^q\text{AppellF1}\left[-\frac{1}{2},-p,-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(a c x\,\text{AppellF1}\left[-\frac{1}{2},-p,-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+2 x^3\left(b c p\,\text{AppellF1}\left[\frac{1}{2},1-p,-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d q\,\text{AppellF1}\left[\frac{1}{2},-p,1-q,\frac{3}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 1144: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 84 leaves, 3 steps):

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

Result (type 6, 173 leaves):

$$\left(a c\left(a+b x^2\right)^p\left(c+d x^2\right)^q\text{AppellF1}\left[-\frac{3}{2},-p,-q,-\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/\left(-3 a c x^3\,\text{AppellF1}\left[-\frac{3}{2},-p,-q,-\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+6 x^5\left(b c p\,\text{AppellF1}\left[-\frac{1}{2},1-p,-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d q\,\text{AppellF1}\left[-\frac{1}{2},-p,1-q,\frac{1}{2},-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)$$

Problem 1145: Result unnecessarily involves higher level functions.

$$\int x^5\left(a+b x^2\right)^p\left(c+d x^2\right)^q\,dx$$

Optimal (type 5, 242 leaves, 5 steps):

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

Result (type 6, 160 leaves):

$$\left(2 a c x^6 \left(a+b x^2\right)^p \left(c+d x^2\right)^q \text{AppellF1}\left[3,-p,-q,4,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/$$
$$\left(3 \left(4 a c \text{AppellF1}\left[3,-p,-q,4,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+b c p x^2 \text{AppellF1}\left[4,1-p,\right.\right.\right.$$
$$\left.\left.\left.-q,5,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+a d q x^2 \text{AppellF1}\left[4,-p,1-q,5,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)$$

Problem 1146: Result unnecessarily involves higher level functions.

$$\int x^3 \left(a+b x^2\right)^p \left(c+d x^2\right)^q \, dx$$

Optimal (type 5, 146 leaves, 4 steps):

$$\frac{\left(a+b x^2\right)^{1+p} \left(c+d x^2\right)^{1+q}}{2 b d (2+p+q)}-\left(\left(b c (1+p)+a d (1+q)\right) \left(a+b x^2\right)^{1+p} \left(c+d x^2\right)^q \left(\frac{b \left(c+d x^2\right)}{b c-a d}\right)^{-q}\right.$$
$$\left.\text{Hypergeometric2F1}\left[1+p,-q,2+p,-\frac{d \left(a+b x^2\right)}{b c-a d}\right]\right)\Big/\left(2 b^2 d (1+p) (2+p+q)\right)$$

Result (type 6, 159 leaves):

$$\left(3 a c x^4 \left(a+b x^2\right)^p \left(c+d x^2\right)^q \text{AppellF1}\left[2,-p,-q,3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\Big/$$
$$\left(4 \left(3 a c \text{AppellF1}\left[2,-p,-q,3,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.\right.$$
$$x^2 \left(b c p \text{AppellF1}\left[3,1-p,-q,4,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]+\right.$$
$$\left.\left.\left.a d q \text{AppellF1}\left[3,-p,1-q,4,-\frac{b x^2}{a},-\frac{d x^2}{c}\right]\right)\right)\right)$$

Problem 1148: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 97 leaves, 3 steps):

$$-\frac{1}{2\,a\,(1+p)}\left(a+b\,x^2\right)^{1+p}\left(c+d\,x^2\right)^q\left(\frac{b\,(c+d\,x^2)}{b\,c-a\,d}\right)^{-q}\text{AppellF1}\left[1+p,\,-q,\,1,\,2+p,\,-\frac{d\,(a+b\,x^2)}{b\,c-a\,d},\,\frac{a+b\,x^2}{a}\right]$$

Result (type 6, 225 leaves):

$$\left(b\,d\,(-1+p+q)\,x^2\,(a+b\,x^2)^p\,(c+d\,x^2)^q\,\text{AppellF1}\left[-p-q,\,-p,\,-q,\,1-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\Big/\left(2\,(p+q)\left(b\,d\,(-1+p+q)\,x^2\,\text{AppellF1}\left[-p-q,\,-p,\,-q,\,1-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-a\,d\,p\,\text{AppellF1}\left[1-p-q,\,1-p,\,-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-b\,c\,q\,\text{AppellF1}\left[1-p-q,\,-p,\,1-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 1149: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 98 leaves, 3 steps):

$$\frac{1}{2\,a^2\,(1+p)}b\left(a+b\,x^2\right)^{1+p}\left(c+d\,x^2\right)^q\left(\frac{b\,(c+d\,x^2)}{b\,c-a\,d}\right)^{-q}\text{AppellF1}\left[1+p,\,-q,\,2,\,2+p,\,-\frac{d\,(a+b\,x^2)}{b\,c-a\,d},\,\frac{a+b\,x^2}{a}\right]$$

Result (type 6, 225 leaves):

$$\left(b\,d\,(-2+p+q)\,(a+b\,x^2)^p\,(c+d\,x^2)^q\,\text{AppellF1}\left[1-p-q,\,-p,\,-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\Big/\left(2\,(-1+p+q)\left(b\,d\,(-2+p+q)\,x^2\,\text{AppellF1}\left[1-p-q,\,-p,\,-q,\,2-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-a\,d\,p\,\text{AppellF1}\left[2-p-q,\,1-p,\,-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-b\,c\,q\,\text{AppellF1}\left[2-p-q,\,-p,\,1-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 1150: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 100 leaves, 3 steps):

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

Result (type 6, 228 leaves):

$$\left(b\,d\,(-3+p+q)\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[2-p-q,\,-p,\,-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\Big/\left(2\,(-2+p+q)\,x^2\,\left(b\,d\,(-3+p+q)\,x^2\,\text{AppellF1}\left[2-p-q,\,-p,\,-q,\,3-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-a\,d\,p\,\text{AppellF1}\left[3-p-q,\,1-p,\,-q,\,4-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]-b\,c\,q\,\text{AppellF1}\left[3-p-q,\,-p,\,1-q,\,4-p-q,\,-\frac{a}{b\,x^2},\,-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 1154: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 89 leaves, 3 steps):

$$\frac{1}{e}2\,\sqrt{e\,x}\,\left(a+b\,x^2\right)^p\,\left(1+\frac{b\,x^2}{a}\right)^{-p}\,\left(c+d\,x^2\right)^q\,\left(1+\frac{d\,x^2}{c}\right)^{-q}\,\text{AppellF1}\left[\frac{1}{4},\,-p,\,-q,\,\frac{5}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]$$

Result (type 6, 179 leaves):

$$\left(10\,a\,c\,x\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[\frac{1}{4},\,-p,\,-q,\,\frac{5}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Big/\left(\sqrt{e\,x}\,\left(5\,a\,c\,\text{AppellF1}\left[\frac{1}{4},\,-p,\,-q,\,\frac{5}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+4\,x^2\,\left(b\,c\,p\,\text{AppellF1}\left[\frac{5}{4},\,1-p,\,-q,\,\frac{9}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{5}{4},\,-p,\,1-q,\,\frac{9}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)$$

Problem 1155: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 89 leaves, 3 steps):

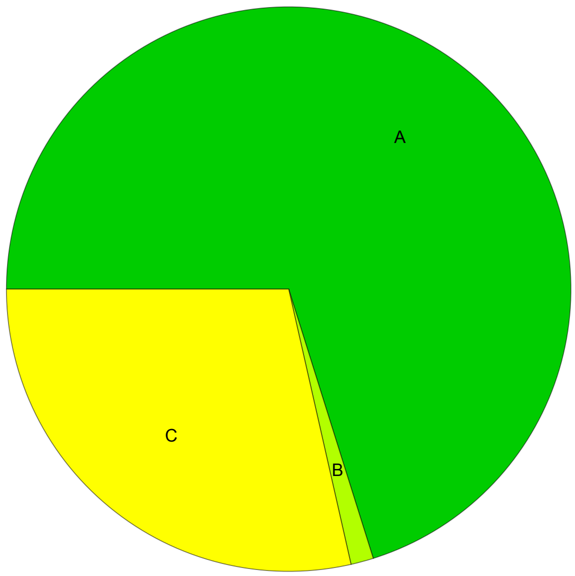
$$-\frac{1}{e\,\sqrt{e\,x}}2\,\left(a+b\,x^2\right)^p\,\left(1+\frac{b\,x^2}{a}\right)^{-p}\,\left(c+d\,x^2\right)^q\,\left(1+\frac{d\,x^2}{c}\right)^{-q}\,\text{AppellF1}\left[-\frac{1}{4},\,-p,\,-q,\,\frac{3}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]$$

Result (type 6, 179 leaves):

$$-\left(\left(6\,a\,c\,x\,\left(a+b\,x^2\right)^p\,\left(c+d\,x^2\right)^q\,\text{AppellF1}\left[-\frac{1}{4},\,-p,\,-q,\,\frac{3}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\Big/\left((e\,x)^{3/2}\,\left(3\,a\,c\,\text{AppellF1}\left[-\frac{1}{4},\,-p,\,-q,\,\frac{3}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+4\,x^2\,\left(b\,c\,p\,\text{AppellF1}\left[\frac{3}{4},\,1-p,\,-q,\,\frac{7}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{3}{4},\,-p,\,1-q,\,\frac{7}{4},\,-\frac{b\,x^2}{a},\,-\frac{d\,x^2}{c}\right]\right)\right)\right)\right)$$

Summary of Integration Test Results

1156 integration problems



A - 811 optimal antiderivatives

B - 15 more than twice size of optimal antiderivatives

C - 330 unnecessarily complex antiderivatives

D - 0 unable to integrate problems

E - 0 integration timeouts